

and at first green, but finally brown; they are large compared with the size of the plant, and are arranged in a circle near the margin.

I am indebted to Dr. Dickie for determining the name of this plant, which I had supposed was one hitherto undescribed, and also for a specimen gathered at Falaise which he had received from M. Lenormand.

Having sent a British specimen to Professor Kützing, he informed me, that as far as he could determine from the dried specimen, it is his *Phylactidium pulchellum*; but although he considers it distinct from *Coleochate scutata*, which he has also gathered in Prussia, I believe that he has only described its young state as *Phylactidium pulchellum*, for his figure well represents our plant before the appearance of bristles; and as it is undoubtedly Brébisson's plant, I have retained the present name*.

PLATE X. fig. 2. *Coleochate scutata*: *b*, portion of a frond in fructification; *c*, portion magnified to show the processes.

XXXIV.—*Notice of a new genus and several new species of Nudibranchiate Mollusca.* By JOSHUA ALDER and ALBANY HANCOCK, Esqrs.

Genus EUMENIS.

BODY elongated, quadrilateral; head subinferior, with corneous jaws; veil very small or none. Tentacles two, dorsal, clavate and laminated, with sheaths. Branchiæ papillose, set on a waved pallial expansion down the sides of the back. Foot linear. Orifices of the generative organs and of the anus? on the right side.

Eumenis marmorata. Body nearly linear, tapering to an obtuse point behind; olive-brown, streaked and spotted with dark chocolate-brown and white. Head with a few tubercular processes in front. Tentacles clavate, broadly laminated on the upper part and truncated at the apex; lower part plain, inclosed in small and rather tight sheaths. The sides of the body are produced into a pallial expansion, which undulates into three or four lobes, the margin set with irregular papillose branchiæ of a fawn-colour with pale edges. Interrupted dark brown markings run down the centre of the back, streaked and spotted on each side with brown and white. The sides of the body below the margin of the cloak are also streaked with interrupted lines of dark brown

* "*Phylactidium*, Kütz. *Phylloma minutum*, monostromaticum, orbiculare, s. flabellatim conjuncta constituentibus compositum. Spermatia ignota." —Kütz. *Phycologia Generalis*, p. 294.

"1. *P. pulchellum*, Kütz. Orbiculare, amœne viride; cellulis cælogonicis, demum transverse zonatis, centro globulo gonimico majori notatis." —Kütz. *l. c.* p. 295. t. 16. f. 11.

and white. Foot nearly linear, transparent white, the front transversely slit and produced at the sides into tentacular points. Length rather more than half an inch.

From deep water, Torbay.

This genus belongs to the family of *Eolididæ*, having a ramified digestive system. In general appearance however it greatly resembles a *Tritonia*. It has the same squared or prismatic form, with a pallial expansion down the sides of the back bearing the branchiæ, which are papillose and not branched as in that genus. The jaws are large and powerful, resembling those of *Eolis*, but rather shorter and flatter. The tongue is covered with numerous rows of strong teeth denticulated at the edges. In most respects, the anatomy, as far as it could be made out from a single specimen imperfectly preserved, agrees pretty nearly with that of *Eolis*. The principal trunk of the digestive system appears to be folliculated and the branches much-divided. The foot, in the only known species, has long tentacular processes, as in several of the *Eolides*, which it also approaches in the papillose branchiæ. We thus find the external characters of the two typical genera of the *Tritoniadæ* and the *Eolididæ* so united in this animal, that were it not for its internal organization, we should have been at a loss in which family to place it.

From this circumstance we see the impropriety of dividing these families into separate orders. The anatomy of *Dendronotus* leads to the same conclusion. This genus, which we have found it necessary to establish in the first part of our 'Monograph of the British Nudibranchiate Mollusca' for the *Tritonia arborescens* of authors, shows the ramifications of the digestive system peculiar to the *Eolididæ*, with a remarkable modification approaching it to the other two families of the order. The follicular portion, instead of being entirely at the extremity of the branches as in *Eolis*, is principally concentrated round the main trunk, thus reverting in part to the form of the true liver, and supporting the views of those anatomists who consider the ramifications to be merely modifications of the hepatic ducts. So far, therefore, as the digestive system is concerned, there appears to be no good reason for dividing the order as proposed by M. de Quatrefages; and respecting the vascular system, we have cause for believing that we were correct when we hazarded an opinion that there would be found less difference throughout the order than was supposed.

We have recently discovered that the *Dorides*—even the most spiculose—have the whole of the cloak covered with vibratile cilia. From this circumstance alone it might be inferred that the *Dorididæ* as well as the *Eolididæ* have the blood partially aerated from the general surface of the body. This inference however is

rendered still more probable from the fact that the skin is a tissue of cells, or perhaps is rather composed of a sort of network of vessels running in every direction and uniting in two large trunks that pass along the sides and pour themselves into the *posterior angles of the auricle*. The blood that comes from the skin consequently never passes into the true branchiæ. Cuvier, we are aware, states that these vessels empty themselves into the gills. With all deference to his high authority, we have convinced ourselves after repeated dissections that such is not the case, but that they go at once, as above stated, to the auricle.

This fact is interesting, as it shows that even in those Nudibranchs which have the branchiæ most perfectly specialized, only a portion of the blood passes through the gill; and when taken in connexion with the anatomy of *Dendronotus*, and with the peculiar form and internal organization of *Eumenis*, goes far to establish the unity of the order *Nudibranchiata*.

Doris diaphana. Body not much depressed, equally rounded at both ends, transparent yellowish white: cloak covered with rather large clavate tubercles. Tentacles nearly linear, laminated with eight oblique plates; apertures without sheaths. Branchial plumes eleven, simply pinnate, retractile within separate cavities, set in an imperfect open circle. Head with a large veil. Foot yellowish white, showing the liver through in a large dark patch. Length nearly an inch.

Under stones near low-water mark on Meadfoot sands, Torbay.

This *Doris* approaches nearest to *D. bilamellata*, but has much fewer plumes and is quite transparent and colourless.

Doris pusilla. Body ovate, much depressed: cloak yellowish white, thickly freckled with dark brown spots, and having numerous conical papillæ obtusely pointed at the top. Tentacles long and slender, pure white and finely laminated. Branchial plumes nine, beautifully white, simply pinnate, set in an incomplete, rather distant circle round the vent, and retractile within separate cavities. Head with a broad veil. Foot rather broad. Length about three lines.

Under stones between tide-marks, Torbay.

This pretty little species is not unlike *D. depressa*, but has the papillæ less slender. The plumes are fewer and form a smaller circle, but are more conspicuous from their snowy whiteness contrasted with the darker colour of the cloak.

Doris subquadrata. Body rather elevated, white with a slight yellowish tinge, semitransparent. Cloak small, scarcely covering the head and foot, a little squared before and behind, with the edge slightly raised, not very convex, thinly covered with small papillary tubercles. Dorsal tentacles finely laminated, retractile within short smooth sheaths. Branchial plumes seven, non-re-

tractile, large and spreading, bipinnate, the central stem large and lying flat on the back. Head covered by a broad veil, projecting frequently a little beyond the cloak in front. Foot large and thick, rounded before, and extending to a blunt point considerably beyond the cloak behind; the sides rather high. Length nearly an inch.

One specimen was dredged near Berry Head in Torbay.

Doris oblonga. Body rather convex, oblong-ovate, tapering behind. Cloak pale straw-coloured, freckled and spotted with umber-brown, densely spiculate, covered with moderate-sized, nearly equal conical papillæ. Tentacles rather thick and finely laminated, without sheaths. Branchial plumes seven, shortish and not much spreading, surrounded by a circle of large tubercles. Head furnished with a large veil. Foot narrowish, straight and slightly notched in front, not extending beyond the cloak behind. Length nearly half an inch.

Obtained with the last.

Goniodoris castanea. Body ovate, rather broad and flattish, of a reddish brown hue, covered with soft warty tubercles. Head bilobed, deeply sinuated in the centre, arched and terminating in tentacular points at the sides. Cloak small, warty, the margin reflected all round; interrupted behind. An elevated waved ridge runs down the centre of the back, intersected by a small transverse one about half-way down. Dorsal tentacles small, very broadly laminated and truncated at the apex. Branchial plumes eight or nine, rather large, purplish brown, bipinnate, forming a complete circle round the vent. A waved tubercular ridge extends down to the tail, which is rather obtuse. Foot broad, extending much beyond the cloak, with a deep notch under the mouth in front, and rounded at the sides; yellowish with a tinge of purple. The upper surface tuberculated like the rest of the body, the prominent parts being blotched with opaque white. Length three-quarters of an inch.

Under stones at low-water mark near the ruins of Salcombe Castle, Devonshire.

Eolis glauca. Body rather depressed, oblong, tapering to a fine point behind, of a pale brick-red, more intense towards the head. Dorsal tentacles moderately long and rather slender, tapering. Oral tentacles about the same length as the dorsal ones, set wide apart, whitish with a tinge of red. Branchiæ numerous, rather stout, vermicular, tapering at the ends and depressed towards the base; of a pale sage-green colour, speckled with brown and opaque white, and frequently with a reddish tinge near the apex; arranged in about fourteen transverse rows on each side, leaving a bare space for about half-way down the back; the front rows divided into clusters of two or three rows each. Foot pel-

lucid, broadish in front, slightly arched and extending into broad tentacular points at the sides; tapering to a fine point behind. Length $1\frac{3}{4}$ inch.

One specimen of this fine species was dredged up in Torbay.

Eolis inornata. Body ovate-oblong, rather depressed, tapering to a fine point behind. Oral and dorsal tentacles rather short and thick, nearly of the same length; the first white, the others yellowish and slightly wrinkled. Back pale fawn-coloured or nearly white. Branchiæ cylindrical, tapering to an obtuse point, set in eight or nine rows of four or five papillæ each; of a dull brownish orange freckled with brown and white: apices for some distance transparent white, with the ovate vesicle of a more opaque white seen distinctly through. Foot white, expanded in front, curved and extended into points at the sides. Length $\frac{4}{10}$ ths of an inch.

Under stones near low-water mark, Torbay. When in motion, the branchiæ nearly cover the whole of the back. This species is allied to *E. angulata*.

Eolis punctata. Body yellowish, inclining to flesh-colour on the back, covered with largish opaque white spots. Dorsal tentacles yellow, thickish, tapering and truncated at the top; laminated with twelve or thirteen oblique folds sloping downwards behind as in *Doris*. Oral tentacles very long and tapering. Branchiæ nearly linear, tapering to a fine point; of a yellowish brown colour spotted with white, arranged in five or six clusters down the sides of the back, the first and second large, the rest small and confluent, extending nearly to the tail. Foot nearly linear, the front bow-shaped and extending into tentacular points at the sides. Length nearly an inch.

Dredged in deepish water, Torbay.

This *Eolis* is peculiar from the shape of its dorsal tentacles and the conspicuous white spots with which it is entirely covered. It is allied to the *Eolis Drummondi* of Mr. Thompson.

Eolis tenuibranchialis. Body fawn-coloured or yellowish, rose-coloured near the head. Dorsal tentacles orange tipped with yellow, and ringed with numerous small laminæ. Oral tentacles rather longish and thick at the base. Branchiæ small and very slender, linear, of an olive colour tipped with opaque white; set in seven clusters down the sides of the back, the first three distinct, the others coalescing. The back in the region of the stomach is of a dark purplish colour. Foot with a deep transverse slit in front and extending into tentacular processes at the sides. Length an inch and a quarter.

A single specimen in a sickly state was dredged in Torbay and died very soon afterwards.

Allied to *E. Drummondi*.

Eolis amæna. Body slender, greenish or yellowish white. Dorsal tentacles wrinkled, long, linear, greenish with a band of brown and spotted with white. Oral tentacles much shorter than the dorsal ones, white. Branchiæ linear or slightly elliptical, of a warm green spotted with white, brownish towards the base, and a faint yellowish white ring near the apex. They are set in eight transverse rows; each row has three, sometimes four papillæ on each side: the three anterior rows are placed close together, the rest wide apart. The back has rich brown markings near the region of the heart. Foot rather slender, rounded in front, and not produced at the sides. Length about three lines.

Two specimens of this beautiful little *Eolis* were dredged up at different times in Torbay.

Allied to *E. viridis* of Forbes.

Eolis elegans. Body slender, subpellucid, yellowish white. Oral tentacles long, tapering. An opaque white line runs down each, and is continued across the front of the head. Dorsal tentacles not above half the length of the oral ones, stoutish, erect, tapering at the top and wrinkled, pale fawn-coloured or buff. Branchiæ numerous, slender, nearly linear, set in about seven dense clusters on each side: the first cluster large and approaching very near the dorsal tentacles; the remaining diminish gradually and extend very close to the tail. They are of a deep rosy flesh-colour, terminated above and below by a dark patch of purplish brown approaching to black, above which, on the apex, is a ring of white. Foot slender, produced into longish angles at the sides. Length half an inch.

One specimen dredged up near Berry Head, Torbay.

The contrast of the dark spot with the white and red on the papillæ gives this species a very elegant appearance.

Eolis amethystina. Body yellowish, slightly depressed. Oral and dorsal tentacles of a yellowish tinge, the latter twice as long as the former, bases approximating, points fine and spreading. Branchiæ elliptical, much inflated one way and somewhat depressed the other, set in nine or ten rows of four papillæ each; the gland linear, purple, granulated; apices with a broad ring of pale orange-red. Foot transparent, linear, rounded in front, and a little widened for a considerable way backwards. Length three-eighths of an inch.

Under stones at low-water mark, Cullercoats.

This species comes near to *E. tricolor*, but differs from it in the shape of the anterior portion of the foot, in the length of the tentacles, and in the size and character of the branchiæ.



Alder, Joshua and Hancock, Albany. 1845. "XXXIV.—Notice of a new genus and several new species of Nudibranchiate Mollusca." *The Annals and magazine of natural history; zoology, botany, and geology* 16, 311–316.

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