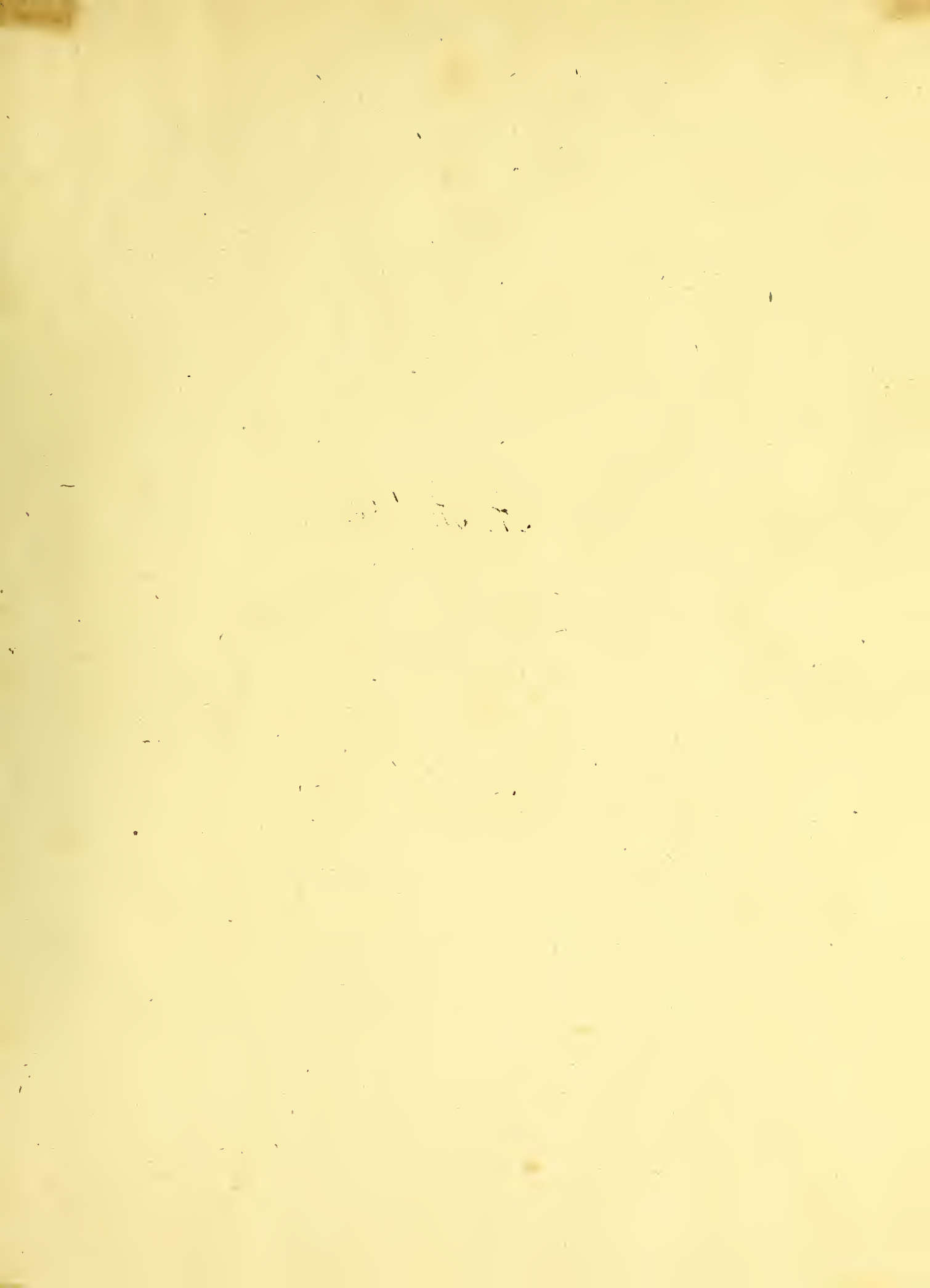
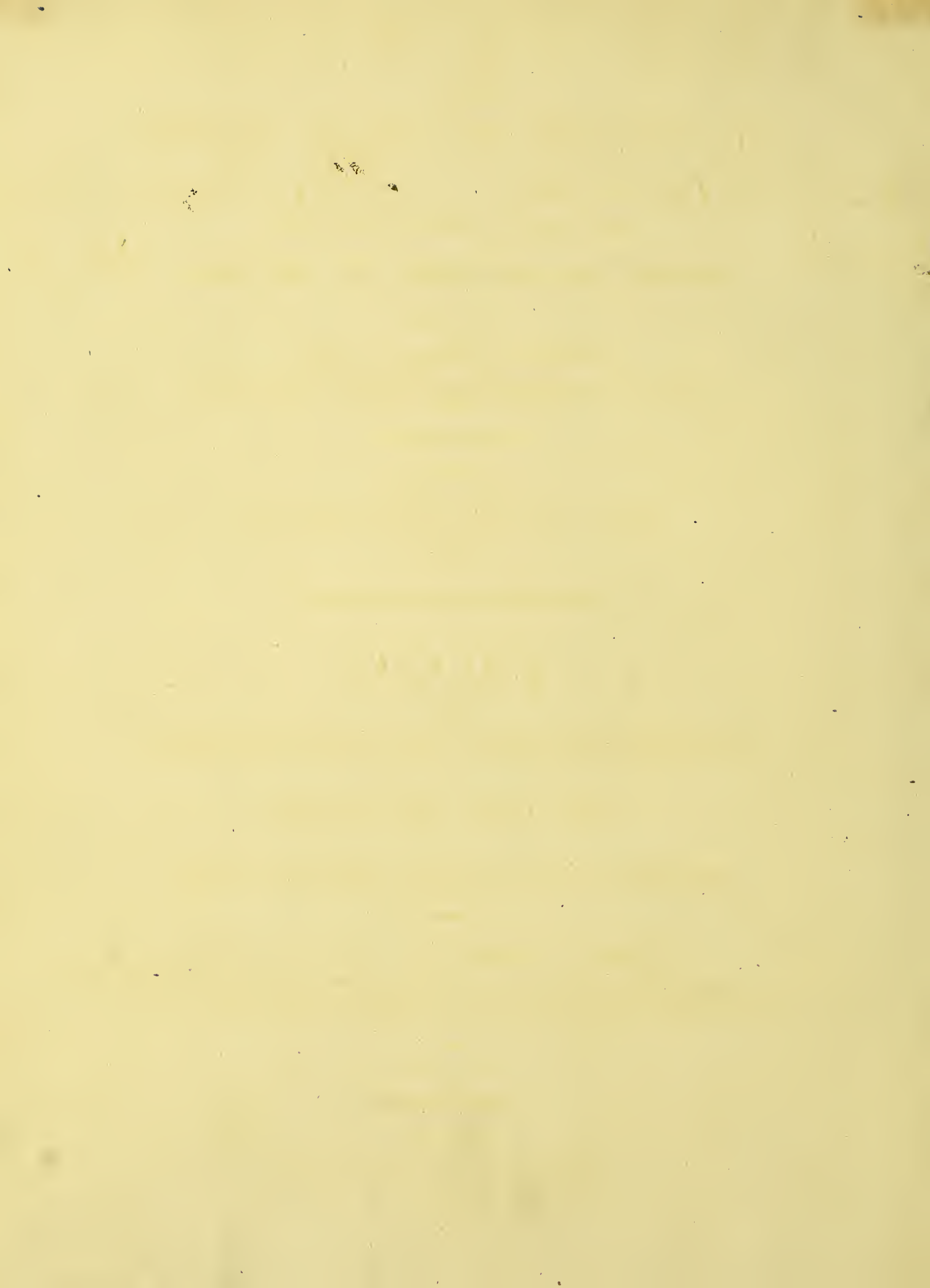


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F U C I

SIVE.

PLANTARUM FUCORUM GENERI

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BOTANICIS ASCRIPTARUM

ICONES DESCRIPTIONES ET HISTORIA.

W. J. G.

AUCTORE

DAWSON TURNER, ARM. M.A.

REG. ANT. ET LINN. SOC. NECNON IMP. AC. NAT. CUR. REG. AC. HIB. ET
ALIAM SOCIETATUM SOCIO.

LONDINI:

TYPIS J. M'CREERY.

IMPENSIS J. ET A. ARCH, IN VICO CORNHILL DICTO.

MDCCCXI.

F U C I;

OR,

COLORED FIGURES AND DESCRIPTIONS

OF THE PLANTS

REFERRED BY BOTANISTS TO THE GENUS FUCUS.

BY DAWSON TURNER, Esq. A. M. F. R. A. & L. S.

HONORARY MEMBER OF THE IMPERIAL ACADEMY NATURE CURIOSORUM, OF THE ROYAL IRISH ACADEMY,
OF THE HONORABLE DUBLIN SOCIETY, OF THE NATURAL HISTORY AND WERNERIAN SOCIETIES
OF EDINBURGH, OF THE PHYSICAL SOCIETY OF GOTTINGEN, &c. &c.

VOL. III.

LONDON:

PRINTED BY J. M'CREERY, FLEET-STREET,
FOR JOHN AND ARTHUR ARCH, 61, CORNHILL.

1811.

HISTORIA FUCORUM.

135.—FUCUS TOMENTOSUS.

Fucus, fronde tomentosâ, teretiusculâ, filiformi, dichotomâ, totâ compactâ ex utriculis clavatis, horizontalibus, per filamenta capillaria tubulosa ramosa densissimè intertextis: capsulis lanceolatis, utriculorum ad latera sessilibus.

Fucus tomentosus. *Fl. Ang.* p. 584. (excl. syn. Linn.) *WITH.* IV. p. 107. *Ner. Brit.* p. 21. t. 7. *Linn. Trans.* III. p. 195. *Eng. Bot.* X. t. 712. *Syn. Fuc.* II. p. 300. *ESPER, Ic. Fuc.* II. p. 1. t. 112. *CLEMENTE.* p. 319.

F. fungosus. *Fl. Atl.* II. p. 428.

Ulva tomentosa. *Fl. Fr. Éd. 2da.* II. p. 6.

Spongia dichotomos teretifolia viridis. *RAII Syn.* p. 29. n. 3.

Spongia dichotomos compressa, ex viridi splendens. *RAII Syn.* p. 29. n. 4.

Fucus spongiosus teres ramosior viridis erectus. *MORIS. Hist. Ox.* III. p. 647. s. 15. t. 8. f. 7.

Lamarckia stirpe ramosa subdichotoma, ramulis cylindricis apice obtusis. **OLIVI, in Usteri's Annalen.* VII. p. 80.

β . *marginifer*; fronde dichotomâ, ubique ramis brevibus horizontalibus bifurcis dichotomisque e marginibus proliferâ.

γ . *sub-palmatus*; fronde basi terete, sursùm complanatâ dilatâtâque, apices versus palmatâ, segmentis brevibus teretibus.

δ . *elongatus*; fronde terete, sexpedali et ultrâ, sparsim et remotè dichotomâ.

Ulva decorticata. *WOODWARD, in Linn. Trans.* III. p. 55.

HABITAT Angliæ Australis ad oras; in Cornubiâ, copiosè.—In Devoniâ, apud Exmouth. *D. T. Frankland, Baronetus*.—Apud Ilfracombe. *D^{na} Hill*.—In Comitatu, Clare. *D. Mackay*.—In littore Comitatus Antrim, passim. *D. Scott*.—In Sinu, “Bantry Bay.” *D^{na} Hutchins*.—Galliæ ad oras, in Oceano et Mari Mediterraneo. *Decandolle*.—Circa Algeciras, Tarifa, Gades et alibi. *Clemente*.—In Mari Numidico. *Desfontaines*.—Apud Nootka Sound. *D. Menzies*.—Ad Caput Bonæ Spei. *D. Brand, in Herb. Banks*.— β in Sinu, “Bantry Bay.” *D^{na} Hutchins*— γ . prope Gades. *D. S. de Roxas Clemente*.— δ e Mari Mediterraneo accepit *D. Wigg*.

Perennis. Junio, Julio.

RADIX, ut verbis idoneis utar, nulla, sed frons, radicis loco, saxis iustrata iis artissimè adhæret, et tapete denso lato informi velutino, Lichenis cujusdam crustacei vel potiùs *Confervæ amphibix* aut *velutinæ* ad instar, obducit.

FRONDES ex eâdem basi plurimæ, teretes, vel levitè compressæ, filiformes, longitudine, ut plurimum, sex pollicum, et pennæ anserinæ crassitie, interdùm autem quindecim pollices longæ digitoque auriculari crassiores, ipsam prope basin bifurcæ, atque exinde dichotomiis multoties repetitis intervallo inter singulas incerto ramosæ; furcarum anguli obtusiusculi; segmenta omnia fastigiata; apices semper rotundati obtusique, plerumque emarginati:—Fuci hujus frons tota constat e congerie filamentorum capillaceorum, ramosorum, artissimè implexorum (longitudinalitèr dispositorum?) ex quibus oriuntur utriculi homogenei, haud lineam longi, sparsi, simplices, tubulosi, claviformes, horizontalitèr semper positi, apicibus incrassatis frondis superficiem, quæ, ita sibi densissimè incumbunt, omninò nihil est nisi horum congeries, attingentes: fructificationis tempore, ex utriculorum parte superiore apices versus oriuntur filamenta alia simplicia, lutescentia, tenuissima, utriculis ipsis ter quater longiora, per quæ planta faciem mollissimè villosam induit.

FRUCTIFICATIO capsulæ exiguæ, oblongo-lanceolatæ, nigro-virides, utriculorum ad latera sessiles; quarum tamen moles perpusilla prohibuit quominùs quod in se includunt ritè perspicerem: semina certè nulla vidi.

COLOR intensè gramineus, *exsiccatæ* nigro tinctus, nec rarò nitens; *diu in aquâ dulci servatæ* pallidior, et primùm in lurido-virescentem, mox in sordidè albicantem evanidus.

SUBSTANTIA tenuis, membranacea, tactu mollis; *in recente* firma, *in marcescente* flaccida.

Varietas β formam servat speciei propriam dichotomam frondemque teretiusculam, sed ubique pullulat ramis horizontalibus, abbreviatis, bifidis dichotomisve. In reliquis cum plantæ facie usitatâ convenit.

In unico varietatis γ quod vidi exemplare frons quatuor circitèr pollices longa ad dimidiam altitudinem teres atque dichotoma pennæ anserinæ minoris crassitiem servat; deinceps compressa se sensim dilatât, donec apices versus plana facta ad pollicis ferè latitudinem explanatur, atque ibi palmatim finditur in segmenta plurima teretiuscula abbreviata.

VOL III.

B

Varietatem

* Tractatum de *Lamarckia* in *Zoologiâ suâ Adriaticâ* edidit Olivi, qui cùm liber ad manus non sit, verba ejus sicut ab Ustero tradita invenio citare cogor.

Varietatem ꝛ casu nauta aliquis ad D. Wigg reportavit, et in *Societatis Linnæanæ Actis* sub *Ulvæ decorticatæ* nomine descripsit Woodwardius. Habitus huic strictus ab illo *F. tomentosi* abludit: color arenaceus, sicut in plantâ multas tempestatis mutationes perpessâ; longitudo plusquam sexpedalis; crassities digiti auricularis; frons dichotoma, ramis longissimis, non sæpiùs quàm bis terve divisis. Facies omninò *Fuci lorei*; itâ ut aliquis exsiccatum videns facile pro illo læso præteriret: fructificatio adest.

Obs. Stirps facie externâ spongiâs magis quàm Fucos refert, et, illarum instar, madefacta aquæ plurimum imbibit, quam, si perstringas, citò reddit; nequaquam verò est intùs cava:—exsiccatione in membranâ crassiusculam comprimitur, quæ chartæ laxissimè adhæret:—extra aquam aliquot horas servata odorem gravem fœdumque spirat:—*Flustra pilosa*, *Fucus palmatus* aut *phyllitis* et *Conferva rubra* non rarè ejus perrepunt ramos.

Dum Fucorum familiam perlustro, stirpem quærens cujus iconem novî hujusce operis tomi fronti præfigerem, invenio nullam *F. tomentoso* anteponendam; nulla enim structurâ magis singulari gaudet, et nulla Historiæ Naturalis Cultorum acumen ad se suamque indolem bene intelligendam intensiùs poscit. Talis quidem est hæc structura qualis effecit ut multum diuque sit disceptatum ubinam in naturæ systemate rectiùs poneretur. Botanici omnes antiqui uno ore ad *Spongiâs* retulendam conclamârunt, sic revera Regno Animalî associantes; neque nostro in ævo desunt quibus eadem stat sententia. Hoc facerent quoque plurimi e facie judicantes externâ; oculo enim inermi *Spongiam* prorsùs refert; quamvis vegetabile dixerunt cuncti, quotquot ad illa vocârunt examina, quæ inter animalia et plantas certissimi habentur testes. * De hæc re, sicut et de internâ hujusce atque insequentis *Fuci* structurâ, doctè multa in *Zoologiâ* suâ *Adriaticâ* disseruit rev. Olivius; promittens se mox alium de his plantis editurum tractatum seorsum; quod fecerit, necne, nihil pro comperto habeo. † Rectissimè hic, si pro characteribus genericis structurâ niti liceat, ex his ‡ duobus *Fucis* novum genus constituit, quod ipsi *Lamarkia* audit, nomine desumpto a botanico clarissimo Gallico, viro, si quis alius, summis qui penes Historiam Naturalem sunt honores dignissimo qui decoraretur. Huic ille generi insequentem quo designaretur characterem proponit; de quo memorandum est pro fructu haberi materiem illam viridem, e quâ stirpis color pendet, quæ totam frondem recentem implet, sed, marcescente plantâ, hic illic in parvas figuræ enormis congeries areascit, reliquas frondis partes coloris expertes pellucidâsque relinquens:

“*LAMARKIA. Stirps radicata sub-coriacea mollis, composita utriculis in axim perpendicularibus.*”

“*Utriculi membranacei virides cylindrici approximati utrinque filamentis tubulosis tenuissimis connectentibus terminati. Fructificatio. Globuli inter utriculos et filamenta sparsi.*”

Liquet ex hoc veram *F. tomentosî* fructificationem Olivium latuisse, neque aliquis hanc unquam, quod scio, viderat botanicus, priusquam æstate novissimâ detexit D^{na} Hutchins, cujus amicitia gratâ mente accepta refero plurima de hoc *Fuco* suprâ memorata, unâ cum icone. hic depictâ, ab ipsâ ad exemplar vivum delineatâ. Animadvertit illa fibras eas tenuissimas, quæ utriculorum ex apicibus exortæ plantam totam, fimbriâ more, cingunt, fructûs modò tempore adesse; in quo, sicut in fronde epidermidis experte, hæc stirps multum affinitatis cum *Rivulariis* prodit. Quamvis, uti jamjam in descriptione est dictum, capsularum moles perpusilla vetuit ne quidnam in se includunt ritè perspiceretur, nihilominus horum apparet structura ei reliquæ frondis absimilis, differentiamque arguit essentialem quòd per exsiccationem hæ immutatæ atro-virides maneant, dum utriculi colore penitus carent. Multum erravit Hudsonus, qui *F. elongatum* Linnæi *F. tomentoso* pro synonymo adjunxit; quod contra, sicut ex ejus herbario constat, nihil est nisi *F. lorei* varietas levis, vix digna quæ memoraretur. Obiter inspicienti videtur *F. tomentosus* ad *Confervæ spongiosæ* structuram accedere; re tamen accuratiùs lustratâ, evanescit omnis inter has plantas similitudo; *C. spongiosa* enim et congeneres et ramulis constant brevibus setaceis densè imbricatis costæ centrali heterogeneæ affixis, dum *F. tomentosus* nihil habet ejusmodi, sed totus est filamentorum utriculorumque intertextorum congeries.

- a. *F. tomentosus*, magn. nat.
- b. *frondis fructiferæ pars*.
- c. *ejusdem portio*, magn. auct. - - - 4.
- d. *utriculus cum capsulâ* - - - 2.

* Ut lectoribus quibus Olivi tractatum adeundi non datur potestas morem geram, exscribenda duco præcipua ex illis quæ de hæc re memorat; “Una fabbrica semplicissima di null’altro composta, che di un puro aggregato di otricelli cavi pellucidi e ripieni d’un fluido trasparente acqueo, e soltanto muniti di altri minimi filamenti capillari destinati ad assorbire l’acqua e ad espellere i semi già manifestamente riconoscibili; una fabbrica in cui queste parti tutte uniformi non sono composte che da una membrana sottile equabile consistente lucida compatta secca e perfettamente simile nel tessuto e in tutti gli altri caratteri a quelle, onde sono formati i Fuchi le Conferve e le Ulve, una fabbrica che, invece di spappolarsi e corrompersi, resiste e si secca, che non ha la più piccola porzione gelatinosa vivente, e che putrefacendosi non dà nè odore nè residuo animale; una fabbrica che non palesa alcun movimento spontaneo, nè il più piccolo indizio di sentimento; una fabbrica finalmente che, come le Alghe, ha i semi globosi, e collocati nei vasellini membranosi componenti tutto il suo corpo, che in una spezie è quasi sferica, e mezzo vuota come alcuni funghi, e in un’ altra è dirittamente come la maggior parte dei fuchi; questa fabbrica non può essere assolutamente se non vegetabile, e dessa è appunto quella della Bursa del Baulin e della Vermillara dell’ Imperato.”—His omnibus, sicut Olivius memorat, obstat modò unicum, quòd *F. Bursæ* frons pertusa violentè se contrahat, sed hoc e motu quodam merè [mechanico] pendere censet. Simili quoque, nullus dubito, causæ ascribendum est quiddam de *F. tomentoso* a D^{na} Hutchins observatum, scilicet ramos arte dispositos explanatosque interdùm rursùs revolvendo sese claudere.

† Idem quoque fecit Stackhousius, qui ex *F. tomentoso* genus distinctum *Codium* nominatum construxit, sequentibus notis dignoscendum:—*Fructificatio in tubulis implicatis;—frons cylindrico-compressa; statu madido spongiformis; sicco, tomentoso.*—*Ner. Brit. Pref.* p. xxiv.

‡ Nullam aliam Algam *F. tomentoso* et *F. Bursæ* associandam in præsens vidi, nisi forsan pro distinctâ specie agnosceretur *Fucus*, nuperrimè a D. S. de Roxas Clemente acceptus, de quo tradit, rupes prope Gades velamine denso velutino maculis informibus velare. Hunc e speciminibus inmissis tantummodò esse *F. tomentosum* ætate primâ suspicor. Servatur in D. Brown Herbario *Fucus* e Novâ Hollandiâ reportatus inter quem et *F. tomentosum* affinitas quædam interest.



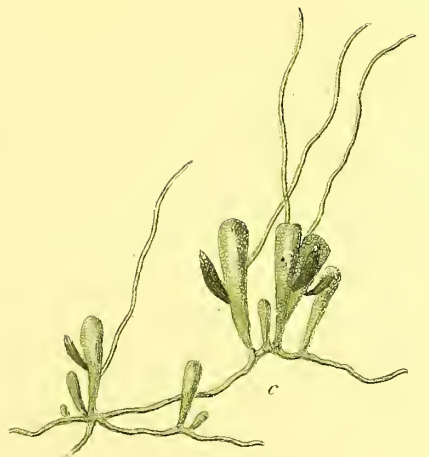
a



b




d



c

Fucus tomentosus.



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HISTORY OF THE FUCI.

135.—FUCUS TOMENTOSUS.

Fucus tomentosus, frond woolly, sub-cylindrical, filiform, dichotomous, wholly composed of clavate, horizontal vesicles, most closely matted together by capillary, tubular, branching fibres: capsules lanceolate, sessile on the sides of the vesicles.

Fucus tomentosus. *Fl. Ang.* p. 584. (excl. syn. Linn.) WITH. IV. p. 107. *Ner. Brit.* p. 21. t. 7. *Linn. Trans.* III. p. 195. *Eng. Bot.* X. t. 712. *Syn. Fuc.* II. p. 300. *ESPER, Ic. Fuc.* II. p. 1. t. 112. CLEMENTE. p. 319.

F. fungosus. *Fl. Atl.* II. p. 428.

Spongia dichotomos teretifolia viridis. *RAII Syn.* p. 29. n. 3.

Spongia dichotomos compressa ex viridi splendens. *RAII Syn.* p. 29. n. 4.

Fucus spongiosus teres ramosior viridis erectus. *MORIS. Hist. Or.* III. p. 647. s. 15. t. 8. f. 7.

Lamarckia stirpe ramosa sub-dichotoma, ramulis cylindricis apice obtusis. * *OLIVI, in Usteri's Annalen.* VII. p. 80.

β. *marginifer*; frond dichotomous, beset all over with short, horizontal, forked, or dichotomous segments.

γ. *sub-palmatus*; frond cylindrical at its base, flattened and widened upwards, and near its apices palmate with short cylindrical segments.

δ. *elongatus*; frond cylindrical, six feet or more long, dichotomous at very distant intervals.

Ulva decorticata. *WOODWARD, in Linn. Trans.* III. p. 55.

Southern coast of England; at King's Cove and St. Michael's Mount, in Cornwall, plentiful.—Exmouth. *Sir Thomas Frankland*.—Ilfracombe. *Miss Hill*.—Coast of the County of Clare. *Mr. Mackay*.—County of Antrim. *Dr. Scott*.—Bantry Bay, in immense abundance. *Miss Hutchins*.—French coast, both towards the Atlantic and the Mediterranean. *Decandolle*.—About Algeciras, Tarifa, and Cadiz, where γ was found. *Clemente*.—Numidian sea. *Desfontaines*.—Nootka Sound. *Mr. Menzies*.—Cape of Good Hope. *Mr. Brand*, in the Banksian Herbarium.—β in Bantry Bay. *Miss Hutchins*.—δ sent from the Mediterranean to *Mr. Wigg*.

Perennial. June, July.

ROOT, to speak properly, none, but the plant grows over the rocks, and adheres closely to them, covering them with wide, shapeless, velvety patches, like some crustaceous Lichen, or, rather like *Conferca amphibia*, or *velutina*.

FRONDS, numerous from the same base, cylindrical, or slightly compressed, filiform, generally about six inches long, and as thick as a goose-quill, but sometimes extending in length to fifteen inches, and equalling in thickness the little finger, forked near the base, and repeatedly dichotomous, at irregular intervals, with rather obtuse angles; the segments are all of nearly equal height; the apices constantly rounded and blunt, and mostly emarginate:—the whole frond of this *Fucus* is composed of a mass of capillary, branched filaments, most closely matted together, and probably disposed in a longitudinal direction, out of which grow a series of vesicles not a liue long, scattered, simple, tubular, club-shaped, placed horizontally, with their thickened apices reaching the surface of the frond, which, from their great number, is altogether a mass of them:—these vesicles, at the time of fructification, throw out from their upper part other very thin, simple, yellowish filaments, three or four times longer than themselves, which give the whole plant a more than usually soft and woolly appearance.

FRUCTIFICATION, small, blackish-green capsules, of a shape between oblong and lanceolate, sessile on the sides of the vesicles:—the small size of these prevented me from obtaining any correct idea of their contents, but I could discover no seeds.

COLOR, deep grass-green, tinged with black when dry, and frequently glossy; turning paler if kept long in fresh water, and fading at first into a lurid light-green, and afterwards to a dirty white.

SUBSTANCE, thin, membranaceous, soft to the touch; firm when the plant is fresh, but flaccid after it has been some time gathered.

The variety β has the common dichotomous mode of growth of the species, and the sub-cylindrical frond, but is all over covered with short, horizontal, bifid, or dichotomous branches:—in other respects it agrees with the common appearance of the plant.

In

* I am under the necessity of referring to the copy of this author's treatise on the genus *Lamarckia* in *Usteri's Annalen*, having no opportunity of consulting his *Zoologia Adriatica*, in which it was originally published.

In the only specimen that I ever saw of the variety γ , the frond, which is about four inches long, rises to half that height cylindrical and dichotomous, and preserves the thickness of a small goose-quill, after which it becomes compressed, and gradually widens, till near the apices it is quite flat, and almost an inch wide, and is there palmate with many short, sub-cylindrical segments.

It was accidentally brought by a sailor to Mr. Wigg from the Mediterranean, and described by Mr. Woodward in the *Linnæan Transactions*, under the name of *Ulva decorticata*. Its mode of growth is straight, and unlike that of *F. tomentosus*: its color a sandy green, probably from having been exposed to many changes of weather: its length above six feet: its thickness equal to that of the little finger: its frond dichotomous, with very long branches, not more than twice or thrice divided: its habit is altogether that of *F. loreus*, so that any one seeing it dry would take it for an injured specimen of that plant. It is in fruit.

Obs. The external appearance of this plant resembles that of the sponges rather than of the Fuci, and, like the former, it imbibes a great deal of water, which, on squeezing, it readily gives out:—it is by no means hollow within:—in drying it flattens into a thickish membrane, which adheres loosely to paper:—if kept a few hours out of water, it has a strong and unpleasant smell:—*Flustra pilosa*, and *F. palmatus*, and *phyllitis*, as well as *Conferva rubra*, are often found upon it.

In beginning a new volume of this work, it has been my wish to select for the front of it a species particularly deserving of the attention of naturalists, and I know of none, which, from its extraordinary formation, better merits such a distinction than that figured in the plate before us. Its nature is so peculiar, that its place in the system has been repeatedly called in question; and almost all the older botanists concurred in removing it from the Fuci to the Sponges, thus virtually, if not intentionally, declaring their opinion, that it belonged more properly to the animal than to the vegetable kingdom. Among those of our days, also, have not been wanting many who entertained similar sentiments; nor is it too much to say, that almost any one, judging from external appearance alone, would do the same; as to the naked eye it altogether resembles a sponge; though, if subjected to those trials, which are generally regarded as affording the surest criterions between productions of animal and vegetable origin, it must be allowed a place among the latter. * Upon this subject, and upon the internal structure of the present and the following Fucus, a learned dissertation was written many years ago by the Abate Olivi in his *Zoologia Adriatica*, which he promised to follow by a work expressly appropriated to the same subject; but whether he executed this intention I never heard. † He there, most justly, if structure be allowed to form a proper basis for generic distinction, proposed to constitute of these ‡ two plants a new genus, to be called *Lamarckia*, after the celebrated French botanist, the Chevalier *Lamarck*, than whom no man is more duly entitled to whatever honors natural history can confer. The following is the generic character proposed, in which it will be observed, that he regards as the fructification the coloring matter of the filaments, which, as the plant dries, collapses into irregular, granular masses of a dark-green hue, leaving the rest of the tubes and the vesicles quite colorless:

“*LAMARCKIA. Stirps radicata sub-coriacea mollis; composita utriculis in axim perpendicularibus.*

“*Utriculi membranacei virides cylindrici approximati utrinque filamentis tubulosis tenuissimis connectentibus terminati. Fructificatio. Globuli inter utriculos et filamenta sparsi.*”

It appears, however, that the true fructification of *F. tomentosus* was altogether unknown to him; nor was this ever discovered till the summer of 1808, when it was detected by Miss Hutchins, to whose friendship I am happy to own myself indebted for many of the particulars above mentioned in the description of the species, as well as for the drawing here represented, which was made by herself from a recent specimen. She remarked that the fibres which fringe the frond are observable only at the time of the fruit, in which respect, as well as in the want of an external covering, this plant shows a strong affinity to the *Rivularia*. The capsules, as noticed above, are so minute, that I found it impossible to ascertain the real nature of their contents; they seem to be of a structure dissimilar to the rest of the frond, and what also indicates an essential difference is, that they remain unaltered by drying, when both the filaments and utriculi become entirely colorless, excepting only minute, scattered, patches of green. Mr. Hudson

was

* For the benefit of my readers who are not in possession of Olivi's treatise, I think it right to transcribe what he says on this head: “Una fabbrica semplicissima di null' altro composta, che di un puro aggregato di otricelli cavi pellucidi e ripieni d'un fluido trasparente acqueo, e soltanto muniti di altri minimi filamenti capillari destinati ad assorbire l'acqua e ad espellere i semi già manifestamente riconoscibili; una fabbrica in cui queste parti tutte uniformi non sono composte che da una membrana sottile equabile consistente lucida compatta secca e perfettamente simile nel tessuto e in tutti gli altri caratteri a quelle, onde sono formati i Fuchi le Conferve e le Ulve, una fabbrica che, invece di spappolarsi e corrompersi, resiste e si secca, che non ha la piu piccola porzione gelatinosa vivente, e che putrefacendosi non dà nè odore nè residuo animale; una fabbrica che non palesa alcun movimento spontaneo, nè il piu piccolo indizio di sentimento; una fabbrica finalmente che come le Alge, ha i semi globosi, e collocati nei vasellini membranosi componenti tutto il suo corpo, che in una specie è quasi sferica, e mezzo vuota come alcuni funghi, e in un'altra è drittamente come la maggior parte dei fuchi; questa fabbrica non può essere assolutamente se non vegetabile e dessa è appunto quella della Bursa del Bauhin e della Vermillara dell' Imperato.” Olivi observes, that there is but one circumstance to be placed in opposition to all these proofs of a vegetable nature, which is the violent contraction of the *F. Bursa*, upon an incision being made in any part of it, and this he most justly regards as a mere mechanical motion. To a similar cause is also undoubtedly ascribable what Miss Hutchins remarked in *F. tomentosus*, that, if a specimen be laid out, it will sometimes roll on the paper and close again, so that she says she feels as if she were giving pain to something endued with sensation.

† Mr. Stackhouse has done the same thing, and has made of *F. tomentosus* a genus, which he calls *Codium*, and of which he gives the following character:—“*Fructificatio in tubulis implicatis;—frons cylindrico-compressa; statu madido spongiformis; sicco, tomentosa.*”—*Ner. Brit. Pref. p. 24.*

‡ I know of no other plant to be classed with *F. tomentosus* and *F. Bursa*, unless one which I lately received from Don Simon de Roxas Clemente, under the name of *F. lichenoides*, which, he tells me, covers the rocks at Cadiz with irregular patches, should prove a distinct species. From the specimens he sent, I cannot but suspect it is only the first stage of *F. tomentosus*. There is in Mr. Brown's collection a Fucus from New Holland nearly allied to them.

was strangely mistaken in referring, as a synonym to *F. tomentosus*, the *F. elongatus* of Linnæus, which appears evidently from his herbarium to be only a slight variety of *F. loreus*. *F. tomentosus* on a cursory view seems nearly allied to *Conferva spongiosa*; but a more attentive investigation proves the resemblance to extend no farther than general appearance; for that plant and its congeners are all formed of short, closely-imbricated, setaceous ramuli, attached to a common centre of a different substance from themselves, while in the present all is uniform.

- a. *F. tomentosus*, natural size.
 b. part of the frond in fruit.
 c. portion of the same, magnified - - - 4.
 d. vesicle and capsule - - - 2.

136.—FUCUS BURSA.

Fucus, fronde tomentosâ, sphæricâ, cavâ, totâ compactâ ex utriculis clavatis in axim perpendicularibus, per filamenta capillaria tubulosa ramosa densissimè intertextis.

Fucus subglobosus. CLEMENTE, MSS.

Alcyonium Bursa. LINN. *Syst. Nat.* I. p. 1295. *Syst. Nat. Ed. Gmel.* I. p. 3813. PALLAS, *El. Zooph.* p. 352.

Alga pomum monspeliensium. J. BAUHIN, *Hist.* III. p. 795.

Bursa marina. C. BAUHIN, *Pin.* p. 368. RAII *Syn.* p. 31. n. 3.

Lamareckia depressa globosa cava, intus filis arachnoideis sparsis, extus lapillis (papillis?) radicatis. OLIVI, in *Usteri's Annalen.* VII. p. 80.

HABITAT in mari Anglico et Mediterraneo. Linnæus.—In Sussexiæ littore, copiosè. Pallas.—Cornubiæ ad oras. D. Rashleigh.—Juxta Gades. D. S. de Roxas Clemente.—Prope Monspeliæ. M. Bouchet.—In mari Adriatico. OLIVI.

Perennis?

RADIX prorsus nulla, sed stirps, * teste Olivio, per filamenta propria saxis affixa adhæret.

FRONS, simplicissima, globosa, nunc pomi mediocris, nunc capituli humani magnitudine, cava, tota constans e filamentis capillaceis densissimè intertextis, e quibus hic illic oriuntur utriculi homogenei exigui, tubulosi, claviformes, horizontalitèr semper positi, parte incrassatâ frondis superficiem spectante, et ad illam attingente, neque epidermide ullâ ut coopertâ, extrinsecus visa stirps ex his modò constare videatur, massamque referat æqualem, velutinam, cui neque apex est neque basis ulla:—frons intus vacua, præter fila sparsa arachnoidea; aut† interdum aquâ repleta.

FRUCTIFICATIO, nondum detecta.

COLOR, qui recentis intensè viridis, fit in aquâ dulci servatâ aut luci objectâ pallidior, et tandem in sordidè albicantem evanescit.

SUBSTANTIA, membranacea, tactu mollis, tenax, vivâ rigidiuscula, marcescentis flaccida.

Obs. Planta per desiccationem chartæ non adhæret: pressuræ graviori subjecta, vel foramine aliquo pertusa, formam suam sphæricam amittit, enormitèr rugosa atque depressa facta, qualem sistit hæc tabula ad exemplar exsiccatum iterumque immersum parata, cum recens nunquam viderim: madefacta aquæ plurimum imbibit, instar spongiarum quas facie externâ magis quàm Fucos refert, et, sicut ex illis, aqua facilè exprimitur.

Qualiscunque sit locus quem, Algis submersis demùm ritè dispositis, Botanici posterî *F. tomentoso* tribuendum censebunt, satis cuivis liquet *F. Bursam* in eundem esse recipiendum, si faciem externam aut si structuram interiorem respiciat; neque, nisi invitissimâ Naturâ, has plantas ullo modo divelli posse. Quoniam igitur res ita se habet, et quoniam postulavit hujus operis ratio ut *F. tomentosum*, utpote jam universè ferè inter vegetabilia ascitum Fucisque associatum, hic quoque asciscerem, fieri nequirit ut *F. Bursam* excluderem, quamvis sit Zoophytis a Pallasio Linnæoque adjunctus, neque ab alio quopiam, quod scio, Historiæ Naturalis cultore, pro Fuco habitus. Quanta sit inter hunc et *F. tomentosum* affinitas perspexit inter auctores solus Olivius, qui in tractatu suo de *Lamareckia*, jam sæpe sub *F. tomentoso* citato, præcipuam curam *F. Bursæ*, quem recentem videndi sæpe oblata est facultas, impendit.

Multa

* De hoc Olivio, "Abita in diversi luoghi, e piu propriamente nei duri calcarei: resta attaccato mediante i proprii filamenti a qualche pezzetto pietroso."

† Nihil hujusmodi memorat Pallas, sed contrâ Olivii rem ita se semper habere perhibet, dicitque exemplarium pondus non rarè per aquam inclusam ad viginti tres et ultrâ uncias evehi.

Multa igitur suprâ in hujus Fuci descriptione tradita ejus ex dissertatione deprompsi, plura minùs accuratè a me visa ad eandem emendavi, neque puto me gratius aliquid acceptiusve lectoribus hic offerre posse, quàm si ea quæ de hujus Fuci facie atque structurâ tradidit vir reverendus propriis verbis exscribam: "La sua forma rappresenta una sfera depressa, cava, verde oscura, poco piu grande d'un Arancio, formata da una crosta che a primo aspetto sembra coriacea, ma che poi si riconosce quasi rassomigliante ad un feltro. Considerato attentamente, il composto di cotesta crosta si trova formato da una serie innumerabile d'otricelli membranosi quasi cilindrici, strettamente uniti, e disposti trasversalmente, i quali vengono a rappresentare all' esterna superficie tante papille pellucide. Coll' ajuto del microscopio ciascun di loro si scopre terminato all' estremità esteriore da due sottilissimi filamenti tubulosi, i quali costituiscono quella molle e tenuissima peluria che cinge la superficie della sfera, e che appena si riconosce ad occhio nudo, e all' estremità interna si scopre parimente terminato da due o tre altri sottilissimi filamenti pur tubulosi, che si inseriscono negli altri otricelli, e per mezzo di tale concatenazione li ritengono connessi stretti ed uniti, formanti insomma una compagine consistente. L'estremità interna degli stessi otricelli manda eziandio un' altra serie di filamenti più lunghi ad attaccarsi internamente alla parte opposta della crosta sferica, rendendola in tal modo più concatenata." Quamvis hactenus *F. Bursa* fructificatio latet, dubitabit, uti credo, nullus, Olivii verbis lectis, quibus consentiunt quædam a Pallasio animadversa, quin reperta fuerit planta fibrillis iisdem fimbriata, quas exhibet nostra *F. tomentosi* fructiferi icon, et quas nunquam nisi in fructifero adese credit D^{na} Hutchins. Hæc tamen in exemplaribus meis prorsus desunt. De aquâ in hoc Fuco inclusâ, et simul de modis per quos semet illuc insinuaverit, multis verbis disserit Olivius, sententiamque suam refert, plantam duas aquæ portiones distinctas in se capere, unam in spherâ cavâ liberè fluitantem, ipsâque modò fronde coercitam, quâ pertusâ effluit, alteram in utriculorum filamentorumque substantiâ inclusam; quarum illa vi merè mechanicâ in corpus naturâ pervium impellitur, servaturque ibi per leges quibus aqua semper obedit, hæc verò attractione, quam dicunt, capillari absorbetur, et in plantæ substantiam recepta mutationem quandam subit, per quam stirpis succus proprius facta ejus nutrimento postmodum inservit.

- a. *F. Bursa*, magn. nat.
 b. *filamenta et utriculi*, magn. auct. - - - 4.
 c. *utriculus* - - - - - 2.

136.—FUCUS BURSA.

Fucus Bursa, frond woolly, spherical, hollow, wholly composed of clavate vesicles placed perpendicularly to the center, and most closely matted together by capillary tubular branching filaments.

Fucus subglobosus. CLEMENTE, MSS.

Alcyonium Bursa. LINN. *Syst. Nat.* I. p. 1295. *Syst. Nat. Ed. Gmel.* I. p. 3813. PALLAS, *El. Zooph.* p. 352.

Alga pomum monspeliensium. J. BAUHIN, *Hist.* III. p. 795.

Bursa marina. C. BAUHIN, *Pin.* p. 368. RAII *Syn.* p. 31. n. 3.

Lamarckia depressa globosa cava, intus filis arachnoideis sparsis; extus lapillis (papillis?) radicatis. OLIVI, in *Usteri's Annalen.* VII. p. 80.

In the English and Mediterranean Seas.—LINNÆUS.—Coast of Sussex, plentifully. Pallas—Shore of Cornwall. Mr. Rashleigh.—Near Cadiz. Don Simon de Roxas Clemente.—Near Montpellier. M. Bouchet.—In the Adriatic. Olivi.

Perennial?

ROOT, no vestige of any; but, according to Olivi,* the plant attaches itself to the rocks by filaments for the purpose.

FROND, completely simple, globular, varying in size from that of a moderate apple to that of the human head, hollow, altogether composed of a series of capillary filaments most closely interwoven together, out of which grow here and there small tubular club-shaped vesicles, of the same nature and substance as the filaments, always placed horizontally,

* Upon this subject Olivi says, "Abita in diversi luoghi, e piu propriamente nei duri calcarei: resta attaccato mediante i propri filamenti a qualche pezzetto pietroso."



Fucus Bursa.

horizontally, with their larger ends pointing to the surface of the frond, and reaching to it, and not covered by any epidermis, so that the plant appears externally to be formed of nothing but these, and looks like an uniform velvety mass, without either base or apex: internally it is either empty, excepting only some scattered filaments,* or is filled with water.

FRUCTIFICATION, at present unknown.

COLOR, deep green when fresh; but, if kept in fresh water, or exposed to the light, soon turning paler, and at last fading to a dirty white.

SUBSTANCE, membranaceous, soft and velvety, tough, firm in a recent state, but flaccid when turning to decay.

Obs. In drying this plant does not adhere to paper: if a hole be made in it, or it be squeezed hard, it loses its spherical shape, and becomes wrinkled and flattish, as I have been obliged to represent it in this plate, having never seen it alive: when moistened, it imbibes a large quantity of water, like the sponges, which it resembles to the naked eye more than the Fuci, and, like them also, it immediately gives out the water on pressure.

Whatever may be the situation finally allotted in the system of nature to the subject of the preceding plate, it is obvious, both from external appearance and internal structure, that the same must also be assigned to the subject of the present, and that they can by no means be kept separate. Such being the case, as the plan of this work required the admission of the former, it being generally considered to be of a vegetable nature, and having by most naturalists been referred to the genus *Fucus*, I have felt it necessary not to exclude the latter; although both by Linnæus and Pallas classed with the Zoophytes, nor joined to *F. tomentosus* by any writer with whom I am acquainted, excepting the Abate Olivi. This author has, in his treatise upon the genus *Lamarckia*, made *F. Bursa*, which he had frequent opportunities of examining recent, the principal object of his researches, and many parts of my description are either borrowed from him, or corrected from his observations; nor do I think that I can perform towards my readers a more acceptable service than by translating what he has written upon the general appearance and structure of this plant. "Its form," according to the Abate, "is a flattened sphere; its size a little larger than an orange; its color dark green; it is composed of a crust that appears at first sight coriaceous, but looks on closer inspection like felt. If examined attentively, this crust is found to consist of an innumerable quantity of nearly cylindrical membranaceous little vesicles, closely matted together, and disposed transversely, resembling so many pellucid papillæ. With the assistance of the microscope every one of these is seen to be terminated at its exterior extremity by two very thin tubular filaments, which constitute the soft woolliness that lines the whole surface, but is so fine as scarcely to be perceptible to the naked eye, and also at its interior by two or three other equally thin and tubular filaments, which are inserted into other vesicles, thus holding the whole firmly united together, so as to form a solid mass. Another series of filaments, longer than those just mentioned, also originates from the internal extremity of the vesicles, by means of which those of the opposite sides of the spherical crust are attached to each other, and the whole body rendered more compact." Though the fructification of *F. Bursa* has not yet been discovered, from the preceding account given by Olivi, and from observations of a similar nature made by Pallas, there can be no doubt of the plant having been found with those capillary fibres which are represented in the figure of *F. tomentosus*, and which Miss Hutchins has observed as always accompanying the fruit, but visible at no other season. These, however, are wholly wanting in my specimens. Olivi dwells much at large upon the circumstance of water being met with in the interior of this *Fucus*, and upon the means by which it was most probably conveyed thither; and he gives it as his opinion that the plant contains two distinct portions of liquid; the one floating in the cavity of the sphere, and confined by the coat of the frond, upon any puncture being made in which it escapes; the other inclosed in the substance of the minute tubes and filaments themselves: the former penetrating by mere mechanical force a body naturally pervious, and preserving itself there by means of the laws to which water is necessarily subject; the latter absorbed by capillary attraction, and probably undergoing in its confinement some change, so as to become the lymph of the vegetable, and be subservient to its nutriment.

- a. *F. Bursa*, natural size.
 b. *filament and vesicles*, magnified - - - 4.
 c. *vesicle* - - - - - - - - - 2.

* Pallas mentions nothing of this kind, but Olivi expressly says that it is always so, and that specimens are not unfrequently found which from this cause weigh twenty-two ounces.

Fucus Labillardieri, frond cartilaginous, compressed, linear, much and irregularly branched; branches between horizontal and patent, pinnated, throughout their whole length, with distichous, patent, subulate, simple ramuli; placed close to each other: capsules globular, standing on very short peduncles at the axillæ of the ramuli.

F. Labillardieri. MERTENS, MSS.

At Van Diemen's Land, in New Holland. *M. Labillardière*.

Perennial?

ROOT, I have not yet seen.

FROND, nine inches or more in length, nearly cylindrical immediately adjoining the base, but soon becoming compressed, and afterwards preserving to its summit an almost equal width of about half a line, irregularly branched; branches distichous, patent, scattered, rather remote, slightly flexuose, some opposite, others alternate, some quite simple, others beset with a series of shorter ones disposed in the same manner, and these sometimes with others, long and short being mixed together without any apparent order: the frond is throughout its whole length pinnated with distichous ramuli of the same nature as itself, placed close to each other, between horizontal and patent, somewhat incurved, subulate, simple, a line, or a line and half long, never, apparently, either lengthening into branches, or undergoing any alteration in their shape: they are, however, sometimes wanting in the primary shoots of old specimens.

FRUCTIFICATION, small, spherical, blackish-red tubercles, situated upon the branches at the axillæ of the ramuli, supported on cylindrical petioli hardly the tenth part of a line long, smooth externally, internally containing a mass of irregularly oblong seeds.

COLOR, a most beautiful scarlet, devoid of gloss, but darker and almost black in the primary shoots; if exposed to the sun, or kept in fresh water, soon fading to a dirty yellowish, and at length to white.

SUBSTANCE, cartilaginous, flexible, tough.

OBS. I have found *Sertularia cirrata* growing upon this *Fucus*:—its color is so fugitive that, like *F. cartilagineus*, it is generally seen beautifully party-colored:—its appearance is most elegantly feathery:—in drying it does not adhere to glass.

For specimens of this *Fucus*, accompanied by a drawing, I have to acknowledge my obligations to the kindness, so often already mentioned, of Professor Mertens, who sent it to me marked with the name of *M. Labillardière*, by whom it appears originally to have been discovered. The elegant work of this eminent botanist, upon the Plants of New Holland, well deserves any reward that the natural history of that extensive country can confer, and certainly, among the Fuci, it would not have been easy to select a more desirable species, on which to bestow his name. This plant has also been gathered upon the coast of New Holland, by our own countryman, Mr. Brown; and I have likewise received from the friendship of Mr. Lambert, the celebrated author of the splendid Monograph of the Genus *Pinus*, other specimens collected upon the same shores by Governor King. I am therefore led to conclude, that it is by no means of unfrequent occurrence in those seas, though not at present found in any other. In brilliancy of color, it rivals the most beautiful of the Fuci, and in elegant regularity of form it yields to few. In this latter respect it bears a considerable resemblance to *F. pinnatus* and *F. taxifolius*, from which its nature is altogether different, and scarcely a less one to *F. asparagoides*, which must be regarded as its nearest affinity. From this it is immediately distinguished by its greater size, its flat frond, and its firm texture, almost horny when dry, as well as by the more decisive character of the tubercles not being, as in that species, borne upon the ends of the ramuli, but really at their axillæ, upon proper peduncles.

- | | | | | | | |
|----|---------------------------|---------------|---|---|---|----|
| a. | <i>F. Labillardieri</i> , | natural size. | | | | |
| b. | branch, | magnified | - | - | - | 6. |
| c. | tubercle, | separatè | - | - | - | 4. |
| d. | longitudinal section | of the same | - | - | - | 3. |
| e. | seeds | | - | - | - | 1. |



Fucus Labillardieri.

Fucus, fronde cartilagineâ, compressâ, lineari, ramosissimâ; ramis horizontalitèr patulis, ubique pinnatis ramulis distichis patentibus approximatis subulatis simplicibus: capsulis ramulorum ad alas brevissimè pedunculatis.

F. Labillardieri. MERTENS, MSS.

HABITAT ad Promontorium Van Diemen Novæ Hollandiæ. *D. Labillardière*.

Perennis?

RADIX nondum a me visa.

FRONS dodrantis, et ultrâ, ipsam juxta basin teretiùscula, exinde per totam longitudinem compressa, et latitudinem circitèr semilineâ a basi ad apices usque servans, vagè ramosa, ramis distichis, patentibus, sparsis, remotiusculis, oppositis alternisve, lenitèr flexuosis, his simplicibus, illis iterùm aliis brevioribus simili ratione dispositis obsitis, brevioribus longioribus absque normâ immixtis; frons ubique pinnata ramulis homogeneis, distichis, approximatis, horizontalitèr patentibus, levitèr incurvis, subulatis, simplicibus, lineam sesquilineamve longis, nullo unquam, ut videtur, tempore sese in ramos producentibus, vel formam suam mutantibus, hi autem in exemplaribus vetustis interdùm in ramis primariis desunt.

FRUCTIFICATIO tubercula exigua, sphærica, atro-sanguinea, in ramis ramulorum ad alas sita, petiolo tereti vix decimam lineâ partem longo fulta, extrinsecùs lævia, intùs seminum enormitèr oblongorum congeriem foventia.

COLOR pulcherrimè miniatus, absque nitore, in ramis modò primariis intusior et sub-nigricans; soli objectæ vel in aquâ dulci servatæ citò in sordidè lutescentem, et demùm in album evanidus.

SUBSTANTIA cartilaginea, lenta, tenax.

Obs. *Sertulariam cirratam* huic Fuco innascentem reperi:—ob colorem volaticum frons non rarò, *F. cartilaginei* instar, perpulchrè bicolor apparet:—habitus et facies elegantissimè plumiformis:—per exsiccationem chartæ non adhæret.

Persæpe quidem, dum in hoc opere edendo sum versatus, gratâ ego mente plurima Mertensii benevolentia accepta retuli; quâ ille ut sese mihi utilem præstaret, libentissimè semper et amicissimè accinxerit. Huic quoque debeo, hujusce Fuci adumbrationem missam unâ cum exemplaribus ab ipso a Labillardiero acceptis, cujus nomen speciei inditum jussit. Amici jussis in hoc obsequi per jucundum: primus enim, nisi fallor, celeberrimus hic botanicus, dum infelicis La Peyrouse vestigia lustrans terras adiret Australes, hanc plantam reperit; neque quisquam de Australasia Historiâ Naturali meliùs meruit, neque Australasia Nereis stirpem aliquam jactat pulchriorem, quâ ipsi dicatâ plenius ejus compensaret labores. In iisdem mox littoribus *F. Labillardieri* legit D. Brown; et sunt mihi etiam alia illis ex oris exemplaria, quæ communicavit D. Lambert, generis *Pinus* Monographiæ splendidæ auctor clarissimus. Faciunt hæc ut credam hunc Fucum non infrequentem esse illorum marium incolam, quamvis hactenus in nullis aliis repertum. Planta est quæ colorum splendore cum pulcherrimis suæ familiæ certat, formæ elegantia perpaucis cedit. Quoad ramulorum dispositionem *F. pinnato* et *F. taxifolio*, cætera dessimillimis, accedit; nec minùs ad *F. asparagoidem*, reverà Naturâ affinem. Primo statim aspectu ab hoc dignoscitur, cum mole majore, fronde planâ, substantiâ per exsiccationem tenace ad corneum appropinquante, tum, quòd magis valet, tuberculis nequaquam, sicut in illâ specie, ramulorum apicibus insidentibus, sed eorum ad alas sitis, pedunculisque, quòd videtur, propriis fultis.

a. <i>F. Labillardieri</i> , magn. nat.	
b. <i>ramus</i> , magn. auct.	6.
c. <i>tuberculum</i>	4.
d. <i>idem longitudinalitèr sectum</i>	3.
e. <i>semina</i>	1.

Fucus venosus, frond between membranaceous and cartilaginous, flat, linear, sub-dichotomous, entire at the margins, the surface painted with numerous, longitudinal, nearly parallel, anastomosing, elevated, roughish veins.

Fucus venosus. LINN. *Mant.* p. 312. *Syst. Nat. Ed. Gmel.* II. p. 1387.

At the Cape of Good Hope. *Linnaeus*.

ROOT, not yet known.

FROND, flat, linear, a foot or more long, and from half an inch, to three quarters of an inch wide, divided here and there in an irregularly dichotomous manner, so as rather to seem accidentally torn, than really branched, its segments constantly of the same breadth, excepting the extreme ones, which are many times narrower than the rest; the margins are every where quite entire, except that they are occasionally uneven with what appear to be the remains of scattered broken branches; the apices are truncate and irregularly notched; the frond has no midrib, but its surface, as observed by *Linnaeus*, is every where painted with longitudinal, branched veins, of a darker color than the frond, thicker than it, and elevated above it, rather wide, clustered and roughish: they run uninterruptedly from the base to the summit in nearly parallel lines, but often anastomosing, and are no less remarkable at the top and bottom of the frond than in the middle.

* FRUCTIFICATION, undiscovered.

COLOR, that of red bricks, destitute of gloss, semitransparent, paler towards the apices.

SUBSTANCE, between membranaceous and cartilaginous, thickish, flexible, and tough, when dry approaching to horny.

Obs. The frond is smooth, the veins, especially if viewed through a microscope, look rough: in drying it does not at all adhere to paper.

Among the Fuci described by *Linnaeus*, few are less known than *F. venosus*, and few are of less frequent occurrence; as, though a native of the Cape of Good Hope, of which the natural productions have been examined with more care than those of any part of the world, excepting only the most civilized countries of Europe, I have notwithstanding never seen specimens of it in any herbarium besides that of *Linnaeus* himself. It appears also to be mentioned by no other author, unless, indeed, what is so called by *Weber* and *Mohr*, in their † *Beiträge*, be really the same, of which I cannot but entertain the strongest doubts, since they speak of their plant as in some degree allied to *F. rubens*, in having at the base of the frond an obsolete midrib, which appears quite foreign to the nature of the *Linnaean* specimens, and they also represent it with a fructification similar to that of *F. crispus*, which seems equally improbable. I should be much rather inclined to expect that its capsules would prove to resemble those of *F. Corallorhiza*, which, as is observed under that species, is, both in color, shape, texture, and habit, its nearest affinity. From this, as well as from all others, it is immediately distinguishable by its remarkable veins, which cover nearly the whole surface of the frond, and are of a nature altogether peculiar to this plant; being quite unlike those of *F. laceratus*, to which they appear at first sight in some degree analogous, as there is also in the general outline and habit of the two species a considerable resemblance.

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|----|-----------------------------------|---|---|----|
| a. | <i>F. venosus</i> , natural size. | | | |
| b. | part of the frond, magnified | - | - | 6. |
| c. | portion of the same | - | - | 5. |

* The remark in the *Synopsis of the British Fuci*, that *Dr. Smith* had observed near the base of the frond single, scattered seeds, like those of the *Ulva*, is founded in error.

† What they here say upon the subject is as follows: "Ein seltner Capischer Tang aber, der *F. venosus* Linn. *Mant.*, der mit dem *F. rubens* insofern einigermaßen Analogie hat, dass unten in seiner, sich auch keilförmig erweiternden Frons, eine obsolete Mittelrippe durchschliesst, ist unbezweifelt ein *chondrus*, im strengsten Sinne der *Stackhouseschen* Gattung. Indess sind die *Pericarpia*, indem sie zu beiden Seiten hemisphärisch hervorragen, an Form mehr denen der *Sphärococcen* ähnlich. Merkwürdig ist uns sonst dieser *F. venosus*, ausser einer andern physiologischen Rücksicht, seinen ganzen Bau betreffend, deshalb geworden, weil wir an einigen grössern der in seinen *Pericarpia* enthaltenen Körner etwas Aehnliches mit dem *Limbus*, der sonst allein den Saamen der *Fucorum* der ersten Abtheilung, oder der *gymnocarporum* bekam, glauben bemerkt zu haben."—*Beiträge zur Naturkunde.* p. 275.



Fucus venosus.

Fucus, fronde membranaceo-cartilagineâ, planâ, lineari, sub-dichotomâ, integerrimâ, pictâ venis confertis, longitudinalibus, sub-parallelis, anastomosantibus, elevatis, scabriusculis.

Fucus venosus. LINN. *Mant.* p. 312. *Syst. Nat. Ed. Gmel.* II. p. 1387.

HABITAT ad Caput Bonæ Spei. *Linnaeus*.

RADIX nondùm cognita.

FRONS plana, linearis, longitudine pedalis et ultrâ, latitudine unguicularis, vel sesquiunguicularis, hîc illic ordine vagè dichotomo divisa, ut potius casu laciniata quàm verè ramosa videatur, segmentis ubique linearibus, extremis modò exceptis, quæ reliquis sunt multoties angustiora; margines integerrimi, nisi quòd hîc illic ramorum, ut videatur, diffractorum reliquiis sint inæquales; apices truncati et erosi apparent; costa nulla, sed "tota frondis superficies," ut Linnæi verbis utar, "quasi picta venis longitudinalibus, ramosis, elevatis, superficie crassioribus, latiusculis, confertis, minùs lævibus, saturatiùs rubris," frequentèr anastomosantibus, et a basi ad apices, non minùs in his quam in plantâ medio conspiciendis, percurrentibus.

* FRUCTIFICATIO latet.

COLOR lateritiùs, absque nitore, apices versus dilutior, sub-diaphanus.

SUBSTANTIA membranaceo-cartilaginea, crassiuscula, lenta, tenax, per desiccationem sub-cornea.

OBS. Frons revera lævis, quamvis ob venas, quæ sunt, præsertim per microscopium visæ, scabriusculæ, haud ita apparet:—exsiccatione chartæ non adhæret.

Perpaucis modò botanicis innotescit *F. venosus*, ut inter *Fucos* a Linnæo descriptos vix unus sit atque alter dubiorum nebulis densioribus involutus. Crederem quoque esse stirpem quæ infrequentissimè occurrit, quoniam in Herbario Linnæano solo hactenus servatam vidi; quod mirum de plantâ incolâ Capitis Bonæ Spei, quo nullam ferè orbis terrarum regionem, paucas Europæas si excipias, botanicorum oculi intentiùs perlustrârunt. Nulla etiam ejus icon extat, neque ab auctore aliquo præter Linnæum memoratam invenio, nisi forsân eandem revera stirpem hoc nomine, in opere suo, † *Beitrüge* dicto, appellaverint Weberus Mohriusque, de quo fieri nequit quin scrupuli summi restent; plantam enim suam quodammodò *F. rubenti* affinem describunt, eo magis quod basin versus obsoletè sit costata, fructuque eodem dicunt præditam qualem fert *F. crispus*, quæ utraqûe *F. venosi* Linnæani naturæ prorsùs repugnantia videntur. Quod ad fructificationem attinet, longe verisimiliùs putarem *F. venosum* in hâc cum *F. Corallorhizâ* convenire; quoniam, uti jam ‡ supra in hoc opere memoratur, summa inter hos *Fucos*, colore, formâ, texturâ, atque habitu, affinitas interest. Dignoscitur autem *F. venosus* primo statim aspectu, cùm ab hoc, tum ab omnibus aliis in præsens notis *Fucorum* speciebus, per venas a quibus nomen ducit. Hæ totam ferè frondis superficiem tegunt, substantiæ fronde crassioris, atque, ut videtur, nequiquàm ejusdem, suntque hujus modò stirpis, quantum hactenus innotuit, propriæ; attentè enim lustratâ toto cælo abludunt ab iis *F. lacerati*, quibus consentaneas forsân aliquis obiter inspiciens diceret, præsertim cùm in totâ harum specierum figurâ, sicut etiam in habitu, quod aiunt, generali, simile quiddam inest per quod congeneres facilè existimarentur.

- a. *F. venosus*, magn. nat.
 b. *frondis pars*, magn. auct. - - - 6.
 c. *ejusdem portio* - - - - 5.

* Quod in *Fucorum Britannicorum Synopsi* animadvertitur, vidisse Smithium prope frondis basin semina sparsa solitaria, sicut in *Ulvæ*, ex errore pendet.

† Exscribenda credo ea quæ de hâc re dicunt:—"Ein seltner Capischer Tang aber, der *F. venosus* Linn. *Mant.*, der mit dem *F. rubens* insofern einigermassen Analogie hat, dass unten in seiner, sich auch keilförmig erweiternden Frons, eine obsolete Mittelrippe durchschießt, ist unbezweifelt ein *Chondrus*, im strengsten Sinne der Stackhouseschen Gattung. Indess sind die Pericarpia, indem sie zu beiden Seiten hemisphärisch hervorragen, an Form mehr denen der *Sphærococcen* ähnlich. Merkwürdig ist uns sonst dieser *F. venosus*, ausser einer andern physiologischen Rücksicht, seinen ganzen Bau betreffend, deshalb geworden, weil wir an einigen grössern der in seinen Pericarpieen enthaltenen Körner etwas Aehnliches mit dem Limbus, der sonst allein den Saamen der *Fucorum* der ersten Abtheilung, oder der gymnocarporum bekam, glauben bemerkt zu haben."—*Beitrüge zur Naturkunde*, p. 275.

‡ Sub *F. Corallorhizâ*, II. p. 71.

Fucus buccinalis, stipes fistulous, undivided, expanded at its apex into a coriaceous, flat, nerveless, lanceolate leaf, pinnated with lanceolate leaflets, entire at their margins.

Fucus buccinalis. LINN. *Mant.* p. 312. *Syst. Nat. Ed. Gmel.* II. p. 1389.

F. maximus. OSBECK'S *Travels.* II. p. 73.

Arundo indica fluitans. BAUHIN, *Pin.* p. 19.

In the ocean, off the Cape of Good Hope, growing on the deepest rocks, from which it is often torn up, and thrown upon the shore. *Koenig*.

Perennial.

ROOT, according to Linnæus, fibrous and woody.

FROND, arising with a simple cylindrical stipes, of the length of which I am ignorant, about as thick near the summit as the little finger, and, to use the words of Linnæus, "attenuated at its base, thence gradually swelling, fistulous, afterwards inflated, till at length it is again narrowed," when it becomes gradually compressed, and finally expands into a single, flat leaf, between oblong and lanceolate, destitute of veins or midrib, undivided, a foot and half, or more long, and above two inches wide, pinnated throughout its whole length with horizontal leaflets, standing near to each other, oblong, or between oblong and cuneiform, much narrowed at their base, undivided, nearly of the same size as the primary leaf, rounded at their apices, and quite entire at their margins.

FRUCTIFICATION, at present unknown.

COLOR, of the stem blackish, of the leaf blackish red, not altogether devoid of gloss, and so dark that, unless held to the light, it appears wholly black.

SUBSTANCE, woody in the stem, in the leaf coriaceous, thick, flexible, and tough.

Obs. In drying it does not adhere to paper; but the margins of the leaf become slightly undulated, and the stipes deeply grooved with longitudinal furrows, which do not disappear on subsequent immersion.

The drawing of *F. buccinalis* represented in the present plate, was, through the kindness of Sir Joseph Banks, copied from the specimen preserved in his own herbarium, and is the only one that I ever met with in any degree entire; whatever else I have seen of the plant having been mere fragments of leaves. Even in this, however, the greater part of the stem is wanting, so that it accords but ill with the description above copied from the *Mantissa* of Linnæus; and I the more regret this imperfection, as the most obvious mark of the species seems to depend upon the swollen fistular stipes, and its name also is derived from the same circumstance. It seems to be a plant well known to navigators, among whom it has acquired the appellation of *Trumpet-weed*, and is regarded as a certain sign of the vicinity of the Cape of Good Hope. Osbeck, who particularly mentions it in his voyage, calls it *F. maximus*, and says the specimens he saw were above a yard long, as thick as an Indian cane, and commonly grew with some stalks joined together. He adds, that it formed, as it were, fly-flaps at the top, where the leaves stand in two rows, decreasing in size by little and little. The substance of the leaf is as thick as stout shoe-leather, and extremely tough, not having the least tendency to succulency, as is the case in that of *F. edulis*, which is of the same color, and nearly of equal thickness. In the Banksian specimen, the part of the stem that remains is about eight inches long, and every where solid. If a thin horizontal section of this be examined, the centre appears much paler than the rest, and the whole is found under the microscope to be composed of a net-work of fibres, most closely matted together, and forming irregular hexagonal meshes. The pinnated form of the leaf at once distinguishes *F. buccinalis* from *F. digitatus*, which seems to be its nearest affinity.

a. *F. buccinalis*, natural size.

b. horizontal section of the stem.

c. portion of the same, magnified - 1.



J. B. Esq. del.

Fucus buccinalis.

Fucus, stipite fistuloso, indiviso, apice expanso in folium coriaceum, planum, enerve, lanceolatum, foliolis lanceolatis integerrimis pinnatum.

Fucus buccinalis. LINN. *Mant.* p. 312. *Syst. Nat. Ed. Gmel.* II. p. 1389.

F. maximus. OSBECK'S *Travels*. II. p. 73.

Arundo indica fluitans. BAUHIN, *Pin.* p. 19.

HABITAT in oceano, extra Caput Bonæ Spei, lapidibus profundissimis innatus, inde sæpe evulsus natat, et ad littora rejicitur. *Koenig.*

Perennis.

RADIX, teste Linnæo, fibrosa, lignosa.

FRONS stipite assurgens simplice, terete, cujus de longitudine nihil est quod dicam, apicem versus digiti auricularis crassitie, et, ut Linnæi verbis utar, "e basi attenuatâ sensim incrassato, fistuloso, demùm inflato, ultimo iterùm attenuato, tumque se expandente" in folium unicum, oblongo-lanceolatum, planum, nervi venarumque expers, indivisum, cubitum et ultrâ longum, duosque et ultrâ pollices latum, foliolis horizontalibus, approximatis, e basi angustatâ oblongis, aut oblongo-cuneiformibus, ejusdem ferè quâ folium primum magnitudinis, indivisis, apice rotundatis, margine integerrimis, per totam longitudinem pinnatum.

FRUCTIFICATIO hactenus latet.

COLOR stipitis nigricans, folii atro-sanguineus, non sine aliquo nitore, ita intensus ut, nisi luci objiciatur, ater videatur.

SUBSTANTIA in stipite lignosa, in folio coriacea, crassa, lenta, et tenax.

Obs. Exsiccatione chartæ nequaquam adhæret; sed folii margines levitèr fiunt undulati, stipesque profundè exaratur sulcis longitudinalibus, qui nunquam postea e madefacto evanescent.

F. buccinalis exemplaris Banksiani iconem hæc tabula delineatam exhibet, quod Banksii optimi amicitia acceptum refero. Temporibus diversis aliquot hujus Fuci frustula vidi, sed nihil quod cum specimine hîc depicto conferri possit, quamvis hoc quoque mancum; maximâ enim stipitis parte, totâ quidem illâ quæ fistulosa est, caret, et præcipua speciei nota e stipite pendet inflato, a quo nomen quoque specificum deducitur. Hinc fit ut tabula nostra nequaquam satis aptè respondeat descriptioni supra e Linnæi *Mantissâ* exscriptæ; de stirpe verò nulla dubitatio. Mirum quidem quod *F. buccinalis* in omnibus ferè desideretur phytophylaciis, quoniam inter navigatores bene diu innotuit, *tubæ marinæ* (anglicè *trumpet-weed*) nomine his cognitus. Osbeckius præ cæteris illum in itineris sui descriptione memorat, *F. maximum* vocans; dicitque specimina a se visa longitudinem superâsse tripodalem, cannæ indicæ crassitiem æquavisse. Insuper his addit, nasci solitum stipitibus pluribus unâ conjunctis, et folia ad apicem bifariam posita muscarii speciem quodammodo præ se ferre. Folii substantia crassitie corio calceatorio non cedit, et tenacissima est, ne minimum in se succosi habens; in quo insignitèr discrepat a *F. eduli*, cui substantia ferè eadem, color non diversus. Stipitis illa portio, quæ exemplari Banksiano superstes manet, ubique solida, octo circitèr pollicum est longitudinis. Hujus, si horizontalitèr dissecti frustulum lenti subjiciatur, pars media reliquâ pallidior apparet, totusque constare reperitur e fibris retis in modum densissimè intertextis, maculis enormitèr hexagonis. Folii forma pinnata efficit ut *F. buccinalis* statim dignoscatur a *F. digitato*, cui magis quàm alii cuilibet naturâ affinis videtur.

a. *F. buccinalis*, magn. nat.

b. stipitis horizontalitèr dissecti pars.

c. ejusdem portio, magn. auct. - - 1.

Fucus Cabrera, frond between coriaceous and cartilaginous, flat, nerveless, very narrow, linear, irregularly dichotomous, quite entire at the margins: tubercles solitary, elliptical, terminal.

Fucus Cabrera. CLEMENTE. p. 313.

About Cadiz. *Clemente*.

Perennial?

ROOT, a hard, woody, shapeless knob.

FROND, rising with a cylindrical *stipes* as thick as a swan's quill, scarcely half an inch long, and undivided, but throwing out numerous scattered branches from its apex; *branches* cylindrical at their base, and to the height of one or two lines, and not thicker than a sparrow's quill, then immediately becoming flat, and afterwards preserving throughout their whole length, which extends to about six or seven inches, an equal width of about a line, most of them are repeatedly dichotomous at uncertain intervals, with the angles of their divisions acute, others might more properly be called undivided, but loosely beset on both sides with a series of smaller ones, which are distichous, scattered, between erect and patent, shorter than the primary ones, but of the same nature and substance as they, and, like them, either dichotomous, or furnished again with others arranged in the same manner; the margins of all are quite entire; the apices acute, excepting those that are in fructification, or those from which the fruit has just fallen, which are truncate:—the annular appearance of the frond, noticed under *F. lumbricalis*, is also observable in this *Fucus*, arising from young narrow shoots springing out of the truncated apices.

FRUCTIFICATION, placed upon the ends of the branches, which then expand into a small flat disk, supporting a single cylindrical tubercle, scarcely a line long, of a pale flesh-color, slightly tinged with brown, destitute of any epidermis, and wholly consisting of very thin, parallel, whitish fibres, of a clavate shape, with a rounded tip, mixed with which lie oblong reddish seeds.

COLOR, a pleasing, transparent, olive green.

SUBSTANCE, between coriaceous and cartilaginous, flexible and tough.

Obs. The habit of this plant is straight: in drying it does not adhere to paper.

I lately received this remarkable *Fucus* in a large parcel of marine plants sent me from the neighborhood of Cadiz, by my friend, Don Simon de Roxas Clemente, who first described it in a catalogue of the submersed Algæ of the kingdom of Seville, published by him, at the end of his Essay upon the Varieties of the common Vine. He gave it the name it here bears, in honor of one of his fellow-laborers in the investigation of the botany of Spain, * Don Antonia Cabrera, canon of the church of Cadiz, and it must be allowed that he has chosen for his friend a curious species. The habit of *F. Cabrera* is altogether that of some *Fuci* of the division *foliis unitis*, inasmuch, that any botanist, who had seen it only barren, might easily be led to believe it was merely one of that tribe in an imperfect state, or an early stage of growth. In its fruit, however, it is most unlike them, and in the interior formation of its capsules agrees with *F. rotundus*, to which, in other respects, it has not the least affinity. The texture of the frond approaches that of *F. aculeatus*, which the root also resembles. The fructification appears to have escaped the notice of Clemente, who expresses himself doubtful if the plant may not possibly belong more properly to the *Ulvæ* than to the *Fuci*, and says, that it has numerous, globular, yellowish, pellucid, immersed seeds, scarcely visible to the naked eye, nothing of which kind I can see in my specimen. He also adds, that the ends of the frond are acute, except from † accidental causes. The external appearance of the tubercles resembles that of the apices of *F. lumbricalis* β, between which plant and *F. Cabrera* there is another point of affinity, in the fruit of both falling off in decay, and the frond pushing out from the centre of the injured part new branches, which, being considerably more narrow than the primary ones, cause it to look here and there as if marked with annular strictures.

- | | | | | |
|--------------------------------------|---|---|---|----|
| a. <i>F. Cabrera</i> , natural size. | | | | |
| b. part of the frond, magnified | - | - | - | 6. |
| c. apex, with tubercle | - | - | - | 5. |
| d. horizontal section of a tubercle | - | - | - | 2. |
| e. fibres and seeds | - | - | - | 1. |

* Upon this subject, Clemente says, "Cabrerae nomine eam insignivi, ut constet inter botanicos hujus et futuri ævi sedulitas, ingenium, et mira sagacitas, quibus D. Anton. Cabrera, Ecclesie Gaditanæ Canonicus, algarum marinarum indagini se dedit, preclara in aliis disciplinis parta merita non parum exornans."

† "Apices sæpe truncati ex spontaneo extremitatum defluvio per commissuras incrassatas ad superiorem frondis partem frequentiores absque ordine positas locum habenti."—*Clemente*.



Fucus Cabrera.

Fucus fronde coriaceo-cartilagineâ, planâ, enervi, angustissimâ, lineari, sub-dichotomâ, integerrimâ: tuberculis solitariis, ellipticis, terminalibus.

Fucus Cabrera. CLEMENTE. p. 313.

HABITAT circa Gades. *Clemente*.

Perennis?

RADIX callus durus, lignosus, informis.

FRONS *stipite* assurgens terete, pennâ olorinâ crassitiæ, vix unguem longo, indiviso, sed apice ramis plurimis vagè obsito; *rami*, e basi exiguâ teretiusculâ lineam unam alteramve longâ, et pennâ passerinâ haud crassiore orti, statim fiunt plani, et per totam longitudinem, quæ sex septemve pollices æquat, latitudinem unius circitèr lineæ ubique æqualem ad apices usque servant; *rami* hi, et quidem plurimi, intervallis incertis crebrò dichotomi, furcæ angulis acutis; illos potiùs indivisos diceretis, et utrinque laxè obsitos aliis, homogeneis, brevioribus, distichis, sparsis, erecto-patulis, qui quoque, primariorum instar, vel dichotomi sunt, vel aliis eadem ratione dispositis instructi; margines cunctis integerrimi; apices acuti, nisi in fructiferis, aut fructu jam delapso, quum truncati conspiciuntur:—idem in hoc Fucò, quod in *F. lumbricali*, accidere solet; scilicet ramos novos angustioresque ex apicibus truncatis ortos frondi faciem annulatam dare.

FRUCTIFICATIO sita ad apices ramorum, qui tunc in discum explanantur dilatatum, cui insidet tuberculum unicum, teres, vix lineam longum, dilutè carneum non sine fuscedine, epidermide nullâ obtectum, sed totum constans e fibris parallelis, tenuissimis, albicantibus, claviformibus, apice rotundato, quibus immixta jacent semina oblonga rubentia.

COLOR amœnè olivaceus, diaphanus.

SUBSTANTIA coriaceo-cartilaginea, tenuis, lenta, tenax.

OBS. Habitus strictus; facies comosa; exsiccatione chartæ non adhæret.

Paucis modò abhinc mensibus accepi hunc Fucum, hactenus nullibi nisi prope Gades ab amicissimo Clemente lectum. Hic primus descripsit in Catalogo Algarum submersarum regni Sevillæ, quem operis sui de *Vitis vinifera* varietatibus ad calcem apposuit. *F. Cabrera* nomen speciei indidit, honori consulens* D. Antonii Cabrera, Ecclesiæ Gaditanæ Canonici, quem in Algis Hispanis indagandis collegam habuerat. Singularem sanè stirpem, dignamque quæ botanici nomen ferret, amico dicendam selegit. Habitu hæc planta gaudet tali, quali plures e Fucis quibus *folia* sunt, quæ dicuntur, *unita*; ut, si sterilem modò reperiret aliquis, facilè quendam ex his crederet, et forsàn intactum præteriret, mancum junioremve existimans. Longè tamen ab his omnibus fructifera recedit; capsularumque formâ internâ cum *F. rotundo*, a quo in cæteris diversissima, convenit. Frondis texturâ ad *F. aculeatum* accedit, atque radicem habet hujus similem. Fructificationem nunquam vidit cl. Clemente, qui dubitare se profitetur utrum rectè fecerit Fucis potiùs quam Ulvis associando, memoratque ferè semina plurima spherica lutescentia pellucida in frondis substantiâ immersa, adèd exigua ut aciem inermem penè fugiant. Talia ego frustra in exemplaribus meis quæsivi, et casu modò adfuisse, non plantæ fuisse propria, suspicor. Adjungit quoque idem ramorum apices naturâ esse acutos, nisi † fortuitò læsi reperiantur. Tuberculorum facies externa haud absimilis est ejus apicum frondis in *F. lumbricalis* varietate β; interestque alia etiam inter illum Fucum et *F. Cabreram* affinitas, quòd utriusque fructus effœtus decidat, et e ramorum extremitatibus hanc ob causam truncatis rami novi propullulent, qui, primariis longè angustiores, frondis faciem hìc illic annulatam reddunt.

- | | | | |
|-----------------------------------------------|---|---|----|
| a. <i>F. Cabrera</i> , magn. nat. | | | |
| b. <i>frondis pars</i> , magn. auct. | - | - | 6. |
| c. <i>apex, cum tuberculo</i> | - | - | 5. |
| d. <i>tuberculum horizontalitèr dissectum</i> | - | | 2. |
| e. <i>fibræ et semina</i> | | | 1. |

* De hoc Clemente, "Cabrera nomine eam insignivi, ut constet inter botanicos hujus et futuri ævi sedulitas, ingenium, et mira sagacitas, quibus D. Anton. Cabrera, Ecclesiæ Gaditanæ Canonici, algarum marinarum indagini se dedit, præclara in aliis disciplinis parta merita non parùm exornans."

† "Apices sæpe truncati ex spontaneo extremitatum defluvio per commissuras incrassatas ad superiorem frondis partem frequentiores absque ordine positas locum habenti."—*Clemente*.

Fucus confluens, frond coriaceous, flat, nerveless, linear, mostly undivided, pinnated with branches between erect and patent, alternate, chiefly simple, long, sub-petiololed, sinuated at their margins, rounded at their apices: tubercles immersed in the smaller branches.

Fucus confluens. BROWN, MS.

At Port Dalrymple, in New Holland. Mr. Brown.

Perennial.

ROOT, I have never seen.

FROND, in the part nearest the base, probably from the action of the waves, between compressed and cylindrical, and two or three lines in diameter, but almost immediately becoming flat, and thence preserving throughout its whole length, which extends to a foot and half, or more, an everywhere equal width of about half an inch; it is constantly destitute both of veins and midrib; near the base it is once or twice dichotomous, after which it continues undivided, but is pinnated at irregular intervals, sometimes of an inch, sometimes of scarcely half an inch each, with branches of the same nature and substance as itself, distichous, alternate, between erect and patent, the lowest longest, and nearly a foot in length, the uppermost hardly two inches long; the shorter branches are simple, the longer pinnated with other smaller ones, disposed in the same manner as themselves, all of them so much attenuated at their base as to appear almost petiolated, but soon becoming flat and linear, and of nearly the same width as the primary frond, like which they are here and there irregularly, but slightly, sinuated at their margins, and at their apices obtuse and rounded.

FRUCTIFICATION, situated in the apices of the branches, especially the smaller ones, (but these do not, from their containing the fruit and performing the office of receptacles, alter their form, but are merely thicker, and externally torulose, and perforated with very minute pores,) consisting of imbedded spherical tubercles, full of extremely thin fibres, but, in my specimens, destitute of seeds, which had in all probability escaped.

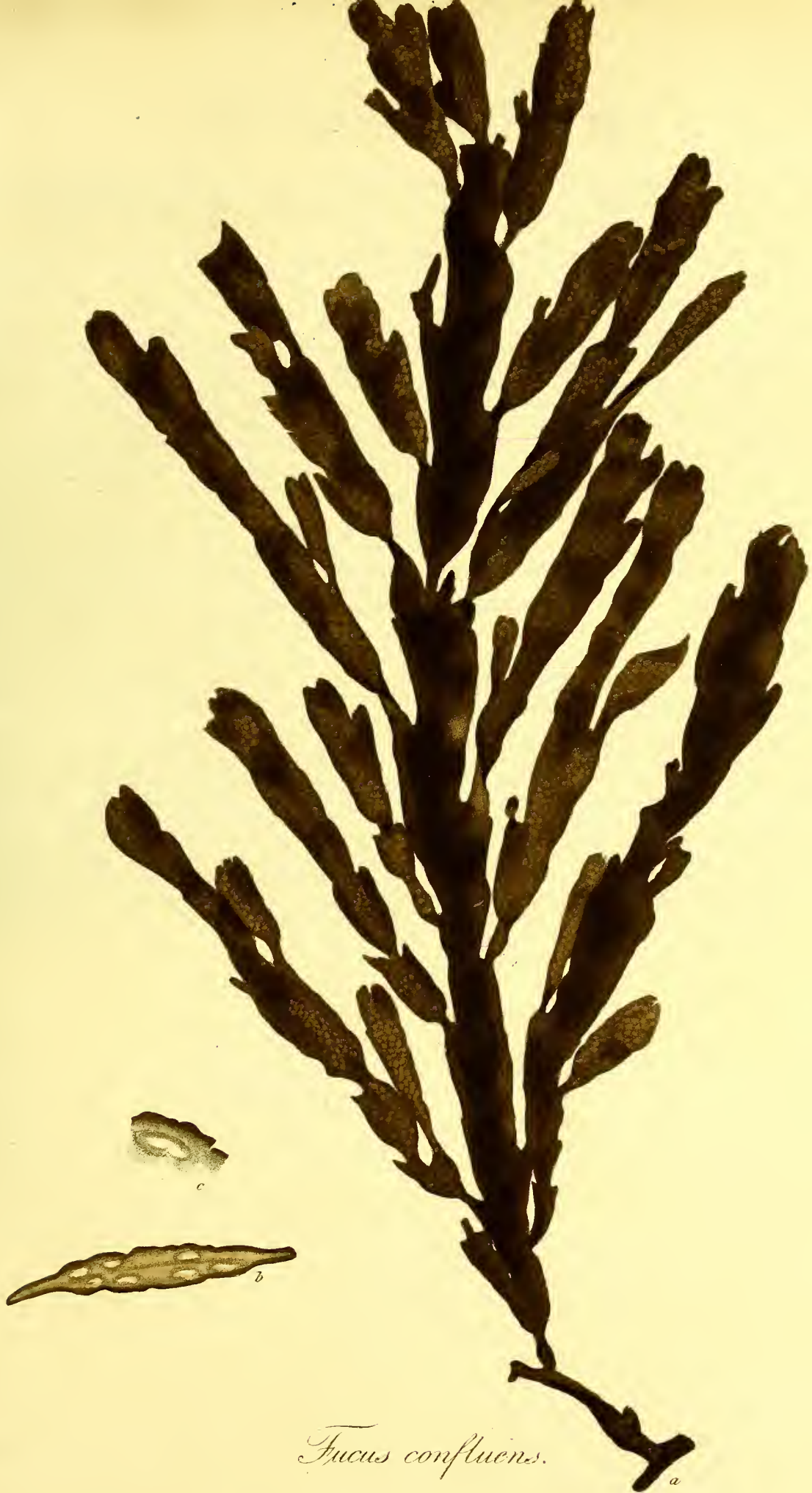
COLOR, olive-green, blackish in a dry state, but, if kept long in fresh water, turning to a deep, red-brown.

SUBSTANCE, between coriaceous and cartilaginous, flexible and tough.

OBS. The barren apices of the frond, if held to a strong light, appear evidently thickest in their centre, and of a darker color, so as to exhibit the appearance of an obsolete midrib:—the surface is sometimes uneven with minute longitudinal wrinkles:—the branches are not uncommonly once twisted at their base:—in drying the plant does not adhere to paper.

The striking resemblance, in point of size, color, habit, and fructification, between the *Fucus* here figured and *F. serratus*, can scarcely fail of being noticed by every botanist; and it is such, that these plants may justly be regarded as close affinities, though the strong difference of the one having a thick visible midrib, which in the other is wholly wanting, may render it necessary to keep them at a distance from each other in an artificial arrangement. Nor is this the only particular in which they differ; for they equally disagree in the margins of *F. confluens* being only here and there sinuated, while those of *F. serratus* are regularly serrated; in the apices of the former being always rounded, while those of the latter, though obtuse when barren, are acute when in fructification; and in the remarkable peculiarity of *F. confluens* having its branches so attenuated at their bases as to appear as if they were really petiolated, and to look like proper receptacles destined to perform no other office but that of containing the fruit. The frond, too, of this latter, is far from being dichotomous, and might more properly be described as a flat stem, pinnated with branches similar to itself. I have seen no specimens of this plant, besides those which I owe to the kindness of Mr. Brown, one of which is represented in the present plate.

- a. *F. confluens*, natural size.
 b. horizontal section of a receptacle, magnified 6.
 c. portion of the same - - - - 3.



Fucus confluens.

Fucus, fronde coriaceâ, planâ, enervi, lineari, sub-indivisâ, pinnatâ ramis erecto-patulis, alternis, simpliciusculis, elongatis, sub-petiolatis, sinuatis, apice rotundatis: tuberculis in ramis minoribus immersis
Fucus confluens. BROWN, M.S.

HABITAT apud Portum Dalrymple in Novæ Hollandiæ oris. D. Brown.

Perennis.

RADIX a me nondùm visa.

FRONS quâ basi proxima (vi forsân fluctuum ibi attrita) e tereti compressa, duarum triumve linearum diametro, exinde ferè statim fit plana, servatque latitudinem eandem circitèr unguicularem per totam longitudinem quæ sesquipedem æquat vel superat; costâ venisque semper caret; juxta basin semel iterumve est dichotoma, ex quo indivisa manet, sed intervallis nunc pollicaribus nunc vix unguicularibus pinnata conspicitur ramis homogeneis, distichis, alternis, erecto-patentibus, inferioribus longissimis et propemodùm pedilibus, summis haud bipollicaribus, longis tamen brevibusque, nullo ordine servato, immixtis; rami breviores simplices, longiores aliis minoribus simili ratione dispositis pinnati, omnes ortu angustati ut propemodùm petiolati videantur, mox plani et lineares, ejusdem ferè cum fronde primariâ latitudinis, atque, illius instar, margine hîc illic enormitèr, sed levitèr, sinuati, apiceque obtusi et rotundati.

FRUCTIFICATIO in ramis, præsertim minoribus, apices versus sita, interdùm totos occupans, (hi tamen, dum receptaculorum vice funguntur, ob fructum inclusum formam non mutant, et tantùm crassiores fiunt, extrinsecusque torulosi, porisque minutissimis pertusi,) e tuberculis constat immersis, sphericis, fibris tenuissimis repletis, sed in nostris exemplaribus sine seminibus, quæ procul dubio aufugerant.

COLOR olivaceus, *exsiccatæ* nigricans, *in aquâ dulci diu servatæ* intensè fuscus.

SUBSTANTIA coriaceo-cartilaginea, lenta, tenax.

Obs. Frondis in apicibus sterilibus luci fortiori objectis pars media aliquantùm incrassata apparet colorisque intensioris, ut costæ obsoletæ speciem præ se ferat; superficies quoque interdùm est rugosula, rugis minutis longitudinalibus:—rami basi non rarò semel torti:—planta exsiccata chartæ non adhæret.

Quanta interest colore magnitudine habitu et fructu inter *Fucum* hîc depictum et *F. serratum* similitudo, nemo, uti credo, botanicus non statim agnoscat. Ea quidem hæc est ut hæc duæ species jure habeantur arctissimè affines; quamvis, ob frondem in hæc manifestè percursam costâ incrassatâ, in illâ prorsùs enervem, necesse sit ut in systemate artificiali non parvo disjungantur intervallo. Neque quidem in hoc modò uno discrepant, sed et alia diversissima; *F. serrati* enim frondis margines dentibus acutis per totam longitudinem sunt obsiti, quibus *F. confluens* prorsùs caret, et tantùm est hîc illic lenitèr sinuatus; hujus ramorum apices semper rotundati; illius steriles obtusi, fructiferi acuminati: adde quòd *F. confluens* ramos habeat basi ita attenuatos ut petiolis brevissimis insidere videantur, referantque receptacula ad nullum alium finem, nisi ut semina includant, a naturâ comparata. Fronde etiam gaudet nequaquam verè dichotomâ; sed potiùs dicendâ instructa caule plano ramis homogeneis pinnato. Nulla hujus plantæ exemplaria unquam vidi præter ea quæ D. Brown benevolentia debeo, quorum unum hæc tabula delineatum exhibet.

a. *F. confluens*, magn. nat.

b. *receptaculum horizontalitèr dissectum*, magn. auct. 6.

c. *ejusdem pars* - - - - - 3.

Fucus comosus, stem coriaceous, compressed, linear, branched, beset on both sides with leaves and vesicles; leaves standing close to each other, flat, nerveless, linear, dentato-serrate, bearing fruit; vesicles elliptical, petiolate, terminated with leaves: tubercles imbedded in the leaves.

Fucus comosus. LABILL. *Pl. Nov. Holl.* II. p. 112. t. 258.

β. subintegrifolius; leaves mostly quite entire; color dark, reddish brown.

Both varieties are found at Van Diemen's Land. *M. Labillardière*, and *Mr. Brown*.

Perennial.

ROOT, I have not yet seen.

FROND, rising with a compressed, smooth stem, from a foot and half to six feet, or more, in length, preserving from base to summit an every where equal width of three or four lines, sometimes, and, according to Labillardière, most frequently, simple, in other specimens irregularly dichotomous, and beset on both sides with a few scattered, patent branches of the same substance and nature as itself, which, though long, are always, as far as I have seen, simple, but, like the stem, produce throughout their whole length leaves and vesicles; leaves distichous, some standing close to each other, others rather remote, between horizontal and patent, flat, destitute of midrib or veins, * sessile, linear, about three inches long, and three or four lines wide, most of them straight, but some slightly falcate; the surface in barren specimens is smooth, in fructified ones rugged and perforated: the apices are rather acute, occasionally acuminate; the margins are serrato-dentate, with large irregularly scattered teeth; vesicles mixed with the leaves, but † sparingly so, scattered, elliptical, as large as Olives, supported on cylindrical petioli a line in length, externally smooth, internally empty, terminated at their apex by a leaf similar to the rest, but smaller, which is sometimes so broken or imperfect as to appear only like a cylindrical arista.

FRUCTIFICATION, spherical tubercles immersed in the substance of the leaves, (which at that period perform the office of receptacles, and are full of mucus, and swollen to four times their usual thickness) scattered all over them, externally perforated with very minute pores, and internally containing numbers of elliptical, brown, dotted seeds, together with parallel fibres, and irregularly oblong, pellucid granules, apparently, similar to those observable in the tubercles of *F. tuberculatus*, and many other Fuci.

COLOR, olive-green, blackish when dry.

SUBSTANCE, coriaceous in the stem, cartilaginous in the leaves and vesicles; every where flexible and tough.

Obs. The leaves sometimes reach the length of six inches, as if they were about to lengthen into branches; and I have seen one which was bifid: according to Labillardière, two leaves occasionally, though rarely, grow from the end of the same vesicle:—the plant, in drying, does not adhere to paper.

The variety *β* principally differs from *α* in having most of its leaves entire at the margins, though some are remarkably toothed; in the direction of these being between erect and patent, not between horizontal and patent; in their being so attenuated at the base as to look as if they were supported upon short, sub-cylindrical petioli; and in the appearance of the whole plant being quite smooth, and the color a brown tinged with dark red, without any portion of olive.

This *Fucus* affords a very extraordinary, and, I believe, an unique instance of the tubercles being immersed in the substance of the leaves, which, though they perform the office of receptacles, yet on such account undergo no alteration in form, and merely become more thick in their substance, and wrinkled or granulated in their surface. The specimen represented in the present plate, for which I am indebted to Mr. T. F. Forster, who received it, I understand, among the remains of Ellis's herbarium with no locus natalis annexed, is in full fruit: that figured by Labillardière in his *Plants of New Holland* is altogether barren, and this author seems, from his description, to be acquainted with it in such a state alone. They appear to agree in every other respect, and the specimens of the var. *β*, gathered by Mr. Brown, curiously unite them, by being partly barren, and partly in fruit; while at the same time they differ from both in their nearly entire leaves, and have their color so greatly unlike that of the subject of the plate before us. With respect to the color of *M. Labillardière's* plant, it is impossible to say any thing, as it is not mentioned in the description. The leaves of *F. comosus* are, when barren, merely a thin membrane, of a substance, apparently, quite uniform, and without any tendency to a fibrous structure; but, when in fruit, their nature seems altogether changed, and the alteration they undergo is not wholly unlike that which takes place in the pinnæ of *F. esculentus*, except that the outer coat, instead of being composed of pyriform seeds, consists of parallel jointed fibres, under which the tubercles lie imbedded. A series of minute, dark-brown, globular granules, is generally found lying immediately at the base of the fibres, or sometimes mixed among them, but what purpose they are designed to answer I have not the least idea. Their form differs from that of the seeds contained in the tubercles. Mr. Forster, who has long been in possession of this *Fucus*, had intended to have described it in the *Linnean Transactions*, under the name

* Labillardière calls the leaves sub-petiolate, which is by no means the case in the specimen here figured, but holds good in my variety *β*, of which the leaves are remarkably attenuated at the base.

† I describe from what I have seen; but Labillardière, on the other hand, says, that the vesicles are produced plentifully, and that most of the leaves are at their bases dilated into an elliptical vesicle much wider than themselves; upon which subject I think it necessary to observe, that it appears to me impossible that the leaves should ever widen so as to be changed into vesicles, but that I believe these latter to be first formed, and the leaves to grow afterwards out of their apices.



Fucus comosus.

name of *F. nuciferus*, which appellation would have been greatly preferable to the unmeaning one since given by Labillardière. *F. comosus* agrees in its mode of growth with *F. Menziesii*, from which it is at first sight distinguishable by the smooth stem and the serrated leaves, not to mention either the difference in substance, or the most important character of the latter, that of the fruit being imbedded in the substance of the leaves; upon which, however, no stress can be laid, while the fructification of *F. Menziesii* continues unknown, as it is possible that it may be like that of *F. comosus*, though the texture of the plant makes such a supposition highly improbable.

a. <i>F. comosus</i> , natural size.	
b. horizontal section of a leaf, magnified	- 6.
c. part of the same	- - - 4.
d. portion of a receptacle	- - - 3.
e. seeds	- - - 1.
f. pellucid granules	- - - 1.
g. horizontal section of a leaf, without receptacles	5.
h. part of the same	- - - 2.

142.—FUCUS COMOSUS.

Fucus, caule coriaceo, compresso, lineari, sub-ramoso, utrinque foliis vesiculisque obsito; foliis approximatis, planis, enervibus, linearibus, dentato-serratis, fructiferis; vesiculis ellipticis, petiolatis, apice foliiferis: tuberculis in foliis immersis.

Fucus comosus. LABILL. *Pl. Nov. Holl.* II. p. 112. t. 258.

β. *subintegrefolius*; foliis plurimis integerrimis; colore sanguineo-fusco.

HABITAT utraque varietas ad capitis Van-Diemen littora. D. Labillardière et D. Brown.

Perennis.

RADIX a me nondum visa.

FRONS caule assurgens compresso, lævi, sesquipedali, orgyali, et ultrà, latitudinem tri- quadri- linearem ubique æqualem a basi ad apices servante, nunc, et quidem, teste Labillardiero, plerumque, simplice, nunc vagè dichotomo, ramisque aliquot utrinque obsito sparsis, homogeneis, patentibus, elongatis, semper, quantum ego vidi, simplicibus, folia vesiculasque, sicut et caulis, per totam longitudinem sustentantibus; folia disticha, hinc conferta, illic remotiuscula, horizontalitèr patula, plana, nervi venarumque expertia, * sessilia, linearia, tres circitèr pollices longa, et tres quatuorve lineas lata, pleraque recta, sed quædam lenitèr falcata; superficies in sterilibus lævis, in fructiferis rugosa et pertusa; apices acutiusculi, interdum acuminati; margines laxè serrato-dentati, dentibus magnis enormitèr sparsis; vesicula foliis immixtæ, sed illis longè † infrequentiores, sparsæ, ellipticæ, *Olea europææ* druparum magnitudine, petiolis teretibus lineam longis fultæ, extrinsecus læves, intus cavæ et vacuæ, apice terminatæ folio reliquorum simili sed illis duplo triplove breviorè, quod aliquandò diffractum aut abortivum aristam modò teretem simulat.

FRUCTIFICATIO tubercula spherica, immersa in substantiâ foliorum, (quæ tunc receptaculorum vice funguntur et mucò repleta sunt solito quadruplo crassiora,) ubique per illa sparsa, poris minutissimis extrinsecus pertusa, intus includentia

* Sub-petiolata describit Labillardierus, quod neutiqum in exemplare hinc depicto valet: res tamen ita se habet in varietate nostrâ β, cujus folia basi insignitèr sunt attenuata.

† Ita quidem in nostris est exemplaribus, sed contra frequentissimas dicit Labillardierus, "folia plurima basi in vesiculam ellipticam multo iisdem latiorè dilatari" memorans; de quo animadvertendum, videri mihi impossibile folia revera in vesiculis dilatata mutari, sed omninò credo has primitus formari, et folia postea ex apicibus oriri.

includentia myriadas seminum fuscorum ellipticorum punctatorum, unà cum fibris parallelis, granulisque enormitèr oblongis pellucidis, similibus, uti videtur, illorum in *F. tuberculati* aliorumque multorum Fucorum tuberculis observatorum.

COLOR olivaceus, siccata nigricans.

SUBSTANTIA in caule coriacea, in foliis et vesiculis cartilaginea, ubique lenta et tenax.

Var. β præcipuè discrepat ab α quòd folia habeat pleraque margine integerrima, aliqua verò insignitèr dentata; quòd hæc non sint horizontalitèr, sed erecto, patula; quòd basi ita attenuentur ut in petiolos brevissimos teretiunculos desinere videantur; denique quòd toti stirpi facies sit lævigata, et color fuscus in sanguineum proclivis, nequaquam olivaceus.

OBS. Folia interdùm in septem pollicum longitudinem producuntur, quasi semet in ramos elongatura, et unum vidi bifidum: teste Labillardiero, vesiculæ foliis binis rarè coronantur:—planta exsiccata chartæ non adhæret.

Notabilis et, quantum scio, unicus est hic Fucus inter Algas cui tubercula sunt immersa in substantiâ foliorum, quæ, dum receptaculorum vice funguntur, nullam idcirco formæ suæ mutationem subeunt, sed tantummodò crassiores fiunt, superficieque rugosa aut granulata. Exemplar in hæc tabulâ delineatum benevolè admodùm mecum communicavit D. T. F. Forster, qui inter herbarii Ellisiani reliquias accepit, loco natali adjecto nullo. Hoc ubique est fructiferum; sed fructu omninò caret illud a Labillardiero inter plantas Novæ Hollandiæ depictum, neque, quantum e descriptione liquet, receptacula ille unquam vidit. In cæteris hæc stirpes convenire videntur, atque inter utramque facie ambigunt varietatis β specimina a D. Brown lecta, quibus folia quædam capsulifera, alia tuberculis carent. Hæc autem, dum utramque sic connectunt, ab utrâque recedunt per foliorum margines subintegerrimos, tingunturque colore illi absimili quo planta hæc depicta gaudet. De exemplaris Labillardieriani colore nihil est quod dicam, ipse enim in descriptione immemoratum transit. *F. comosi* folia sterilia membrana sunt tenuis, cui substantia est uniformis, et quæ nihil ad structuram fibrosam accedens ostendit, sed in fructiferis indoles prorsùs alia; hæc enim intùs mutantur eadem ferè ratione quâ *F. esculenti* pinnæ, excepto quòd in his e seminibus pyriformibus in illis e fibris parallelis articulatis tota constet superficies. Sub fibris jacent tubercula, et sæpiùs fibrarum ad basin vel illis immixta conspicitur granulorum minorum sphericorum fuscorum series, de quibus ego nullo modo hariolari possum ad quem finem in plantæ economiâ destinentur. Horum forma discrepat ab illâ seminum in tuberculis inclusorum. D. Forster, qui diu hunc Fucum in herbario suo servavit, illum in *Societatis Linnæanæ Actis* sub *F. nuciferi* nomine descripsisse destinaverat, nomine sanè aptissimo atque illi quod nunc fert longè anteponendo. Crescendi modo venit *F. comosus* cum *F. Menziesii*, a quo primo statim aspectu distinguunt caulis glaber et folia serrata; ut silentio transeam substantiam alienam vel fructum in foliis immersum. Hoc autem, quantumvis sit *F. comosi* character essentialis, nequaquam niti licet, donec *F. Menziesii* innotuerit fructificatio; fieri enim potest ut utrique sit eadem, quamvis textura diversa tali sententiæ repugnet.

a. <i>F. comosus</i> , magn. nat.	
b. folium horizontalitèr dissectum, magn. auct.	6.
c. ejusdem pars - - - - -	4.
d. receptaculi pars - - - - -	3.
e. semina - - - - -	1.
f. granula pellucida - - - - -	1.
g. folium horizontalitèr dissectum, sine receptaculis - - - - -	5.
h. ejusdem pars - - - - -	2.

Fucus, fronde coriaceo-cartilagineâ, planâ, enervi, lineari, alternatim pinnatifidâ; segmentis patentibus, lenitè falcatis, simplicibus, pinnatifidisque, integerrimis: receptaculis planis, lanceolatis, subsessilibus, marginalibus, sparsis.

HABITAT in Novæ Hollandiæ oris occidentalibus. *D. Menzies*.

Perennis.

RADIX callus informis, aliquantum explanatus, fibras aliquot incurvas rigidas teretes emittens.

FRONS longitudine sesquipedali et ultra, ipsam ad basin compressa, pennæque ibi anserinæ crassitie, mox, quamprimùm ad pollicis unius altitudinem attingit, plana, atque exinde latitudinem ubique eandem duarum circitèr linearum per totam longitudinem servans, nervi venarumque prorsus expers, hic illic vagè dichotoma, ramis elongatis, omnibus ab ortu ad apices pinnatifidis, segmentis patentibus, lenitè incurvis, alternis; approximatis, decurrentibus, linearibus, apice rotundatis, atque ibi non infrequentèr dente uno alterove sparsa brevi obsitis, cætera integerrimis, his simplicibus duosque tresve pollices longis, illis quadruplo et ultra longioribus atque iterùm simili modo pinnatifidis, longis brevibus absque normâ immixtis; segmenta summa, quæ longissima, e simplicium breviorum alis oriuntur.

FRUCTIFICATIO ramorum superiorum, rarè tamen nisi primariorum, ad margines sita, e receptaculis constat planis, crassiusculis, lanceolatis, vel ovato-lanceolatis, semiunguem aut unguem longis et duas circitèr lineas latis, frondi concoloribus, hic illic fasciculatis, singulis pedunculo brevissimo tenuissimo fultis, extrinsecùs torulosus per-tusisque poris minutis, sub quibus latent tubercula subrotunda, immersa, singula includentia semina aliquot pyriformia, fusca, limbo* perquam lato cincta, immixtis fibris parallelis simplicibus articulatis granulisque ellipticis pellucidis seminibus multoties minoribus.

COLOR e fusco obscurè ruber, in surculis junioribus multo pallidior et ad roseum accedens, *exsiccata* ita intensus ut ferè nigrescat.

SUBSTANTIA inter cartilagineam et corneam media, crassiuscula, satis firma, tenax.

Obs. Stirps insignitèr lævis, nitoris tamen expers:—*exsiccata* chartæ non adhæret:—capsulæ per pedunculos tantummodò tenuissimos frondi affixæ facillè decidunt, ramorumque margines pedunculis persistentibus scabriusculos relinquunt.

Fuci huc depicti exemplaria mea D^{no} Menzies accepta refero, qui multis abhinc annis Novæ Hollandiæ ad oras legit. Iisdem mox in littoribus detexit D. Brown, qui mecum quoque benevolè communicavit. Species est fructu insignis; hic enim, quantumvis extrinsecùs a *F. vesiculosi* vel *F. natantis* receptaculis toto cælo abludere appareat, structurâ internâ prorsus cum iis consentit, ut fieri nequeat quin, Fucis demùm ritè in genera dispositis, horum familiis *F. dorycarpum* inseramus, quamvis crescendi modo texturâ atque colore ab his omnibus adeò usque recedit, ut naturâ invitâ ita facere videamur. Crederet potiùs aliquis, e facie exteriorè modò judicans, ut major inter *F. dorycarpum* et *F. dentatum* intercedat affinitas; sed fructificatio utriusque dissimillima. Color hujus Fuci ad illum ferri rubiginosi accedit. Ponitur in capsularum formâ præcipuum speciei discrimen, a quâ igitur nomen duxi, capsulas lanceolatas innuens.

a.	<i>F. dorycarpus</i> , magn. nat.				
b.	<i>receptaculum</i> , magn. auct.	-	-	-	6.
c.	<i>idem horizontalitèr dissectum</i>	-	-	-	5.
d.	<i>ejusdem pars</i>	-	-	-	3.
e.	<i>tuberculi dissecti portio</i>	-	-	-	2.
f.	<i>semen</i>	-	-	-	1.

* In exemplaribus a D. Menzies lectis adeò latus est hic limbus ut semina, eorum *F. membranacei* instar, non tam margine albo cincta quàm in sacco albo inclusa videantur, in iis autem quæ D. Brown ad eadem littora reperit semina limbo prorsus carent.

Fucus dorycarpus, frond between coriaceous and cartilaginous, flat, nerveless, linear, alternately pinnatifid; segments patent, slightly incurved, entire at their margins, some simple, others pinnatifid: receptacles flat, lanceolate, nearly sessile, scattered, lateral.

On the western coast of New Holland. *Mr. Menzies.*

Perennial.

ROOT, a shapeless, callous knob, furnished with a few rigid, incurved, cylindrical fibres.

FROND, a foot and half, or more long, compressed immediately adjoining the base, and there about the thickness of a goose-quill, but becoming flat as soon as it rises to an inch in height, and afterwards preserving throughout its whole length an everywhere equal width of about two lines, quite destitute of veins or midrib, irregular dichotomous at uncertain intervals, with long branches, all of which, from their origin to their extremities, are pinnatifid with patent, slightly incurved, alternate segments, standing close to each other, decurrent, linear, rounded at their apices, and not uncommonly there provided with one or two short, scattered teeth, in other parts quite entire, some of them simple, and not more than two or three inches in length, others four times as long, and again pinnatifid; long and short are mixed together, without any order, but the upper ones are generally longest, and grow out of the axillæ of shorter ones.

FRUCTIFICATION, situated upon the margins of the upper branches, seldom, however, of any but the primary ones, consisting of flat, thickish receptacles, of a lanceolate or an ovato-lanceolate shape, from a quarter of an inch to half an inch long, and two lines wide, of the same color as the frond, growing here and there in clusters, each supported upon a very short, and very thin separate peduncle, externally torulose, and perforated all over with minute pores, under which lie roundish, imbedded tubercles, in each of which are a few brown, pyriform seeds, surrounded by a *very wide limbus, mixed with simple, jointed, parallel fibres, and with pellucid, elliptical granules, many times smaller than the seeds.

COLOR, dark brownish red, in the younger shoots paler, and approaching to pink; when dry, so deep as to look almost black.

SUBSTANCE, intermediate between cartilaginous and horny, rather thick, tough, and flexible.

OBS. Whole plant remarkably smooth, but destitute of gloss:—in drying it does not adhere to paper:—the capsules are attached to the frond by so very thin peduncles that they easily fall off, and the remains of the peduncles give the branches a rough appearance, as if from minute teeth.

I have to express my obligations for my specimens of the *Fucus* here figured to Mr. Menzies, who gathered it many years ago upon the coast of New Holland, where it has been subsequently found by Mr. Brown. It is a remarkable *Fucus*, particularly on account of its fructification, which, however unlike in appearance, is in its formation precisely the same as that of *F. vesiculosus*, *F. natans*, and their affinities, from all which the plant so widely differs in habit, in mode of growth, in texture, and in color, that it is impossible not to feel as if violence were done to nature in uniting species so dissimilar. *F. dorycarpus* seems rather, from its external appearance, to be naturally allied to *F. dentatus*, with which, in point of fruit, it has not the smallest affinity. Its color considerably resembles that of rusty iron. The form of the capsules constitutes the most striking peculiarity of the species, and I have therefore from this circumstance derived the name, expressive of its resemblance, though in miniature, to the head of a spear.

a.	<i>F. dorycarpus</i> , natural size.				
b.	receptacle, magnified	-	-	-	6.
c.	horizontal section of the same	-	-	-	5.
d.	part of the same	-	-	-	3.
e.	portion of a tubercle	-	-	-	2.
f.	seed	-	-	-	1.

* In the specimens gathered by Mr. Menzies this limbus is so wide, that the seeds, like those of *F. membranaceus*, look rather as if they were inclosed in a white bag, than surrounded by a white border. In Mr. Brown's specimens the seeds are altogether destitute of any similar appearance.



Fucus dorycarpus.

Fucus, fronde membranaceâ, planâ, costatâ, lineari, dichotomâ, sinuosè pinnatifidâ, apicibus obtusis: capsulis planis, membranaceis, subsessilibus, sub-orbicularibus, hîc illic in costâ fasciculatis.

HABITAT ad Caput Bonæ Spei. D. C. Brand, in *Herb. Banks.*

Perennis?

RADIX callus parvulus, sub-conicus.

FRONS longitudine circitèr dodrantalis, e nervo constans crasso, vix nisi planta luci objiciatur detegendo, apices versus prorsùs evanescente, cui utrinque applicatur membrana concolor, angusta, linearis, ut totius frondis latitudo ubique æqualis duas tresve lineas æquet; frons dichotomiis divisa plurimis, juxta basin incipientibus, atque exinde sæpiùs, spatio inter singulas haud æquo, repetitis; segmenta erecto-patula, sub-fastigiata; apices rotundati, obtusi; margines sinuosè pinnatifidi, nunc ita lenitèr incisi, ut tantummodò serratos diceret, nunc ita profundè, ut segmenta in novos ramos abitura videantur:—in exemplare hîc depicto, quod unicum hactenus vidi, nervus est ubique, nisi prope apices, denudatus, unde fit ut planta potiùs compressa quàm plana, et ad basin, ubi pennam corvinam magnitudine superat, teretiüscula appareat.

FRUCTIFICATIO capsulæ planæ, membranaceæ, sub-orbiculares, vel orbiculari-obcordatæ, diametro sesquilineares, singulæ pedicello brevissimo tereti fultæ, ramorum nervo impositæ, hîc illic fasciculatæ, sub lente pulcherrimè reticulatæ, semina foventes plurima, sparsa, immersa, enormitèr subrotunda, in tres partes dehiscentia.

COLOR, qui basin versus ita intensè est fuscus ut propemodùm nigrescat, supernè fit dilutè fusco-roseus et subdiaphanus; in *exsiccatâ madefactâque* idem.

SUBSTANTIA nervi cartilaginea ad coriaceam accedens, lenta et tenax, membranæ tenuis atque tenera.

OBS. Exsiccatione chartæ non adhæret, neque faciem ullo modo mutat.

Primo statim aspectu longè ab omnibus aliis hucusque notis Fucorum speciebus recedit stirps in hâc tabulâ depicta, ut absque ullâ dubitatione hîc pro novâ distinctâque specie fidentèr botanicorum examini subjiciam; quamvis uno solo, illoque nequaquàm perfecto, exemplare niti cogar. Utinam sanè liceret æquè fidentèr de crescendi modo loqui; sed de hoc scrupuli mihi multi restant, et quidem vereor ut rectè fecerim, frondem suprâ alatum describendo; forsân enim accuratiùs dixissem basi teretem, mox compressam, et deinde planam, sicut in multis quoque aliis Fucis accidere solet, qui etiam, hujus instar, costam habent in membranâ, quo magis ad apices accedit eo sensim magis magisque obsoletam. In tali certè fuit sententiâ cl. Solander, qui exemplari Banksiano subscripserat *F. cuneati* nomen, sed qui forsân nunquam madefactum viderat. Sunt in hoc ipso exemplare diversæ faciei rami, e quibus botanicus aliquis hos inspiciens frondem diceret alatum, dum alter illis nisus planè enervem prædicaret; quod cum ita sit, rein in medio posteris, quibus litem dirimendi occasiones meliores arrideant, dijudicandam relinquere cogor. Eadem etiam in culpâ est dubitatio ut nihil possim de Fucis huic maximè affinis dicere. Capsulæ planæ latæ membranaceæ speciei characterem præ aliis manifestum suppeditant, quare ab his derivatum nomen plantæ indidi. Harum forma, si parva licet componere magnis, ab illâ *Ulmi montanæ* fructûs non multum discrepat. Facie externâ referunt præcedentis speciei receptacula, a quibus sunt intùs diversissimæ, similesque capsularum *F. sanguinei* plantarum, cujus et affinium instar, *F. platycarpus* quoque verisimilitèr tubercula fert spherica.

a. <i>F. platycarpus</i> , magn. nat.					
b. capsulæ, magu. auct.	-	-	-	-	6.
c. una ex iisdem	-	-	-	-	5.
d. capsulæ pars	-	-	-	-	3.
e. semina	-	-	-	-	1.
f. semen diffractum	-	-	-	-	1.

Fucus platycarpus, frond membranaceous, flat, midribbed, linear, dichotomous, sinuose or pinnatifid, obtuse at the apices: capsules flat, membranaceous, nearly sessile, suborbicular, clustered here and there on the midrib.

At the Cape of Good Hope. *Mr. Brand, in the Banksian Herbarium.*

Perennial?

ROOT, a small, nearly conical knob.

FROND, about nine inches long, composed of a thick midrib scarcely visible except the plant is held to the light and completely disappearing near the apices, to each side of which is attached a membrane of the same color, linear, and so narrow, that the width of the whole frond, which is everywhere the same, does not exceed two or three lines; the frond is divided with numerous dichotomies, that originate near the base, and are afterwards frequently repeated at irregular intervals; the segments are between erect and patent, all nearly of equal height; the apices rounded and obtuse; the margins between sinuose and pinnatifid, in some places so slightly cleft, that they might be called merely serrated, in others so deeply, that the segments appear as if lengthening into new branches:—in the specimen here painted, the only one I have ever seen, the nerve is everywhere stripped of its leafy membrane, except near the apices, so that the plant appears compressed rather than flat, and is almost cylindrical at the base, where it is somewhat thicker than a crow's quill.

FRUCTIFICATION, flat, membranaceous capsules, of an orbicular form, or between orbicular and obcordate, about a line and a half in diameter, standing here and there in small clusters upon the midrib of the branches, and appearing under the microscope beautifully reticulated, each supported upon a very short, cylindrical peduncle, and containing numerous, immersed, scattered, irregularly orbicular seeds, which split into three parts.

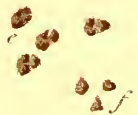
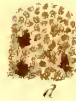
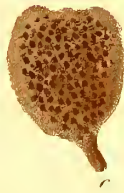
COLOR, so dark towards the base of the frond as to appear almost blackish, in the upper parts a pale pinky brown, and semitransparent, the same dry as wet.

SUBSTANCE, in the midrib cartilaginous, approaching to coriaceous, flexible and tough, in the membrane thin and tender.

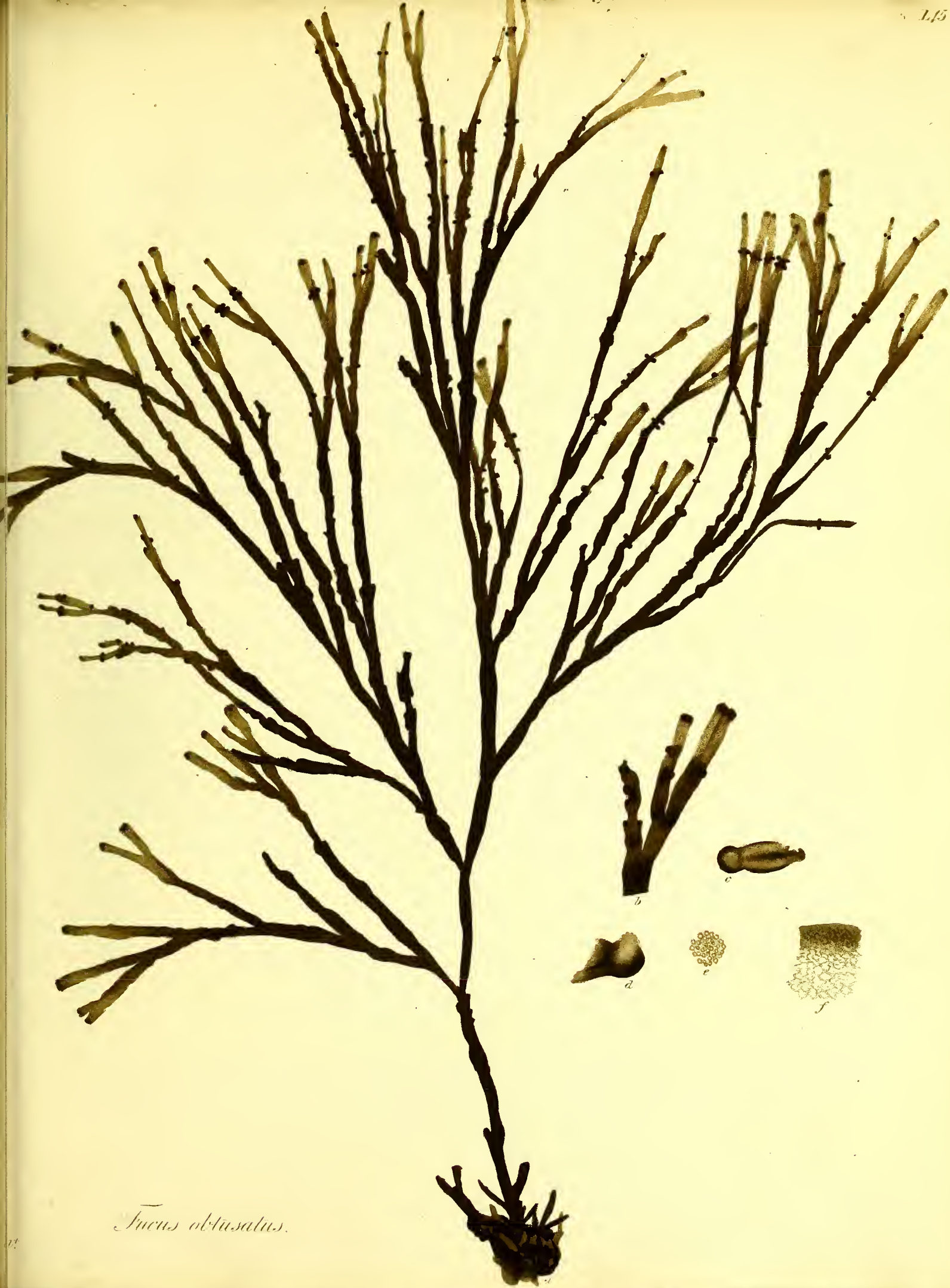
Obs. In drying it does not adhere to paper; nor does it alter its appearance.

This *Fucus* is, even at first sight, so different from all others, that I have not felt the least scruple in here publishing it as a distinct species, although I have at present seen only a single specimen, and that far from a perfect one. I am, however, by no means equally sure that I have done right in the description above given of its mode of growth; as, though it seems to me to be naturally a winged frond, it is certainly possible, perhaps not improbable, that, like very many other *Fuci*, it may, even in its most perfect state, be cylindrical near the base, and thence gradually expanded into a flat membrane, yet still preserving the traces of an obsolete midrib, which grows more and more faint in proportion as it approaches the summits. Such, undoubtedly, was the opinion of Dr. Solander, who in the Banksian Herbarium has given it in the MS. name of *F. cuneatus*, but who, perhaps, never had the opportunity of seeing it moist. There are different branches even in the specimen before us, which, taken separately, would lead any botanist to incline alternately to the one or the other way of thinking, and I can therefore do no more than leave the question in doubt, to be settled by future naturalists who may have more favorable opportunities of judging. The same doubt makes me also unable to decide upon the most natural affinities of the species. Its most striking character evidently consists in the broad, flat, membranous capsules, from which I have derived its name. These, though somewhat similar in external appearance, are in their internal structure altogether unlike those of the preceding plant, and rather resemble those of *F. sanguineus*, like which, and its affinities, *F. platycarpus* also probably produces spherical tubercles.

a. <i>F. platycarpus</i> , natural size.				
b. capsules, magnified	-	-	-	6.
c. one of the same	-	-	-	5.
d. part of a capsule	-	-	-	3.
e. seeds	-	-	-	1.
f. seed broken	-	-	-	1.



Fucus platycarpus.



Fucus obtusatus.

Fucus, fronde cartilagineâ, compresso-planâ, enervi, lineari, dichotomâ, margine eroso-crenulatâ, apice rotundato-truncatâ, orâque tenui nigricante marginatâ : tuberculis hemisphæricis, lateralibus, sessilibus, sparsis.

Fucus obtusatus. LABILL. *Pl. Nov. Holl. II.* p. 111. t. 255.

HABITAT ad Capitis Van Diemen littora. *Labillardière*.

Perennis.

RADIX discus callosus, tenuis, diametro unguicularis, nigricans.

FRONDES ex eâdem basi plurimæ, planæ, nervi venarumque expertes, longitudine pedales et ultrâ, latitudine duarum linearum ubique æquali, divisæ dichotomiis juxta basin incipientibus atque exinde decies pluriesve repetitis, intervallo inter singulas circitèr pollicari, segmentis sub-fastigiatis, erecto-patentibus, summis tamen interdum lenitèr falcato-recurvis; margines ubique minutè crenulati, quamvis aded enormitèr ut potiùs casu erosos crederes; apices nunquam non obtusi, rotundato-truncati, *orâque angustâ nigricante aliquantulum incrassatâ cincti: totam per frondem, sed præsertim apices versus, rami hîc subitò contracti conspiciuntur, atque pars superior ex ortu angustiore sensim ad suetam dilatatur latitudinem, unde facies quodammodò catenulata aut prolifera, quæ in his individuis insignis, in illis prorsus deest: hoc forsàn, sicut †annulata *F. lumbricalis* aut *F. Cabrera* facies, e fronde læsâ novos angustioresque ramos edente pendet.

FRUCTIFICATIO tubercula hemisphærica, nigricantia, *Brassica Rapa* seminibus aliquantum minora, frondis marginibus, præcipuè prope apices, insidentia, sessilia, sparsa, solitaria, sæpe opposita, poro nullo pertusa, intus sub epidermide crassâ includentia congeriem seminum minutissimorum sphæricorum dilutè fuscorum.

COLOR badius, sanguineo tinctus, ita intensus ut propemodum niger videatur, nitoris experts, juxta apices pallidior, atque ibi, si diu in aquâ dulci retineatur, demùm sordidè lutescens.

SUBSTANTIA cartilaginea, crassiuscula, lenta, tenacissima.

OBS. Habitus strictus:—*Sertularia cirrosa* atque alia quædam *Sertulariæ* species nondum, quoad scio, descripta hunc *Fucum* perperere amant:—exsiccatus chartæ non adhæret.

Quod in hâc tabulâ depingitur *F. obtusati* exemplar Dⁿⁱ Brown amicitiaè debeo, lectum ab ipso apud Portum Dalrymple juxta meridionale Australasiæ caput, ubi aliquot ante annis detexerat Labillardierus, qui primus descripsit. Cl. hic auctor, cum in descriptione, tum in icone, immemoratos transit frondis margines crenulatos stirpisque faciem proliferam; dubitationesque idcirco quasdam mihi injecerat num ambo reverà eandem plantam ante oculos habuerimus, quas tamen nuper abstulit specimen ab ipso ad Mertensium missum meisque omninò conveniens. Accesserat etiam tertia dubitandi causa, quòd, dum ille talia tam manifesta prætermittit, describit depingitque ‡ocellos per frondis superficiem sparsos, quales nostris in exemplaribus prorsus desunt. Hos verò e casu ortos, et ex insecti cujusdam marini puncturâ pendere suspicor; vidi enim similes in quibusdam diversorum *Fucorum* individuis, dum in aliis ejusdem speciei frustra eorum vestigia quæsi. Magnitudine, habitu, crescendique modo, *F. obtusatus* cum *F. disticho*, sicut animadverterat Labillardierus, consentit; hujusque instar interdum, nequaquam verò semper, frondem apices versus ostendit medio aliquantum incrassatam, quasi costâ obsoletâ percursam. Fructu tamen toto cælo discrepant hæc duæ species, ut dubitationi nullus detur locus quin postea in diversa relegandæ sint genera. Quod ad fructificationem attinet, *F. obtusatus* maximè refert *F. crispi* congeneres, inter quos dantur aliqui nondum descripti a quibus formâ non ita longè ablutit. Froudus apices obtusi lenitèr rotundati, segmentaque superiora aliquantum falcata, unde stirpi facies quodammodò flabelliformis, efficiunt ut hæc species habitu, ut aiunt, generali affinitatem quandam cum *Zonariis*, cæteroquin dissimillimis, primo aspectu prodant.

- | | | | | | |
|----|----------------------------------------------|-------------|---|---|----|
| a. | <i>F. obtusatus</i> , | magn. nat. | - | - | - |
| b. | frondis apex, | magn. auct. | - | - | 6. |
| c. | ramus cum tuberculo horizontalitèr dissectus | | - | - | 5. |
| d. | ejusdem pars, tuberculo jam disrupto | | - | - | 4. |
| e. | semina | | - | - | 1. |
| f. | ramus horizontalitèr dissectus | | - | - | 1. |

* Apices lineato-granulatos in caractere specifico dicit Labillardierus: sed nihil ego tale in exemplaribus meis aut in specimine ab ipso ad Mertensium misso detegere potui: e contrario, quamvis a reliqua stirpe colore discrepant, ut extrinsecus visa aliquid sui proprium includere suspiceris, intus sunt omninò similia.

† Eadem propemodum est facies, sicut plurimis botanicis est notum, in *Polytricho communi*, ubi annuli annua plantæ incrementa denotant.

‡ Dicit ille de his, "Ocelli minimi, atri, sparsi, numerosi aut nulli."

Fucus obtusatus, frond cartilaginous, between compressed and flat, nerveless, linear, dichotomous, crenulated at its margins, at its apices obtuse, slightly rounded, and bordered by a thin blackish edge: tubercles hemispherical, lateral, sessile, scattered.

Fucus obtusatus. LABILL. *Pl. Nov. Holl.* II. p. 111. t. 255.

At Van Diemen's Land, near New Holland. *Labillardière*.

Perennial.

ROOT, orbicular, half an inch in diameter, thin, blackish, callous.

FRONDS, numerous from the same base, flat, destitute of midrib or veins, a foot or more long, and preserving from base to apices an equal width of two lines, forked at a short distance from the root, and afterwards ten or twelve times dichotomous, at uncertain intervals of about an inch each; the segments are nearly of equal height, between erect and patent, but the upper ones occasionally slightly recurved; the margins are everywhere minutely crenulated, though so irregularly, that they have rather the appearance of being accidentally erose; the apices are constantly obtuse, between rounded and truncate, and tipped with a narrow, blackish, somewhat swollen *margin, which makes them look as if they had been scorched:—all over the frond, but particularly towards the extremities, the branches are here and there suddenly contracted, and the part immediately above such contractions is very narrow at its origin, but gradually expands to the common width of the plant: this gives the frond a †catenated, or proliferous appearance, which is very striking in some specimens, though wholly wanting in others: it is in all probability analogous to the annuli of *F. lumbricalis* or *F. Cabrera*, and imputable to the same cause, the branches being broken, and pushing out new shoots from the centre of the apices.

FRUCTIFICATION, hemispherical, blackish tubercles, somewhat smaller than turnip-seed, sessile upon the margins of the frond, especially towards the apices, scattered, solitary, but often opposite, not perforated by any pore, containing under a very thick epidermis a mass of exceedingly minute, spherical, pale-brown seeds.

COLOR, rich chesnut-brown, with a tinge of crimson, so dark that it appears almost black, destitute of gloss, paler near the extremities, and, if long kept in fresh water, turning there to a dirty yellowish.

SUBSTANCE, cartilaginous, thickish, flexible, very tough.

Obs. Habit straight:—*Sertularia cirrosa*, and another species of *Sertularia* near *S. Filicula*, but at present, I believe, undescribed, are found growing upon this *Fucus*:—in drying it does not adhere to paper.

For the specimen of *F. obtusatus*, figured in the present plate, I am indebted to the friendship of Mr. Brown, who gathered this plant at Port Dalrymple, in Van Diemen's Land, at the southern extremity of New Holland, the same place in which it had previously been found by M. Labillardière. This latter writer, both in his description and figure, passes wholly unnoticed the crenulated margins, as well as the proliferous appearance of the frond, which are so striking in all Mr. Brown's specimens, that I should almost have been tempted to have regarded the two plants as distinct, had I not, through the kindness of Professor Mertens, lately received a specimen, communicated to him by M. Labillardière himself, which puts an end to all doubts upon the subject. At the same time that he omits to mention these two points, he particularly notices and figures scattered punctures all over the surface, of which I have never seen any symptoms. These, however, I am inclined to suspect are merely accidental, and probably arise from the puncture of some marine insect, since I have occasionally met with perforations of, apparently, a similar nature in individuals of other species, in which they were far from constant. In size, habit, and mode of growth, *F. obtusatus* bears a considerable resemblance to *F. distichus*, as observed by Labillardière, like which it is also near some, but not all, of its apices slightly thickened in the centre, so as to wear the appearance of having an obsolete midrib. These two species, however, differ as widely as possible in their fruit; so that they must necessarily hereafter be placed in different genera. In this latter respect *F. obtusatus* approaches to the congeners of *F. crispus*, and bears considerable affinity to some of these not yet described. In its blunt, slightly rounded apices, and recurved upper segments, giving the whole frond a fan-like form, it shows a resemblance in appearance, which would scarcely be expected from its nature and fruit, to some of the *Zonaria*, especially to a nondescript species lately received from New Holland.

- a. *F. obtusatus*, natural size.
- b. apex of the frond, magnified - - 6.
- c. horizontal section of a branch and tubercle 5.
- d. part of the same; tubercle bursting - 4.
- e. seeds - - - - - 1.
- f. horizontal section of a branch - - 1.

* Mr. Labillardière, in his description of this plant, says, that the apices are terminated with a granulated margin, and in his specific character, he calls them *lineato-granulatos*; but I must own that I never could see any thing to warrant such epithets, either in my own specimens, or in one communicated by him to Professor Mertens. On the contrary, though their external appearance and color naturally leads to the suspicion that they essentially differ from the rest of the frond, yet their internal structure exactly accords with it.

† A familiar instance of the same mode of growth is afforded by *Polytrichum commune*, in which the growth of every separate year is marked by similar annuli.

Fucus, caule coriaceo, compresso, lineari, ramoso; ramis cartilagineis, planis, enervibus, linearibus, pinnatifidis; segmentis erecto-patulis alternis, simplicibus, integerrimis: receptaculis cylindraceis, torulosis, breviter pedunculatis, ramulorum ad latera juxta alas sitis.

Fucus axillaris. BROWN, MS.

β. *scorteus*; fronde unguem ferè latâ, crassâ, nervo obsolete costatâ.

F. scorteus. MERTENS, MS.

HABITAT apud Portum Dalrymple in Novâ Hollandiâ. D. Brown.

Perennis.

RADIX a me nunquam visa.

FRONS instructa caule pedali, bipedali, et ultrâ, compresso, ancipite, latitudinem unius circiter lineæ ubique æqualem a basi ad apices servante, vagè diviso, ramis utrinque obsito; rami caulis e marginibus absque normâ orti, spatium nunc tri-quadrilinearibus nunc totidem pollicum distincti, longitudinis quoque quàm diversissimæ, ut hi pedem illi vix pollicem exuperent, omnes ortu caulem referentes, illiusque instar compressi, mox, quamprimùm ad perbreve in brevissimis ad longiusculam in elongatis altitudinem attigerunt, se sensim in latitudinem duplo majorem explanantes, qualem, jam plani facti, ad apices usque servant; nervo venisque omninò carent; per totam longitudinem pinnatifidè conspiciuntur, segmentis alternis, erecto-patulis, semiunguiculari ferè inter utrumque intervallo, pollicem unum alterumve longis, simplicibus, integerrimis, apice lenitè attenuato rotundatis.

FRUCTIFICATIO receptacula lutescenti-fusca, teretia, duas lineas longa, pennâ passerinâ multùm tenuiora, segmentorum pinnatifidorum ad margines juxta alas sita, nunquam nisi interius horum latus occupantia, approximata, singula pedunculo minutissimo fulta, extrinsecus ubique torulosa ut submoniliformia appareant, porisque pertusa, sub quibus latent tubercula innata, spherica, semina includentia aliquot enormitè pyriformia intensè fusca limbo lato pellucido cincta, unâ cum fibris plurimis simplicibus articulatis albis.

COLOR caulis intensè badius ut propemodùm nigrescat, ramorum longè dilutior et subdiaphanus.

SUBSTANTIA in caule coriacea, in ramis cartilaginea et crassiuscula, ubique lenta atque tenax.

Var. β, quam Novæ Hollandiæ ad littora detexit cl. Labillardierus, qui cum Mertensio communicavit, tantum ab α discrepat per frondem latam substantiamque crassiorem propemodùm coriaceam ut speciem distinctam simulet. Nulla quæ magnitudinè inter hanc et α ambigerent exemplaria hactenùs vidi.

Obs. Planta insignitè lævis, nitoris tamen expers:—exsiccata chartæ nequaquam adhæret:—ramorum in parte planâ, basin versus, costæ angustæ incrassatæ non rarè cernuntur vestigia, quæ tamen haud, ut in plurimis aliis Fucis, medium percurrit, sed latus hoc illudve occupat:—hæc costa in var. β maximè manifesta:—receptacula per pedunculos tenuissimos frondi affixa citò decidunt, et pedunculorum diffractorum reliquiæ denticulos referunt.

Licet hîc idem repetere quod jam sub *F. dorycarpo* prædicatur, neminem botanicum, e facie modò externâ judicantem, *F. natantis* vel *F. vesiculosi* familiis hanc illamve stirpem relaturum; quod tamen ut faciamus jubere videtur fructus vera indoles, in his omnibus eadem, quâ summoperè est in generibus stabilendis nitendum. *F. axillaris* receptacula formâ atque structurâ conveniunt cum iis *F. ericoidis* *F. fibrosi* et congenerum, quibus a hæc nostra cæteroquin est dissimillima, neque facilitè reperiemus aliam quamlibet his illisque communem notam. Receptacula verò, nequaquam, sicut in illis, quamprimùm suas partes peregerunt, in ramos immutantur, sed, contrâ, effœta manifestè decidunt; unde fit ut, quod suprâ memoratur, ramorum margines scabriusculi atque inæquales sæpiùs occurrant. Colore, fornâ, habituque generali, intercedit talis inter *F. axillarem* et *F. dentatum* affinitas, qualis verisimillimè efficeret ut juxta se collocaret hos duos Fucos quicumque botanicus steriles modò viderat, aut quicumque, verâ utriusque fructus indole neglectâ, illius putaret receptacula tam re quàm facie similia hujus capsularum lanceolarum. Descriptio et icon, quibus *F.* suum *gladiatum* illustravit Labillardierus, semel iterùmque dubitationem mihi injecerunt annon reverà ante oculos habuerit *F. axillaris* exeuplar muticum aut imperfectum. De hoc quoque scrupuli mihi etiamnum restant, sed non sum idcirco ausus *F. gladiatum* pro *F. axillaris* synonymo citare, nedùm utramque plantam prædicare eandem, et suum nomen huic nostræ indere.

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|-----------------------------------------|---|---|---|----|
| a. <i>F. axillaris</i> , magn. nat. | | | | |
| b. rami pars, magn. auct. | - | - | - | 6. |
| c. receptaculum horizontalitè dissectum | - | - | - | 4. |
| d. semina et fibræ | - | - | - | 1. |
| e. var. β frustulum, magn. nat. | | | | |

Fucus axillaris, stem coriaceous, compressed, linear, branched; branches cartilaginous, flat, nerveless, linear, pinnatifid, with simple, alternate, erecto-patent segments: receptacles cylindrical, torulose, standing on short peduncles along the edges of the ramuli near the axillæ.

Fucus axillaris. BROWN, MS.

β . *scorteus*; frond nearly half an inch wide, thick, having an obsolete midrib.

F. scorteus. MERTENS, MS.

At Port Dalrymple, in New Holland. Mr. Brown.

Perennial.

ROOT, I have not yet seen.

FROND, furnished with a stem from one to two feet or more in length, compressed, two-edged, preserving from base to summit an every where equal width of about a line, irregularly divided, and on both sides beset with branches; branches arising without order from the margins of the stem, separated by intervals of not more than three or four lines in some instances, but in others of as many inches, extremely variable likewise in their length, so that some extend to a foot, others to not more than an inch, all of them at their origin similar to the stem, and, like that, compressed, but soon becoming flat, and expanding to a width twice as great as they had at first, after which they continue linear to their extremities; they are entirely destitute of midrib and veins; throughout their whole length they are pinnatifid with alternate segments, between erect and patent, standing about a quarter of an inch from each other, one or two inches long, simple, entire at their margins, slightly attenuated, and rounded at their apices.

FRUCTIFICATION, receptacles of a yellowish brown color, cylindrical, two lines long, much more thin than a sparrow's quill, placed along the margins of the pinnatifid segments, near their axillæ, constantly upon the interior side, standing close to each other, each supported on an extremely minute peduncle, externally torulose all over, so as to appear almost moniliform, and perforated with fine pores, under which lie imbedded spherical tubercles, containing a few, irregularly pyriform, dark-brown seeds, surrounded by a pellucid limbus, together with numerous, white, jointed, simple fibres.

COLOR, a rich chesnut-brown, so deep in the stem as to appear almost black, much paler and semitransparent in the branches.

SUBSTANCE, of the stem coriaceous, of the branches cartilaginous and thickish, every where flexible and tough.

The variety β , which was found on the coast of New Holland, by M. Labillardière, and by him communicated to Professor Mertens, differs so much in its wider frond and thicker substance, that it looks like a distinct species. I have seen no intermediate specimens between it and α .

OBS. The whole plant is remarkably smooth, though devoid of gloss:—in drying it does not adhere to paper:—in the flat part of the branches, towards their base, are not uncommonly observable traces of a narrow, thickened midrib, which, however, does not, as in most other Fuci, run through the middle of them, but is confined to one or the other side:—this is by far most conspicuous in the var. β :—the receptacles, being attached to the frond only by very thin peduncles, easily fall off, and the remains of the broken peduncles look like small teeth.

It may be said of the *Fucus* represented in the present plate, with the same propriety as of *F. dorycarpus*, that no botanist, judging from external appearance, would think of arranging it among the affinities of *F. natans* and *F. vesiculosus*, with which, nevertheless, the internal structure of the fruit sufficiently clearly proves that both the one and the other must hereafter be classed. The receptacles of *F. axillaris* are similar, both in form and structure, to those of *F. ericoides*, *F. fibrosus*, and their congeners, from all which plants the present is in other respects so widely different, that it would be difficult to adduce another point of resemblance between them; and the fruit does not, as in those species, turn into new branches when its office of perfecting the seeds is accomplished, but very evidently falls off, leaving, as above mentioned, the margins of the branches uneven. In color, and general form, and habit, *F. axillaris* approaches much more closely to *F. dentatus*, near which it would probably be placed by any botanist who had seen it only in a barren state, or who, neglecting to investigate the real nature of the receptacles, might pronounce them, on a cursory view, similar to the lanceolate pods of that species. I have more than once been led to doubt, from Labillardière's figure and description of his *F. gladiatus*, whether they might not in reality have been taken from a mutilated specimen of *F. axillaris*, nor am I now able to satisfy myself if such be not the case, though it appears to me most probable that it is not so, on which account I have not ventured upon adopting his name, nor even upon referring to his plant.

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|------------------------------------------|---|---|---|----|
| a. <i>F. axillaris</i> , natural size. | | | | |
| b. part of a branch, magnified | - | - | - | 6. |
| c. horizontal section of a receptacle | - | - | - | 4. |
| d. seed and fibres | - | - | - | 1. |
| e. piece of var. β , natural size. | | | | |



Fucus acillaris.

det.

Fucus, fronde membranaceâ, planâ, enervi, lineari, sub-dichotomâ, margine ligulis homogeneis horizontalibus simpliciusculis ubique proliferâ: tuberculis hemisphæricis, mammillosis, sparsis, in superficie utrâque sessilibus.

β . *nudiusculus*; frondis marginibus plerumque denudatis.

γ . *lichenoides*; frondis apicibus lenitè attenuatis, acutiusculis.

F. lichenoides. ESPER, *Ic. Fuc. I.* p. 102. t. 50. (exclusis synonymis omnibus.)

HABITANT omnes varietates in Mari Rubro. *Vicecomes de Valentia*.— α prope Olyssiponem. *D. Teede*.

Annua?

RADIX callus perpusillus, discoideus.

FRONS plana, nervi venarumque prorsus expers, longitudine tri- quadri- pollicari, latitudine circitè bilineari et ubique æquali, ipso ab ortu ramosissima, ramis, ut plurimum, dichotomis, segmentis erecto-patulis, interdum alternis patentibus, apices bifidi furcis patentibus lenitè attenuati obtusi, margines integerrimi, ubique tamen obsiti, ut sub-pinnati videantur, ligulis horizontalibus, sparsis, homogeneis, nunc approximatis, nunc remotiusculis, ortu angustis subulatis et cilia referentibus, mox oblongis ejusdemque ferè cum ramis primariis latitudinis, semper tamen basi attenuatis, sub-unguicularibus, sed sæpe longioribus, seque in novos ramos iterum sub-pinnatos iterumque dichotomos mutantibus.

FRUCTIFICATIO tubercula hemisphærica, aut demum mammillosa, papaveris seminum magnitudine, sessilia, ubique per ramos sparsa, satis copiosa, utriusque eorum paginæ imposita, quandoque etiam in ligulis marginalibus obvia, intensioris quàm reliqua frons coloris, intus foventia congeriem seminum minutissimorum enormitè oblongorum rubicundorum.

COLOR amœnè glaucus, sub-diaphanus, *soli diu expositæ aut in aquâ dulci servatæ* sordidè albescens.

SUBSTANTIA cartilagineo-membranacea, tenuis.

Var. β ligulis marginalibus maximâ ex parte caret, colorisque est longè quàm α intensioris, et fusco vel purpurascete tincti; crescenti quoque modus huic magis ex ordine dichotomus, ramis strictis erectis; unde facies ab α ab-ludens, et illi *Ulvæ dichotomæ* non absimilis.

Frondem habet var. γ dimidio angustior quam quæ in varietatibus præcedentibus conspicitur; ligulæ quoque marginales sunt patentès, nec horizontales, magis quam in β , sed minùs quam in α frequentes: color, teste Espero, albus, quod tamen fortuitum suspicor.

Obs. Per desiccationem chartæ nequaquam adhæret.

Si quis botanicus nullum unquam *F. æruginosi* exemplar præter illud in hâc tabulâ depictum viderit, vix ille possibile credet, plantam ullo ætatis suæ stadio vel ullis casibus objectam ita immutari, ut, quem ab Espero accepit, *F. lichenoidis* titulum bene mereat. Quantumvis autem hoc mirum videtur, res ita se certè habet cum varietate in *Fucorum Iconibus* delineatâ, cujus specimina, ab ipso auctore benevolè missa, cum nostris collata, discrimen obtulerunt nullum, quod ad duas species constituendas sufficeret. Primo tamen aspectu multum discrepant, et Esperis stirps per frondis angustæ peripheriam atque habitum, non minùs quàm per colorem albicantem, se *Physciis* Acharianis, præsertim autem *Licheni prunastri* simillimam præstat. Colorem hunc e casu verisimilitè pendere, exemplaribus diutiùs æquo soli expositis, jam suprâ monui; eoque magis in hanc sententiam propendo, quia talis est substantia qualis in stirpe insolatâ quæreretur, et quia tubercula colorem lutescentem faciemque quasi corneam induerunt. Esperis specimina non omnibus suis numeris atque partibus iconi respondent; utpote qui ramos habent nequaquam in acumen longum productos, quamvis certè attenuatos et acutiusculos. In illis quæ juxta Olyssiponem legit b. Teede individuis, tubercula sunt longè majora quem in nostris Esperianisve, et *Brassicæ Rapæ* seminibus magnitudine vix cedunt, quare cl. Mertensius, a quo accepi, *F. macrocarpum* dixerat; sed cætera, quantum video, similia. Plurima *F. æruginosi* exemplaria, ab ipso in Mari Rubro lecta, servantur in nob. Vicecomitis de Valentia herbario; quæ cuncta mole atque formâ plurimum ludunt, tingunturque colore non minùs variabili, in his, et quidem in plurimis, glauco, in illis prasino, in aliis fusco, sive purpurascete. Multa ex his *Zosteræ* alicujus stipitibus parasiticè innascuntur. Inter *F. æruginosum* et *F. crispum* affinitas quædam manifestè interest, sed statim dignoscitur hæc nostra stirps ab omnibus Proteos illius marini varietatibus per substantiam teneram atque tenuem, ut alia taceam. Formâ quoque accedunt aliquæ *F. æruginosi* varietates ad *F. corneum* vel *F. filicinum*, sed magis adhuc ad *Ulvas* quasdam membranaceas, cum quibus ne sterilis commisceatur est cavendum.

- | | | | | |
|--------------------------------------|---|---|---|----|
| a. <i>F. æruginosus</i> , magn. nat. | | | | |
| b. <i>ramus</i> . | | | | |
| c. <i>ejusdem pars</i> , magn. auct. | - | - | - | 6. |
| d. <i>tuberculum dissectum</i> | - | - | - | 4. |
| e. <i>semina</i> | - | - | - | 1. |

Fucus æruginosus, frond membranaceous, flat, nerveless, linear, sub-dichotomous, beset every where at its margin with strap-shaped, horizontal, mostly simple processes; tubercles hemispherical, scattered, sessile on both sides of the frond.

β. *nudiusculus*; margins of the frond mostly naked.

γ. *lichenoides*; apices of the frond slightly attenuated and rather acute.

F. lichenoides. ESPER, *Ic. Fuc. I.* p. 102. t. 50. (exclusis synonymis omnibus.)

All the varieties are found in the Red Sea. *Lord Valentia*.—α near Lisbon. *Mr. Teede*.

Annual?

ROOT, a very small, callous disk.

FROND, flat, entirely destitute of veins or midrib, three or four inches long, and preserving every where a nearly equal width of about two lines, much and irregularly branched from the very base; branches mostly dichotomous with segments between erect and patent, sometimes themselves disposed in an alternate and patent direction, their apices bifid with slightly attenuated, obtuse, patent segments, their margins quite entire, but beset all over, so as to appear almost pinnated, with horizontal, scattered, strap-shaped processes of the same nature and substance as themselves, sometimes placed close together, in other cases rather remote, narrow, subulate, and resembling cilia in their earliest state, but afterwards taking an oblong shape, and attaining to nearly the same width as the primary shoots, yet constantly preserving their narrow bases; the common length of these is about half an inch, though they sometimes attain to much more, and change into new branches, which are again sub-pinnated, and again dichotomous.

FRUCTIFICATION, tubercles of an hemispherical shape, but mammillose at maturity, as large as poppy-seed, sessile, plentifully scattered all over the branches, lying upon the surface on both sides, sometimes also found upon the marginal ligulæ, of a darker color than the rest of the frond, containing a mass of extremely minute, reddish, irregularly oblong seeds.

COLOR, a pleasant, glaucous green, semitransparent, turning, from exposure to the sun, or from being long kept in fresh water, to a dirty whitish.

SUBSTANCE, between cartilaginous and membranaceous, thin.

The variety β almost wholly wants the marginal processes, and is of a much darker color than α, and tinged with purplish or brown; the mode of growth, too, is more regularly dichotomous, with straight, erect branches, which gives the plant an appearance unlike that of the more common variety, and approaching to *Ulva dichotoma*.

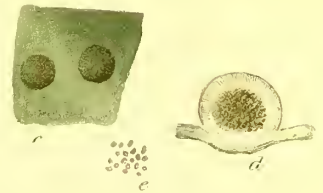
In γ the frond is not above half the width of the two preceding varieties; the marginal processes are patent, not horizontal, and are more numerous than in the one, but less so than in the other; the apices are attenuated and rather acute: and, according to Dr. Esper, the color is white, but this I suspect to be accidental.

OBS. In drying it does not adhere to paper.

The specimen of this *Fucus* here represented would scarcely lead to the supposition that it was possible for the plant in any stage of its growth, or under any change of its form, to deserve the name of *F. lichenoides*, given it by Professor Esper; and yet such is certainly the case in a striking degree with the variety figured in his work, which, on account of its more narrow frond, its general outline, and its dead-white color, bears a strong resemblance to *Lichen prunastri*. I have above stated my opinion, that this color is merely accidental, arising from the specimens having been bleached in the sun, and I am strengthened in this conjecture from the substance being such as might be expected under similar circumstances, and from the tubercles being of a pale, horny yellow. Dr. Esper has been so good as to favor me with specimens of his plant, by which I know it to be the same as mine. They do not, however, altogether accord with his figure, not being by any means acuminate at the apices, though certainly attenuated there, and somewhat acute. In the individuals found near Lisbon, by Teede, for which I am indebted to Professor Mertens, the tubercles are twice as large as I had previously seen them, and nearly equal in size to turnip-seed, on which account my friend had given it the name of *F. macrocarpus*, but I can find in it no other difference. Lord Valentia's collection contains many specimens of *F. æruginosus* gathered by himself in the Red Sea, extremely irregular in point of size, outline, and color, in which latter respect they vary from a glaucous green, which is most common, to a grass-green, or to brown or purplish, but none of these varieties appeared to me sufficiently striking or permanent to require particular notice, excepting those above mentioned. Many of the specimens are parasitical upon the stems of some species of *Zostera*. *F. æruginosus* is evidently allied to *F. crispus*, but is sufficiently distinguishable, even at first sight, from all the varieties of that marine Proteus by its thin and tender substance. It also discovers in some individuals an approach, that would scarcely be expected to *F. corneus*, and *F. filicinus*, but is most likely to be overlooked in a barren state for some of the membranaceous *Ulva*.

- a. *F. æruginosus*, natural size.
- b. *small branch*.
- c. *part of the same*, magnified - - - 6.
- d. *section of a tubercle* - - - 4.
- e. *seeds* - - - 1.

* There is in Lord Valentia's collection a specimen almost exactly intermediate between *F. æruginosus* and *F. corneus*.



Fucus ceruginosus.

Fucus, fronde cartilagineâ, carnosâ, hinc longitudinalitèr canaliculatâ, illinc convexâ, lineari, dichotomâ; apicibus , patenti-divaricatis, sub-incrassatis: tuberculis sphæricis, marginalibus, sparsis, brevissimè pedunculatis, sæpiùs congestis.

HABITAT in Indiâ Occidentalis oris. *D. Wright.*—In Mari Rubro. *Vicecomes de Valentia.*

Annua?

RADIX nondùm a me visa.

FRONS tri-quadri-pollicaris, primo ortu teretiuscula, pennæque corvinæ crassitie, mox, quamprimùm ad linearum aliquot altitudinem attingit, compressa, eandemque formam latitudinemque circitèr bilinearem ubique æqualem ad apices usque servans, ipsam ferè ad basin furcata, atque exinde dichotomiis sexies vel septies repetitis, intervallo inter singulas vix semiungiculari, divisa, furcarum omnium anguli acuti, extremitatum modò exceptis, qui patenti-divaricati; apices obtusi, lenitèr incrassati; margines integerrimi; frons ab ortu ad apices hinc longitudinalitèr canaliculata, alveo lato, parùm profundo, oris tenuibus, extantibus, illinc convexiuscula.

FRUCTIFICATIO in utrâque ramorum paginâ sita, e tuberculis constans sparsis, præcipuè apices versus conspiciendis, nequaquàm frequentibus, sphæricis, *Sinapios arvensis* seminum magnitudine, his sessilibus, illis breviter pedunculatis, sæpe pluribus in unum capitulum congestis, semina foveitis minutissima, enormitèr oblonga, dilutè rosea.

COLOR, quis sit in recente prorsùs nescio, violaceum suspicor, in iis quæ ego vidi exemplaribus e fusco sordidè viridis, purpurascente immixtus, citò evanidus, seque in albido-luteum mutans.

SUBSTANTIA *madefactæ* cartilaginea carnosâ et tenax, *exsiccata* cornea.

OBS. Exsiccatione ad dimidiam ferè magnitudinem se contrahit, formæque canaliculatâ prorsus deperditâ, insignitèr rugosa apparet: chartæ nequaquàm adhæret.

Magnâ cum voluptate huic Fuco nomen indidi viri optimi, Gulielmi Wright, medici Edinensis, cùm per Dissertationem de Plantis Insulæ Jamaicæ Medicinalibus et per alia scripta edita jamdudum inter botanicos celebris, tùm per multa in hoc opus collata beneficia de me optimè meriti. Hic primus, dum in Indiis Occidentalibus commoraretur, hanc stirpem detexit, quam postea iisdem ex maribus benignè, pro more, ad me misit nob. Baro de Seaforth, et mox in Mari Rubro legit Vicecomes de Valentia, copiosè hic quidem, quatenus judicare licet e specimium reportatorum copiâ. Plantam tamen a nullo auctore memoratam invenio. Nota speciei maximè cuius obvia in texturâ ponitur, quæ intùs visa illam Fucorum mollium pulposorumque refert, sed extrinsecùs faciem quondam habet spongiosam, quam præcipuè per desiccationem induit, et tum quodammodò ad *F. tomentosum* accedit. Ad speciem discriminandam frons canaliculata satis superque valet; sunt enim perpaucæ tantùm aliæ simili modo confictæ, quæ omnes per discrimina nulli prætermittenda tyroni primâ facie a *F. Wrightii* discrepant.

- | | | | | |
|----|-----------------------------------|---|---|----|
| a. | <i>F. Wrightii</i> , magn. nat. | | | |
| b. | rami pars, cum tuberculo. | | | |
| c. | tuberculum dissectum, magn. auct. | - | - | 6. |
| d. | semina (cum fibris?) | - | - | 3. |
| e. | semina - - - - - | - | - | 1. |
| f. | frons horizontalitèr dissecta | - | - | 6. |
| g. | frons longitudinalitèr dissecta | - | - | 6. |

Fucus Wrightii, frond cartilaginous, fleshy, longitudinally channelled on one side, on the other convex, linear, dichotomous, with apices slightly swollen, blunt, and between patent and divaricated: tubercles spherical, standing on short peduncles, often clustered, scattered along the margins of the frond.

On the shores of the West Indies. *Dr. Wright.*—Red Sea. *Lord Valentia.*

Annual?

ROOT, I have not yet seen.

FROND, three or four inches long, at its origin nearly cylindrical, and about as thick as a crow's quill, but as soon as it has attained to the height of a few lines becoming compressed, and preserving afterwards to its extremities the same form, and an uniform width of about two lines; it is forked almost immediately adjoining the base, and then six or seven times dichotomous, at intervals of scarcely three lines each, with acute angles, excepting those of the upper segments, which are between patent and divaricated; the apices are obtuse and slightly swollen; the margins quite entire; the frond is from the base to the summit longitudinally grooved on one side with a wide shallow furrow, bordered by thin, prominent edges, and on the other slightly convex.

FRUCTIFICATION, growing on both sides of the branches, generally near the apices of the frond, but far from abundant, consisting of scattered spherical tubercles, of the size of mustard seed, some sessile, others standing on short peduncles, often several clustered together, containing a quantity of extremely minute, pale pink seeds, of an irregularly oblong shape.

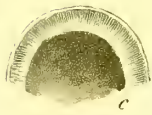
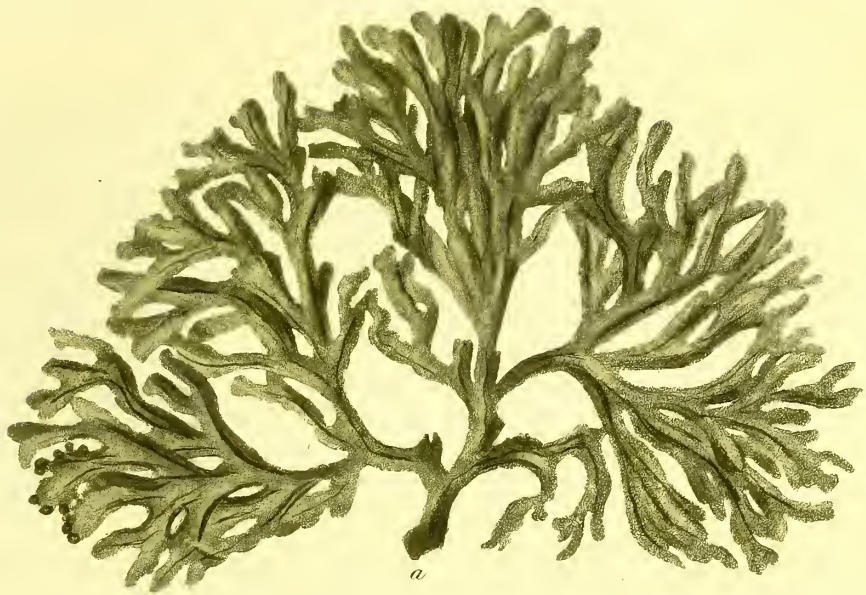
COLOR, in the fresh plant probably purplish, but in all the specimens that I have seen a dirty greenish brown, yet preserving a slight purplish tinge, soon fading, and changing into a yellowish white.

SUBSTANCE, cartilaginous, fleshy, and tough when moist, but horny after it has been dried.

OBS. In drying it shrinks to little more than half its original size, wholly loses its channelled appearance, and looks singularly wrinkled; it does not adhere in the least to paper.

I have had much pleasure in naming this *Fucus* after a very worthy man, to whom I am indebted for many contributions towards the present work, and whose name has long been known among botanists by his dissertations upon the medicinal plants of Jamaica. *F. Wrightii*, which was first discovered by him during his residence in that island, has been since sent me from the same seas by the kindness of Lord Seaforth, and appears to be of far from unfrequent occurrence in the Red Sea also, as far as may be judged from the many specimens of it preserved in Lord Valentia's collection. It seems, nevertheless, to have escaped the observation of all authors upon the subject. Its most striking singularity is in its texture, which is internally like that of the more soft and pulpy species, but has, when dry, a remarkably spongy appearance, so as in that state to approach in a measure to *F. tomentosus*. Its channelled frond removes the probability of its being confounded with any other; the few that are formed in a similar manner, being sufficiently unlike in other more important particulars.

- | | | | |
|---------------------------------------|---|---|----|
| a. <i>F. Wrightii</i> , natural size. | | | |
| b. part of a branch and tubercle. | | | |
| c. section of a tubercle, magnified. | - | - | 6. |
| d. seeds (and fibres?) | - | - | 3. |
| e. seeds | - | - | 1. |
| f. horizontal section of the frond | - | - | 6. |
| g. longitudinal section of the same | - | - | 6. |



Fucus Wrightii.

Fucus, fronde membranaceâ, tubulosâ, filiformi, simpliciusculâ, ramulis horizontalibus tubulosis teretibus simplicibus confertis undique obsitâ.

Fucus ramentaceus. LINN. *Syst. Nat.* II. p. 718. *Syst. Nat. Éd. Gmel.* II. p. 1387. OEDER, *Enum. Plant. Fl. Dan.* p. 19.

Ulva sobolifera. *Fl. Dan.* t. 356. OEDER, *Enum. Plant. Fl. Dan.* p. 14.

β . *tumidus*; fronde a basi angustissimâ superne incrassatâ, apice rotundato.

HABITAT in Oceano Septentrionali. Linnæus.—Copiosè in scopulis Oceani Islandici. Oeder.—Apud Reikiavik et ad Insulam Akarve, Islandiæ. D. W. I. Hooker.

Annua?

RADIX callus perpusillus, discoideus, albicans.

FRONDES ex eâdem basi plurimâ, viginti et ultrâ, singulæ caule assurgentes unico, simplice, tubuloso, terete, palmari et ultrâ, subfiliformi, basi tenuissimo, ut propemodum sit capillaceus, exinde sensim tumescente donec pennæ passerinæ vel corvinæ molem æquat, apices versus iterum paullum attenuato, atque ibi acutiusculo, indiviso, per totam longitudinem undique obsito ramentis homogeneis, foliaceis, confertis, horizontalibus, flexuosis, tubulosis, caule duplo angustioribus, utrinque acuminatis, unguem pollicemve longis, simplicibus, aut, quod rarius accidit, apice bifidis; caulis quoque aliquandò, sed perrarò, bifurcus, aut etiam vagè ramosus.

FRUCTIFICATIO hactenus ignota.

COLOR aquosè ruber, fusco tinctus, sub-diaphanus, *exsiccata* et *rursus madefacta* magis fuscescit.

SUBSTANTIA membranacea, tenuis.

Varietas β , cujus unicum modò exemplar vidi, et quod forsàn merè lusus est naturæ, caule gaudet pedali, sensim incrassato a basi ad apices, ubi pennæ olorinæ crassitiem superat et obtusè desinit; ramentis paucis, iisque brevibus et ferè capillaceis est instructa.

OBS. Ramuli in primo ætatis gradu faciem insignitè articulatam præ se ferunt, quam adulti perdunt:—stirps exsiccata chartæ non adhæret.

Fucus Ulvisne rectiùs associaretur hæc pulchra Algæ species in suspenso relinquatur necesse est quamdiu ejus fructificatio indetecta maneat. Ut verum quidem fatear, quatenus ex habitu atque affinibus hariolari licet, Ulvam potiùs a posteris habendam dicerem; neque tamen hoc obstitit quin optimum duxerim, operis instituto obsequens, hic pro Fuco, qualem putavit Linnæus, recensere, præsertim cum gauderem quòd sese mihi offerret facultas discutiendi dubitationum nebulas quæ jam diu hanc stirpem obnubilaverunt. Specimina hic depicta in herbario Linnæano servantur, in quo varietas β suprâ descripta eidem cui cætera chartæ agglutinata adhæret; neque scrupulus mihi restat ullus quin ad eandem revera speciem pertineat, quantumvis primo aspectu discrepare videatur, et, jam per desiccationem plana facta, facie quasdam *F. ciliati* varietates potiùs quàm *F. ramentaceum* referat. Unicum modò ejus extat exemplar, et hujus fortasse forma, sicut suprâ annuitur, e casu quodam pendet. Ne suspicari quidem possum quid velit Linnæus, * dicendo ramenta foliacea ex altero tantum caulis latere oriri, cum in suis ipsius exemplaribus utrinque paritèr copiosa reperiantur. Læsa hæc facillimè decidunt, substantianque habent longè teneriorem magisque gelatinosam quam caulis. Plurima de hoc Fuco in descriptione tradita Dⁿⁱ Hooker amicitia debeat, qui ætate novissimâ hanc plantam copiosè Islandiæ ad littora legit, et † adumbrationes quas hæc tabula, ad litteras *c*, *d*, et *e*, exhibet, ibi ad plantam recentem paravit. Exemplaria Linnæana colorem suum pristinum maximâ ex parte mutaverant, atque ramenta, pressuræ graviori æquo subjecta, formam penitèr deperdiderant teretem, in quam iterum madefacta nunquam iterum sunt reversa. Hinc fit ut tabula nostra stirpem *F. filicini* quodammodò similem repræsentare crederes, nulla licet inter utramque, hanc planam, illam tubulosam, affinitas intersit.

- a. *F. ramentaceus*, magn. nat.
 b. *frondis pars*, magn. auct. - - - 6.
 c. *ramentum in primâ ætate, ad exemplar vivum*
delineatum - - - 6.
 d. *idem horizontalitèr dissectum* - - - 3.
 e. *ejusdem pars* - - - 1.
 f. *var. β* , magn. nat.

* "Stipites ab altero tantum latere ramentis foliaceis."—*Syst. Nat.* II. p. 718.

† Amicus hic meus suavissimus, cum jam tres menses in Islandiâ sit commoratus, omnia, quæcunque ad ejus historiam naturalem pertinent, eo, quo se semper insignem præstitit, summo labore summoque mentis acumine investigando, colligendo, delineando, nihil ferè aliquid præter has tres adumbrationes secum redux attulit; felix, ah nimium felix, quòd ipse incolumis sit reversus, mortem crudelissimam aufugiens. Navis enim in quo redibat, et simul omnia quæ collegerat, Danorum aliquot nautarum scelere incensa flammis perierunt:

—"piget hæc opprobria genti
 "Et dici potuisse, et non potuisse refelli."

Fucus ramentaceus, frond membranaceous, tubular, filiform; mostly undivided, beset on all sides with horizontal, tubular, cylindrical, clustered ramuli.

Fucus ramentaceus. LINN. *Syst. Nat.* II. p. 718. *Syst. Nat. Ed. Gmel.* II. p. 1387. OEDER, *Enum. Plant. Fl. Dan.* p. 19.

Ulva sobolifera. *Fl. Dan.* t. 356. OEDER, *Enum. Plant. Fl. Dan.* p. 14.

β . *tumidus*; frond filiform at its base, but gradually enlarging upwards, and rounded at its apex.

In the northern ocean. Linnæus.—Plentifully upon the rocks of the sea near Iceland. Oeder.—At Reikiavik, and the Island of Akarve, by Iceland Mr. W. I. Hooker.

Annual?

ROOT, a very small, whitish, callous disk.

FRONDS, twenty or more from the same base, each rising with a single, simple, tubular, cylindrical stem, three or four inches in height, so thin at its base as to be almost capillary, but thence gradually swelling, till it attains to the size of a sparrow's or a crow's quill, which it preserves till towards the apex it again decreases, and ends in a sharpish point; it is mostly undivided, but sometimes, though rarely, forked, or even once or twice irregularly branched; throughout its whole length it is on all sides beset with foliaceous processes, like itself, but smaller, clustered, horizontal, flexuose, tubular, attenuated at both ends, twice as narrow as the stem, and not more than half an inch, or an inch, long, almost always simple, though occasionally bifid.

FRUCTIFICATION, at present unknown.

COLOR, pale red, with a slight brownish tinge, semitransparent, becoming more brown from being wetted and again dried.

SUBSTANCE, membranaceous, thin.

The variety β , of which I have hitherto seen only a single specimen, and which is probably a mere *lusus naturæ*, has a stem a foot long, and gradually swelling from the base to the apex, where it is thicker than a swan's quill, and rounded at the point; it has very few foliaceous processes, and those few short, and merely capillary.

OBS. The ramuli have in their earliest stage of growth a strikingly jointed appearance, which they lose as they advance: the plant in drying does not adhere to paper.

The fructification of this beautiful Alga not being at present known, it is impossible to determine with certainty whether it belongs most properly to the Fuci or the Ulvæ. To judge from its habit and natural affinities, I should conceive it most probable that it will hereafter be classed among the latter, though at present I have thought it best to follow Linnæus, and leave it with the Fuci, especially as I was glad of an opportunity of figuring a plant, which appears to be hitherto very imperfectly understood among botanists. The specimens here represented are from the Linnæan herbarium, where the variety β is upon the same paper as the others, nor can I doubt of their identity, though at first sight they appear different, and this latter, pressed flat by drying, seems rather to approach some varieties of *F. ciliatus*. It probably merely originated in accident, as there is only a single frond of it. What Linnæus designed in the *Systema Naturæ*, by saying that *F. ramentaceus* is on *one side only provided with the foliaceous ramenta, I am altogether at a loss to guess. They seem, even upon his own specimens, to be equally abundant on both sides of the frond, unless it is injured; but they fall off very easily, and are of a more tender and gelatinous texture than the stem. I am indebted for many of the particulars above-mentioned respecting this Fucus to my friend, Mr. Hooker, who gathered it last summer in great abundance during his stay in Iceland, where he made from recent plants the † sketches represented at *c*, *d*, and *e*. The Linnæan specimens had in great measure lost their color, and the ramenta had been so pressed that they would not again recover their cylindrical form, on which account the figure bears a degree of resemblance which has no existence in nature to the subject of the following plate.

- | | |
|---------------------------------------------------------|----------|
| a. <i>F. ramentaceus</i> , natural size. | |
| b. part of the frond, magnified | - - - 6. |
| c. ramentum, in a young state, drawn from a fresh plant | - - - 6. |
| d. horizontal section of the same | - - - 3. |
| e. part of the same | - - - 1. |
| f. variety β , natural size. | |

* "Stipites ab altero tantum latere ramentis foliaceis."—*Syst. Nat.* II. p. 718.

† These sketches are nearly the whole of what my most valuable friend has preserved after a residence of three months in that island, during which time he was incessantly engaged in collecting, drawing, and describing the natural productions of that most wonderful of countries. His entire collection and manuscripts were destroyed on his way home, by the villainy of some Danish sailors, who set fire to the ship in which he was returning, and he himself escaped with difficulty with his life.



Fucus ramentaceus.

Fucus, frondē cartilagineā, sub-gelatinosā, planā, nervi, lineari, simpliciusculā, ramulis distichis horizontalibus sparsis planis linearibus simpliciusculis utrinque obsitā.

Fucus filicinus. WULFEN, in *Jacq. Coll.* III. p. 157. t. 15. f. 2. WULFEN, *Crypt. Aquat.* n. 31. ESPER, *Ic. Fuc.* I. p. 134. t. 67. LINN. *Syst. Nat. Ed. Gmel.* II. p. 1388.

HABITAT in Mari Adriatico, corporibus submarinis accrescens. *Wulfen*.—A Capite Bonæ Spei accepit *Mertensius*.—E Mari Indico. *Banksius*.

Perennis?

RADIX callus explanatus, orbicularis, frondi concolor.

FRONDES ex eādē basi plurimæ, singulæ caule assurgentes unico, sex octo pollices longo, flexuoso, orta teretiusculo peniūque passerinā vix crassiore, mox, quamprimum ad linearum aliquot altitudinem attingit, compresso, atque exinde latitudinem ferè eandem unius circitèr lineæ ubique servans, donec ad apices appropinquans rursus attenuatur, et, sicut inceperat, acutiusculus desinit; caulis in his indivisus, in illis semel iterumve dichotomus; in omnibus a basi ad apicem utrinque obsitus ramulis, (pinnae vel folia si mavis dicas) homogeneis, distichis, horizontalibus, sparsis, nunc approximatis, nunc remotiusculis, interdum et hìc illìc fasciculatis, nec rarò frondis apices versus omninò deficientibus, basi et apice attenuatis teretiusculisque, cæteroquin compressis, inferioribus atque summis plerumque brevissimis et circitèr tres lineas longis, mediis duplo longioribus, cunctis indivisis et sæpiùs simplicibus, sed aliquandò pinnatis aliis longè minoribus simili ratione dispositis, interdum etiam unus et alter elongatus in novum ramum immutatur.

FRUCTIFICATIO nulla hactenus nota.

COLOR, variabilis; namque, ut *Wulfenii* verbis utar, “ludit elegantissimā in eodem specimine colorum mixturā. Partes ejus aliquas dilutè virentes videas, et transparentes, dum earum aliæ nitidissimā se commendant purpurā hyacinthinā, et ipsæ illustres; hæ e rubro magis nigrescunt magisve, atro-rubentes denique; illæ jam quantæ sunt atræ, non nisi luci obversæ, hyacinthino coloratæ rubore inveniuntur. Ætatis dicerem effectum, nisi mutuo in se emori colōres hosce viderem.”

SUBSTANTIA cartilaginea, non sine lubricitate aliquā, tenera, mollis.

OBS. Stirps insignitèr glabra et nitida:—habitus flexuosus, in ramulis quodammòdò tortilis:—exsiccata chartæ adhæret.

Primus hunc *Fucum* in mari Adriatico detexit, ejusque *descriptione atque icone accuratissimā in *Jacquini Collectaneis* editā, pro novā specie statuit cl. *Wulfenius*, qui *F. filicinum* quoque nomen imposuit, ductum a similitudine quæ inter frondis peripheriam ejusque quarundam filicum specierum interest. Utinam sanè quàm in animo habuit filicem dixerat, ipse enim nescio, neque tamen dubito, probè sciens quantum hic in nominibus selegendis præstat, quàm hìc etiam titulus, reliquorum suorum instar, plantæ optimè conveniat. Formā crescendique modo *F. filicinus* inter *Algas* elegantiores recenseri meretur, figurā tamen vix minùs quàm colore ludit, mira enim in individuis variis extat discrepantia, cum ramulos in hoc longos, in illo breves, in hoc copiosas, in illo infrequentes, frondem in uno divisam, in altero integram, et nunc semel, nunc bi- tri- pinnatam, reperias. Nihil hactenus de fructificatione enotescit, neque qualis hæc demùm reperietur facilè conjiceret aliquis. Viscida frondis textura prohibere videtur quominùs fructum *F. cornei* similem expectes, quamvis hæ duæ species facie insignitèr conveniant. Eo quidem usque conveniunt ut se dubitare profitetur *Wulfenius* annon pro *F. filicini* synonymo citare debuisset *F. spinosum* *Gmelini*, qui, sicut satis est inter botanicos notum, nihil est aliud nisi *F. cornei* varietas. Singulare id quidem quod alii ejusdem varietate, ab hæc tamen diversissimæ, *F. filicini* nomen indiderit *Hudsonus*. Dignoscitur *F. filicinus* ab omnibus *F. cornei*, quantumvis mutabilis, varietatibus per substantiam dissimilem per frondem minùs ex ordine pinnatam, et per crescendi modum semper plusve minusve tortilem. Ab *F. flaccido*, cui forsitan magis est naturā affinis, differt colore, fronde minùs ramosā, ramulis enormitèr dispositis, et nunquam iterum pinnatis donec in longitudinem unguicularem et ultrà excreverunt, denique partium omnium mole majore.

a. *F. filicinus*, magn. nat.

* Inest, ut verum fatear, in hæc descriptione unicum quod non bene capio, quod eadem huic *Fuco* tribuat *brevem, coriaceum, teretiusculum, atro-purpurascens*.

Fucus filicinus, frond cartilaginous, sub-gelatinous, flat, nerveless, linear, mostly simple, beset on both sides with distichous, horizontal, scattered, flat, linear, mostly simple ramuli.

Fucus filicinus. WULFEN, *Jacqu. Coll.* III. p. 157. t. 15. f. 2. WULFEN, *Crypt. Aquat.* n. 31. ESPER, *Ic. Fuc.* I. p. 134. t. 67. LINN. *Syst. Nat. Ed. Gmel.* II. p. 1388.

In the Adriatic, growing upon different submarine substances. *Wulfen*.—Sent from the Cape of Good Hope to *Professor Mertens*, and from the Indian Ocean to *Sir Joseph Banks*.

Perennial?

ROOT, a flat, orbicular, callous disk, of the same color as the frond.

FRONDS, numerous from the same base, each rising with a single stem, from six to eight inches long, flexuose, nearly cylindrical at its origin, and scarcely thicker than a sparrow's quill, but, as soon as it has attained to the height of a few lines, becoming compressed, and afterwards preserving everywhere a nearly equal width of about a single line, till, upon approaching to the apices, it again grows narrow, and ends in a sharpish point as it began; the stem is in some instances undivided, in others once or twice dichotomous, in all beset on both sides from the base to the summit with ramuli, or pinnæ, of the same nature and substance as itself, distichous, horizontal, scattered, some standing close to each other, some rather remote, and others clustered here and there, not uncommonly altogether wanting near the top of the frond; these ramuli are, like the stem, at their base and their points attenuated and sub-cylindrical, but in other parts compressed, the lower and upper ones are shortest, and about three lines long, the central ones twice as long, or still more, the whole undivided and generally simple, but sometimes pinnated with a series of much smaller ones arranged in the same manner, occasionally one or two are lengthened, and take the form of new branches.

FRUCTIFICATION, at present unknown.

COLOR, according to *Wulfen*, often most elegantly varied in the same specimen; some parts are pale green, and transparent, others a bright glossy purple, others deep-red, or even tinged with black, and so dark, that, unless held to the light, the redness or purple is not discoverable. *Wulfen* says he should have been inclined to regard these variations of color as the effect of age, had he not seen them mutually change into one another: for my own part, I am persuaded they are not all natural, but arise from some accidental cause, probably a greater or less exposure to the air.

SUBSTANCE, cartilaginous, not without some degree of lubricity, tender and soft.

OBS. Plant remarkably smooth and glossy: habit flexuose, somewhat twisted in the ramuli: in drying it adheres to paper.

Baron *Wulfen*, who first discovered this *Fucus*, and by his excellent * description and figure of it in *Jacquin's Collectanea*, established its claim to a place as a distinct species, was induced to give it the name of *F. filicinus*, from a fancied resemblance in the form of the outline of the frond to that of some species of fern. I wish he had mentioned the species that he particularly had in his view, for he is usually so happy in the choice of his names, that I cannot doubt of his being equally so in the present instance, and I recollect no fern to which this *Fucus* bears a striking resemblance. It is an elegant plant, in point of its shape and mode of growth, but is in the former of these respects scarcely liable to less variation than in its color, different individuals being widely different from each other in the length and number of their ramuli, in their more or less divided frond, and in being either simply or repeatedly pinnated. Respecting the fructification nothing whatever is at present known, nor is it easy to conjecture of what nature it will most probably be found to be, the viscid texture of the frond rendering it unlikely that it should be similar to that of *F. corneus*, which species is in its general appearance most similar to the present. Indeed, such is this resemblance, that *Wulfen* expresses his doubts whether he ought not to have quoted as a synonym to *F. filicinus* the *F. spinosus* of *Gmelin*, which, it is well known, is only a large variety of *F. corneus*, of which plant, by a strange coincidence, *Hudson* gave the name of *filicinus* to another variety. *F. filicinus* is distinguished from *F. corneus* by its dissimilar substance, by being much less regularly pinnated, and by its mode of growth being always more or less twisted. From *F. flaccidus*, to which it is perhaps still more closely allied, it differs in its color, in being far less branched, and in having its ramuli disposed without any order, and never again pinnated till they attain to a considerable length, besides which, the size of all its parts is much greater.

a. *F. filicinus*, natural size.

* In this description there is one thing that I do not understand, when he speaks of the plant as rising with an extremely short, sub-cylindrical, blackish purple stem, coriaceous like the disk, and of the thickness of packthread, which is afterwards divided into many branches, originating, as it were, from a common centre.



Fucus filicinus.

Fucus, caule coriaceo, plano, ancipite, lineari, flexuoso, sub-indiviso, foliis distichis horizontalibus alternis coriaceis ellipticis enervibus dentato-runcinatis sessilibus pinnato.

Fucus quercifolius. BROWN, MS.

HABITAT in meridionalibus Australasiæ littoribus. D. Brown.

Perennis.

RADIX nondùm a me visa.

FRONS instructa caule compresso, ancipite, flexuoso, pedali et ultra, latitudinem unius circitèr lineæ et ubique ferè æqualem a basi ad apices servante, nunc simplice, nunc bifurco, et aliquando ramum unum alterumque emittente lateralem, sparsum, horizontalem, abbreviatum, qui, sicut etiam caulis, per totam longitudinem foliis obsitus conspicitur; folia caulis e marginibus orta, disticha, horizontalitèr patula, alterna, intervallis sesquilinearibus vel bilinearibus semota, elliptica, sessilia, duos circitèr pollices longa, et unguem lata, nervo nullo percursa, sed centro lenissimè incassata; margine dentibus profundis approximatis incisa, ita ut propemodùm runcinata diceret; superficie poris nullis pertusa.

FRUCTIFICATIO hactenus latet.

COLOR, qui recentis in caule nigricans in foliis olivaceus, exsiccatae ubique est niger, et nitoris prorsùs expers.

SUBSTANTIA coriacea, crassa, tenax.

OBS. Exsiccatione chartæ nequaquàm adhæret.

Nemo, nisi fallor, dubitabit botanicus, *F. quercifolii* substantiæ, habitûs, coloris, crescendique modo respectu habito, quin locus huic in systemate inter Fucos qui Webero Mohrioque *Fuci proprii* audiunt debeat, et quin omnibus hisce idem fructificationis sit modus. Inest tamen in exemplare hic depicto, quod unicum ferè hujus speciei hactenus vidi, nihil a quo suspicari possit aliquis in quâ frondis parte hunc demùm quærere debemus fructum, et anne verisimilius sit ut e receptaculis constet ad nullum alium comparatis finem, an potiùs, sicut *F. comosi* tubercula, in foliis, quibus in utrâque stirpe eadem ferè est substantia, immersa ponantur. Fieri quoque forsitan potest, e congeneribus judicans, ut *F. quercifolius*, in quibusdam ætatis suæ stadiis, vesiculis instructus reperiatur, quamvis in hoc certè exemplare talium vestigia incassum quæreremus. Folia, quantum perspicere potui, nullam unquam formæ mutationem subeunt, et nunquàm in novos ramos attenuata producuntur. Harum peripheria in primâ ætate ab illâ *F. pristoidis* foliorum non ita multum discrepat, sed adulta satis declarant quam benè plantæ conveniat nomen ab amicissimo D. Brown datum, qui solus inter botanicos hactenus reperiisse videtur. Nulla datur alia, quantum scio, *Fuci* species, quâcum est timendum ne *F. quercifolius* commisceatur.

a. *F. quercifolius*, magn. nat.

Fucus quercifolius, stem coriaceous, flat, two-edged, linear, flexuose, mostly undivided, pinnated with distichous, horizontal, alternate, coriaceous, elliptical, nerveless, sessile leaves, so deeply dentate as to appear runcinate.
Fucus quercifolius. BROWN, MS.

On the south coast of New Holland. Mr. Brown.
 Perennial.

ROOT, I have never yet seen.

FROND, furnished with a compressed, two-edged, flexuose stem, a foot or more in length, and preserving from its base to its apex an every where equal width of about one line, simple in some specimens, in others forked, or occasionally throwing out from its margins one or two scattered, horizontal, short branches, which, like the stem, are throughout their whole length beset with leaves, which arise from the margins of the stem, and are distichous, between horizontal and patent, alternate, separated by intervals of a line and half, or two lines each, sessile, about two inches long, and half an inch wide; destitute of any nerve, but slightly incrassated in the middle; the margins deeply cleft with teeth, standing near each other, in such a manner as to make the leaves almost runcinate; the surface not perforated with any pores.

FRUCTIFICATION, hitherto unknown.

COLOR, in the recent plant, blackish in the stem, but olivaceous in the leaves; when dried, every where blackish, and quite devoid of gloss.

SUBSTANCE, coriaceous, thick, and tough.

Obs. In drying it does not in the least adhere to paper.

That the fructification of *F. quercifolius* will be found to agree so far with that of *F. vesiculosus* and its congeners, as to require the arranging of these plants together in the system, appears to me a point that admits of no doubt, though the specimen here figured, which is almost the only one I ever saw, leaves it altogether uncertain in what part of the frond this fructification may be to be sought for, and whether it may bear the form of separate receptacles, or may be, like the fruit of *F. comosus*, immersed in the substance of the leaves, which is in both species nearly the same. It likewise appears to me uncertain if the plant may not at some periods of its growth produce vesicles, a supposition which seems to be warranted by its affinities, but not at all so by the specimen here figured, in which are no vestiges of any. The leaves seem in no case to change their appearance, or to lengthen into new branches: in their earliest stage their outline considerably resembles that of the leaves of *F. pristoides*, but, when fully grown, they show strongly the propriety of the name given to the plant by my friend, Mr. Brown, who appears to be the only botanist that ever found it. I am not aware that there is any other *Fucus* for which it is liable to be mistaken.

a. *F. quercifolius*, natural size.



Fucus quercifolius.

Fucus, fronde cartilagineâ, plano-compressâ, enervi, lineari, dichotomâ, fastigiâtâ, hîc illîc obsoletè articulato-constrictâ; segmentis patentibus, apicibus obtusis.

HABITAT apud insulas, "Kent's Islands," dictas prope Novam Hollandiam. *D. Brown.*

Perennis?

RADIX nondùm a me visa.

FRONS quadri-sex-pollicaris, e plano compressa, nervi venarumque prorsùs expers, latitudinem circitèr semiflinearem ubique a basi ad apices servans, (nisi quòd hîc illîc constricta reperitur, intervallis haud certis, sæpiùs tamen breviusculis, ut obsoletè articulata, articulis oblongo-cylindraceis, appareat,) juxta radicem bifurca, atque exinde dichotomiis septies octiesve repetitis ramosa, spatio inter inferiores longiusculo, sæpe sesquipollicari, inter superiores multo breviorè; rami patentes, vel patenti-divaricati, omnes fastigiati; margines integerrimi; apices bifidi, segmentis abbreviatis, teretiusculis, obtusis, non rarò incrassatis et quodammodò clavatis.

FRUCTIFICATIO in præsens latet.

COLOR intensè purpurascenti-ruber, apices versus pallidior, subdiaphanus, per desiccationem nitens, fugacissimus, et primò in dilutiùs rubentem, mox in album evanidus.

SUBSTANTIA cartilaginea, sub-cornea, crassa, lenta, tenax.

OBS. Amat in densis cæspitibus crescere:—habitus strictus, et juxta apices quodammodò tortilis:—frons hîc illîc ramorum brevium horizontalium congerie e marginibus pullulat:—exsiccata chartæ non adhæret.

Duas Fuci species, adèd usque inter se dissimillimas ut in nihilo ferè consentiant, conjungit *F. constrictus*, cujus forma atque crescendi modus cum *F. crispî* varietatibus angustissimis, textura verò color habitusque generalis cum *F. corneo* consentiunt. Ab hoc tamen non minùs quàm ab illo per frondem hîc illîc obsoletè constrictam primo statim aspectu dignoscitur; et, cùm hæc articulata facies notam speciei tam certam, nisi fallor, quàm cuivis maximè obviam suppeditet, nomen ex hæc quærendum judicavi. In quibusdam hæc locis e casu manifestè pendet, fronde læsâ, novosque ex apicibus truncatis ramos inferioribus angustiores edente, sicut in *F. lumbricali* vel *F. Cabrera* accidere solet; sed nequaquàm semper ita evenit, nullusque dubito quin talem crescendi modum speciei esse proprium jusserit natura. Dantur quidem rami qui nullâ sunt in parte constricti, alii verò sparsim aut infrequentèr, et denique alii intervallis certis vix lineam unam superantibus, quorum facies ad normam catenulata. Seminibus licet careant, sintque idcirco pro sterilibus habenda *F. constricti* exemplaria a *D. Brown* lecta, quæ sola hujus Fuci hactenus vidi, satis ex apicibus quorundam incrassatis liquet, tuberculorum in his esse sedem, hique capsularum formam jam innuunt. In hoc quoque *F. constrictus* cum *F. corneo* et *F. cartilagineo*, quibus naturâ artissimè est affinis, consentit.

- a. *F. constrictus*, magn. nat.
- b. *frondis sterilis apex*.
- c. *frondis incrassatæ, verisimilitèr ob fructum incipientem, apex*, magn. auct. - - 6.

Fucus constrictus, frond cartilaginous, between flat and compressed, nerveless, linear, dichotomous, with branches of equal height, here and there contracted as if jointed; segments patent, apices blunt.

At Kent's Islands, near New Holland. *Mr. Brown.*

Perennial?

ROOT, I have not yet seen.

FROND, from four to six inches long, between flat and compressed, wholly destitute of veins or midrib, preserving from its base to its apices a nearly equal width of about half a line, except that it is here and there contracted, at irregular, mostly shortish, intervals, so as to appear obsoletely jointed, with joints between oblong and cylindrical; it is forked near the root, and afterwards seven or eight times dichotomous, the distance between the lower dichotomies being often an inch and half in length, that between the upper ones much shorter; the branches are patent, or subdivaricated, and of equal height; the margins quite entire; the apices bifid, with short, sub-cylindrical, obtuse segments, which are not unfrequently swollen, and nearly clavate.

FRUCTIFICATION, at present undiscovered.

COLOR, a deep purplish red, paler near the apices, semitransparent, glossy, and much darker when dry, extremely fugitive, and changing, first into a lighter red, afterwards to white.

SUBSTANCE, cartilaginous, inclining to horny, thick, flexible, and tough.

Obs. Its mode of growth is in thick tufts:—its habit is straight, but generally somewhat twisted near the summits:—the frond here and there throws out from the margin a small cluster of short, horizontal branches:—in drying it does not adhere to paper.

This *Fucus* is in a measure intermediate between two species, so widely dissimilar that they have few points in common, *F. crispus* and *F. corneus*, agreeing with the most narrow varieties of the former in its size and mode of growth, but with the latter in its texture, its color, and its general habit. It differs at first sight from both in its obsoletely jointed structure, from which, as being, apparently, the strongest, as well as the most obvious, character of the species, I have thought it proper to derive its name. This appearance, which is, in some branches, not altogether unlike that of some specimens of *F. Opuntia*, is very evidently here and there the effect of accident; the frond, like that of *F. lumbricalis* or *F. Cabrera*, pushing out, where broken, from the centre of the injured part new branches more narrow than those below them; but, however such may be occasionally the case, it is assuredly far from being always so, and I cannot but regard the constrictions as a natural property of the species. They are in some branches wholly wanting, in others irregularly scattered, and again in others observable at intervals of scarcely more than a line each. Though Mr. Brown's specimens, the only ones that I have ever seen of this *Fucus*, are all barren, there is still no doubt, from the incrassated apices of many of them, but that the tubercles are there situated, and that these specimens were in reality just beginning to form their fructification, the future shape of which they clearly indicate. In this respect likewise the plant agrees with *F. corneus* and *F. cartilagineus*, its nearest natural affinities.

- a. *F. constrictus*, natural size.
- b. *summit of a barren branch.*
- c. *summit of a branch swollen, probably for*
fruit, magnified - - - - - 6.



Fucus constrictus.

Fucus, fronde cartilagineâ, filiformi, compressâ, dichotomâ, fastigiâtâ; angulis lenitè rotundatis: tuberculis hemisphæricis, marginalibus, sessilibus.

Fucus concinnus. BROWN, MS.

HABITAT apud Insulas "Kent's Islands" dictas, prope Novam Hollandiam. D. Brown.

Perennis?

RADIX callus difformis, exiguus, frondi concolor.

FRONDES ex eâdem basi plurimæ, dodrantes, compressæ, filiformes, basi pennæ passerinæ crassitie, sursum versus aliquantùm angustiores, divisæ dichotomiis, nunc juxta radicem, nunc non nisi frondis circiter mediam altitudinem, incipientibus, atque exinde persæpe repetitis, spatio inter singulas vix semiunguiculari; dichotomiarum anguli levissimè rotundati; segmenta erecta, omnia fastigiata, summa abbreviata atque lenitè incurva, apicibus obtusis truncatis, interdùm etiam aliquantùm incrassatis, orâ nigricante; margines ubique integerrimi, ramis lateralibus nullis.

FRUCTIFICATIO tubercula sphærica, atra, papaveris seminum magnitudine, ramorum marginibus apices versus insidentia, enormitè sparsa, nunc unum nunc plura in singulis ramis, extrinsecùs glabra, intùs *seminum minutissimorum oblongorum dilutè rubrorum congeriem includentia.

COLOR ita intensè purpurascens ut ferè niger appareat, ad apices pallidior, atque ibi sordidè luteo immixtus; *soli diu objectæ* in albicantem transiens.

SUBSTANTIA cartilaginea, lenta, tenax.

Obs. Planta nitoris prorsus exers, et ferè lurida, exsiccatione chartæ non adhæret.

F. radiati nomine, sicut omnibus ferè fucologis est notum, et sicut est jamjam in hoc opere memoratum, *F. rotundum* nostrum olim insigniverunt viri optimè de re botanicâ meriti, Goodenovius Woodwardiusque, titulo ducto a radiatâ seu flabelliformi ramorum dispositione, in plantâ ritè explicatâ insigni. Idem quoque hic titulus ob eandem causam non minùs aptè quadraret stirpi in hâc tabulâ depictæ, quæ insupèr etiam *F. rotundo* convenit, quòd dichotomiarum habeat angulos omnes manifestè, quamvis levitè, rotundatos, segmentis erectis atque aliquantùm incurvatis. Inter Fucos *F. concinno* congeneres nulli tam actè naturâ affinis videtur quàm *F. Griffithsiæ* aut *F. plicati* var. β , a quibus, sicut ab *F. rotundo*, per frondem compressam capsulasque sphæricas statim dignoscitur. Ramos quoque habet magis ex ordine quàm *F. Griffithsiæ* vel *F. plicatus* dichotomos, texturâque corneâ, hujus caractere maximè manifesto, omninò caret. *F. concinni* nomen plantæ indi jussit D. Brown, qui solus inter botanicos hactenus reperisse videtur.

a. <i>F. concinnus</i> , magn. nat.					
b. <i>frondis pars</i> , magn. auct.	-	-	-	-	6.
c. <i>tuberculum dissectum</i>	-	-	-	-	3.
d. <i>fibræ?</i>	-	-	-	-	1.
e. <i>semina</i>	-	-	-	-	1.

* Anne fibras quoque seminibus immixtas fovent tubercula, an semina in lineas parallelas disposita fibras mentiantur? Prohibuit partium parvas quominus hoc ritè perspicerem.

Fucus concinnus, frond cartilaginous, filiform, compressed, dichotomous; branches of equal height; angles slightly rounded; tubercles hemispherical, sessile on the margins.

Fucus concinnus. BROWN, MSS.

At Kent's Islands, near New Holland. Mr. Brown.

Perennial?

ROOT, a small, shapeless, callous knob, of the same color as the frond.

FRONDS, numerous from the same base, eight or nine inches long, compressed, as thick at their origin as a sparrow's quill, but somewhat smaller upwards, repeatedly forked, with dichotomies beginning in some specimens very near the root, in others not till the plant has attained to half its height, but afterwards frequently repeated at intervals of scarcely a quarter a line each; the angles of them very slightly rounded, the segments erect, all of equal height, the upper ones short and somewhat incurved, with blunt truncated apices, which are occasionally rather swollen and tipped with a narrow blackish rim, as if scorched; the margins of the frond are every where entire, and destitute of lateral shoots.

FRUCTIFICATION, black, spherical tubercles, of the size of poppy-seed, growing upon the sides of the branches near their summits, irregularly scattered; sometimes only one and sometimes many on a branch, externally smooth, internally containing a mass of extremely minute oblong pale red* seeds.

COLOR so dark a purple as to appear almost black, paler towards the apices, and having there generally a dirty yellowish tinge; from exposure to the sun it becomes whitish.

SUBSTANCE cartilaginous, flexible, and tough.

OBS. Plant quite destitute of gloss, so as to have a lurid appearance:—in drying it does not adhere to paper.

The name of *F. radiatus*, given by Dr. Goodenough and Mr. Woodward to *F. rotundus*, on account of its taking, when expanded, a radiated or flabelliform appearance, would for the same reason be peculiarly applicable to the subject of the plate before us, which also agrees with that species in having the angles of its dichotomies manifestly, though slightly, rounded, and the segments erect and somewhat incurved. Its nearest affinities appear to be *F. Griffithsæ* and the var. β of *F. plicatus*, from both which, as well as from *F. rotundus*, it is immediately distinguishable by its compressed frond and its spherical capsules. It is also much more regularly dichotomous than either of them, and it wholly wants the horny texture, which is so striking in *F. plicatus*. The name of *F. concinnus* was given to this species by Mr. Brown, who alone appears yet to have found it.

a.	<i>F. concinnus</i> , natural size.	-	-	6.
b.	part of the frond, magnified	-	-	3.
c.	section of a tubercle	-	-	1,
d.	fibres?	-	-	1,
e.	seeds	-	-	1,

* The extreme minuteness of the contents of the tubercles prevented me from being able to satisfy myself, whether there are really any fibres mixed with the seeds, or whether the seeds themselves are disposed in parallel lines so as to look like fibres.



Fucus concinnus.

Fucus, fronde membranacæ, planâ, nervi, lineari, sub-dichotomâ, segmentis patentibus, marginibus per cilia sparsa brevissima hîc illîc agglutinatis: tuberculis sphæricis, minutis, in fronde juxta margines immersis.

Fucus bifidus. Linn. Trans. III. p. 159. t. 17. f. 1. (excl. syn. Huds.) Eng. Bot. XI. t. 773. (excl. syn. Huds.) Syn. Fuc. I. p. 165. (excl. syn. Huds.) WITH. IV. p. 103. CLEMENTE. p. 311.

F. ceranoides. WULFEN, in Jacq. Coll. III. p. 160. (excl. syn. omn.) WULFEN, Crypt. Aquat. n. 9. (excl. syn. omn.)

F. laceratus. Fl. Fr. Ed. 2da. II. p. 28.

β. *ciliatus*; fronde lineari, marginibus dentato-ciliatis, apicibus lanceolatis acutis.

F. bifidus. β. Syn. Fuc. I. p. 165.

F. lucer. WULFEN, Crypt. Aquat. n. 10. (excl. syn. Linn.)

γ. *decipiens*; fronde enormitèr ramosâ; marginibus sub-ciliatis; apicibus sub-ovalibus, acutis.

F. bifidus. γ. Syn. Fuc. I. p. 165.

δ. *sub-palmatus*; fronde lineari, sub-palmatâ; apicibus rotundatis.

F. bifidus. δ. Syn. Fuc. I. p. 165.

ε. *sinuosus*; fronde apices versus aliquantum dilatatâ, atque ibi levitèr sinuosâ.

ζ. *stipitatus*; fronde basi teretiusculâ; apicibus nunc dilatatis obtusis, nunc angustatis acutis; ramis e margine proliferis.

HABITANT tres primæ varietates in Orientalibus Angliæ littoribus, et præsertim in Norfolciâ.—α circa Tarifa et Gades. Clemente.—Prope Belfast. D. Templeton.—In Septentrionalibus Galliæ oris. Decandolle.—α et β Tergesti, in Mari Adriatico. Wulfen.—δ apud Insulam Vectis.—ε et ζ in sinu “Bantry Bay.” Dna Hutchins.

Perennis?

RADIX callus minutus, tenuis, fibras emittens plurimas, capillares, dilutè roseas, Fucorum majorum, quos perrepunt, stipitibus arctissimè adhærentes.

FRONDES ex eâdem basi plurimæ, quaquaversum spectantes, unde totius stirpis peripheria subglobosa, planæ, nervi venarumque prorsùs expertes, duos tresve pollices longæ, et duarum triumve linearum latitudinem ubique æqualem servantes, lenitèr contortæ, divisæ dichotomiis juxta radicem incipientibus, atque exinde ter quater repetitis, spatio inter singulas perbrevis, segmentis patentibus, vel patienti-divaricatis, ultimis tamen divaricatis; apices obtusi, emarginati vel bifidi; margines ubique integerrimi, hi prorsùs denudati, illi instructi processibus aliquot sparsis, brevibus, angustis, spiniformibus, qui, radicularum vice fungentes, efficiunt ut planta, non modò per basin, verùm etiam per ramorum margines aliis affigatur Fucis corporibusve marinis, aut ut rami sibi invicem conglutinati adhæreant, quasi anastomosantes, quod sæpe tali modo accidit ut nulla ars ad extricandos integros valeat.

FRUCTIFICATIO tubercula sphærica, papaveris seminibus duplo minora, intensè rubra, vel matura nigricantia, nunc frondis marginibus per totam longitudinem insidentia, nunc in ipsâ membranâ, semper tamen marginibus propinqua, immersa, sparsa, solitaria, copiosiora in his quàm in illis, seminum minutissimorum oblongorum congeriem foventia.

COLOR, amœnissimè roseus, lateritio interdùm perfusus, sub-diaphanus; *exsiccata* intensior et sub-sanguineus; *marcescentis* demùm albicans.

SUBSTANTIA membranacea, tenuissima, et tenerima.

Var. β frondem habet angustiore quàm α et ubique ad amussim linearem, neque sursum versus aliquo modo dilatam, segmentis summis elongatis atque acutis; ramorum quoque margines copiosè obsident processus exigui, horizontales, vix quartam lineæ partem longi, qui, uti suprâ animadvertitur, radicularum cirrorumve loco inserviunt; forsân etiam, cùm plantam nunquam nisi sterilem viderim, si ætas sineret, proliferam prolem postea suppeditarent.

In var. γ. frondis latitudo unguem ferè æquat, et stirps crescendi modo gaudet nequaquàm dichotomo neque palmato, sed prorsùs enormi: hujus varietatis, cujus unum modò alterumque exemplar hactenus vidi, insigne est, segmenta habere summa elongata formæque ellipticæ, apicibus acutiusculis.

Var. δ ejusdem ferè est quâ β magnitudinis, sed apices habet obtusos cæteraque omnia sicut in α, nisi quòd substantiâ gaudeat crassiore ad cartilagineam accedente, ramosque habeat plurimos palmatim divisos.

Var. ε in omnibus cum α convenit præter summos ramos, qui insignitèr dilatantur, perbreves sunt, apicesque habent rotundatos et sinuatos, unde planta primo aspectu longè a reliquis recedere videtur.

In var. ζ, quæ an rectè *F. bifido* associetur necne dubito, multa paradoxa:—fructiferam nondùm vidi:—magnitudo et substantia eadem ferè quæ α, sed planta ad basin teretiuscula, unde stipiti insidere videtur brevi, e quo absque normâ pullulant rami plurimi, omnes ex ortu angustissimo sensim dilatati, hi vix lineam lati, lineares, dichotomi, apicibus acuminatis, illi duplo triplove latiores, subpalmati, apicibus latis rotundatis, utriusque e marginibus proliferi, ramis aliis primariorum similibus.

Obs. Planta recens violarum odorem angustum spirat:—frons, lenti acerrimæ subjecta, obsoletè reticulata apparet; aliàs ubique prorsùs uniformis:—venarum nulla unquam vestigia ostendit:—*exsiccata* chartæ adhæret.

Jam* suprâ in hoc opere monuimus plantam in hâc tabulâ depictam non esse eandem quam sub *F. bifidi* nomine designare in animo habuit Hudsonus, alterique idcirco deberi illud quod hæc nunc fert nomen. Altera ea est *F. Palmetta*

F. Palmetta noster, qui verus *F. bifidus* Hudsoni, nihilque ferè habet cum hâc stirpè commune, quæ multo quoque longius ab illo Fuce recedit qui Gmelino *F. bifidus* audit, plantâ à me nunquam visâ, sed quæ, ut satis ex icone descriptioneque in *Historiâ Fucorum* datis liquet, inter *F. saccharini* familiam est recensenda, locum sibi asserens *F. bulboso* proximum, cujus exemplaria vidi juniora illam multùm referentia. Hæc cum ita sint, nihilo tamen minus nomina uti nunc sunt reliquenda judicavi; timens ne, universè inter Botánicos recepta mutando, novam synonymorum confusione ansum præberem, satiusque ratus *F. bifidi* Gmeliniani nomen recudere, dummodò videndi describendique unquam sese offerret facultas. Hisce igitur dimissis, liceat mihi nunc de *F. bifido* modò nostro loqui, plantâ, quæ, quamvis in multis sit reperta locis, nullibi, quod scio, copiosè provenire solet, sed plurimis iisque insignibus formæ mutationibus ludit. Hoc satis testantur quæ suprâ sunt descriptæ varietates, quarum secundam in novarum specierum numerum ascribendam censet D. Wigg; quam ob causam ejus particulam hic delineatam exhibui, secus licet ipse sentiam; cum exemplaria viderim quæ inter illam atque usitatam plantæ faciem ambigerent, et hæc etiam ciliis marginalibus rarè prorsus caret. Dubito quidem an rectè fecerim, quòd *F. lacerum* Wulfenii huic varietati adjunxerim; sed de *Fuce* ejus *ceranoide* scrupuli mihi vix ulli restant quin revera ad *F. bifidum* pertineat, quocum omninò consentientem video, texturam si excipias magis carnosam, quæ facit ut ad *F. Norvegicum* vel ad *F. crispum* varietates quasdam tenuiores accedat. Silentio tamen non est prætereundum, plantam Wulfenianam nondùm esse nisi sterilem repertam, qualem ad me olim misit nobilissimus hic auctor, et qualem ex Hispaniâ nupèr accepi. Eâdem fermè substantiâ gaudet var. δ , quæ insuper est per crescendi modum plerumque palmatum insignis, attamen ab *F. bifido* ægrè disjungenda. Utinam sanè liceret paritèr confidentèr de ultimâ varietate loqui, quam benevolentia Dnæ Hutchins nunquam satis laudendæ debeo. Hæc sola hactenus eam legit, sententiamque suam (dubitanter, quidem, atque eâ, quâ semper utitur, modestiâ) refert, ab *F. bifido* non esse diversam. Ita certè judicaret aliquis ramos latiores inspiciens, sed angustiores, horum longè dissimiles, stirpem distinctam mentiuntur, et potiùs *F. Sarniensis* surculos juniores simulat. Mirum hoc; quoniam inter *F. Sarniensem* et *F. bifidum* similitudo nulla interest. Maximam certè habet *F. bifidus* cum *F. lacerato* affinitatem, et quidem talem qualis efficit ut non desint Botanici qui conjungendos existiment. Conjunxit revera Decandollius. Ab his ego dissentio, specie distinctissimos credens: dignoscitur enim *F. bifidus* tuberculis minutis nunquam non marginalibus; frondis marginibus semper integerrimis; substantiâ crassiore atque tenaciore, haud ita laceratu facili; crescendi modo nequaquam enormitèr torto vel crispo, quamvis plerumque semel iterùmve spiritalitèr volubili; et denique venarum longitudinalium pellucidarum absentia; ramisque variè per marginem agglutinatis. Insuper his, nunquam, quod scio, detectus est *F. bifidus* cum seminibus in fronde sparsis nudis; quod nî sit, vereor ne postea nobis imponatur necessitas dispescendi in diversa genera plantarum naturâ arctissimè connexas. Nullus alius mihi innotescit Fucus, quocum fieri potest ut commisceatur *F. bifidus*.

a. <i>F. bifidus</i> , magn. nat.	-	-	-	-	-
b. <i>frondis pars</i> , magn. auct.	-	-	-	-	6.
c. <i>tuberculum dissectum</i>	-	-	-	-	3.
d. <i>semina</i>	-	-	-	-	1.
e. <i>var. β</i> , magn. nat.					

Fucus bifidus, frond membranaceous, flat, nerveless, linear, mostly dichotomous; segments patent; margins here and there glued together by very short, scattered cilia; tubercles spherical, minute, immersed in the frond near the margins.

Fucus bifidus. Linn. Trans. III. p. 159. t. 17. f. 1. (excl. syn. Huds.) Eng. Bot. XI. t. 773. (excl. syn. Huds.) Syn. Fuc. I. p. 165. (excl. syn. Huds.) WITH. IV. p. 103. CLEMENTE. p. 311.

F. ceranoides. WULFEN, in Jacqu. Coll. III. p. 160. excl. syn. omn. WULFEN, Crypt. Aquat. n. 9. (excl. syn. omn.)

F. laceratus. ϵ . Fl. Fr. Ed. 2da. II. p. 28.

β . *ciliatus*; frond linear, fringed with minute tooth-like cilia along its margins, its apices lanceolate and acute.

F. bifidus. β . Syn. Fuc. I. p. 165.

F. lacer. WULFEN, Crypt. Aquat. n. 10, (excl. syn. Linn.)

γ . *decipiens*; frond irregularly branched; its margins here and there ciliated; its apices nearly oval and acute.

F. bifidus. γ . Syn. Fuc. I. p. 165.

δ . *sub-palmatus*; frond linear, sub-palmated, the apices rounded.

F. bifidus. δ . Syn. Fuc. I. p. 165.

ϵ . *sinuosus*; frond somewhat dilated, and slightly sinuated towards the apices.

ζ . *stipitatus*; frond nearly cylindrical at the base; some of the apices dilated and obtuse, others narrow and acute; the margins of the branches proliferous.

The three first varieties are found upon the eastern coast of England, especially in Norfolk.— α near Belfast. Mr. Templeton.—About Tarifa and Cadiz. Clemente.—On the northern shores of France. Decandolle.— α and β at Trieste. Wulfen.— δ on the shores of the Isle of Wight.— ϵ and ζ in Bantry Bay. Miss Hutchins.

Perennial? September—January.

ROOT, a minute, thin, expanded callous disk, sending out numerous, pale-pink, capillary fibres, adhering very closely to the stems of the larger Fuci, which they grow upon.

FRONDS, numerous from the same root, pointing in all directions, so that the outline of the plant is nearly globular, quite destitute of midrib or veins, from two to three inches long, and preserving from base to summit an everywhere equal-width of two or three lines, slightly twisted, forked near the root, and afterwards three or four times dichotomous at very short intervals, with segments patent, or between patent and divaricated, excepting the extreme ones, which are divaricated; the apices are obtuse, and emarginated or bifid; the margins constantly quite entire, some of them altogether naked, others fringed with a few scattered, short, narrow, spine-like processes, which perform the office of roots, and cause the plant to fasten itself to other Fuci or marine bodies not by its base alone, but also by the edges of its branches, besides which they make the different branches adhere together, as if they really anastomosed, and this, frequently, to such a degree, that it is impossible to disentangle them without the destruction of the individual.

FRUCTIFICATION, spherical tubercles, twice as small as poppy-seed, of a deep-red color, or blackish when ripe, arranged along the margins of the branches throughout their whole length, and sometimes sessile upon the very margins, sometimes immersed in the substance of the membrane, but always near them, scattered, solitary; more plentiful in some specimens than in others, containing a mass of exceedingly minute oblong seeds.

COLOR, a very beautiful pink, having sometimes a tinge of scarlet, or, if injured, of yellow, semitransparent; darker and nearly crimson when dry; turning in decay to white.

SUBSTANCE, membranaceous, exceedingly thin and tender.

The variety β has its frond narrower than α , and by no means dilated upwards, but everywhere exactly linear, with the extreme segments long and acute; the margins of the branches are also plentifully fringed with small, horizontal processes, hardly the fourth part of a line long, which, as above observed, perform the office of radicles or tendrils, and might possibly, as I have never seen the plant otherwise than barren, also serve, if the duration of the individual would admit it, to supply a proliferous mode of increase.

In γ the frond is nearly half an inch wide, and the mode of growth neither properly dichotomous nor palmate, but very irregular: it is the striking character of this variety, of which I have met with only two or three specimens, to have the upper segments long and of an elliptic shape, with sharpish points.

The size of δ is nearly the same as that of β , but it agrees with α in its obtuse apices, and in every other respect, except that its substance is thicker and approaching to cartilaginous, and most of its branches are divided in a palmated manner.

The variety ϵ also accords entirely with α , except in its upper branches, which are remarkably dilated and very short, and terminate in rounded and sinuated apices, which gives the whole plant at first sight an appearance considerably unlike the others.

With regard to ζ , I have many doubts if I have done right in joining it to *F. bifidus*: it is a strange plant, and I have never seen it in fruit: its size and substance are nearly the same as those of α , but at its origin it is subcylindrical, so as to look as if it grew with a short stalk, out of which rose, without any order, numerous branches, all extremely narrow at their origin, but gradually widening, some of them scarcely a line wide, nearly linear, and dichotomous, with acuminated

acuminated apices, others twice or thrice as wide, mostly palmate, and terminating in wide and rounded extremities; both are proliferous from their margins, with other shoots similar to the primary ones.

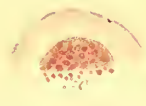
OBS. The plant has, when fresh, a faint smell of violets:—the frond, under the highest powers of the microscope, appears obsolete reticulated, but, otherwise, looks quite uniform:—it never has the slightest traces of veins:—in drying it adheres to paper.

It has* already been observed in the present work, that the plant here figured is not the real *F. bifidus* of Hudson, and, consequently, ought never to have received that name, which belongs to our *F. Palmetta*, a species to which the present is very little allied. Still less is it so to the *Fucus* called by Gmelin *F. bifidus*, a plant I never saw, but which, from the figure and description in the *Historia Fucorum*, evidently belongs to the family of *F. saccharinus*, and seems to come nearest to some young specimens of *F. bulbosus*. Notwithstanding this, however, as the subject of the present plate is now generally known among botanists by the appellation it here bears, I have thought that the making of any change would only lead to confusion, and that it was therefore best to leave the names unaltered, giving a new one to Gmelin's, should I ever be fortunate enough to obtain specimens of it. *F. bifidus* is a plant of far from frequent occurrence, even upon those shores where it has been found in the greatest quantity; but the specimens we have seen of it have been sufficient to show that it is liable to very extraordinary changes in its appearance. Of this the varieties above enumerated afford abundant proof. Mr. Wigg has been inclined to regard the second of these as a distinct species, and I have, greatly on that account, been led to figure a portion of it; but, at the same time, I can by no means agree with him in opinion, as I have seen individuals that were intermediate between it and the more common appearance of the species, and the latter also is seldom altogether destitute of the marginal cilia, though never, I believe, so plentifully provided with them. Whether I have done right in referring to this variety the *F. lacer* of Wulfen, I am far from certain. The † *F. ceranoides* of that noble author, I have no doubt belongs truly to *F. bifidus*, though it appears to have been seen only in a barren state, in which he himself had the goodness to communicate it to me. It agrees with our plant, except in its more fleshy substance, in which respect it resembles some specimens sent me from Spain, and shows an affinity to *F. Norvegicus*, or young plants of the narrow varieties of *F. crispus*. The var. δ has nearly the same substance, and is still more remarkable, from its mode of growth being mostly palmate, but is still, I believe, only *F. bifidus*. I wish I could feel equally certain respecting the last variety, for which I am indebted to Miss Hutchins, who also expresses her doubts whether it belongs to this species, though she inclines to think it does so. The wider branches certainly favor such an opinion, but the narrow ones are exceedingly unlike *F. bifidus*, and rather resemble some of the early shoots of *F. sarniensis*. *F. bifidus* is evidently most nearly allied to *F. laceratus*, and some recent botanists are of opinion that it is not really distinct from that species. Decandolle has even published them as the same. From such a decision I must beg leave altogether to dissent, being convinced that the two plants are essentially different, and that sufficient characters are to be found in the minute, always marginal, tubercles of *F. bifidus*, its constantly entire margins, its firmer and thicker substance not equally liable to injury, its mode of growth not curled as in *F. laceratus*, though generally having a tendency to be once or twice twisted, its constantly wanting the longitudinal pellucid veins, so characteristic of the other, and its different branches being fastened together at their edges in various places, contributing greatly to its globular form. In addition to these marks, it has never, I believe, been found with naked seeds, a circumstance that may probably hereafter produce a necessity, I should greatly lament, of placing the two plants in different genera. I am acquainted with no other *Fucus* with which *F. bifidus* is likely to be confounded.

- a. *F. bifidus*, natural size.
- b. part of the frond, magnified - - 6.
- c. section of a tubercle - - - 3.
- d. seeds - - - - 1.
- e. var. β , natural size.

* II. p. 5.

† Wulfen's description of this plant is a botanical curiosity, being written in the full persuasion that his own *F. ceranoides* and those of Linnæus and Gmelin, were the same plant, instead of being as different as possible, the one the *F. bifidus*, the other the *F. ceranoides*, and the third the *F. crispus* of this work. He therefore labors from the beginning to the end to reconcile them together, and he does it with a dexterity that is remarkable; but how so acute an observer could be led to think that such a *Fucus* as he had before him could at any period of its growth bear receptacles like those of *F. vesiculosus* is surprising. I mention this chiefly to shew how even Wulfen may be mistaken, and, if he could not avoid errors like this, which of us may hope to do it?



Fucus bifidus.

Fucus, fronde coriaceâ, planâ, alternatim decomposito-pinnatâ; caule ramisque linearibus, flexuosis, ortu retroflexis, infernè articulatis, articulis e basi solutâ ramos edentibus: vésiculis obovatis, in ramis petiolatis: receptaculis sub-cylindraceis, torulosis, terminalibus.

Fucus retroflexus. LABILL. *Pl. Nov. Holl.* II. p. 113. t. 260.

HABITAT ad Capitis Van Diemen littora, prope Novam Hollandiam. *Labillardière*.—In Australibus Novæ Hollandiæ oris. *D. Brown*.

Perennis.

RADIX hactenus latet.

FRONS caule assurgens unico, indiviso, pedali, bipedali, et ultrâ, plano, ancipite, latitudinem circiter bilinearem et ubique ferè æqualem a basi ad apicem servante, toto flexuoso, vel, ut aptiùs loquar, eâ ratione quam *zizac* dicunt composito, scilicet constante ex serie articularum unguem pollicemve longorum, basi solutorum, quod in inferiore caulis parte perquàm manifestum quo altiùs ascendis eo magis fit obsoletum et apicem versus evanescit; caulis quâ radici propior, nudus, cætera ramis pinnatus; *rami* distichi, articularum semper e basi, et quidem e parte solutâ, orti, sunt quasi hujus productio, atque idcirco alterni, intervallisque articularum longitudine sejuncti, plani, primùm deflexi, mox sub-horizontales, dodrantem et ultrâ longi, eâdem quâ caulis ratione conficti, hujusque prorsùs similes, nisi quodd triplo vel quadruplo sint angustiores articulosque habeant pro ratâ parte breviores, ipsi etiam prope ortum nudi, sed sursum versus ex articularum basi edentes novam ramorum seriem, qui, primariis breviores et angustiores, nulla articularum volorum vestigia ostendunt, sed intervallis exiguis pinnati conspiciuntur tertiâ serie ramorum ita tenuium ut propemodùm sint capillares, et hi rursùm alios ferunt minores, simili ratione dispositos, circiter unguem longos, simplices, erecto-patentes, basi tamen lenissimè deflexos; *vesiculæ* in ramis præsertim primariis, et sæpissimè horum juxta basin sitæ, haud ita frequentes, formæ obovatæ vel ex ellipticâ sphericæ, *Pruni spinosæ* druparum magnitudine, petiolis teretiusculis vix lineam longis fultæ, extinsecùs læves, intùs cavæ atque vacuæ:—*folia*, quantum ego vidi, et quantum per *Labillardierum* liquet, semper huic *Fuco* desunt.

FRUCTIFICATIO in ramis terminalibus sita, qui tunc toti intumescentes pennæ ferè passerinæ crassitiem æquant, et moniliformes fiunt ob tubercula inclusa sphericæ, quæ brevibus intervallis sejuncta disponuntur, singula poro minutissimo extrinsecùs pertusa; sub quo latent semina aliquot fusca, elliptica, limbo pellucido cincta, unâ cum fibris plurimis, articulatis, abbreviatis, simplicibus.

COLOR, qui recentis verisimillimè olivaceus, fit in *exsiccatâ* et paritèr in *rursùs madefactâ* niger.

SUBSTANTIA coriacea.

OBS. Planta ob ramos elongatos tenues flaccida, habitu comoso:—*exsiccata chartæ non adhæret*.

Sicut de Africâ perhibere sunt soliti veteres, semper aliquid novi gignere, ita et nobis de Australasiâ loqui licet, quæ, interplurima aliâ ad Historiam Naturalem pertinentia nunquam aliunde accepta, novam quoque *Fucorum* nuper patefecit familiam, formâ longè recedentium ab aliis, quotquot sunt in reliquis orbis Terrarum hucusque detectæ littoribus. Hi omnes ad illam *Fucorum* tribum pertinent, qui *Webero Mohri*que *Fucii proprii* audiunt, et per duos præcipuè dignoscuntur characteres. Primus est e duobus, quodd caulem habeant planum ramis homogeneis planis multoties pinnatum; qui cuncti, sicut etiam caulis, ex articularum distinctorum serie constare videntur, ordine flexuoso sibi invicem impositorum, ita tamen ut subjacentis cujusvis apex non in ipsam superioris inseratur basin, sed affigatur parti circiter lineam a basi remotæ, calcem liberam solutamque relinquens. Spectabilis hæcce frondis conformatio præprimis est in caulis ramique cujuslibet parte inferiore manifesta, sed quo altiùs accedis eo sensim magis magisque obsoleta, donec ad apices prorsùs evanescit. Altera illa horum *Fucorum* propria nota in ramorum situ ponitur, qui, semper distichi, nunquam, sicut in aliis accidit *Algis*, e caulis angulis ortum ducunt acutis, sed semper e lateribus planis emicant, ramorumque imum occupant, ordine nunquam non alterno dispositi, ortu deorsùm spectantes, ut ferè articulos productos crederes. Hinc speciei hujus nostræ nomen duxit *Labillardierus*, hanc unam inter *Fucos* tales memorans. Icon ab hoc data frondis frustulum e parte inferiore desumptum sistit, ramosque idcirco retroflexos evidentissimè exhibet, meæ in hoc præstans, in quâ media ferè exemplaris pars delineatur, et quæ ad stirpis faciem universalem exprimendam potiùs destinatur. Nullus datur *Fucus* hactenus in hoc opere depictus, vel ab auctore quolibet descriptus, cui *F. retroflexus* crescendi modo accedit, vel quocum fieri potest ut a *Botanicis* commisceatur, quare ea quæ de congeneribus sunt dicenda differre cogor, donec hi tandem publici erunt juris facti. Exemplar hic delineatum *Dni Brown* amicitia debeo.

- | | | | |
|-----------------------------------------------|---|---|----|
| a. <i>F. retroflexus</i> , magn. nat. | | | |
| b. <i>rami fructiferi pars</i> , magn. auct. | - | - | 6. |
| c. <i>tuberculum horizontalitèr dissectum</i> | - | - | 3. |
| d. <i>semina et fibræ</i> | - | - | 1. |

Fucus retroflexus, frond coriaceous, flat, alternately repeatedly pinnated; stem and branches linear, flexuose, bent downwards at their origin, divided in their lower part into joints unconnected at their base, whence the branches issue: vesicles obovate, standing on peduncles on the branches: receptacles sub-cylindrical, torulose, terminal.

Fucus retroflexus. LABILL. *Pl. Nov. Holl.* II. p. 112. t. 260.

On the shores of Van Diemen's Land near New Holland. *Labillardière*.—Southern Coast of New Holland. *Mr. Brown*.

Perennial.

Root, at present unknown.

FROND, furnished with a single, undivided stem, from one to two feet or more long, flat, two-edged, preserving from its base to its apex an every where nearly equal width of about two lines, flexuose throughout, or rather growing in a ziczac direction, being, apparently, composed of a series of joints from half an inch to an inch long, standing diagonally, in alternately opposite directions, and with the bottom of each projecting, which is very visible in the lower part of the stem, but becomes more and more obsolete the higher you go, and towards the top ceases to be observable; the stem is naked in the part nearest the root, but afterwards beset with branches, which grow in a distichous manner, constantly originating from the base of the joints, of which they seem to be mere elongations, and are, consequently, alternate and separated from each other by the length of the joints; they are flat, bent downwards at their origin, but afterwards nearly horizontal, nine or ten inches long, formed in the same way as the stem, and exactly like it, except that they are three or four times narrower and have joints proportionably shorter; these also are naked below, but afterwards beset with a new series of branches originating from the base of the joints, shorter and narrower than the primary ones, and not having the same jointed appearance, but likewise in their turns pinnated with a third set, which are so narrow as to be nearly capillary, and these again produce others, still disposed in the same manner, about half an inch long, simple, between erect and patent, but very slightly bent downwards at their origin; vesicles situated upon the branches, especially the primary ones, and generally near the base of them, not very numerous, obovate, or between elliptical and spherical, as large as sloes, supported upon subcylindrical petioli scarcely a line long, externally smooth, internally empty:—leaves, as far as I have seen, or as appears from *Labillardière*, always wanting.

FRUCTIFICATION, placed in the terminal branches, which then perform the office of receptacles, and, swelling to the size of nearly a sparrow's quill, become moniliform from the tubercles they inclose, which are spherical, separated by very short intervals from each other, and each perforated by an extremely minute pore, under which lie a few, dark brown, elliptical seeds, surrounded by a pellucid limbus, and with these a number of short, simple, yellowish, jointed fibres.

COLOR, of the recent plant, most probably, olive-green, but turning black from drying, and continuing so if again moistened.

SUBSTANCE, coriaceous.

OBS. The long, thin, very numerous branches render this plant flaccid, and give it a bushy appearance:—when dried, it does not adhere to paper.

The coast of New Holland produces a tribe of Fuci different in their conformation from any thing yet found in other parts of the world. They belong to that family which is called by Weber and Mohr *Fuci proprii*, and are all composed of a stem repeatedly pinnated with different series of branches, the whole of which are, as well as the stem itself, flat, and formed, as it were, of a set of distinct joints placed upon each other in a sort of ziczac direction, yet so that the top of one is not attached immediately to the bottom of that above it, but is inserted at the space of about a line above the lower extremity, leaving the remainder projecting beneath. This singular formation is particularly visible in the lower part of the stem and branches, but gradually wears away towards the apices, where it is scarcely observable. Another remarkable point attending these Fuci is, that the branches always arise from the flat parts of the stem, and never from the angles, contrary to the common practice of nature in these plants, and are regularly placed in an alternate direction at the bottom of the joints, of which they appear to be a continuation, so that they are at their origin bent downwards. It is from this circumstance that *Labillardière* has derived the name of the species before us, with which alone of the family he appears to be acquainted. His figure, representing a small portion only of the lower part of a specimen, shows the retroflexed disposition of the branches in a more striking point of view than is done by mine, which is taken from the center of the plant, and is more calculated to give an idea of its general appearance. There cannot possibly be an apprehension of confounding *F. retroflexus* with any of the Fuci yet figured in this work, and, when an opportunity is afforded me of introducing the others more nearly allied to it, I shall endeavor to point out the manner in which they differ. For the specimen represented in the present plate I am indebted to *Mr. Brown*.

- a. *F. retroflexus*, natural size.
- b. part of a branch in fruit, magnified - - 6.
- c. horizontal section of a tubercle - - 3.
- d. seeds and fibres. - - - - 1.



Juniperus retroflaxus.

Esq. del.

Fucus, caule coriaceo, plano, lineari, infernè sub-articulato, articulis basi sub-solutis, sterili folioso et simplice, fructifero apices versus paniculato: foliis distichis, lineari-ellipticis, crenulatis, ortu deflexis: vesiculis inter folia sphaericis, petiolis planis, inter receptacula ellipticis, petiolis teretibus: receptaculis cylindraceis, terminalibus, sub-paniculatis.

Fucus paradoxus. BROWN, MSS.

HABITAT in Australibus Novæ Hollandiæ oris. D. Brown.

Perennis.

RADIX a me nondùm visa.

FRONS caule instructa unico, vagè juxta basin diviso, bi- tri- pedali et ultrà, tetragono angulis acutis sub-alatis, infernè diametro lineam æquante, sursum versus gradatim attenuato, ut ad apices triplo quadruplove sit angustior, segmentis ad dimidiam et ultrà altitudinem indivisis atque foliosis, exinde paniculatim ramosis atque aphyllis, in utrâque parte ut plurimum vesiculiferis; folia disticha, e caulis lateribus planis alternatim orta, spatio inter singula brevi, ortu deflexa, mox horizontalia, hæc tres pollices, illa vix unum longa, omnia elliptica, vel elliptico-subrotunda, et circiter unguem lata, petiolis brevissimis planis caulem latitudine æquantibus fulta, nervo crassiusculo nigricante percursa, margine in his integerrimo, in illis crenulato, aut etiam sparsim spinuloso; folia surculos juniores per totam longitudinem vestiunt, adultiorum vix ultra mediam altitudinem attingunt, sed caulis super hæc ad apices usque exasperatus conspicitur, quasi petiolorum diffractorum, omnium deorsum spectantium, reliquii; vesiculæ dimorphæ, utræque extrinsecus læves, intus vacuæ, hæc foliis immixtæ, eorumque petiolis fultæ, globosæ, nunc solitariae, nunc binæ vel ternæ, *Pisi sativi* seminum magnitudine, petiolis brevissimis planis insidentes, plerumque folio subrotundo crenato coronatæ, nec rarè membranâ brevi dentatâ alata, illæ inter receptacula positæ, ellipticæ, vel elliptico-sphaericæ, vix *Cannabis sativæ* seminibus majores, petiolis teretibus circiter lineam longis fultæ, et mucrone setaceo aristatæ.

FRUCTIFICATIO in ramis paniculatis, præsertim eorum apices versus, frequentissima, ut totos ferè cooperiat, e receptaculis constans cylindraceis, duas tresve lineas longis, sub-paniculatim dispositis, brevissimè pedunculatis, extrinsecus poris frequentibus pertusis, sub quibus latent tubercula sphaerica immersa, sed semina omnia e meis aufugerant exemplaribus:—receptaculis immixta vidi folia aliquot sparsa, linearia, tres lineas longa et unam lata, in qualia suspicor receptacula effeta mutari: quod si ita sit, quàm revera est hæc stirps paradoxa!

COLOR recentis verisimillimè olivaceus, exsiccatae et paritèr rursus madefactæ niger in caule, in foliis fuscus.

SUBSTANTIA caulis coriacea, foliorum vesicularumque cartilaginea.

OBS. Rectiùs forsàn de hoc Fuco, sicut de *F. retroflexo*, diceretur, caulem ramosque habere articulatos, articulis e basi solutâ folia emittentibus; sed hoc neutiquam tam manifestè in *F. paradoxo* quàm in *F. retroflexo* locum habet:—planta exsiccata chartæ non adhæret.

Si quid est in Algis, et quàm multa sunt sciunt omnes in his plantis investigandis versati, quod mirum atque ab usitatâ naturæ facie recedens *paradoxum* nominari meretur, illum jure optimo titulum *Fucus* hîc depictus asserit, quem Australasiæ ad littora primus et, quantum compertum habeo, solus legit D. Brown. Piget quidem quòd tabulæ nostræ prohibuerit magnitudo, nimis angustis circumscripta terminis, quominùs talem ejus exhiberem iconem qualis ritè exprimeret stirpis indolem, non tam ab aliis omnibus quàm ab ipsâ abludentem: magisque adhuc piget quòd per pauca modò investigandi exemplaria mihi sit in præsens oblata facultas; quamobrem, mihi vix blandiri possum me descriptionem confecisse, quæ botanicis arrideat posteris stirpem in loco natali lustrantibus. Inter duo, quæ mihi hujus Fuci misit D. Brown specimina, dissimilitudo interfuit summa, ut nemo ferè, ex his solis judicans, pro iisdem venditare auderet. Horum unum, quod hîc delineatur, caulem habet principalem fructiferum, sed prorsus aphyllum, et sursum versus in ramos plurimos fissum, dum minores reliqui sunt steriles, indivisi, atque per totam longitudinem foliosi, vesiculis tamen nullis: alteri caulis modò unicus, cui fructus deest, et qui, quamvis fructiferum mole æquat, simplex manet, foliis a basi ad apicem obsitis, quæ longitudine ea in exemplare alio duplè triplè superant, et sunt omnia vesiculis comitata. Neque equidem hoc solum in plantâ paradoxâ paradoxum, sed et alia; formâ enim, uti suprâ memoratur, discrepant inter se vesiculæ receptaculis atque eæ foliis immixtæ; et talis est foliorum inter receptacula conspiciendorum forma, ut impossibile videatur hæc unquam reliquorum similia futura. Crescendi quoque modus in hoc Fuco singularis, inter illos ambigens qui, *F. retroflexi* instar, e serie articularum basi solutorum constant, atque illos quibus est caulis, ut in plurimis, uniformis: ita tamen ut maximè ad priores appropinquare diceres, quia rami atque folia, quod in illis insigne, nunquam nisi e planis caulis lateribus oriuntur. *F. paradoxi* folia formâ referunt illa *F. telephifolii* vel *F. latifolii*, sed planta ipsa adeò usque ab omnibus aliis hactenus notis recedit, ut sit eum nullo, vel a tyronibus, commiscenda.

- a. *F. paradoxus*, magn. nat.
- b. *receptacula et vesicula*, magn. auct. - - 6.
- c. *receptaculum dissectum* - - - 3.
- d. *frondis sterilis pars, cum vesiculis*, magn. nat.

Fucus paradoxus, stem coriaceous, flat, linear, with an obsolete appearance in its lower part of joints unconnected at their base, leafy and simple when barren, when in fruit paniced near the apex: leaves distichous, linearly elliptical, crenulated, bent downwards at their origin: vesicles of two kinds; those among the leaves spherical with flat petioli, those among the receptacles elliptical on cylindrical petioli: receptacles terminal, cylindrical, disposed in a sub-paniculate manner.

Fucus paradoxus. BROWN, MSS.

On the southern coast of New Holland. Mr. Brown.

Perennial.

ROOT, I have not yet seen.

FROND, furnished with a single stem, irregularly divided near its base, extending to the length of two or three feet, or more, square, with sharp, almost winged, angles, a line in diameter in its lower part, but gradually growing smaller as it rises, so that near the apex it is three or four times more narrow, its segments continuing for more than half their height undivided, and beset with leaves, but afterwards branched in a paniced manner, and leafless, in both parts generally producing vesicles; leaves distichous, always rising in alternate order from the flat sides of the stem, separated from each other by short intervals, bent downwards at their origin, afterwards horizontal, some reaching to three inches, others to scarcely one in length, all elliptical, or between elliptical and roundish, and about half an inch wide, standing on extremely short flat petioli of the same width as the stem, furnished with a thickish, dark-colored midrib, the margin of some entire, of others crenulated, and, again, of others, beset with a few, minute, spine-like processes; the younger shoots are lined by the leaves from their base to their summit, but the full grown ones seldom have any beyond half their height, though they are, to the very top, rough with what appear to be the remains of broken petioli, all pointing downwards; vesicles of two kinds, both smooth without and hollow within, the one sort mixed with the leaves, and growing on their footstalks, sometimes solitary, and sometimes standing two or three together, as large as the seeds of the common pea, supported upon extremely short, flat petioli, mostly terminated by a roundish crenated leaf, and not uncommonly winged with a short toothed membrane, the other situated among the receptacles, elliptical, or between elliptical and spherical, scarcely larger than hemp-seed, standing on cylindrical petioli a line long, and tipped with a setaceous mucro.

FRUCTIFICATION, placed on the paniced branches, particularly towards their apices, and so abundant as almost to cover them, consisting of cylindrical receptacles, two or three lines long, arranged on very short peduncles in an irregularly paniced manner, externally uneven, and perforated with numerous pores, under which lie imbedded spherical tubercles, but all the seeds had, in my specimens, escaped:—mixed with the receptacles I have seen a few, scattered, linear leaves, about three lines long and one wide, into which I suspect that the receptacles change, when they have fulfilled their office: if so, this plant is more truly paradoxical than it appears to be.

COLOR, most probably, an olive green in the fresh plant, but turning, from drying, to brown in the leaves, and to black in the stem, which also continues to be the case upon subsequent immersion.

SUBSTANCE, of the stem coriaceous, of the leaves and vesicles cartilaginous.

Obs. This *Fucus* might, probably, with more propriety be described, like *F. retroflexus*, as having a stem composed of a set of distinct joints, so placed upon each other, that the bottom of each is left disengaged and projecting (yet not standing, as in that species, in a zigzag direction,) and as sending out from the base of the joints its leaves and branches:—such a conformation, however, is far less evident in *F. paradoxus* than in *F. retroflexus*:—in drying it does not adhere to paper.

This *Fucus* well deserves the name of *F. paradoxus* assigned to it by Mr. Brown, the only botanist that has at present found it, and I greatly lament, not merely that, from the size of my work, it has been impossible to give such a figure of it as might convey an adequate idea of its extraordinary nature, but, equally so, that I have been prevented by the small quantity of specimens before me, from describing it in a manner likely to be satisfactory to those who may hereafter meet with it. Such was the difference between two individuals sent me by Mr. Brown, that no botanist, whose means of judging were derived from these alone, would imagine them to be the same; the one, which is represented in the plate before us, having its leading stem devoid of leaves and divided above into numerous branches, while its smaller shoots are unbranched and leafy from top to bottom, but unprovided with vesicles; the other, of which I have been able to figure only a small part, being altogether barren and undivided, though equal in size to the fructified one, and being beset throughout its whole length with leaves three or four times longer than those in the former specimen, and each attended with one or two vesicles growing on its petiolus. The different shapes, likewise, of the vesicles just mentioned, and of those found among the receptacles, and the circumstance of the petioli of the latter being cylindrical, while those of the former are flat, are things both remarkable and extraordinary; but, still more so, are the linear leaves scattered among the fructification, the form of which is such as seems to forbid the supposition that they can ever be so changed as to resemble the others. *F. paradoxus* is a curious link between the *Fuci* formed like *F. retroflexus*, and those of more common appearance: it has the strong character of the former that the leaves originate from the flat sides of the stem, and it has likewise a tendency to the same jointed mode of growth. Its leaves in shape greatly resemble those of *F. telephifolius* or *F. latifolius*, but the plant itself is too much unlike any other to need any observation for the purpose of distinguishing it.

- a. *F. paradoxus*, natural size.
- b. receptacles and vesicle, magnified - - - 6.
- c. section of a receptacle - - - - 3.
- d. part of a barren frond, with vesicles, natural size.



Ficus parviflora.

G. A. N. Esq. del.

Fucus, frondē coriaceâ, planâ, alternatim pinnatâ; caule ramisque linearibus, flexuosis, articulatis; caulis articulis è basi solutâ ramos edentibus simplices, ortu deflexos, quorum ex articulis basi solutis oriuntur vesiculæ ellipticæ petiolatæ et receptacula cylindracea, torulosa, copiosissima.

Fucus torulosus. BROWN, MSS.

HABITAT apud Insulas "Kent's Islands" dictas, prope Novam Hollandiam. D. Brown.

Perennis.

RADIX a me nondum visa.

FRONS caule assurgens unico, sub-pedali, qui, ipsam ad basin teres pennæque corviinæ ferè crassitie, ad aliquot linearum altitudinem fit planus, aut plano-compressus, latitudinemque exinde eandem unius circiter lineæ ad apicem servat; plerumque est indivisus, sed interdum semel iterumve sursum versus bifurcus segmentis sub-fastigiatis, semper per totam longitudinem in articulos, quorum imi brevissimi ut annulos referant, reliqui circiter unguiculares, diffractus, ordine flexuoso, quem nostrates *ziczac* dicunt, dispositos, basi tamen utriusque liberâ, atque ramum emittente; caulis cætera nudus; rami articulorum e basi, ut jam memoratur, orti, hinc distichi atque alterni, *simplices, omnes sub-pollicares, ortu deflexi, mox horizontales, eadem quâ caulis ratione conficti, ejusque omninò similes, nisi quòd minores sint, et quòd articuli, qui brevissimi, per medium modò connexi utrumque apicem habeant liberum et ex utroque emittant adèò densam fructus vesicularumque copiam, ut vera ramorum figura ægrè dignoscatur; vesicula haud ita frequentes, ut rarè plures quàm duas vel tres in eodem reperias ramo, ellipticæ, vel ob basin aliquandò elongatam elliptico-pyriformes, *Lathyri tingitani* seminibus majores, petiolis teretibus circiter lineam longis fultæ, receptaculis immixtæ, et sæpe horum pedunculis insidentes, extrinsecus læves, intus cavæ atque vacuæ.

FRUCTIFICATIO receptacula sub-cylindrica, longitudine unguem diametro lineam æquantia, copiosissima, ut rami nihil aliud nisi horum congeries primo aspectu videantur, pedunculis imposita angustis, aliquot lineas longis, compressis, nunc simplicibus, nunc, quod quidem sæpius accidit, semel iterumve dichotomis, extrinsecus ubique torulosa, porisque minutissimis pertusa, sub quibus latent tubercula immersa, sphaerica, includentia semina aliquot enormiter pyriformia, intensè fusca, limbo pellucido cincta, unâ cum fibris albicantibus, simplicibus, articulatis, granulorumque ellipticorum diaphanorum seminibus multoties minorum congerie:—receptacula, seminibus elapsis, cava fiunt, atque extrinsecus constricta intervallis brevibus, ut obsolete articulata appareant, et *F. siliquosi* vesiculas referant.

COLOR, qui recentis verisimilimè olivaceus, est in *exsiccata* et paritèr in *rursus madefactâ* ater, nitoris expers.

SUBSTANTIA inter coriaceam et cartilagineam media, lenta, tenax.

Obs. Exsiccata chartæ non adhæret:—caulis formâ graminum quorundam rachin refert:—*Sertulariam cirratam* atque *Corallinam graniferam* huic Fuco innascentes vidi.

Eadem illa frondis conformatio, per quam se *F. retroflexus* insignem præstat, et quam, dum illum describeremus Fucum, multis verbis exposuimus, magis est dilucidè in *F. toruloso* conspicienda, neque in hâc, sicut in illâ, specie plantæ tantummodò partes inferiores occupat, sed per totam longitudinem, ubique paritèr manifestè, valet; in hoc singularis, quòd articuli sint prope caulis ramique cujuslibet ortum triplo quadruplove quàm alibi breviores. Nulla unquam foliorum vestigia in hoc Fuco vidi, atque exemplaria a D. Brown lecta, quæ sola observandi hactenus est data facultas, omnia formâ inter se congruunt; quòd tamen non obstat quin suspicer plantam in diversis ætatis suæ stadiis facies longè diversas induere. Ita suadet indoles receptaculorum, quæ, seminibus jam elapsis, tam intus quàm extrinsecus, *F. siliquosi* vesicularum similia evadunt; sed de re nondum visâ non est ut aliquid ex tripode asseram. Hoc saltem absque dubio proferre licet, *F. torulosum*, quantumvis casu vel ætate mutatum, nunquam eo usque a seipso recedere posse, ut sit ullus in distinguendo labor.

- a. *F. torulosus*, magn. nat.
- b. receptacula et vesicula.
- c. receptaculum longitudinalitèr dissectum, magn. auct. - - - - - 6.
- d. idem horizontalitèr dissectum - - - - - 6.
- e. semina - - - - - 1.
- f. fibræ et granula pellucida - - - - - 1.
- g. pars receptaculi dissecti, seminibus emissis - 6.

* An verè simplices?—Sanè nescio an rami rectius dicerentur simplices pedunculique ramosi, an pedunculi pro ramis haberentur secundariis ramique idcirco divisi perhiberentur:—nihil sanè refert; sicut enim cuivis inter Algas marinas versato botanico satis est notum, partes onues Fucorum (paucos si excipias,) tempore progrediente, in alias mutantur, et hi pedunculi, si plantæ sineret ætas, rami fierent.

Fucus torulosus, frond coriaceous, flat, alternately pinnated: stem and branches linear, flexuose, jointed; joints of the stem unconnected at their base, whence issue the simple branches, deflexed at their origin, and out of the base of the joints of the branches arise elliptical, petiolated vesicles, and a profusion of cylindrical torulose receptacles.

Fucus torulosus. BROWN, MSS.

In Kent's Islands, near New Holland. Mr. Brown.

Perennial.

ROOT, I have not yet seen.

FROND, rising with a single stem about a foot long, which is at the base cylindrical, and almost as thick as a crow's quill, but as soon as it has attained to the height of a few lines becomes flat, or between flat and compressed, and afterwards preserves to its apex an everywhere equal width of about a line; it is generally undivided, but sometimes once or twice forked in its upper part with segments of nearly equal height, throughout its whole length it is constantly flexuose, as if it were composed of a series of distinct joints placed upon each other in a ziczac direction, the lowest so short as to appear nothing more than annular tumors, the rest above half an inch long; from the bottom of each of these joints, which is loose and prominent, issues a branch, so that the stem, though in other respects naked, is pinnated with a series of distichous, alternate, *simple branches, about an inch long, bent downwards at their origin, afterwards horizontal, formed in the same manner as the stem, and exactly like it, except in their smaller size, and in having the joints, which are extremely short, connected only in their centres, so that both ends are loose, and both give rise to such a profusion of fruit and vesicles that the true nature of the branches is not easily distinguishable; vesicles not very abundant, so that seldom more than two or three are observable on the same branch, elliptical, or elongated at their base so as to approach to pyriform, larger than the seeds of the *Tangier Pea*, supported upon cylindrical petioli, about a line long, growing mixed with the receptacles, and often springing from their footstalks, externally smooth, internally empty.

FRUCTIFICATION, nearly cylindrical receptacles, half an inch in length, and a line in diameter, very abundant, so that the branches appear at first sight to be merely a mass of them, standing upon narrow, compressed peduncles some lines long, which are sometimes simple, and sometimes, indeed most commonly, once or twice dichotomous; the receptacles are extremely torulose all over, and perforated with very minute pores, under which lie imbedded spherical tubercles, containing a few irregularly pyriform, dark-brown seeds, surrounded with a pellucid limbus, mixed with whitish, simple, jointed fibres, and a mass of elliptical, transparent granules many times smaller than the seeds:—the receptacles, when they have discharged their seeds, become hollow, and externally contracted at short intervals, so as to have an obsolete moniliform appearance, and resemble the pods of *F. siliquosus*.

COLOR, most probably, olive-green in a recent state, but turning black from drying, and continuing so if again moistened, destitute of gloss.

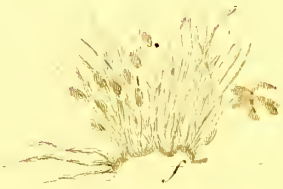
SUBSTANCE, intermediate between coriaceous and cartilaginous, tough and flexible.

OBS. In drying it does not adhere in the least to paper:—the stem resembles in its form the *rachis* of some grasses:—*Sertularia cirrata* and *Corallina granifera* are found growing on this plant.

The same singular conformation of the frond, as has already been spoken of at considerable length under *F. retroflexus*, is still more remarkable in the subject of the present plate, in which the jointed appearance is not confined to the lower part alone, but reaches to the very apices, attended with this extraordinary peculiarity, that the joints are, near the origin both of the stem and branches, much shorter than in any other part. I have seen no appearance of leaves in any specimens of this *Fucus*. From the circumstance of the receptacles taking, after they have discharged their seeds, the form, both externally and internally, of the vesicles of *F. siliquosus*, I should conceive that *F. torulosus* must be a species very different in its appearance at different periods of its growth; but I have had no opportunity of examining it in any other state than that here figured, so that I speak of this only as matter of conjecture. Whatever, however, may be the changes to which it is liable, I cannot imagine that any of them can so alter it as to make it possible for it to be confounded with any other *Fucus* at present known.

- | | | | |
|----|-------------------------------------------------------------------|---|----|
| a. | <i>F. torulosus</i> , natural size. | | |
| b. | receptacles and vesicle. | | |
| c. | longitudinal section of a receptacle, magnified | - | 6. |
| d. | horizontal section of the same | - | 6. |
| e. | seeds | - | 1. |
| f. | fibres and transparent granules | - | 1. |
| g. | part of a receptacle, after it has discharged its seeds, cut open | - | 6. |

* I am at a loss whether it is most correct to call the branches, as I have done, simple, and the peduncles branched, or whether to regard these latter as a secondary set of branches, and call the branches divided: it is, however, a matter of little moment, for, as every botanist conversant with the study of the marine Algæ knows, all the parts of *Fuci*, with a few exceptions, are changed into others, and these peduncles, did the age of the plant admit of it, would become real branches.



T. del.

Fucus torulosus.

Fucus, fronde membranaceâ, planâ, costatâ, lineari, dichotomâ, margine ubique minutè dentato-ciliatâ, superficie sparsim punctatâ.

Fucus Woodwardia. BROWN, MSS.

HABITAT in Septentrionalibus Novæ Hollandiæ oris. D. Brown.

Perennis.

RADIX a me nondùm visa.

FRONS dodrantalis, et ultrâ, plana, circitèr semiunguem lata, linearis, dichotomiis juxta basin incipientibus atque exinde sæpe repetitis, spatio inter singulas rarè unguiculari, divisa, furcarum sinibus acutis, ubique percursa costâ, quæ, basi nigricans firma atque pennâ passerinâ vix tenuior, sensim, uti progreditur, magis fit angusta magisque palida, donec juxta apices frondi concolor facta propemodùm evanescit; frons superficie sparsim utrinque pertusa, poris minutis atris fibrarum albarum brevium articulatarum fasciculos emittentibus, apice bifida, segmentis abbreviatis patentibus obtusis, margine lenitèr undulata atque per totam longitudinem dentato-ciliata, denticulis minutissimis, nigricantibus, spinulas referentibus:—basin versus membrana vi fluctuum sæpiùs deteritur, et costa hinc denudata stipitis speciem præ se fert.

FRUCTIFICATIO hactenus latet.

COLOR, qui *recentis* verisimillimè dilutè olivaceo est viridis non sine flavedine et nitidus, fit in *exsiccata* aquosè gramineo-fuscescens, semper tamen diaphanus.

SUBSTANTIA quoque, quæ, semper tenuis, in *recente* verisimillimè inter cartilagineam et membranaceam ambigit atque elastica est, fit in *exsiccata* aut *rursùs madefactâ* insignitèr flaccida atque tenerrima.

Obs. Exsiccatione chartæ nequaquàm adhæret; sin absque curâ aut pressurâ exsiccet, partes omnes sibi invicem impositæ ita agglutinantur, ut nullo modò postea disjungi possint:—frons sub lente lineis tenuissimis, nigricantibus, parallelis, approximatis, a costâ ad margines diagonalitèr excurrentibus notata conspicitur.

Cùm omnibus ferè numeris inter se consentiant *F. membranaceus* atque *Fucus* hic noster *Woodwardia*, sitque hujus descriptio nihil fermè aliud nisi illius repetita, lectori forsan magis placuissem, certè brevitati meliùs consuluissem, dicendo modò de plantâ hîc depictâ, habere omnia cum alterâ communia, frondis margines si excipias, serratos in unâ, in alterâ integerrimos. Dum tamen sic de stirpe universâ loquor, fateri necesse est me analogiâ quodammodò niti; ita facere coactus, quoniam omnia *Fuci Woodwardia* quæ hactenus vidi exemplaria, pauca quidem illa, manca fuerunt, utpote quibus cùm radix tùm fructificatio et costæ vis prolifera defuerunt. Neque id solum describenti obfuit, quòd sint manca, sed et de hactenus exsiccatis nihil certi, quod ad recentium colorem texturam odoremve attinet, proferre licuit; hæc enim, quæ quàm magni sunt in *F. membranaceo* momenti nemo botanicus nescit, omnia mutata. Sint licet talia, aut etiam plura, ignota, nullus timeo ne temeritatis reus arguar, putarerque, ut aiunt, in festinationibus nimias suscepisse celeritates, sententiam meam proferendo, *Fucum Woodwardia* non minùs in ignotis quàm in notis cum *F. membranaceo* consentire. E contrario magis vereor ut rectè fecerim quòd pro diversis speciebus habuerim, præsertim quoniam *Ulva atomaria*, stirps hisce summoperè affinis, margine nunc serrato nunc integerrimo ludit; quamvis, alterâ ex parte, nequaquàm eodem quo *F. Woodwardia* modo serrata; illius enim dentes, absque normâ dispositi, et in his ramis frequentes in illis rari vel nulli, sæpe potiùs e casu quàm e verâ frondis indole pendere videntur, hujus semper intervallis disjuncti certis totam frondem cingunt, videnturque sub lente substantiâ atque colore a reliquâ fronde discrepare. Nomen quod huic Fucò imponi voluit D. Brown libentissimè adhibui, cùm quia similitudinem, quæ inter illum et Filicum familiam *Woodwardiam* dictam summa interest, denotat, (similitudinem jam olim inter has stirpes et *F. membranaceum* Webero Mohrioque intercedere observatam,) tùm præcipuè quia viro optimè de re herbariâ merito et a me ipso summâ semper observantiâ culto atque colendo honorem meritis quæsitum mandat.

a. *F. Woodwardia*, magn. nat.

b. *frondis pars*, magn. auct. - - G.

Fucus Woodwardia, frond membranaceous, flat, midribbed, linear, dichotomous, its margin every where fringed with minute spine-like teeth, its surface punctured with scattered blackish dots.

Fucus Woodwardia. BROWN, MSS.

On the North coast of New Holland. *Mr. Brown*.

Perennial.

ROOT, I have not yet seen.

FROND, nine inches or more long, flat, about a quarter of an inch wide, linear, branched with dichotomies beginning the base, and afterwards frequently repeated, the intervals between each being seldom equal to half an inch, angles of the divisions acute; a midrib passes through the whole frond, which in the lower part is blackish, stiff, and almost as thick as a sparrow's quill, but, as it advances, gradually decreases in size and grows more pale, till, near the extremities, it fades to nearly the same color as the frond, and is scarcely observable; the surface of the frond is perforated all over on both sides with minute, black, scattered pores, out of which issue small clusters of short, white, jointed fibres; the apices are bifid with short, patent, obtuse segments; the margins slightly undulated, and throughout their whole length fringed with exceedingly small blackish teeth, placed at short, regular distances from each other, and resembling little spines, the intermediate space between each being circular, so that they might almost be called crenate:—towards the base of the frond, the membranous part is generally worn away by the attrition of the waves, and the midrib, being consequently left naked, wears the appearance of a stipes.

FRUCTIFICATION, at present undiscovered.

COLOR, most probably a pale olive-green tinged with yellow, and glossy in the recent plant, but turning from drying to a very light, brownish, grass-green, always transparent.

SUBSTANCE, very thin, remarkably flaccid and tender after it has been dried, and continuing so if again wetted, but, most probably, between cartilaginous and membranaceous, and having a considerable degree of elasticity in a recent plant.

OBS. In drying it does not in the least adhere to paper; but, if it be dried without care or pressure, all those parts of the frond which touch each other, adhere together, and can never afterwards be separated:—under the microscope, the frond is seen to be marked with fine, blackish, parallel lines, running diagonally from the midrib to the margins.

In the description of the *Fucus* figured in the present plate, I have done little more than copy what had been previously said in this work of *F. membranaceus*, with which the plant before us so exactly accords, that it would have, perhaps, been the most satisfactory, as it would have, undoubtedly, been the shortest plan, to have said in few words that they have every point in common, except that the edges of the one are entire, and those of the other toothed. In making, however, this general observation, I am obliged to depend, in a measure, upon analogy; since the specimens which I have had an opportunity of seeing of *F. Woodwardia* have been both few in number, and far from perfect, wanting the root, the fructification, and the proliferous tendency of the midrib, all which are strong characteristics of *F. membranaceus*. In like manner, their having been previously dried renders it impossible to speak with certainty upon the question of their color or their texture, or how far they participate in the strong offensive smell of the other; but, still, I entertain no apprehension, lest any botanist should regard me as too precipitate, in expressing my decided opinion, that in all these points the two plants agree. Indeed, I am rather inclined to doubt if I have done right in separating them; especially as *Ulva atomaria*, a plant very nearly allied to them, is found with its margins sometimes toothed, and sometimes entire; though, on the other hand, the serratures of this latter are always scattered without order, and more copious in some branches than in others, often resembling only accidental lacerations, while those of *F. Woodwardia* are remarkable for the regularity of their size and of their disposition, and appear under the microscope to be of a nature and color distinct from the rest of the frond. I have had a peculiar pleasure in following Mr. Brown in the name he has given to this *Fucus*, which both serves to perpetuate the memory of an able and distinguished botanist, whom I highly respect and esteem, and also to point out the resemblance of the plant to the Genus of Ferns that bears his name; a resemblance that had been already remarked by Weber and Mohr to exist between *F. membranaceus* and the *Woodwardia*.

a. *F. Woodwardia*, natural size.

b. part of the frond, magnified - - 6.



Fucus Woodwardia.

Fucus, caule coriaceo, compresso, lineari, ramoso, æquè ac ramis ubique pinnato vesiculis distichis, alternis, compressis, lineari-lanceolatis, petiolatis, articulatis: foliis ad basin distichis, alternis, planis, linearibus, integerrimis: receptaculis juxta apices distichis, alternis, pedunculatis, compressis, lineari-lanceolatis.

Fucus siliquosus. LINN. *Sp. Pl.* II. p. 1829. *Syst. Nat.* II. p. 716. *Fl. Suec.* p. 1150. *Fl. Lapp.* p. 365. *Syst. Nat. Ed. Gmel.* II. p. 1381. GMELIN, *Hist. Fuc.* p. 81. t. 2. B. *Fl. Dan.* t. 106. *Fl. Ang.* p. 574. *Fl. Scot.* II. p. 921. WITH. IV. p. 88. *Linn. Trans.* III. p. 124. *Fl. Ped.* II. p. 329. *Fl. Norv.* I. p. 83. *Eng. Bot.* VII. p. 474. *Ner. Brit.* p. 8. t. 5. *Syn. Fuc.* I. p. 60. *Fl. Fr. Ed. 2da.* II. p. 21. (excl. var. β et ejus syn.) ESPER, *Ic. Fuc.* I. p. 27. t. 8. (excl. syn. Sebæ, quod ad *F. vesiculosum* pertinet.) WULFEN, *Crypt. Aquat.* n. 14. *Fl. Monsp.* p. 458. *Fl. Germ.* III. p. 440.

F. angustifolius, vesiculis longis siliquarum æmulis. RAII *Syn.* p. 48. n. 38. MORIS. *Hist. Ox.* III. p. 647. n. 7.

Alga marina, ramis plurimis, tenuibus, longis; vesiculis oblongis, siliquarum æmulis. SEBA, *Theas.* III. p. 186. t. 98. n. 3.

β . *minor*; fronde vix dodrantali, vesiculis raris.

F. siliquosus. β . *Syn. Fuc.* I. p. 61.

F. siliculosus. *Ner. Brit.* p. 42. t. 11. WITH. IV. p. 88.

γ . *denudatus*; fronde elongata, ubique foliosâ, vesiculis foliisque nullis.

HABITAT in Oceano Septentrionali et Atlantico.—Britanniarum ad oras, copiosissimè.—In Mari Mediterraneo et Adriatico. *Wulfen*.—Apud Newfoundland, et in Oceano Sinensi. *Herb. Banks.*—Ad Insulas Fortunatas. *Bory de St. Vincent*.— β Cornubiæ ad oras. *Stackhouse*.— γ apud Weymouth. *D. Bryer*.

Perennis. Nov.—Apr.

RADIX callus expansus, orbicularis, in plantis provectoribus semper conoideus, ligneus, ater, diametro sæpe pollicaris.

FRONDES ex eâdem basi tres vel plures, singulæ instructæ caule unico, nunc unum nunc quatuor pedes longo, compresso, circiter lineam lato, ubique lineari, lenitèr flexuoso, glaberrimo, in his indiviso, in illis ramoso, semper per totam longitudinem vesiculis et fructificatione pinnato; rami sparsi, infrequentes, distichi, horizontalitèr patuli, longitudinis in diversis individuis diversissimæ, ut nunc vix palmam nunc pedem exuperent, rarè ipsi ramosi, semper caulem omninò referentes, nisi quòd minores sint, ejusque instar receptaculis vesiculisque pinnati; *vesiculæ* caulis et ramorum ad latera sitæ, distichæ, alternæ, patentes, spatio inter singulas aliquot linearum, lineari-lanceolatæ, siliquiformes, longitudine in eodem exemplare discrepantes, hæ unum illæ tres pollices longæ, lineam unam alteramve latæ, compressæ, petiolis brevibus angustis compressis fultæ, et sæpiùs rostro plano ipsis triplo angustiore et breviorè terminatæ, extrinsecus sulcis plurimis transversalibus utroque circitèr lineam ab altero distante notatæ atque torulosæ, intus cavæ, nisi quòd, septis interceptæ totidem, articulatæ reperiantur, præter quod fibris percurruntur aliquot tenuibus albicanibus parallelis rarè anastomosantibus; *folia* vix unquam nisi in plantæ ætate primâ aut adultioris ipsam ad basin detegenda, plana, linearia, duos et ultrâ pollices longa, vix lineam lata, eâdem quâ vesiculæ ratione dispositæ, brevissimèque, sicut illæ, petiolata, apice obtusa, margine integerrima, costâ tenui nigricante non nisi planta luci objiçiatu conspicuendâ percursa, plerumque poris minutissimis sparsis nigricantibus copiosè pertusa, e quibus tamen nulli, quantum vidi, fibrarum, ut in *F. serrato* et reliquis, emittuntur fasciculi:—stirps junior faciem habet ab adultâ quàm diversissimam, tota ex his foliis constans, quæ, progrediente ætate, sensim intumescencia in ramos vesiculasque mutantur; unde constat fibras jam memoratas, quæ vesiculas longitudinalitèr percurrunt, reverà esse nihil nisi foliorum costas.

FRUCTIFICATIO semper juxta ramorum caulisque apices sita, atque ibi haud ita copiosa, ut rarè plura quàm quatuor vel sex receptacula in eodem reperias ramo, e receptaculis constans *lineari-lanceolatis, compressis, vix pollicem longis, aut lineam latis, distichis, alternis, intervallo inter singula exiguo, brevissimè pedunculatis, extrinsecus æqualibus, quantumvis ubique poris minutissimis pertusis, sub quibus latent tubercula immersa, spherica, seminum oblongorum fuscorum congeriem foventia, unâ cum fibris plurimis albis articulatis.

COLOR olivaceus, nitoris expers, et nihil in se diaphani habens; soli objectæ aut exsiccata aterrimus, nec rursùs madefactæ in pristinum redit.

SUBSTANTIA coriacea; recentis lenta et tenax; exsiccata perquam fragilis.

Var. β singularis est planta, staturæ humilis rarè sex vel novem pollices superantis, omnibusque partibus duplò minor quàm usitata *F. siliquosi* facies: receptacula fert copiosiora, vesiculas longè infrequentiores.

Facie gaudet var. γ magis quàm β insigni, atque eousque a vulgari recedente, ut pauci botanici primo aspectu pro *F. siliquoso* haberet: unicum modò hujus exemplar hactenus vidi, quod stirpis, ut videtur, longè majoris est ramus, sed in longitudinem plusquam pedalem producitur, e caule constans compresso, angusto, cui annectuntur folia elongata, tenuia, plana, nullibi in vesiculas vel in siliquas intumescencia: stirpis latitudo ubique ferè eadem vix unam lineam æquat.

OBS.

* Formâ atque situ cum vesiculis conveniunt receptacula, quas faciè quoque externâ prorsùs referunt, nisi quòd sulcis transversalibus careant; dubitandumque non est quin effecta in vesiculas mutantur, in quas transeunt, sicut illæ *F. torulosi* jam in hoc opere depictæ, non rarè reperiuntur:—nequaquam verò hinc colligitur vesiculas omnes primitùs fuisse receptacula, et quidem tali sententiæ repugnare frondis indoles videtur. Similitudo quæ inter receptaculorum et vesicularum formam interest causæ extitit quòd *F. siliquosi* fructus tandiu botanicè jatuerit.

Obs. Frons non infrequenter visco quodam sordidè dilutè viridi; hujus modò, nisi fallor, Fuci proprio, obducta reperitur, quæ per desiccationem immutata manet:—in meridionalibus Britanniae oris *Sertularia Pluma* hunc Fucum perrepere amat:—* rarè reperitur exemplar in quo aliquæ e vesiculis vel foliis non sunt diffractæ, harumque persistentes petioli faciunt ut caulis ramique faciem quandam spinosam induant.

De Fuco, quo nullus ferè diutiùs inter botanicos innotuit, perpauca modò sunt quæ sese descriptioni adjicienda præstant, præsertim cum sit quoque vix ullus magis in universum cognitus, vel qui jactare possit characterem magis primo aspectu obvium. Vesiculæ, quæ hunc characterem suppeditant, et a quibus planta nomen suum aptissimum ducit, quantumvis ab illis *F. vesiculosi* *F. natantis* et reliquorum formâ discrepent, manifestè sunt ad eundem a naturâ destinatæ finem, nihilque habent omninò cum fructu commune, sicut veteres, e figurâ judicantes, censere sunt soliti, qui, Fabarum siliquis conferentes, semina non minùs in illis quàm in his quærenda autumârunt. *F. siliquosus*, marium ferè omnium a botanicis aditorum incola, paucis, uti videtur, formæ mutationibus est obnoxius, nullis eam ob causam; ut, nisi aliter docerent chartæ quibus exemplaria in Herbario Banksiano agglutinantur, nullo modo sciri possit quin stirpes ibi servatæ ex Americanis atque Sinensibus reportatæ littoribus in nostris essent oris lectæ. Quod ad varietates duas suprâ memoratas attinet, priorem ex his, ob staturam humilem † vesicularumque absentiam, pro novâ specie depinxit descripsitque Stackhousius; a quo invitus dissentire cogor, quia characteres nullos qui ad speciem distinctam constituendam sufficiant detegere potui. Liceat obiter dicere stirpem esse ab hâc toto cælo diversam *F. siliculosum* Linnæi, quem pro *F. siliquosi* synonymo citat Decandollius. Altera nostra varietas olim est in *Fucorum Britannicorum Synopsi* pro mero naturæ lusu habita, et talem jam nunc credidisset, nisi repugnaret b. D. Bryer sententia, qui sese eandem non rarè in littore prope Weymouth reperisse perhibuit; quam ob causam hic in varietatum numerum asciscendam putavi, eoque id libentiùs feci, quòd illi vix persuadere potuerim ad *F. siliquosum* ullo modo pertinere. Iconem in hâc tabulâ delineatam viri nobilissimi T. Frankland Baroneti benevolentiae gratâ mente acceptam refero.

a, b.	<i>F. siliquosus</i> ,	magn. nat.	-	-	-	-
c.	<i>planta junior.</i>		-	-	-	-
d.	<i>vesicula dissecta</i> ,	magn. auct.	-	-	-	6.
e.	<i>receptaculum dissectum</i>		-	-	-	6.
f.	<i>ejusdem pars</i>		-	-	-	3.
g.	<i>semina et fibra</i>		-	-	-	1.

* Multi hanc spinosam frondis faciem, quæ certè e casu modò pendet, memoraverunt auctores, inter quos Wulfenius tanti esse momenti credidit, ut in characterè inseruerit specifico, in quo dicit "caulem alternatim breviter esse dentatum," cui in descriptione adjungit, "denticulis compressis, aculeorum more, sursum versus curvulè acuminatis."

† Hæ non semper desunt, quamvis ita in *Nereide Britannica* censuisse videtur Stackhousius; video enim aliquas in exemplare ab ipso communicato, quamvis paucas, parvas, mancas, et obsoletas.

Fucus siliquosus, stem coriaceous, compressed, linear, branched, pinnated, like the branches, with distichous, alternate, compressed, petiolated, jointed, lineari-lanceolate vesicles: leaves placed near the base, distichous, alternate, flat, linear, entire: receptacles placed near the apices, distichous, alternate, compressed, lineari-lanceolate, pedunculated.

Fucus siliquosus. LINN. *Sp. Pl.* II. p. 1829. *Syst. Nat.* II. p. 716. *Fl. Suec.* p. 1150. *Fl. Lapp.* p. 365. *Syst. Nat. Ed. Gmel.* II. p. 1381. GMELIN, *Hist. Fuc.* p. 81. t. 2. B. *Fl. Dan.* t. 106. *Fl. Ang.* p. 574. *Fl. Scot.* II. p. 921. WITH. IV. p. 88. *Linn. Trans.* III. p. 124. *Fl. Ped.* II. p. 329. *Fl. Norv.* I. p. 83. *Eng. Bot.* VII. p. 474. *Ner. Brit.* p. 8. t. 5. *Syn. Fuc.* I. p. 60. *Fl. Fr. Ed. 2da.* II. p. 21. (excl. var. β et ejus syn.) ESPER, *Ic. Fuc.* I. p. 27. t. 8. (excl. syn. Sebæ, quod ad *F. vesiculosum* pertinet.) WULFEN, *Crypt. Aquat.* n. 14. *Fl. Monsp.* p. 458. *Fl. Germ.* III. p. 440.

F. angustifolius, *vesiculis longis siliquarum æmulis*. RAII *Syn.* p. 48. n. 38. MORIS. *Hist. Ox.* III. p. 647. n. 7.

Alga marina, *ramis plurimis, tenuibus, longis; vesiculis oblongis, siliquarum æmulis*. SEBA, *Thes.* III. p. 186. t. 98. n. 3.

β . *minor*;

F. siliquosus. β . *Syn. Fuc.* I. p. 61.

F. siliculosus. *Ner. Brit.* p. 42. t. 11. WITH. IV. p. 88.

γ . *denudatus*;

In the Northern and Atlantic Ocean.—Shores of the British Isles, in the greatest quantity.—In the Mediterranean and Adriatic. *Wulfen*.—At Newfoundland, and in the Chinese Ocean. *Banksian Herbarium*.—Canary Islands. *Bory de St. Vincent*.— β on the coast of Cornwall.—*Stackhouse*.— γ at Weymouth. *Mr. Bryer*.

Perennial. November—April.

ROOT, an expanded, orbicular, callous disk, black, woody, often an inch in diameter, always taking a conical form in old plants.

FRONDS, three or more from the same base, each rising with a single stem, from one to four feet long, compressed, about a line wide, everywhere linear, slightly flexuose, very smooth, sometimes undivided, but more frequently branched, constantly pinnated throughout its whole length with vesicles and fructification; branches scattered, far from numerous, distichous, between horizontal and patent, varying in length from three or four inches to a foot in different specimens, seldom again divided, exactly resembling the stem, except in their smaller size, and, like it, pinnated with receptacles and vesicles; vesicles placed along the sides of the stem and branches, distichous, alternate, patent, separated from each other by intervals of a few lines, between linear and lanceolate, looking like siliquæ, of different lengths in the same individual, so that some are not more than one inch while others are three inches long, from one to two lines wide, compressed, standing on short, narrow, compressed footstalks, and generally terminated with a flat beak three times shorter and narrower than themselves, externally marked by numerous transverse furrows, each about a line from the other, internally hollow, except that they are divided into joints by an equal number of dissepiments, and have a few, thin, whitish, parallel fibres, which rarely anastomose, running longitudinally through them; leaves seldom, if ever, to be seen, except in very young specimens, or immediately at the base of older ones, flat, linear, two inches or more long, scarcely a line wide, disposed in the same manner as the vesicles, and supported, like them, on short, narrow petioli, obtuse at their apices, entire at their margins, provided with a thin, blackish midrib, which is not observable unless held to the light, their surface mostly perforated with a profusion of minute, scattered, black pores, out of which, as far as I have seen, issue no clusters of fibres, as in *F. serratus*, and others:—the appearance of young specimens is widely different from that of older ones, the plant then consisting altogether of these leaves, which, as it advances in age, gradually swell into branches and vesicles: hence it appears that the fibres just mentioned as running longitudinally through the vesicles, are in reality the remains of the midrib of the leaves.

FRUCTIFICATION, always situated at the extremities of the stem and branches, consisting of receptacles, of which there are seldom more than five or six on any branch, of a form between linear and lanceolate,* compressed, scarcely an inch long, or a line wide, distichous, alternate, separated by small intervals, supported upon extremely short peduncles, externally even, although they are perforated all over with minute pores, under which lie imbedded spherical receptacles containing a mass of brown seeds, together with a profusion of white jointed fibres.

COLOR, olive-green, devoid of gloss, and perfectly opaque: turning to a deep black from exposure to the sun or drying, and never recovering by subsequent immersion.

SUBSTANCE, coriaceous, flexible and tough when fresh, but extremely brittle after it has been dried.

The variety β is a singular plant, not rising to the height of above six or nine inches, and having all its parts less by one half or more than those of the more common appearance of *F. siliquosus*: it produces its receptacles also more plentifully, and its vesicles much more rarely.

* Both the shape and the disposition of the receptacles is exactly like that of the vesicles, which they resemble also in their external appearance, except that they want the transverse furrows; nor is there any doubt but that, when they have discharged their seeds, they are turned themselves into vesicles: it is not uncommon to meet with them in *F. siliquosus* in this state of progression, similar to what has been figured under *F. torulosus*; but whether all the vesicles have previously been pods is a very different question, and, in my opinion, the nature of the plant forbids such a supposition. It is this resemblance between the receptacles and vesicles that caused the fruit of this *Fucus* to remain so long unknown.

The appearance of γ is considerably more remarkable than that of β , so that few botanists would at first sight think of referring it to this species: the only specimen I have seen of it is, apparently, the side-shoot of a larger plant, but extends above a foot in length, composed of a very narrow, compressed stem, and long, thin, flat leaves, without any appearance of their anywhere swelling into vesicles or pods: the width of the plant is scarcely half a line, and nearly the same in all its parts.

OBS. The frond is not unfrequently found covered with a dull, pale-green, slimy matter, peculiar, I believe, to this Fucus, which continues unchanged, even after it is dried, and alters its natural appearance:—in drying, it does not adhere at all to paper:—on the southern coast of England specimens of *Sertularia Pluma* are commonly met with on this plant:—*F. siliquosus* is seldom seen in so perfect a state, but that some of the vesicles or leaves have been broken off, the petioli of which, continuing, give the branches and stem the thorny appearance noticed by many writers.*

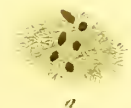
Upon the subject of a Fucus which has so long been known and so generally been understood as the present, it can be necessary to add but few words to the description already given; especially as the singular construction and appearance of the vesicles is a circumstance in itself sufficient to distinguish the species at all times from its congeners. These vesicles, from which the plant derives its highly appropriate name, are evidently intended, like those of *F. vesiculosus*, *F. natans*, and others, to preserve the frond in a state of buoyancy, and have no connection with the fructification, of which they were regarded as the seat by the botanists of former times, who, comparing them to the pods of beans, expected, from analogy, to find the seeds within them. There are few, if any, Fuci known to be more widely extended over the different waters of the earth than *F. siliquosus*, and very few are liable to less variation in point of appearance, or less affected by distant places of growth; so that the specimens preserved in the Banksian Herbarium, from Newfoundland and China, can only be known by their labels not to have been the productions of our own shores. Of the two varieties above mentioned, the first, from its diminutive size and †general want of vesicles, has been by Mr. Stackhouse regarded as a distinct species, and probably with reason; though I can at present discover no character that appears to authorize my following his example. It is, however, by no means the *F. siliculosus* of Linnæus, which Decandolle has referred to the present plant, but which is altogether ‡different, and unlike any other I ever saw. My other variety, I should have been tempted still to have considered a mere *lusus naturæ*, as I had previously done in the *Synopsis of the British Fuci*, but that, since the publication of that work, my lamented correspondent, Mr. Bryer, informed me he had often found the plant in a similar state on the beach at Weymouth; on which account I am led to look upon it as deserving of farther notice, and the more so, as that gentleman could scarcely be induced to believe I had done right in referring it to *F. siliquosus*. For the drawing here represented, I am happy to acknowledge my obligations to Sir Thomas Frankland.

- a, b. *F. siliquosus*, natural size.
 c. *young plant*.
 d. *section of a vesicle*, magnified - - - 6.
 e. *section of a receptacle*, magnified - - - 6.
 f. *part of the same* - - - - - 3.
 g. *seeds and fibres* - - - - - 1.

* Wulfen has laid such a stress upon this circumstance, which is certainly only accidental, that he makes it a part of the specific character that the stem is *alternatim breviter dentatus*, and he farther adds in his description, "*denticulis compressis, aculeorum more, sursum versus curvule acuminatis.*"

† They are certainly not *always* wanting, though apparently considered so in the *Nereis Britannica*, as I find some, though but few, and those few imperfect, in a specimen communicated to me by Mr. Stackhouse himself.

‡ Of this plant, I hope to be able to lay a figure before my readers previously to the close of my work, though the indifferent state of the specimens in the Linnæan Herbarium, the only ones I have yet seen, prevent my entertaining the expectation of giving a satisfactory one.



Fucus siliculosus.

Fucus, fronde membranaceâ, tenerimâ, costatâ, lineari, sub-dichotomâ; ramis alternatim pinnatis: tuberculis sphaericis, sessilibus, seminibusque nudis, sparsis, nunc ramorum apicibus, nunc processibus oblongis e costâ ortis insidentibus.

Fucus alatus, *Fl. Ang.* p. 578. GMELIN, *Hist. Fuc.* p. 187. t. 25. f. 1. LINN. *Mant.* p. 135. *Syst. Nat.* II. p. 718. *Syst. Nat. Ed. Gmel.* II. p. 1387. *Fl. Scot.* II. p. 951. WITH. IV. p. 95. *Fl. Dan.* t. 352. *Fl. Norv.* II. p. 91. Linn. *Trans.* III. p. 142. *Ner. Brit.* p. 79. t. 13. ESPER, *Ic. Fuc.* I. p. 20. t. 3. *Syn. Fuc.* I. p. 144. *Eng. Bot.* XXVI. t. 1837. *Fl. Fr. Ed. 2da.* II. p. 28.

Fucus dichotomus parvus costatus et membranaceus. RAII *Syn.* p. 44. n. 20.

F. purpureus tenuiter divisus non geniculatus. MORIS. *Hist. Plant. Ox.* III. p. 646. n. 15.

β . *dilatatus*; fronde latiore, marginibus undulatis.

F. alatus var. GMELIN. *Hist. Fuc.* t. 25. f. 3.

F. alatus β . *Syn. Fuc.* I. p. 145.

γ . *angustissimus*; fronde angustissimâ; nervo membranâ laterali ferè destituto.

F. alatus, junior. GMELIN, *Hist. Fuc.* t. 25. f. 2.

F. alatus γ . *Syn. Fuc.* I. p. 145.

HABITAT in Oceano Septentrionali. Koenig.—In Oceano Islandico, circa Besserstedt et Oerebacke. Oeder.—In Occidentalibus et Meridionalibus Angliæ et Hiberniæ littoribus, haud infrequens.—E mari, “Davis Streights” dicto, accepi.—Galliæ ad oras, prope Dieppam. Decandolle.—In Mari Finnarchico. Gunner.— β apud Weymouth.— γ apud Scarborough. D. Pitchford.—Apud Lossiemouth, in Scotiæ Septentrionalis oris orientalibus. D. Brodie.

Perennis. Jan.—Aug.

RADIX callus expansus, enormitèr discoideus, dilutè roseus.

FRONDES ex eadem basi plurimæ, quatuor sexve pollices longæ, e costâ constantes compressâ, basi pennæ passerinæ crassitie, sursum versus sensim attenuatâ atque angustatâ ideòque magis obsoletâ ut juxta apices propemodum evanescat; huic utrinque per totam longitudinem annectitur membrana tenuissima, linearis, lineam unam alteramve lata, frondem efficiens ubique alatum, nisi quòd juxta basin membrana vi fluctuum sæpiùs deperdita costam denudatam relinquat, quæ tunc teretiuscula fit, et stipitem simulat:—frons plerumque prope ortum bifurca, atque exinde sæpiùs divisa, ordine certo nullo, ramis nunc distichis, nunc dichotomis, interdum et trichotomis, his frequentibus, illis raris, longitudinis quoque incertissimæ, sed plerumque ita ut frondis expansæ peripheriæ latitudo longitudinem superet, semper quo magis ad apices accedis eo copiosioribus, atque ibi semper pinnatis serie minorum, distichorum, patentium, alternorum, decurrentium, quorum inter singulos intervallum duarum circitèr linearum interest; hi quoque non rarò simili sunt ratione pinnati, et aliquandò est cernere totam frondem juniorem sic pinnatam; rami summi sensim abbreviati; apices bifurci, segmentis erectis, lenitèr incurvis, obtusis, vix lineam longis, interdum ita brevibus ut apices rectiùs emarginatos diceret; margines frondis ubique plani atque integerrimi: ex utroque costæ latere emanant ejusdem ramusculi, qui venarum pellucidarum albarum series in *F. ruscifolio* conspicuas oculo inermi simulant, intervallis brevibus distincti, patentes, ad foliorum margines simplices et paralleli decurrentes.

FRUCTIFICATIO duplex, in diversis individuis; hæc e capsulis constans sessilibus, sphaericis, papaveris semine multoties minoribus, saturatè sanguineis, seminum minutissimorum congeriem foventibus; illa e seminibus sparsis, nudis, atro-rubentibus, sub lente in tres partes dehiscentibus;—uterque fructus nunc ipsis est impositus ramis, tubercula costæ prope frondis apices, semina nuda membranæ insidentia ipsos frondis ad apices in maculas parvas oblongas disposita, nunc in processibus cernitur exiguis, lanceolatis, e costâ enormitèr hic illic ortis, vix lineam longis, his solitariis, illis binis ternisque, atque, uti videtur, ad nullum alium finem a naturâ destinatis, quoniam, fructu evanescente, decidunt.

COLOR membranæ pulcherrimè saturatè roseus, diaphanus, per desiccationem intensior et sanguineus; costæ intensè coccineus, juxta basin non rarò nigricans, sed prope apices membranæ ferè concolor; totius stirpis marcescentis sordidè arenaceus aut virescens.

SUBSTANTIA in costâ cartilaginea, in membranâ tenuissima et tenerima.

Var. β crescendi modo prorsus cum α convenit, sed ramos habet duplo latiores, ut aliqui unguem ferè æquent; margines quoque minutè sunt undulati, et color sanguineus.

In var. γ omnia varietati præcedenti opposita: membrana frondis semper est angustissima et plerumque prorsus deest, aut per frustula modò sparsa hic illic conspicitur; costa solito crassior; altitudo interdum novem pollices superat: habitu ab α et β recedit.

OBS. Exsiccata chartæ adhæret.

F. Hypoglosso et *F. ruscifolio*, ipsis pulcherrimis, artissimè affinem sese jactat hæc perelegans Fuci species, quæ tamen ab utroque horum aded usque formâ crescendique modo abludit, ut verba tantum prodigeret quisquis ad dignoscendos plus quàm quod in caractere reperitur specifico proferret. Sicut in *F. sinuoso*, sic etiam in *F. alato*, costa, quantum vidi, nunquam prolifera occurrit; nisi quidem injuriâ aliquâ acceptâ, aut ubi processus suprâ memoratos emittit, qui, dum capsularum, ut illi *F. sinuosi*, vice funguntur, minimè, illorum instar, effecti in novos producuntur ramos. Semina nunc in capsulis inclusa, nunc nuda, et nunc ramis nunc his processibus imposita, causæ extitere ut hujus Fuci fructum trimorphum dixerit Stackhousius. In specierum facillimè dignoscendarum numero recensendus est *F. alatus*,

alatus, formâ habituque paullum ludens, varietatem nostram γ si excipias, quæ tantum ab usitatâ plantæ facie ludit, ut dubitaverint nonnulli annon rectius pro distinctâ sit habenda specie. Huic favet opinioni quod amicissimus Brodiaeus, qui copiosè nascentem legere solet, semper sui esse similem et paullum variare perhibeat. Nihilominus tamen, cum fructificatione gaudeat illius *F. alati* prorsus simili, cum texturam habeat eandem quam ejus costa, et cum utriusque rami sint eadem prorsus ratione dispositi, tali sententiæ assentiri non sum ausus. Hujus varietatis iconem exiguam, eandemque haud bonam, dat Gmelinus, qui ramos graciles e stirpis ætate tenerâ pendere credit; cui quidem opinioni repugnant statura solito major et fructificatio copiosa: neque magis videtur verisimile costam esse a casu vel injuriâ aliquâ denudatam; vix enim, si ita res esset, membranam tam perpetuâ, quasi ex arte, deperditam videremus, et ramorum summoperè luxuriantium vigor plantam illæsam denotat. Denique hic crescendi modus e borealibus quas colere amat orbis terrarum plagis non pendet; quoniam exemplaria ex Islandiâ reportata membranæ latitudine Cornubiensibus et Devoniensibus nostris non cedunt. Primo aspectu magis ad *F. glandulosum* aut *F. coccineum* quàm ad *F. alatum* pertinere hæc videtur varietas.

a.	<i>F. alatus</i> , magn. nat.				
b.	<i>frondis pars, cum seminibus sparsis in processibus oblongis</i> , magn. auct.	-	-	-	6.
c.	<i>unus e processibus seminiferis</i>	-	-	-	4.
d.	<i>semen</i>	-	-	-	1.
e.	<i>frondis pars, cum seminibus sparsis in ramorum apicibus</i>	-	-	-	6.
f.	<i>frondis pars, cum tuberculis in processibus oblongis</i>	-	-	-	6.
g.	<i>unus e processibus tuberculiferis</i>	-	-	-	4.
h.	<i>pars frondis var. β</i> , magn. nat.				
i.	<i>ejusdem pars</i> , magn. auct.	-	-	-	6.
k.	<i>pars frondis var. γ</i> , magn. nat.				
l.	<i>ejusdem pars</i> , magn. auct.	-	-	-	6.

160.—FUCUS ALATUS.

Fucus alatus, frond membranaceous, extremely tender, midribbed, linear, sub-dichotomous; the segments alternately pinnated; spherical sessile tubercles, and naked scattered seeds, both placed sometimes on the apices of the branches, and sometimes on oblong processes, originating from the midrib.

Fucus alatus. *Fl. Ang.* p. 578. GMELIN, *Hist. Fuc.* p. 187. t. 25. f. 1. LINN. *Mant.* p. 135. *Syst. Nat.* II. p. 718. *Syst. Nat. Ed. Gmel.* II. p. 1387. *Fl. Scot.* II. p. 951. WITH. IV. p. 95. *Fl. Dan.* t. 352. *Fl. Norv.* II. p. 91. *Linn. Trans.* III. p. 142. *Ner. Brit.* p. 79. t. 13. ESPER, *Ic. Fuc.* I. p. 20. t. 3. *Syn. Fuc.* I. p. 144. *Eng. Bot.* XXVI. t. 1837. *Fl. Fr. Ed. 2da.* II. p. 28.

Fucus dichotomus parvus costatus et membranaceus. RAII *Syn.* p. 44. n. 20.

F. purpureus tenuiter divisus non geniculatus. MORIS. *Hist. Plant. Ox.* III. p. 646. n. 15.

β . *dilatatus*; frond wide, undulated at the margins.

F. alatus. var. GMELIN, *Hist. Fuc.* t. 25. f. 3.

F. alatus. β . *Syn. Fuc.* I. p. 145.

γ . *angustissimus*; frond extremely narrow; midrib almost wholly destitute of the lateral membrane.

F. alatus, junior. GMELIN, *Hist. Fuc.* t. 25. f. 2.

F. alatus. γ . *Syn. Fuc.* I. p. 145.

In the Northern Ocean. Koenig.—On the coasts of Iceland, about Besserstedt and Oerebacke. Oeder.—On the Southern and Western shores of England and Ireland, not uncommon:—I have received it also from Davies' Streights.—Coast of France, at Dieppe. Decandolle.—In the sea about Finmark. Gunner.— β at Weymouth.— γ at Scarborough. Mr. Pitchford.—At Lossiemouth, on the North-east coast of Scotland. Mr. Brodie.

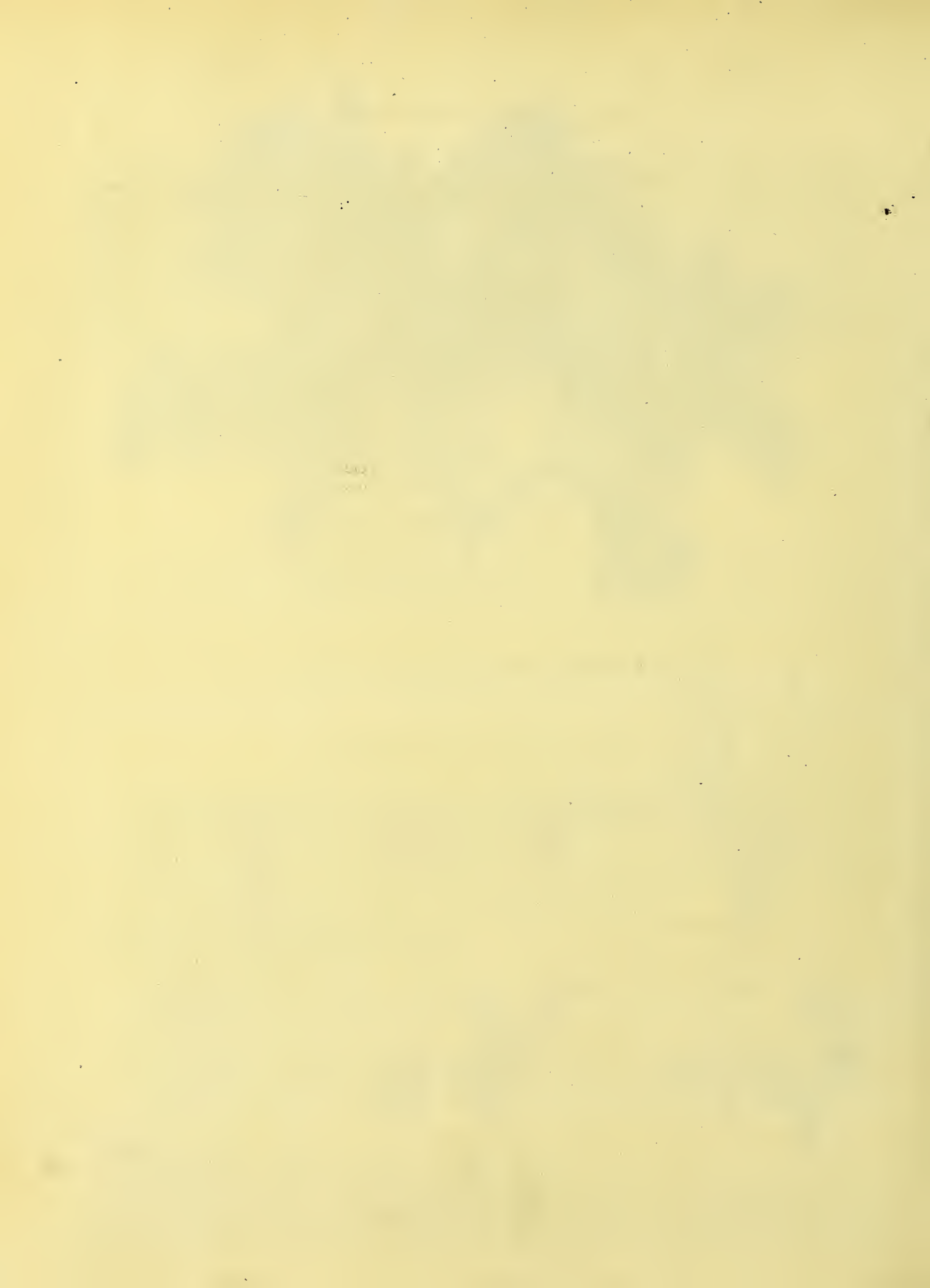
Perennial.—January—August.

ROOT, an expanded, irregularly formed callus, of a pale pink color.

FRONDS, numerous from the same base, from four to six inches long, composed of a compressed midrib, which is at the base as thick as a sparrow's quill, but as it rises grows more thin, and more narrow, till near the apices it is almost obsolete; to each side of this, throughout its whole length, is attached a linear membrane, one or two lines wide, thus constituting a frond everywhere winged, except that, towards the base, the membranous part is generally worn



Fucus alatus



worn away by the action of the waves, and the midrib, left naked, becomes sub-cylindrical, and has the appearance of a stipes:—the frond is most frequently forked near the base, and afterwards repeatedly divided without any certain order, the branches being sometimes distichous, and at other times dichotomous, or even trichotomous, numerous in some specimens, in others unfrequent; in point of length, also, they are very variable, but are mostly so long, that the width of an individual, fully expanded, is greater than its height; towards the summits of the frond they are always most abundant, and are there regularly pinnated with a series of smaller ones, which are distichous, patent, alternate, decurrent, and separated by intervals of about two lines; these, likewise, are sometimes pinnated in their turns in a similar manner, and occasionally, a whole plant may be seen thus branched in an early stage of its growth; the ramuli grow gradually shorter as they approach the top of the plant; the apices are forked, with erect, slightly incurved, obtuse segments, scarcely a line long, or in some instances so short that the apices might more properly be called emarginate; the margins of the frond are constantly flat and entire:—from both sides of the midrib spring ramifications of it, separated from each other by short intervals, and running in a patent direction, simple and unbranched, to the margin of the membrane: these to the naked eye look like the pellucid veins so remarkable in *F. ruscifolius*.

FRUCTIFICATION, of two kinds, placed on different individuals; *the one* consisting of sessile, spherical capsules, of a deep-red color, many times smaller than poppy-seed, and containing a mass of extremely minute seeds; *the other* of scattered, naked, dark-red seeds, appearing under the microscope composed of three parts:—both these kinds of fruit are sometimes situated upon the branches themselves, the tubercles solitary upon the midrib near the apex of the frond, the naked seeds upon the membrane at the very apices clustered into small oblong patches, and sometimes grow on minute, lanceolate processes, hardly a line long, which grow without order out of different parts of the midrib, some solitary, others two or three together, and are apparently designed by nature for no other purpose, as they fall off after the seeds are perfected.

COLOR, of the membrane, a most beautiful deep rose-red, transparent, turning darker and taking a blood-red tinge from drying; of the midrib a rich scarlet, not uncommonly almost black at the base, and towards the summits of the same color as the membrane: in decay the whole plant becomes of a dirty, sandy, or greenish color.

SUBSTANCE, cartilaginous in the midrib, extremely thin and tender in the membrane.

The variety β agrees entirely in its mode of growth with α , but has its branches twice as wide, and some of them almost half an inch in width: the margins, also, are minutely undulated, and the color is a blood-red.

The variety γ is completely the reverse of the foregoing one; the membranous part of the frond is always extremely narrow, and generally altogether wanting, or visible only here and there in small scattered fragments: the midrib is thicker than in the other varieties, and the habit unlike them: it sometimes rises to the height of more than nine inches.

OBS. In drying it adheres to paper.

The nearest affinities of this beautiful and elegant *Fucus* are *F. Hypoglossum* and *F. ruscifolius*, from both which it differs so essentially, and so obviously in its form and mode of growth, that there can be no necessity for pointing out more fully than is done in the specific characters the means of distinguishing them. It is remarkable that in *F. alatus*, as in *F. sinuosus*, the midrib appears never to be proliferous, except in case of injury, and in the instance of the processes that produce the fruit, which I have never seen, as in the latter species, lengthen into branches. The circumstance of the capsules and of the scattered seeds being found sometimes on these processes, and sometimes on the frond itself, has induced Mr. Stackhouse to call the fruit *trimorphous*. *F. alatus* seems to be a species always easily distinguished, and subject to but few variations in its form or mode of growth; indeed to none which materially disguise it, excepting only the var. γ above described, which is so widely dissimilar to the common appearance of the species, that many botanists have been induced to regard it as distinct; and it is far from certain that they are not right, though I can at present see no sufficient reason to induce me to accede to their opinion. This variety is found in great abundance by Mr. Brodie, who describes it as constant in its form and mode of growth. Its great size and abundant fructification forbid the supposition entertained by Gmelin of its being only in an early stage of its existence, while the vigor and luxuriance of its shoots render equally improbable any idea of the membrane having been carried away by injury; nor can its peculiar habit be ascribed to the northern latitudes it inhabits, as the Icelandic specimens, one of which is figured in the *Flora Danica*, have a membrane as broad as those found in Devonshire or Cornwall. This variety, at first sight, seems more allied to *F. glandulosus* or *F. coccineus* than to *F. alatus*.

- a. *F. alatus*, natural size.
- b. part of the frond, with scattered seeds on the oblong processes, magnified - - - - 6.
- c. one of the oblong processes - - - - 4.
- d. seed - - - - 1.
- e. part of the frond, with scattered seeds on the end of the branches - - - - 6.
- f. part of the frond, with tubercles on the oblong processes - - - - 6.
- g. one of the oblong processes - - - - 4.
- h. part of var. β , natural size.
- i. portion of the same, magnified - - - - 6.
- k. part of var. γ , natural size.
- l. portion of the same, magnified - - - - 6.

Fucus bulbosus, root hollow, swollen into a bulb, rough all over: stipes coriaceous flat, twisted once at its origin, its margins undulated in the lower part, its apex expanded into a single, cartilaginous, flat, nerveless leaf, entire at its margins, deeply cleft into numerous ensiform, mostly simple, segments: oblong seeds immersed in the margins of the stipes.

Fucus bulbosus. *Fl. Ang.* p. 579. *Linn. Trans.* III. p. 153. *Syn. Fuc.* II. p. 212. *ESPER, Ic. Fuc.* II. p. 24. t. 123. *Eng. Bot.* XXV. t. 1760.

F. polyschides. *Fl. Scot.* II. p. 936. *WITH.* IV. p. 97. *Ner. Brit.* p. 6. t. 4.

F. palmatus. *GMELIN, Hist. Fuc.* p. 202. t. 30. (excl. syn. plurimis.)

F. bifurcatus. *GUNNER, Fl. Norv.* I. p. 96.

F. bicornis. *GMELIN, Hist. Fuc.* p. 192.

F. arboreus, polyschides, caule plano, et tortuoso. *REAUMUR, in Act. Gall.* 1712. p. 21. t. 1. f. 1.

Ulva bulbosa. *Fl. Fr. Ed. 2da.* II. p. 16.

In the Northern Ocean and the Mediterranean. *Gmelin*.—On the Scotch coast, but not plentifully; at the Island of Iona. *Lightfoot*.—At Lossiemouth, on the North-east coast of Scotland. *Mr. Brodie*.—Shores of Cornwall, everywhere. *Hudson*.—Bantry Bay. *Miss Hutchins*.—Eastern coast of France. *Decandolle*.

Perennial.

ROOT, tuberiform, globular, or oblong, varying in size from that of a crow's egg to that of a child's head, or sometimes, according to Stackhouse, attaining to the size of a very large turnip, of a hard thick substance, blackish, internally hollow, externally thickly beset all over with flattish horizontal fibres, or papillæ of the same color as the root, from one to two lines long, and scarcely less wide, their apices slightly dilated, by means of which they adhere so firmly to the rocks, as often to defy the strength of a man to tear them up: these fibres also give the root a singularly echinated appearance.

FRONDS, generally solitary, but sometimes growing two or three together, rising with a flat *stipes* always once twisted immediately adjoining the root, but afterwards straight, from half a foot to a foot or more long, three or four inches wide at the base, and having its margins there remarkably undulated and fimbriated, but growing gradually more narrow and less undulated as it rises, till at its apices it is quite flat, and scarcely an inch in width: sometimes also it continues about this width, and perfectly linear for half its length; the fimbriated margins of the stipes, though thick and coriaceous, are of a different substance from the central part, and more thin; at its top the stipes expands suddenly into a single flat leaf, wholly destitute of veins or midrib, of an oblong or semicircular form, of various diameter from one to ten feet, cleft in a palmate manner into ensiform or acinaciform segments, of which the number differs in different specimens, some having not more than six, others twenty, of these some are simple, others again palmate, and others divided in an irregular manner, as if accidentally torn; the apices, too, are sometimes obtuse, and sometimes acute; the margins are always quite entire; the surface smooth and even:—the plant in its earliest stage of growth differs so materially from the appearance it has when full grown, that scarcely any botanist, who had seen only a single specimen of each, would regard them as the same; the stem of the young plant is narrow and linear, destitute of the fimbriated margin, but always at the distance of a few lines from the base dilated, and again suddenly narrowed, so as to look, when dry, as if it had there an umbrella-shaped process; the leaf is membranaceous; extremely thin, plentifully perforated all over with very minute pores, out of which issue pencils of whitish fibres; its shape is between linear and oblong, it is sometimes not cleft deeper than the middle, sometimes only bipartite, in one specimen communicated to me by Miss Hutchins, which is a foot and half long, is perfectly undivided.

FRUCTIFICATION, generally confined to the fimbriated margins of the frond, but sometimes occupying the whole stipes, or even spreading in broad irregular patches over the lower part of the leaf; the parts where it is situated generally swell to double their usual thickness, and undergo such a change that their whole surface is turned into a mass of * linear, or oblong, whitish, pellucid seeds, placed in a parallel and vertical direction, together with a profusion of white simple fibres, and not covered by any epidermis:—if the plant be kept any considerable time in fresh water, the seeds and fibres, which are formed into an uniform mass, and kept adhering to the frond by a colorless mucus, gradually roll back and peel off.

† COLOR, a deep olive-green, with a greater or less mixture of brown, opaque, glossy, as if varnished; blackish, when dry, and then devoid of gloss.

SUBSTANCE, thick, coriaceous in the root and stipes, cartilaginous in the leaf, everywhere tough and flexible.

Obs. In drying the whole plant becomes twisted and rigid, and by no means adheres to paper:—I received some time ago a specimen from Mrs. Griffiths, over the surface of which, both in the stem and leaf, were scattered warts of a similar appearance and nature to those observable in *F. subfuscus*, and other species.

The

* In the specimens examined both by Mr. Sowerby and myself, the appearance of these seeds has been uniform throughout; but Mr. Brodie, who has observed them recent, says, they are then always transparent at one end: he very aptly compares a section of the frond in fruit under the microscope to a section of a Syngnesious flower, with the seeds protruding from the receptacle among the bristly pappus.

† Mr. Brodie's observations upon the color of *F. bulbosus* in Scotch specimens, do not exactly accord with what I noticed in Cornwall: he says, "the color of the whole plant is light-brown, (no red in any part of it;) the furbelow somewhat darker, and its narrow welting round the edge a yellow white." The following remarks made by him on a number of fresh specimens for my use are too accurate not to be recorded: "the whole plant, when expanded, occupies nearly the whole of a circle of thirty-two inches diameter, from the centre of which, the leaves, as rays, extend themselves in about eighteen divisions: these are again divided and subdivided, so as to form about 60 acute endings at the disk, towards which they become gradually thinner in substance: the rays occupy the whole of the circumference, except about twenty-four inches at the bottom: the furbelows are from one and a half to two inches deep, gradually decreasing as they rise to within three inches of the centre.



Sargassum bulbosum

The size to which this *Fucus* not unfrequently attains is so immensely great, that it in this respect far exceeds any other species found upon the shores of the British Isles, and well deserves the names of *F. giganteus* and *F. arboreus*, which some earlier writers have bestowed upon it. The author of the *Nereis Britannica*, whose long residence upon the coast of Cornwall afforded him the most favourable opportunities of observing it, confirms the observation of Lightfoot, that it sometimes grows so large that a single specimen is a sufficient load for a man's shoulders, and adds, that it is of no small importance as an article of manure, and is both in Cornwall and the Scilly Isles burned into kelp. Whether Gmelin's remark, that the inhabitants of the Southern Ocean employ its leaves instead of paper to wrap their sugars in, is equally accurate, may, with justice, admit of some doubt; particularly as he does not say upon whose authority this assertion rests, and it is certain that a great part of the synonyms quoted by him belong to *F. palmatus*. The singularity of the root of *F. bulbosus*, the flatness of its stem, the twisted manner in which this stem rises, and its furlbeled margin are circumstances too characteristic of the plant to leave any doubt of its being perfectly distinct; although many modern authors, and all the older ones appeared to have confounded it with *F. digitatus*, which in other respects it closely resembles. The suggestion of some French naturalists, mentioned by Decandolle, whether it may not be really a monstrosity of the latter species, would not require to be noticed, were it not that the passing of it in silence might probably lead those who are unacquainted with the plants themselves to suppose it possible. No man who has once seen them will ever do so. I should wish to hint, for the observation of those botanists who live near the rocks on which *F. bulbosus* grows, whether the tubular radicles or fibres with which the bulbous base is beset do not in their use, as well as appearance, resemble what Pennant calls the tentacula of the *Asterias*, and enable it to fix itself in the same manner. Mr. Brodie once found a specimen, in which the bulb, independently of these, had thrown out a few, solid, palmated, root-like fibres, by means of which it had embraced *F. digitatus*, on which it grew. The fructification of this plant, after having long remained unknown, was detected by Mr. J. D. Sowerby, at the same time with that of *F. esculentus*, which it resembles, except in the presence of the fibres and different shape of the seeds. An opportunity of consulting Gunner's figure of his *F. bifurcatus* in the *Acta Nidrosensia*, subsequently to the publication of the *Synopsis of the British Fuci*, has convinced me of the accuracy of the suspicion there mentioned, that that plant is nothing more than the present in an early stage of growth; and I have also so little doubt of Gmelin's *F. bicornis* being the same, that I have ventured above to quote them both as synonyms.

- a. *F. bulbosus*, natural size.
 b. section of the frond, in fruit, magnified - 6.
 c. part of the same - - - - - 3.
 d. seeds and fibres - - - - - 1.

161.—FUCUS BULBOSUS.

Fucus, radice inflato-bulbosâ, exasperatâ: stipite coriaceo, plano, semel ad ortum torto, marginibus infernè undulatis, apice expanso in folium, unicum, cartilagineum, planum, enerve, integerrimum, in segmenta plurima ensiformia simpliciuscula profundè fissum: seminibus oblongis, stipitis in marginibus immersis.

Fucus bulbosus. Fl. Ang. p. 579. Linn. Trans. III. p. 153. Syn. Fuc. II. p. 212. ESPER, Ic. Fuc. II. p. 24. t. 123. Eng. Bot. XXV. t. 1760.

F. polyschides. Fl. Scot. II. p. 936. WITH. IV. p. 97. Ner. Brit. p. 6. t. 4.

F. palmatus. GMELIN, Hist. Fuc. p. 202. t. 30. (excl. syn. plurimis.)

F. bifurcatus. GUNNER, Fl. Norv. I. p. 96.

F. bicornis. GMELIN, Hist. Fuc. p. 192.

F. arboreus, polyschides, caule plano, et tortuoso. REAUMUR, in Act. Gall. 1712. p. 21. t. 1. f. 1.

Uva bulbosa. Fl. Fr. Ed. 2da. II. p. 16.

HABITAT in Oceano Septentrionali et Mediterraneo. Gmelin.—Scotiæ [ad oras, nec tamen copiosè; apud Insulam Ionam. Lightfoot.—In littore Cornubiensi, passim. Hudson.—Apud Lossiemouth, in Scotiâ Septentrionali. D. Brodie.—In sinu "Bantry-Bay." Dna Hutchins.—Galliæ ad oras oceano objectas. Decandolle.

Perennis.

RADIX tuberiformis, globosa, vel oblonga, magnitudine nunc ovi corvini, nunc infantis capitis, et nunc, teste Stackhousio, rapi maximi, nigricans, substantiæ duræ, crassæ, intùs cava, extrinsecùs ubique densè obsita fibris, seu papillis, horizontalibus, planiusculis, concoloribus, lineam unam alteramve longis, et vix minùs latis, apicibus lenitè dilatatis, per quos planta aded tenacissimè rupibus adhæret, ut sæpe hominis vires ad divellendam sint impares; hæc quoque fibræ radici dant faciem insignitè echinuatam.

FRONDES plerumque solitariae, rarius binæ, aut etiam ternæ, instructæ *stipite* plano, semper semel ad ipsum ortum torto, exinde recto, longitudine semipedali, pedali, et ultra, latitudine, quâ radici est proximus, tri-quadri-pollicari, marginibusque ibi insignitè undulatis fimbriatisque, mox sensim angustato et minùs undulato, donec ad apicem fit omninò planus et vix pollicem latus; interdum etiam ita per dimidiam ferè longitudinem ubique linearis cernitur; stipitis margines fimbriati substantiæ sunt ab eâ centri diversæ et tenuioris, sed hi quoque crassi atque coriacei; stipes ad apicem illicò explanatur in *folium* (*frondem*, si mavis, appelles) unicum, planum, nervi venarumque prorsùs expers, peripheriâ oblongum aut circuli dimidium exhibens, nunc unius nunc decem pedum diametro, ad ipsam ferè basin palmatim fissum in segmenta ensiformia, seu acinaciformia, quorum numerus in diversis exemplaribus a sex ad viginti variatur, hæc simplicia, illa iterum palmata, aut aliquandò vagè divisa, quasi casu laciniata, apicibus nunc obtusis, nunc acutis, marginibus semper integerrimis, superficie lævi, æquali:—planta junior ab adultâ adeo usque discrepat, ut nemo ferè, (unico modò utriusque exemplare viso) pro eâdem agnosceret; stipes tunc angustus atque linearis, margine fimbriato nullo, sed semper spatio aliquot linearum a basi dilatatus atque illicò rursus attenuatus, ut in exsiccata processu umbraculiformi instructus videatur; folium membranaceum, tenuissimum, poris minutissimis, e quibus fibrarum albicantium penicilli exeunt, copiosè pertusum, lineari-oblongum, interdum non profundius quàm ad medium fissum, interdum tantummodò bipartitum, et in uno exemplare a D^{na} Hutchins communicato, cujus longitudo sesquipedem æquat, prorsùs indivisum.

FRUCTIFICATIO plerumque in stipitis modò marginibus fimbriatis posita, sed interdum totum stipitem foliique basin occupans, qui tunc intumescunt et sunt solito ferè duplò crassiores, mutanturque ita ut superficies tota constet e seminibus *lineari-oblongis, albicantibus, pellucidis, parallelis, interjectis fibris copiosissimis, parallelis, verticalibus, albis, simplicibus, epidermide coopertis nullâ:—si stirps diutius æquo in aquâ dulci retineatur, semina et fibræ, quæ per viscum quandam concolorem frondi affixa adhærent et massam uniformem effingunt, sensim revoluta deglubuntur atque aufugiunt.

COLOR, intensè olivaceo-viridis, fusco plùs minùs immixtus, nitens quasi vernice obductus, opacus; *exsiccata* nigricans et nitoris expers.

SUBSTANTIA crassa, in radice et stipite coriacea, in folio cartilaginea, ubique lenta atque tenax.

OBS Per desiccationem tota planta tortuosa fit et rigida, et chartæ nequaquàm adhæret:—exemplar a D^{na} Griffiths olim accepi, stipitis foliique superficie sparsim obsità verrucis, quarum forma faciesque externa eas in *F. subfusco* Fucisque aliis observandas referebant, et quæ dissectæ ejusdem cum reliquâ fronde substantiæ videbantur.

In talem solet lic Fucus excrescere molem, qualis longè superat alios omnes nostrorum littorum incolas, efficitque ut bene mereat, quod a Botanicis quibusdam antiquioribus accepit, *F. arborei* vel *F. gigantei* nomen. De hoc testes habemus oculos *Flora Scotica Nereidisque Britannica* auctores, aded immensæ molis esse plantam ut quandoque vix humeris sustinenda sit, adjungitque Stackhousius in occidentali Angliæ parte, gratum opus agricolis, stercoris vice fungi, et in insulis Cassiteridum sal kali, *kelp* vulgo dictum, ex eodem confici. Eadem ferè habet Gmelinus, qui in super his adjungit, Oceani Meridionalis accolæ, uti foliis, quoniam substantiæ sunt lentæ et coriaceæ, loco chartæ, ad saccharum amicum. Cùm tamen ille silentio transeat cujus fide hoc memorat, forsitan, et quidem verisimillimè, est dictum de *F. palmato*, quem respiciunt plurima e synonymis ab ipso sub *F. bulboso* nostro citata, vel de *F. digitato*, quem cum eodem commiscet. *F. bulbosi* radix, dissimilis illi aliorum Fucorum et hujus modò propria, stipes planus, semel semper ad ortum et nunquam postea tortus, marginesque hujus stipitis fimbriati characteres speciei nimis certos nimisque manifestos suppeditant ut dubitet aliquis an revera a *F. digitato* discrepet, cujus est in cæteris simillimus, et quocum omnes antiqui et aliqui inter hodiernos botanicos conjunxerunt. Refert cl. Decandollius cujusdam suæ gentis sententiam, fieri posse ut *F. bulbosus* neque in specierum neque in varietatum numerum recipi debeat, et sit tantummodò lusus, quod aiunt, naturæ, ad *F. digitatum* reapse pertineus. Hanc ego sententiam, quantumvis a ratione abhorrentem, sub silentio prætermittere nolui, ne sint qui iconibus descriptionibusque nisi, plantis ipsis nunquam visis, fide aliquâ dignam crederent. Quærant velim botanici, littorum in quibus *F. bulbosus* nasci solet, incolæ, annon fibræ illæ tubulosæ, radicem bulbosam undique obsidentes, asteriarum tentacula, tam usu, quàm facie, referant, efficiantque ut stirps semet eadem ratione rupibus affigat. Reperit olim Brodiaeus exemplar, cujus bulbosus, præter hosce tubulos, radículas aliquot solidas palmatas emiserat, quas circum *F. digitatum*, cui est agnatus, arcè implicuerat. Diu incompertus latuit hujus speciei fructus, quem denique Dⁿⁱ J. D. Sowerbæi acumen detexit. Eodem ille tempore detexit *F. esculenti* fructificationem, similem illius *F. bulbosi*, nisi quòd fibris careat seminumque formâ aliquantum discrepet. Editâ jam *Fucorum Britannicorum Synopsi*, in quo suspicari me sum professus, *F. bifurcatum* Gunnerianum nihil esse aliud nisi *F. bulbosi* junioris exemplar, obtulit sese occasio videndi illius stirpis in *Actis Nidrosiensibus* iconem, quæ scrupulos omnes exemit; neque magis dubito quin sit idem *F. bicornis* Gmelini, quare utrumque pro synonymis indubiis suprâ citare sustinui.

- | | |
|----------------------------------------------------------|------------|
| a. <i>F. bulbosus</i> , magn. nat. | |
| b. <i>frondis fructiferæ dissectæ pars</i> , magn. auct. | 6. |
| c. <i>ejusdem portio</i> | - - - - 3. |
| d. <i>semina et fibræ</i> | - - - - 1. |

* Semina in exemplaribus a Sowerbæo et a me ipso illustratis faciem ubique uniformem obtulerunt; sed D. Brodiaeus, qui recentia microscopio subjecit, hinc pellucida, sicut illa *F. esculenti*, vidit. Idem aptissimè componit frondem fructiferam dissectam et lente auctam flori alicui e Classe Linnæanâ, Syngenesia, similiter secto, cujus semina inter pappum setaceum e receptaculo emicant.

Fucus, radice fibrosâ: stipite ligneo, terete, apice expanso in folium unicum, cartilagineum, planum, enerve, subrotundum, integerrimum, in segmenta plurima ensiformia simpliciuscula profundè fissum.

Fucus digitatus. LINN. *Mant.* p. 134. *Syst. Nat.* II. p. 718. *Syst. Nat. Ed. Gmel.* II. p. 1388. *Fl. Dan.* t. 392. *Fl. Ang.* p. 579. *Fl. Scot.* II. p. 935. WITH. IV. p. 98. *Linn. Trans.* III. p. 152. *Ner. Brit.* p. 5. t. 3. *Syn. Fuc.* II. p. 207. ESPEER, *Ic. Fuc.* I. p. 99. t. 48, 49. (excl. syn. Gmel. et Réaum.) ROTH. *Fl. Germ.* III. p. 447. *Fl. Lus.* II. p. 437.

F. hyperboreus. *Fl. Norv.* I. p. 34. t. 3.

F. arboreus polyschides edulis. RAII *Syn.* p. 46. n. 31.

F. maximus polyschides. PARKINSON, p. 1292. t. 5. f. 2.

Ulva digitata. *Fl. Fr. Ed. 2da.* II. p. 16.

HABITAT in Oceano Septentrionali, Sueciæ, Norvegiæ, Britanniarum, Lusitaniæ, et Galliæ ad oras.

Perennis.

RADIX callus conicus, subtùs cavus, divisus in fibras plurimas, bi- tri- pollicares, pennâ corvinâ crassiores, rigidas, nigricantes, lignosas, radiatim dispositas, multifidas, suprâ convexas, subtùs longitudinalitèr canaliculatas, ortu subhorizontales, mox deflexas, apicibusque incurvis aded tenacitèr saxa quibus innascuntur prehendentes, ut sæpe hominis vis ad divellendas impar deficiat.

FRONS solitaria, stipite assurgens pedali, vel bi- tri- pedali, aut etiam ultrâ, erecto, indiviso, solido, nunc pennæ anserinæ, nunc *baculi ambulatorii magnitudine, ubique filiformi, et paritèr ubique terete, nisi quòd ipsum sub apicem fiat compressus, ubi illicò sese expandit in folium unicum, planum, subrotundum, vel flabelliforme, nervi venarumque prorsùs expers, longitudine sæpe quatuor pedes, latitudine sæpe duos superans, ipsam ferè ad basin enormitèr fissum in lacinias plurimas ensiformes, has simplices, illas bifurcas, aut etiam semel iterùmve vagè dichotomas, quarum margines integerrimi, apices acuminati, sed rarò illæsi detegendi:—laciniarum numero mirè ludunt diversa hujus Fuci exemplaria; sunt enim cum viginti, sunt cum decem, et sunt tantummòdò cum duabus; neque minùs inter se discrepare solent harum laciniarum latitudo, in eodem individuo incerta, et nunc duos pollices nunc vix totidem lineas æquans; folii etiam basis formam ostendit in his lanceolatam, in illis reniformem, plerumque inter utramque ambigentem; occurruntque interdùm specimina vix infra medium fissa.

†Fructificatio hactenus latet.

COLOR junioris dilutè, adultæ intensè olivaceus, fusco plùs minùs tinctus, opacus, in folio nitens quasi vernice obductus; exsiccatæ fuscus, absquè nitore; soli diu objectæ albus.

SUBSTANTIA in stipite lignosa, in folio cartilaginea, lenta, et tenax.

OBS. Stipitem undique obsidere solet Fucorum minorum Confervarumque densa messis:—planta per desiccationem rigida et tortuosa evadit, chartæque non adhæret: stipes tunc longitudinalitèr fit sulcatus, neque unquam postea formam lævem teretem recuperat:—folium in aquâ dulsi immersum visci pellucidi plurimum effundit:—*Patella pellucida*, quod mirum, observante D^{na} Hutchins, non rarò sub hujus Fuci radice conicæ cavo sepulta reperitur, inde certè nunquam semet extricata.

Cùm *Fucorum Britannicorum Synopsis* ederem, dubitare me sum professus, rectiùsne pro unâ an pro duabus speciebus haberentur *F. digitatus* et *F. saccharinus*, pigetque admodùm fateri me nihil in præsens vidisse quod has dubitationes eximere valeat. Non me equidem fugit botanicum quemlibet, unico modò utriusque exemplare viso, statim pro distinctis prædicaturum, crediturumque nullo modo fieri posse ut hujus frons oblonga simplex in illius subrotundum multipartitum mutaretur. Quis autem, in Algis investigandis tantillùm versatus, nescit non esse per unum alterumve exemplar de Fucis dijudicandum? quod, si in aliis verum, in duobus quos nunc tractamus verissimum; quorum viderunt plurimi botanici, ad littora ubi hi Fuci reperiuntur commorati, specimina ita inter utrumque ambigentia, ut impossibile sit dictu utri rectiùs referentur. Radice, stipite, habitu, colore, structurâ, et facie hæc stirpes inter se consentiunt, dissimiles modò in formâ frondis, quæ etiam in primo ætatis stadio ambabus est eadem, ut nullum prorsùs per quod dignoscantur tunc intersit discrimen, quum *F. digitati*, non minùs quàm *F. saccharini*, folium oblongum est et simplex. Quin etiam, quum adoleverit ætas, non omnia *F. digitati* specimina formam speciei propriam paritèr citò induunt, sed aliqua in magnam molem immutata excrescunt; et quum tandem folium in segmenta finditur, ita enormitèr divisum plerumque conspicimus, ut potiùs casu laceratum quàm naturâ multipartitum videatur. Huic favent sententiæ laciniarum margines, attentius intuenti, inæquales et inconcinni. *F. digitati* fructificationem nemo lacteus vidit, et nemo, quod scio, frondem bullatam, sicut sæpe in *F. saccharino* accidere solet. Miror sanè, similitudine inter hos duos Fucos prætervisâ, tot botanicos *F. digitatum F. bulboso* conjungendum censuisse, quos distinctissimos tanta jam sub hoc memorata discrimina ostendunt, ut de hâc re ne dubitationis umbrula maneat.

VOL. III.

K

Commiscuit

* Negat optimus Rothius (*Fl. Germ.* III. p. 448.) caulem tantæ crassitiæ et magnitudinis unquam producere, at certè fallitur.

† Credunt Rothius Stackhousiusque se *F. digitati* fructum detexisse, sed utrumque in hoc falli suspicor. Rothius dicit, "*Fructificationes* in disco laciniarum substantiæ immersæ, plicis porisque mucifidis sese manifestantes." Stackhousius; "*Fructificatio* in vesiculis tenuibus continetur, quæ quidem variæ magnitudinis et formæ in foliorum superficie producentur; liquor intùs gelatinosus sine granulis conspicuis."—Adjungit mox idem, "the papillæ perforated at top are often discoverable in this species, and particularly after the seeds are shed, even in dry specimens; but the seeds are too minute to be observed, unless in the form of small blackish dust, under a high magnifier." Unam harrum papillarum ab ipso ad me benevolè missam hæc tabula exhibet, sed neque in hâc neque in specimine vesiculifero, quod etiam ab ipso accepi, aliquid fructûs simile detegere potius.

Commiscuit tamen ipse Gmelinus, qui alioquin stirpem tam vulgarem quam *F. digitatum* nunquam immemoratum prætermisisset; et ex eâdem radice ortos delineavit Parkinsonus. Certè sunt naturâ maximè affines, et affinis quoque est *F. digitatus* *F. radiato* et *F. buccinali*, ab hoc per stipitem solidum foliumque nequaquam pinnatum, ab illo per texturam crassam frondisque margines integerrimos facillimè dignoscendus. Accepi aliquot abhinc annis *F. digitati* exemplar, formâ insignitèr ab usitatâ abluens, cujus frons, quatuor licet pedes longitudine superet, haud duos est pollices lata, et profundissimè in segmenta tantummodò duo, linearia, sæpius dichotoma finditur. Vidi etiam aliquot specimina, quorum segmenta, cæteroquin libera, apicibus connexis coaluerant, atque illicò rursùs dilatata in novam sunt expansa frondem, inferiori similem, sed duplo crassiorem. Talis crescendi modus, uti satis est notum, *F. saccharini* est proprius, sed in *F. digitato* rarissimè, nisi fallor, occurrit. Unum hujus speciei individuum, quod Dⁿⁱ Bingham benevolentia debeo, stipitem habet juxta apicem bifurcum, utroque segmento folium digitatum ferente. In litoribus ubi hic Fucus abundat egregii est usus ad agros pinguefaciendos, aut ad salem alcalinum, *Kelp* dictum, conficiendum. Memorat etiam Gummerus, qui optimam ejus descriptionem tradidit, frondem et caules juniores coctos in Norlandiâ dari pecoribus; immò caulem coctum interdum, ut fertur, ab hominibus edi; caules siccatos, præsertim in Lofoten et Vesterdaalen, foco; putrefactos agris lætificandis, sicut apud nos, inservire: adjungit quoque, inter Lapponum esse superstitiones, Bacchantes caulibus loco fustium uti, et sagis, ut fabula habet, mari inequitantibus et algis undique vestitis, olim eosdem caules thyrsi loco inservire.

- a. *F. digitatus, exemplar pusillum, magn. nat.*
 b. *exemplaris, quale plerumque occurrit, stipes horizontaliter dissectus, magn. nat.*
 c. *ejusdem pars, magn. auct.* - - - - 5.
 d. *stipitis longitudinalitèr dissecti portio* - - - - 1.
 e. *frondis pars a Stackhousio missæ, cum tuberculis (fortuitis?)* - - - - 6.
 f. *unum e tuberculis* - - - - 3.

Fucus digitatus, root fibrous: stipes woody, cylindrical, expanded at its apex into a single, cartilaginous, flat, nerveless, roundish leaf, quite entire at its margins, deeply cleft into numerous, ensiform, mostly simple segments.

Fucus digitatus. LINN. *Mant.* p. 134. *Syst. Nat.* II. p. 718. *Syst. Nat. Ed. Gmel.* II. p. 1388. *Fl. Dan.* t. 392. *Fl. Ang.* p. 579. *Fl. Scot.* II. p. 935. WIRTH. IV. p. 98. *Linn. Trans.* III. p. 152. *Ner. Brit.* p. 5. t. 3. *Syn. Fuc.* II. p. 207. ESPER, *Ic. Fuc.* I. p. 99. t. 48, 49. (excl. syn. Gmel. et Réaum.) ROTH, *Fl. Germ.* III. p. 447. *Fl. Lus.* II. p. 437.

F. hyperboreus. *Fl. Norv.* I. p. 34. t. 3.

F. arboreus polyschides edulis. RAIH *Syn.* p. 46. n. 31.

F. maximus polyschides. PARKINSON, p. 1292. t. 5. f. 2.

Ulva digitata. *Fl. Fr. Ed. 2da.* II. p. 16.

In the northern ocean, on the coasts of Sweden, Norway, the British Isles and France:—also on the coast of Portugal. *Brotero*.

Perennial.

ROOT, conical, hollow beneath, divided into numerous, blackish, rigid, woody fibres, from two to three inches long, and thicker than a crow's quill, disposed in a radiated manner, multifid, convex in their upper and longitudinally channelled in their under surface, horizontal at their origin, afterwards bent downwards, and adhering so firmly to the rocks by their incurved apices, that the strength of a man is often insufficient to tear them up.

FROND, solitary, rising with a *stipes* from one to three feet, or even more long, erect, undivided, solid, varying in thickness from that of a swan's quill to that of a common walking stick,* of equal size throughout, and every where cylindrical, except that it becomes compressed immediately under its apex, where it suddenly expands into a single, roundish, or flabelliform *leaf*, wholly destitute of veins or midrib, often four feet long, and one or two wide, divided down to the very base into a number of ensiform laciniaë, some simple, others forked, or even once or twice irregularly dichotomous, all quite entire at their margins, and acuminate at their apices, where, however, they are seldom found uninjured:—different specimens vary extremely in the number of these laciniaë, some having as many as twenty, while others have not more than two, and the width of them is also most uncertain, as they may sometimes be found, even in the same individual, from two lines to as many inches wide: the form of the base of the leaf varies through every gradation from lanceolate to reniform; and specimens are occasionally met with, that are not divided lower down than the middle.

† **FRUCTIFICATION**, at present unknown.

COLOR, a pale olive-green in young specimens, but darker in old ones, more or less tinged with brown, opaque, glossy, as if varnished, in the leaf; brown, and destitute of gloss, when dry; turning to a horny white from long exposure to the sun.

SUBSTANCE,‡ of the stem woody, of the leaf cartilaginous, thick, tough, and flexible.

OBS. The stem of this plant is generally found covered with a profusion of the smaller *Fuci* and *Confervæ*: in drying it becomes longitudinally furrowed, and never afterwards recovers its smooth polished surface:—the plant, when dry, does not adhere in the least to paper:—on immersion in fresh water, the leaf discharges a quantity of pellucid slimy mucus:—Miss Hutchins has remarked that the delicate *Patella pellucida* is not unfrequently found buried under the cavity formed by the root of this *Fucus*, which seems impossible to have happened, unless the plant originally grew upon it.

In the *Synopsis of the British Fuci* I have expressed my doubts how far *F. digitatus* and *F. saccharinus* are really distinct, and I am sorry to say, that since that time I have never been able to satisfy myself upon the subject. I am aware that any botanist, viewing only single specimens of each, would be at no loss to pronounce them specifically different, and would say that the oblong undivided frond of the one could scarcely by any accident be changed into the roundish multipartite leaf of the other: yet it is nevertheless certain, that intermediate specimens are not uncommonly found, and that those naturalists, who reside near the places of growth of these plants, and have, consequently, the most favorable opportunities for examining them, feel themselves least able to decide the question. The root, the stem, the habit, the structure, the color, and the appearance of both are the same, and in their earliest stage the form also of the frond is similar, so that there seems no difference whatever between them; for *F. digitatus*, like *F. saccharinus*,

* Dr. Roth denies (in his *Flora Germanica*, III. p. 443.) that it ever attains to such a size, but he is certainly in error.

† Both Dr. Roth and Mr. Stackhouse describe the fruit of *F. digitatus*, but I cannot help doubting whether what either of them has taken for it, is true fructification: the former speaks of it, as immersed in the substance of the laciniaë, and shewing itself by plicæ and mucifluous pores; the latter says it consists of thin inflated pellicles of various forms, produced without order on the surface; but the mucus within has no apparent granules: he adds, in another place, "the papilla perforated at top are often discoverable in this species, and particularly after the seeds are shed, even in dry specimens; but the seeds are too minute to be observed, unless in the form of small blackish dust, under a high magnifier." *Ner. Brit. Pref.* p. 33.—Specimens, both of this bullated appearance, and with papillaë, Mr. Stackhouse was so good as to send me before the publication of the *Synopsis of the British Fuci*, where I have mentioned my inability to find seeds in them. Of the latter kind I have figured a small piece in this plate.

‡ The texture of the stem of *F. digitatus* is a curious microscopical object, and may possibly serve to throw some light upon the physiology of the *Fuci*; it is composed of longitudinal, parallel, jointed, colorless fibres, forming a very hard and solid mass, and disposed in concentric circles, but whether these mark the age of the specimen or not, I have no idea. Round the circumference is a narrow circle of a different color and substance, full of small, oblong, longitudinal cavities.

saccharinus, consists at that time only of a lanceolate, or oblong, simple, stipitate leaf. Even in more advanced specimens the difficulty of determining them is sometimes considerable; as *F. digitatus* does not change its form equally soon in every individual, and, though its leaf becomes gradually divided, the divisions are, as above mentioned, most irregular, and their edges, if examined carefully, are found to be so uneven, that they appear rather to have been torn by accident than to have been the effect of a natural separation. The fruit of *F. digitatus* has not yet been discovered, nor has the plant, I believe, ever been found with that bullated appearance that is often so remarkable in *F. saccharinus*. It is not a little extraordinary, that the possibility of these two species being the same should have been almost universally overlooked, and that so many botanists should have confounded *F. digitatus* and *F. bulbosus*, of the essential difference between which there is not the shadow of a doubt. Even Gmelin must have done so, or otherwise he would surely never have omitted so common a species as the present. Parkinson goes so far as to figure them both growing from the same root. *F. digitatus* is also nearly allied to *F. radiatus* and *F. buccinalis*, already figured in this work; but is immediately distinguishable from the former by its thick substance and entire margins, and from the latter, by its solid cylindrical stem, and by its leaf never affecting a pinnated mode of ramification. I received many years ago from Portsmouth a very remarkable specimen, the frond of which is of a linear form, and, though above four feet long, is only divided near the base into two equal, narrow, repeatedly dichotomous segments. I have also seen a few individuals with the segments connected together at the top, and then suddenly expanding into a new frond, similar in every respect to the one below it, except in being of a much thicker substance. This circumstance, which is also noticed by Gunner, I believe, is not common; but it tends most strongly to mark the affinity between *F. digitatus* and *F. saccharinus*, of which latter it is a striking character. In a single specimen, for which I am indebted to the kindness of Mr. Bingham, the stipes is forked near the apex, and each division produces a digitate leaf. This *Fucus* is commonly used in the manufacturing of kelp, and is also no inconsiderable article of manure on the coasts where it abounds; besides which, Bishop Gunner, who has given an excellent account of it, says, that in Nordland the stems and fronds of young specimens are boiled and given to cattle, and that the stem is sometimes, when boiled, eaten by men; that the dried stalks, in Lofoten and Vesteraalen, are employed as fuel; and are in a putrid state used, as in this island, to manure the fields.

- a. *F. digitatus*, a very small specimen, natural size.
- b. horizontal section of the stem of a common sized specimen.
- c. portion of the same, magnified - - - 5.
- d. part of the stem, cut longitudinally - - - 1.
- e. portion of a frond, from Mr. Stackhouse, with tubercles (accidental?) - - - 6.
- f. one of the tubercles - - - 3.



Fucus digitatus.

W. J. H. Esq. del.

Fucus, radice fibrosâ; fibris elongatis, ramosis: stipite sub-lignoso, terete, indiviso, apice expanso in folium unicum, cartilagineum, planum, simplex, enerve, lineari-oblongum, integerrimum: seminibus sparsis, folio innatis.

Fucus saccharinus. LINN. *Sp. Pl.* II. p. 1630. *Syst. Nat.* II. p. 718. *Fl. Lapp.* p. 364. *Fl. Suec.* p. 431. *Syst. Nat. Ed. Gmel.* II. p. 1389. GMELIN, *Hist. Fuc.* p. 194. t. 28. *Fl. Ang.* p. 578. *Fl. Scot.* II. p. 940. WITH. IV. p. 96. LINN. *Trans.* III. p. 151. *Syn. Fuc.* II. p. 198. *Fl. Lus.* II. p. 437. *Fl. Germ.* III. p. 446. *Fl. Norv.* I. p. 52. ESPER, *Ic. Fuc.* I. p. 52. t. 24. p. 112. t. 56. THUNBERG, *Fl. Jap.* p. 346.

Fucus longissimo latissimo crassoque folio. RAII *Syn.* p. 39. n. 1.

F. latissimo crassoque folio. MORIS. *Hist. Ox.* III. p. 646. n. 3.

β . *bullatus*; fronde bullatâ; marginibus undulatis.

F. saccharinus. β . LINN. *Trans.* III. p. 151. *Syn. Fuc.* II. p. 198.

F. saccharinus. *Fl. Dan.* t. 416. GMELIN, *Hist. Fuc.* t. 27. *Ner. Brit.* p. 31. t. 9. *Eng. Bot.* XX. t. 1376.

F. saccharinus. var. ESPER, *Ic. Fuc.* I. p. 113. t. 57.

F. latissimus et longissimus, oris crispis. RAII. *Syn.* p. 39. n. 1. MORIS. *Hist. Ox.* III. p. 646. n. 3.

F. folio singulari longissimo, in medio rugoso. MORIS. *Hist. Ox.* III. p. 646. n. 2.

F. folio singulari longissimo lato, in medio rugoso, qui batteiformis dici potest. RAII. *Syn.* p. 39. n. 1.

Ulva latissima. LINN. *Syst. Nat.* II. p. 719.

Ulva saccharina. *Fl. Fr. Ed. 2^{da}.* II. p. 15.

γ *acuminatus*; fronde oblongâ, sub-membranaceâ, acuminatâ.

F. saccharinus. γ . *Syn. Fuc.* II. p. 199.

Ulva longissima. *Fl. Norv.* II. p. 128. t. 7.

δ . *latissimus*; fronde latâ, sub-orbiculari.

F. saccharinus. δ . *Syn. Fuc.* II. p. 199.

Ulva maxima. *Fl. Norv.* II, p. 127. t. 7.

HABITAT α^* unâ cum β in Oceano Septentrionali et Atlantico, Sueciâ, Norvegiâ, Britanniarum et Galliâ ad oras.—Ad littora Oceani Iaponici, vulgaris. Thunberg.— γ passim in Mari Norvegico. Gunner.—Apud Dubrem. D. Dillwyn.— δ ubique ad oras pelagicas in Norvegiâ. Gunner.—Inter rejectamenta maris apud Yarmouth semel legit D. Mason.

Perennis.—Hyeme.

RADIX callus conicus, subtus cavus, basi divisus in fibras plurimas, pollicares, vel sesquipollicares, filiformes, pennæ corvinæ ferè crassitie, juniores flavicantes et molles, adultas nigras lignosasque, radiatim dispositas, multifidas, suprâ convexas, subtus longitudinalitèr canaliculatas, ortu sub-horizontales, mox deflexas, apicibusque incurvis, neque tamen idcirco explanatis, saxa aut alia, quibus innascuntur, corpora marina tenacissimè prehendentès.

FRONS † solitaria, stipite assurgens plerumque sub-spithamæo, sed sæpe pedali, et interdum sexpedali, erecto, indiviso, pennæ nunc corvinæ nunc olorinæ crassitie, ubique filiformi, et paritèr ubique terete, nisi quòd ipsum fiat sub apicem compressus, ubi subito sese expandit in folium unicum, planum, indivisum, ensiforme, lineare, vel ellipticum, nervi venarumque prorsus expers, cujus longitudo ab uno ad sex pedes, latitudo ab uno ad octo pollices ludit; folii basis ut plurimum levitèr cordata, sed aliquandò circuli majoris minorisve segmentum exhibet, aut etiam lanceolata conspicitur; apex, qui rarissimè illæsus occurrit, nunc acutiusculus, nunc rotundatus; margines nunquam non integerrimi, aliquantum tamen undulati, nec infrequentèr casu hic illuc erosi:—reperiuntur haud rarò exemplaria (quale icon nostra a delineatum exhibet) quorum folia ad minus majusve a basi intervallum ita contrahuntur ut pars inferior pyriformis evadat, superior verò in figuræ solitæ frondem producit, de quo subtus pluribus est disserendum.

FRUCTIFICATIO, folii in centro conspicienda, in maculas disponitur enormes, longitudinales, nunc unguem nunc pollicem latas, variè in his diffractas, in illis cursu continuo per totam porrectas frondem: folium hinc duplo crassius est, coloris fusci et opaci, extrinsecus visco sordidè viridi illitum, sin dissecti portio lenti subjiciatur tota superficies constare reperitur e seminibus minutissimis, oblongis, parallelis, fuscis, limbo nullo cinctis, intus punctatis, immixtis fibrarum tenuissimarum pallidiorum fasciculis.

COLOR folii intensè olivaceus, fusco perfusus, plùs minùs diaphanus, nitens, junioris lutescens; stipitis nunc lutescens, nunc intensè fuscus: *Soli diu objectæ* albescit.

SUBSTANTIA in stipite lignosa, in folio cartilaginea, lenta, et tenax.

Dignoscitur var. β per frondis margines insignitèr undulatos, ejusque centrum rugosum sinibus rotundiusculis plerumque totum folium a basi ad apicem percurrentibus, atque ita dispositis ut lineas duas effingant latiusculas paralelas, quas pars interposita angustas, costæ instar, sejungit; interdum autem in lineam omnes unam confluent; et aliquandò, sed rariùs, enormitèr sunt sparsi:—bullata hæc facies tam in primo quàm in ultimo frondis ætatis stadio conspicitur:—nunquam hanc varietatem fructiferam vidi.

Varietas γ in eo modò discrepat ab α quòd folium habeat acuminatum et propemodum mucronatum; neque magis equidem var. δ , cui folium suborbiculare, vel, ut rectiùs dicam, latè cuneiforme, apice rotundato.

Obs.

* Var α tantummodò in Angliâ littoribus quæ Orientem, β in ùs modò quæ Occidentem et Meridiem spectant, reperitur.

† Non raro accidit frondes quatuor quinque pluresve, radicibus invicem implexis, gregatim oriri, sed harum unaquæque revera solitaria suâ modò radice nititur.

Obs. Exsiccatas hic Fucus chartæ non adhæret; si quandò exsiccetur, curâ non antea satis idoneâ adhibitâ ut aquâ purâ expurgetur sal marinus, reperietur postea, quotiescunque humet aer, pulvere obductus tenuissimo albo, unde nomen; "certum est," ut bene dicit Gmelinus, "hunc pulverem non nisi salem marinum esse, in substantiâ Fuci efflorescentem, qui propterea levitèr gustatus dulcedinis sensum linguæ imprimit, quique purgantem effectum edit si Fuci ingesta copia nimia fuerit, sale tum fibras intestinales vellicante?"—in Australibus Angliæ Hiberniæque oris sæpe hujus Fuci folium latè perreperit *Flustra membranacea*.

Obitèr atque brevità jam suprâ in descriptione perstrinximus, quod sæpe reperitur, frondem hujus Fuci medio quasi arte constrictam, eo quidem modo ut folium e duâbus constare partibus videatur, quarum inferior nunquam non pyriformis evadit, substantiamque habet superiore tenuiorem. Hoc, quod quidem speciei est *hujus unius proprium, primùm fuit in *Fucorum Britannicorum Synopsi* memoratum, paucis tamen ibi verbis atque diffidentèr, uti de re novâ par erat, tractatum. Ne verò res observari dignissima, cujus simile nihil fuit antea inter Fucos repertum, Botanicorum incuriâ delitescere pergeret, diligentissimè in illam investigandam incubuerunt viri acutissimi, D. Borrer et D. Bingham, quorum observationes nos edocent Dillwynium rectè de hâc re conjectavisse, comprobantque talem crescendi modum ipsi speciei indoli esse insitum, eamque Fucum faciem quotannis necessariò induere; cùm planta perennis nihil præter stipitem immutatum servet, cujus ex apice novum singulis annis exoritur folium, quod sensim propellit vetustum officio jam functum, neque hoc citiùs decidit quàm illud in magnam excreverit molem, quum ætate imminutum atque confectum frustratim delabatur. Hinc fit ut discrepare videamus in diversis individuis, et e singulorum ætate pendeat, quantum a folii basi contractio distet; et hoc paritèr causæ extat quòd pars nunc inferior nunc superior major conspiciatur, et quòd illa semper tenuis viridis atque vegeta, hæc semper crassa sordidè fusca atque marcescens, ætatem primæ florentem alterius exoletam prodat. De causâ quæ frondi faciem dat bullatam, e quâ var. nostra β pendit, utinam quidem liceret paritèr audactèr loqui. Fieri prorsus nequit ut assentiret Gmelino Lightfootique sententiam suam ferentibus Fucum sic rugosum per fructificationem fieri; quod contra nunquam nisi planum seminiferum vidi. Prohibet quoque bullarum certa dispositio quominùs fortuitas crederes, diversissimæque sunt ab illis tumoribus factis ab aere intra duas e quibus frons constat laminis admissio. Quidnam igitur de his sentiendum? †Varietates quæ suprâ describuntur tertiam et quartam casu modò ortas credo, fronde forsàn læsâ, neque pro distinctis enumerare operæ pretium duxissem, nisi utriusque iconem descriptionemque dedisset in *Florâ Norvegicâ* Gunnerus. Quòd in *F. saccharini* synonymorum numerum *Ulvam latissimam* reciperem suasit Herbarii Linnæani auctoritas, in quo pro vero *F. saccharino* servatur, nisi fallor, nihil aliud nisi frustulum unius segmentorum *F. digitati* frondis. Characteres specifici, si quidem revera specifici, qui Fucum hîc depictum a *F. digitato* et *F. Phyllitide* distinguunt, sub iis memorati inveniuntur plantis; satis hîc de stirpe quam tractamus loqui, de quâ multa jam restant dicenda. Gmelinus imprimis, Andersono auctore fretus, refert ab Islandis sequentem in modum usurpari. "Coqui in lacte, pultriculam inde confici, cochleari sorbendam. Vel et aquâ fontanâ imbui, loco arido et aprico exponi, ut sole induretur, arefactum vasis ligneis optimè condi, tum aliquo tempore interjecto album colorem acquirere, dulcedinemque habere saccharo non inferiorem, comedere quoque eam Islandi cum Butyro. Idem mox, referente Pallasio, pergit; "certum est incolas in Angliâ ad maris littora habitantes fucum hunc oleris ad instar coquere et comedere, bono cum successu." Porro ‡Thunbergius certiores nos facit, totum haberi inter Japonicos post præparationem esculentum, coriaceæ licet substantiæ; et dum munera hîc offeruntur laminam quandam hujus Fuci chartæ agglutinari illi, quæ singulari modo replicata et filis argento auroque obductis circumligata muneribus super imponitur." Suspiciatur acutissimus nostras || Barrovius hoc ita fieri, ut pateat quanto in honore hæc planta inter Japonicos habeatur; eo forsàn animo quia cujusvis menti adesse volunt quot qualia et quanta beneficia mare gentibus offert, quot thesauros illis pandit, qui in ipso scrutando diligentèr incumbunt. Idem etiam verisimile credit, jus gelatum inter Sinenses in deliciis habitum et *Chinchou* nomine appellatum ex hoc quadantenus Fucò confici. Nemo autem, quod scio, inter auctores tantam *F. saccharino* conciliavit gloriam quantam §D. Broughtonus, navis cuiusdam bellicæ Britannicæ præfectus, qui illum tan magni esse in Japoniâ momenti refert, ut nemini postea decantare liceat famosum illud "projectâ vilior algâ." Vidit hic, cùm prope Eudermo navigaret, incolas semper in hoc Fucò legendo occupatos, quem postea Soli objectum ut bene siccat, et in fasciculis collectum transvehunt. Plurimas ille vidit naves hoc onustas, quæ a sinu "Volcano" dictis per fretum Matymai ad insulam Niphon velificarent, commercia non parva facientes. "*F. saccharinus*" testè Gunnero, "pabulum est pecoris consuetum in Finmarchiâ, Norlandiâ, et alibi in maritimis;" habetque Anderson, "tam recentem jumentis pabulum præbere quàm siccatam fœni annonam; carnem verò pinguem inde fieri, sed nauseosam." In Scotiâ cum aliis Fucis sali alcalino *kelp* dicto conficiendo inservit.

a, a.	<i>F. saccharinus</i> , magn. nat.			
b.	frondis fructiferæ pars, magn. auct.	£	-	6.
c.	ejusdem pars	-	-	4.
d.	eadem dissecta	-	-	3.
e.	ejusdem pars	-	-	1.
f.	planta junior, magn. nat.			

* Anne hoc rectè dictum? simile certè aliquid est jam in hoc opere sub *F. Agaro* animadvertum, II, p. 10.

† Aliam etiam varietatem his longè magis memorabilem, cui frons spiralitèr torta, Islandiæ ad littora copiosè legit D. Hooker, de quâ nihil est ut dicam, cùm exemplaria nulla viderim.

‡ Flora Japonica, p. 346.

|| Barrow's Voyage to Cochinchina, p. 313.

§ Voyage of Discovery to the North Pacific Ocean, p. 272.

Fucus saccharinus, root fibrous; fibres long, and branching: stipes almost woody, cylindrical, undivided, expanding at its apex into a single, cartilaginous, flat, simple, linear-oblong, nerveless leaf, entire at its margins: scattered seeds immersed in the leaf.

Fucus saccharinus. LINN. *Sp. Pl.* II. p. 1630. *Syst. Nat.* II. p. 718. *Fl. Lapp.* p. 364. *Fl. Suec.* p. 431. *Syst. Nat. Ed. Gmel.* II. p. 1389. GMELIN, *Hist. Fuc.* p. 194. t. 28. *Fl. Ang.* p. 578. *Fl. Scot.* II. p. 940. WITH. IV. p. 96. *Linn. Trans.* III. p. 151. *Syn. Fuc.* II. p. 198. *Fl. Lus.* II. p. 437. *Fl. Germ.* III. p. 446. *Fl. Norv.* I. p. 52. ESPER, *Ic. Fuc.* I. p. 52. t. 24. p. 112. t. 56. THUNBERG, *Fl. Jap.* p. 346.

Fucus longissimo latissimo crassoque folio. RAII *Syn.* p. 39. n. 1.

F. latissimo crassoque folio. MORIS. *Hist. Ox.* p. 646. n. 3.

β . *bullatus*; frond bullated in the centre; margins undulated.

F. saccharinus. β . *Linn. Trans.* III. p. 151. *Syn. Fuc.* II. p. 198.

F. saccharinus. *Fl. Dan.* t. 416. GMELIN. *Hist. Fuc.* t. 27. *Ner. Brit.* p. 31. t. 9. *Eng. Bot.* XX. t. 1376.

F. saccharinus. var. ESPER, *Ic. Fuc.* I. p. 113. t. 57.

F. latissimus et longissimus, oris crispis. RAII *Syn.* p. 39. n. 1. MORIS. *Hist. Ox.* III. p. 646. n. 3.

F. folio singulari longissimo lato, in medio rugoso, qui balteiformis dici potest. RAII *Syn.* p. 39. n. 1.

Ulva latissima. LINN. *Syst. Nat.* II. p. 719.

Ulva saccharina. *Fl. Fr. Ed. 2da.* II. p. 15.

γ . *acuminatus*; frond oblong, thin and almost membranous, acuminate.

F. saccharinus. γ . *Syn. Fuc.* II. p. 199.

Ulva longissima. *Fl. Norv.* II. p. 128. t. 7.

δ . *latissimus*; frond wide, nearly orbicular.

F. saccharinus. δ . *Syn. Fuc.* II. p. 199.

Ulva maxima. *Fl. Norv.* II. p. 127. t. 7.

Both α^* and β are found abundantly in the Northern and Atlantic Oceans, on the coasts of Sweden, Norway, the British Isles and France.—Shores of Iceland, where they reach an immense size. *Mr. Hooker*.—Common on the coast of Japan. *Thunberg*.— γ and δ every where in the sea about Norway. *Gunner*.— γ at Dover. *Mr. Dillwyn*.— δ once gathered among the rejectamenta of the sea at Yarmouth by *Mr. Mason*.

Perennial.—Winter.

ROOT, conical, hollow, divided at its base into numerous fibres, from an inch to an inch and half long, filiform, almost as thick as a crow's quill, in their younger state yellowish and pulpy, but when full-grown black and woody, disposed in a radiated direction, multifid, convex above, beneath longitudinally grooved, at first horizontal, but soon bending downwards, and afterwards attaching themselves to the rocks or other marine bodies they grow upon by their incurved apices, which, however, are not on that account dilated.

FROND, solitary,† rising with a *stipes*, which, though mostly not more than a span long, sometimes extends to the length of one or even of six feet; it is erect, undivided, of various thickness, from that of a crow's to that of a swan's quill, every where filiform, and equally every where cylindrical, except that it becomes compressed at the very apex, where it suddenly expands into a single, flat, undivided, ensiform, linear, or elliptical *leaf*, quite destitute of midrib or veins, uncertain in its length from one to six feet, and in its width from one to eight inches; the base is in general slightly cordate, but sometimes is the segment of a greater or smaller circle, or even is lanceolate; the apex, which is very seldom found uninjured, is, in different specimens, either sharpish or somewhat rounded; the margins are naturally quite entire, though slightly undulated, and not unusually here and there accidentally torn or eaten by insects: specimens are commonly met with, (one of which is represented in the present plate at *a*) which at a greater or smaller distance from the base are contracted in such a manner, that the lower part is pyriform, but the upper lengthens into a frond of the common shape: upon this subject more will be said in the observations on the species.

FRUCTIFICATION, observable in the centre of the leaf, where it takes the form of irregular spots, from half an inch to an inch wide, and of various length, sometimes extending uninterruptedly throughout the whole of the frond, and at other times broken without order: the frond is in these places twice as thick as usual, of an opaque brown color, appearing to the naked eye externally covered with a dull greenish slime, but, if a section be placed under the microscope, the whole surface is found to consist of extremely minute, oblong, parallel, brown seeds, destitute of any limbus, dotted internally, mixed with a profusion of very thin pale fibres.

COLOR, of the *leaf* a deep olive green with more or less of a tinge of brown, semitransparent, and glossy, yellowish in its first state; of the *stipes* either yellowish or deep brown; from long exposure to the sun the whole turns white.

SUBSTANCE, woody in the stipes, in the leaf cartilaginous, and flexible, but tough.

The variety β is distinguished by having the margins of its frond remarkably undulated, and the centre wrinkled into roundish sinuses, which generally run longitudinally from base to summit in two widish parallel lines, leaving a narrow part

* The variety α seems to be peculiar to the Eastern, and β to the Western and Southern shores of England.

† It often happens that four, five, or even more fronds grow clustered together, but this is merely from the roots being entangled, each of them being really distinct from the others.

part between them, like a midrib, but sometimes form only one line, and sometimes are scattered without regularity: this bullated appearance is visible in the earliest stage of the plant, and continues so as long as it exists:—I have never seen this variety in fruit.

γ Differs only in its leaf being acuminate and almost mucronated.

δ Has a leaf nearly orbicular, or rather widely cuneiform, with a rounded apex.

Obs. When dried, it does not adhere to paper; if dried without being sufficiently washed, it will be found subsequently covered with a whitish efflorescence, which is, in appearance, similar to sugar, and leaves upon the palate, if slightly applied, a sweetish taste, but is at the same time, as Gmelin has remarked, nothing more than salt, and if taken in too great a quantity, has the effect of irritating the bowels: hence the name of the plant:—on the southern shores of England and Ireland *Flustra membranacea* is found in large patches upon the leaf of this Fucus, and sometimes almost covers it.

The most * extraordinary circumstance attendant upon this Fucus is the contraction often visible in the frond, as already mentioned in the description, and the consequent division of the leaf into two parts of different substance, the lower of which has a pyriform outline. This, which was first noticed in the *Synopsis of the British Fuci*, had at the time of the publication of that work been only so recently observed, that very little could then be said upon the subject; but it has since been attended to with the care it deserved at Brighton by Mr. Borrer, and still more particularly at Dover by Mr. Bingham† of Uxbridge, whose accurate observations, coinciding greatly with those of Mr. Dillwyn, place it beyond a doubt that the contraction is the natural effect of the growth of the plant, and necessarily takes place every year; the stem alone remaining unaltered, and throwing out a new leaf, which gradually pushes forward the old one, increasing in size as the latter wears away. Hence it happens that the distance of the contraction from the base, and, consequently, the relative proportion of the upper and lower parts, are variable in different individuals, or, rather, are regulated by the time of year at which the plant is found; and that the part below the contraction is constantly young, and vigorous, and much more thin than that above, which as constantly shews every mark of approaching decay. The bullated appearance of the frond, upon which depends my second variety, is another peculiarity of *F. saccharinus*, and is not easily accounted for. Both Gmelin and Lightfoot have been inclined to regard this as the fructified appearance of the plant, in which I am convinced they are mistaken; as I never saw fruit on any specimens whatever thus wrinkled, but, on the contrary, have always found the seeds on those which were quite flat. The sinuses are too regular to be the effect of accident, and have nothing in common with the occasional blisters in the frond caused by the admission of air between the coats of which it is composed. ‡ The third and fourth varieties I regard as so entirely accidental, that I should scarcely have noticed them, but for the sake of referring to Bishop Gunner's figures in the *Flora Norvegica*, which represent them. It is upon the authority of the Linnæan Herbarium that I have above quoted *Ulva latissima* as a synonym, the specimen there preserved under that name being the bullated variety of *F. saccharinus*; while, as the genuine *F. saccharinus*, Linnæus had kept only what appears to be a portion of a segment of *F. digitatus*. Upon the characters that distinguish this plant from *F. digitatus* and *F. Phyllitis*, to which it is most nearly allied, remarks will be found under those species. With regard to

* Something similar has already been observed under *F. Agarum* in this work. II. p. 10.

† The following remarks with which Mr. Bingham favored me on the subject are so interesting and curious, that I trust no apology is necessary for introducing them at length:

“The common form of *F. saccharinus* obtains in all plants during the first year of their growth till the middle of November, at which time a pyriform contraction is discoverable at the base of every leaf. The young seedlings partake of this change equally with the older plants, except that in them it begins rather later, but in all before the end of December.

“From this time the former frond (which I call the primary one) ceases to grow or increase, while a new, or secondary frond gradually usurps its place, and may be traced week after week till May or June, when, having attained its full size, the whole plant loosens from its attachment, and comes ashore or is carried out to sea. It is now met with in great abundance.

“Plants not having this appendage, but answering to the common specific character, are occasionally met with in the autumnal months, which from their thick coriaceous texture and ragged extremities would appear to have contended with the waves more than one season, but this I am of opinion is not the case; because in the winter and early spring I never could meet with any plants, except seedlings of Jan. Feb. and March, which had not the contracted frond. Many secondary fronds are to be met with in June, July, and August, the produce of late seedlings of the former year, which, having had their terminal leaf torn away, might at first view be mistaken for primary plants, but upon examination, the point of the frond instead of being ensiform terminates abruptly, and is lacerated. This circumstance alone would not be sufficient to distinguish them, but by attention to the following marks, the primary and secondary fronds may at any period of their growth be distinguished with certainty, and I never had any reason to believe that secondary fronds could retain their situation and assume the characters which I think exclusively belong to primary ones.

“The length of a primary frond without the footstalk rarely exceeds two feet and a half, and its breadth is seldom so much as four inches; whereas the secondary frond is often four feet long exclusive of the footstalk, and seldom (when this length) so narrow as four inches, more generally five, and bears at the extremity the old frond about a foot long in a state of decay.

“The secondary frond is always much thinner than a primary one of the same size, and always somewhat thinner than its own primary frond. The length and breadth of a secondary frond are always in proportion to that of its primary:—thus a seedling of six inches long shall have a secondary frond of two feet:—the full grown specimen has been already described.

“The sinuses or wrinkles are not so strongly marked on the secondary frond, and I never saw it in fructification.

“The margins of secondary fronds, instead of being broken or ill-defined, are always very entire and waved like a ruffle, so as to form plaits or folds when pressed, and remarkably express the idea of newness. They are particularly smooth and transparent compared with any specimens of primary fronds.

“The only conjecture I have formed on the use of the secondary frond is that it is designed to give the plant buoyancy, by presenting a larger surface to the water, without proportionably adding to its weight, and so to assist its dispersion at the season most favourable to propagation, or to supply food to distant tribes of fishes. As *F. digitatus* (which I look upon as a variety of *saccharinus*) never fructifies, it has no need of the secondary frond.

“Nothing is wanting to prove them varieties of each other, but finding digitations and wrinkles on the same plant.”

‡ Mr. Hooker found upon the coast of Iceland another and much more remarkable variety, not uncommon, with a spirally twisted frond: upon this, however, I am able to say nothing, never having seen a specimen of it.



Fucus saccharinus.

J. H. Esq. del.

to the uses of *F. saccharinus*, Gmelin informs us, on the authority of Anderson, that the natives of Iceland boil it in milk into a kind of pottage, which they eat with a spoon; or steep it in fresh water for some time, after which they expose it to be dried and hardened in the sun, and, when this is sufficiently the case, put it up in wooden vessels, in which, after a certain period, it acquires a white color, and a sweetness not inferior to sugar, when they eat it with butter. He farther adds, from the information of Pallas, that in some parts of the coast of England it is cooked and eaten for a pot-herb. Thunberg* informs us that it is in Japan prepared in such a manner as to be quite esculent, and that it is customary there, when presents are made, to lay upon them a slice of this Fucus, attached to a piece of paper folded in a curious manner, and tied with threads of gold and silver. "This," Barrow† conjectures, "may possibly have been intended to shew in how high estimation this plant is held, being considered, perhaps, as the representative of those resources of sustenance which the sea so amply supplies to such nations as from choice or necessity may be led to avail themselves of its various productions." The same author gives it as his opinion that the *Chinchou* jelly of China may probably be made in part of *F. saccharinus*. No one, however, represents this plant of so much consequence as Captain Broughton,‡ who, speaking of the people about Endermo, says that he always found those who lived on the opposite side of the Isthmus open to the sea collecting *F. saccharinus*, which they dried in the sun, and made up into bundles for exportation; and that a considerable trade was carried on in this weed from Volcano Bay to Matzmai, whence it is exported to Nipon. He even mentions having seen several ships loaded with it. In Norway, according to Gunner, it is a considerable article of food to cattle; and the same in Iceland, according to Anderson, who says it is there also dried like hay, in which state it soon fattens, but renders the flesh unpleasant. In Scotland it is employed with other Fuci in the manufacture of kelp.

- a, a. *F. saccharinus*, natural size.
 b. *portion of the frond in fruit*, magnified - 6.
 c. *part of the same* - - - - 4.
 d. *section of the same* - - - - 3.
 e. *part of the same* - - - - 1.
 f. *young plant*, natural size.

* *Fl. Japan.* p. 346.

† *Voyage to Cochinchina*, p. 313.

‡ *Voyage of Discovery to the North Pacific Ocean*, p. 272.

164.—FUCUS PHYLLITIS.

Fucus, radice fibrosâ; fibris abbreviatis, simpliciusculis: stipite cartilagineo, compresso, lineari, indiviso, apice expanso in folium unicum, membranaceum, tenerrimum, simplex, planum, enerve, lineari-lanceolatum, utrinque acuminatum, integerrimum.

Fucus phyllitis. *Ner. Brit.* p. 33. t. 9. WITH. IV. p. 100. *Syn. Fuc.* II. p. 193. *Eng. Bot.* XIX. t. 1331. *ESPER, Ic. Fuc.* II. p. 81. t. 149.

F. saccharinus. *β. Fl. Scot.* p. 941?

F. phyllitidis folio. *RAII Syn.* p. 40?

F. longissimo latissimo tenuique folio. *RAII Syn.* p. 40. n. 2?

Ulva phyllitis. *Fl. Fr. Ed. 2da.* II. p. 15.

HABITAT in Britanniarum oris, Fucus majoribus plerumque innascens, haud ita frequens.—Apud Sidmouth in Devonâ. *Dna. Griffiths.*—Apud Larne juxta Belfast. *D. Templeton.*—In sinu, Bantry Bay. *Dna. Hutchins.*—Inter rejectamenta maris apud Yarmouth rarissimè legi.—In Oceano Gallix oras alluente. *Decandolle.*—In *F. vesiculosus* circa Gades. *Clemente.*

Annua?

RADIX fibrosa, fibris quatuor vel quinque crassiusculis, succosis, cylindræcis, divaricatis, simplicibus bifurcivæ, vix lineam longis, frondi concoloribus.

FRONDES ex eâdem basi plurimæ, singulæ *stipite* instructæ unguiculari, pennæ passerinæ crassitie, basin versus teretiusculo, exinde sensim magis magisque compresso, in quibusdam etiam ab ipso ortu compresso, apice plano, seque sensim dilatante in *folium* unicum, planum, simplex, lanceolatum, vel lineari lanceolatum, utrinque nunquam non insignitè et pariter attenuatum, ut in petiolum decurrere jure optimo dicatur, longitudine pedali et ultrâ, latitudine ab unguiculari ad pollicarem incertâ, nervi venarumque prorsus expers, marginè integerrimum, sed pulcherrimè, quamvis minutè, undulatum, et quandoque crispatum:—frondis vetustioris in centro conspiciuntur interdum vestigia ejusdem crescendi modi bullati atque rugulosi, quo *F. saccharini* var. *β* nititur.

FRUCTIFICATIO hactenus latet.

COLOR *folii* in plantâ recente intensè flavus fuscédine perfusus, qualis ille *F. ligulati* vel *F. viridis*, qui, simul atque stirps aquæ immergitur dulci, in amœnè dilutè luteo-virescentem transit, semper diaphanus et nitidus; *exciccata* magis adhuc virescit, et *Soli diu objectæ* fit albida; *stipitis* color magis ad fuscum accedit, et est minùs diaphanus, sed hoc in diversis exemplaribus diversum.

SUBSTANTIA, quæ *folii* membranacea tenerima et tenuissima, *stipitis* est cartilaginea et succosa.

Obs. Exciccata chartæ arcè adhæret:—frons sub lente pulcherrimè reticulata.

Speraveram, cùm in *Fucorum Britannicorum Synopsi F. phylliditem* describerem, non multum esse præteritum temporis priusquàm, aut per observationes ab amicis acceptas, aut per exemplaria a me ipso reperta, oblata fuerit facultas dijudicandi utrùm hæc planta pro distinctâ rectiùs sit habenda specie, an ad meram varietatem redacta sub *F. saccharino* in posterum militaret. Spes autem hæc me fefellit, neque ampliùs dicere nunc licet, quàm quod olim dixi; scilicet meo iudicio *F. phylliditem* esse distinctum, sed me characteres adhuc nullos monstrare posse per quos persuadere mihi possum ut certò dignoscatur. Stipitem quidem habet compressum ejusdem cum fronde substantiæ; confertim nasci solet; et folium ostendit texturâ insignitè tenui delicatâ atque reticulatâ, cujus forma nunquam non lineari-lanceolata conspicitur. His in omnibus a *F. saccharino* abludit; et hæc, dummodò semper stabilia maneant mutationibusque nullis sint obnoxia, certè sufficerent; sed ut hoc sit vereor. Forsan e loco natali aut ex aliâ quâlibet nondùm cognitâ causâ plùs minùs pendent. Hoc saltem indubiè profari possum, me nulla unquam vidisse *F. saccharini* exemplaria, etiamsi fuerint in primo ætatis stadio, quorum frondes crassitie non vincerent *F. phylliditem* adultum vetustumve; neque unquam reperire mihi contigit *F. saccharinum* parasiticè aliis *Fucis* innascentem, neque, si radices lignosas validas ramosas contempler, verisimile mihi apparet hoc ita fieri posse. *F. phyllitis* autem semper, quantum vidi, nobiscum sic nascitur, *F. siliquosi* aut *F. vesiculosi* ramis affixus; et idem etiam de eo apud Gades testatur Clemente. Incertus sum an potiùs credam *F. phylliditem* debere inter *Fucos* rarissimos recenseri, an esse ab omnibus ferè auctoribus prætermissum. Memoratur a perpauca, neque inter hos paucos habeo ulla pro indubiis synonymis, præter *Smithium Esperum* et *Stackhousium*. Imò, ut verum fatear, de secundo horum et tertio scrupuli mihi quidam restant; quoniam radicem fibris longis nigricantibus instructam depinxerunt, et hoc a stirpis verâ naturâ abhorrere videtur. Quod autem ad *Esperum* attinet, exemplar ab ipso delineatum ego misi, quare nullus dubito quin pictor talem radicem incuriâ et parùm fidelitèr plantæ assignaverit.

a. <i>F. phyllitis</i> , magn. nat.					
b. <i>radix</i> , magn. auct.	-	-	-	-	6.
c. <i>folii portio</i>	-	-	-	-	1.



Fucus Phyllitis.

Fucus phyllitis, root fibrous; short, and mostly simple: stipes cartilaginous, compressed, linear, and undivided, expanding at its apex into a single, membranaceous, very tender, simple, flat, nerveless leaf, of a lineari-lanceolate shape, acuminate at both ends, and quite entire at the margin.

Fucus phyllitis. *Ner. Brit.* p. 33. t. 9. *WITH.* IV. p. 100. *Syn. Fuc.* II. p. 193. *Eng. Bot.* XIX. t. 1331. *ESPER, Ic. Fuc.* II. p. 81. t. 149.

F. saccharinus. β . *Fl. Scot.* p. 941?

F. phyllitidis folio. *RAII Syn.* p. 40?

F. longissimo latissimo tenuique folio. *RAII Syn.* p. 40. n. 2?

Ulva phyllitis. *Fl. Fr. Ed. 2da.* II. p. 15.

On the shores of the British Isles, generally growing on other Fuci, not very common.—At Sidmouth. *Mrs. Griffiths*.—Larne, near Belfast. *Mr. Templeton*.—Bantry Bay. *Miss Hutchins*.—Among the rejectamenta of the sea near Yarmouth, very scarce.—Northern coast of France. *Decandolle*.—On *F. vesiculosus* about Cadiz. *Clemente*.

Annual?

ROOT, composed of four or five thickish, succulent, cylindrical, radiated fibres, scarcely a line long, either simple or forked, of the same color as the frond.

FRONDS,* numerous from the same base, each rising with a stipes about half an inch long, as thick as a sparrow's quill, almost cylindrical near the base, but growing, as it advances, more and more compressed, till at the apex it becomes quite flat, and insensibly loses itself in a single, flat, simple leaf, of a lanceolate or lineari-lanceolate shape, constantly attenuated in an equal degree at both extremities, so that its point is acuminate, and its base may with the greatest propriety be said to be decurrent into a petiolus; its length is a foot or more, its width varies from half an inch to an inch, it is always wholly destitute of midrib or veins, and quite entire at the margin, but very beautifully, though minutely, undulated, and sometimes curled:—in the centre of old fronds are occasionally observable traces of the same bullated and wrinkled appearance, which is the characteristic mark of the variety β of *F. saccharinus*, but always more faint than in that species.

FRUCTIFICATION, at present unknown.

COLOR, of the leaf deep yellow with a slight tinge of brown in a fresh specimen, like that of *F. viridis* or *F. ligulatus*, but immediately changing, from immersion in fresh water, into a pleasing pale yellowish green, always transparent and glossy; in a dry state it becomes more green, and from exposure to the sun turns white; the color of the stipes is browner and less transparent, but this varies in different individuals.

SUBSTANCE, membranaceous and extremely thin and tender in the leaf, in the stipes cartilaginous and succulent.

OBS. In drying it adheres closely to paper;—the frond appears under the microscope beautifully reticulated.

Since the time when the description of *F. phyllitis* for the *Synopsis of the British Fuci* was written, I am sorry to say I have met with nothing that might tend to remove the doubts and difficulties there expressed, so that I still remain in the same uncertainty how far it ought to be regarded as a distinct species from *F. saccharinus*. It is, indeed, now, as it then was, my opinion that the two plants are really specifically different, but I am at a loss to point out any certain and unvarying characters; as, though the compressed stem of nearly the same substance as the frond, the thick short seldom branching fibres of the root, the clustered mode of growth, and the peculiar delicacy of the substance of the leaf of *F. phyllitis*, as well as its beautifully reticulated structure, and constantly lineari-lanceolate shape, seem to afford in general sufficient marks of discrimination, I cannot but entertain apprehensions lest these should all be liable to variation, or should depend upon the place of growth, or upon some other accidental circumstance. Thus much I may say with confidence, that I never saw any specimens of *F. saccharinus*, even in an early stage, equally thin as I have seen old ones of *F. phyllitis*, nor did I ever find the former with an outline so regular as the latter; besides which, all I have met with of *F. phyllitis* has been parasitical on *F. vesiculosus* or *F. siliquosus*, and the same is said by *Clemente* to be the case at Cadiz, but I never saw *F. saccharinus* so, nor should I conceive it possible, from its woody branching roots, for it to grow so. *F. phyllitis* must either be a species of rare occurrence, or must have been generally overlooked; as I find it mentioned by very few authors, and even with regard to the synonyms above quoted I feel great doubts; nor would I regard any as unquestionable, except those of *English Botany*, *Mr. Stackhouse*, and *Dr. Esper*; and upon the two latter of these some uncertainty seems to be thrown, from their having figured the plant with long black fibres to its root, which is quite unlike what I ever observed. This, however, in *Professor Esper* I know to be a mistake, as his specimens were sent him by me, and I therefore feel certain that his artist has in this respect departed from accuracy.

- a. *F. phyllitis*, natural size.
 b. root, magnified - - - - 6.
 c. portion of the leaf - - - - 1.

* The fronds of this *Fucus*, though they grow in a manner nearly similar to those of *F. saccharinus*, cannot with the same propriety be called distinct and solitary; as their roots are so entangled and joined that they can scarcely be separated without injury.

Fucus Langsdorfi, stem coriaceous, cylindrical, filiform, branched; branches scattered, simple, beset all over with small ramuli standing close to each other, of a shape between lanceolate and subulate, flat, and undivided: receptacles placed near the summits of the branches, spherical, standing on very short peduncles.

On the Coast of Japan. *Dr. Langsdorff*.

Perennial?

ROOT, I have not yet seen.

FROND, furnished with a *stem*, of the length of which, and whether it is divided or not, I am altogether ignorant, cylindrical, filiform, as thick as a blackbird's quill, beset with branches of the same nature and substance as itself, but in other respects, apparently, naked; *branches* scattered, some alternate and separated by intervals of an inch each, others standing close together, and not uncommonly two or three rising together from the same point, all between erect and patent, straight, about half a foot long, always, as far as I have seen, undivided and simple, each swollen at it's base into a small bulb, but afterwards cylindrical, and filiform, and about the thickness of a sparrow's quill; the branches are beset throughout their whole length, except immediately adjoining the apices where they produce the fruit, with *ramuli* or *leaves* standing close together in a spirally alternate manner, patent, but slightly incurved, flat, nerveless, lanceolate at their base and afterwards subulate, so as in form to bear considerable resemblance to the leaves of *Hypnum polyanthos*, about a line and half long, and quite entire.

FRUCTIFICATION, placed in receptacles which are disposed at the ends of the branches and for half an inch or an inch down them, their shape is spherical, and their size somewhat larger than mustard-seed, they stand, like the leaves, in a spirally alternate manner, but not so close to each other, they are supported on narrow flat petioli scarcely half a line in length, and externally they are all over minutely wrinkled and perforated with pores so small as to be invisible to the naked eye, under which lie imbedded spherical tubercles, but out of these all the seeds had escaped in my specimens:—while the tubercles lie immediately under the epidermis, I have found the interior part of the receptacles quite empty, nor have I now any means of knowing how far this is natural to the plant or only the effect of drying: analogy leads to the supposition that the latter is the case, and that in a recent state the receptacles, like those of *F. vesiculosus* or *F. nodosus*, are full of a clear colorless mucus.

COLOR, in the fresh plant most probably olive-green, but quite black when dried, and never recovering from subsequent immersion, destitute of gloss.

SUBSTANCE, between coriaceous and cartilaginous, flexible, and tough.

Obs. In drying it does not in the least adhere to paper, nor does it, from being again moistened, increase in size, or change in any respect its appearance.

At the request of my friend, Professor Mertens, to whom I am indebted for the knowledge of this plant, as well as for the drawing represented in the plate before us, I have called it by the name of *Dr. Langsdorff*, from whom he received it, and who, as Natural Philosopher, attended the Russian Expedition round the world made by the ships *Neva* and *Nadeshda*, to which expedition I have already had to express my obligations for many of the subjects of the present work. The only specimen I have seen of *F. Langsdorfi* has been a part of that here figured; so that my knowledge of the plant is exceedingly confined, and I can say little more about it, than that it appears to me one of the most curious species yet discovered, extremely different from all others, and forming a link of union between two Fuci so dissimilar as *F. ericoides* and *F. Banksii*, the former of which it resembles in its general habit and its leaves, while its receptacles shew considerable affinity to those of the latter, though perhaps they might with still more propriety be compared to those of *F. nodosus*.

- | | | | | |
|-----------------------------------------|---|---|---|----|
| a. <i>F. Langsdorfi</i> , natural size. | | | | |
| b. part of the branch, magnified | - | - | - | 6. |
| c. leaf | - | - | - | 4. |
| d. receptacle | - | - | - | 6. |
| e. section of the same | - | - | - | 4. |



Fucus Langsdorfi.

Fucus, caule coriaceo, terete, filiformi, ramoso; ramis sparsis, simplicibus, ubique obsitis ramulis exiguis approximatis, planis, lanceolato-subulatis, indivisis: receptaculis juxta ramorum apices sphaericis, brevissimè pedunculatis.

HABITAT ad littora Japonica. *D. Langsdorff*.

Perennis?

RADIX a me nondùm visa.

FRONS instructa *caule*, cujus de longitudine et an divisus sit necne nihil scio, terete, filiformi, Merulæ pennæ crassitie, ramis homogeneis obsito, cæteroquin, ut videtur, nudo; *rami* sparsi, hi alterni et intervallis pollicaribus sejuncti, illi approximati, non rarè ex eodem puncto bini vel terni orti, erecto-patentes, stricti, semipedem longi, quantum ego vidi indivisi et simplices, basi in bulbillum parvum incrassati, exinde teretes filiformes et pennæ passerinæ crassitiem ubique servant, undique per totam longitudinem, excepto prope apices ubi fructum ferunt, laxè obsiti *ramulis*, seu *foliis*, approximatis, homogeneis, spiralitèr alternis, erecto-patentibus, lenitèr incurvis, planis, enerviis, e basi lanceolatâ subulatis, ut *Hypni polyanthi* folia formâ non malè referant, sesquilineam longis integerrimis.

FRUCTIFICATIO in receptaculis sita, quæ ramos, ibi foliis destitutos, ad unguis pollicisve longitudinem ab apicibus obsident, sphaerica sunt, Sinapis seminibus aliquantum majora, et ordine spiralitèr alterno, sicut folia, sed laxiùs, disponuntur, patentia, petiolis angustis planis vix semilineam longis fulta, extrinsecùs ubique minutè rugulosa, et poris nudum oculum latentibus pertusa, sub quibus latent tubercula immersa sphaerica, sed ex his semina omnia in meis aufugerant exemplaribus; tubercula dum hæc interiorem receptaculorum parietem occupabant partem mediam prorsùs vacuam inveni, sed an hoc casu aliquo sit factum, an e plantæ ipsius naturâ pendeat prorsùs nescio: quatenus ex analogiâ judicare licet, crederem recentis receptacula muco esse repleta.

COLOR, qui *recentis* verisimillimè fuit olivaceus, est in desiccata et paritèr in rursùs madefactâ nigerrimus nitoris expers.

SUBSTANTIA coriaceo-cartilaginea, lenta, tenax.

OBS. Post desiccationem madefacta faciem nullo modo mutat neque volumen auget:—exsiccata chartæ nequaquam adhæret.

Iconem Fuci quam hæc tabula æri incisam exhibet benevolentissimè, de more, mecum communicavit Mertensius, cujus votis obsequens plantam *F. Langsdorffii* nuncupo, nomine ducto a Botanico qui eam primus detexit, dum Russicam circa orbem expeditionem a navibus Newa et Nadeshda habitam, ut physicus, comitaretur. Unicum ille modò hujusce Fuci exemplar, idque parvum, ad Mertensium misit, a quo mox ejusdem bipartiti dimidium accepi, neque ullum unquam aliud vidi; ut de stirpe perpauullulùm cognitâ nihil ferè sit quod descriptioni suprâ datæ adjiciam. Quantum adhuc judicare potui, *F. Langsdorffii* ab omnibus distinctissimum et in specierum maximè notabilium numerum recipiendum arbitror. Medius ferè stat inter duos Fucos longè dissimiles, *F. ericoidem* et *F. Banksii*; ad illum habitu generali et foliis, ad hunc receptaculis maximè accedens, nisi quidem verisimile putaretur receptacula recentia formâ potius illa *F. nodosi* referre.

a. <i>F. Langsdorffii</i> , magn. nat.					
b. <i>rami pars</i> , magn. auct.	-	-	-	-	6.
c. <i>folium</i> - - - -	-	-	-	-	4.
d. <i>receptaculum</i> - - -	-	-	-	-	6.
e. <i>idem dissectum</i> - - -	-	-	-	-	4.

Fucus decipiens, stem coriaceous, cylindrical, mostly undivided, pinnated with simple branches: leaves very numerous, flat, linear, extremely narrow, forked, or dichotomous, entire at the margins: receptacles mixed with the leaves, lineari-lanceolate, clustered, standing on short peduncles.

Fucus decipiens. BROWN, MSS.

At Port Dalrymple in New Holland. Mr. Brown.

Perennial.

ROOT, an expanded, callous disk, about a quarter of an inch in diameter, hard, woody, and black.

FROND, arising with a single cylindrical stem, as thick as a goose-quill at the base, but gradually growing more and more thin upwards, so that its apex is not thicker than a sparrow's quill, two feet or more long, in some specimens undivided throughout its whole length, in others cleft at the height of about an inch, into numerous undivided segments of nearly equal length, all of them beset from their root to their apices with branches of the same nature as themselves, but in other respects naked; branches placed round the stem in an irregularly spiral manner, generally alternate, separated from each other by intervals in some places of two inches, in others of not more than as many lines, occasionally also opposite, between horizontal and patent, flexuose, all about two or three inches long, nearly cylindrical, considerably more thin than a sparrow's quill, filiform, thickly clothed with leaves and fructification; leaves very numerous upon the branches, disposed without order, between horizontal and patent, sessile, half an inch long, compressed, linear, nerveless, scarcely the third part of a line wide, quite entire, generally only forked, but sometimes twice or thrice dichotomous.

FRUCTIFICATION, growing upon the leaves, and either at their bases, or at the axillæ of their divisions, consisting of lineari-lanceolate, sub-cylindrical receptacles, about a line long, clustered, yet each standing on its own extremely short peduncle, blackish, externally slightly torulose, but, as far as I have seen, not perforated with any pores, internally containing a quantity of shapeless, black, largish seeds, destitute of a limbus:—how far these seeds are contained in tubercles, which from the nature of the plant seems most probable, the small size of the receptacles prevented me from seeing.

COLOR, most probably olive-green in the recent plant, but quite black when it is dried, and equally so if again wetted.

SUBSTANCE, coriaceous in the stem and branches, in the leaves cartilaginous, every where tough and flexible.

Having said thus much upon the plant in its perfect state, it remains to speak of it while yet young, when it differs in very many respects; and, as it sometimes attains to a considerable size, and still keeps the same appearance as in its earliest stage of existence, so as to be likely to mislead not merely an unpractised but even an experienced botanist, I have thought it best to describe its two states separately, and therefore now proceed to speak of it before it has attained perfection;

It has then a flat stem, two lines wide at the base, but gradually growing more narrow upwards, pinnated in its lower part with leaves, in its upper one with branches; leaves distichous, horizontal, or deflexed, alternate, about a quarter of an inch distant from each other, two inches long, having a blackish midrib, pinnatifid with alternate, nearly linear segments, which are between horizontal and patent, bluntish at their apices, quite entire at their margins, and perforated all over with blackish mucifluous pores; the width of the lower leaves is equal to a line and a half, but the upper ones gradually grow more and more narrow, till they lose themselves in compressed branches beset with the leaves* above mentioned in the description.

COLOR, even when dried or again moistened, a semi-transparent olive green, tinged with brown.

OBS. In drying it does not adhere to paper: I have observed upon this plant specimens of a minute, and, I believe, hitherto non-descript *Sertularia*:—the stem near the base appears muricated from the remains of broken branches.

The same remarkable difference of appearance at different periods of growth, which induced Mr. Brown to bestow upon another *Fucus* lately published in this work the name of *F. paradoxus*, has led him also to call the present by the equally expressive appellation of *F. decipiens*; since it is a plant liable to such extraordinary changes as may easily deceive and mislead any botanist not prepared to expect them. In its youngest state it clearly shews towards the base a tendency to the same mode of growth already noticed in *F. retroflexus* and others, especially in the deflexed position of the branches: their originating from the flat sides of the stem and the jointed structure of this latter, are points far from being equally evident; but these also are ambiguous. When full grown, *F. decipiens* seems wholly to lose this tendency; and, what is most extraordinary, the leaves upon the branches appear then to be both shorter and less divided. This, however, is so contrary to nature, that it is impossible not to suspect somewhat of deception on this point, arising from the specimens I have seen having had their leaves injured, or having grown in a situation that rendered them less luxuriant than the young ones. *F. decipiens* plainly belongs to the division of *Fuci*, termed *folus unitis*, among which its nearest affinities are *F. discors* L. and the subject of the following plate,

* These leaves might probably with more propriety be called a secondary set of branches; but, indeed, this is a mere difference in words, as it is sufficiently obvious that this *Fucus* and its congeners have no leaves that would not in time change to branches.

W. J. H. Esq. ad.

Junus decipiens.



plate, from both which its want of vesicles immediately distinguishes it, without having recourse to other equally obvious and important characters.

- a. *F. decipiens*, natural size.
 b. lower part of a young plant.
 c. portion of a branch, magnified - - - 6.
 d. small part of the same to shew a leaf and fruit - 3.

166.—FUCUS DECIPIENS.

Fucus, caule coriaceo, terete, sub-indiviso, ramis simplicibus pinuato: foliis in ramis frequentissimis, planis, linearibus, angustissimis, bifurcis, dichotomisve, integerrimis: receptaculis inter folia lineari-lanceolatis, confertis, breviter pedunculatis.

Fucus decipiens. BROWN, MSS.

HABITAT apud Portum Dalrymple, in Novâ Hollandiâ. D. Brown.

Perennis.

RADIX callus explanatus, discoideus, diametro sub-unguicularis, durus, lignosus, ater.

FRONS caule assurgens unico, terete, basi pennæ anserinæ crassitie, exinde sensim attenuato ut ad apicem vix passerinam æquet, bipedali et ultra, nunc per totam longitudinem indiviso, nunc circiter pollicis unius a basi altitudinem vagè in plurimos fastigiatos indivisos fisso, semper ramis homogeneis per totam longitudinem obsito, cætera nudo; rami circa caulem subspiritaliter dispositi, plerumque alterni, intervallis hic pollicaribus illic vix bilinearibus sejuncti, quidam et oppositi, horizontaliter patuli, flexuosi, bi-tri-pollicares, omnesque longitudinis ferè ejusdem, teretiusculi, pennâ passerinâ multùm tenuiores, filiformes, foliis fructuque densè vestiti; folia in ramis frequentissima, absque normâ posita, horizontaliter patentia, sessilia, unguicularia, compressa, linearia, enervia, vix tertiam lineæ partem lata, integerrima, ut plurimum tantummodò bifurca, interdum et furcis bis ter repetitis dichotoma.

FRUCTIFICATIO foliis immixta, eorum nunc basi insidens, nunc furcarum ad alas sita, e receptaculis constans lineari-lanceolatis, teretiusculis, circiter lineam longis, confertis, singulis tamen pedunculo proprio brevissimo illo quidem fultis, nigricantibus, extrinsecùs levissimè torulosis, at poris, quantum ego vidi, nullis pertusis, intus foventibus congeriem seminum informium, atrorum, majusculorum, sine limbo.—an hæc semina in tuberculis sint inclusa, quod plantæ natura suadet, parva receptaculorum moles prohibuit quominus ritè perspicerem.

COLOR, qui recentis verisimillimè fuit olivaceus, est in exsiccata et pariter in rursus madefactâ aterrimus.

SUBSTANTIA caulis ramorumque coriacea, foliorum cartilaginea, ubique lenta et tenax.

Hactenus de plantâ adultâ et quam dicimus perfectâ, sed in juniore omnia ferè diversa, et cum stirps in magnam aliquandò excrescat molem, neque tamen deponat formam quam in primâ gesserat ætate, ut aliquis non modò tyro verum etiam in hac re versatissimus, paucis tantum exemplaribus visis, pro distinctâ haberet specie, melius fore sum ratus si utramque seorsum describerem, quare quæ de juniore dicenda sese mihi offerunt hæc sunt;

Caulis planus, duas basi lineas latus, sursum versus gradatim angustatus, in parte inferiore foliis, in superiore ramis obsitus; folia disticha, horizontalia, vel deflexa, alterna, spatiis circiter semiunguicularibus disjuncta, duos pollices longa, nervo nigricante percursa, pinnatifida, segmentis horizontaliter patulis, alternis, propemodum linearibus, apice obtusiusculis, margine integerrimis, superficie poris mucifluis nigricantibus pertusâ; foliorum inferiorum latitudo sesquilineam æquat, sed superiora sensim angustantur, donec se in ramos compressos mutant, foliis supra in descriptione memoratis obsitos.

Color huic exsiccatae vel rursus madefactæ olivaceo-fuscus, sub-diaphanus.

Obs. Per desiccationem hic *Fucus* chartæ non adhæret:—*Sertulariæ* cujusdam exiguæ et nondum, quod scio, descriptæ exemplaria caulem perreptentia vidi:—caulis juxta basin ob ramorum diffractorum reliquias muricatus conspicitur.

Eadem illa causa, quæ D. Brown movit ut *Fuco* nuper in hoc opere descripto *F. paradoxo* nomen inderet, suasit etiam ut plantam hic depictam *F. decipientem* nuncuparet; neque equidem titulus minùs aptè huic quàm illi convenit, cum uterque in diversis ætatis suæ stadiis facies tam diversas induat, ut jure sit optimo paradoxus habendus, deciperet-que

que quemvis etiamsi haud mediocritèr in his plantis versatum. *F. decipiens* noster, si exemplaria juniora et præsertim si horum partem inferiorem intuearis, manifestè est adeundem crescendi modum proclivis per quem *F. retroflexus* et congeneres tantum a reliquis abludunt. Rami sunt manifestè ortu deflexi, et si e caulis lateribus planis non omninò oriantur, aut si caulis ipse non tam evidentèr quam ille *F. torulosi* ex articulis distinctis constet, hæc saltem sunt ambigua. Progrediente autem stirpis ætate talia omnia evanescent, neque rami diutiùs deflexi evadunt, sed horizontalitèr patuli conspiciuntur. Notabile hoc; sed multo magis est notabile folia ramea tum breviora minùsque frequentèr divisa quàm in juniore apparere, quod Naturæ repugnare videtur. Persuadere tamen mihi nequeo quin ipse humani aliquid in hoc sim passus, loco natali forsan minùs aridente speciminibus a me visis adultis quàm junioribus, aut foliorum incremento in adultis casu impedito, aut denique, quod vix possibile, foliis omnibus læsis. *F. decipiens* manifestè ad illam Fucorum familiam attinet, cui sunt *folia*, quod dicunt, *unita*; et inter hos arctissimè est affinis *F. discordi* L. et Fuco in tabulâ sequente depicto, quorum ab utroque statim dignoscitur per vesicularum absentiam, ut alios vix minoris momenti characteres præteream.

- a. *F. decipiens*, magn. nat.
 b. *stirpis junioris pars inferior*.
 c. *rami pars*, magn. auct. - - - - 6.
 d. *ejusdem portio, ut folium et receptacula in con-*
 spectum veniant - - - - 3.

Fucus, caule coriaceo, tetragono, bipinnato; ramis e caulis lateribus planis ortis: foliis lineari-lanceolatis, profundè dentatis, uno singulorum ramorum ad basin reliquis longè majore: vesiculis raris, sphaericis, petiolatis: receptaculis foliorum ad alas teretiusculis, racemosis.

HABITAT apud Portum Dalrymple in Novâ Hollandiâ. *D. Brown.*

Perennis.

RADIX a me nondùm visa.

FRONS caule assurgens indiviso, pedali, et ultrà, (forsan et multùm longiore, cùm nihil quod basin proximam indicaret viderim,) acutè tetragono, infernè pennæ Merulæ crassitiæ, hinc sursum versus sensim attenuato, ut ad apices vix passerinam æquet, ramis homogeneis per totam longitudinem pinnato, cætera nudo; rami circa caulem sub-spiraliter dispositi, e lateribus ejus planis semper orti, alterni, intervallo inter singulos sub-unguiculari, horizontaliter patuli, inferiores bi-tri-pollicares, summi duplo breviores, ut frondis peripheria sit sub-pyramidalis, omnes, caulis instar, tetragoni, illiusque similes, nisi quod tenuiores sint, basi folio instructi unico, quod ipsis vix brevius bracteæ vice fungitur, sessili, lineari, tertiam unguis partem lato, nervo nigricante percurso, margine profundè et ferè ad nervum inciso, dentibus approximatis, his angustis, illis latis, his simplicibus, illis bi-tri-cranis; rami primarij præter hoc folium unicum aphylli, sed pinnati serie ramorum aliorum minorum, qui, foliiferi, vesiculiferi, atque fructiferi, sunt primariis multo breviores, eadem quâ illi ratione dispositi, et folio unico ipsos superante ad basin bracteata, præter quod folia quoque per totam longitudinem ferunt alia minora, disticha, horizontaliter patula, remotiuscula, alterna, unguem sesquiunguemve longa, e basi angustissimâ sensim ad semi-lineæ latitudinem dilatata, atque exinde linearia, ad centrum usque incisa, dentibus angustis, acutis, cilia referentibus, remotiusculis, alternis. *vesicula* ramis minoribus prope basin impositæ, sed non nisi in uno alterove qui cauli est proximus conspiciendæ, singulæ in singulis, sphaericæ, *Lathyri odorati* seminum magnitudine, petiolis teretiusculis lineam longis insidentes, apice folio brevi angusto dentato aristatæ, et margine quoque sæpe spinis aliquot homogeneis armatæ, extrinsecus læves, intus cavæ et vacuæ.

FRUCTIFICATIO, foliorum ad alas in ramis minoribus sita, e receptaculis constat teretiusculis, vix semi-lineam longis spinulosis, atris, racemosim congestis, quorum moles perpusilla prohibuit quominus quid in se includunt ritè perciperem.

COLOR, totius plantæ recentis verisimillimè olivaceus, *exsiccatæ* ubique nigricans, *madefactæ* caulis ater, foliorum olivaceo-fuscus et diaphanus.

SUBSTANTIA, quæ cauli coriacea, cartilaginea est et tenuis in foliis atque vesiculis.

Obs. Per desiccationem chartæ non adhæret.

Immixtum *F. decipienti* reperit *D. Brown* exemplar hujus Fuci unicum quod in hac tabulâ depingitur, neque aliud ego ullum hactenus vidi. Dubitavisset idcirco de edendo, si minùs a reliquis distinctus sit visus. Talis autem est, ut animo concipere nequeo ullas, quibus verisimile est ut sit obnoxia, mutationes, quæ facere possunt ut cum aliâ quâpiam commiseretur specie. De fructificatione perpauillum liquet; satis tamen ad monstrandum stirpem esse quæ non minùs fructu quàm habitu crescendique modo ad *F. natantis* familiam pertinet. Huic ascribere nemo Botanicus dubitaret. Folia ramorum majora bracteas stipulasve referentia characterem speciei certissimum suppeditant, neque sunt iis *F. longifolii varietatis* γ, absimilia. Facie autem universali *F. lacerifolius* potiùs *F. dentifolium* refert, a quo cùm foliorum forma tum horum textura tenuis et totius frondis peripheria pyramidalis primo statim aspectu distinguunt.

- | | | | | |
|----------------------------------------|---|---|---|----|
| a. <i>F. lacerifolius</i> , magn. nat. | | | | |
| b. ramus, e minoribus, magn. auct. | - | - | - | 6. |
| c. vesicula et receptacula | - | - | - | 5. |
| d. receptacula | - | - | - | 2. |

Fucus lacerifolius, stem coriaceous, quadrangular, bipinnate; branches originating from the flat sides of the stem: leaves lineari-lanceolate, deeply toothed, one much larger than the rest, growing at the base of every branch; vesicles few, spherical, petiolate: receptacles sub-cylindrical, growing in racemi at the base of the leaves.

At Port Dalrymple in New Holland. *Mr. Brown.*

Perennial.

ROOT, I have never seen.

FROND, rising with an undivided stem a foot or more long, (perhaps indeed much longer, as I have seen nothing that seemed near a base) sharply quadrangular, as thick below as a blackbird's quill, but gradually attenuated upwards, so that at its apex it is not larger than a sparrow's quill, beset throughout its whole length with branches of the same nature and substance as itself, in other respects naked; branches disposed in an irregularly spiral manner, always originating from the flat sides of the stem, alternate, separated by intervals of about half an inch each, nearly horizontal, the lower two or three inches long, the rest gradually shortening, so that the outline of the frond is sub-pyramidal, all of them square, like the stem, which they resemble in every respect, except that they are more thin, and all furnished at the base with a single linear, sessile leaf, which is scarcely shorter than the branch itself, and looks like a bractea, it is about the sixth of an inch wide, has a blackish midrib run through it, and is at its margin serrated with teeth so deep as to reach nearly to the middle of the leaf, standing close to each other, some of them simple, others having two or three points; the primary branches have no other leaf besides this one, but are pinnated with a series of other smaller branches, which bear both leaves, vesicles, and fruit; these also are undivided, and disposed in the same manner as the primary ones, like which they have at the base a single leaf longer than themselves, but are moreover pinnated from top to bottom with other smaller leaves, distichous, between horizontal and patent, rather remote, alternate, from half an inch to three quarters of an inch long, extremely narrow at their base, whence they gradually expand till they attain the width of about half a line, when they become linear, deeply cleft at their margins into rather remote alternate teeth so narrow and sharp as to look like cilia; vesicles situated at the base of the smaller branches, but never on more than one or two of those nearest to the stem, and never more than one on each branch, spherical, as large as the seeds of the *Sweet Pea*, standing upon sub-cylindrical petioli a line long, tipped at their apices with a short narrow toothed leaf, and not unfrequently having on their sides a few soft spines, externally smooth, internally hollow and empty.

FRUCTIFICATION, situated at the axillæ of the leaves in the smaller branches, consisting of nearly cylindrical receptacles, which are scarcely half a line long, covered with small spines, black, placed in a racemose manner, but so small as to baffle all the attempts I have hitherto made to discover their internal structure.

COLOR, most probably olive-green in the whole plant when growing, when dry blackish all over, but if again moistened black in the stem, and in the leaves a semitransparent olive-green tinged with brown.

SUBSTANCE, of the stem coriaceous, of the leaves and vesicles cartilaginous and thin.

Obs. In drying it does not adhere to paper.

I have seen of this *Fucus* no other specimen than the one figured in the present plate, which *Mr. Brown* found mixed with *F. decipiens*; but I have still not hesitated about publishing it as a distinct species, since it seems sufficiently different from all others. Of the fructification, though so little is at present known, enough is visible to shew that the plant in this respect, no less than in its habit and mode of growth, agrees with the family of *F. natans*, to which no botanist would hesitate about referring it. Its larger leaves, which look like bractæ and stipulæ, and afford the strongest character of the plant, are not unlike those of *F. longifolius* var. γ , but in general appearance the plant rather resembles *F. dentifolius*, from which it is immediately distinguishable, no less by these leaves, than by its thin substance and pyramidal outline.

- | | | | | | |
|-------------------------------------------|---|---|---|---|----|
| a. <i>F. lacerifolius</i> , natural size. | | | | | |
| b. small branch, magnified | - | - | - | - | 6. |
| c. vesicle and receptacles | - | - | - | - | 5. |
| d. receptacles | - | - | - | - | 2. |



Taxus lacerifolia.

Fucus, caule coriaceo, tereti usculo, ubique muricato, bipinnato; ramis alternis: foliis linearibus, integerrimis, serratisve: vesiculis sphaericis, petiolatis; petiolis planis: receptaculis cylindraceis, solitariis, simplicibus, bifurcisque.

Fucus Acinaria. GMELIN, *Hist. Fuc.* p. 99. (excl. *Syn. Linn.*) WULFEN, in *Jacqu. Coll.* IV. p. 342. WULFEN, *Crypt. Aquat.* n. 1. ESPER, *Ic. Fuc.* I. p. 130. t. 65. *Fl. Ped.* II. p. 330.

Fuco Acinara con foglie lunghe e strette. GINANNI, *Op. Post.* p. 19. t. 19. n. 36.

Acinara o Agresto marino dell' Imperato. DONATI, *Adr.* p. 36. t. 4.

Fucus folliculaceus Linariae folio. BAUH. *Pin.* p. 365.

β *asperifolius*; foliis angustissimis, ubique muricatis.

HABITAT in Mari Mediterraneo et Adriatico.—Tergesti, minimè rarus. *Wulfen*.—In Mari Nicænsi et Uneliæ Allioni.—Ægypti ab oris, unà cum var. β, accepit, D. I. Banks, *Baronet*.

Perennis.

RADIX, quam nondùm vidi, est, teste Gmelino, discus explanatus.

FRONDES nunc solitariae, nunc ex eadem basi plurimae, singulae caule assurgentes terete, vel e terete compresso, pedali, bipedali, et ultrà, pennae in his anserinae in illis vix corvinae crassitie, sursum versus attenuato, indiviso, undique plus minus laxè obsito ramis homogeneis, sui, staturà minore deniptà, prorsus similibus, sparsis, his vix pollicem, illis semipedem longis, cunctis indivisis, sed sæpe minorum paritèr sparsorum serie obsitis, cunctisque foliosis, vesiculiferis, atque fructiferis; folia in ramis alterna, remota, horizontalia, plana, linearia, obtusa, pollicem et ultrà longa, raro lineam lata, sessilia vel in petiolum brevissimum attenuata, nervo tenui nigricante percursa, superficie copiosè nigro-punctata, margine nunc, et quidem plerumque, integerrimo, nunc vagè serrato, quorum utriusque exempla sæpe in eodem occurrunt specimine; prope caulibus basin conspiciuntur aliquot folia rameis duplo triplove majora formæque lineari-oblongæ; vesiculae foliis immixtae, iisque frequentiores, semper ad amussim sphaericae, neque ullo modo, sicut illae *F. Acinariae*, in petiolos decurrentes, *Vicia sativa* seminibus majores, petiolis fultae planis angustissimis linearibus non raro unguem longis, extrinsecus laeves, intus cavæ et vacuæ:—totus caulis, sicut etiam rami, ubique muricatus conspicitur processibus homogeneis, perbrevibus, horizontalibus, copiosis, ramorum primordia referentibus, unde stirpi facies insignitèr exasperata.

FRUCTIFICATIO in ramis sæpissimè foliorum ad alas sita, e receptaculis constans cylindraceis, duas tresve lineas longis, his simplicibus, illis bi- tri- furcis extrinsecus ubique lenissimè torulosis, porisque minutissimis pertusis, sub quibus latent tubercula immersa sphaerica, sed semina omnia e meis aufugerant exemplaribus.

COLOR, teste Wulfenio, *recentis* ubique rufo-fuscens, *exsiccata* nigerrimus, absque nitore.

SUBSTANTIA, caulis ramorumque coriacea, foliorum atque vesicularum cartilaginea satisque tenuis, totius stirpis *madefacta* lenta, *exsiccata* fragilis flectique nescia.

Var. β folia habet solito multo angustiora, quæ, et paritèr vesicularum petioli, ubique sunt, caulis instar, muricata.

Obs. Exsiccata chartæ non adhæret; plures Sertulariæ species pluresque e minoribus Fucis atque Confervis hunc Fucum perperere amant.

Diu inter Botánicos innotuit hic *Fucus*, et diu est ab auctoribus *F. acinarii* nomine descriptus. Optimo igitur jure hunc sibi titulum vindicat, quem nihilominus alii ego speciei indidi; Linnæum in hoc, forsau cæcè, secutus. Errori vir ille clarissimus primus dedit ansam; credens nimirum plantam a se ex Indiâ acceptam esse eandem quam auctores antiqui *F. acinarium* appellaverant, illi licet hanc nunquam viderint, et ad hanc referens eorum synonyma, quæ ad stirpem ipsi paritèr ignotam reapse pertinuerunt. Deceperant folia utriusque integerrima. In *F. linifolio* autem nostro sæpe accidit folia integerrima serrataque in eodem individuo conspici. Characteres qui has invicem distinguunt stirpes sub *F. acinario* Linnæano memorantur. Ne serrata *F. linifolii* folia, presertim si in exemplare læso reperiantur, hallucinationibus extent causæ magnoperè est cavendum. Planta hæc *F. natanti* tum insignitèr accedit, et vix est nisi per caulem muricatum dignoscenda. Muricatae hujus faciei absentia me movit, ut Esperii Iconem (I. t. 66.), quam ipse atque Wulfenius paritèr indubiè ad *F. linifolium* referunt, potiùs *F. natanti* adjuugendæ existimem. Neque in hoc solo ab aliis mihi contigit discrepare auctoribus, sed et æquè de iconibus Ginannianis, quas omnes, præter unam, *F. natantis* varietates credo. In errorem quàm maximè singularem est lapsus hic auctor, dum *F. fruticulosum* *F. linifolii* caulem ramosque perperentem ejusdem partem habet, atque ita habitum describit delineatque. In hoc non incomitatus; ipse enim Gmelinus, quod longè magis miror, cæteroquin acutissimus, non modò non perspexit errorem, verùm et idem depingi curavit. *F. linifolii* descriptionem, de more optimam, dedit Wulfenius, a quâ meæ partem sum mutuatus. Multum etiam in illo illustrando desudavit * Donati, iconè haud mediocri adjectâ. Cùm necesse fuerit hujus Fuci nomen mutare, novum indidi, depromptum ex antiquissimo illo Baulhini, qui *F. Linariae folio* dixit. Hunc secutus *F. Linariifolium* appellavisse destinaveram; fecissemque, nisi tinerem

* Plurimum ille laboris fructificationi investigandæ impendit, persuasumque sibi habet se optimis in hoc avibus processisse. Foliorum poros pro floribus masculis, contrà eos receptaculorum pro femineis habet; et nihil de hoc dubitans sic acuté argumentari pergit, verborum et numerorum non parvo dispendio; "Non voglio qui trattenermi dal manifestarvi il numero ben sorprendente di fiori, che in una sola Pianta d' *Acinaria* io rilevai col computo, cioè fiori maschi 545,600 e fiori femmine 1,728,000, onde in tal guisa sono li fiori maschi alle femmine come 1 a 5, cosicche in tale specie ciascheduno de' fiori maschi potrà fecondare cinque femmine. Se dunque li due numeri saranno ridotti ad una somma, avrassi il prodotto di 2,073,600, numero in verità sorprendente per una Pianta, che assai di raro giunge all' altezza di tre Cubiti."——
Donati, p. 36.

timerem ne titulus qui nimis similis sonaret *F. linearifolii* nostri novas de stirpe jam satis confusâ confusiones excitaret.

- a. *F. linifolius*, magn. nat.
 b. *folia que caulis ad basin nascuntur*.
 c. *receptaculum dissectum*, magn. auct. - - - §.
 d. *pars frondis var. β* magn. nat.

168.—FUCUS LINIFOLIUS.

Fucus linifolius, stem coriaceous, sub-cylindrical, muricated all over, bipinnate, branches alternate: leaves linear, entire, or serrated: vesicles spherical, standing on flat petioli: receptacles cylindrical, solitary, some simple, others forked.

Fucus Acinaria. GMELIN, *Hist. Fuc.* p. 99. (*excl. Syn. Linn.*) WULFEN, in *Jacqu. Coll.* IV. p. 342. WULFEN, *Crypt. Aquat.* n. 1. ESPER, *Ic. Fuc.* n. 1. ESPER, *Ic. Fuc.* I. p. 130. t. 65. *Fl. Ped.* II. p. 330.

Fuco Acinara con foglie lunghe e strette. GINANNI, *Op. Post.* p. 19. t. 19. n. 56.

Acinara o Agresto marino dell' Imperato. DONATI, *Adr.* p. 35. t. 4.

Fucus folliculaceus Linaria folio. BAUHIN, *Pin.* p. 365.

β. *asperifolius*; leaves extremely narrow, muricated all over.

In the Mediterranean and Adriatic Seas. At Trieste, by no means rare. *Wulfen*.—In the sea near Nice and Oneglia. *Allioni*.—Sent from the coast of Egypt, together with the var. β, to *Sir Jos. Banks*.

Perennial.

ROOT, according to Gmelin, an expanded disk.

FRONDS, sometimes solitary, sometimes many arising from the same base, each furnished with a stem either cylindrical, or between cylindrical and compressed, from one to two feet or more long, as thick in some specimens as a goose-quill, in others not thicker than a crow's, gradually attenuated upwards, undivided, beset on all sides more or less plentifully with branches of the same nature as itself, and exactly like itself, excepting their smaller size, scattered, varying in length from an inch to half a foot, all undivided, but frequently furnished with a series of smaller ones arranged in the same manner, and all bearing leaves, vesicles, and fruit; leaves placed alternately upon the branches, remote, horizontal, flat, linear, obtuse, an inch or more long, but seldom a line wide, either quite sessile, or attenuated at the base into an extremely short petiolus, having a thin blackish midrib passing through them, their surface plentifully spotted with small black perforations, their margins sometimes, and indeed most commonly, entire, but sometimes irregularly serrated, instances of both of which often occur on the same individual; near the base of the stem are observable a few leaves twice or thrice larger than those of the branches, and of a shape between linear and oblong: vesicles mixed with the leaves, and more numerous than they, always exactly spherical, and by no means running down into petioli, like those of *F. Acinaria*, larger than the seeds of *Vicia sativa*, externally smooth, internally empty, standing on very narrow flat linear petioli not uncommonly an inch long:—the whole stem, as well as the branches, is muricated all over with a profusion of extremely short, horizontal processes, of the same nature as itself, and resembling the rudiments of branches, which give the plant a singularly rough appearance.

FRUCTIFICATION, situated upon the branches, and generally at the axillæ of the leaves, consisting of cylindrical receptacles, two or three lines long, some simple, others twice or thrice forked, externally uneven all over with slight swellings, and perforated with very minute pores, under which lie imbedded spherical tubercles, but all the seeds had escaped out of these in my specimens.

COLOR, according to Wulfen, reddish brown in the fresh plant, quite black when dry and without gloss.

SUBSTANCE, of the stem and branches coriaceous, of the leaves and branches coriaceous and rather thin, flexible in the whole plant when moist, but brittle after it is dried.

The variety β has leaves much narrower than the common appearance of the species, and these, as well as the petioli of the vesicles, are, like the stem, muricated all over.

OBS. In drying it does not adhere to paper:—many species of *Conferva* and many of the smaller *Fuci* and *Confervæ* are often found on this plant.

The *Fucus* represented in the present plate has long been known by authors under the name of *F. Acinaria*, and therefore best deserves that appellation, which I have nevertheless been induced, in deference to the Linnæan Herbarium,

Juncus tenuifolius.



barium, to bestow upon another. The error in this case has depended upon Linnæus alone, who evidently designed to have described the same plant as had been previously described by those older writers to whose works he referred, but, trusting implicitly to the character of the linear and entire leaves, took a plant from the East Indies most probably unknown to them, while theirs, a native of the Mediterranean was, apparently, as little known to him. The differences between the two have already been pointed out under *F. Acinaria*, from which, in addition to the characters there noticed, *F. linifolius* is also distinguishable by its being generally found with leaves both serrated and entire upon the same individual. This circumstance is peculiarly liable to give rise to error, and may often create a doubt, with respect to imperfect specimens with serrated leaves, whether they do not belong to *F. natans*, between which plant and *F. linifolius* the muricated stem of the latter seems to afford the most obvious means of judging, and it was from the want of such a character that I was induced to refer to the former Esper's supposed variety of *F. Acinaria*, (I. t. 66.); thus differing both from him and Wulfen, neither of whom seems to have had any hesitation in joining it to the other. I have equally differed from preceding Botanists (with what propriety I must leave to others to determine) respecting the figures in Ginanni, all of which, except one, appear to me to belong to *F. natans*. This author has fallen into a curious error, in supposing *F. fruticosus*, with which he saw the stem of *F. linifolius* often covered, to be really the same plant; and, what is much more extraordinary, even Gmelin was so far from being positive as to the error, that he seems rather to consider him as right, and has figured a specimen thus overgrown. Of the plant before us, Baron Wulfen has given an excellent description, from which I have borrowed some part of my own. Much pains had also previously been taken in the illustration of it by Donati*, who has added to his description a satisfactory figure. It being necessary to change the name of this Fucus, I have taken a new one from the appellation originally given it by Bauhin, which I should have copied more nearly, and called the plant *F. linariifolius*, had I not found that by so doing I might cause ambiguity between it and *F. linearifolius*.

- a. *F. linifolius*, natural size.
 b. leaves at the base of the stem.
 c. section of a receptacle, magnified - - - 3.
 d. part of the frond of var. β , natural size.

* He has principally directed his attention to the fructification, which he considered himself as having satisfactorily ascertained, and, calling the punctures of the leaves male flowers and those of the receptacles female ones, he makes the following curious observations: "Non voglio qui trattenermi dal manifestarvi il numero ben sorprendente di fiori, che in una sola Pianta d' *Acinaria* io rilevai col computo, cioè fiori maschi 545,600 e fiori femmine 1,723,000, onde in tal guisa sono li fiori maschi alle femmine come 1 a 5, cosicche in tale specie ciascheduno de' fiori maschi potrà fecondare cinque femmine. Se dunque li due numeri saranno ridotti ad una somma, avrassi il prodotto di 2,073,600, numero in verità sorprendente per una Pianta, che assai di raro giunge all' altezza di tre Cubiti."——Donati, p. 36.

169.—FUCUS HEMIPHYLLUS.

Fucus, caule filiformi, sub-triquetro, ramis alternis simplicibus obsito: foliis lineari-cuneiformibus, truncatis, apice erosis, enervibus: vesiculis ellipticis, petiolatis, mucronulatis.

HABITAT apud Portum Nagasaki. D. Horner.

Perennis?

RADIX a me nondùm visa.

FRONS caule instructa obsolete trigono, de cujus longitudine et paritè an divisus sit necne nihil scio, debili, flexuoso, pennæ passerinæ crassitie, filiformi, ramis homogeneis hic illic obsito, cætera nudo; rami caulis prorsus similes, nisi quòd sint duplo tenuiores, spiralitè alterni, spatiis unguicularibus pollicaribusve sejuncti, horizontales, semipedem et ultrà longi, flexuosi, indivisi, foliosi, vesiculiferique; folia alterna, at interdùm bina, plerumque remota, horizontalitè patula, plana, enervia, elongato-cuneiformia, unguem longa, et supra sesquilineam lata, basi in petiolum brevissimum attenuata, apice truncato eroso-dentata, margine in plurimis integerrimo, in quibusdam sparse denticulato, juniora angusta propemodùm linearia atque integerrima; vesiculae e foliorum, haud tamen omnium, alis ortæ, solitariae vel rarius binæ, ellipticæ, *Ervi tetraspermi* seminibus majores, petiolis haud lineam longis capillaceis teretibus fultæ, apice aristatæ mucrone setaceo tenuissimo brevi.

FRUCTIFICATIO hucusque latet.

COLOR aquosè fuscus ad fulvum accedens, subdiaphanus, nisi in caule, qui intensior; exsiccatae badio-fuscus, absque nitore.

SUBSTANTIA cartilaginea, flaccida.

OBS. Per desiccationem chartæ non adhæret.

Elegantem hic exhibeo Fuci speciem, quæ fructum quidem in presenti celare pergit; eidem autem est manifestè annumeranda familiæ, quæ *F. Horneri*, *F. fulvellum*, *F. pallidum*, et *F. sisymbroidem* complectitur. Eorundem etiam, quorum illi, marium est incola; his ab omnibus, sicut etiam a cunctis aliis jamjam detectis Fucorum speciebus distinguenda per foliorum figuram, quæ efficit ut folia primo aspectu dimidiata videantur, parte superiore casu aut arte, si in hujusmodi re ars aliqua usurpari posset, abruptâ. Nomen hinc derivatum, monente Mertensio, stirpi indidi. Hic, quærens mihi gratificari, exemplar in hæc tabulâ delineatum, quod ille unicum accepit ab Hornero, commodavit, neque ego ullum aliud hactenus alicunde vidi.

a. *F. hemiphyllus*, magn. nat.

b. *rami pars*, magn. auct. - - - 6.

169.—FUCUS HEMIPHYLLUS.

Fucus hemiphyllus, stem filiform, nearly triangular, beset with alternate simple branches: leaves lineari-cuneiform, truncate, irregularly toothed at their apex, nerveless: vesicles elliptical, petiolated, tipped with a short mucro.

At Nagasaki. Dr. Horner.

Perennial?

ROOT, I have not yet seen.

FROND, furnished with an obsoletely triangular stem, of the length of which, and whether it is divided or not I am entirely ignorant, flexuose, weak, as thick as a sparrow's quill, filiform, beset here and there with branches of the same nature and substance as itself, in other respects naked; branches exactly like the stem, except in being twice as narrow, disposed in a spirally alternate manner, separated from each other by intervals of half an inch or an inch in length, horizontal, half a foot or more long, flexuose, undivided, bearing leaves and vesicles; leaves alternate, but sometimes growing in pairs, mostly remote, between horizontal and patent, flat, nerveless, of a shape between linear and cuneiform, half an inch long, and above a line and half wide, attenuated at their base into an extremely short petiolus, their apex truncate and toothed as if eaten by insects, their margins in general entire, but occasionally beset with a few scattered teeth; the leaves in an early stage of growth are narrow, linear, and every where entire; vesicles growing at the axillæ of the leaves, but by no means of all the leaves, solitary, or sometimes found in pairs, elliptical, larger than the seeds of *Eryum tetraspermum*, supported upon capillary cylindrical petioli not a line long, and tipped at their apices with a very short and thin setaceous mucro.

FRUCTIFICATION, hitherto unknown.

COLOR, a very pale brown inclining to tawny, and semitransparent, except in the stem which is darker and opaque; from drying it becomes a chocolate brown and destitute of gloss.

SUBSTANCE, cartilaginous, flaccid.

OBS. When dry it does not adhere to paper.

This elegant Fucus, which, though its fructification is at present unknown, evidently belongs to the family as *F. Horneri*, *F. pallidus*, *F. fulvellus*, and *F. sisymbroides*, and was brought from the same seas, is distinguished from all its congeners, and indeed from every other species of Fucus at present known, by the singular shape of its leaves, which is such as makes them look as if the upper half had been torn off, and induced Professor Mertens to call the plant by the name here given it. I am indebted to him for the loan of the specimen represented in this plate, the only one which he received from Dr. Horner, and the only one also that I ever saw.

a. *F. hemiphyllus*, natural size.

b. *part of a branch*, magnified - - - 6.



J. H. Esq. del.

Fucus hemiphylloides.

Fucus fronde membranaceâ, planâ lineari, obsolete costatâ, ramis sub-alternis enormitèr pinnatâ, margine ubique fimbriatâ ciliis patentibus, abbreviatis, subulatis, demùm in capsulas lanceolatas intumescens.

Fucus fimbriatus. BROWN, MSS.

HABITAT in Septentrionalibus Novæ Hollandiæ oris. D. Brown.

Perennis?

RADIX a me nondùm visa.

FRONS plana, dodrantem ferè longa, unam circiter lineam lata et ubique linearis, infernè aliquantulùm torta, mox recta, e caule constans indiviso, per totam longitudinem pinnato ramis homogeneis, distichis, oppositis alternisque, spatiis bi- tri- linearibus sejunctis, patentibus, inferioribus longissimis et ferè semipedalibus, reliquis sensim caulibus apices versus magis magisque abbreviatis, ut summi vix unguem exuperent; rami primarii, summis brevissimis modò exceptis, simili sunt ratione minoribus pinnati, et hi quoque interdùm seriem tertiam ferunt; apices omnibus obtusi atque rotundati, omnesque rami, sicut etiam caulis, margines habent a basi ad apicem fimbriatos ciliis homogeneis, horizontalitèr patentibus, subulatis, dimidiam lineæ partem longis, ejusdemque ferè longitudinis intervallo inter singula, sæpe lenitèr incurvis, et non rarò apice bifidis:—frondis partem inferiorem percurrit costa nigricans, adèd angusta ut oculo inermi lineam modò opacam simulet, quæ, uti progreditur, fit pallidior, donec apices versus frondi concolor facta evanescit:—tota frondis substantia sub lente pulchrè, minutè tamen, reticulata apparet.

FRUCTIFICATIO in ciliis lateralibus sita, quæ tunc producuntur, et intumescens in capsulas mutantur exiguas, lanceolatas, semina foventes aliquot nigro-badia enormitèr spherica majuscula serie duplici disposita.

COLOR, amonè dilute badius, subdiaphanus, in caule intensior.

SUBSTANTIA membranacea, attamen tenax.

Obs. *Sertulariam quadridentatam* atque *anguinam* perrepentes vidi hunc *Fucum*, qui exsiccatus chartæ non adhæret.

F. fimbriatus hic noster accedit multis usque diversissimis *Fucorum* speciebus, si diversas ejus partes separatim respicias; sin totum unà contempleris, primo statim aspectu ab omnibus longè recedit. Formâ facieque generali quasdam ex *F. ciliati* angustioribus aut ex *F. cornei* majoribus varietatibus maximè refert; substantiam habet ferè eandem quam *F. rubens*; et fructu, quod non expectaret aliquis, cum *F. amphibio* convenit. Dubitationi tamen vix est locus quin capsulas quoque sphericas unà cum lanceolatis proferat; quod si ita sit, fructificatione prorsus consentit cum *F. dentato*, colore etiam huic affinis, atque insuper his frondem ostentans simili modo costâ obsolete basin versus percursam. Margines totius plantæ ubique constantèr et certis intervallis fimbriati certissimam speciei notam præbent; quare non dubitavi retinere nomen quod stirpi indi jussit primus atque unicus hujus detector D. Brown, idem licet alii fuerit *Fuco* jam pridem a Desfontainesio in *Florâ Atlanticâ* impositum; cum scrupuli mihi nulli restent quin ejus *F. fimbriatus* sit tantummodò exigua *F. discordis* varietas.

a. *F. fimbriatus*, magn. nat.

b. *rami pars*, magn. auct. - - - - 6.

c. *unum e ciliis*, cum capsulâ - - - - 2.

Fucus fimbriatus, frond membranaceous, flat, linear, obsoletely midribbed, irregularly pinnated with branches generally alternate, the margins every where fringed with patent, short, subulate cilia, which swell at length into lanceolate capsules.

Fucus fimbriatus. BROWN, MSS.

On the North Coast of New Holland. Mr. Brown.

Perennial?

ROOT, I have not yet seen.

FROND, flat, almost nine inches long, and preserving from top to bottom a nearly equal width of about a line, somewhat spirally twisted in its lower part, but afterwards straight, consisting of a single undivided stem pinnated throughout its whole length with branches of the same nature as itself and exactly like it, distichous, some opposite, others alternate, separated by intervals of two or three lines each, patent, the lowest nearly half a foot long, the rest gradually shortening as they approach the apices, so that the upper ones are scarcely half an inch long; the primary branches, except the very short upper ones, are pinnated with smaller ones disposed in a similar manner, and these in their turns sometimes produce a third series, which are extremely short; the ends of all the branches are obtuse and rounded, and the whole of them, as well as the stem, have their margins from the base to the apex fimbriated with cilia of the same nature as themselves, each about half a line long, and each standing at a distance of about half a line from the other, between horizontal and patent, subulate, often slightly incurved, and not uncommonly bifid at the point:—towards the lower part of the stem is observable a blackish midrib, so narrow as to look to the naked eye like nothing more than an opaque line, but growing gradually paler as it advances, till it becomes of the same color as the frond and disappears:—the whole substance of the frond appears under the microscope beautifully, though minutely, reticulated.

FRUCTIFICATION, situated in the lateral cilia, which are at that time somewhat lengthened, and swell into minute lanceolate capsules, containing a few blackish brown, irregularly spherical, rather large seeds, lying in a double row.

COLOR, a pale and pleasing reddish brown, semitransparent, darker in the stem.

SUBSTANCE, membranaceous, but tough.

Obs. *Sertularia quadridentata* and *anguina* are found upon this *Fucus*:—in drying it does not adhere to paper.

There is something in this *Fucus* very peculiar and unlike all others: in shape and general appearance it approaches most to some of the narrow varieties of *F. ciliatus*, or to the larger ones of *F. corneus*; in substance it rather resembles *F. rubens*, and in its fruit and texture shews an affinity scarcely to be expected to *F. amphibius*. Little doubt can, however, be entertained but that, besides the capsules here figured, it also produces spherical ones; thus completely agreeing in point of fructification with *F. dentatus*, which is likewise of nearly the same color, and has a similar obsolete midrib at the base. The regularly fimbriated margins of the frond constitute the most striking character of the species before us, and Mr. Brown's original name derived from these is so appropriate, that I have felt no hesitation about adopting it; entertaining, as I do, not the smallest doubt but that the plant previously so called by Desfontaines in the *Flora Atlantica* is nothing more than a small specimen of the Linnæan *F. discors*.

- a. *F. fimbriatus*, natural size.
 b. part of a branch, magnified - - - 6.
 c. one of the cilia, with capsule - - - 2.



Fucus fimbriatus.



Fucus cactoides.

Fucus, caule terete, filiformi, fistuloso, prostrato, repente: ramis sparsis, erectis, teretibus, fistulosis, undique oblectis ramulis imbricatis, erecto-patulis, elliptico-obovatis, inflatis.

Habitat in Australibus Novæ Hollandiæ oris. *D. Brown.*

Perennis.

RADIX e caule repente hîc illic orta, lutescens, teretiuscula, primùm simplex pennæque corvinæ crassitie, mox in fibras divisa plurimas, tenuissimas, variè ramosas, pollicem et ultrà longas.

FRONS, caule instructa prostrato, repente, palmari, aut forsan multo longiore, semper, quantum ego vidi, indiviso, terete, fistuloso, atque filiformi, sed per desiccationem enormitèr longitudinalitèr sulcato neque postea in pristinam revocando figuram, pennâ olorinâ crassiore, e parte inferiore radices e superiore ramos emittente, cætera nudo; *rami* sparsi, intervallis nunc pollicem nunc vix lineam longis sejuncti, erecti, semipedales, caule aliquantùm tenuiores, teretes, fistulosi, atque filiformes, sed, caulis instar, per desiccationem collapsi et prætereà per totam longitudinem ordine certo annulatim constricti, ut toti constare videantur ex articulis sub-quadratis sibi invicem impositis singulis circitèr lineam longis, hi indivisi, illi apicem versus bifurci, aut ramum unum alterumve brevem lateralem emittentes, omnes ad pollicis sesquipollicisve altitudinem nudi, exinde densè obsiti *ramulis* (*folia vesiculasve*, si mavis, odicas) homogeneis, undique imbricatis, patentibus, elliptico-obovatis, inflatis (per desiccationem tamen rugulosis et planis, utroque pariete alteri tenacissimè adhærente) longitudine unguem diametro duas lineas æquantibus, intùs cavis et vacuis.

FRUCTIFICATIO hactenus latet.

COLOR radicis, caulis, et ramorum, quâ cauli sunt proximi, stramineus, ramulorum extrinsecùs intensè gramineo-viridis, intùs albellus:—tota planta Soli objecta albescit.

SUBSTANTIA caulis atque ramorum cartilaginea, crassa, dura, et tenax, ut vel exsiccati figuram fistulosam servant; ramulorum cartilagineo-membranacea atque tenuis; totius stirpis exsiccatæ firma, rigidiuscula, et fragilis.

Obs. Per desiccationem nitet, quasi vernice oblita, et chartæ nequaquam adhæret:—ramuli crustâ sordidè albicante calcareâ obducti non rarò reperiuntur.

In primo hujus operis tomo sex describuntur Fucorum species *F. cactoidi* huic nostro verè congeneres, quarum de naturâ fusiùs paullo sub *F. pinnato* disserui; id me persuasissimum habere prædicans, familiam a reliquis distinctissimam mox fore ex his constituendam, quum Algæ demùm aquaticæ in nova, uti res postulat, genera dispertientur. Idem quoque antea* fuerat animadversum a Botanico Gallico acutissimo, Lamourouxio, qui nuperrimè, in opere, cui titulus *Journal† de Botanique*, suas de hâc re observationes publici juris fecit, additis specierum sibi cognitarum enumeratione atque descriptionibus. Indidit ille huic generi *Caulerpa* nomen, characterem his verbis definiens;

“SUBSTANTIA sub opaca, absque organisatione, armato etsi oculo.

“FRUCTIFICATIO ignota.

“CAULIS horizontalis, repens, subfistulosus, ramosus, interdum simplex.”

Subjecit hujus characteris calci analysin *Caulerparum* suarum chemicam, et simul multa optimè de illis observata, quæ omnia hîc prætereo, utpote non verè hujus loci, sed rectiùs ad illam nostri operis partem pertinentia, ubi de Algis submersis erit in genere dicendum. Satis sit in præsentî de stirpe quam tractamus loqui. Hanc neque Lamourouxius neque alius quispiam, quod scio, de plantis scriptor memoravit, sed in Novâ Hollandiâ primus et solus detexit *D. Brown*, cujus ego benevolentia acceptam refero. Ille, mecum faciens esse e Fucorum numero excludendam et in novam recipiendam genus, titulo specifico *Opuntiam* appellare voluit. Aptissimum quidem hoc nomen, quod mox latus reponam, coactus nunc rejicere, quia alia jamjam planta est ita dicta, diversissimæ illa a *F. cactoidi* familiæ, sed sub eadem in præsens militans. A congeneribus omnibus *F. cactoides* eo usque discrepat, ut verba modò prodigeret quisquis ad dignoscendum plus quàm quod in characterè includitur specifico diceret.

a. *F. cactoides*, magn. nat.

* Conf. Weberi et Mohrii opus, cui titulus, *Beiträge zur Naturkunde*. I. p. 313.

† II. p. 136.

Fucus cactoides, stem cylindrical, filiform, fistulous, prostrate, creeping: branches scattered, erect, cylindrical, fistulous, covered all over with imbricated, patent, inflated ramuli, of a shape between elliptical and obovate.

On the southern coast of New Holland. *Mr. Brown.*

Perennial.

ROOTS, issuing here and there from the creeping stem, yellowish, sub-cylindrical, simple and as thick as a crow's quill at their origin, but soon divided into numerous very thin branching fibres an inch or more long.

FROND, furnished with a prostrate creeping stem, four inches, or probably much more, in length, always, as far as I have seen, undivided, cylindrical, tubular, and filiform, but becoming, from drying, longitudinally sulcated, and never afterwards recovering their former appearance, thicker than a swan's quill, throwing out roots from their under and branches from their upper side, in other respects naked; branches scattered, standing sometimes an inch sometimes scarcely a line from each other, erect, half a foot long, somewhat thinner than the stem, cylindrical, tubular, and filiform, but, like the stem, collapsing here and there from drying, and, moreover, regularly marked throughout their whole length with annular contractions, so as to look as if they were composed of a series of squarish joints standing upon one another, each about two lines long; of the branches, some are undivided, others near the apices are forked, or throw out one or two short lateral shoots, all of them are naked to the height of an inch or an inch and half, after which they are thickly clothed with ramuli (or they might with equal propriety be called leaves or vesicles) of the same substance and nature as themselves, imbricated on all sides, patent, of a form between elliptical and obovate, tubular, and inflated, when fresh, but from drying becoming wrinkled and flat, the two sides then adhering firmly to each other, half an inch long, two lines wide, internally hollow and empty.

FRUCTIFICATION, at present unknown.

COLOR, in the root, the stem, and that part of the branches which is nearest the stem, a pale greenish yellow, in the upper part of the branches and in the ramuli dark grass-green externally, but whitish within: if exposed to the sun, the whole plant turns to a horny white.

SUBSTANCE, cartilaginous, thick, hard, and tough in the stem and branches, so that, even when dried, they preserve their tubular form; in the ramuli thin, and between cartilaginous and membranaceous: from drying the whole plant becomes rigid and brittle.

OBS. When dried, it shines as if varnished, and does not in the least adhere to paper:—the ramuli are not uncommonly found covered with a dirty whitish calcareous incrustation.

Of the same tribe, to which the fucus here figured belongs, six species have already been introduced in the first volume of this work, where, under *F. pinnatus*, it was particularly remarked that, in any future distribution of the submersed algæ into new genera, these plants cannot fail to constitute a most distinct and interesting family. The same observation had previously* been made by a very acute French naturalist, M. Lamouroux, who has since that time published in the *Journal de Botanique*† his opinions upon the subject, together with an enumeration and description of the species known to him, and has given to this genus the name of *Caulerpa*,‡ defining it by the following character;

“SUBSTANTIA subopaca, absque organisatione, armato etsi oculo.

“FRUCTIFICATIO ignota.

“CAULIS horizontalis, repens, subfistulosus, ramosus, interdum simplex.”

M. Lamouroux has added to this character a chemical analysis of the *Caulerpa*, and many interesting particulars respecting them, all which belong more properly to that part of my work in which I intend to treat of the Fuci in general. It is sufficient here to confine myself to the plant before us, which was unknown to that author, and has been equally so, as far as I can find, to every other writer upon the subject. Mr. Brown, to whom I am indebted for it, had called it by the specific name of *Opuntia*, which I shall gladly restore hereafter, and should now willingly have retained, had there not already been known by the same appellation a plant included with the present in the mass of Fuci, though belonging to a most different family. Such being the case, I have, to follow the intention of my friend and at the same time avoid confusion, named this plant *F. cactoides*. It is so unlike all others that it is needless to say a word upon the means of distinguishing it from them.

a. *F. cactoides*, natural size.

* See *Weber and Mohr's Beiträge zur Naturkunde*. I. p. 318.

† II. p. 156.

‡ Derived from *καυλος caulis* & *εἶσα ἕρπον*.

Fucus, caule terete, filiformi, fistuloso, prostrato, repente: ramis sparsis, erectis, teretibus, fistulosis, undique obtectis ramulis approximatis, horizontalibus, sub-globosis, inflatis, siccitate fornicatis.

Fucus sedoides. Brown, MSS.

F. uvari. LINN. *Syst. Nat.* II. p. 714?

HABITAT apud Insulas, "Kent's islands" dictas, juxta novam Hollandiam. D. Brown.

Perennis.

RADIX hic illic e caule repente orta, lutescens, teretiuscula, primùm simplex, at pennâ quavis passerinâ multoties tenuior, mox in fibras plurimas lutescentes ramosas unguem et ultrâ longas enormitèr divisa.

FRONS caule instructa prostrato, repente, propemodùm spithamæo, terete, per desiccationem tamen compresso et longitudinalitèr sulcato, filiformi, Merulæ pennæ crassitie, (fistuloso?) nunc indiviso, nunc semel iterùmve vagè bifurco, intervallis haud æquis emittente e parte inferiore radices, e superiore ramos, cætera nudo; *rami* erecti, sparsi, ni approximati, illi remoti, ut intervallum nunc vix bilineare, nunc totidem pollices longum, inter singulos intersit, sesquipollicares, caulis instar teretes, (nisi exsiccati quum rugosi et longitudinalitèr sulcati fiunt,) filiformesque, et illo aliquantùm tenuiores, rariùs indivisi, plerumque semel iterùmve dichotomi, aut duos tresve ramos breves laterales subfastigiatos emittentes, omnes ipsam juxta basin nudi, sed exinde undique densè obsiti *ramulis* (folia vesiculasve si mavis dicas) homogeneis, imbricatis, horizontalibus, sub-globosis, vel oblongo-globosis, sessilibus, inflatis, diametro lineam subæquantibus, intùs cavis et vacuis: ramuli per desiccationem rugosi fiunt, et fornicati, unoque pariete alteri tenacissimè adhærente, e membranâ modò simplice constare videntur.

FRUCTIFICATIO nulla hactenus detecta.

COLOR in caule stramineus; in *ramis* nunc idem, nunc ita intensè viridis ut propemodùm nigrescat; in *ramulis* gramineo-viridis et diaphanus; *exsiccatæ* nitens, quasi vernice oblitus; *murrescentis* vel *Soli objectæ* albus.

SUBSTANTIA membranacea, tenuissima, et tenerrima; *madentis* lenta et flexilis; *exsiccatæ* fragilis.

OBS. Planta ne minimum in se viscidè habens per desiccationem chartæ non adhæret:—semel exsiccatâ hic illic contrahitur, et enormitèr fit rugosa, neque unquam iterùm madefacta in pristinam redit formam.

Quamquam nulla ferè est, ut mihi videtur, dubitatio, quin *Fucus* in hâc tabulâ depictus revera sit idem quem sub *F. uvari* nomine describere in animo habuit Linnæus, nihilo tamen minus, cum non desint Botanici quibus scrupuli quidam de hâc re hærent, tutissimum fore duxi, si synonymum Linnæanum interrogationis signo subjecto citarem, neque eodè nomine plantam hanc nostram nuncuparem. Hanc igitur ob causam titulum ego hic servavi specificum quem huic stirpi inditum voluit D. Brown, cujus benevolentia mea exemplaria accepta refero. Eodem olim appellarant viri optimi, Goodenovius Woodwardiusque, quandam e varietatibus *F. ovalis*; inter quam, (singulare quidem hoc,) et *F. sedoidem* nostrum talis intercedit quoad formam similitudo, qualis efficit ut in utroque describendo necesse sit iisdem ferè verbis uti. Hinc facile duceretur aliquis, cui plantas ipsas videndi facultas defuit, ut crederet vix esse pro distinctis habendas species; quod contra nullo modo fieri potest ut sub eodem manere genere in posterum sine-pressurâ exsiccentur, rugosi concavique fiant, eodem ferè modo quo illi *F. sedifolii*, sed longè minùs certò ad normam. Utraque harum plantarum *F. sedifolii* nomen accepisse videtur quia *Sedo dasyphylo* similis est habita; jure quidem hoc; sed jure pari eundem etiam titulum stirpi diversissimæ, et quæ revera nihil est aliud nisi *F. ericifolii* varietas, in *Florâ Atlanticâ* imposuit cl. Desfontainesius, propter ramulos formâ referentes *Sedi reflexi*, (rectiùs me judice dixisset *Sedi sexangularis*,) folia.

a. *F. sedoides*, magn. nat.

b. *rami pars*, magn. auct.

G.

Fucus sedoides, stem cylindrical, filiform, fistulous, prostrate, creeping: branches erect, cylindrical, fistulous, covered all over with horizontal, nearly spherical, inflated ramuli, standing close together, becoming vaulted from drying.

Fucus sedoides. BROWN, MSS.

F. varius. LINN. *Syst. Nat.* II. p. 714?

At Kent's islands, near New Holland. Mr. Brown.

Perennial.

ROOTS, originating in different places without order from the creeping stem, yellowish, nearly cylindrical, simple at first and many times more thin than a sparrow's quill, but soon irregularly divided into numerous yellowish branching fibres half an inch or more in length.

FROND, furnished with a prostrate, creeping stem, nearly a span long, cylindrical, but becoming from drying compressed and longitudinally sulcated, filiform, as thick as a blackbird's quill, apparently fistulous,* undivided in some specimens, in others once or twice forked without any certain order at irregular intervals, throwing out roots from its upper and branches from its under surface, in other respects naked; branches erect, scattered, some standing close together, others at considerable distances, so that between those there is a space of not above two lines while these are separated by an interval of as many inches, an inch and half long, cylindrical, except that when dried they become like the stem wrinkled and longitudinally furrowed, filiform, somewhat more thin than the stem, occasionally, though rarely, undivided, more commonly once or twice dichotomous, or furnished with two or three short lateral branches of nearly equal height, the whole of them naked in the part immediately adjoining the stem, but afterwards closely beset on all sides with ramuli, (or they might with equal propriety be called leaves or vesicles) of the same nature and texture as the branches, imbricated, horizontal, of a form between oblong and globular, sessile, inflated, about a line in diameter, internally empty: from drying the two sides adhere so closely together that the ramuli seem to be composed only of a single membrane, and they then become wrinkled, and are hollow, and cup-shaped.

FRUCTIFICATION, at present unknown.

COLOR, pale yellowish in the stem; in the branches sometimes the same, and sometimes so deep a green as to be almost black; grass-green in the ramuli; everywhere transparent, and shining when dried, as if varnished: from exposure to the sun, or in a state of decay, the whole plant turns white.

SUBSTANCE, membranaceous, extremely thin and tender, flexible when moist, but brittle after it is dried.

OBS. There is nothing whatever viscid or glutinous in the texture of this plant, so that, in drying, it does not adhere to paper:—when the stem and ramuli have once become contracted and wrinkled, they never afterwards recover their natural cylindricality.

The *Fucus* figured in the present plate I have reason to suppose to be the same as was really intended by Linnæus under the appellation of *F. varius*; but, nevertheless, as the matter may appear to others to admit of some doubt, and as I do not feel myself altogether satisfied upon the subject, I have thought it best to quote his synonym with a mark of hesitation, and to preserve to the plant before us the specific name given it by Mr. Brown, to whom I have to acknowledge myself indebted for my specimens. The same name had been previously applied by Dr. Goodenough and Mr. Woodward to one of the varying appearances of *F. ovalis*, a *Fucus* so closely resembling the present in form, that a botanist, who had never seen them, might, from the description of the two, be led to think there were scarcely sufficient characters between them to keep them distinct as species, though they belong in reality to widely different genera. What is likely to increase the perplexity is the circumstance of *F. ovalis* turning in decay to green, and its having its ramuli, if dried without pressure, become concave in nearly the same manner as those of *F. sedoides*, though much less regularly. The substance of the two is indeed widely dissimilar, and the mode of growth not less so. To both these plants the name of *F. sedoides* appears to have been given chiefly with a reference to *Sedum dasyphyllum*, but M. Desfontaines has, in his *Flora Atlantica*, with no less justice called a variety of *F. ericoides* by the same appellation, comparing its ramuli with the leaves of *Sedum reflexum*, or, more properly, of *Sedum sexangulare*.

a. *F. sedoides*, natural size.

b. part of a branch, magnified - - - 6.

* Of this I cannot speak with certainty never having seen the plant recent.



Fucus sedoides.

Fucus, caule terete, filiformi, solido, prostrato, squamuloso: ramis sparsis, erectis, teretibus, solidis, aliis minoribus vagè pinnatis; omnibus undique obtectis ramulis densè imbricatis, erecto-patentibus, teretibus, subulatis.

Fucus hypnoides. BROWN, MSS.

HABITAT apud Insulas, "Kent's islands" dictas, prope Novam Hollandiam. D. Brown.

Perennis.

RADIX a me nondùm visa.

FRONS caule instructa prostrato, terete, pennæ anserinæ crassitie, et, quantum ego vidi, filiformi, sed an hoc ita sit necne, et paritèr an indivisus an dichotomus, et ad quantam excurrat longitudinem, prorsùs nescio, cùm nihil nisi stirpium majorum fragmenta viderim; ramos certè caulis hìc illic emittit, cætera nudus, præter squamas aliquot perbreves, exiguas, horizontales, apice truncato spinulis plurimis minutissimis armatas; rami erecti, pedales vel sesquipedales, caulis instar, teretes, pennam basi anserinam minorem, apice vix merulinam æquantes, nunc indivisi, nunc semel iterùmve vagè bifurci, semper ab exiguo a basi intervallo ad apices usque pinnati ramis minoribus, homogeneis, distichis, horizontalitèr patulis, his alternis, illis oppositis, intervallo inter singulos vix unius lineæ, omnibus simplicibus, circiter sesquipollicem longis, et, nisi quòd minores sint, primariorum prorsùs similibus, quorum instar ubique per totam longitudinem sunt obsiti ramulis erecto-patentibus, laxiusculè imbricatis, indivisis, teretibus, vix lineam longis, et filo emporetico tenuioribus: his in ramulis maculæ quædam exiguæ subrotundæ interdùm conspiciuntur, quas tamen nihil cum fructu commune habere suspicor.

FRUCTIFICATIO nulla hucusque detecta.

COLOR ancènè gramineus; *marcescentis* fusco tinctus, et *Soli diu objectæ* vel *in aquâ dulci servatæ* albicans.

SUBSTANTIA caulis ramorumque cartilagineo-cornea, dura, crassa, tenax, ramulorum membranacea, attamen haud ita tenuis, *totius stirpis madefactæ* lenta atque flaccida, *exsiccata* rigidiuscula fragilisque.

Obs. Planta ne minimum in se viscidì succosive habens per desiccationem chartæ nequaquam adhæret.

Qualiscunque sit illa, in quâ adhuc versamur, ignorantia de *F. hypnoidis* hujus nostri radice, quæ certissimum suppeditat *Caulerparum* Lamourouxii characterem, non tamen hoc, me judice, prohibebit, quo minùs quivis Botanicus, hâc stirpe semel visâ, harum plantarum numero inseri jubeat, omniumque in præsens detectarum facilè pulcherrimam elegantissimamque salutet. Structurâ quoque gaudet *F. hypnoides* magis multiplice quàm congeneres, quos omninò sine organisatione prædicat Lamourouxius, hoc inter generis notas maximè essentielles recensens; habet enim frondem, quæ intùs fibrarum reticulatarum congerie manifestè est instructa, et quæ extrinsecùs plurimis est in caule squamulis obsita, quarum nihil alibi simile inter Fucos existere scio; quoniam fieri nullo modo potest ob harum formam ut sint ramulorum recentium rudimenta, aut diffractorum, sicut illæ *F. squamulosi*, reliquiæ. Primus et, quantum scio, solus hunc Fucum detexit D. Brown, a nullo antea auctore memoratum.

a. <i>F. hypnoides</i> , magn. nat.					
b. <i>ramus</i> , magn. auct.	-	-	-	-	6.
c. <i>ramulus</i>	-	-	-	-	3.
d. <i>caulis horizontalitèr dissectus</i>	-	-	-	-	3.
e. <i>ejusdem pars</i>	-	-	-	-	1.

Fucus hypnoïdes, stem cylindrical, filiform, solid, prostrate, scaly: branches scattered, erect, cylindrical, solid, irregularly pinnated with other smaller ones, the whole of them covered all over with closely imbricated, erecto-patent, cylindrical, subulate ramuli.

Fucus hypnoïdes. BROWN, MSS.

At Kent's islands near New Holland. Mr. Brown.

Perennial.

ROOT, I have not yet seen.

FROND, furnished with a prostrate, cylindrical stem, as thick as a small goose-quill, and, as far as I have seen, filiform, but, having myself met with only fragments of large plants, I am unable to say whether this is always the case, and also to what length the stem extends, and whether it is undivided or not; it certainly throws out branches here and there, and is, apparently, in other respects naked, excepting a few very short and small horizontal scales, of a cylindrical shape, tipped at their points with numerous extremely minute spines; branches erect, a foot or a foot and half long, cylindrical like the stem, as thick at their base as a small goose-quill, but not larger at their apices than a blackbird's quill, some undivided, others once or twice irregularly forked, all of them pinnated from a small distance from their base to their summits with a series of smaller branches of the same nature and substance as themselves, distichous, between horizontal and patent, either opposite or alternate, separated from each other by intervals of scarcely a line each, all simple, about an inch and half long, and, except in their smaller size, precisely resembling the primary ones, like which they are throughout their whole length beset with ramuli standing in a direction between erect and patent, rather loosely imbricated, undivided, cylindrical, scarcely a line long, and thinner than packthread:—in these ramuli some small roundish spots are occasionally observable, which, however, I regard as having no connection with the fruit, and therefore do not hesitate to consider the

FRUCTIFICATION, as at present unknown.

COLOR, a pleasing grass-green, taking a brownish tinge when approaching to decay, and turning to white from exposure to the air, or from being long kept in fresh water.

SUBSTANCE, between cartilaginous and horny, hard, thick, and tough, in the stem and branches; in the ramuli membranaceous, but not very thin; in the whole plant, when moist, flexible and flaccid, but, when dried, stiff and rather brittle.

OBS. There is not in the nature of this plant the least viscosity or moisture, so that in drying it does not adhere at all to paper.

Ignorant as we are at present of the roots of the plant before us, there can still, I think, be no doubt in the mind of any botanist, but that it belongs to the family of *Algæ* called by Lamouroux *Caulerpa*; nor will any one, in my opinion, hesitate about assigning to it by far the first place for elegance and beauty among such of this family as we are at present acquainted with. Its structure also is much more complicated than that of its congeners, the internal part of the stem being evidently formed of a reticulated mass of jointed fibres, while the exterior is beset with a number of scales, to which I know nothing analogous among the Fuci; it being impossible, from their form, that they should either be the rudiments of new ramuli, or the remains of old ones, like those of *F. squamulosus*. We are entirely indebted to Mr. Brown for this interesting addition to our catalogue of Fuci.

a. <i>F. hypnoïdes</i> , natural size.					
b. branch, magnified	-	-	-	-	6.
c. ramulus	-	-	-	-	3.
d. horizontal section of the stem	-	-	-	-	3.
e. part of the same	-	-	-	-	1.



Fucus hypnoides.

q' d' 1'

Fucus, caule terete, filiformi, fistuloso, prostrato, repente; ramis erectis, basi teretibus fistulosis nudisque, mox planis, linearibus, atque pinnatis ramulis planis, erecto-patentibus, lenitè falcatis, approximatis, oblongo-linearibus, obtusis, integerrimis.

Fucus scalpelliformis. *Brown, MSS.*

Habitat in Meridionalibus Novæ Hollandiæ oris. *D. Brown.*

Perennis.

RADIX hîc illic e caule repente orta, fibrosa, lutescens, primùm simplex teres et pennæ passerinæ crassitie, mox in fibras plurimas ramosas unguem et ultrâ longas enormitèr divisa.

FRONS instructa caule prostrato, repente, tri- quadri- pollicari, (aut forsan multo longiore, integrum enim nunquam vidi,) fistuloso, terete, nisi quòd per desiccationem longitudinalitèr fiat rugosus neque formam pristinam unquam postea madefactus recuperet, filiformi, Merulæ pennæ crassitie, e parte inferiore radices, e superiore ramos emittente, cætera nudo: rami erecti, sparsi, intervallis incertissimis sejuncti, quadripollicares vel semipedales, indivisi, teretes atque nudi ad pollicis altitudinem assurgentes, eandemque ibi ferè habentes crassitiem quam caulis, cujus omninò sunt similes, exinde fiunt plani, circiter lineam lati, lineares, et utrinque obsiti ramulis, qui tamen ita eorum pars esse videntur ut ramos potius pinnatifidos quàm pinnatos dicas; ramuli distichi, patentès, approximati, plani, nervi venarumque expertes, scalpelliformes, oblongi, obtusi, duas tresve lineas longi, et circiter semilineam lati, margine integerrimi.

FRUCTIFICATIO hactenus latet.

COLOR amènè gramineo-viridis, sub-diaphanus, in caule et in ramorum parte inferiore stramineus; citò albescens, si stirps in aquâ servetur dulci aut Soli objiciatur.

SUBSTANTIA caulis ramorumque quâ basi proximi dura rigida sub-cornea, alibi membranacea atque tenuissima.

Obs. Rami atque ramorum pars inferior lineis aliquot parallelis, tenuissimis, nigricantibus striati conspiciuntur:— planta per desiccationem chartæ non adhæret.

Sicut Lamourouxii *Caulerpa* cum *Ulvis Zonarîusque* quodammodò connectit *F. Ophioglossum* jam in hoc opere depictus, locum ferè medium inter hæc genera occupans, et formâ frondis *Ulvas*, *Caulerpa* verò naturâ suâ cauleque repente referens; ita etiam *Fucum Ophioglossum* reliquis suæ familiæ speciebus adjungit ille quem in hâc tabulâ exhibemus *Fucus*, cui substantia est e membranâ simplice tenui constans, sed frondis forma propior illi *F. pinnati* et cæterorum affinium. Notabilis quoque est hæc species, in hoc etiam *F. Ophioglossi* similis, quòd frondem habeat lineolis obscuris striatam; nequaquàm tamen ostendit structuram sub lente reticulatam. Paucissima modò legit *D. Brown* exemplaria *F. scalpelliformis*, quem in nullo alio hactenus vidi phytophylacio. Immemoratum etiam reliquisse videntur Lamourouxius aliique de *Algis submersis* scriptores. Frons figurâ insignitèr refert quosdam e *Fissidentibus* Hedwigianis.

a. *F. scalpelliformis*, magni. nat.

Fucus scalpelliformis, frond cylindrical, filiform, fistulous, prostrate, creeping: branches erect, cylindrical, fistulous and naked at their base, afterwards flat, linear, and pinnated with flat, erecto-patent, slightly falcated, oblongo-linear, obtuse, entire ramuli, placed close to each other.

Fucus scalpelliformis. BROWN, MSS.

On the southern coast of New Holland. Mr. Brown.

Perennial.

ROOT, originating here and there from the creeping stem, fibrous, yellowish, at its origin simple cylindrical and as thick as a sparrow's quill, but soon becoming irregularly divided into numerous branching fibres half an inch or more long.

FROND, furnished with a prostrate, creeping stem, three or four inches in length, or possibly much longer, for I have never seen it entire, fistulous, cylindrical, except that from drying it becomes longitudinally wrinkled, after which it never again recovers its original appearance from any subsequent immersion, filiform, of the thickness of a blackbird's quill, throwing out roots from its lower and branches from its upper side, in other respects naked; branches erect, scattered at very irregular intervals, from four inches to half a foot high, undivided, for the first inch from the base naked and cylindrical, and entirely resembling the stem, then becoming flat, about a line wide, linear, and pinnated on both sides with ramuli, which, however, so exactly resemble the branches in their nature and texture, that these latter might perhaps more properly be called pinnatifid than pinnated; the ramuli are distichous, patent, placed close to each other, flat, destitute of veins or midrib, oblong, obtuse, slightly curved, two or three lines long, and about half a line wide, quite entire at their margins.

FRUCTIFICATION, at present unknown.

COLOR, pale yellowish in the stem, and in the lower and cylindrical part of the branches, in the other parts of the plant a pleasing semi-transparent grass-green, turning white from exposure to the sun, or from being kept in fresh water.

SUBSTANCE, of the stem, and of the branches where they join the stem, hard, rigid, and rather horny, in other parts membranaceous and extremely thin.

OBS. In the branches, and at the base of the ramuli, are observable a few parallel, blackish, very thin lines, running in a longitudinal direction:—on drying, the plant does not adhere at all to paper.

In like manner as *F. Ophioglossum*, already figured in this work, shews in the form of its frond the transition of the *Caulerpæ* to the *Ulvæ* or *Zonariæ*, so the subject of the present plate is a curious link of connection between that species and the remainder of the same interesting family; agreeing with these latter in its shape and mode of growth, but with the former in being composed only of a single membrane. It is remarkable too for being, like *F. Ophioglossum*, streaked with a few dark lines; but it wholly wants the reticulated structure of that plant. The number of specimens of *F. scalpelliformis* found by Mr. Brown was very small, and I have never seen it in any other collection, nor do I find it mentioned by M. Lamouroux or any writer upon the subject. The resemblance of its frond in shape to some of the individuals of the Hedwigian genus, *Fissidens*, is very remarkable.

a. *F. scalpelliformis*, natural size.



Fucus scalpelliformis.

Fucus, fronde teretiusculâ, filiformi, simplice, vel ramo uno alterove sparso brevi instructâ, apicibus obtusis incrassatisque; totâ compactâ ex utriculis oblongo-clavatis, inflatis, horizontalibus, per filamenta capillaria tubulosa ramosa densissimè intertextis.

HABITAT apud Insulas "Kent's Islands" dictas prope Novam Hollandiam. *D. Brown.*

Perennis.

RADIX a me nondùm visa.

FRONS teres, filiformis, pennæ anserinæ majoris crassitie, sub-pedalis, erecta, stricta, nunc prorsùs simplex, nunc semel iterùmve vagè dichotoma, et nunc, quod quidem sæpiùs accidit, indivisa, sed ramo uno alterove sparso, simplice, erecto-patente, caulis omnimodis simili, vix pollicem longo, instructa; apices ubique obtusissimi, et lenitèr incrassati;—frondis totius epidermis, oculo etiam inermi spectata, cooperta videtur papillis exiguis sphæricis, siccitate depressis concavisque: dissecta et lenti subjecta frons tota constare reperitur e congerie filamentorum capillaceorum, arctissimè implexorum, e quibus oriuntur utriculi homogenei, oblongo-claviformes, haud semilineam lati, horizontalitèr semper positi, apicibus incrassatis attingentibus frondis superficiem, quæ, ita sibi invicem densissimè incumbunt, nihil est nisi horum congeries.

FRUCTIFICATIO hactenus latet.

COLOR dilutè gramineus; *exsiccata* atro-virens, et nitens, quasi vernice oblitus; *in aquâ dulci diu servata* pallidior atque demùm sordidè albicans.

SUBSTANTIA tenuis, membranacea; *madefacta* lenta et debilis; *exsiccata* fragilis.

OBS. Frons per desiccationem plana facta, si luci objiciatur, juxta basin, ubi color sæpe deficit, primo aspectu constare videtur e costâ crassâ nigricante papillis pellucidis obsessâ: chartæ nequaquam adhæret.

Incrementa, quæ per peregrinatorum industriam indies ferè capit nostra Historiæ Naturalis cognitio, efficiunt ut in nominibus, quæ cuivis individuo bene convenient, seligendis non tenuis sit labor. Nullibi hoc magis quàm in Regno Vegetabili valet, et necessariè præsertim in iis generibus maximâ specierum copiâ scatentibus. Hæc inter emicat *Fucus*, qui, sicut in præsens constituitur, haud mediocrem Algarum submersarum partem in se unus capit, multarum non bene junctarum familiarum discordia semina includens. Dubitari nequit, uti jam sæpe in hoc opere memoratur, quin hæc familiæ posthac segregentur, neque ulla meliore jure vindicat sibi locum generis distincti quàm illa quæ Olivio *Lamarckia** audiit, ad quam stirps hic depicta atinet. Hoc cum ita sit, nullam aliam de nomine huic indendo curam adhibui, nisi ut talis delectum facerem, quale a congeneribus suis solis, *F. tomentosus* et *F. Bursâ*, hoc sphærico, illo nunquam non dichotomo, statim dignosceret; parùm sollicitus annon inter illas plantas quæ nunc appellantur *Fuci* una sit aut altera cui idem paritèr quadraret titulus. Scrupuli mihi adhuc restabant dum *F. tomentosum* describerem, utrùm *F. simpliciusculus* hic noster rectiùs Olivii *Lamarckius* aut Lamourouxii *Caulerpi* associaretur. Has quidem texturâ et facie externâ potissimùm refert, quippe quibus omnibus idem est color, superficies eadem nitida, eademque substantia inter Algas submersas et Zoophyta ambigens, propiùsque his quàm illis accedens. Hoc insignitèr de iis valet exemplaribus, quæ Soli diu exposita tempestatumque mutationes perpessa colorem nativum viridem mutaverunt albo corneum simulante. Insuper his nihil ostendit *F. simpliciusculus* superficièi illius mollis velutinæve per quam alteræ illæ duæ *Lamarckie* species dignoscuntur. E contrario tota est papillis exiguis muriculata. Structura tamen interior prohibuit quominùs *Caulerpi* adjungerem; fierique forsam potest ut facies papillosa e casu modò pendeat, plantæ læsæ superficie tomentosâ detritâ. Haudquaquam autem est inficiandum eandem ostendisse faciem omnia exemplaria a *D. Brown* reportata, cui uni debemus quòd singularis hæc stirps Botanicis innotuerit. Radice quoque hæc omnia caruerunt; infaustum id, quoniam radix maximi est in *Caulerpi* distinguendis momenti, atque ea *F. tomentosus* a reliquis *Fucis* abhorret.

- | | | | | | | | |
|-------------------------------------------|---|---|---|---|---|---|----|
| a. <i>F. simpliciusculus</i> , magn. nat. | - | - | - | - | - | - | 6. |
| b. <i>rami pars</i> , magn. auct. | - | - | - | - | - | - | 3. |
| c. <i>ejusdem dissecti portio</i> | - | - | - | - | - | - | 3. |

* De hujus generis caractere vide quæ sunt dicta sub *F. tomentosus*, III. p. 4.

Fucus simpliciusculus, frond cylindrical, filiform, simple, or furnished with one or two short scattered branches, their apices obtuse, the whole consisting of oblongo-clavate, inflated, horizontal vesicles, most closely matted together by capillary, tubular, branching filaments.

At Kent's Islands on the coast of New Holland. *Mr. Brown.*

Perennial.

ROOT, I have not yet seen.

FROND, cylindrical, filiform, as thick as a large goose-quill, nearly a foot long, erect, straight, some specimens perfectly simple, others once or twice regularly dichotomous, and again others, which indeed is most common, undivided, but beset with one or two scattered simple branches, scarcely an inch long, between erect and patent, and altogether resembling the leading stem; the ends of all are very obtuse and slightly incrassated; the epidermis of the whole frond appears, even to the naked eye, covered all over with minute spherical papillæ, which from drying become flattened and concave; if dissected and examined under a microscope, the frond is found to consist entirely of a mass of capillary filaments, very closely interwoven together, out of which arise numerous small vesicles of the same nature and substance as the fibres, not half a line long, of a shape between oblong and clavate, always placed horizontally with their larger end pointing to the surface of the frond, which, from their being so closely imbricated, appears to be merely composed of a quantity of them.

FRUCTIFICATION, at present undiscovered.

COLOR, a pale grass-green, turning to a blackish green from drying, and then glossy, as if varnished; but, if long kept in fresh water, fading to a dirty white.

SUBSTANCE, thin, membranaceous, flexible and flaccid when moist, but brittle after it is dried.

Obs. After the frond is flattened by drying, it appears, if held to the light, in those places where the color has faded, to consist of a thick blackish midrib, beset all over with pellucid papillæ:—the plant does not in the least adhere to paper.

Considering it as admitting of no doubt that the tribe* of Algæ described by Olivi under the name of *Lamarkia* will hereafter be allowed to retain its place as a distinct genus, I have, in fixing upon a specific appellation for the present interesting addition to that remarkable family, been guided only by the wish to select such an one, as might readily distinguish it from either the dichotomous ramification of *F. tomentosus* or the spherical shape of *F. Bursa*, without being deterred by the reflection that, among the heterogeneous mass of plants at present indiscriminately called *Fuci*, there may be many to which the same may be equally or even more correctly applicable. While writing the account of the former of these species, I was still doubtful how far *F. simpliciusculus* really belonged to this family, and whether it would not more properly be ranked with the *Caulerpæ* of Lamouroux, which in its texture and external appearance it far more closely resembles; having the same color, the same glossy surface, and the same substance intermediate between the submersed Algæ and the Zoophytes, or even partaking, apparently, rather of the nature of the latter than of the former. Such is particularly the case in those specimens, of which the frond has, from exposure to the air, turned to a horny white; and, in addition to this, there is in *F. simpliciusculus* nothing of the soft velvety exterior that distinguishes the two other *Lamarkie*; but the whole, as mentioned in the description, is completely papillose. I have, nevertheless, felt no hesitation in classing it among them, on account of its internal structure, nor do I consider it as impossible that the instance of dissimilarity last adduced may be merely the effect of accident; though it is equally visible in all the specimens brought home by Mr. Brown, to whom we owe our knowledge of this plant. The absence of a root to the whole of these is peculiarly to be regretted; it being so leading a character of the *Caulerpæ*, and so remarkable also in *F. tomentosus*.

- a. *F. simpliciusculus*, natural size.
 b. part of a branch, magnified - - - - 6.
 c. portion of the same dissected - - - - 3.

* See the character of this genus under *F. tomentosus*. III. p. 4.



a

Fucus simpliciusculus.

1841

Fucus, fronde coriacea, terete, ramosissimâ: caule sub-indiviso, obsito ramis patentibus, spiralitèr alternis, iterum atque iterum divisus, terminalibus apice fructiferis: receptaculis cylindraceis, obtusis, sub-paniculatis: foliis vesiculisque nullis.

HABITAT apud Insulas, "Kent's Islands" dictas, prope Novam Hollandiam. *D. Brown.*

Perennis.

RADIX a me nondum visa.

FRONS caule assurgens unico, pedali, sesquipedali, et ultra, terete, basi pennæ corvinæ aut anserinæ minoris crassitie, exinde apices versus sensim attenuato, ut supra vix fili emporetici molem superet, per totam nunc longitudinem indiviso, nunc hic illic sparsim dichotomo, ramis ubique homogeneis obsito, cæteroquin nudo; rami caulis omnino similes, nisi quod duplo sint tenuiores, patentes, vagè spiralitèr alterni, intervallis nunc duorum triumve pollicum, nunc vix totidem linearum, sejuncti, hi semipedem et ultra, illi haud sesquipollicem longi, medii plerumque longissimi, sed hoc incertum, cuncti ad unguis pollicisve a basi longitudinem nudi, aut tantummodò petiolorum diffractorum reliquiis perbrevisibus exasperati, exinde ramis aliis eadem ratione dispositis suique similibus, attamen minoribus, obsiti, qui quoque alios ferunt, et hos etiam spiralitèr alternos, lineæ unius spatio inter singulos, teretes, filiformes, setæ porcinæ crassitie, horizontalitèr patentes, unguem ferè longos, nunc simplices, nunc bifurcos, segmentis fastigiatis:—folia atque vesiculæ, quantum vidi, desunt.

FRUCTIFICATIO ramulorum ad apices sita, sed tantummodò eorum ramos majores terminantium, e receptaculis constans oblongo-cylindraceis, vix lineam longis, ramulis multoties crassioribus, revera solitariis, quamvis ob ramulorum brevitate conferti et in paniculam exiguam coarctatam dispositi videntur, extrinsecùs ubique torulosis porisque minutissimis pertusis, sub quibus latent tubercula immersa, sphærica, singula semen includentia unicum, pyriforme, fuscum, limbo pellucido cinctum, unà cum fibris plurimis, tenuissimis, simplicibus, fuscillis.

COLOR, qui recentis verisimillimè fuit olivaceus, fit in *exsiccata*, et paritèr in *rursùs madefactâ* ubique niger nitorisque expers.

SUBSTANTIA coriacea, lenta, tenax.

Obs. *Sertulariarum* minorum aliquot species, unà cum confervâ quâdam hactenus indescrptâ, hunc Fucum, qui per desiccationem chartæ nequaquam adhæret, perrepentes inveni.

In animo habuit *D. Brown*, cui Fucum in hâc tabulâ depictum debemus, illi *F. scoparii* nomen indere, qui cùm titulus jamjam sit in hoc opere speciei longè diversæ impositus, necesse fuit alium qui huic plantæ conveniret de integro seligere. Talem quærenti nihil sese obtulit quod plantæ magis proprium est visum quàm dispositio fructûs, qui efficit ut ramorum apices paniculam referant; receptacula enim, in omnibus a me adhuc visis exemplaribus, non reperiuntur insidentia apicibus cunctorum sine discrimine ramulorum, sed illorum tantummodò ramos primarios terminantium. Huic si adjicias characteri vesicularum foliorumque absentiam, habebis, nisi fallor, notas, per quas planta statim est ab omnibus distinguenda congeneribus, *F. barbato* uno excepto, cui quidem est ubique arctissimè affinis. Idem enim est utriusque crescendi modus, idem color, idem habitus, et magnitudo ferè eadem, sed receptaculorum figurâ insignitèr discrepant. Hæc habet *F. paniculatus* cylindracea atque obtusa, dum ea *F. barbati* lanceolata sunt et acuminata. Aliud insupèr interest inter has stirpes discrimen; quòd *F. paniculati* caulis ostendat juxta basin aliquid accedens ad eandem articulatam conformationem, quâ gaudent *F. retroflexus*, *F. torulosus*, speciesque aliæ ramis insignes deflexis.

a. <i>F. paniculatus</i> , magn. nat.					
b. <i>ramus</i> , magn. auct.	-	-	-	-	6.
c. <i>receptacula</i>	-	-	-	-	4.
d. <i>receptaculum, horizontalitèr dissectum</i>	-	-	-	-	2.
e. <i>semen et fibræ</i>	-	-	-	-	1.

Fucus paniculatus, frond coriaceous, cylindrical, much branched: stem mostly undivided, beset with patent, spirally alternate branches again and again divided, the terminal ones bearing the fructification at their apices: receptacles cylindrical, obtuse, disposed in an irregularly paniced manner: leaves and vesicles none.

At Kent's Islands, near New Holland. *Mr. Brown.*

Perennial.

ROOT, I have not yet seen.

FROND, rising with a single stem, from a foot to a foot and half or more long, cylindrical, as thick near the base as a crow's quill or a small goose-quill, but gradually growing more and more narrow as it rises towards the apex, where it is not thicker than packthread, in some specimens undivided throughout its whole length, in others here and there irregularly dichotomous, constantly beset from top to bottom with branches of the same nature and substance as itself, but in other respects naked; branches altogether resembling the stem, except that they are twice as thin, patent, disposed in a spirally alternate manner, separated by irregular intervals sometimes only of two or three lines and sometimes of as many inches, varying in length from an inch or an inch and half to half a foot, the middle ones usually, but not always, longest, all of them naked for a short distance from the base, or only rough with the remains of broken petioli, but afterwards beset with a series of other branches, like themselves, but smaller, and disposed in the same manner; these in their turns produce a set of still smaller ones, disposed, like the rest, in a spirally alternate order, separated by intervals of about a line each, cylindrical, filiform, not thicker than hog's bristles, between horizontal and patent, about half an inch long, some simple, others forked, with segments of equal height:—of leaves or vesicles I have seen in this plant no appearance.

FRUCTIFICATION placed at the ends of the ramuli, but only of such as terminate the larger branches, consisting of oblong or cylindrical receptacles, scarcely a line long, many times thicker than the ramuli, really solitary, although the shortness of the ramuli makes them appear clustered into a small and close panicle, externally uneven all over, and perforated with very minute pores, under which lie imbedded spherical tubercles, each containing a single, brown, pyriform seed, surrounded by a pellucid limbus, mixed with numerous thin, simple, brownish fibres.

COLOR, most probably an olive-green in the fresh plant, but turning black and devoid of gloss from drying, and continuing so when again moistened.

SUBSTANCE, coriaceous, tough, and flexible.

OBS. Several of the smaller species of *Sertularia* together with a nondescript *Conferva* were found upon the stem of this *Fucus*, which, in drying, does not adhere in the least to paper.

The name of *F. scoparius*, designed by Mr. Brown for the *Fucus* here figured having already been allotted in this work to a very different species, I have been under the necessity of selecting for the present another; in doing which, I have chosen one expressive of the paniced disposition of the fruit, which appears, in all the specimens I have seen, not to occupy indiscriminately the ends of the whole of the smaller branches, but merely of such as terminate the leading shoots. This circumstance, together with the total absence of both vesicles and leaves, seems sufficiently to distinguish *F. paniculatus* from all its congeners, excepting only that to which it is most closely allied, *F. barbatus* of Linnæus, the mode of growth, size, and habit of which are the same, but the shape of the receptacles very different, being cylindrical and obtuse in the one, but lanceolate and acuminate in the other. There is likewise in *F. paniculatus*, towards the base of the stem, a singular appearance, indicating an approach to the deflexed position of the branches so remarkable in *F. retroflexus* and others.

a. <i>F. paniculatus</i> , natural size.						
b. branch, magnified	-	-	-	-	-	1.
c. receptacles	-	-	-	-	-	2.
d. horizontal section of a receptacle	-	-	-	-	-	4.
e. seed and fibres	-	-	-	-	-	6.

H. J. M. B. 1847

Junus paniculatus.



Fucus, fronde coriaceâ, quadrangulâ; caule basi diviso; segmentis simplicibus, pinnatis ramis abbreviatis, simplicibus, alternis, foliis fructuque densè vestitis: foliis oblongo-linearibus, integerrimis, sessilibus: receptaculis, compressis, linearibus, sessilibus, spinosis: vesiculis nullis.

Fucus vestitus. BROWN, MSS.

HABITAT apud insulas, "Kent's Islands" dictas, juxta Novam Hollandiam. D. Brown.

Perennis.

RADIX callus frondis concolor, haud ita maguus, enormitèr conicus.

FRONS caule assurgens unico, tetragono, diametro juxta basin haud unius lineæ, atque exinde sensim attenuato, sub ipsum ortum fisso in segmenta tria vel quatuor sub-pedalia, indivisa, sed foliis ramisque ita densè obsita, ut, his tota vestita vix ipsa in conspectum venant; rami rarè infra caulis medium positi, ejus e lateribus planis orti, alterni, patentés, caulis prorsus similes, nisi quòd sint angustiores, nunc vix unguem, nunc quatuor pollices longi, simplices, approximati in his individuis, in illis remotiusculi; folia, quæ in ramis plerumque sunt frequentissima, in vetustioribus fructiferis interdum prorsus desunt, sparsa, patentia, linearia, apice acuminata, basi in petiolum brevissimum attenuata, nervo tenuissimo nigricante percursa, margine integerrima, illa quæ sunt sita juxta basin ramorum pollicem longa, et propemodum lineam lata, reliqua quo magis ad apices accedis eò minorà, ut summa longitudine vix tres lineas latitudine vix quartam lineæ partem exuperent: vesiculæ nullæ.

FRUCTIFICATIO foliis copiosissimè immixta, e receptaculis constans approximatis, oblongis, compressis, haud unam lineam longis, sessilibus, margine sparsim spinuloso-dentatis, superficie pertusâ poris minutissimis, sub quibus latent tubercula immersa, spherica, singula semen unicum oblongum fuscum limbo pellucido cinctum foventia.

COLOR, qui recentis verisimillimè fuit olivaceus, est in exsiccata niger, in rursus madefactâ badius.

SUBSTANTIA caulis ramorumque coriacea, foliorum cartilaginea, satis tenuis.

Obs. Exsiccata chartæ nequaquam adhæret, et faciem nullo modo mutat.

E numero fucorum ad *F. natantis* familiam pertinentium paucissimi* modò sunt qui vesiculis prorsus carent; ut in talibus a se invicem distinguendis nullus ferè pateat dubitationi locus. Hos inter duo tantum hactenus sunt cogniti foliis verè integerrimis præditi, *F. linearifolius* et *F. vestitus* hic noster, qui, dum in hoc uno consentiunt et sic a reliquis omnibus dignoscuntur, vix ullum alium monstrant utrique communem characterem. *F. vestitus*, si ramos fructiferos aphyllis respicias, *F. decipientem* quodammodò refert; sin eos potiùs intuearis surculos, qui, sicut in plantæ ætate primâ accidere solet, foliis sunt cooperti, destituti verò vesiculis, necesse foret cavere ne commisceres cum *F. muricato*, nisi quòd hujus facie scabrâ, speciei notâ maximè insigui, semper careret.

a, b. <i>F. vestitus</i> , magn. nat.					
c. folium, magn. auct.	-	-	-	-	6.
d. rami fructiferi pars	-	-	-	-	6.
e. receptacula	-	-	-	-	4.
f. receptaculum horizontalitèr dissectum	-	-	-	-	3.
g. semina	-	-	-	-	1.

Quinque modò in hoc opere jam sunt editæ species, quæ ullo modo referri possunt ad illum Fucorum ordinem, qui dicitur, "*Fuci foliis distinctis, absque vesiculis*." Hi quinque sunt *F. diversifolius*, *F. lendigerus*, *F. linearifolius*, *F. quercifolius*, et *F. vestitus*. Cùm tamen etiam ex his quinque suspicari liceat duos primùm memoratos interdum vesiculis esse præditos, et cùm tres posteriores sint stirpes quorum pauca hactenus vidimus exemplaria ut de illis perpauillum innotescat, fieri nequit quin scrupuli mihi restent annon omnes certis temporibus locisque vesiculas ferant, atque idcirco annon hic ordo potiùs sit abolendus.

Fucus vestitus, frond coriaceous, quadrangular; stem divided at the base into a few simple segments, pinnated with short, simple, alternate branches, thickly clothed with leaves and fruit: leaves oblongo-linear, quite entire, sessile: receptacles compressed, linear, sessile, spinous: vesicles none.

Fucus vestitus. BROWN, MSS.

At Kent's Islands near New Holland. Mr. BROWN.

Perennial.

ROOT, irregularly conical, of the same color as the frond, in proportion to which it is rather small.

FROND, rising with a single quadrangular stem, not a line in diameter near the base, and thence gradually tapering upwards, divided immediately adjoining its origin into three or four segments, which are about a foot long, and undivided, but so thickly beset with branches and leaves, as to be quite covered with them, and scarcely visible themselves; branches seldom found below the middle of the stem, out of the flat sides of which they always grow, alternate, patent, precisely like the stem, except in their smaller size, varying in length from half an inch to four inches, simple, some standing close together, others rather remote; leaves generally extremely numerous upon the branches, but sometimes altogether wanting in the older fruit-bearing shoots, scattered, patent, linear, acuminate at the apex, at the base attenuated into a very short petiolus, marked with a narrow blackish midrib, their margins quite entire, those situated near the base of the branches an inch long, and nearly a line wide, the rest growing gradually smaller and smaller as they stand more near the ends, so that the upper ones are scarcely three lines in length, or the fourth part of a line wide: vesicles none.

FRUCTIFICATION, most abundantly intermixed with the leaves, consisting of oblong, compressed receptacles, placed close together, not a line long, sessile, their margins toothed with a few small scattered spines, their surface punctured all over with exceedingly minute pores, under which lie imbedded spherical tubercles, each containing a single, brown, oblong seed, surrounded by a pellucid limbus.

COLOR, most probably, an olive-green when the plant is fresh, but turning quite black in drying, and becoming a chestnut brown from subsequent immersion.

SUBSTANCE, coriaceous in the stem and branches, in the leaves cartilaginous and thin.

Obs. In drying, it does not adhere to paper or change its appearance.

So exceedingly small* is the number of Fuci at present known to exist belonging to that section of the family of *F. natans* which is destitute of vesicles, that the different individuals composing it are immediately distinguishable from each other. *F. linearifolius* and the subject of the present plate are the only ones of which the leaves are perfectly entire; but, while these two plants agree in this important circumstance, they are dissimilar in almost every other; so that no botanist, who had either seen the figures or read the descriptions of them, could ever feel a moment's fear of confounding them. *F. vestitus*, in its fertile, but leafless, branches, bears a much greater general resemblance to *F. decipiens*, from which its leaves are so widely different; while in such young shoots as are wholly clothed with leaves but destitute of capsules, it might almost be mistaken for *F. muricatus*, except that it always wants the rough appearance, so characteristic of the latter species.

a, b. <i>F. vestitus</i> , natural size.						
c. leaf, magnified	-	-	-	-	-	6.
d. part of a branch, with fruit	-	-	-	-	-	6.
e. receptacles	-	-	-	-	-	4.
f. horizontal section of a receptacle	-	-	-	-	-	3.
g. seeds	-	-	-	-	-	1.

* Only five species have yet been figured in this work that can by any means be regarded as belonging to the division of "*Fuci, foliis distinctis, absque vesiculis*," *F. diversifolius*, *F. lendigerus*, *F. linearifolius*, *F. vestitus*, and *F. quercifolius*. Even of these, it may be considered as doubtful if the two first do not under certain cases bear vesicles, and this circumstance, added to the knowledge that such Fuci of this tribe as are generally found with them are sometimes found without them, makes me feel much diffidence in giving a positive opinion that any really want them.



Fuens vesiculosus.

W. J. H. Esq. del.

Fucus, frondē cartilagineā, compressā, bipinnatā: ramis primariis horizontalibus, elongatis; secundariis patentibus, abbreviatis; his ramuliferis; ramulis conoideis, obtusiusculis, granulosis, confertis.

HABITAT apud insulas, "Kent's Islands" dictas, prope Novam Hollandiam, rupibus in aquā parū profundā innāscens. *D. Brown.*

Annua?

RADIX fibrosa, repens, fibris plurimis frondi concoloribus, ejusdemque cum illā indolis.

FRONS instructa caule compresso, filiformi, longitudine sex pollices latitudine semilineam æquante, indiviso, ubique lenissimè flexuoso, et per totam longitudinem ramis homogeneis pinnato, cætera nudo; rami distichi, alterni, horizontalitèr patuli, intervallis semiungularibus sejuncti, inferiores bi- tri- pollicares, medii aliquantū longiores, exinde sursum versus sensim abbreviati, ut summi vix unguem æquent, omnes, instar caulis, quo sunt angustiores, compressi, lenitèrque flexuosi, omnesque, sicut ille, indivisi, et nudi, nisi quòd minorum simili modo dispositorum serie sint instructi, qui quoque sunt compressi, alterni, patentés, indivisi, inferiores pollicem, superiores vix lineam longi, utrique obsiti ramulis, qui, dum hos totos cooperiunt, in illis sunt distichi et intervallis brevissimis sejuncti, eandem in utrisque formam magnitudinemque servant, nempe longitudinem vix lineā unā majorem, figuram breviter conoideam, obtusiusculam, extrinsecus ubique granulosa, ut, si parva liceat componere magnis, sub lente visa botrum referant avis confertissimis scatentem.

FRUCTIFICATIO nulla hactenus detecta.

COLOR anicēnè dilutè purpurascens, fuscello perfusus; *exsiccatæ* intensior, et quasi nigricans; *Soli objectæ* aut in aquā dulci *servatæ* sensim pallidior factus, et demum in lutescentem evanidus.

SUBSTANTIA cartilaginea, pulposa, lenta, tenax.

OBS. Per desiccationem chartæ lenitèr adhæret.

Non desunt, ut probè scio, Botanici, qui persuasissimum sibi habent, *F. botryoidem* Wulfenianum esse revera a *F. ovali* distinctum, et quibus idcirco necessariè malè factum videbitur, quòd idem sit hìc nomen speciei diversæ inditum. Tale consentibus in promptu est responsum; scilicet omnia nos, edocuisse Wulfenii plantam vix esse pro *F. ovalis* varietate definiendam, nedum pro verâ specie habendam; et titulum, quem ille tulerat, jure optimo pertinere ad hunc, cujus ramuli, uti suprâ in descriptione memoratur, per lentem maximè augentem visi botrum valde simulant. *F. thyrsoidi* olim in hoc opere depicto Naturâ arctissimè accedit *F. botryoides*. Color est et substantia utriusque idem; et vix est dubitandum quin fructificatione paritèr convenient, et quin hæc fructificatio eundem in utroque situm occupet. Liqueat tamen per exemplar in hâc tabulâ depictum, ramulos *F. botryoidis*, etiamsi steriles, figuram habere inflatam talem, qualis haud est in *F. thyrsoide*, nisi fructifero, observanda. Crescendi etiam modo hi duo Fuci multum discrepant, et, frondis peripheriam si spectes, minor est *F. botryoidi* cum *F. thyrsoide* quàm cum *F. obtuso* affinitas. Ab ambobus statim est dignoscendus; ramulorum enim figura nequaquam cum *F. obtuso* convenit, et frons plana pyramidata toto cælo a *F. thyrsoide* discrepat.

- | | | | | | |
|-----------------------------------------------|---|---|---|---|----|
| a. <i>F. botryoides</i> , magn. nat. | | | | | |
| b. frondis pars, magn. auct: | - | - | - | - | 6. |
| c. ejusdem portio | - | - | - | - | 4. |
| d. ramuli longitudinalitèr dissecti particula | - | - | - | - | 3. |

Fucus botryoides, frond cartilaginous, compressed, bipinnate: primary branches horizontal and long; secondary ones patent, short, and bearing conical, bluntish, granulated, clustered ramuli.

At Kent's Islands, near New Holland, on rocks in shallow water. *Mr. Brown.*

Annual?

ROOT, creeping, consisting of numerous fibres, of the same color and texture as the frond.

FROND, furnished with a compressed, filiform stem, about six inches long and half a line wide, undivided, everywhere very slightly flexuose, and throughout its whole length pinnated with branches of the same nature as itself, in other respects naked; branches distichous, alternate, between horizontal and patent, separated by intervals of nearly a quarter of an inch each, the lowest two or three inches long, the middle ones somewhat longer, the rest thence growing shorter as they approach the apices, where they do not reach half an inch in length; all of them are compressed, and somewhat flexuose, like the stem, than which they are more narrow, and all, like it, are undivided, and naked, except that they are furnished with a series of smaller ones, disposed in the same manner as themselves, and likewise alternate, patent, and undivided, the lowest of which are an inch long, and the extreme ones scarcely a line, but both equally beset with ramuli, which wholly cover the latter, but in the former are distichous, and separated by short intervals; in both instances they are of the same shape and size, their length scarcely exceeding a line, and their form being that of a short bluntish cone, externally granulated all over, and, to compare small things with great, considerably resembling, when magnified, a bunch of thickly clustered grapes.

FRUCTIFICATION, not at present discovered.

COLOR, a pleasing pale purplish, with a brownish tinge; turning much darker from drying; but, if exposed long to the sun, or kept in fresh water, growing gradually more and more pale, and at last fading into a faint dirty yellow.

SUBSTANCE, cartilaginous, full of moisture, flexible, and tough.

Obs. In drying it adheres slightly to paper.

To this plant, which is among the most beautiful species brought by Mr. Brown from the coast of New Holland, the appellation of *F. botryoides* is so peculiarly applicable, on account of the singular appearance of its ramuli, that I have felt no scruple in so naming it, though I am well aware that there will not be wanting botanists, who will be of opinion that I have in this done wrong, thinking that the *F. botryoides* of Wulfen is really distinct from *F. ovalis*. The circumstance of the specimen here figured being completely barren makes it evident that the swollen form of the ramuli does not depend upon the fructification, as is the case with those of *F. thyrsoides*, which is its nearest affinity, and with which there is no doubt of its agreeing, as well in the nature and situation of the fruit, as in the color and texture of the frond. The general habit of the two is indeed considerably dissimilar, and in this latter respect *F. botryoides* approaches more nearly to *F. obtusus*, from which the figure of its ramuli immediately distinguishes it, as these, together with its nearly flat frond and its different outline, keep it at first sight separate from *F. thyrsoides*.

- a. *F. botryoides*, natural size.
- b. part of the frond, magnified - - - - 6.
- c. portion of the same - - - - 4.
- d. part of a ramulus longitudinally cut open - 3.



Fucus botryoides.

Fucus, fronde gelatinoso-cartilagineâ, filiformi, ramosissimâ: ramis densissimè confertis: ramulis horizontalibus, setaceis, remotiusculis, lenitè incurvis, secundis.

Fucus congestus. BROWN, MSS.

HABITAT apud Insulas, "Kent's Islands" dictas, prope Novam Hollandiam. D. Brown.

Annua?

RADIX a me nondùm visa.

FRONS caule assurgens unico, subindiviso, tri- quadri- pollicari, vel forsàn multùm longiore, cùm nihil basi proximum in præsens viderim, terete, infernè Merulæ ferè pennæ crassitie, exinde sensim attenuato, ramis undique obsitò sparsis, caulis prorsùs similibus nisi quòd paulùm sint tenuiores, unius alteriusve lineæ intervallo inter singulos, horizontalitèr patulis, duos tresve pollices longis, ipsis iterùm obsitis aliis brevioribus tenuioribusque ratione simili dispositis, qui primariorum juxta basin infrequentiores prope apicem confertissimi oriuntur, suntque ter quaterve dichotomi, segmentis patentibus, fastigiatis, summis ferentibus aliquot ramulos, ramorum omnimodè præter molem minorem similes, patentes, lenitèr incurvos, secundos, subulatos, vix lineam longos, intervallis brevissimis distinctos.

FRUCTIFICATIO hactenus latet.

COLOR fusco-lateritius, non sine purpurascentiâ; *exsiccatâ* atro-purpureus; nitoris semper expers.

SUBSTANTIA gelatinoso-cartilaginea, carnosa, tenax.

Obs. Habitus insignitèr densus et congestus:—si stirps diutiùs æquo in aquâ dulci servetur, frondis apices, colore vero deperdito, sordidè albicantes fiunt:—per desiccationem chartæ levitèr adhæret, minuiturque in molem vix mardentis diuidiam, superficie tunc rugosâ factâ et inæquali, neque unquam postea lævitatèr pristinam recuperat.

In descriptione hujus Fuci suprâ datâ nihil omninò de ejus fructu proferre sum ausus, verens ne, si ita facerem, lectores meos in errorem inducerem; quoniam fructificatione tali, qualis perfecta est ullo jure dicenda, caruerunt omnia hactenus a me visa exemplaria. Res autem quamvis ita sit, nihilo tamen minus satis sub lente monstrant hæc specimina, ut absque multâ dubitatione de *F. congesto* prædicare liceat, capsulas ferè ramorum superiorum ad latera sessiles, convenireque in hoc cùm illis speciebus, ad quas habitu, quod aiunt, generali potissimùm accedit. Has inter stirpes, si figuram frondis aut si texturam respicias, nulli est arctiùs quàm *F. purpurascenti* affinis, et hunc magnitudine forsàn in littoribus nativis æquat, de quo multùm doleo quòd plantæ a D. Brown reportatæ omnes diffractæ nullam dijudicandi viam suppeditent. Colorem etiam habet hic noster Fucus ab illo *F. purpurascenti* haud ita multùm abludentem, quamvis certè minùs purpureo perfusum minùsque diaphanum. *Exsiccatus F. tenacem* quodammodò refert, eâdemque prorsùs texturâ gaudere videtur, ut nullus dubitem quin ad eosdem sit aptus usus. Ramorum minorum dispositione (quâ, donec deprehenditur fructus, character specificus necessario maximâ ex parte nititur) cum *F. aciculari* consentit; hujusque instar Fuci frondem habet filis pellucidis articulatis longitudinalibus intùs repletam.

- | | | | | | | | |
|----------------------------------------------------------------------|---|---|---|---|---|---|----|
| a. <i>F. congestus</i> , magn. nat. | | | | | | | |
| b. <i>rami pars</i> , magn. auct. | - | - | - | - | - | - | 6. |
| c. <i>ejusdem portio</i> | - | - | - | - | - | - | 5. |
| d. <i>particula dissecta, ut fibra internæ in conspectum veniant</i> | | | | | | | 3. |

Fucus congestus, frond between gelatinous and cartilaginous, filiform, much and irregularly branched: branches thickly crowded: ramuli horizontal, setaceous, rather reinote, slightly curved, standing on one side.

Fucus congestus. BROWN, MSS.

At Kent's Islands, near New Holland. Mr. Brown.

Annual?

Root, I have not yet seen.

FROND, rising with a single, mostly undivided stem, three or four inches long, (or, perhaps, much longer, for I have observed in no specimens any appearance of the base being near) cylindrical, about the size of a blackbird's quill in their lower part, and thence gradually diminishing upwards, on all sides beset with scattered branches, which are precisely like the stem, except in being somewhat more thin, and stand in a direction between horizontal and patent, two or three inches in length, and in their turns support other shorter and thinner ones disposed in the same manner; these latter are loosely scattered near the base of the primary branches, but much crowded towards their extremities, and are three or four times dichotomous with patent segments of equal height, the upper ones bearing a few ramuli in every respect similar to the branches, except in their smaller size, patent, slightly incurved, standing on one side of the branches, subulate, scarcely a line long, and separated by extremely short intervals.

FRUCTIFICATION, at present undiscovered.

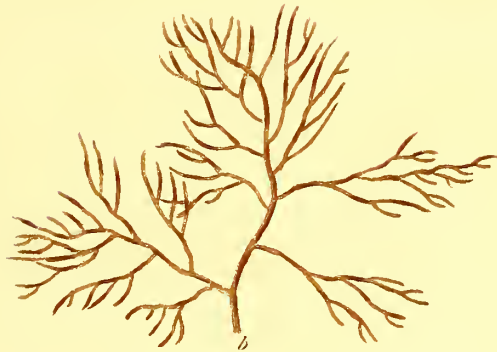
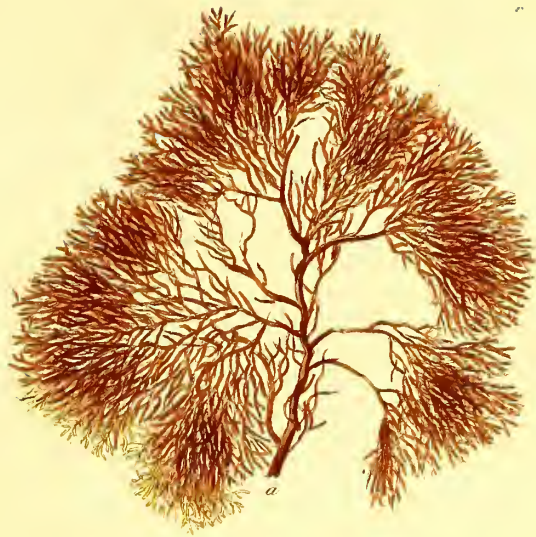
COLOR, that of red bricks, tinged with brown, and not without a mixture of purplish; turning, when dry, to a blackish purple: always devoid of gloss.

SUBSTANCE, between gelatinous and cartilaginous, fleshy, tough.

Obs. The habit of the plant is remarkably thick and bushy: if kept too long in fresh water, the apices of the frond turn to a dirty white:—in drying, it adheres slightly to paper, and shrinks to less than half its original size, besides which, its surface becomes so wrinkled and uneven, that it never afterwards, from subsequent immersion, completely recovers its original cylindricity.

Impossible as it is at present to say any thing with certainty as to the fructification of this *Fucus*, it may nevertheless be allowed us, from the appearance under the microscope of the few specimens brought home by Mr. Brown, to pronounce, without much hesitation, that it bears its fruit on the sides of the upper shoots, and that it does not in this respect greatly differ from those species to which it is in other particulars most strongly allied. Among these, its nearest natural affinity is with *F. purpurascens*, which it strikingly resembles, both in its mode of growth, its habit, and its texture; nor is it by any means impossible but that it may attain to an equal size with that species, though nothing I have at present seen would justify me in saying that it does so. Its color, also, is not greatly unlike that of *F. purpurascens*, though certainly less purple, and less transparent. When dried, *F. congestus* looks like *F. tenax*, nor have I a doubt of its being applicable to the same purposes. In the disposition of its smaller branches, upon which, in our present ignorance of its fructification, its specific character must be considered as chiefly depending, it agrees with *F. acicularis*, and, like that plant, has the interior part of its frond full of transparent, jointed filaments, lying in a longitudinal direction.

- a. *F. congestus*, natural size.
 b. part of a branch, magnified - - - - 6.
 c. portion of the same - - - - 5.
 d. small part, cut open to shew the internal fibres 3.



Fucus congestus.

Fucus, fronde corneâ, terete, æquali, vagè dichotomâ, ramis obsitâ subsecundis, horizontalibus, simpliciusculis, implicatis, confertissimis; apicibus obtusis: tuberculis enormitèr hemisphæricis, sessilibus.

Fucus plicatus. Gmelin, *Hist. Fuc.* p. 142. t. 14. f. 2. *Fl. Ang.* p. 589. *Fl. Scot.* II. p. 929. WITH. IV. p. 114. *Syst. Nat. Ed. Gmel.* II. p. 1385.

Fl. Dan. t. 408. *Linn. Trans.* III. p. 228. *Ner. Brit.* p. 23. t. 7. *Syn. Fuc.* II. p. 323. *Eng. Bot.* XVI, t. 1089. *Fl. Ped.* II. p. 332. *Fl. Fr. Ed. 2da.* II. p. 37. CLEMENTE. p. 319.

Ceramium plicatum. ROTH, *Cat. Bot.* II. p. 162. *Fl. Germ.* III. p. 458.

Fucus trichoides nostras aurei coloris, ramulorum apicibus furcatis. RAII *Syn.* p. 45. n. 26. MORIS. *Hist. Ox.* III. p. 649. n. 10.

F. coralloides erectus. RAII *Syn.* p. 51. n. 57. MORIS. *Hist. Ox.* III. p. 649. n. 8.

β. *elongatus*; fronde sub-dichotomâ; segmentis elongatis, strictis, subfastigiatis.

F. plicatus. β. *Syn. Fuc.* II. p. 324.

F. longissimus. ESPEr, *Jc. Fuc.* I. p. 44. t. 20. (excl. syn.)

γ. *fastigiatus*; fronde dichotomâ, fastigiata, tuberculis lateralibus, hemisphæricis.

HABITAT in Britanniarum oris, vulgaris.—In mari Balthico, ad Holsatiam. Gmelin.—Galliæ ad littora. *Decandolle*.—Juxta Gades. *Clemente*.—Ad rupes maris Nicæensis. *Allioni*.—β. apud Weymouth. *D. Bryer*.—Apud Brighton. *D. Borrer*.—In Hiberniæ Septentrionalis oris. *D. Templeton*.—γ. in Novæ Hollandiæ oris. *D. Brown*.

Perennis. Oct.—Apr.

RADIX callus exiguus, dilatatus, albicans.

FRONDES ex eadem basi plurimæ, tri- quadri-pollicares, aut interdum semipedales, teretes, a basi ad apicem ubique ad amussim filiformes, setæ porcine crassitie, hic illic vagè quater pluriesve dichotomæ, intervallis inter furcas incertissimis, sed plerumque ad dimidiam ferè altitudinem indivisæ assurgentes, segmentaque habentes summa unguem longa et simplicia; quod tamen in diversis individuis est diversum, quædam enim sunt ipsum ad ortum et paritèr ad apices bifurca, furcis summis divaricato-patentibus: omnibus e ramis plùs minùs copiosè emicant ramuli homogenei, laterales, horizontales, absque ordine dispositi, ut hic sint approximati, illic remoti; hic, quod sæpiùs accidit, secundi, illic quaquaversum spectantes; hic vix lineâ sint longiores et indivisi, illic pollicem superent, sintque dichotomi, aut etiam minoribus obsiti: de horum autem situ sæpissimè prædicare licet, confertiores longioresque reperiri, quo magis, plantæ apicibus appropinquant, et hic magis sursumversus spectare, situm horizontalem patenti mutantes: totius plantæ apices sunt obtusi, quasi truncati.

FRUCTIFICATIO* tubercula minutissima, enormitèr hemisphærica, in ramis superioribus lateralia, sessilia, nunc remota, nunc conferta, aut etiam confluentia, quædam etiam ipsi apicibus imposita, quibus ob colorem intensiorem faciem dant crematam, illi capillorum ustulorum haud absimilem.

COLOR maximè variabilis, nunc intensè purpurascens, (qualis verus plantæ color videtur, cum præcipuè juxta frondis basin, ubi mutationibus minùs est obnoxius, reperitur) nunc dilutior, nunc roseus, nunc fuscus, nec rarè flavus, aut lutescens, aut etiam albiissimus:—aliquandò plurimi ex his, si non omnes, in eodem individuo conspiciuntur, ut planta pulcherrimè versicolor evadat:—semper est semidiaphanus, excepto in tuberculis, nitidusque.

SUBSTANTIA‡ cartilagineo-cornea; *madentis* lenta et tenax; *exsiccatæ* cornea, rigida, et fragilis.

Var. β ad novem pollicum altitudinem assurgit, fronde magis regularitèr, præsertim apices versus, dichotomâ, segmentis erecto-patentibus strictisque; ramulis lateralibus longè infrequentioribus.

Var. γ, quæ an hujus sit loci dubito, mole et facie cum β convenit, sed substantiâ gaudet teneriore minùsque corneâ, colore e purpurascenti roseo, fugace, in album evanescente, fronde ubique dichotomâ, ramis lateralibus destitutâ, segmentis erectis fastigiatis, tuberculisque hemisphæricis, verè, nisi fallor, seminiferis.

Obs. Densissimis cæspitibus amat hæc planta crescere, ita insignitèr plicatis implicitisque ut vix nisi lacerando extricari possint, et verus crescendi modus ægrè detegatur:—ob ramorum copiam singulæ frondes in magnam molem excrescunt, atque idcirco facilè per ventorum marisque furores a rupibus uativis fractæ divelluntur, radice relictâ, quæ ergò rarissimè est a Botanicis conspecta:—per desiccationem chartæ nequaquam adhæret, sed tortuosa fit et crispa.

Ea est *F. plicati* textura cornea faciesque metalli neti similis, tamque insignem se reddit hæc species per crescendi modum implicitum, a quo nomen ducit, ut, quamvis ramorum dispositione multum ludat, nihilo tamen minùs hoc non obstat quin ascribendus sit in illorum Fucorum numerum, qui facillimè dignoscuntur, et omnibus ferè Botanicis diu innotuerunt. Excipiendi quidem sunt Linnæus et Esperus, quorum hic in *Fucorum Iconibus* stirpem longè diversam, et de quâ nihil certi dicere ausim, sub *F. plicati* nomine depictam exhibuit, et ille in operibus suis omnibus penitèr hanc plantam prætermisit, nisi forsitan cum *F. fastigiato* commiscuerit, utrosque conjungendos ratos. Fieri enim nullo

* An vera fructificatio?—sanè nescio:—semina cèrte in his nulla vidi, sed structuram prorsus uniformem; et fibræ paritèr defuerunt: figura quoque non omnibus est eadem, ut potiùs verrucas simulent, et forsitan sunt nihil aliud.

† Rothius capsulas interdum esse pedunculatas dicit, talibus fortè deceptus, quæ in ramulis brevissimis sunt terminales:—sed, ut verum fatear, de verbis modò lis est.

‡ Benè habet de substantiâ Lightfootius; "it bears a strong resemblance to what the anglers call *Indian grass*, that is, the tendrils issuing from the extremities of the ovary of the dog-fish."

modo potest ut sic prætermissam ignorasset, cum duo acceperat exemplaria a Koenigio, quæ in Herbario suo servata reliquit, subscripto nomine, *F. fastigiato*; stirpe quæ interdum ita formâ variatur, ut ad Fuci hujus nostri varietatem β quodammodo accedat. Multo autem magis *Fuco Griffithsiae* affinis est *F. plicatus*, de quo jam sub illo tractavimus. Varietatibus duabus supra descriptis adjicienda forsitan est tertia, memorata a Clemente, quam tamen non enumeravi unâ cum aliis, non tam quia nondum est a me visa, quam quia fatetur auctor, si quis alius, ingenuus se dubitare an verè ad *F. plicatum* attineat. Hanc ille varietatem prope Gades reperit, sequentibusque verbis describit, de quibus hoc unum monendum censeo, me nunquam *F. plicatum*, quantumvis versicolore, coccineum vidisse: "*F. plicatus. v. coccineus.* Fronde vix pollicari, tenuissimâ, pulchrè coccineâ."

a. *F. plicatus*, magn. nat.

b. *rami pars (cum capsulis?)* magn. auct. - - 6.

180.—FUCUS PPLICATUS.

Fucus plicatus, frond horny, cylindrical, of equal size throughout, irregularly dichotomous, beset with clustered, entangled, horizontal, mostly simple branches, generally pointing in the same direction; apices obtuse: tubercles irregularly hemispherical, sessile.

Fucus plicatus, GMELIN, *Hist. Fuc.* p. 142. t. 14. f. 2. *Fl. Ang.* p. 589. *Fl. Scot.* II. p. 929. WITH. IV. p. 114. *Syst. Nat. Ed. Gmel.* II. p. 1385.

Fl. Dan. t. 408. *Linn. Trans.* III. p. 228. *Ner. Brit.* p. 23. t. 7. *Syn. Fuc.* II. p. 323. *Eng. Bot.* XVI. t. 1089. *Fl. Ped.* II. p. 332. *Fl. Fr. Ed. 2da.* II. p. 37. CLEMENTE. p. 319.

Ceramium plicatum. ROTH, *Cat. Bot.* II. p. 162. *Fl. Germ.* III. p. 458.

Fucus trichoides nostras aurei coloris, ramulorum apicibus furcatis. RAII *Syn.* p. 45. n. 26. MORIS. *Hist. Ox.* III. p. 649. n. 10.

F. coralloides erectus. RAII *Syn.* p. 51. n. 57. MORIS. *Hist. Ox.* III. p. 649. n. 8.

β . *elongatus*; frond mostly dichotomous; segments long, straight, generally of equal height.

F. plicatus. β . *Syn. Fuc.* II. p. 324.

F. longissimus. ESPER, *Ic. Fuc.* I. p. 44. t. 20. (excl. syn.)

γ . *fastigiatus*: frond dichotomous; segments of equal height; tubercles lateral, hemispherical.

On the shores of the British Isles, common.—Coast of Holstein, in the Baltic. *Gmelin.*—Coast of France, both north and south. *Decandolle.*—Near Cadiz. *Clemente.*—Rocks about Nice. *Allioni.*— β . at Weymouth. *Mr. Bryer.*—At Brighton. *Mr. Borrer.*—North of Ireland. *Mr. Templeton.*— γ . on the coast of New Holland. *Mr. Brown.*

Perennial. October—April.

ROOT, a small, expanded, whitish, callous disk.

FRONDS, numerous from the same base, three or four inches or sometimes half a foot long, of the thickness of hog's bristles, cylindrical, perfectly filiform from their origin to their apices, irregularly branched in a dichotomous manner at most uncertain intervals, but generally rising undivided to about half their height, and having their ultimate segments half an inch long and entire; but this varies in different individuals, for some are forked immediately adjoining their root, and again at their very summits with segments between patent and divaricated: out of the sides of all the branches arise a greater or less quantity of ramuli of the same nature and substance as themselves, horizontal, placed without order; so that some stand close together, while others are remote; some, as is indeed generally the case, point only one way, others are equally distributed round all sides of the branches; some are not above a line long and simple, others exceed an inch in length, and are dichotomous, or even beset with a series of still smaller ones: in general, however, it is observable with regard to the ramuli, that towards the base of the plant they are remote, short, and horizontal, while, as they approach the apices, they grow more clustered and longer, and affect a patent direction: the tips of the whole frond are obtuse, and appear as if they had been truncated.

FRUCTIFICATION,* extremely minute tubercles, of an irregularly hemispherical shape, growing sessile upon

* I have great doubt how far these tubercles are real fructification:—the structure of such as I have examined has been quite uniform internally, and destitute both of seeds and fibres: they vary too in form, and look rather like warty excrescences, which perhaps they really are.



Fucus plicatus.

the sides of the upper branches, remote in some cases, in others clustered, or even confluent;* some of them are also situated upon the points of the ramuli, to which their dark color gives an appearance like that of singed hair.

COLOR, very variable, either dark purple, which seems to be the true color of the plant, being found generally near the base which is least exposed to change, or a paler purple, or pink, or brown, and not uncommonly dark or light yellow, or even white:—it occasionally happens that the greater number or the whole of these are observable in the same individual:—it is always glossy, and semitransparent, except in the tubercles.

SUBSTANCE,† between cartilaginous and horny; flexible and tough while moist; but horny, stiff, and brittle, after it is dried.

The variety β rises to the height of nine inches, having its frond more regularly dichotomous, especially in its upper part, with segments between erect and patent, and straight: its lateral ramuli are far less numerous.

Respecting γ I much doubt how far it really belongs to this species; its size and appearance agree with the preceding variety, but its substance is more tender and less horny; its color between purple and pink, soon changing to white; its frond regularly dichotomous, with erect segments of equal height, destitute of lateral ramuli; its tubercles all quite hemispherical, and, if I am not mistaken, really full of seeds.

Obs. This plant grows in so thick and entangled a manner, that a single frond can scarcely be separated without tearing, and its true mode of branching is with difficulty perceivable: the great quantity of its branches make it singularly bushy in its upper part, and give the winds and waves such power over it that it is generally torn from its native rocks, leaving the root still attached, on which account this part has very seldom been seen by botanists:—on drying, it becomes much curled, and does not in the least adhere to paper.

The singular horny or wiry texture of *F. plicatus*, and, still more, the peculiar mode of growth to which it owes its name, render it so easily distinguishable from all others, that, irregular as it is in point of ramification, it is nevertheless one of those Fuci that have been most universally known and best understood among botanists. Linnæus and Esper are almost the only exceptions to this general observation, the latter of whom has figured under the name of *F. plicatus* a widely different species, that I am unable satisfactorily to refer to any I am at present acquainted with, and the former has passed it altogether unnoticed, though he has left in his Herbarium two specimens, badly indeed preserved, sent him by König, and marked by himself *F. fastigiatus*, with some appearances of which plant the variety β of the one before us has more affinity, than most botanists who have seen but little of it would be disposed to allow. Besides the two varieties above described, a third is mentioned by Clemente, who at the same time admits that he is not certain of its really belonging to *F. plicatus*, on which account, having never seen it myself, I have not added it to the others. He finds it near Cadiz, and describes it as scarcely reaching to an inch in height, and as having very thin bright scarlet filaments, a color that among the many various hues of this plant I never saw or heard of.

a. *F. plicatus*, natural size.

b. part of a branch (with capsules?) magnified - 6.

* Roth has probably been led by some circumstance of this kind to observe that the capsules are occasionally pedunculated, whereas they are really sessile on the ends of the branches: it is, however, in fact nothing more than a difference in words.

† Lightfoot is happy in his remark upon the substance, that "it bears a strong resemblance to what the anglers call *Indian grass*, that is, the tendrils issuing from the extremities of the ovary of the dog-fish.

Fucus divaricatus, frond between gelatinous and membranaceous, cylindrical, filiform, much and irregularly branched: branches divaricated, loosely beset all over with horizontal, short, subulate, irregularly pectinated ramuli: spherical capsules imbedded in the substance of the larger branches.

Fucus divaricatus. BROWN, MSS.

On the coast of New Holland. Mr. Brown.

Annual.

ROOT, at present unknown.

FROND, furnished with a cylindrical, filiform stem, of the thickness of a sparrow's quill, three or four inches in length, (or, probably, much longer, for I never saw it entire,) irregularly divided into several divaricated segments of unequal length, all of them furnished here and there with shorter and more thin horizontal branches of the same nature and substance as themselves, and the whole of these are likewise beset on all sides with horizontal ramuli separated from each other by extremely short intervals, cylindrical, capillary, about a line long, some only forked, others, and indeed the greater number, pectinated with a few still smaller ones, quite similar to them, and disposed in the same manner:—it not uncommonly happens that a ramulus is here or there observable longer than the rest, and taking the appearance of a primary branch, from which none of them differ otherwise than in their smaller size.

FRUCTIFICATION, small, spherical capsules, half immersed in the substance of the larger branches and half prominent, of a deep red color, solitary, scattered without order, containing a cluster of exceedingly minute, irregularly oblong, dark red seeds, which at length escape by the bursting of the capsule.

COLOR, pale pink, semitransparent, very fugitive, and fading to white.

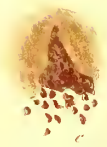
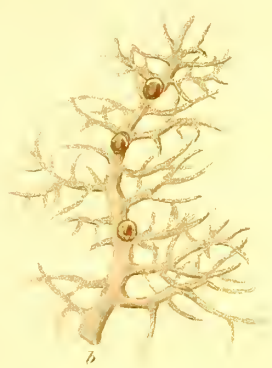
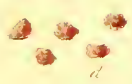
SUBSTANCE, a gelatinous membrane, extremely tender.

Obs. In drying, it adheres closely to paper.

This elegant Fucus, which belongs to the same natural order as *F. kaliformis* and *F. clavellus*, is in its size and mode of growth most nearly allied to *F. hamulosus*,* which has not yet been discovered with spherical capsules, though it most probably produces them. Even supposing, however, such to be the case, a sufficient and obvious difference between the two will be found in the shape of the ramuli, which in *F. divaricatus* are singularly pectinated, and appear, before the plant is carefully examined, greatly to resemble those of the beautiful *Conferva Plumula*. The name of *F. divaricatus* was originally assigned, as is sufficiently known, by Linnæus to a casual appearance of *F. vesiculosus*, which I conceive that but few Botanists will concur with the immortal Swede in regarding as a distinct species; but even those, if there be any, who may do so, may still be satisfied, that in following the example of my friend, Mr. Brown, and giving the same appellation to the species before us, there is little risk of a confusion of synonyms; as it is impossible but that the two plants should hereafter be placed in distinct genera. Of the one before us Mr. Brown met with only a single specimen.

a. <i>Fucus divaricatus</i> , natural size.						
b. branch, magnified	-	-	-	-	-	6.
c. capsule	-	-	-	-	-	3.
d. seeds	-	-	-	-	-	1.

* I say nothing as to the possibility of *F. divaricatus* not producing scattered seeds, as from its nature and appearance there does not seem to me the slightest room for doubt of its doing so; and no argument can be deduced in opposition to such an opinion from the circumstance of their not being yet found, since only one specimen of the plant has been detected, and that had capsules, which, it is sufficiently known, are not seen on the same individuals as bear the naked seeds.



Fucus divaricatus.

Fucus, fronde gelatinoso-membranaceâ, terete, filiformi, ramosissimâ; ramis divaricatis, ubique laxè obsitis ramulis horizontalibus, abbreviatis, subulatis, vagè pectinatis: capsulis sphæricis in ramis majoribus immersis.

Fucus divaricatus. BROWN, MSS.

HABITAT in Novæ Hollandiæ oris. D. Brown.

Annua.

RADIX hactenus latet.

FRONS caule instructa terete, filiformi, pennæ passerinæ crassitie, tri- quadri- pollicari, (aut forsàn multo longiorè, integrum enim nunquam vidi) vagè in segmenta plurima, quorum longitudo est incerta, divaricata fissa, omnia ramis homogeneis brevioribus tenuioribusque horizontalibus hic illic obsita, qui cuncti, sicut etiam caulis, per totam undique longitudinem sunt obsiti ramulis horizontalibus, his quoque homogeneis, brevissimo inter singulos intervallo, teretibus, filiformibus, capillaceis, circiter lineam longis, his modò bifurcis, illis, cujusmodi sunt plurimi, pectinati aliquot aliis, adhuc minoribus, sui similibus, similique ratione dispositis:—non rarè evenit ramulum unum alterumve hic illic produci, quasi inramos, quos, mole minore demptâ, prorsus referunt, sint mutandi.

FRUCTIFICATIO capsulæ exiguæ, sphæricæ, in ipsâ ramorum majorum substantiâ semi-immersæ, coccineæ, solitariæ, hic illic sparsæ, seminum minutissimorum, enormitèr oblongorum, intensè rubrorum congeriem foventes, quæ demùm disruptæ effundunt.

COLOR dilutè roseus, semidiaphanus, fugacissimus, et in album evanidus.

SUBSTANTIA tenerrima, gelatinoso-membranacea.

Obs. Per desiccationem chartæ arctè adhæret.

Elegantissima illa, cujus iconem hic exhibemus, Fuci species manifestè est eidem ascribenda familiæ quæ *F. kaliformem* et *F. clavellusum* includit; sin frondis molem crescendique modum respicias, nequaquam tam arctè ad hos accedit, quàm ad *F. hamulosum*, cujus nulla adhuc sunt detecta exemplaria capsulis sphæricis prædita, quamvis vix ullus dubitationi locus extet quin tales aliquandò ferat. Utcunque autem hæc se res habeat, si fructu hæc duæ stirpes prorsus conveniant, et si capsulis sphæricis *F. hamulosus*,* *F. divaricatus* autem lanceolatis instructus postea detegatur, nulla tamen esset in distinguendis difficultas; satis enim discriminis ponitur in ramulis, qui in *F. divaricato* sunt pectinati, videnturque cuivis obitèr intuenti haud absimiles illis pulcherrimæ *Confervæ Plumulæ*. Nemo ferè nescit Botanicus Linnæum olim indidisse idem quod hæc planta nunc fert nomen cuidam e *F. vesiculosi* varietatibus, quam pro specie distinctâ habuit, in quo pauci modò viventem sunt secuti, et, nisi fallor, nullus nunc sequi vellet. Dummodò autem sint qui ita censentes malè factum dicerent, quòd synonymorum confusionem augere pergamus, his in promptu est responsum; scilicet, tale vix evenire et nullo modo durare posse, cùm necesse sit omninò ut hæc duæ stirpes nihil ferè commune habentes in genera diversissima dispescantur. Unum tantummodò *Fuci* sui *divaricati* exemplar legit D. Brown, qui solus hactenus reperit.

a. <i>F. divaricatus</i> , magn. nat.						
b. <i>ramus</i> , magn. auct.	-	-	-	-	-	6.
c. <i>capsula</i>	-	-	-	-	-	3.
d. <i>semina</i>	-	-	-	-	-	1.

* Hoc vix verisimile videtur, sed contrà omnia in *F. divaricati* indole testantur semina nuda sparsa esse in illo quærenda. Tali opinioni nequaquam obstat quòd talia nondùm sint detecta; cùm unicum modò hactenus viderimus plantæ exemplar, idque capsuliferum, satisque constat capsulas et semina nuda in eodem non reperiri individuo.

Fucus corniculatus, frond between cartilaginous and gelatinous, filiform, in its lower part cylindrical and naked, in its upper compressed and bipinnate; pinnæ horizontal, compressed, with cylindrical and acuminate apices.

Fucus corniculatus. BROWN, MSS.

At Kent's Islands, near New Holland. Mr. Brown.

Perennial.

ROOT, a small, callous disk, throwing out a few cylindrical suckers, which are decumbent at their origin, but soon rise into new plants.

FRONDS, consequently, numerous from the same base, each furnished with a single stem two or three inches in length, cylindrical and of the thickness of a sparrow's quill near its origin, and continuing so till it has attained to half its height or more, when it becomes somewhat dilated and compressed, and thus proceeds linear till it reaches its apex, where it again grows cylindrical, and ends in an acuminate point; it is in general undivided, but sometimes forked, and occasionally, though rarely, twice or thrice dichotomous; to the distance of about an inch from the base it is always naked, but afterwards pinnated with branches of the same nature and texture as itself, standing distichous, and horizontal, some alternate, others opposite, some close together, others rather remote, the whole of them precisely resembling the stem, except in their smaller size, the lower ones, which are longest, extending to about half an inch in length, the rest gradually shortening, so that the upper ones are not above a line long; the apices everywhere remarkably acuminate; the longer branches are pinnated with a series of smaller ones, which, when the plant is young, are very short and simple, but in older specimens become in their turn pinnated with others, thus giving the frond a singularly clustered appearance, so that its true mode of growth is not perceptible except on a close examination.

FRUCTIFICATION, at present unknown.

COLOR, a pale livid purple in the recent plant, with sometimes an æruginous tinge, diaphanous, but brown at the tips, as if they had been singed, very fugitive, and turning, from exposure to the sun, or from being kept in fresh water, to a pale yellowish, or a greenish yellow, and at last to a dirty white: when dry, it becomes much darker, and is in some places a very deep purple, in others a yellowish brown.

SUBSTANCE, between gelatinous and cartilaginous, full of moisture, and tender: horny and rigid after it is dried.

Obs. The surface of the frond is very smooth, and in drying it does not adhere to paper.

No traces whatever of fructification are visible in the specimens of this plant gathered by Mr. Brown, so that we are wholly left to analogy to determine the family that it may most properly be arranged with; in doing which there is, fortunately, but little difficulty, its whole habit and texture so strongly pointing out its affinity to *F. corneus* and its congeners. Among these, in color and substance, it is most nearly allied to *F. gigartinus*, but not so in its mode of growth; for in this respect it so exactly agrees with *F. cartilagineus*, that a suspicion might almost be entertained whether it be not in reality merely a stunted variety of that species; a supposition that would evidently be unfounded; as independently of the difference of color and texture, the former of which, however changeable in land plants, is of much importance in determining marine ones, they are also distinguishable by the cylindricity of the lower part of *F. corniculatus*, and by its constantly acuminate apices. The name applied by Mr. Brown to this, as well as to the preceding species, had been previously given to a very different one; but may nevertheless be here used without objection, the *F. corniculatus* of Wulfen* having been acknowledged by the noble author himself to be nothing more than a variety of *F. ericoides*.

a. *F. corniculatus*, natural size.

b. horizontal section of the stem, magnified . . . 3.

* I say this upon the authority of the reviewer of the *Cryptogama Aquatica* in the *Allgemeine Literatur-zeitung*, for 1805. III. p. 453.



Fucus corniculatus.

Fucus, fronde gelatinoso-cartilagineâ, filiformi, infernè terete et nudâ, supernè compressâ et bipinnatâ; pinnis horizontalibus, compressis, apicibus teretibus acuminatisque.

Fucus corniculatus. BROWN, MSS.

HABITAT apud Insulas, "Kent's Islands" dictas, juxta Novam Hollandiam. D. Brown.

Perennis.

RADIX callus exiguus, discoideus, stolones aliquot emittens teretes, ortu decumbentes, mox in novas frondes assurgentes.

FRONDÈS hinc ex eâdem basi plurimæ, singulæ caule instructæ unico, bi- tri- pollicari, juxta basin terete et pennæ passerinæ crassitie, quali etiam modo et filiformis ad dimidiam aut ultra altitudinem attollitur, quando perpaullum fit explanatus atque compressus, progrediturque ita linearis ad apices, ubi iterum attenuatus teresque factus desinit in acumen; caulis nunc, et quidem plerumque, indivisus, interdum est bifurcus, aut etiam, sed raro, bis terve vagè dichotomus, semper ad altitudinem circiter pollicis nudus, exinde autem pinnatus ramis homogeneis, distichis, horizontalibus, alternis, oppositisque, his approximatis, illis remotiusculis, omnibus caulibus prorsus similibus, nisi quod minores sint, inferioribus, qui longissimi, unguem ferè longis, reliquis sensim abbreviatis, ut summi lineam haud exuperent, et aculeos modò referant; cunctorum apices insignitè sunt acuminati: rami longiores aliorum minorum serie sunt pinnati, qui in stirpe juniore brevissimi et simplices, in adultâ elongati conspiciuntur atque ipsi iterum aliis pinnati, ut valdè conferti sint, nec nisi attentius intuenti vera crescendi ratio pateat.

FRUCTIFICATIO hactenus latet.

COLOR recentis dilutè livido-purpurascens, ærugineo aliquandò perfusus, diaphanus, ipsis tamen apicibus fuscis, quasi ustulatis, fugax; Soli objectæ aut in aquâ dulci servatæ lutescens, vel e viridi lutescens, et demum sordidè albicans; exsiccata longè intensior fit, et hinc atro-purpurascens, illuc fusco-flavescens evadit.

SUBSTANTIA gelatinoso-cartilaginea et tenera, succi plena, per desiccationem cornea et rigida.

Obs. Planta lævissima exsiccata chartæ non adhæret.

In hujus Fuci exemplaribus a D. Brown lectis, quæ sola hactenus Botanicis innotuerunt, nulla omninò fructus detegenda sunt vestigia, ut analogiâ modò niti cogamur, si de ejus affinis loqui, et in alicujus Fucorum familiæ numerum inserere velimus. Auspicatò tamen evenit, quòd talis sit huic plantæ indoles, qualis prohibet quominus in hoc faciendo dubitemus; omnia enim *F. corneum* et congeneres affectant. Hos inter, colore et substantiâ, maximè *F. gigartinum* refert; crescendi autem modo toto cælo ab hoc discrepat, et cum *F. cartilagineo* eo usque convenit, ut vix mirum mihi videretur, si non deessent aliqui qui existimarent esse nihil aliud nisi ejus varietatem casu quòdam pumilionem redditam. Hi autem certissimè hallucinantur; sunt enim stirpes, si quæ aliæ, distinctæ, dignoscendæ per *F. corniculati* frondem basi teretem apicibus acuminatis, et paritèr per substantiam, et per colorem dissimilem, qui in Algis marinis distinguendis multum valet, nec mutationibus est, sicut in plantis terrestribus, obnoxius. In hoc Fuceo, ut in præcedente, evenit nomina D. Brown impositum olim fuisse alii inditum, neque tamen idcirco rejiciendum; *F. corniculatus* enim Wulfenii, consentiente b. auctore, iater *F. ericoidis* varietates in posterum est recensendus.

a. *F. corniculatus*, magn. nat.

b. *frons horizontalitèr dissecta*, magn. auct. - - 3.

Fucus rangiferinus, frond cartilaginous, compressed, subdichotomous, beset with short, distichous, horizontal, multifid ramuli, standing close to each other, and mucronated at their tips, which swell into lanceolate capsules.

Fucus rangiferinus. BROWN, MSS.

At Kent's Islands, near New Holland. Mr. Brown.

Perennial?

ROOT, a flat, widish, callous disk.

FRONDS, numerous from the same base, two or three inches long, compressed, nearly a line wide at their origin, and continuing so till they have attained to the height of three-quarters of an inch or an inch, where they become forked with more narrow patent segments, which in their turns are repeatedly dichotomous at uncertain intervals, regularly growing more narrow as they rise: in addition to this mode of ramification, the frond also shoots out, especially near the apices, numerous, lateral, scattered, patent branches, of the same nature and substance as itself, some, and indeed the greatest part, scarcely a line long, and either quite simple or only forked at the tips with exceedingly short segments between patent and divaricated, others much longer, and twice or thrice forked, or even beset with a few shorter lateral ones; the apices of the frond are everywhere acute; the margins quite entire; the segments all of equal height.

FRUCTIFICATION, very minute, roundish, deep red seeds, scattered about the tips of the lateral ramuli, which then swell into a lanceolate shape.

COLOR, a beautiful semitransparent scarlet, soon changing, from exposure to the sun, or from being kept in fresh water, to a pale dirty yellow, and at last to white.

SUBSTANCE, cartilaginous.

Obs. The mode of growth is singularly thick and bushy:—in drying it does not adhere to paper.

In size and general habit the fucus here figured approaches so nearly to *F. spermophorus*, that on a cursory view it might almost be taken for a variety of it, but, if examined more attentively, especially in its smaller branches, it will be found to bear a considerably greater resemblance to *F. cervicornis*, which, from a nearly similar conformation of its ramuli, has received also a very similar appellation. From the former of these species *F. rangiferinus* is immediately distinguished by its ramification, which is by no means, as in *F. spermophorus*, merely dichotomous, but also abounds in lateral shoots; while from every specimen that I have yet seen of the latter it may be known at first sight, not only by its size and color, but likewise by its very different mode of growth; the whole plant being compressed, and gradually growing more and more narrow from the base upwards, while *F. cervicornis* has a flat and comparatively wide stem, the branches lining which are many times more narrow and cylindrical.

- | | | | | |
|-------------------------------------------|---|---|---|----|
| a. <i>F. rangiferinus</i> , natural size. | - | - | - | 6. |
| b. part of the frond, magnified | - | - | - | 4. |
| c. small portion of the same, in fruit | - | - | - | 2. |
| d. part of a capsule | - | - | - | 2. |



Fucus sanguiferinus.

Fucus, fronde cartilagineâ, compressâ, sub-dichotomâ, ramulis obsitâ distichis, approximatis, horizontalibus, abbreviatis, multifidis, mucronatis, in capsulas lanceolatas apice intumescensibus.

Fucus rangiferinus. BROWN, MSS.

HABITAT apud Insulas, "Kent's Islands" dictas, prope Novam Hollandiam. D. Brown.

Perennis?

RADIX callus explanatus, discoideus.

FRONDES ex eâdem basi plurimæ, duos tresve pollices longæ, compressæ, juxta ortum lineam ferè latæ, atque eandem servantes latitudinem, donec ad sesquiunguis vel pollicis altitudinem attingunt, quum bifurcæ fiunt, segmentis angustioribus, patentibus, ipsis rursus pluries vagè dichotomis, utrâque serie subjacentibus angustiore, atque insuper edentibus, præsertim apices versus, ramos homogeneos, laterales, frequentes, patentés, hos, quales sunt plurimi, vix lineam longos, nunc simplices, nunc apice bifurcos, furcis brevissimis divaricato-patientibus, illos duplo triplove longiores, et bi- tri- furcos, aut etiam uno alterove brevior lateralibus sparsim obsitos; frondis apices ubique sunt acuti, marginesque integerrimi; segmenta omnia fastigiata.

FRUCTIFICATIO semina, minutissima, subrotunda, intensè rubra, sparsa in apicibus ramulorum lateralium, qui tunc tumescentes formam lanceolatam induunt.

COLOR pulchrè coccineus, subdiaphanus; *Soli objectæ vel in aquâ dulci servatæ* citò in sordidè lutescentem et demùm in album evanidus.

SUBSTANTIA cartilaginea.

Obs. Crescendi modus insignitè dumosus et densus:—per desiccationem chartæ non adhæret.

Magnitudine suâ habituque, quod aiunt, generali *Fucus* hic depictus ita ad *F. spermophorum* accedit, ut facilè quivis, plantâ obitè inspectâ, illi conjunctissimum crederet, aut etiam pro merâ varietate neglectum prætermitteret; sin attentius observetur, evanescit talis concepta affinitas, reperiturque *F. rangiferinus* longè magis consentire cum *F. cervicorni*; ramulis præsertim minoribus simili ratione in utroque dispositis divisisque, a quibus ductum nomen ferè simile utrique est inditum. Ut rem tamen clariùs exponamus, dignoscitur hæc nostra stirps a *F. spermophoro* per frondem nequaquam tantummodò dichotomam, verùm etiam ramis lateralibus, qui in illo nulli sunt, scatentem; et ab omnibus, quæ hactenus vidi, *F. cervicornis* exemplaribus vix minùs certè primo aspectu discrepat, cum per colorem et molem dissimilem, tum quia frondem habet ubique compressam, a radice ad apices sensim angustatam; quod contra, *F. cervicornis* caule assurgit plano dilatatoque ramis teretibus multoties angustioribus obsito.

a. <i>F. rangiferinus</i> , magn. nat.						
b. <i>frondis pars</i> , magn. auct.	-	-	-	-	-	6.
c. <i>ejusdem particula, cum fructu</i>	-	-	-	-	-	4.
d. <i>capsulæ pars</i>	-	-	-	-	-	2.

Fucus confertus, frond membranaceous, flat, midribbed, linear, sub-dichotomous, and also beset with lateral branches, irregularly serrated; tubercles spherical, scattered, sessile upon the midrib and both sides of the frond.

Fucus confertus. BROWN, MSS.

At Kent's Islands, near New Holland. Mr. Brown.

Perennial?

ROOT, a small, thin, pale brown, dilated, callous disk.

FRONDS, numerous from the same base, pointing in every direction, so that the outline of the whole plant is nearly globular, flat, two inches long, and preserving from the base to the apices an everywhere equal width of about a line, some of them, and indeed the greater number, undivided, but others irregularly forked, or twice or thrice dichotomous, all of them proliferous at their margins with *branches* of the same nature and substance as themselves, scattered, distichous, patent, or between horizontal and patent, separated by short but uncertain intervals, varying in length from three-quarters of an inch to even less than a line, long and short growing intermixed without any order, all of them undivided, but the larger ones not unfrequently proliferous, like the primary shoots, with a series of others extremely short, but in other respects similar to themselves, and disposed in a similar manner; the apices of all are rounded; the margins irregularly serrated, as if they were ciliated, with minute scattered teeth: some fronds are perfectly entire: throughout the whole plant runs a very narrow midrib, of a somewhat darker color than the rest of the frond, not equally visible in every individual:—it not unfrequently happens that the edges of the branches are found, as is the case with *F. bifidus*, here and there fastened together, by means of the serratures abovementioned, apparently anastomosing, so that it is impossible to separate them without tearing.

FRUCTIFICATION, (at least what appears to be such,) situated in minute roundish capsules, of no regular shape and size, of a deep red color, abundantly scattered over the whole frond on both sides of the branches:—in these I have never been able to detect any traces of either seeds or fibres, and I therefore entertain doubts if they ought not rather to be regarded as mere warts.

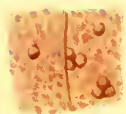
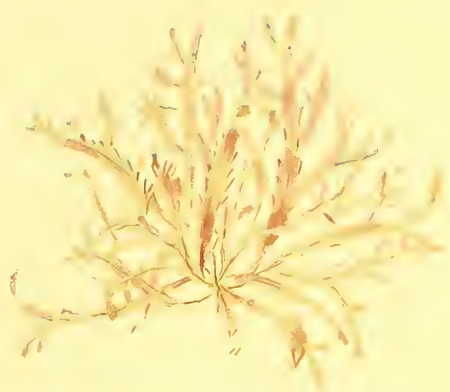
COLOR, a pale semitransparent red, soon turning, from exposure to the sun, or from being kept in fresh water, to a pale yellowish, or greenish.

SUBSTANCE, membranaceous and thin, but not tender.

OBS. In drying it scarcely adheres at all to paper.

No doubt will be entertained as to the distinctness of this *Fucus*, the natural place of which in the system is next to *F. bifidus*, with which it agrees in most particulars, though the presence in the former of a midrib, which is wholly wanting in the latter, may render it necessary in an artificial arrangement of the species to keep them at some distance from each other. *F. confertus* is an elegant *Fucus*, apparently subject to but little variation in its size or mode of growth, and easily distinguishable from all its congeners.

- | | | | | | |
|----------------------------------------|---|---|---|---|----|
| a. <i>F. confertus</i> , natural size. | - | - | - | - | 6. |
| b. part of the frond, magnified. | - | - | - | - | 4. |
| c. smaller piece of the same | - | - | - | - | 2. |
| d. tubercle? cut open | - | - | - | - | |



Fucus confertus.

Fucus fronde membranaceâ, planâ, costatâ, lineari, sub-dichotomâ, ramis quoque lateralibus obsitâ, sparsim, serratâ: tuberculis sphaericis, sparsis, in costâ et utrâque frondis paginâ sessilibus.

Fucus confertus. BROWN, MSS.

HABITAT apud Insulas, "Kent's Islands" dictas, prope Novam Hollandiam. D. Brown.

Perennis?

RADIX callus exiguus, dilatatus, tenuis, dilutè fuscus.

FRONDES ex eâdem basi plurimæ, quaquaversum spectantes, ut toti stirpi peripheria sit sub-globosa, planæ, nervo percursæ angustissimo coloris reliquâ fronde paullum intensioris, sed nequaquam pariter in omnibus individuis manifesto, duos pollices longæ, latitudinemque ubique eandem unius circiter lineæ a basi ad apicem servantes, hæ, et quidem plurimæ, indivisæ, illæ vagè bifurcæ, aut bis terve dichotomæ, omnes e marginibus proliferæ ramis homogeneis, sparsis, distichis, patentibus, vel horizontaliter patentibus, intervallo inter singulos brevi, attamen incerto, nunc sesquiunguem, nunc vix lineam longis, majoribus minoribusque absque normâ immixtis, indivisis, at non rarò ipsis proliferis serie aliarum brevissimarum, sui similium, et simili modo dispositarum; apices cunctis rotundati; margines enormiter serrato-ciliati, dentibus exiguis sparsis: haud desunt frondes integerrimæ:—ramorum margines per cilia jam memorata non rarò hic illic (sicut in *F. bifido* accidere solet) agglutinati sibi invicem adhærent, quasi anastomosantes, nec sunt, nisi lacerando, divellendi.

FRUCTIFICATIO (dummodò reapse sit fructificatio) in capsulis posita subrotundis, sed quibus nec forma nec magnitudo certa datur, utriusque ramorum paginæ copiosè insidentibus, rubicundis, perquam minutis, ubique per frondem sparsis:—cùm tamen in his neque seminum neque fibrarum ulla vestigia detegere licuerit, dubito annon sint rectius pro meris verrucis habendæ.

COLOR dilutè ruber, sub-diaphanus, si *Soli objiciatur* aut in aquâ dulci servetur, citò in sordide lutescentem virescentemve transiens.

SUBSTANTIA membranacea, tenuis, neque tamen tenera.

OBS. Per desiccationem chartæ vix aut ne vix adhæret.

Nemo est qui dubitabit quin *Fucus* ille, quem hæc tabula delineatum exhibet, jure optimo in specierum distinctarum numerum recipiatur. Mole suâ, crescendi modo, plurimisque aliis, cum *F. bifido* convenit, postulatque Natura, quæ has stirpes arctissimè affines effinxit, ut huic proximus collocetur; quamvis forsan frons unius costata alterius prorsus enervis efficiet ut in artificiali quâdam Fucorum dispositione longè segregentur. *F. confertus* est planta, quæ, quantum mihi videre contigit, formâ facieque perpauillum variare solet, et est primo statim aspectu a congeneribus dignoscenda.

a. <i>F. confertus</i> , magn. nat.					
b. <i>frondis pars</i> , magn. auct.	-	-	-	-	6.
c. <i>ejusdem pars</i>	-	-	-	-	4.
d. <i>tuberculum? dissectum</i>	-	-	-	-	2.

Fucus rugosus, frond coriaceous, tubular, linear, branched; branches distichous, between horizontal and patent, attenuated at their base, rounded at their apex, simple: tubercles imbedded, scattered all over the frond.

Ulva rugosa. LINN. *Mant.* p. 311. *Syst. Nat. Éd. Gmel.* II. p. 1391.

At the Cape of Good Hope. *Koenig.*—New Holland. *Mr. Brown.*

Perennial.

ROOT, an expanded, flat, thin, black, callous disk, almost half an inch in diameter.

FRONDS, numerous from the same base, each rising with a single, undivided stem, of five or six inches long, tubular, inflated, between cylindrical and compressed, filiform, of the thickness of the little finger, rounded at the apex, but by no means, as Linnæus says, open there (unless indeed such should accidentally be the case): from both sides of the stem arise, without any regularity, branches of the same nature and substance, and similar also to it in every other particular, except in being somewhat smaller, the lower ones about four inches long, the rest gradually shortening upwards, so that the highest are scarcely half an inch in length, all of them separated from each other by intervals of only a few lines, sub-distichous, between horizontal and patent, perfectly simple, and exceedingly narrow at their point of union with the stem, but immediately afterwards swelling to their natural size, which they then preserve unaltered throughout the whole of their length.

FRUCTIFICATION, scattered all over the stem and branches, as well near the base as at the tips, consisting of imbedded spherical tubercles, placed close to each other, containing a mass of brown pyriform seeds, surrounded by a pellucid limbus, mixed with numerous, white, branching fibres: wherever the tubercles lie the frond is elevated into very minute swellings, each perforated at the top with a small pore.

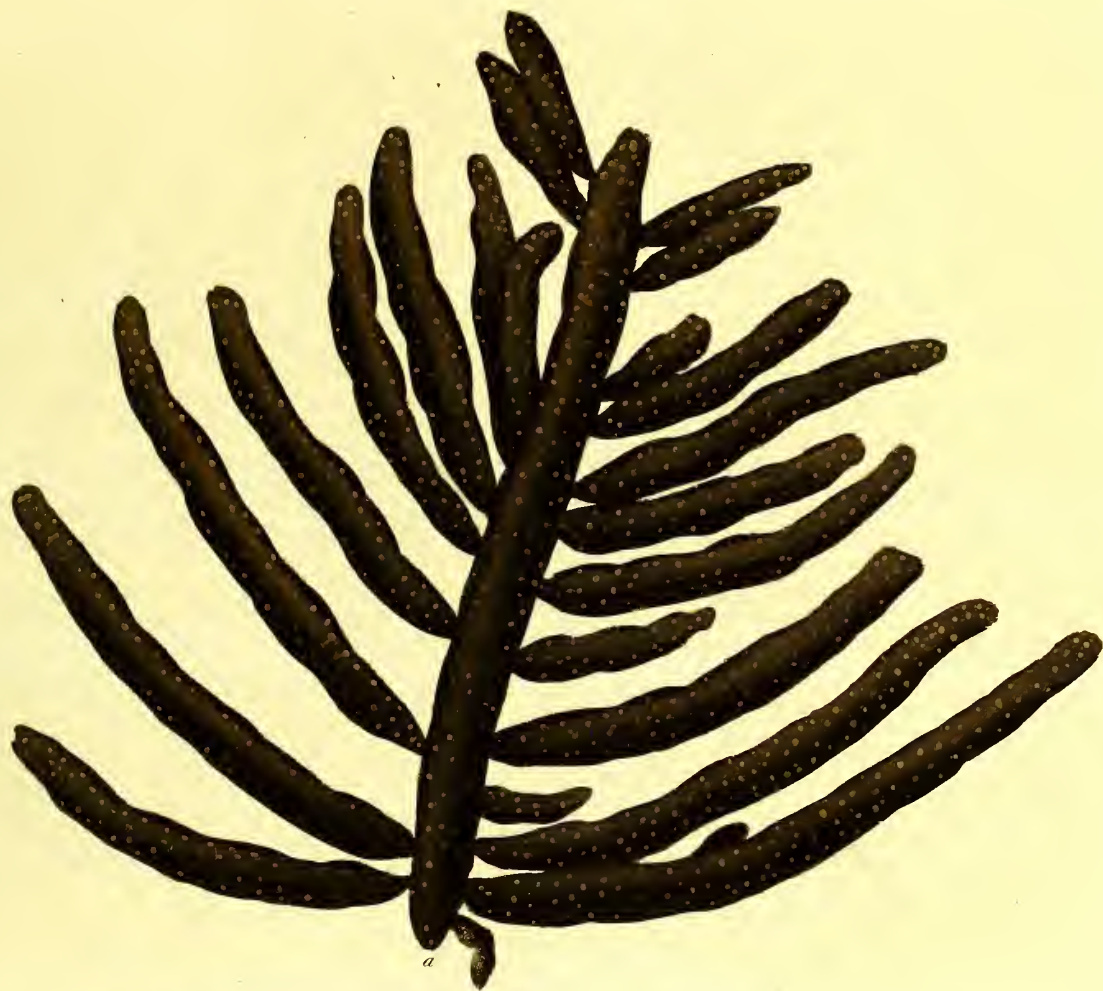
COLOR, most probably an olive green in the fresh plant; quite black, when dried; turning to a deep brown from subsequent immersion, but with the tips pale olive.

SUBSTANCE, between membranaceous and coriaceous, tough, and flexible.

OBS. The whole plant in drying becomes singularly wrinkled, and does not adhere in the least to paper:—on cutting open this *Fucus* so great a number of fibres, and those so long, flowed from the interior, that it is scarcely possible they could have been confined to the tubercles, but it seems more probable that the sides of the frond are quite lined with them; unless, indeed, we suppose that the interior of this plant, as of *F. Opuntia*, *F. acicularis* and others, is in a recent state filled with them and with a pellucid mucus.

I have great pleasure in being enabled here to lay before my readers a full description and figure of a plant, which, though long since mentioned in the works of Linnæus, has been scarcely known, but by name, among subsequent naturalists. The representation here given is, through the kindness of Dr. Smith, taken from a specimen in the Linnæan Herbarium, excepting only the magnified delineations of the fruit, for which I am indebted to Mr. Brown, by whom the fructification was first detected. This interesting discovery, at the same time that it shows more clearly than ever the near affinity between the *Fuci* and *Ulva*, has fortunately removed all doubts as to the generic place of a species, which, otherwise, on account of its singularly simple structure, I should never have ventured to have published among the *Fuci*, though its coriaceous texture would always have led me to suspect that it really belonged to them. It is in point of appearance a very singular plant, exceedingly unlike all others, and when dried, excepting in texture and color, rather resembling some inflated specimens that I have seen of *Ulva filiformis* than any other submerged *Alga* that I am acquainted with.

a. <i>Fucus rugosus</i> , natural size.	
b. part of the frond, in fruit, cut open, magnified	6.
c. external view of the same	6.
d. tubercle and fibres	4.
e. section of a tubercle	1.
f. fibres	1.



Fucus rugosus.

Fucus, fronde coriaceâ, tubulosâ, lineari, ramosâ; ramis distichis, horizontalitèr patulis, basi attenuatis, apice rotundatis, simplicibus: tuberculis immersis, ubique per totam frondem sparsis.

Ulva rugosa. LINN. *Mant.* p. 311. *Syst. Nat. Ed. Gmel.* II. p. 1391.

HABITAT ad Caput Bonæ Spei. *Koenig.*—In Novæ Hollandiæ oris. *D. Brown.*

Perennis.

RADIX callus dilatatus, planus, tenuis, niger, diametro ferè unguicularis.

FRONDES ex eâdem basi plurimæ, singulæ assurgentes *caule* unico, indiviso, sesquipalmari, tubuloso, inflato, e terete compresso, filiformi, digiti minoris crassitie, apice rotundato, nequaquàm verò, quod Linnæus habet, aperto, (nisi quidem hoc casu eveniat); caulis ex utroque latere absque ullâ normâ oriuntur *rami* homogenei, ejus omninò similes, aut tantummodò aliquantum minores, inferiores longissimi et subpalmares, reliqui sensim magis magisque abbreviati, ut summi vix sint unguiculares, omnes subdistichi, aliquot linearum intervallis disjuncti, horizontalitèr patuli, cauli per basin tenuissimam affixi, sed exinde statim in molem suetam turgescentes, eamque per totam longitudinem servantes, simplicissimi.

FRUCTIFICATIO ubique per caulem ramosque sparsa, nec minùs juxta basin quàm ad apices copiosè, e tuberculis constans sphaericis, immersis, approximatis, foveantibus congeriem seminum pyriformium, fuscorum, limbo pellucido cinctorum, unâ cum fibris plurimis, albicantibus, ramosis: ubicunque jacent tubercula frons poris minutissimis per-tusa conspicitur, tumoribusque perpusillis est inæqualis.

COLOR *recentis* verisimillimè olivaceus; *exsiccatæ* aterrimus; *iterùm immersæ* intensè brunneus, apicibus tamen dilutè olivaceis.

SUBSTANTIA membranaceo-coriacea, lenta, tenax.

OBS. Tota stirps per desiccationem insignitèr rugosa evadit, et chartæ nequaquàm adhæret:—magna fibrarum copia ex hoc Fuco dissecto effluit, adeoque fuerunt hæ longæ ut vix fieri possit esse olim in tuberculis inclusas; verisimilius videtur cinxisse parietes frondis internos, aut forsân frondem recentem esse his et muco pellucido repletam, sicut est in *F. Opuntia*, *F. aciculari*, et aliis animadversum.

Magno cum gaudio plantam hîc delineatam exhibeo, quæ, quantumvis sit a Linnæo multis abhînc annis in *Mantissâ* suâ descripta, nihilo tamen minus vix ulli Botanicorum hujus nostri ævi innotuit. Amicissimi Smithii benevolentiæ acceptum refero, quòd in hâc tabulâ depingatur ipsius Linnæi exemplar ex Herbario suo depromptum, ut nullus sit de specie dubitationi locus. Cùm tamen hoc specimen prorsùs sterile sit, adjeci fructum ex alio reportato a D. Brown, qui primus, fructificatione a nullo antea visâ detectâ, omnes de plantæ situ generico scrupulos exemit. Dubium hoc quidem aliàs, me judice, mansisset; prohibuisset enim frondis simplex structura quominùs stirpem segregarem ab *Ulvis*, quibuscum antehac associata fuèrat, dum textura coriacea omninò Fucis adjungendam suaderet. Et nunc quidem non est negandum quin per ipsam *F. rugosi* fructificationem doceamur naturam nullos posuisse limites inter *Fucos* et *Ulvas*; quoniam receptaculorum indoles hoc genus respicit, situs autem cum illo convenit. Facie suâ *F. rugosus* ab aliis omnibus Fucis longè recedit, et nullam inter Algas submersas tantum refert, quantum aliqua, quæ Yermuthæ reperi, *Ulva filiformis* exemplaria inflata, cujus tamen textura et color sunt dissimillimi.

a. <i>Fucus rugosus</i> , magn. nat.	
b. <i>frondis dissectæ pars</i> , cum fructu, magn. auct.	- 6.
c. <i>ejus pars</i> , extrinsecus visa	- - - 6.
d. <i>tuberculum et fibræ</i>	- - - 4.
e. <i>tuberculum dissectum</i>	- - - 1.
f. <i>fibræ</i>	- - - 1.

Fucus inermis, frond between coriaceous and cartilaginous, almost ligneous near the base, cylindrical, filiform, much and irregularly branched; ramuli compressed, linear, acuminate: tubercles solitary, cap-shaped, terminal.
Fucus inermis. BROWN, MSS.

At Port Dalrymple, and on the southern coast of New Holland. Mr. Brown.

Perennial.

ROOT, a woody callous disk, nearly half an inch in diameter.

FROND, solitary, rising with a single stem, from a foot to a foot and half in height, cylindrical, as thick at its base as a small goose-quill, but thence gradually growing more thin, so that at its apices it scarcely exceeds the size of a sparrow's quill; throughout its whole length it is straight, and undivided, but beset with branches, in other respects naked; of the branches the lower ones are distichous, the rest alternately disposed in an irregularly spiral manner, but sometimes growing in pairs, all of them separated by very short intervals, patent, between cylindrical and compressed, completely resembling the stem, except that they are twice or thrice as slender, varying in length from two inches to eight or nine, the uppermost generally but not always longest, the whole of them pinnated with a series of smaller ones, which are compressed,* alternate, patent, about a line distant from each other, simple, and acuminate:—the ends of the branches are not uncommonly tipped with exceedingly minute hollow oblong tubercles, which are attached to them like little caps, and fall off on the slightest touch: of these tubercles the substance is membranaceous, apparently not unlike that of the rest of the frond, with which they also agree in color: so exceedingly small as they are, it is impossible to speak with any certainty of their nature, but I sought in vain for either fibres or seeds in them.

FRUCTIFICATION, unknown; unless indeed the tubercles just mentioned have any connection with the fruit, and resemble in their nature, as well as in their appearance, those of *Fucus Cabrera*.

COLOR, blackish in the stem; in the branches a pleasing transparent olive green.

SUBSTANCE, between coriaceous and cartilaginous, woody near the base of the stem, every where flexible and tough.

OBS. Habit bushy: mode of growth very straight: in drying it does not adhere to paper.

It is from the affinity of this plant to *F. aculeatus* that Mr. Brown, to whom I am indebted for my specimens, has been induced to bestow upon it the name of *F. inermis*, on account of its wholly wanting the marginal spine-like processes so characteristic of the other species. Such an appellation by no means ill accords with the subject of the plate before us, but is far from being equally applicable to another specimen, apparently a very old one, brought home by Mr. Brown himself, the ramuli of which are short, and the whole exterior rough and spinous. I am nevertheless so convinced of the accuracy of my friend, that I have retained the name, being convinced he would not have given it, had it not accorded with the general appearance of the plant. In point of habit *F. inermis* agrees remarkably with *F. aculeatus*, and there is no less similarity in the color and texture of the two: it likewise bears to *F. Cabrera* a very strong resemblance, which is increased by the circumstance of many of the apices terminating in swellings externally like those of *F. Cabrera*, though internally appearing very dissimilar, unless indeed those of my specimen had received some injury. These, when magnified, resemble in miniature the pileus of *Lycoperdon phalloides*. *F. inermis* is distinguished from *F. aculeatus* by the want of the marginal spines; and from *F. Cabrera* by its different mode of growth and its cylindrical or slightly compressed frond.

- a. *F. inermis*, natural size.
- b. small branch.
- c. part of a branch, with tubercles, magnified - 6.
- d. apex of the same, with the tubercle taken off - 3.

* Such at least is their appearance when dry, but their wrinkled exterior leads me to believe that in a recent state they were cylindrical.

H. J. H. Eng. del.

Sargassum nigrum.



Fucus, fronde coriaceo-cartilagineâ, basi sublignosâ, terete, filiformi, ramosissimâ; ramulis sub-compressis, linearibus, acuminatis: tuberculis solitariis, pileiformibus, terminalibus.

Fucus inermis. BROWN, MSS.

HABITAT apud Portum Dalrymple, et in Meridionalibus Novæ Hollandiæ oris. D. Brown.

Perennis.

RADIX callus discoideus, diametro ferè unguicularis, lignosus.

FRONS solitaria, caule assurgens unico, pedali, sesquipedali, et ultrâ, terete, basi pennæ anserinæ minoris crassitie, attamen exinde sensim attenuato, ut ad apices passerinam vix superent, stricto, indiviso, sed per totam longitudinem ramis obsito; rami inferiores distichi, reliqui circa caulem subspiritaliter dispositi, interdum etiam gemelli oriuntur, intervallo inter singulos brevissimo, patentes, e terete compressi, caulis prorsus similes, nisi quod duplo triplove sint tenuiores, hi dodrantes, illi vix bipollicares, superiores plerumque longissimi, quod tamen est incertum, omnes aliis pinnati minoribus, compressis,* alternis, patentibus, lineæ unius alteriusve intervallo sejunctis, simplicibus, acuminatis:—ramulorum apicibus aliquandò insident tubercula minutissima, frondi concolora, oblonga, cava, quæ pileorum instar ramos coronant, et leviter tacta decidunt: substantia horum tuberculorum membranacea, illi reliquæ frondis haud dissimilis est visa; sed in tantâ partium minutie quisnam aliquid certi efferre auderet?—Hoc tantum liquet, me nulla in illis semina nullas fibras detegere potuisse.

FRUCTIFICATIO hactenus latet, nisi quidem tubercula jam memorata ullo modo ad fructum pertineant, et tam indole quàm facie illa *Fuci Cabrera* referant.

COLOR in caule nigricans, in ramis amoenè olivaceus atque diaphanus.

SUBSTANTIA coriaceo-cartilaginea, caulis basin versus lignosa, ubique lenta et tenax.

OBS. Habitus strictus: facies comosa: per desiccationem chartæ non adhæret.

Arcta ea quæ inter *Fucum* hîc depictum et *F. aculeatum* affinitas interest movit D. Brown ut inderet stirpi huic nostræ, cujus exemplaria illi accepta refero, *F. inermis* nomen; eo scilicet animo, ut, cum margines unius integerrimi alterius spinulosi in plantis hisce dignoscendis plurimum valeant, non deessent utrique nomina tales characteres exprimentia. Negandum etiam non est quin, si *F. inermis* facies semper sit talis qualis est illius exemplaris quod in hâc tabulâ exhibemus, planta jure sit optimo ita appellanda; sed, infaustò, non illæ modò stirpes armatæ apparent, quæ margine sunt serratæ, sed et eæ quoque, quæ, quum diffractæ vetustæve reperiuntur, ob ramorum frequentissimorum copiam undique aculeis horrere videntur. Talitèr quidem se res habet cum uno e speciminibus a D. Brown ipso relatis, quod tamen haud obstitit quominus obsequeretur amico accuratissimo, qui *Fucum* in loco natali vidit, et certissimè nunquam ita nuncupavisset, nisi nomen rectè congrueret. Habitum, ut aiunt, generalem si respicias, *F. inermis* maximè accedit ad *F. aculeatum*, cui colore etiam et texturâ non minus est affinis: plurimum quoque *Fucum Cabrera* refert, similitudinemque hoc multum adjuvat, quod nonnulli ex apicibus in tumores desinant, qui extrinsecus similes videntur eorum in *Fuco Cabrera* notabilium, sed intus sunt dissimillimi, nisi quidem forsitan illi a me visi casu aliquo læsi fuerint, faciemque veram idcirco perdidierint. Hi in *F. inermi* tumores per lentem maximè augmentem conspecti non ita malè referunt *Lycoperdonis phalloidis* pileos. Dignoscitur *F. inermis* a *F. aculeato* per spinarum marginalium absentiam; et a *F. Cabrera* tam per crescendi modum diversum quàm per frondem teretem vel leviter modò compressam.

a. *F. inermis*, magn. nat.

b. *ramulus*.

c. *rami pars, cum tuberculis*, magn. auct. - - 6.

d. *ejusdem apex, tuberculo detracto* - - 3.

* Annon recentes teretes fuerint dubito: ita suadet facies insignitèr rugosa, quasi madefacti formam pristinam non recuperent.

Fucus aculeatus, stem ligneous, short, cylindrical, divided at its apex into cartilaginous, flat, linear, nerveless branches, repeatedly branched in a pinnated manner, scattered, often growing two or three together; the primary ones entire at their margins; the ultimate ones at first fringed with pencils of fibres, then with small, subulate, erect spines, placed close to each other.

Fucus aculeatus. LINN. *Sp. Pl.* II. p. 1632. *Syst. Nat.* II. p. 717. *Mant.* p. 509. *Syst. Nat. Ed. Gmel.* II. p. 1384. *Fl. Ang.* p. 585. *Fl. Scot.* II. p. 924. *Fl. Dan.* t. 355. WITH. IV. p. 113. *Linn. Trans.* III. p. 179. *Ner. Brit.* p. 24. t. 8. ROTH, *Fl. Germ.* III. p. 452. *Syn. Fuc.* II. p. 262. *Fl. Fr. Ed.* 2da. II. p. 34.

F. muscoides. LINN. *Sp. Pl.* II. p. 1630. *Syst. Nat.* II. p. 717. GMELIN, *Hist. Fuc.* p. 130. t. 12. ESPER, *Ic. Fuc.* I. p. 116. t. 59. *Fl. Ped.* II. p. 331. *Fl. Ang.* p. 590. *Fl. Carn.* II. p. 403.

F. virgatus. *Fl. Norv.* I. p. 45.

F. usneoides. OEDER, *Enum. Plant. Fl. Dan.* p. 116.

F. contortus. ESPER, *Ic. Fuc.* I. p. 89. t. 43. (excl. syn.)

F. angustifolius, foliis dentatis. RAIL. *Syn.* p. 48. n. 38.

F. tenuifolius, foliis dentatis. MORIS. *Hist. Ox.* III. p. 648. s. 15. t. 9. f. 4.

On the shores of the British Isles, not very uncommon.—In the sea about Norway. *Gunner*.—Coast of the German Ocean, near Wangeroge. *Roth*.—Atlantic Ocean, near France. *Decandolle*.—Coasts of Piedmont. *Allioni*.—Sent from the Tagus to *Mr. Woodward*; and from Ceylon to *Linnaeus*.

Perennial.—February. *Stackhouse*.

ROOT, a small callous disk.

FROND, furnished with a cylindrical stem (or perhaps it might more properly be called a *stipes*,) about the thickness of a crow's quill or a small goose-quill, erect, straight, woody, rising to the height of three or four inches undivided and filiform, either quite simple, or irregularly pinnated with one or two pairs of opposite branches, then divided at its apex into numerous branches, which run to the length of two or three feet, and are immediately at their origin somewhat swollen, then cylindrical like the stem, afterwards compressed, and at last (the whole taking place before they are three inches long) flat, after which they preserve to their very tips an everywhere uniform width of about half a line; they are for the most part wholly destitute of both veins and midrib, but occasionally in large specimens shew faint traces of the latter, some grow solitary, others two, three, or four together, all are undivided, but pinnated from top to bottom with smaller ones disposed in the same manner, alternate, distichous, patent, forming at their base a roundish angle with the stem, pinnated, like the primary ones, with others three or four inches long, also disposed in the same manner, and these in their turns sometimes produce a fourth series; the ultimate branches are an inch or an inch and a half long, most of them quite simple, but a few proliferous with a smaller shoot or two; the apices are everywhere obtuse, almost as if truncated; the margins of all the branches are quite entire, excepting those of the ultimate ones, which are fringed with a row of alternate spine-like teeth, of the same substance as the branches, separated from each other by extremely short spaces, subulate, about a line long, all pointing upwards:—in the first stage of the plant's growth the branches show no symptoms of these teeth, but in their room produce pencils of yellow branched and jointed fibres, which fall off as the plant advances in age, and are succeeded by the aculei.

FRUCTIFICATION,* I have at present seen none.

COLOR, a more or less pale yellow in the young plant: in the full grown one, brown and opaque in the stem; but olive green inclining to grass-green, and semi-transparent in the branches: in drying it not unfrequently turns blackish.

SUBSTANCE, ligneous and hard in the stem, in the branches cartilaginous, and very flexible, but very tough; when dry, it becomes stiff and brittle.

OBS. The habit is particularly thick, bushy, and entangled: it has been by many authors well compared to the tail of a sorrel horse: young plants are subgelatinous and adhere firmly to paper, but full-grown ones do not in the least do so.

Long and generally as this *Fucus* has been known, I believe that no botanist ever suspected till lately how different are the appearances it puts on at different periods of its existence; or if any one ever saw a specimen fringed with the tufts of fibres, he either passed it by unnoticed, supposing the plant to be merely infested with some parasitic conferva, or he treasured it in his Herbarium as a new species, for which I have more than once received it. For the removing of our error upon this subject, and enabling us better to understand one of the most curious of its tribe, we are principally

* Upon the subject of the fruit of this *Fucus* Dr. Goodenough and Mr. Woodward remark, that they observed extremely minute tubercles, thinly scattered on the surface and on the margins of the linear branches and apparently filled with seeds. Mr. Stackhouse attributes to it a different kind of fructification, which, he says, "consists of an irregular, echinated, wax-like excrecence, coming out near the bottom at the setting on of the branches." He adds, "it expands, when ripe, and falls down round the branch, exposing to view a beautifully granulated surface, yellowish, studded with brown." Miss Hill, whose obliging communications I have often had occasion to mention, writes me word that she has found a third sort of fruit, lanceolate capsules mixed with the pencils of hairs; and Oeder describes a fourth, which he calls innate and concatenated. For my own part, I must confess that I have in vain tried to satisfy myself as to any of these being true fruit, and cannot but think that none of them are so.



Fuchs del.

Fucus aculeatus.

cipally indebted to Mrs. Griffiths and Miss Hutchins, to the latter of whom I have still farther to express my obligations for the drawing represented in the plate before us, made by herself from specimens found in Bantry Bay. The discovery of the plant in its fibrous state leaves no doubt of its affinity to *F. pedunculatus* and *Conferva villosa*; and I cannot but think it may reasonably be expected that we should find upon it a fructification similar to that of the latter of these species, under which my excellent friend, Mr. Dillwyn, has well remarked of the young state of this plant, that he found to his great surprise that the aculei of *F. aculeatus* were regularly jointed, and that the main filaments, especially towards their extremities, had a similarly jointed internal tube running longitudinally through them, and occupying nearly half of their width. The whole of this jointed structure disappears as the plant grows older. Different specimens of *F. aculeatus* differ materially in the number and width of their branches; and some are even found almost wholly destitute of the aculeiform teeth, that principally distinguish the plant, and give it its name. I am, however, quite at a loss to imagine what could have induced various authors to divide it into two species, and with regard to the Linnæan *F. muscoides*, I cannot but think that the immortal Swede had originally in his mind some plant unknown to us; as he could never have said of the present, that when dry it cannot be distinguished from a moss.

- a. *F. aculeatus*, natural size.
 b. root and base of the stem.
 c. branch in its earliest state.
 d. fibres, magnified - - - - - 1.

 187.—FUCUS ACULEATUS.

Fucus, caule lignoso, brevi, terete, apice diviso in ramos cartilagineos, planos, lineares, enerves, repetito-pinnatim ramosos, sparsos, non rarò binos ternosque; primarios integerrimos; ultimos margine primùm penicilliferos, mox spinulosos; spinis approximatis, subulatis, erectis.

Fucus aculeatus. LINN. *Sp. Pl.* II. p. 1632. *Syst. Nat.* II. p. 717. *Mant.* p. 509. *Syst. Nat. Ed. Gmel.* II. p. 1384. *Fl. Ang.* p. 585. *Fl. Scot.* II. p. 924. *Fl. Dan.* t. 355. WITH IV. p. 113. *Linn. Trans.* III. p. 179. *Ner. Brit.* p. 24. t. 8. ROTH, *Fl. Germ.* III. p. 452. *Syn. Fuc.* II. p. 262. *Fl. Fr. Ed. 2da.* II. p. 34.

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F. virgatus. *Fl. Norv.* I. p. 45.

F. usneoides. OEDER, *Enum. Plant. Fl. Dan.* p. 116.

F. contortus. ESPER, *Ic. Fuc.* I. p. 89. t. 43. (excl. syn.)

F. angustifolius, foliis dentatis. RAII. *Syn.* p. 48. n. 98.

F. tenuifolius, foliis dentatis. MORIS. *Hist. Ox.* III. p. 648. s. 15. t. 9. f. 4.

HABITAT Britanniarum ad oras, haud ita infrequens.—In Mari Norvegico. *Gunner*.—Ad littora maris septentrionalis prope Wangeroge. *Roth*.—In oceano Galliam alluente. *Decandolle*.—In mari Nicæensi et Uneliæ. *Allioni*. Tagi ad littora lectum accepit *D. Woodward* et e *Zeylonâ Linnaeus*.

Perennis.—Februario. *Stackhousius*.

RADIX callus exiguus, discoideus, perpauillum dilatatus.

FRONS caule (*stipitem* forsân rectiùs dicas) instructa terete, pennæ corvinæ aut anserinæ minoris crassitiæ, erecto, stricto, lignoso, qui ad duorum triumve pollicum altitudinem indivisus filiformisque assurgit, nunc simplex, nunc vagè pinnatus ramis aliquot oppositis, apice divisis in ramos plurimos, bi-tri-pedales, qui ipso ortu sunt aliquantùm incrasati, mox teretes, sicut caulis, tum compressi, et demùm (quod etiam evenit priusquam spithamam sunt longi) plani, quo facto, eandem ubique latitudinem, unius lineæ circiter dimidium, ad apices usque servant; rami costæ venarumque plerumque

plerumque prorsus expertes, sed interdum costâ obsoletâ notati, *nunc solitarii, nunc, quod sæpius accidit, bini terni quaternive oriuntur, omnes indivisi, sed per totam longitudinem alternatim pinnati aliis, distichis, qui quoque vel sunt solitarii, vel duo aut plures unâ orti, spatio inter singulos subpollicari, primariorum prorsus similes, nisi quod sint aliquantum minores, patentes, primo tamen ortu angulum cum caule rotundatum efficientes, ipsi pinnati aliis tri-quadrupollicaribus simili ratione dispositis, qui quoque interdum quartam seriem ferunt; rami ultimi pollicares vel sesquipollicares, ut plurimum simplicissimi, rarius uno alterove minore proliferi; apices ubique obtusi et quasi truncati; margines ramorum omnium præter ultimos integerrimi, horum ubique obsiti dentibus aculeos referentibus, homogeneis, subulatis, lineam ferè longis, sursum spectantibus, alternis, singulis spatio brevissimo sejunctis: in primâ plantâ ætate rami nullos habent aculeos, neque ulla monstrant horum vestigia, sed eorum loco ferunt penicillos fibrarum flavicantium ramosarum articulatarum, quæ, plantâ jam adultâ, decidunt, et aculei proveniunt.

FRUCTIFICATIO† nulla a me hactenus visa.

COLOR plantâ junioris luteus, aut flavicans; adultâ fuscus in caule, cætera olivaceus aut olivaceo-gramineus, et subdiaphanus: exsiccata sæpe nigrescit.

SUBSTANTIA caulis lignosa, ramorum cartilaginea, tenacissima, per desiccationem rigida et fragilis.

Obs. Crescendi modus densus, dumosus, et implicitus, quare multi auctores dixerunt referre equi helvi caudam: exemplaria juniora sub-gelatinosa sunt, et per desiccationem chartæ arcuè adhærent, quod nullo modo faciunt adulta.

Quàm verè adhuc in cunabulis versatur nostra Algarum submersarum cognitio hinc colligere licet, quòd, quamvis hic Fucus diu et universè inter omnes ferè botanicos innotuerit, nemo ejus faciem plumosam memorârît; et si quis talem viderit, aut prætermisit, credens scilicet Fucum Confervis modò parasiticis fortuitò impeditum; aut pro novâ specie habitum in Herbario cautè seposuit. Nunc tandem lux aliqua affulsit stirpi dignissimæ quæ observetur, naturâque, si quæ alia, singulari præditæ, et scimus quantum a se invicem discrepant diversa ejus ætatis stadia; quod debemus feminis lectissimis, optimè de botanicis omnibus meritis, D^{næ}. Griffiths et D^{næ}. Hutchins, quarum utraque multum studii in hoc Fuco ritè investigando impendit. Detectis jam fibrarum penicillis in *F. aculeato*, nemo non perspiciet quàm sit affinis *F. pedunculato* et *Conferva villosa*; consentientque, nisi fallor, plerique mecum, sentienti esse quærendum eundem ferè in *F. aculeato* fructum, quem in *Conferva villosâ* uno abhinc anno reperit D. Leathesius. Frons *F. aculeati* junioris tota est præsertim ad apices et in aculeis plùs minùs manifestè articulata, videturque, ut Dillwinii eximii verbis utar, quasi eam percurreret tubus internus septis distinctus mediam ejus latitudinem occupans. In plantâ verò adultâ evanescent omnia articularum vestigia. Ramorum numero et latitudine multum inter se discrepant diversa *F. aculeati* exemplaria, reperiunturque interdum individua quæ maximâ ex parte, si non omninò, carent aculeis illis, stirpis caractere essentiali. Hariolari nescio quæ causa induxerit auctores de algis marinis scribentes ut in duas species dividerent *F. aculeatum*, et nequeo non suspicari Linnæum olim in animo habuisse diversam speciem, cum primùm suum *F. muscoideum* describeret; nequaquam enim Fucus hic noster respondet illi quod de suâ stirpe memorat, exsiccata non esse a musco distinguendam. Iconem hîc datam, ad exemplaria recentia confectam, debeo amicitia D^{næ} Hutchins, jamjam millies laudatæ.

a. *F. aculeatus*, magn. nat.

b. *radix*, et *caulis basis*.

c. *ramus in ætate primâ*.

d. *fibrarum fasciculus*, magn. auct. - - - 1.

* Bene monet Stackhousius, hujus Fuci habitum magnooperè variare; in quibusdam enim individuis ramulos sparsim produci; in aliis ita densè congestos esse, ut caudam equinam, ut rectè observavit D. Gunner, quodam modo referre videatur Fucus hic.

† De *F. aculeati* fructu dicunt Goodenovius Woodwardiusque: "fructificatio tubercula minutissima nigricantia in ramis ramisque sparsa." Oederus fructificationes innatas concatenatas memorat. Contrâ Stackhousius: "in axillis ramulorum producitur fructus, obtusè echinatus, irregularis, per maturitatem sese expandens, substantia intùs granulata." Demùm D^{næ} Hill nuper me per literas certiore fecit, se detexisse capsulas lanceolatas intra fibrarum penicillos latentes.

Fucus, fronde cartilagineâ; terete, filiformi, pinnatim ramosâ; ramis sub-alternis, elongatis, horizontalibus, simplicibus, tuberculiferis; tuberculis ellipticis, sub-pedunculatis, apice fibrilliferis.

Fucus pedunculatus. *Fl. Ang.* p. 587. *Linn Trans.* III. p. 213. *With.* IV. p. 120. *Ner. Brit.* p. 110. t. 16.

Eng. Bot. VIII. t. 545. *Syn. Fuc.* II. p. 367. *ESPER, Ic. Fuc.* II. p. 95. t. 156.

F. Gärtnera. *GMELIN, Hist. Fuc.* p. 164. t. 19. *Syst. Nat. Ed. Gmel.* II. p. 1386.

F. anomalus. *PALLAS, Misc. Zool.* p. 199. t. 14. f. 24. (*sic Gmelini.*)

HABITAT in Meridionalibus Angliæ oris.—In rupibus et saxis submarinis in Insulâ Portlandicâ. *Hudson*.—In Devoniâ. *Dna. Griffiths*.—Inter rejectamenta maris apud Yarmouth et Cromer in Norfolciâ.—Unicum frustulum in sinu, “Bantry Bay” dicto; repertum a *Dna. Hutchins*.

Annua.—Auctumno.

RADIX callus exiguus, subglobosus, nigricans, cornea.

FRONS* nunc solitaria, nunc bina, vel terna, teres, filiformis, longitudine dodrantalis, pedalis, aut etiam sesquipedalis, crassitie pennâ passerinâ duplò minor, † *caule* assurgens unico, indiviso, a basi ad apicem obsito ramis setaceis, homogeneis, sub-spiraliter dispositis, vagè alternis, duobus tribusve interdum unâ ortis, indivisis, horizontalibus, spatio inter singulos perbrevis, mediis qui palmares et ultrâ plerumque longissimis, reliquis inde sensim utrinque brevioribus, ut summi vix unguem æquent, sed inferiores nunquam ita breves, unde toti stirpi exiccatae et chartæ adpressæ peripheria ovata; caulis, si ramos excipias, nudus conspicitur, sed ramos ubique obsident tubercula elliptica, minutissima, concolora, pedunculis brevissimis fulta, horizontalia, alterna, aut opposita, aliquandò etiam bina ternave, ut plurimum tamen spatii circiter linearibus sejuncta, apice emittentia fibrarum lutescentium simplicium obsolete articulatarum fasciculos, ipsis triplo quadruplove longiores, qui etiam non rarò desunt, præsertim in exemplaribus vetustis.

FRUCTIFICATIO, dummodò reverà sit fructificatio, in tuberculis jamjam memoratis sita, quæ juniora e merâ corpusculorum (seminum?) oblongorum congerie constare videntur, sed in seriore ætatis gradu, si horizontaliter dissecentur, manifestè constant e filamentis densissimè constipatis horizontalibus radiatim dispositis, apice in granula subrotunda fusca intumescensibus.

COLOR flavicans in caule, non sine dilutâ aliquâ fuscitudine; in ramis pallidior; ubique subdiaphanus: *exiccata* intensior, et in hoc statu fibræ aliquandò virescunt.

SUBSTANTIA cartilaginea, ad corneam accedens, fragilis, in caule rigidiuscula.

OBS. Optimè de hujus Fuci tuberculis dicit Gmelinus, “Hypni antheram gracilem referre, inferius pedunculata, apice in penicillum laxum, fluitantem, subviridem, facillimè deciduum efflorescentia:” hæc per lentem visa non malè Hydrarum quibusdam speciebus assimilari possunt:—planta per desiccationem chartæ arcè adhæret.

Paucissimos jactat mare Fucos elegantiores *F. pedunculato*, quocum nemo est qui non delectatur, si recens et si illæsus conspiciatur, oceani summis fluctibus innatans, penicillis ubique vestitus confervoideis, qui non modò stirpi dant faciem pulcherrimè plumatam, sed colorem spargunt vividissimum fulvum, plantâ ex elemento genitali detractâ statim evanidum. *Fucus* est, ut videtur, annumerandus inter illos qui rarissimè occurrunt; in *Florâ enim Anglicâ* diu ejus extitit descriptio; in plerisque servatur herbariis; et facie ita singulari gaudet ut semel visus prætermitti non possit; nihilo tamen minus unum modò alterumve locum habitare scimus Britanniarum ad oras, nullibi extra eas repertus, nisi forsân in mari mediterraneo a Pallasio lectum credamus. Dubium autem hoc in præsens manet, et verisimilimè semper dubium manebit: cuiam enim dijudicare dabitur, an Gmelini *F. Gärtnera* sit idem qui *F. pedunculatus* noster? Suadet descriptio, icon repugnat. Hoc ex suo Fuco duobusque aliis a me nondum visis huic congeneribus construxit Gmelinus suum tertium Fucorum ordinem, quos *penicilliferos* nominat; caractere essentiali deprompto, quòd fructificationem habeant *corpuscula ovata penicillis terminata*. Hunc ego characterem quamvis non omnibus convenire scio, nihilo secius persuasum mihi habeo fore olim constitutam Fucorum familiam naturæ congruentem et a reliquis satis recedentem ex hisce Fucis, unâ cum *F. aculeato* et *F. radiciformi*, *Confervâ villosâ* et *Confervâ verrucosâ* *Eng. Bot.* quibus fortasse adjungendi erunt *F. ligulatus* et *F. viridis*. Hæc reputans, nullus dubito quin fibrarum penicilli in his obvii ad plantas ipsas pertineant, et nequaquam sint, quod a multis creditur botanicis, meræ confervæ parasiticæ Fucis fortuitò innatæ. Nescimus tamen adhuc cui fini in fucorum œconomiâ hi inseruiunt. Structura articulata obstat ne proliferum crescendi modum decidendo suppeditare putemus; neque talis vis aliquo modo necessaria videtur, cum tubercula dissecta evidentè constent e fibrarum seminumque congerie. Ad hoc autem ritè conspiciendum lente acerrimâ est opus, et opus est ut dissecentur tubercula, quæ vel integra vel microscopio mediocri visa substantiam planè uniformem frondi ferè homogeneam ostendunt. Insuper autem hæc tubercula ab iis cæterorum plurimorum Fucorum discrepant, quòd sint tactu dura, hoc scilicet habentia cum reliquâ fronde commune, quæ nihil in se habet tenerum gelatinosumve. Fibrarum penicilli interdum majusculi conspiciuntur, tuberculis jam minimis aut vixdum formati, et dantur aliquandò exemplaria tuberculis fibrisque pariter orbata. Hoc in statu ne plantam cum *Confervâ villosâ*

* Non rarò evenit *Confervam villosam* et *Fucum pedunculatum* ex eadem basi oriri, et vix unquam rejicitur hic sine illâ a mari prope Yarmouth.

† *Caulem tubulosum* dicit Stackhousius, in quo certè hallucinatur.

villosâ commisceas est cavendum. Rami nunquam non simplices *F. pedunculatum* ab hæc, sicut tubercula pedunculata, color, crescendique modus ab aliis algis submersis distinguunt.

a.	<i>F. pedunculatus</i> , magn. nat.					
b.	<i>ramus</i> , magn. auct.	-	-	-	-	6.
c.	<i>ejusdem pars</i>	-	-	-	-	4.
d.	<i>unum e tuberculis, diffractum, fibrâ unâ superstite</i>					1.
e.	<i>rami pars, tuberculis ætate provectis, fibrarum expertibus</i>	-	-	-	-	5.
f.	<i>tuberculum</i>	-	-	-	-	4.
g.	<i>idem horizontalitèr dissectum</i>	-	-	-	-	2.
h.	<i>semina et fibræ</i>	-	-	-	-	1.

188.—FUCUS PEDUNCULATUS.

Fucus pedunculatus, frond cartilaginous, filiform, irregularly pinnated; branches mostly alternate, long, horizontal, simple, bearing elliptical, sub-pedunculated tubercles, tufted at their apices with pencils of fibres.

Fucus pedunculatus. *Fl. Ang.* p. 587. *Linn. Trans.* III. p. 213. *With.* IV. p. 120. *Ner. Brit.* p. 110. t. 16. *Eng. Bot.* VIII. t. 545. *Syn. Fuc.* II. p. 367. *ESPER, Ic. Fuc.* II. p. 95. t. 156.

F. Gærtnera. *Gmelin, Hist. Fuc.* p. 164. t. 19. *Syst. Nat. Ed. Gmel.* II. p. 1386.

F. anomalus. *Pallas, Misc. Zool.* p. 199. t. 14. f. 24. (fide Gmelini.)

On the southern coast of England.—On rocks and stones in the sea at the Isle of Portland. *Hudson*.—Devonshire coast. *Mrs. Griffiths*.—Among the rejectamenta of the sea at Yarmouth and Cromer.—A single specimen found in Bantry Bay by *Miss Hutchins*.

Annual.—Autumn.

ROOT, callous, small, nearly globular, blackish, horny.

FROND,* sometimes solitary, sometimes growing two or three together, cylindrical, filiform, from nine inches to a foot or a foot and half in length, not more than half the thickness of a sparrow's quill, rising with a single undivided† *stem*, which from top to bottom is beset with setaceous *branches*, of the same nature as itself, disposed in an irregularly spiral direction, mostly alternate, but occasionally growing two or three together from the same point, undivided, horizontal, separated by very short intervals, the middle ones, which are generally longest, extending to three or four inches in length, the others gradually diminishing on both sides, so that the upper ones are not more than half an inch long, but the lower ones are never equally short, which gives the whole frond, when dried and pressed on paper, an ovate outline; the stem is quite naked, excepting the branches, but these latter are every where beset with elliptical, very minute *tubercles*, of the same color as themselves, supported upon extremely short peduncles, horizontal, some alternate, others opposite, and others growing two or three together, but most commonly separated by intervals of about a line each, sending out from their apices tufts of simple, obsolete jointed, yellowish fibres, which are three or four times longer than the tubercles;—they are, however, not uncommonly wanting, especially in old specimens.

FRUCTIFICATION, (at least what is considered as such), situated in the above-mentioned tubercles, which, when young, appear wholly composed of a mass of oblong granules (probably seeds), but at a more advanced period of growth are found, if horizontally dissected, evidently to consist of closely matted filaments, all lying parallel and horizontal, and disposed in a radiated direction, as if originating from a common centre, the apices swelling into brown roundish granules.

COLOR,

* It is far from uncommon to find *F. pedunculatus* and *Conferva villosa* growing from the same base, and it very seldom indeed happens that one of them is thrown upon the beach at Yarmouth without the other.

† Stackhouse calls the stem *tubular*, which is certainly an error.



Fucus pedunculatus.



COLOR, yellowish, with a faint tinge of brown, in the stem; paler in the branches; every where semi-transparent, turning darker from drying, in which state the fibres are occasionally greenish.

SUBSTANCE, cartilaginous, approaching to horny, brittle, somewhat rigid in the stem.

Obs. The tubercles of this *Fucus* are aptly assimilated by Gmelin to the slender capsule of a *Hypnum*, pedunculated below, and tufted with a small loose floating pencil of deciduous filaments:—if seen with a strong microscope, these tubercles are not unlike some species of *Polypi*:—the plant, in drying, adheres firmly to paper.

Nothing can well be more elegant than perfect specimens of *F. pedunculatus*, when seen quite fresh floating in the sea, the beautiful conferva-like tips of their pedunculated tubercles not only giving to the whole a most pleasing feathery appearance, but also displaying a richness and glow of coloring scarcely to be imitated, which almost immediately fades upon the plant being taken out of its native element. It seems to be a species of particularly unfrequent occurrence, having, though long known, been but partially found upon the shores of our own island, and never upon those of any foreign country, except indeed that it has been gathered in the Mediterranean by Pallas, supposing I am correct in the reference above given to Gmelin's *F. Gärtnera*, which from the description I am led to think must certainly be the case, though the figure seems decidedly to favor a contrary opinion. This able botanist has of his *F. Gärtnera* and two other species unknown to me made what he calls the third order of *Fuci*, which he denominates *Fuci penicilliferi*, founding the leading character of the division upon the fructification consisting of ovate bodies terminated with pencils of hairs. That this definition will not hold exactly good I am fully persuaded, but I am not less confident that these species, in conjunction with the subjects of the preceding and following plates, *Conferva villosa*, *Conferva verrucosa* Eng. Bot. and perhaps *F. ligulatus* and *F. viridis*, will hereafter be found to constitute a distinct and natural family, and I feel consequently persuaded that the fibres, which have by many Naturalists been regarded as parasitical *Confervæ*, are really parts of the plant, though we are at present unacquainted with the purpose they are by nature designed to answer. Their jointed structure precludes the possibility of their being intended to afford the plant a prolific mode of increase; nor indeed does such a provision seem necessary, as the tubercles appear, when dissected under a powerful microscope, to be a mass of seeds and fibres; though, if seen entire, or with an inferior magnifier, they look only like uniform bodies of nearly the same texture as the frond. Their extreme hardness is a singular property, by which they differ from those of most other *Fuci*, but the same difference is also observable in the whole plant, which has in it nothing tender or gelatinous. If seen without tubercles or fibres, which latter are sometimes very large, while the former are so young as to be scarcely perceptible, *F. pedunculatus* may easily be overlooked as a barren specimen of *Conferva villosa*, from which, however, it is always distinguishable by its simple branches. Its color and mode of growth keep it sufficiently separate from all other submersed algæ.

a.	<i>F. pedunculatus</i> , natural size.					
b.	branch, magnified	-	-	-	-	6.
c.	part of the same	-	-	-	-	4.
d.	one of the tubercles broken, with a single fibre remaining	-	-	-	-	1.
e.	part of a branch of an old plant, the tubercles having lost their fibres	-	-	-	-	5.
f.	tubercle	-	-	-	-	4.
g.	horizontal section of the same	-	-	-	-	2.
h.	seeds and fibres	-	-	-	-	1.

Fucus radiformis, frond cartilaginous, compressed, filiform, irregularly bipinnate: branches scattered, long, patent, bearing spherical tubercles on rather long peduncles, which, though naked, pour out, when pressed, tufts of fibres from their apices.

Fucus radiformis. BROWN, MSS.

In Bass' Straights and Kent's Islands, near New-Holland. *Mr. Brown*.

Perennial.

ROOT, an expanded, flat, shapeless, callous disk.

FROND, rising with a single, undivided, *stem*, about a foot in length, compressed, as thick as a black-bird's quill near the base, but thence gradually growing more and more thin, so that at the apex it is not more than a third or a fourth of that thickness, beset throughout its whole length with branches precisely resembling itself, except in their smaller size, scattered, distichous, patent, separated by intervals of one or two lines, the lower ones nine inches long, the upper ones scarcely two inches, yet not regularly shortening from the base upwards, all of them undivided, and most simple, but some of the longer ones beset with a series of others considerably shorter, arranged in the same manner as the primary ones: the branches are everywhere fringed with *tubercles* like those of *F. pedunculatus*, but so much more evidently belonging to the fruit, that I think it best to describe them under that head.

FRUCTIFICATION, globular tubercles, many times smaller than the smallest pin's head, standing upon capillary peduncles a line or more long, scattered at the distance of a line or two from each other over the whole of the smaller branches from top to bottom, distichous, patent, externally smooth and even, but proving upon dissection to be wholly composed of a mass of club-shaped bodies, whether seeds or fibres I am at a loss to tell, lying closely matted together parallel to each other, in such a manner that the thickest part forms the surface of the tubercle: mixed with these bodies are also some smaller roundish granules:—the tubercles, if pressed, emit from their apices minute tufts of whitish pellucid fibres, which give them an elegant crested appearance.

COLOR, a deep brown in the stem, in other parts tawny and semi-transparent: soon growing paler from being kept in fresh water, and at length turning to nearly white: always destitute of gloss.

SUBSTANCE, cartilaginous, almost horny, flexible, very tough.

OBS. In drying, the branches curl inwards, in nearly the same manner as those of *Sertularia falcata*; the substance also becomes hard and rigid, and the whole plant, which in no case adheres in the least to paper, considerably resembles the roots of some phænogamous vegetables, or rather perhaps some radiform Fungi.

I feel how imperfect is my description of *F. radiformis*, it having been made altogether from dried specimens; and I particularly regret this circumstance, as it appears to me probable that the whole list of Fuci does not contain a more remarkable species. Its affinity to *F. pedunculatus*, in texture, color, habit, and fructification, is very obvious, and I consider it far from impossible that the two plants may really agree in the latter of these circumstances, though the specimens I have yet seen of the one before us having been dried without pressure, and having long been kept in a dry state, do not justify me in concluding that such is actually the case. On the contrary, the tubercles of *F. radiformis* in these specimens shewed no appearance of the tufted filaments, till squeezed under the microscope, when to my great surprise they readily poured out a quantity of white fibres considerably thicker and more evidently jointed than those of *F. pedunculatus*, or any of its congeners. What is also remarkable in them is that the central part appeared of a substance unlike the rest; nor did the seeds themselves, if seeds they be, look altogether similar to those of *F. pedunculatus*; but I know, as must every one who is in the habit of using high microscopical powers, how difficult it is to make observations that are implicitly to be depended upon in objects so exceedingly minute; not to mention the possibility of the same thing being subject to variation in the different periods of its existence. For the specimen here figured I am indebted to Mr. Lambert.

a. <i>F. radiformis</i> , natural size.					
b. part of a branch, magnified	-	-	-	-	6.
c. tubercle	-	-	-	-	4.
d. fibre	-	-	-	-	1.
e. horizontal section of a tubercle	-	-	-	-	3.
f. contents of the same	-	-	-	-	1.



Fucoxanthum radiformis.

Fucus, fronde cartilagineâ, compressâ, filiformi, bipinnatim ramosâ; ramis sparsis elongatis, patentibus, tuberculiferis; tuberculis sphaericis, pedunculatis, nudis, compressis, filamenta ex apice effudentibus.

Fucus radiformis. BROWN, MSS.

HABITAT prope Novam Hollandiam in freto, "Bass' Streights," dicto, et in insulis "Kent's Islands," dictis. D. Brown.

Perennis.

RADIX callus explanatus, deformis.

FRONS caule assurgens unico, indiviso, sub-pedali, compresso, Merulae pennae crassitie juxta basin, exinde sensim attenuato, ut juxta apices triplo quadruplove sit tenuior, ramis per totam longitudinem obsito homogeneis, sui que similibus, nisi quod minores sint, sparsis, distichis, patentibus, singulis unius alteriusve lineae intervallo sejunctis, inferioribus dodrantalibus, summis vix bipollicaribus, neque tamen sensim a basi ad apicem abbreviatis, omnibus indivisis, sed quibusdam e longioribus rursus instructis aliis multo minoribus eadem qua primarii ratione dispositis: ramorum latera ubique obsident tubercula, illorum *F. pedunculati* similia, sed magis manifeste ad fructum attinentia, quare mox infra sub fructificatione descripsi.

FRUCTIFICATIO tubercula globosa, aciculae cujusvis capite multoties minora, pedunculis teretibus setaceis lineam et ultra longis fulta, in ramis minoribus disticha, per totam eorum longitudinem disposita, sparsa, lineae unius alteriusve intervallis sejuncta, patentia, extrinsecus aequalia, sin horizontaliter dissecantur, tota constare reperiuntur e corpusculis (seminibus an fibris?) claviformibus, articulatis, parallelis, parte incrassata tuberculorum superficiem respiciente, densissime constipatis, immixtis granulis subrotundis minoribus:—tubercula duriuscule compressa effundunt ex apicibus penicillos filorum pellucidorum, albicantium, simplicium, articularum, per quae faciem cristatam induunt.

COLOR in caule intense fuscus, caetera fulvus et subdiaphanus; in aqua dulci diu servata pallidior et demum albicans: nitoris semper expers.

SUBSTANTIA cartilaginea, sub-cornea, lenta, tenacissima.

Obs. Per desiccationem rami inflectuntur eodem ferè modo quo illi *Sertularia falcata*; substantia quoque dura et rigida evadit; et tota stirps, quae chartae nequaquam adheret, plantarum aliquarum phaenogamarum radices, aut fungus quosdam rhizomorphos, non male refert.

Nemo botanicus ignorat quanti sit momenti ad omnes ferè Fucos ritè intelligendos ut descriptiones conficerentur ad recentia exemplaria; quod si valeat in majoribus atque coriaceis, necesse est ut longè magis valeat in tenerrimis, qualis est hic *F. radiformis* noster, qui, nisi fallor, si cauto examini recens subjiciatur, multum lucis diffundet familiae praeter ceteris dignae quae investigetur. Summa, ut primo aspectu satis liquet, affinitas interest inter speciem hic depictam et *F. pedunculatum*, quoad colorem, texturam, et habitum; quin etiam verisimile mihi videtur utrumque esse praeditum fructu omnimodis eodem, quamvis specimina mea absque pressurâ exsiccata et diu in statu exsiccato servata nihil tale arguant, sed potius suadent plantas in hoc discrepare. His enim in speciminibus tubercula ostendebant nulla penicillorum vestigia, donec sub microscopio perstringerem, ut diffractorum substantia melius pateret, quum compressa effuderunt fasciculos fibrarum albicantium, crassiorum evidentiusque geniculatum iis *F. pedunculati* aut Fucorum caeterorum congenerum. Habuerunt insuper aliud notabile, quod pars media constaret e substantia uniformi pulposa, cui nihil fibrosi infuit: neque semina ipsa, (dummodò sint semina) prorsus referebant illa *F. pedunculati*. Fieri tamen potest, (et quam facile hoc potest sciunt omnes in microscopii compositi usu versati) ut in tali partium omnium minutie aliquid humani sim passus; ne dicam Fucorum fructum aliquandò in diversis aetatis stadiis faciem induere diversam. Exemplar in hac tabulâ delineatum cl. Lambertii benevolentiae debeo.

a. <i>F. radiformis</i> , magn. nat.		
b. rami pars, magn. auct.	- -	6.
c. tuberculum	- - -	4.
d. fibra	- - -	1.
e. tuberculum horizontaliter dissectum	- -	3.
f. ejusdem diffracti portio	- -	1.

Fucus Desfontainesii, stem coriaceous, compressed, filiform, bipinnate; branches between horizontal and patent, alternate, compressed; the primary ones solitary and undivided; the ultimate ones growing in threes, dichotomous, and bearing vesicles and fruit; vesicles solitary, spherical, petiolated; capsules linear, racemose.

Fucus comosus. POIRET, in *Encycl. Method. Bot.* VIII. p. 375.

On the shores of the Canary Islands. *M. Desfontaines*.

Perennial.

ROOT, I have not yet seen.

FROND, furnished with a stem a foot or more long, slightly compressed, and nearly angular, filiform, (of what thickness, and whether divided or not, I am ignorant) beset with numerous branches, which are of the same nature and substance as itself, alternate, patent, straight, compressed, half a foot long, scarcely thicker than a sparrow's quill, filiform, and undivided, but also beset from top to bottom with a series of others that are not more than the half or a third of their size, between compressed and flat, growing two or three together in an irregularly spiral alternate manner, separated from each other by intervals of a line or a line and half, all about three inches long, not thicker than hog's bristles, filiform, four or five times dichotomous at uncertain distances, the angles of the dichotomies being rounded, and the base, to use the words of Poiret, dilated into a small, compressed triangular membrane; the apices are every where obtuse; towards the tops of the shoots are observable a few spherical vesicles, about the size of the seeds of *Lathyrus odoratus*, growing near the base of the secondary branches, a single one only on each, and seldom more than six or eight upon each primary branch, supported upon very narrow flat petioli two lines long, externally smooth, internally empty.

FRUCTIFICATION, not satisfactorily known at present; but it appears clearly, from some rudiments of receptacles that may be seen on the smaller branches near the vesicles, that the fruit consists of cylindrical receptacles growing in racemi.

COLOR, a semitransparent olive-green.

SUBSTANCE, coriaceous, flexible.

OBS. Habit remarkably and elegantly tufted:—whole plant very smooth and glossy:—in drying, it does not adhere to paper.

I am indebted to my friend, Mr. Stackhouse, for specimens of this *Fucus*, which, during the short period of the late peace, was communicated to him by *M. Desfontaines*, but without any name annexed, nor does it appear that the plant received one till lately, when it was described by *M. Poiret* in the last volume of that excellent work, the *Botanical part of the Encyclopédie Méthodique*, under the title of *F. comosus*, which I have been obliged to change, as already given to another, and I have therefore called it after the eminent Botanist by whom it appears to have been discovered. Of *M. Poiret's* description I have greatly availed myself; for, without it, my own must have been most imperfect; as the specimen represented in this plate is the largest I ever saw, though evidently only a part of a considerably larger plant. The ternate branches of *F. Desfontainesii* seem to be its most certain and most obvious character, in addition to which it also differs from most other *Fuci* in its pisiform vesicles. In this latter respect, however, as well as in the shape and dichotomous division of the ultimate branches, it agrees with *F. piluliferus*, to which it perhaps altogether bears a closer natural affinity than to any other; but the habit of the two plants is very dissimilar, on account of the branches of *F. piluliferus* not being more than a third of the length of those of *F. Desfontainesii*, and growing altogether singly. In addition to this they are so wide, that analogy rather requires them to be considered as leaves; not to mention that a midrib runs through them, of which there is no symptom in *F. Desfontainesii*.

- a. branch of *F. Desfontainesii*, natural size.
 b. ultimate branches, magnified - - 6.
 c. one of the upper ones, with vesicle and fruit 6.



Fucus Desfontainesii.

Fucus, caule coriaceo, compresso, filiformi, bipinnato; ramis horizontaliter patentibus, alternis, compressis; primariis solitariis, indivisis; ultimis ternis, dichotomis, vesiculiferis, fructiferisque; vesiculis solitariis, sphaericis, petiolatis; capsulis linearibus, racemosis.

Fucus comosus. POIRET, in *Encycl. Method. Bot.* VIII. p. 375.

HABITAT in Oceano Insularum fortunatarum, ad littora. D. *Desfontaines*.

Perennis.

RADIX nondum a me visa.

FRONS instructa caule pedem et ultra longo, leviter compresso et sub-anguloso, filiformi, (quantæ crassitie, et an divisus sit necne, nescio) ramis obsito plurimis, homogeneis, alternis, patentibus, strictis, compressis, semipedalibus, vix pennâ passerinâ crassioribus, filiformibus, indivisis, sed per totam longitudinem obsitis serie aliorum duplò triplòve tenuiorum, compresso-planorum, qui terni quaternive oriuntur, et ordine sub-spiraliter alterno, intervallo lineæ vel sesquilineæ inter singulos, disponuntur, suntque omnes circiter tres pollices longi, setâ porcinâ haud crassiores, filiformes, quater pluriesve dichotomi, intervallis incertis, segmentorum angulis rotundatis, et, ut Poirerii verbis utar, furcarum basi in membranam exiguam compressam triangularem expansâ; apices ubique obtusi; ramorum summities versus conspiciuntur aliquot vesiculæ sphaericæ, *Lathyri odorati* seminum magnitudine, ramis secundariis prope eorum basin impositæ, una modò in singulis, et rarò plures quàm sex aut octo in ramo quolibet primario, petiolis fultæ tenuissimis, planis, duas lineas longis; extrinsecus læves, intus cavæ et vacuæ.

FRUCTIFICATIO hæcenus non bene cognita; sed rudimenta aliquot receptaculorum imposita ramis minoribus prope vesiculas testantur constare e receptaculis cylindraceis racemosim dispositis.

COLOR olivaceus subdiaphanus.

SUBSTANTIA coriacea, lenta.

OBS. Facies insignitè et elegantè comosa:—stirps tota perquam lævis et nitens:—per desiccationem chartæ non adhæret.

In brevi illo spatio, cum paullispèr cessaret luctuosum hoc bellum quod jam per tot annos gentes Europæas vexavit, Stackhousius noster accepit hujus Fuci exemplaria a cl. Desfontainesio data, qui primus, nisi fallor, et solus hæcenus in loco natali legit. Nomen tamen his exemplaribus adjectum est nullum, neque ullam plantæ mentionem inter auctores reperio, donec nuperrimè descripta est a Poirerio in opere Gallico eximio, cui titulus *Encyclopædia Methodica*; *F. comosus* ibi appellatus, qui cum titulus jam sit diversæ speciei in hoc nostro libro impositus, alium indidi, viri de re botanicâ optimè meriti nomen commemorans. E Poirerii descriptione mutuari sum coactus partem meæ non exiguam, quæ alioquin perquam manca evasisset; nullum enim vidi exemplar quod illi hîc depicto præstaret, et hoc, ut satis liquet, nihil est nisi stirpis longè majoris frustum. Ad plantam a reliquis Fucis dignoscendam rami *F. Desfontainesii* ordine terno dispositi maximè valent, et ex his speciei character essentialis pendere videtur. Insuper etiam vesicularum pisiformium figurâ a plurimis aliis dignoscitur; sed in hoc, ut quoque in formâ ramorum terminalium, et quodd hi semper dichotomi conspiciantur, cum *F. pilulifero* convenit. Naturâ certè sunt multum affines hi duo Fuci, qui nihilominus habitu valdè discrepant; ramos enim habet *F. piluliferus* duplò triplòve breviores iis *F. Desfontainesii*, et semper solitarios, costâ quoque percursos, atque ita latos ut potius folia simulent.

- a. *F. Desfontainesii* ramus primarius, magn. nat.
 b. rami ultimi, magn. auct. - - - - 6.
 c. unus e superioribus, cum vesiculâ et fructu - 6.

Fucus ericoides, stem ligneous, cylindrical, short, naked, its apex beset with long, cartilaginous, variously divided branches, bearing towards their extremities vesicles and fruit, clothed all over with subulate, mostly simple, erecto-patent, imbricated ramuli: vesicles roundish, innate, generally solitary: receptacles cylindrical, imbedded in the turgid apices of the branches.

Fucus ericoides. LINN. *Sp. Pl.* II. p. 1631. *Syst. Nat. Ed. Gmel.* II. p. 1384. *Linn. Trans.* III. p. 130. *Fl. Fr. Ed. 2da.* II. p. 24. *Eng. Bot.* xxviii. t. 1968.

F. tamariscifolius. *Fl. Ang.* p. 576. (excl. syn. Gmel.) *Fl. Ped.* II. p. 331. WITH. IV. p. 86. *Ner. Brit.* p. 44. t. 11. *Syn. Fuc.* I. p. 88. (excl. syn. Gmel.)

F. selaginoides. ESPER. *Ic. Fuc.* I. p. 69. t. 31. (excl. syn. Gmel.)

Fucus Erica marina. GMELIN, *Hist. Fuc.* p. 128. t. 11. f. 2.

Fucus foliis Ericæ seu Tamarisci. RAIT *Syn.* p. 49. n. 44.

β . *selaginoides*; stem thin and short; ramuli rather remote, vesicles none.

F. selaginoides. LINN. *Mant.* p. 134. *Syst. Nat.* II. p. 717. *Syst. Nat. Ed. Gmel.* II. p. 1382. (excl. syn. Gmel.) WULFEN, in *Jacq. Coll.* I. p. 356. WULFEN, *Crypt. Aquat.* n. 28. (excl. syn. Gmel.) *Fl. Norv.* II. p. 90. *Fl. Ped.* II. p. 329. *Linn. Trans.* III. p. 132. (excl. syn. Gmel.) *Syn. Fuc.* I. p. 85.

γ . *corniculatus*; ramuli closely imbricated, pressed flat to the branches, bifid or trifid at their apices.

F. corniculatus. WULFEN, in *Jacq. Coll.* I. p. 358. WULFEN, *Crypt. Aquat.* n. 29. ESPER, *Ic. Fuc.* I. p. 138. t. 69.

δ . *sedoides*; branches short and straight; ramuli long, loosely imbricated, forked, flexuose when dry.

F. sedoides. *Fl. Atl.* II. p. 423. t. 260. *Fl. Fr. Ed. 2da.* II. p. 24.

α is found on the south-west coast of England, especially the shores of Devonshire and Cornwall.—In Bantry Bay, Miss Hutchins.—Coast of France. *Decandolle*.—In the Mediterranean. *Gmelin*.—At the Canary Isles. *Bory de St. Vincent*.— β and γ in the Adriatic, among the rejectamenta of the sea at Trieste. *Wulfen*.— γ sent from Ceylon to *Linnaeus*.— δ on rocks in the sea near La Calle. *Decandolle*.—Shores of France, in the Mediterranean. *Decandolle*.

Perennial.—June—November.

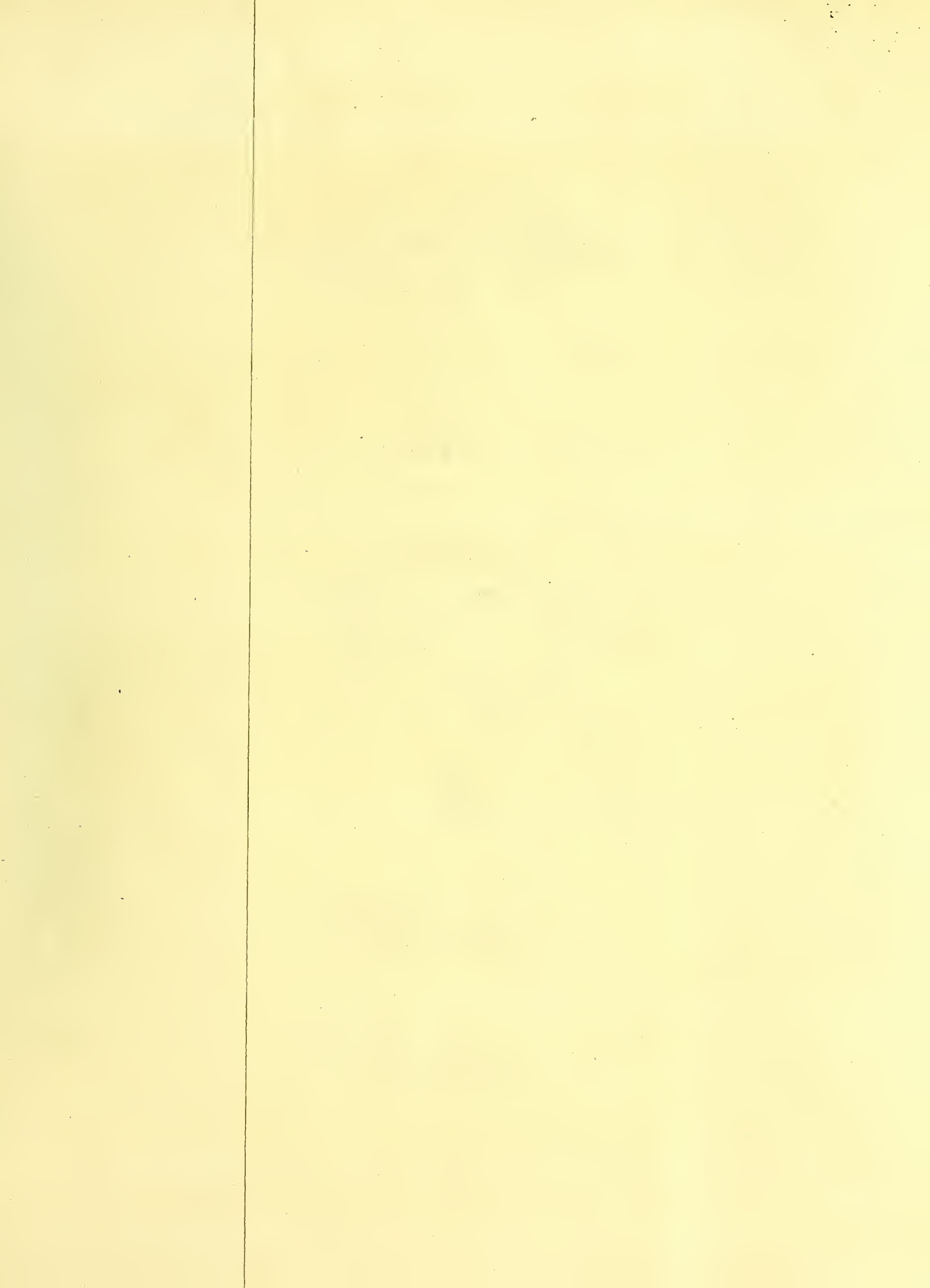
ROOT, orbicular, between flat and convex, an inch or more in diameter, black, woody, extremely hard.

FROND, one or two feet long, subject in its mode of growth to many variations, depending upon its age or place of growth, wearing in general, as is excellently* expressed by Wulfen, the appearance of a pollard tree of *Salix alba*, from the top of the trunk of which is produced a profusion of young shoots; it is furnished with a cylindrical *stipes*, three or four inches long, as thick as a swan's quill, either simple, or forked, or even irregularly branched, and naked, except that it is surrounded on all sides with hard, oblong, or cylindrical knobs, nearly an inch in length, rough with the remains of broken ramuli, and producing, near their extremities, numerous cylindrical filiform *branches*, of about the thickness of a crow's or blackbird's quill, from a foot to a foot and half or more long, of almost equal height, some irregularly divided, others quite entire, and only beset with smaller ones, which in their turns are either simple or again branched: all the branches are disposed in an irregularly paniced manner, and are always so numerous as to give the plant a bushy appearance; all of them, too, are between erect and patent, and all, as well the primary ones as the youngest, clothed from base to summit with *ramuli* (or leaves, as they are called by most writers) cylindrical, subulate, aculeiform, in some specimens closely, in others loosely, imbricated, between erect and pateut, from a line and half to two lines long, chiefly binate and alternate, some simple, others bifid or trifid, and others sub-dichotomous, as if about to lengthen into new branches; in summer, when the plant is in full vigor, the branches swell near their apices into one or two *vesicles*, of a form between elliptical and spherical, somewhat smaller than the seeds of *Vicia sativa*, generally toothed with a ramulus or two at their sides, and at the same time the ramuli below the bladders are placed so much more loosely than in barren specimens, that some of the branches are in places quite naked: the short space above the vesicles, which rarely exceeds half an inch in length, is occupied by the fructification, mixed with numerous *ramuli*, so as to give the vesicles the appearance of being crested.—The whole of the branches are in their first stage composed of flat, ensiform leaves, about an inch long, and scarcely a line wide, generally somewhat oblique, without midrib, and quite entire at their margins, the lower ones simple, the rest pinnatifid: these, as the plant advances in age, become cylindrical, and turn into branches, losing all vestige of their former appearance, nor are they succeeded by any others, on which account they are seldom seen, and have escaped the notice of most Botanists.

FRUCTIFICATION, placed at the ends of the branches, composed of small tubercles immersed in the substance of the frond, at the base of the ramuli, six or seven on each branch, placed close to one another, each perforated with an extremely minute pore, under which lie several brown, roundish seeds, surrounded by a pellucid limbus, mixed with short, jointed fibres, and with whitish granules, of a roundish shape, many times smaller than the seeds:—besides these, and even more commonly, are observable, either at the base of the ramuli, or upon the branches, scattered all over the upper part of the frond,† other small, spherical tubercles, not covered with the epidermis of the plant, wholly composed of pale-brown, parallel, closely matted fibres, mixed with exceedingly minute dark granules of no regular

* "Facie gaudet trunci *Salicis albae* resectæ, cui in resecto capite sylva virgarum succrescit."

† I thought, when I wrote the *Synopsis of the British Fuci*, that the nature of the terminal tubercles was similar to that of these, and as such I described it, which was certainly wrong: this also was what led me to compare the fruit of this *Fucus* and its affinities to that of *F. rotundus*.



W. J. H. Engelm.

Fucus ericoides.



regular figure.—Upon removing these tubercles with the point of a pin, the frond is always found perforated beneath them, but I doubt whether they belong to the fructification, or are* similar to the fibres that occur in *F. serratus*, *membranaceus*, and others.

COLOR, † black and opaque in the stipes, in the branches and ramuli a bright, semi-transparent, yellowish green; after the plant is dried, it is every where blackish; and, from subsequent moistening or exposure to the air, turns to a reddish brown.

SUBSTANCE, ‡ hard and woody in the stipes, in other parts cartilaginous, soft, and flexible, stiff and hard throughout the whole plant when dry.

The variety β differs from α only in being smaller in all its parts, and, as far as I have seen, at no period of its growth provided with vesicles; nor, indeed, are any mentioned by Wulfen; for from his description it is evident that what he has so called are the two kinds of tubercles described above in the account of the fructification: the ramuli are more remote than in α .

γ , according to specimens from Wulfen and Esper, has branches not above three inches long, beset with others about half an inch in length, simple, and between erect and patent; the ramuli are short, thickly imbricated on all sides, and pressed close to the branches:—in this variety also I have seen no vesicles, nor is mention made of any by Wulfen or Esper.

δ varies in length from nine to eighteen inches:—the frond is divided into three or four unequal branches, all surrounded from base to summit with others, extremely numerous, clustered, not more than an inch or inch and half long, so erect as all together to be of a cylindrical form: the ramuli are rather loosely imbricated, longer than in the preceding varieties, deeply forked, when moist curved upwards, when dry slightly twisted: Desfontaines mentions no vesicles, nor have I seen any.

Obs. The stipes is generally found covered with Zoophytes of different kinds, and not uncommonly with *F. fruticulosus*:—in drying it does not adhere in the least to paper, and shrinks very considerably.

The very extraordinary property inherent in this *Fucus*, of reflecting bright glaucous tints, when examined in a growing state, was originally noticed by the late Col. Velley, and has been since remarked by many other Botanists. Among these Mr. Stackhouse, whose residence upon the shores of Cornwall has afforded him the most favourable means of judging on the subject, speaks of it as constantly observable in vigorous plants, and considers it attributable to a slimy mucus or varnish that covers the surface. To Mr. Sowerby and myself, when in June 1799 we visited the same part of England, it appeared so § extraordinary, that, being unprepared for so striking an effect, we were at first completely deceived by it; for the whole *Fucus* under water looked of a pale-green color, very little removed from white, nor could we guess at what we had found, till exposure to the air removed the deception. We observed it in no other species, and I had always hoped that it would prove so characteristic of the present, as to enable any Botanist to distinguish it immediately, while growing, from all its congeners, till Miss Hutchins lately informed me that *F. granulatus* also had in Bantry Bay the same appearance. Such, however, is certainly not the case in general. The specimens brought to England by Lord Valentia, one of which is figured in the following plate, having convinced me of my error in supposing the *F. Myrica* of Gmelin to be only a battered plant of the species before us, I have of course excluded it from the list of synonyms, and have been induced to substitute in its room the *F. Erica marina* of the same author, and to follow the example of my friends, Dr. Goodenough and Mr. Woodward, in restoring the original Linnæan name, taken from its resemblance to the *Erica*. With regard to the plant || figured by Gmelin, t. II. A. f. 1. under the name of *F. Abies marina*, and referred by most authors to the present species, it is so different from any appearance of *F. ericoides* which ever fell under my observation, that I have thought it best to describe it in this work as a distinct species. As to the other synonyms above quoted, I am assured by Professor Mertens that Wulfen himself acknowledged, subsequently to the publication of his *Cryptogama Aquatica*, the identity of his *F. corniculatus* with Gmelin's *F. Erica marina*, a thing I had previously suspected, though Esper's figure, taken from specimens communicated by the noble author himself, had made me doubt upon the subject. That his *F. selaginoides* is also only a small variety of the same I am satisfied from plants that he has had the goodness to send me. Desfontaines' *F. sedoides* rests upon authority no less positive, but, as I have seen only fragments, a part of my description is borrowed from the *Flora Atlantica*. The plant appears in the Mediterranean never to produce vesicles, and to be of a smaller size than what it attains to upon our more northern shores. In Michelis's inedited plates are given figures of what look to be two other varieties different from any above described, but, as I have seen no specimens, I am unable to speak

* Such seems also to be the opinion of Mr. Stackhouse, who says of these, "acetabula, ad instar Lichenis scutellarum, ad basin foliorum in apicibus cernuntur, tubulos pellucidos radiatim dispositos sub aquâ protrudentia."

† Wulfen calls the color of the whole plant a blackish red, so that I suspect he never saw it fresh.

‡ What Mr. Stackhouse says of the substance will certainly not hold good, except in a dried state, and scarcely then, "that it is rough to the touch, and almost hurts the hand."

§ In a letter from Mr. Drummond, he says of *F. ericoides*; "I was lately so lucky as to see the phosphorescent appearance of this plant in high perfection, in a pool near Penlee Point: the sun shone brightly, and the tints were of so bright a green in the young branches, that, contrasted with the deep brown of the stems, the whole had the exact appearance of a bunch of *Erica cinerea*, with which the hill above abounded, and I at first took it for such. It grew about three feet down, but, as I drew it up, the color faded gradually, till in the open air it was like the others."

|| Of this figure there is in the *Historia Fucorum* no description; for the account that refers to it evidently belongs to a different plant, and will be found quoted in this work under *F. faniculaceus*.

speak with any positiveness upon the subject. It remains that I should express my obligations to Mrs. Griffiths, whose interesting communications, accompanied by plants in all stages of growth, have, I trust, at length enabled me to clear up the history of this species more fully than has hitherto been done; and I will conclude this account by transcribing a portion of what she has observed respecting it. "The closely imbricated head, with the spines situated on the tubercle, and the spines being continued down the stem, with a pore at the base of every one, out of which, when fresh, the pink wart-like substance may be seen to exude, are sufficient marks of character to distinguish *F. ericoides* from every other species of the family. The vesicles are by no means constant; I have often seen large plants without them, as well as some that bore them in abundance. In the winter, the stems destitute of small branches or ramuli, look like bunches of coral growing on the rock, but still from their blunt ends reflect the beautiful glaucous tints, which are very striking, and, as far as I have seen, peculiar to the species."

a.	<i>F. ericoides</i> , natural size.				
b.	upper part of a branch of var. β .				
c.	part of the same, magnified	-	-	-	6.
d.	part of a branch of var. δ , natural size.				
e.	ramulus, magnified	-	-	-	6.
f.	another, forked	-	-	-	6.
g.	another, more branched	-	-	-	6.
h.	part of a branch, with vesicles and fruit, natural size.				
i.	upper part of the same, magnified	-	-	-	6.
k.	receptacle, cut through horizontally	-	-	-	4.
l.	seeds, mixed with transparent granules	-	-	-	1.
m.	part of a branch, with tubercles	-	-	-	6.
n.	horizontal section of the same	-	-	-	5.
n*	longitudinal section of a tubercle	-	-	-	3.
o.	the same	-	-	-	2.
p.	fibres	-	-	-	1.
q.	seeds?	-	-	-	1.

Fucus, caule lignoso, terete, abbreviato, nudo, apice obsito ramis cartilagineis, elongatis, variè divisis, apices versus vesiculiferis fructiferisque, undique vestitis ramulis subulatis, simpliciusculis, erecto-patentibus, imbricatis: vesiculis sub-solitariis, subrotundis, innatis: receptaculis cylindraceis ramorum apicibus turgidis immersis.

Fucus ericoides. LINN. *Sp. Pl.* II. p. 1631. *Syst. Nat. Ed. Gmel.* II. p. 1384. *Linn. Trans.* III. p. 130. *Fl. Fr. Ed. 2da.* II. p. 24. *Eng. Bot.* xxviii: t. 1968.

F. tamariscifolius. *Fl. Ang.* p. 576. (excl. syn. *Gmel.*) WITH. IV. p. 86. *Fl. Ped.* II. p. 331. *Ner. Brit.* p. 44. t. 11. *Syn. Fuc.* I. p. 88. (excl. syn. *Gmel.*)

F. selaginoides. ESPER, *Ic. Fuc.* I. p. 69. t. 31. (excl. syn. *Gmel.*)

Fucus Erica marina. GMELIN, *Hist. Fuc.* p. 128. t. 11. f. 2.

F. foliis Ericæ seu Tamarisci. RAII *Syn.* p. 49. n. 44.

β . *selaginoides*; caule tenui, abbreviato; ramulis remotiusculis; vesiculis nullis.

F. selaginoides. LINN. *Mant.* p. 134. *Syst. Nat.* II. p. 717. *Syst. Nat. Ed. Gmel.* II. p. 1382. (excl. syn. *Gmel.*) WULFEN, in *Jacq. Coll.* I. p. 356. WULFEN, *Crypt. Aquat.* n. 28. (excl. syn. *Gmel.*) *Fl. Norv.* II. p. 90. *Fl. Ped.* II. p. 329. *Linn. Trans.* III. p. 132. (excl. syn. *Gmel.*) *Syn. Fuc.* I. p. 85.

γ . *corniculatus*: ramulis densè imbricatis, appressis, apice cornuto-bifidis, trifidisve.

F. corniculatus. WULFEN, in *Jacq. Coll.* I. p. 358. WULFEN, *Crypt. Aquat.* n. 29. ESPER, *Ic. Fuc.* I. p. 138. t. 69.

δ . *sedoides*; ramis brevibus, strictis; ramulis elongatis, laxè imbricatis, furcatis, siccitate flexuosis.

F. sedoides. *Fl. Atl.* II. p. 423. t. 260. *Fl. Fr. Ed. 2da.* II. p. 24.

HABITAT α in Angliæ Australis oris, præsertim in Cornubiâ et Devoniâ.—In sinu, Bantry Bay. *Dna. Hutchins.*—In Galliæ oris. *Decandolle.*—In Mari Mediterraneo. *Gmelin.*—Ad Insulas fortunatas. *Bory de St. Vincent.*— β et γ in mari Adriatico, inter rejectamenta maris Tergesti. *Wulfen.*— γ ex insulâ Zeylonâ accepit *Linnaeus.*— δ , in fundo maris supra lapides prope La Calle. *Desfontaines.*—In Mari Mediterraneo Galliæ ad oras. *Decandolle.*

Perennis.—Jun.—Nov.

RADIX orbicularis, plano-convexus, diametro pollicaris, et ultrâ, ater, lignosus, durissimus.

FRONS longitudine pedalis, vel bipedalis, crescendi modo variationibus multis ob anni tempestatem locumque natalem obnoxia, plerumque, ut optimè pro more dicit Wulfenius, “facie gaudens trunci *Salicis albæ* resectæ, cui in resecto capite sylvâ virgarum succrescit,” instructa stipite terete, sub-palmari, pennæ olorinæ crassitie, simplice, vel bifurco, vel etiam vagè ramoso, nudo, nisi quòd sæpe undique sit obsitus tuberibus pollicem ferè longis, duris, oblongis, cylindraceisve, ramulorum diffractorum reliquiis asperis, e quibus juxta apices oriuntur rami plurimi, teretes, filiformes, corvi seu merulæ pennarum crassitie, pedales, sesquipedales, et ultrâ, sub-fastigiati, nunc vagè divisi, nunc indivisi, et tantummodò aliis minoribus sparsim obsiti; hi quoque vel simplices, vel iterùm ramosi; omnes paniculatim disponuntur, semperque sunt ita numerosi ut facies sit plantæ dumosa; omnes quoque sunt erecto-patuli, et, cùm primarii, tùm seriores a basi usque ad apices vestiti ramulis (spinis aut folia si mavis dicas) teretibus, subulatis, aculeiformibus, in his laxiusculè in illis arcuè imbricatis, erecto-patulis, sesquilineam duasve lineas longis, ut plurimum binatis, et sub-alternis, his simplicibus, illis bi- tri- furcis, aliis sub-dichotomis, seque demùm in novos ramos producturis; æstatis tempore, quum planta summo vigore luxuriat, rami apices versus intumescunt in vesiculam unam alteramve elliptico-sphæricam, *Viciæ sativæ* seminibus aliquantum minorem, ramulo uno aut altero ad latera sæpiùs instructam, eodè tempore etiam tempore ramuli infra vesiculas laxiùs quàm in exemplaribus sterilibus dispositi reperiuntur, ut quidam rami hîc illîc denudati videantur: breve supra vesiculas spatium, rarò ultrâ unguiculare, occupat fructificatio, ramulis plurimis immixta, ut vesiculæ pulchrè cristatæ appareant.—Rami omnes ortu constant e foliis ensiformibus, planis, pollicem circiter longis, et vix lineam latis, plerumque lenitè obliquatis, costæ expertibus, margine integerrimis, inferioribus simplicibus, reliquis pinnatifidis: hæc, progrediente plantæ ætate, cylindrica fiunt, et in ramos mutata omnem formæ pristinæ similitudinem deponunt, neque novorum series locum excipit, quamobrem rarò inveniuntur, et Botanicorum plurimorum notitiam effugerunt.

FRUCTIFICATIO, ramorum ad apices sita, e tuberculis constat exiguis, in ipsâ frondis substantiâ ramulorum ad basin immersis, contiguis, sex septemve in singulis, utroque poro minutissimo pertuso, sub quo latent semina plurima, fusca, subrotunda, limbo pellucido cincta, immixta fibris brevibus, articulatis, granulisque albidis, subrotundis, seminibus multoties minoribus:—præter hæc, et quidem sæpiùs, cernere est, nunc ramulorum juxta basin, et nunc in ramis, ubique per frondis partem superiorem sparsa,* alia tubercula, exigua, sphærica, plantæ epidermide nequaquam oblecta

tota

* Credidi, cùm *Fucorum Britannicorum Synopsis* scriberem, tuberculorum terminalium naturam ejus horum esse similem, et pro tali descripsi, in quo certè erravi: hæc quoque causa fuit quòd hunc *Fucum* et affines cum *F. rotundo* fructu convenire dixerim.

tota constantia e fibris dilutè fuscis, parallelis, densissimè compactis, granulis minutissimis, spadiceis, nullius tamen certæ figuræ, immixtis. Hæc si aciculâ dimoveas, frons sub illis pertusa semper reperitur, anne autem ad fructificationem pertineant, an* similia sint fibrarum in *F. serrato*, *membranaceo*, et aliis occurrentium dubito: ad posteriorem verò sententiam propendo.

Color, † in stipite niger, opacus, in ramis et ramulis lætè lutescenti-viridis, sub-diaphanus; *plantæ exsiccata* ubique nigrescit, et *rursùs madefacta* aut *luci diu objecta fusco-rufescit*.

Substantia‡ in stipite dura et lignosa, cætera cartilaginea, mollis, et flexilis; in totâ stirpe exsiccata rigida et dura.

Var β in eo modò ab α discrepat, quòd sit ubique minor, et, quantum vidi, nullo ætatis tempore vesiculis donata; neque ulla memorat Wulfenius, e cujus descriptione liquet utraque illa, quæ *vesiculas* dicit, esse tubercula suprâ sub fructu descripta: ramuli quoque magis quàm in α remoti.

γ, secundum exemplaria a Wulfenio et Espero accepta, ramos habet longitudine vix palmum superantes, aliis sub-unguicularibus, simplicibus, erecto-patulis instructos; ramuli breves, undique densè imbricati, ramis arcuè adpressi: vesiculas in hæc nullas vidi, nec a Wulfenio Esperove memoratas reperio.

δ longitudine a dodrantali ad sesquipedalem variat; frons in tres quatuorve ramos inæquales dividitur, omnes a basi ad apicem cinctos ramis secundariis, numerosissimis, teretibus, confertissimis, pollicem vel sesquipollicem longis, in cylindrum dispositis: ramuli laxiusculè imbricati, longiores quàm in varietatibus precedentibus, profundè bifurci, madore sursùm incurvi, siccitate lenitè tortiles: vesiculæ nullæ a Desfontaines memorantur, neque ulla ego vidi.

Obs. Stipes Zoophitis variis plerumque obductus reperitur, et sæpe illum perreperit *F. fruticulosus*:—Planta per desiccationem nequaquam chartæ adhæret, et in molem longè minorem contrahi ur.

Optimus b. Velleius, vir nunquam sine desiderio nominandus, primus animadvertit in *F. ericoide* colores illos cæruleos, quos vividissimè iridis instar radiantes effundunt hujus Fuci exemplaria vegeta in loco natali observata. Idem postea alii plurimi Botanici notaverunt, sed causam reddere nenio est conatus præter cl. Stackhousium, qui Cornubiæ ad oras ubi planta copiosissimè provenit diu commoratus auspiciatissimam ejus observandæ facultatem habuit, suamque fert sententiam oriri e muco quodam seu vernice superficiem oblinente. Eadem cum ipse mox littora, comitante amicissimo Sowerbeio, mense Junio, A. D. MDCCXCIX, inviserem, phænomenon tam notabile paritèr ab alterutro insperatum utrosque fefellit, nescivimusque penitèr quid sit illud quod reperimus, donec, Fuco ex aquâ extracto, facies vesicolor desiit. Nihil unquam tale in Fucis huic congeneribus vidimus, speraveramque idcirco fieri posse ut *F. ericoides* semper absque molestiâ per hoc sit ab aliis dignoscendus, donec me nuperrimè per literas certiorum fecit D^{na}. Hutchins se idem etiam in *F. granulato* animadvertisse, remque semper ita se habere in sinu, Bantry Bay dicto, perhibet, quod tamen certè non semper alicubi valet. Doctus a speciminibus quæ secum nob. Vicecomes de Valentia e Mari Erythræo attulit, et quorum unum tabula proxima exhibebit, scio tandem *F. Myricam* Gmelini esse a Fuco hoc nostro disjungendum, et ejus loco inter synonyma recepi ejusdem auctoris *F. Ericam marinam*, Goodenovium Woodwardiumque secutus in hoc, atque insuper restituendo huic stirpi nomen Linnæanum, depromptum a similitudine quæ inter illam et Ericas interest. Plurimi auctores ad *F. ericoidem* referendum censuerunt illum Ficum quem *F. Abietem marinam* dixit Gmelinus: vix satis, nisi fallor, cautè; neque enim vel illius in hunc vel hujus in illum exemplaria ego unquam ulla ullo modo transire vidi; quapropter pro distinctâ specie in hoc opere describere in præsens stat sententia. Quod ad alia synonyma suprâ citata attinet, paucis monendus est lector. Prohibent specimina ab ipso Wulfenio missa quominus scrupuli aliqui mihi hæreant, dum ejus *F. selaginoidem* inter *F. ericoidis* varietates pusillas recenseo, fassusque est idem, de quo Mertensium auctorem habeo, *Cryptogamis Aquaticis* jamjam vulgatis, suum quoque *F. corniculatum* non satis discrepare ab *F. ericoide*. Hoc ego antehac sum suspicatus, et certè utrosque conjunxissem, nisi dubitationes injecisset Esperè icon haud satis bona, exemplaria ab ipso Abbate accepta exhibens. Pari cum fiducia loqui licet de *F. sedoide* Desfontainesii, in quo suprâ describendo partem descriptionis a *Florâ Atlanticâ* sum mutuatus, coactus ad hoc quia nihil nisi stirpium diffractarum frustula ipse adhuc vidi. Quatenus judicare licet a descriptionibus auctorum et plantis e Mari Mediterraneo missis, *F. ericoides* in illo mari nequaquam ad talem excrescit molem, qualem in Septentrionali nostro Oceano adipisci solet, semperque ibi reperitur vesiculis destitutus. Micheli in *Iconibus ineditis* depinguntur duæ, ut mihi videtur, hujusce Fuci varietates ab omnibus iis suprâ memoratis satis diversæ, quas tamen utpote nondum a me visas recensere inter alias non sum ausus. Restat ut gratias agam quas possum maximas fæminæ lectissimæ, D^{nae}. Griffiths, cujus ope præsertim est factum, si magis quàm alii in *F. ericoidis* historiâ enucleandâ profecissem; stirpes enim illa mihi benignè misit recentèr e mari detractas diversis

* Talis videtur esse Stackhousii sententia, qui de his dicit "acetabula ad instar Lichenis scutellarum, ad basin foliorum in apicibus cernuntur, tubulos pellucidos radiatim dispositos sub aquâ protrudentia."

† Totam plantam atro-rubentem dicit Wulfenius, quamobrem nunquam recentem vidisse suspicor.

‡ Certè non nisi in statu exsiccato, et vix in illo, valet id quod de substantiâ memorat Stackhousius, ut "tactu aspera est, et pend manum lædit."

diversis anni temporibus et in plantæ ætatis diversis stadiis, speciminibusque adjunxit observationes maximi commodi ad Fuci indolem ritè perspicendam.

a.	<i>F. ericoides</i> , magn. nat.				
b.	<i>rami pars var. β.</i>				
c.	<i>ejusdem portio</i> , magn. auct.	-	-	-	6.
d.	<i>pars rami varietatis δ</i> , magn. nat.				
e.	<i>ramulus</i> , magn. auct.	-	-	-	6.
f.	<i>alius e ramulis, bifurcus</i>	-	-	-	6.
g.	<i>alius vagè ramosus</i>	-	-	-	6.
h.	<i>rami pars, cum vesiculis et fructu</i> , magn. nat.				
i.	<i>ejusdem pars superior</i> , magn. auct.	-	-	-	6.
k.	<i>receptaculum horizontalitè dissectum</i>	-	-	-	4.
l.	<i>semina, granulis pellucidis immixta</i>	-	-	-	1.
m.	<i>rami pars cum tuberculis</i>	-	-	-	6.
n.	<i>idem horizontalitè dissectus</i>	-	-	-	5.
*n.	<i>tuberculum longitudinalitè dissectum</i>	-	-	-	3.
o.	<i>idem</i>	-	-	-	2.
p.	<i>fibræ</i>	-	-	-	1.
q.	<i>semina?</i>	-	-	-	1.

192.—FUCUS MYRICA.

Fucus, caule cartilagineo, terete, ramis obsito alternis, horizontalitè patulis, pinnatis bipinnatisque; pinnis ultimis sub-distichis, abbreviatis, vesiculiferis fructiferisque: caule ramisque omnibus obsitis ramulis abbreviatis, horizontalibus, approximatis, cylindræis, simplicibus, obtusis: vesiculis sub-globosis, solitariis, innatis: receptaculis, cylindræis, ramorum in apicibus turgidis immersis.

Fucus Myrica. GMELIN, *Hist. Fuc.* p. 88. t. 3. f. 1. LINN. *Syst. Nat. Ed. Gmel.* II. p. 1382.

HABITAT ad littora Kamtschatica. Kraschenninikow.—In Mari Rubro. *Vicecomes de Valentia*.

Perennis.

RADIX nondùm cognita.

FRONS instructa caule pedali et ultrà, terete, filiformi, Merulæ pennæ crassitie, indiviso, sed per totam longitudinem obsito ramis homogeneis, siquæ prorsus similibus, nisi quòd duplò sint tenuiores, spiralitè alternis, horizontalitè patentibus, his quatuor pollices illis vix unum longis, majoribus minoribusque absque normâ immixtis, trium quatuorve linearum intervallo inter singulos, omnibus indivisis, sed ab ortu ad apices pinnatis serie minorum sub-distichorum, eadem quâ primarii ratione dispositorum, longitudine nunc vix bilineari nunc pollicari, breviorum, qui longè numerosissimi, simplicium, longiorum uno alterove adhuc minore sparsim obsitorum, ultimorum semper ferentium vesiculas atque fructum qui nunquam sunt in alio quopiam observandi; caulem totum, ut et ramos omnes, obsident ramuli, (folia forsàn seu spinæ rectiùs dicerentur) homogenei concoloresque, vix lineæ unius dimidium longi, teretes, setâ porcinâ haud crassiores, filiformes, horizontales, lenitè incurvi, sub-alterni, intervallis brevissimis sejuncti, semper,* quantum ego vidi, simplices, magnitudineque in omnibus eadem; vesiculæ ortæ prope basin ramorum minorum, ut hi pro illis pedunculorum vice fungantur, una modò in singulis, immersæ, oblongo-sphæricæ, *Vicia sativa* seminibus minores, extrinsecùs ramulis aliquot sparsis exasperatæ, intùs cavæ et vacuæ, apice nunquam non cristatæ ramo longiùs progrediente.

FRUCTIFICATIO ramorum minorum juxta extremitates ultra vesiculas sita, e receptaculis constans exiguis, in ipsâ frondis substantiâ ramulorum ad basin immersis, extrinsecùs pertusis poris minutissimis, sub quibus latent tubercula, singula semen includentia unicum fuscum limbo pellucido cinctum.

COLOR recentis, teste Gmelino, est in juniore plantâ flavescens lividus, in adultiore vergens in nigricantem; exsiccata nigrescit; rursùs madefacta fit intensè fuscus.

SUBSTANTIA lignoso-cartilaginea, madentis lenta, exsiccata rigidiuscula et fragilis.

* Gmelinus e contrario bifidos dicit, quod tamen non obstat quominus omnes in suâ icona simplices exhibeat.

Obs. Bene habet de hoc Fuco Gmelinus; "vix in hoc Fucorum ordine species datur hoc fruticulo elegantior, videturque natura symmetriam in eo observasse summam:—per desiccationem chartæ nequaquam adhæret.

Magnoperè nisi me mea fallit sententia, concedent omnes, quotquot *Fucum* hunc nostrum *Myricam* cum Gmeliniano conferre operæ pretium ducent, utrasque tabulas revera eandem exhibere plantam; nec minùs forsàn erunt iidem prompti ad agnoscendum, hæc icone et præcedente collatis, inesse inter *F. Myricam* et *F. ericoidem* certum discrimen. E contrario magis quidem timeo ne tale discrimen nimis luculentum videatur, et ne potiùs a Botanicis peritis vertatur mihi vitio quòd icones hæ nostræ, sicut cum multis aliis accidere solet, non usitatas exhibeant plantarum facies, sed eas quæ auctoris opinionem aptissimè firment. Si ita sit, a tali justissimè appello sententiã; nulla enim vidi *F. Myricæ* exemplaria, præter ea a nob. Vicecomite de Valentia reportata, quæ cuncta omnimodè similia fuerunt illius hic delineatæ, facieque paritèr a *F. ericoide* recesserunt. Neque tamen hoc obstat quo minus dubitem ut res semper se habet, suspicerque, si *F. Myrica* cautè in loco natali observetur, eventurum fore ut reperiretur hæc planta facies diversas induens, qualitèr ferè variari solet *F. ericoides*: vix enim fieri posse quin stirpes naturã tam arcè affines iidem ferè mutationibus sint obnoxia. Hæc reputans, minimè videretur mihi mirum si olim acciperem *F. Myricæ* exemplaria stipite foliisque donata, aut si detegerentur alia vesiculis destituta. Nihil, uti centies jam dixi, de algis marinis loqui licet, nisi quod vidimus; quare dubitantèr admodum sententiam fero de *F. ericoidis* et *F. Myricæ* differentiã specificã; quamvis ex omnibus quæ jam vidi exemplaribus verisimillimum videtur esse distinctos. Hoc saltem suadent habitus crescendique modus diversus; firmant ramuli in *F. Myricã* breves simplices obtusi horizontales remotiusculi, dum ii *F. ericoidis* longiores sunt acuminati sæpiùs ramosi patentes imbricatique; stabiliuntque illius vesiculæ nunquam non solitaria, hujus non rarè, catenæ instar, approximata.

a. <i>F. Myrica</i> , magn. nat.					
b. <i>ramus</i> , magn. auct.	-	-	-	-	6.
c. <i>ejusdem apex, cum fructu</i>	-	-	-	-	5.
d. <i>receptaculum dissectum</i>	-	-	-	-	3.
e. <i>semina</i>	-	-	-	-	1.

192.—FUCUS MYRICA.

Fucus Myrica, stem cartilaginous, cylindrical, beset with alternate pinnated or bipinnated branches between horizontal and patent; ultimate pinnæ subdistichous, short, bearing vesicles and fruit; whole plant beset with short, horizontal, cylindrical, simple ramuli, placed near each other: vesicles sub-globose, solitary, innate: receptacles cylindrical, immersed in the turgid apices of the branches.

Fucus Myrica. GMELIN, *Hist. Fuc.* p. 88. t. 3. f. 1. LINN. *Syst. Nat. Ed. Gmel.* II. p. 1382.

On the shores of Kamtschatka. *Kraschenninikow*.—In the Red Sea. *Lord Valentia*.

Perennial.

ROOT, not yet discovered.

FROND, furnished with a stem a foot or more in length, cylindrical, filiform, as thick as a blackbird's quill, undivided, but beset throughout its whole length with branches of the same nature and substance as itself, and perfectly resembling it except that they are twice as thin, spirally alternate, between horizontal and patent, varying in length from one to four inches, great and small growing mixed without order, separated from each other by intervals of three or four lines, all undivided, but all from base to summit pinnated with a series of smaller ones, sub-distichous, disposed in the same manner as the primary ones, some not more than two lines, others an inch long, the shortest, which are by far most numerous, altogether simple, the longer ones irregularly beset with one or two still smaller, the ultimate ones always producing the fruit and vesicles, which are never observable in any other part of the frond; the whole stem, as well as all the branches, is clothed with ramuli (or what might with almost equal propriety be called leaves or spines) of the same nature and color as itself, scarcely half a line long, cylindrical, not thicker than hog's bristles, filiform, horizontal, slightly incurved, separated by exceedingly short intervals, constantly, as far as I have seen, simple,* and all of the same

* Gmelin, on the contrary, says they are often bifid, but he has represented none of them so in his figure, and has made them all quite simple, as they are in Lord Valentia's specimens.



Fucus Myrica

same size; *vesicles* immersed in the smaller branches near their origin, so that these branches look like mere peduncles to them, only a single one on each, of a shape between oblong and spherical, smaller than the seeds of *Vicia sativa*, externally rough with a few scattered ramuli growing over them, internally hollow, always terminated by the branch being continued beyond them.

FRUCTIFICATION, seated near the extremity of the ultimate branches beyond the vesicles, consisting of small receptacles immersed in the substance of the frond, so hidden by the ramuli, at the base of which they lie, that they merely look like a thickening of the branches, externally perforated with very minute pores, under which lie imbedded spherical tubercles, each containing a single brown seed surrounded by a pellucid limbus.

COLOR, according to Gmelin, in the recent plant, a livid yellowish in a young state, but verging to blackish when full grown; turning black from drying, and a deep brown from subsequent immersion.

SUBSTANCE, between ligneous and cartilaginous, flexible while wet, but rather rigid and brittle after it has been dried.

Obs. Gmelin remarks with much justice of this plant, that there is scarcely a more elegant species in all the division to which it belongs, and that nature seems to have observed in it the greatest symmetry:—in drying, it does not in the least adhere to paper.

A comparison of the figure here given with that of Gmelin's *F. Myrica*, will, I flatter myself, be sufficient to satisfy any one that the two plants are the same, and I can scarcely allow myself to doubt but that a farther comparison between the present and the preceding plate will be equally satisfactory as to *F. Myrica* and *F. ericoides* being distinct species. Indeed I am rather apprehensive lest this latter point should appear too clear; for the specimens here represented certainly look very different, and all that I have seen of *F. Myrica* has looked equally so; and yet, knowing how much *F. ericoides* is apt to vary at the several periods of its existence, it is impossible not to apprehend but that a plant so nearly allied to it may be subject to the same changes, and may also be found in its place of growth with a stipes and leaves, even if it be not at some seasons of the year absolutely destitute of vesicles. Considering this, I would wish to be understood as speaking with some degree of hesitation as to the two plants being really essentially distinct, though it assuredly appears to me, from the dissimilarity of their habits and mode of growth, from the short, simple, blunt, horizontal, rather distant ramuli of *F. Myrica* contrasted with the longer, acuminate, mostly branched, patent, imbricated ones of the other, and from the vesicles of the former always growing singly, to be most probable that they really are so.

a. <i>F. Myrica</i> , natural size.						
b. <i>branch</i> , magnified	-	-	-	-	-	6.
c. <i>apex of the same, with fruit</i>	-	-	-	-	-	5.
d. <i>segment of a receptacle</i>	-	-	-	-	-	3.
e. <i>seeds</i>	-	-	-	-	-	1

Fucus fraxinifolius, stem cylindrical, branched, winged; leaves membranaceous, oblong, simple, midribbed and veined, fringed at the margins with minute teeth, and proliferous from the midrib: lanceolate capsules scattered over the midrib, veins, and cilia of the leaves.

In the East Indies. *Vahl's Herbarium*.

Annual?

ROOT, I have not yet seen.

FROND, furnished with a cylindrical, filiform *stem*, somewhat thinner than a sparrow's quill, its length at present unknown, rough with the remains of a battered membrane, sending out here and there scattered, horizontal, simple *branches*, from three to four inches long, which perform the office of midribs, each being on both sides fringed with a lineari-elliptical membrane rather more than half an inch wide, so that they entirely resemble leaves; the apices of these are obtuse and rounded; the margins fringed with extremely minute spine-like teeth, standing at intervals of about half a line each, some simple, others two or three pointed; from both sides of the midrib issue nerves, which seem to be ramifications of the midrib itself, and run in a direction between horizontal and patent to the edges of the leaves, simple and parallel, and always opposite to the marginal spines, which therefore look like continuations of the nerves: the midrib is sometimes found proliferous with a single leaf (I ought rather to say that I have seen only a single one growing from it, though I have little doubt of its producing more) roundish at its origin, but afterwards becoming exactly like the primary ones, excepting that it is smaller: the whole membrane appears under the microscope most beautifully reticulated with round meshes.

FRUCTIFICATION, extremely small, lanceolate capsules, some solitary, others standing in clusters of two or three together, scattered over the midrib, or the veins, or the marginal spines, of a whitish color, and pellucid, each containing four or more roundish dark-red seeds, placed in a double row.

COLOR, deep brown and semitransparent in the leaves; in the stem and midrib blackish.

SUBSTANCE, membranaceous, thin.

Obs. In drying it does not adhere to paper.

F. fraxinifolius, a member of the same elegant family as *F. sanguineus* and *F. sinuosus*, and more nearly allied to these two Fuci than to any other yet known, is well deserving of a place by their side, and probably, when found in a perfect state upon its native rocks, may rival either of them in beauty or gracefulness of form, though it can scarcely be supposed, under any circumstance, to boast those attractive colors by which they are eminently distinguished. There can be little doubt but that in its first state it rises, like them, in the shape of a simple undivided leaf; and it appears to be likely, that, when full grown, it exceeds both of them in size. The whole which I have seen of it is a mere fragment. For the drawing represented in this plate I am indebted to the kindness of Professor Mertens, who copied it from the original specimen preserved in Vahl's herbarium at Copenhagen, and sent it under the expressive name here retained.

a. <i>F. fraxinifolius</i> , natural size.	-	-	-	-	-
b. <i>part of the frond</i> , magnified	-	-	-	-	6.
c. <i>portion of the same</i>	-	-	-	-	3.
d. <i>capsule</i>	-	-	-	-	2.



Fucus fraxinifolius.

Prof. Mertens del.

Fucus, caule terete, ramoso, alato; foliis membranaceis, oblongis, simplicibus, costatis, venosis, margine dentato-ciliatis, e costâ proliferis: capsulis lanceolatis per foliorum costam venas et cilia sparsis.

Habitat in Indiâ Orientali. *Herb. Vahl.*

Annua?

RADIX a me nondùm visa.

FRONS instructa *caule* terete, filiformi, pennâ passerinâ aliquantùm tenuiore, (quantæ longitudinis nescio) membranæ deperditæ reliquiis obsito, hic illic emittente *ramos* sparsos, horizontales, simplices, tri- quadri- pollicares, qui costæ vicem gerunt, utrinque alati membranâ lineari-ellipticâ, semipollicem et ultrâ latâ, ut folia prorsus referant; apices horum obtusi, rotundati; margines ubique dentato-ciliati, spinis minutissimis, his simplicibus, illis bi- tri- cranis, singulis intervallo circitèr dimidii lineæ se junctis: e costâ ad margines foliorum utrinque excurrunt nervi, qui ipsa costa ramificata videntur, simplices, horizontalitèr patentes, paralleli, singuli singulis dentibus marginalibus oppositi, ut illi in hos desinere videantur: *costa* interdùm prolifera conspicitur, folio unico (plura ferè verisimile est, quamvis unum modò vidi) ortu subrotundo, mox omninò simili primariorum, præter molem minorem: membrana pulcherrimè est sub lente reticulata, maculis quadratis.

FRUCTIFICATIO capsulæ valde exiguæ, lanceolatæ, nunc solitariae, nunc duæ tres aut plures hic illic in fasciculos collectæ, venulis aut ipsi costæ aut demùm spinis marginalibus insidentes, albidæ, pellucidæ, singulæ includentes semina quatuor plurave subrotunda, intensè rubra, serie duplice disposita.

COLOR *foliorum* intensè fuscus et subdiaphanus; *caulis costæve* nigricans.

SUBSTANTIA membranacea, tenuis.

OBS. Per desiccationem chartæ non adhæret.

Attinet *F. fraxinifolius* hic noster ad eandem omninò Fucorum familiam quæ *F. sanguineum* et *F. sinuosum* complectitur; et est, sive crescendi modus seu forma vel fructus respiciatur, hisce duobus quàm maximè affinis. Neque forsàn longiùs quàm quod æquum est procederem, si prædicare ausim, fieri posse ut hic *Fucus*, illæsus in loco natali vegetus repertus, formæ elegantia et pulchritudine illos quantumvis pulcherrimos æquiparet; colorum licet splendore, per quem illi omnibus ferè anteunt, semper vincatur. Dubitandum quoque non est, quin hic, illorum instar, in primo suæ ætatis stadio nihil sit nisi folium unicum simplex, quod sensim magis atque magis mole auctum, demùm fit e costâ proliferum, ut obitèr intuenti appareat naturâ ramosus, et forsàn congeneres magnitudine exuperet. Quomodo autem hoc sit mihi nihil nisi per conjecturam effari licet; frustulum enim stirpis unicum modò hactenus vidi. Exemplar in hâc tabulâ delineatum, Hafniæ in herbario Vahliano servatum Mertensius vidit, qui, more suo, nostri nunquam immemor, adumbrationem hanc paravit. Ille etiam nomen quod hic retinui aptissimum imponi jussit.

a. <i>F. fraxinifolius</i> , magn. nat.					
b. <i>frondis pars</i> , magn. auct.	-	-	-	-	6.
c. <i>ejusdem particula</i>	-	-	-	-	3.
d. <i>capsula</i>	-	-	-	-	2.

Fucus decurrens, frond cartilaginous, flat, nearly linear, midribbed, pinnatifid, quite entire at the margins; segments horizontal, linear, close to each other, alternate, decurrent; the lower ones simple; the upper ones irregularly pinnatifid: vesicles spherical, solitary, on short petioli, axillary in the primary segments.

Fucus decurrens. BROWN, MSS.

On the northern coast of New Holland.

Perennial.

ROOT, hitherto unknown; nor is it possible to speak with certainty of the

FROND, either as to its length or its appearance in a perfect state, all I have yet seen of the plant being merely a fragment about nine inches long, flat, nearly three lines wide at the base, whence it gradually grows more and more narrow, but so slowly that at the apex it has not lost more than a line of its width; it is undivided, but throughout its whole length pinnatifid with distichous, alternate *segments*, between horizontal and patent, decurrent, separated by intervals of three or four lines, nearly linear, or, like the stem, slightly narrowed upwards, from one to two inches long, the lowest two lines wide, the highest scarcely half that width, the former mostly simple, the intermediate ones pinnatifid near their points with one or two short segments, those nearest the summit always pinnatifid in the same manner as the stem from their middle upwards; the apices of all are rounded; the margins quite entire; the surface spotted all over with exceedingly minute pores; throughout the centre of the whole plant runs a blackish midrib divided in the same manner as the frond itself, thickish in the stem, but much thinner in the branches; *vesicles* situated at the axillæ of the branches, either solitary, or, as I have seen them in one instance, growing in pairs, spherical, smaller than the seeds of the *Abrus precatorius*, supported upon cylindrical petioli not a line long, externally smooth, internally hollow and empty.

FRUCTIFICATION, none yet seen.

COLOR, most probably an olive-green in the recent plant, but turning to a blackish brown in dried specimens, and becoming brown from subsequent immersion.

SUBSTANCE, cartilaginous, rather thin.

Obs. In drying, it does not in the least adhere to paper.

Small and probably imperfect as is the only specimen I have yet seen of this *Fucus*, I have still felt no hesitation about affording it a place in this work, considering it too much unlike any other to admit of a question as to its being a distinct species, and too remarkable to be allowed to pass unnoticed. It is allied to *F. osmundaceus*, like which it may be supposed that its upper leaves turn into narrow cylindrical or compressed branches, bearing, in all probability, the fructification at their apices, and possibly also producing innate concatenated vesicles very dissimilar to those that originate from the alæ of the leaves. The texture of the frond and its punctated surface give the plant much of the appearance of *F. diversifolius*.

a. *F. decurrens*, natural size.



Fucus decurrens.



Fucus, fronde cartilagineâ, planâ, sublineari, costatâ, pinnatifidâ, integerrimâ; segmentis horizontalibus, linearibus, approximatis, alternis, decurrentibus; inferioribus simplicibus; summis sparsim pinnatifidis: vesiculis sphæricis, solitariis, brevissimè petiolatis, axillaribus.

Fucus decurrens. BROWN, MSS.

HABITAT in septentrionalibus Novæ Hollandiæ oris. *D. Brown*.

Perennis.

RADIX hactenus ignota.

FRONS ad quantam excurrat longitudinem aut qualis sit in statu perfecto prorsùs nescio, cùm nullum plantæ hujus exemplar viderim præter frustulum novempollicare, planum, latitudine ad basin trium circitèr linearum, et exinde sensim attenuato, sed ita lenitèr ut apices duas lineas æquent, indivisum, sed per totam longitudinem pinnatifidum *segmentis* distichis, alternis, horizontalitèr patulis, decurrentibus, singulis trium quatuorve linearum intervallo sejunctis, rectis, vel lenissimè falcatis, sublinearibus, aut, sicut caulis, apices versus lenitèr angustatis, pollicem unum alterumve longis, inferioribus duas lineas summis vix unam latis, illis plerumque simplicibus, intermediis segmento uno alterove brevi juxta apicem pinnatifidis, summis semper a parte mediâ pinnatifidis, segmentis patentibus abbreviatis; apices omnibus rotundati; margines integerrimi; superficies poris ubique minutissimis punctata; frondem totam percurrit costa nigricans, eâdem ratione quâ frons ipsa ramosa, in caule crassiuscula, in ramis tenuior; *vesicula* positæ ad alas ramorum, solitariæ, vel, quod semel vidi, binæ, sphæricæ, *Abri precatorii* seminibus minores, petiolis teretibus haud lineam longis fultæ, extrinsecùs læves, intùs cavæ et vacuæ.

FRUCTIFICATIO hactenus nulla reperta.

COLOR *recentis* verisimillimè olivaceus; *exsiccatæ* fusco-nigricans, *rursùs madefactæ* fuscus.

SUBSTANTIA cartilaginea, tenuis.

OBS. Exsiccatione chartæ nequaquam adhæret.

Sentio bene quàm sit impossibile scribere de tali qualem nunc tractamus Fuco, neque simul timere ne scribendo in errores incidamus, si nihil ejus viderimus nisi tale exemplar quale hæc tabula exhibet. Neque tamen is satis est metus qui me prohibeat quo minus hîc delineatum sistam Fucum qui aded usque a reliquis omnibus discrepat, ut, quamvis illud quod solum vidi specimen sit tantummodò vel in primo ætatis gradu vel sit stirpis longè majoris frustulum, nihilo tamen minus nullus datur dubitationi locus ne vel planta sit specie a reliquis distincta, vel hoc quaecunque sit specimen ad dignoscendam sufficiat. Quantum igitur potui, Horatii consilio obsecutus, majoris culpæ opprobia fugere sum conatus; gavisus præterea quòd data sit facultas nunc primùm edendi stirpem indole, nisi fallor, verè peculiari præditam. *F. decurrens* hic noster affinis est *F. osmundaceo*, cujus ad instar verisimillimum est folia superiora in ramos angustos cylindraceos compressosve sese demùm, ætate progrediente, fore mutatura; fierique etiam insupèr potest ut sic mutata ferant vesiculas innatas concatenatas, illis omninò dissimiles foliorum ad alas sitis. Frondis textura et superficies punctata efficiunt ut intercedat aliqua inter *F. decurrentem* et *F. diversifolium* primo aspectu similitudo.

a. *F. decurrens*, magn. nat.

Fucus cupressoides, stem cylindrical, filiform, fistulous, prostrate, creeping; branches scattered, erect, irregularly dichotomous, covered with oblong, inflated, undivided ramuli, placed close to each other in a triple series.

Fucus cupressoides. VAHL, in *Skripten af Naturhistorie Selskabet*. V. pars 2da. p. 28. ESPER, *Ic. Fuc.* II. p. 114. t. 161.

Caulerpa hypnoides. LAMOUREUX, in *Journal de Botanique*. II. p. 145. t. 3. f. 3.
On the shores of the Island of St. Croix. *Vahl*.

Perennial.

ROOTS, originating here and there out of the creeping stem, about half an inch long, according to Vahl, and simple, except that they are fringed at their extremities with a few undivided fibres.

FROND, furnished with a prostrate, creeping stem, four or five inches or more long, cylindrical, fistulous, and filiform, (but becoming from drying irregularly sulcated lengthwise, and never afterwards regaining its original form) of the size of a blackbird's quill, sending out roots from its upper, and branches from its under side, in other respects naked; branches scattered, separated by intervals of a few lines between each, erect, about half a foot long, exactly like the stem, except that they are somewhat more thin, some undivided, others, and indeed the greater number, irregularly once or twice forked, and also, especially towards their apices, beset with one or two smaller scattered branches, which are between erect and patent, and straight; the whole of them are from an inch to an inch and half from their base naked, but afterwards clothed with ramuli* closely imbricated in a triple row, so that the shape of every branch is triangular, patent, oblong, inflated, quite simple, scarcely half a line long, the apices of some blunt, others tipped with an extremely minute mucro.

FRUCTIFICATION, at present unknown.

COLOR, of the root, the stem, and the lower part of the branches, a pale yellow, of the ramuli grass-green: the whole frond, from exposure to the sun, turns white.

SUBSTANCE cartilaginous, rigid, and inclining to horny in the stem and branches; in the ramuli membranaceous.

OBS. In drying, it does not in the least adhere to paper; nor does it, from subsequent immersion, much change its appearance.

It requires to be remarked, that the specimen of *F. cupressoides* here represented is far from shewing the natural appearance of the species, and has, from want of care in drying, been so injured and distorted, that its habit is perfectly lost, and, excepting its colour, there is little remaining about it to shew the family to which it belongs. On the other hand, however, it is so far larger than any other I ever saw, or than those figured by Lamouroux and Esper, as to deserve the preference given it; and it has a farther advantage in being of unquestionable authority, having been communicated by Vahl himself to Dr. Swartz, who obligingly lent it to me for the purpose of having it introduced in this work. Among the tribe of *Caulerpa* *F. cupressoides* approaches most nearly to *F. ericifolius*, agreeing with it both in general appearance and in the shape of its ramuli, but it is at first view distinguishable by its triangular branches, in which respect it also differs from all other known Fuci, excepting *F. triqueter* and *F. triangularis*, the former of which is in every other respect so dissimilar, that it would be useless to say a word upon the means of distinguishing them, but the latter greatly resembles *F. cupressoides* in size and form; insomuch that Vahl evidently entertained fears lest it should be doubted how far they are essentially distinct. This they unquestionably are, not even belonging to the same tribe of Fuci, and being farther separated by their color and their texture, as well as by the difference in the nature of their ramuli, and by these latter being in the one quite entire, but in the other divided at the apices.

a. *F. cupressoides*, natural size.

b. and c. parts of the frond seen from different sides, magnified 6.

d. ramulus. - - - - - 5.

* Vahl calls them leaves, and perhaps with much propriety; for they are certainly of a very different nature from the rest of the frond, and never lengthen into branches.



Fucoxanthum cupressoides.

Fucus, caule terete, filiformi, fistuloso, prostrato, repente; ramis sparsis erectis, vagè dichotomis, obtectis ramulis oblongis, inflatis, indivisis, approximatis, trifariam dispositis.

Fucus cupressoides. VAHL, in *Skriften af Naturhistorie. Selskabet. V. pars 2da.* p. 38. ESPER, *Ic. Fuc. II.* p. 114. t. 161.

Caulerpa hypnoides. LAMOUREUX, in *Journal de Botanique.* II. p. 145. t. 3. f. 3.

HABITAT in *Insulâ Sanctæ Crucis.* Vahl.

Perennis.

RADICES, e caule repente hîc illîc ortæ, sunt, teste Vahlîo, unguiculares, simplices, apice fibris aliquot indivisis.

FRONS instructa *caule* prostrato, repente, palmari et ultrâ, terete, fistuloso, et filiformi, sed per desiccationem vagè longitudinalitèr sulcato, neque postea in pristinam revocando figuram, merulæ pennæ crassitiè, e parte inferiore radices, e superiore ramos emittente, cætera nudo; *rami* sparsi, aliquot linearum intervallis sejuncti, erecti, circitèr semipedales, caulis prorsùs similes, nisi quòd sint aliquantùm tenuiores, hî indivisi, illi, quales sunt plurimi, vagè semel, atque iterùm bifurci, atque, insuper, præsertim apicès versus, obsiti ramo uno alterove alterno, minore, erecto-patentet stricto, omnes ad pollicis sesquipollicisve altitudinem nudi, exinde vestiti *ramulis* * densè ordine trifario imbricatis, u tota frons triangularis evadat, patentibus, oblongis, inflatis, simplicissimis, vix semilineam longis, apice in his obtuso in illis brevissimè mucronulato.

FRUCTIFICATIO hactenus latet.

COLOR *radicis, caulis, et ramorum*, quâ radici sunt proximi, stramineus, *ramulorum* gramineo-viridis:—tota planta soli objecta albescit.

SUBSTANTIA *caulis* atque *ramorum* cartilaginea, rigida, et sub-cornea, *ramulorum* membranacea.

Obs. Stirps desiccata nequaquàm chartæ adhæret, neque rursùs madefacta faciem multum mutat molemve adauget.

Fuci illi, e quibus suum novum Genus *Caulerpam* constituit Lamourouxius, sunt omnes, uti jam suprâ in hoc opere memoratur, inter se naturâ artissimè connexi, quod vix suspicaretur aliquis, hanc tabulam respiciens, nisi forte crederet, quod certè vero non absimile videretur, me humani aliquid esse passum, *F. cupressoidem* *Caulerpis* associando. Ut tales igitur dubitationes eximantur, memoratu necesse est exemplar hic delineatum formam habitumque proprium maximâ ex parte perdidisse, colore modò relicto per quem familia sua conjiciatur, quod tamen non obstitit quominus aliis antefendum judicarem; cùm quia mole longe præstat omnibus aliis a me visis, et paritèr iis a Lamourouxio Esperoque adumbratis, tùm quia certissimæ est fidei; ab ipso enim Vahlîo datum est Swartzio, a quo benignè commodatum accepi. Inter *Caulerpas* *F. cupressoides* sedem sibi vindicat proximam *F. ericoidi*, hunc referens totius frondis formâ, et ramulorum figurâ, sed primo statim aspectu dignoscendus ab hoc et paritèr ab omnibus reliquis ejusdem tribûs individuis per ramos triangulares, in quo discrepat etiam a cunctis aliis *Fucis*, *F. triquetro* et *F. triangulari* solis exceptis. Horum prior nihil habet aliud cum *F. cupressoidem* commune, ut supervacaneum prorsùs foret disserere de modis quomodo distinguuntur: alter, quamvis reapse ad familiam longè alienam attinet, mole et formâ ita ad hanc nostram accedit stirpem, ut Vahlîus manifestè sit veritus ne putaretur erravisse quòd disjunxisset. Sunt autem distinctissimi; fronde in hoc prostratâ repente, in illo erectâ, ramulis in hoc integris, in illo bifidis, necnon totius frondis colore et substantiâ dignoscendi.

- | | | | |
|-------------------------------------------|---|---|----|
| a. <i>F. cupressoides</i> , magn. nat. | | | |
| b. <i>c. frondis partes</i> , magn. auct. | - | - | 6. |
| d. <i>ramulus</i> | - | - | 5. |

* *Folia* dicit Vahlîus, et forsân rectiùs; certè enim sunt naturæa reliquâ fronde diversæ, et nunquam in ramos producuntur.

Fucus loreus, frond between cartilaginous and coriaceous, compressed, linear, nerveless, entire at the margins, dichotomous, expanded at its base into the shape of a peziza: tubercles immersed in every part and on both sides of the frond.

Fucus loreus. LINN. *Syst. Nat.* II. p. 716. *Syst. Nat. Ed. Gmel.* II. p. 1382. *Fl. Ang.* p. 583. *Fl. Scot.* II. p. 920. *Fl. Dan.* t. 710. WITH. IV. p. 96. *Linn. Trans.* III. p. 176. ESPER, *Ic. Fuc.* I. p. 43. t. 19. & p. 81. t. 39. (*exclusis synonymis plerisque*). *Fl. Germ.* III. p. 453. *Fl. Norv.* II. p. 125. *Ner. Brit.* p. 37. t. 10. *Eng. Bot.* VIII. t. 569. *Syn. Fuc.* II. p. 246. *Fl. Lus.* II. p. 435. *Fl. Fr. Ed. 2da.* II. p. 23.

F. elongatus. LINN. *Sp. Pl.* II. p. 1627. (*excl. syn. Moris.*) *Syst. Nat.* II. p. 716. *Syst. Nat. Ed. Gmel.* II. p. 1381. GMELIN, *Hist. Fuc.* p. 103. (*excl. syn. Huds.*)

Fucus longo angusto crassoque folio. RAI Syn. p. 43. n. 11.

Fucus fungis affinis. RAI Syn. p. 43. n. 15.

Fucus maximus ceranoides, cornu cervi divisurâ, globulis verrucosis signatus. MORIS. *Hist. Or.* III. p. 648. n. 1. s. 15. t. 9.

Fucus marinus secundus Dodonæi. PARKINSON. p. 1292. t. 6, 7. (*figura media.*)

Ulva pruniformis. *Fl. Norv.* II. p. 89. t. 2. f. 6, 7. t. 9. f. 4, 5.

β . *inæqualis*; frond wide, but of unequal width in different parts; angles of the dichotomies and apices obtuse.

F. loreus β . *Linn. Trans.* III. p. 176. *Syn. Fuc.* II. p. 247.

γ . *teretiunculus*; frond narrow, subcylindrical.

In the Northern Ocean, and on the shores of the British Isles, not uncommon.—Northern and western coasts of France. *Decandolle*.—Rocks between the towns of Boarcos and Figueira. *Brotero*.— β . among the rejectamenta of the sea at Yarmouth.— γ . in Bantry Bay. *Miss Hutchins*.

Perennial.—Winter.

ROOT, a callous disk, flattish above, a quarter of an inch in diameter.

FROND, rising with a *stipes* from two lines to an inch in length, cylindrical and as thick as a swan's quill at its base, but dilated upwards, and gradually expanding into a peziziform or umbraculiform disk an inch or more in diameter, and quite entire at its margin, out of the centre of which proceed generally one or two, but occasionally more fronds, appearing like a continuation of the *stipes*, varying in height from five to ten feet, or, according to Borlase, sometimes attaining to twenty-two, quite destitute of midrib or veins, compressed, preserving throughout their whole length an uniform thickness of one and a width of four or five lines, forked at a short distance from their origin, and afterwards repeatedly dichotomous at intervals, which in some cases do not exceed three inches while in others they are more than a foot long: segments nearly of equal height, all in general remarkably straight, but occasionally the upper ones are slightly falcate: apices narrowed and somewhat sharp; margins quite entire; surface very smooth; angles of the dichotomies acute.

FRUCTIFICATION, elliptical tubercles immersed in the frond, and plentifully scattered over the whole of it, and* equally against both sides, making the surface, wherever they are situated, uneven, with small oblong tumors perforated at their apices; they contain a mass of minute, elliptical, dark brown seeds, surrounded with a pellucid limbus, together with a net-work of whitish mostly simple fibres, swollen upwards, and very evidently jointed.

COLOR, olive-green, with a tinge of brown, turning to a deep black in drying.

SUBSTANCE, coriaceous without, within pulpy and succulent, flexible and tough; but brittle after it is dried.

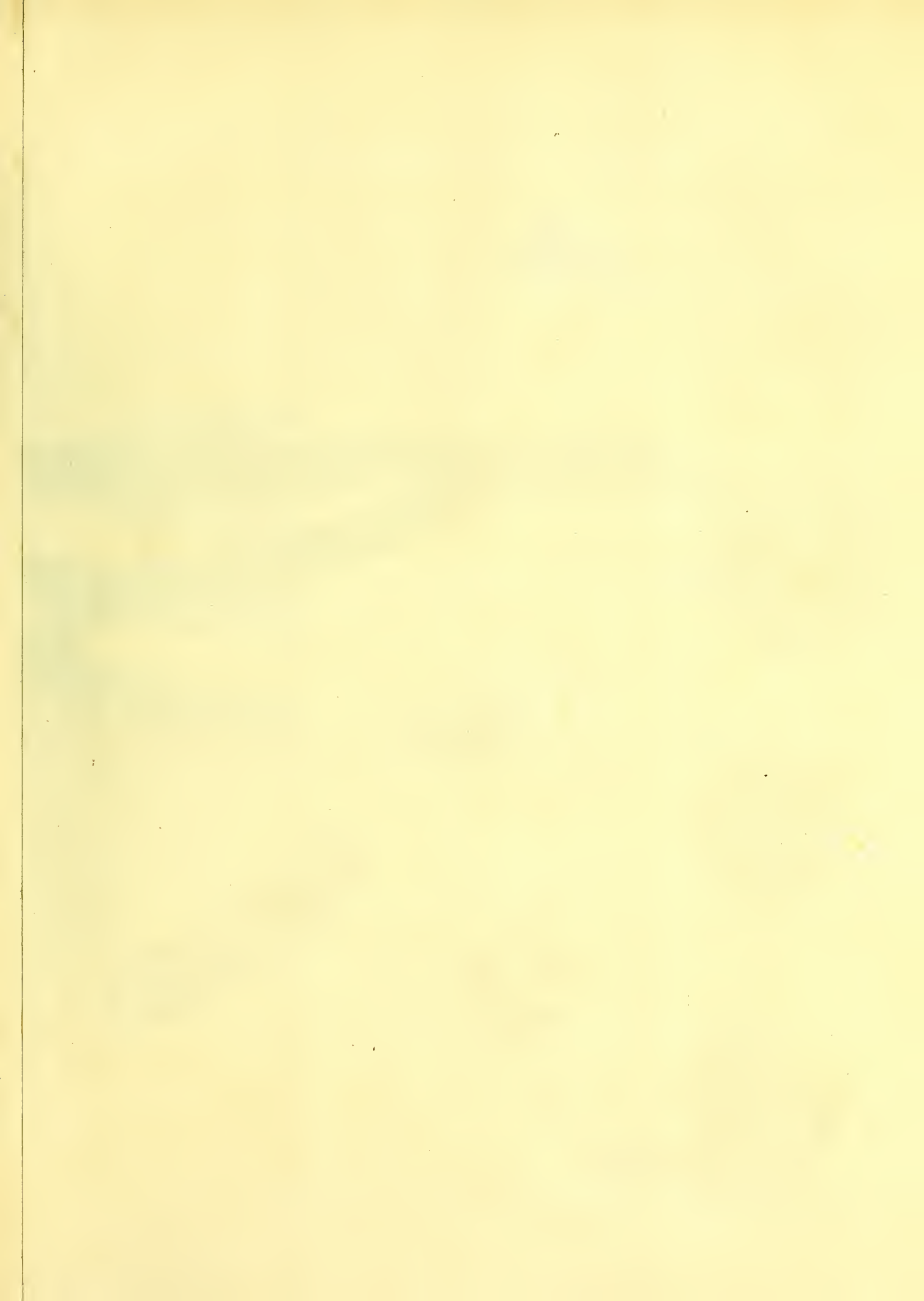
The variety β . which I have introduced more in deference to the opinion of Dr. Goodenough and Mr. Woodward, than in consequence of any observations of my own, has its frond far from linear, and much wider in some parts than in others: the angles likewise of its dichotomies are rounded, and the ends of the segments obtuse.

The variety γ I have not yet seen:—in this, according to Miss Hutchins, the frond is scarcely a line and half wide and nearly cylindrical, and of a yellowish color.

OBS. In drying, *F. loreus* does not adhere to paper; but the surface becomes longitudinally wrinkled, and looks as if it were marked all over with extremely minute, elevated, parallel veins: these it never again loses from subsequent immersion.

The peziziform base of this *Fucus*, of which scarcely any specimens are found destitute, is so extraordinary a character of the species, that this single peculiarity is at all times sufficient to prevent there being any difficulty in distinguishing it from all others. It is by no means easy to conjecture what end is designed by nature to be answered by this singular appendage, which is visible in the earliest stage of the growth of the plant, and acquires a considerable size before any portion of the strap-shaped frond issues from it, making the rocks where the *Fucus* abounds look as if covered with a crop of marine pezizæ. Hence among old authors the expressive name of *Fucus fungis affinis*. In its very first state it is hollow and swollen into an elliptical shape, and the same inflated appearance sometimes happens, most probably from accident, in full grown specimens, instances of which were found by Mr. Mason on the beach

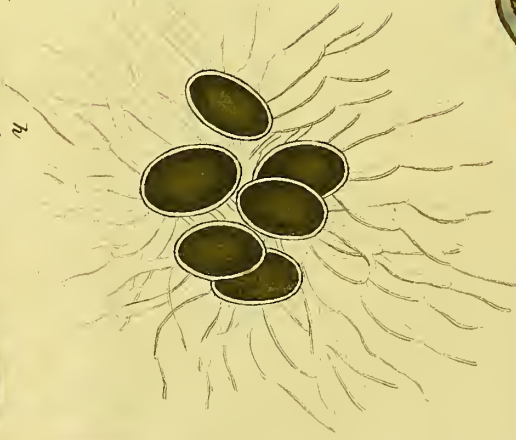
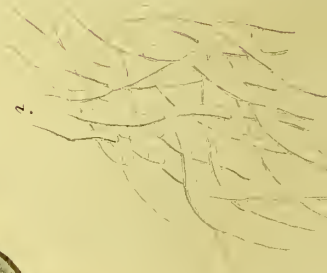
* Brotero particularly describes the tubercles as lying on one side only of the frond, in which he is unquestionably in error.



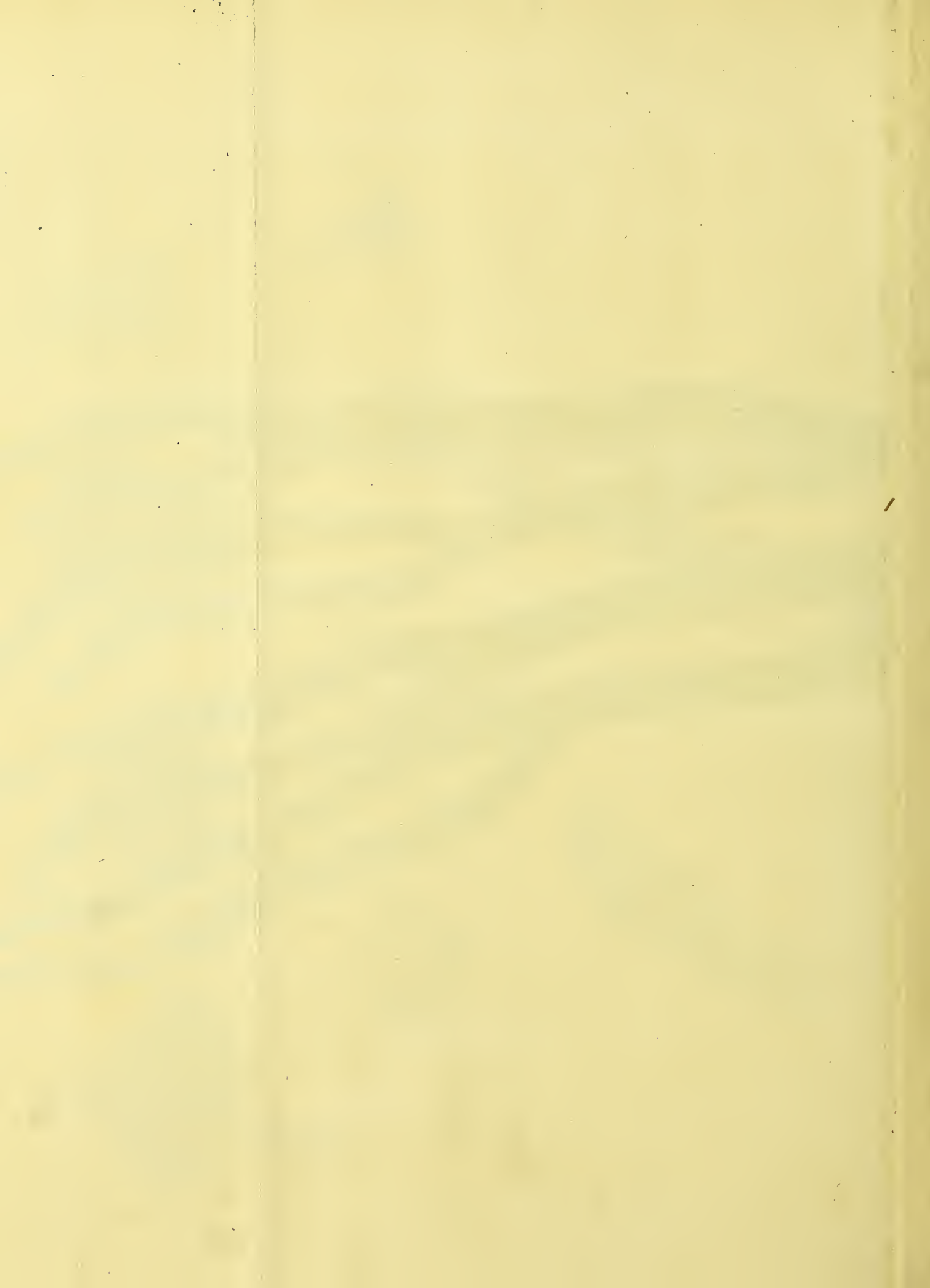
Dis. Hutchins del.



Fucus loricatus.







beach at Yarmouth, in the autumn of 1801, swollen completely into a globular shape. Similar to these are what have been figured by Gunner, as above quoted, under the name of *Ulva pruniformis*, in his description of which the reverend author most justly suspects that they belong to some other Fucus, though he has been led into the strange idea that they are the same as the plant of the same name that has been found in the lakes of Norway. Professor Esper, following him with more than equal strides, does not hesitate to quote as synonyms, without a single mark of doubt, except as to Haller, the *Ulva pruniformis* of all authors, not one of whom, I am persuaded, had fallen into such an error. With regard to the fructification of *F. loreus*, Dr. Roth has been strangely mistaken; and, as he has been so kind as to lend me his specimen for examination subsequently to the publication of the *Synopsis of the British Fuci*, I can now say with certainty that* what he has considered as fruit is nothing more than a casual swelling at the apex, occasioned, in all probability, by injury. The doubts that long existed upon the subject of the Linnæan *F. elongatus* have been removed by the inspection of that author's Herbarium, the specimen preserved in which certainly belongs to *F. loreus*, though destitute of the peziziform base, most probably from being broken off above it, and also differing from any other I ever saw, in being swollen at the dichotomies and generally broken there, which gives it the appearance of being jointed.

- a. *F. loreus*, natural size.
 b. c. seedlings in their earliest state of growth.
 d. e. young plants.
 f. horizontal section of the stem, magnified - - - 6.
 g. portion of the same - - - - - 3.
 h. seeds and fibres - - - - - 1.
 i. fibres - - - - - 1.

* His description of the fruit is as follows: "Fructificationes in ramulis terminales, geminæ, ovatæ, obtusissimæ, apice rotundatæ, subinflatæ, pedunculo compresso ultra unciam longo insidentes, illoque duplo ferè crassiores, tuberculis porisque mucifluis notatæ, tres ad quatuor lineas longæ duasque latæ."

196.—FUCUS LOREUS.

Fucus, fronde cartilagineo-coriaceâ, compressâ, lineari, enervi, integerrimâ, dichotomâ, basi peziziformi: tuberculis ubique et undique in fronde immersis.

Fucus loreus. LINN. *Syst. Nat.* II. p. 716. *Syst. Nat. Ed. Gmel.* II. p. 1382. *Fl. Ang.* p. 583. *Fl. Scot.* II. p. 920. *Fl. Dan.* t. 710. WITH. IV. p. 96. *Linn. Trans.* III. p. 176. ESPER, *Ic. Fuc.* I. p. 43. t. 19. et p. 81. t. 39. (exclusis synonymis plerisque). *Fl. Germ.* III. p. 453. *Fl. Norv.* II. p. 125. *Ner. Brit.* p. 37. t. 10. *Eng. Bot.* VIII. t. 569. *Syn. Fuc.* II. p. 246. *Fl. Lus.* II. p. 435. *Fl. Fr. Ed. 2da.* II. p. 23. *F. elongatus*. LINN. *Sp. Pl.* II. p. 1627. (excl. syn. Moris.) *Syst. Nat.* II. p. 716. *Syst. Nat. Ed. Gmel.* II. p. 1381. GMELIN, *Hist. Fuc.* p. 103. (excl. syn. Huds.)

Fucus longo angusto crassoque folio. RAII *Syn.* p. 43. n. 11.

Fucus fungus affinis. RAII *Syn.* p. 43. n. 15.

Fucus marinus ceranoides, cornu cervi divisurâ, globulis verrucosis signatus. MORIS. *Hist. Or.* III. p. 648. n. 1. s. 15. t. 9.

Fucus marinus secundus Dodonæi. PARKINSON. p. 1292. t. 6, 7. (figura media.)

Ulva pruniformis. *Fl. Norv.* II. p. 89. t. 2. f. 6, 7. t. 9. f. 4, 5.

β. *inæqualis*; fronde latiore, inæquali: angulis dichotomiarum apicibusque obtusis.

F. loreus. β. *Linn. Trans.* III. p. 176. *Syn. Fuc.* II. p. 247.

γ. *teretiusculus*; fronde angustâ, teretiusculâ.

HABITAT in Oceano Septentrionali, et Britanniarum ad oras, haud infrequens.—In Oceano Galliam alluente. *Decandolle*.—In scopulis maritimis inter oppida Boarcos et Figueira in Beira. *Brotero*.—β. inter rejectamenta maris apud Yarmouth.—γ. in sinu, Bantry Bay dicto. *Dna. Hutchins.*

Perennis.—Hyeme.

RADIX callus discoideus, suprâ planiusculus, diametro semiunguicularis.

FRONS hinc assurgens solitaria, *stipite* fulta brevi, nunc vix duas lineas nunc pollicem longo, basi terete et cygni pennæ crassitie, mox sursum versus sensim dilatato in discum plano-concavum, peziziformem, integerrimum, diametro pollicarem vel sesquipollicarem, cujus e medio, ceu stipes ipse rursus continuatus, oritur frons una alterave (interdum sed

sed rarò plures) nunc quinque nunc decem* pedum altitudine, nervi venarumque expers, compressa, eandem ubique servans latitudinem trium vel quinque linearum, et eandem crassitiem unius circiter lineæ, juxta basin bifurca, et mox dichotomiis sæpe repetitis, intervallo inter singulas nunc tripollicari nunc pedali et ultrà, ramosissima; segmenta subfastigiata, omnia plerumque insignitè recta, sed interdùm lenitè falcis instar curvata; apices attenuati, acutiusculi; margines integerrimi; superficies perquam lævis; dichotomiarum anguli acuti.

FRUCTIFICATIO, tubercula elliptica, numerosissima, ubique per frondem sparsa, et † utramque paritèr paginam respicientia, immersa fronde ubicunque disponuntur torulosâ, et quasi verrucis oblongis apice perforatis inæquali, congeriem includentia seminum exiguorum ellipticorum fuscorum limbo pellucido cinctorum, immixtis fibris albicantibus, simpliciusculis, sursùm incrassatis, evidentissimè geniculatis.

COLOR olivaceo-viridis fusco perfusus; *exsiccatæ* nigerrimus.

SUBSTANTIA extrinsecus coriacea, intus pulposa et succi plena, lenta, tenax, *exsiccatæ* autem fragilis.

Var. β. quam magis Goodenovio Woodwardioque obsequens quàm propriis observationibus nisus recenseo, discrepat fronde nequaquam lineari, sed hic illic dilatâtâ: habet insuper dichotomiarum suarum sinus rotundatos frondisque apices obtusos.

Var. γ nondum vidi: hæc, teste D^{nâ}. Hutchins fronde gaudet vix sesquilineam latâ, teretiusculâ, lutescenti-olivaceâ.

Obs. Per desiccationem stirps chartæ non adhæret, sed superficies tota longitudinalitèr fit rugosa, quasi venis picta minutissimis elevatis parallelis, quas rursùm madefacta nunquam amittit.

Facies illa peziziformis, quam frons hujus Fuci paullò supra basin expansa induit, et sine quâ nulla fere exemplaria vel inter maris rejectamenta reperiuntur, cùm stirps rarissimè nisi integra a rupibus nativis divellatur, efficit ut nulla sit in specie distinguendâ difficultas. Nequaquam autem facilè conjiceret aliquis quisnam sit finis cui hæc tam singularis structura in Naturâ œconomiâ inserviat. Frons in primo statim ætatis suæ stadio sic formata conspicitur; et hæc pars prorsus fit, ut ita dicam, adulta priusquàm aliquis e paginâ superiore ramos emittit. Hinc fit ut rupes in quibus hic Fucus scaturit certis anni temporibus Pezizarum marinarum messe coopertas diceret; et hinc nomen stirpi aptissimum selegerunt Botanici antiqui, "*Fucum fungis affinem*" appellando. *F. loreus* jam primùm ortus formæ est ellipticæ et intus cavus; nec desunt interdùm exemplaria satis magna eodem modo inflata, qualia omninò sphærica in littore apud Yarmouth olim legit b. Masonus. Hujusmodi quoque specimina delineata extant in *Floræ Norvegicæ*, sub *Ulvæ pruniformis* nomine a Gunnero descripta. Neque tamen abfuit vir reverendus a suspitione annon hæc revera nihil fuerint nisi Fuci cujusdam alius vesicæ; quamvis, quod maximè mirum, vix dubitavisse videtur quin fuerint eadem illa ejusdem nominis planta Norvegiæ lacuum incola. Esperus, hunc passibus plusquam æquis secutus, omnium auctorum *Ulvam pruniformem* sub suis *F. lorei calicibus*, quod ait, *radicalibus* citat, ne dubitationis quidem signum subjiciens ulli horum præter Hallerum. Singularis quoque admodum est ille error in quem de *F. lorei* fructu incidit cl. Rothius, credens omnes alios Botanicos esse de hâc re hallucinatos, ‡ seque solum veram detexisse fructificationem, quam formæ sphæricæ frondis ad apicem sitam perhibet. Cùm autem ipse, *Fucorum Britannicorum Synopsi* jam editâ, suum, quod unicum habet sic fructiferum, exemplar benevolè mihi commodaverit, indubitanter prædicare auctum virum optimum esse a tumoribus aliquibus fortuitis deceptum. De *F. elongato* Linnæi diu fuit inter Botanicos disceptatio an idem sit qui *F. loreus* noster; quos tandem scrupulos suum exemit Phytophylacium, docuitque has jungendas esse species, quamvis exemplar ibi servatum, basi peziziformi carens, et, sicut in *Systemate Naturæ* describitur, "fronde ad dichotomias tumidiusculâ et quasi articulatâ ubi per exsiccationem discedit ut articuli sæpe solvantur," faciem longe a vulgari alienam induit, et facilè aliquem deciperet.

a.	<i>F. loreus</i> , magn. nat.				
b. c.	<i>stirpes jam primum ortæ.</i>				
d. e.	<i>stirpes juniôres.</i>				
f.	<i>frons horizontalitèr dissecta</i> , magn. auct.	-	-	-	6.
g.	<i>ejusdem portio</i>	-	-	-	3.
h.	<i>semina et fibræ</i>	-	-	-	1.
i.	<i>fibræ</i>	-	-	-	1.

* Ad viginti duorum pedum altitudinem assurgere perhibet Borlasius.

† Hallucinatur procul dubio Broterus qui dicit unam modò ex paginis undique tuberculis obsoletè elevatis adpersam esse.

‡ Rothices fructum his verbis describit: "*Fructificationes in ramulis terminales, geminæ, ovatæ, obtusissimæ, apice rotundatæ, subinflatæ, pedunculo compresso ultra unciam longo insidentes, illoque duplo crassiores, tuberculis porisque mucifluis notatæ, tres ad quatuor lineas longæ duasque latæ.*"

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