

sexually or asexually, could not, as already stated, be decided by me.

At first I thought I was justified in regarding the brood parasitic in the *Carmarinae* as belonging to the *Cunina discoidalis*, Kef. & Ehl., which is pretty frequent at Villafranca and Naples; (and the resemblance of the *Cuninae* sprouting in the stomach of *Carmarina* to *C. discoidalis* has already been noticed by Noschin;) but subsequently this supposition proved to be unfounded, as the young *Cuninae* constricted off from the parasitic polypes became further developed in my aquaria, and then gradually lost their resemblance to *C. discoidalis*, two new marginal corpuscles, with the mantle-lobes belonging to them, being developed upon each segment.

Summing up the conditions here briefly described, it appears:—1, that the *Cunina*-brood which is developed in the stomach of *Carmarina hastata*, Häck., stands in no genetic connexion with the *Geryonid*; and, 2, that the species of *Cunina*, the young of which is parasitic upon the *Geryonid*, is subject during its evolution to an alternation of generations. As is well known, a species of *Cunina* (*C. octonaria*) has already been observed by M'Crady, the brood of which is parasitic, as a proliferant polype, in an Oceanid (*Turritopsis nutricula*). As the *Cunina octonaria* of M'Crady certainly belongs to the same group (*Cunina* in Metznikow's sense) as that observed by me, and as this peculiar mode of development has hitherto been observed only in the species of this group, we may suppose that perhaps all the species of this group are subject to an alternation of generations, contrary to what takes place in the species of the group *Polyxenina*, Metzn., which are developed directly without alternate generations.

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XXII.—*Descriptions of some new Species of Crustacea, chiefly from New Zealand.* By EDWARD J. MIERS, F.L.S., of the Zoological Department, British Museum.

HAVING been intrusted by Dr. Hector, F.R.S., with the compilation of a Catalogue of the species of Podophthalmatous and Edriophthalmatous Crustacea of New Zealand for the New-Zealand Government, I have thought it desirable to publish without delay descriptions of such species as do not appear to have been hitherto recorded: the type specimens of nearly all of these are in the collection of the British Museum, and they will be figured in the Catalogue. I have added descriptions of one or two allied new species from Australia and Tasmania in the collection.

*Halimus Hectori*, n. sp. Type, B.M.

Moderately convex, broadest behind, with the sides converging from the front of the branchial regions, obscurely tuberculated; there are four low tubercles (two median and two lateral) on the gastric, two in front of the branchial region, one at some distance behind, and two smaller upon the sides of the branchial region. The cardiac region is convex. The upper orbital margin projects considerably over the base of the eyes. There are four obtuse spines, of which two are larger, on the hepatic, and about ten small tubercles on the pterygostomian regions; the spines of the rostrum are straight, scarcely at all divergent. Penultimate joint of the ambulatory legs considerably dilated and squarely truncate at its distal extremity. Abdomen of male 6-jointed.

Length rather more than 2 inches.

*Hab.* New Zealand.

A single, unfortunately mutilated, specimen has been presented by Dr. Hector to the British Museum. This species is in many respects intermediate between the genera *Acanthonyx* and *Halimus*; but in the convergent sides of the carapace and squarely truncate penultimate joints of the legs it has most affinity with the latter genus. It is remarkable for the absence of spines on the gastric, cardiac, and branchial regions.

## PARAMITHRAX.

Under this generic name I have constituted two subgenera, as follows:—

## 1. PARAMITHRAX.

Anterior legs in the male enlarged; hand compressed; fingers with a vacant space at base when closed; wrist with two longitudinal ridges, the outer usually oblique.

This subgenus includes the *P. Peronii* and *P. Gaimardii* of Milne-Edwards, and the following species:—

*Paramithrax barbicornis*. B.M.

*Pisa barbicornis*, Latr. Encycl. x. p. 141 (1825).

*Paramithrax barbicornis*, M.-Edw. Hist. Nat. Crust. i. p. 324 (1837).

The specimens of this species in the British-Museum collection from New Zealand prove that the description of Latreille, based on a specimen from Australia, refers to the young female.

The males have the anterior legs greatly developed; arm with a series of strong spines above; wrist with two ridges, the inner divided into several lamellate or tuberculiform lobes, the outer uninterrupted except at the base; hands compressed,

fingers leaving a space at base when closed. The carapace, when the hairs are removed, appears covered with numerous wart-like minutely punctulated flattened tubercles.

Length 2 inches, breadth  $1\frac{1}{2}$  inch.

Should this species, on comparison with specimens of both ages and sexes from Australia, prove distinct from *P. barbicornis*, it may be designated by the name of *P. Latreillei*.

## 2. LEPTOMITHRAX, subgen. nov.

Anterior legs in the male elongated, slender; hand and wrist subcylindrical; fingers meeting along their inner edges when closed; wrist simply granulated, without longitudinal ridges.

This subgenus is intermediate between the true *Paramithrax* and *Maia* of the northern hemisphere. From the latter genus it is distinguished by the much narrower interorbital space and the basal joint of the external antennæ, the flagellum of which arises from the orbital margin, and not from within the orbital cavity as in *Maia*. It includes the *Paramithrax Edwardsii*, De Haan, the *Maia australis*, Jacq. & Lucas, and the following species:—

*Leptomithrax longimanus*, n. sp. Type, B.M.

Carapace triangular; branchial regions convex on the sides; depression separating the branchial from the cardiac, gastric, and hepatic regions deep and well-defined; carapace, arms, and wrists covered with a close velvet-like pubescence, and with small scattered granules. Spines of rostrum long. Antero-lateral margins destitute of spines. Anterior legs very long, about twice as long as the carapace; hand slender, cylindrical, and minutely granulous. Ambulatory legs slender, closely pubescent.

Length  $1\frac{3}{4}$  inch, breadth  $1\frac{1}{2}$  inch.

*Hab.* New Zealand.

This species is distinguished by the great length of the anterior legs, and the absence of spines on the antero-lateral margins. The male only is known.

*Leptomithrax australiensis*, n. sp. Type, B.M.

This species bears a general resemblance to the foregoing; but the carapace is covered with small spinules, and there are three or four larger spines upon the branchial regions. Anterior legs shorter; hand slightly compressed and granulous at base; palm about as long as the wrist. The whole animal is covered with short, stiff hairs, curled at the tips.

*Hab.* Tasmania.

*Neptunus pelagicus.*

Under this name two very distinct species appear to have been confounded, which may be diagnosed as follows:—

1. *Neptunus pelagicus.* B.M.

*Cancer pelagicus*, Linn. Syst. Nat. ed. xii. p. 1042 (1766).

Carapace evenly but not coarsely granulated, with distinct epibranchial lines. Front 6-toothed, the median teeth smaller, but never obsolete. The middle lobe of the upper orbital margin with a small spine at its external angle. Anterior legs very long and slender. Colour (in dried specimens) blue or pink, with irregular spots, blotches, and bands of pale yellow.

This species occurs throughout the Red Sea and Indian Ocean, the East-Indian islands, on the coasts of the Philippines, China, and Japan, the eastern coast of Australia, and at New Zealand, and often attains a very large size.

2. *Neptunus trituberculatus*, n. sp. Type, B.M.

More convex, less coarsely granulated, with the epibranchial lines less strongly marked than in *N. pelagicus*. Three low tubercles placed in a triangle in the central portion of the carapace—one anterior, upon the gastric, and two posterior, upon the cardiac region. Front 4-toothed, the two median teeth being obsolete. Middle lobe of the upper orbital margin commonly without a spiniform prominence. Arms shorter and more robust than in *N. pelagicus*. Colour a dull pink or slate, with numerous regular spots of pale yellow upon the carapace and legs.

This species inhabits the coasts of China and Japan, and is figured by De Haan, in the 'Fauna Japonica,' pls. ix., x., as *N. pelagicus*. It attains to quite as large a size as that species. The *Cancer cedo nulli* of Herbst ('Krabben,' ii. pl. xxxix.) resembles it in having a 4-toothed front; but there is no indication of the three tubercles on the carapace, and the form of the teeth of the antero-lateral margins and front and of the anterior legs is very different.

*Elamene Whitei*, n. sp. Type, B.M.

*Halicarcinus depressus*, White, Ann. & Mag. Nat. Hist. xviii. p. 178 (1846), nec Jacq. & Lucas.

Carapace subtriangular. Front between the eyes broad, lamellate, and concave above, projecting considerably beyond

the eyes, which are visible at the sides of the rostrum, and suddenly narrowing towards the extremity, which is acute. A small tooth external to the eyes. Anterior legs in the male very long, rather slender, and hairy, without spines.

Length and breadth rather more than  $\frac{1}{2}$  inch.

*Hab.* New Zealand, Bay of Islands.

The *Elamene pilosa*, A. M.-Edw. N. Arch. Mus. Hist. Nat. ix. p. 322, pl. xviii. fig. 6 (1873), somewhat resembles this species, but differs from it in the form of the carapace and front. In *E. truncata* (A. M.-Edw. *l. c.* p. 323) the eyes are concealed by the rostrum, which is produced below into a lobe separating the inner antennæ.

#### PETROLISTHES.

##### PETROCHELES, subgen. nov.

Sides of the rostrum spinose. Lateral margins of the carapace with a series of spines. Anterior legs elongated, slender; arms with spines on the anterior margin.

##### *Petrocheles spinosus*, n. sp. Type, B.M.

Carapace depressed, broader behind, almost entirely covered with a close short pubescence; lateral margins with a series of ten or eleven small spines. Front prominent; lateral margins with three or four spinules. Anterior legs closely pubescent, granulous above; arm with a series of four or five spines on the anterior margin; fingers hairy on their inner margins, and not quite meeting at their base when closed. Ambulatory legs with the superior margins spinulous and hairy.

Length of carapace  $7\frac{1}{2}$  inches, breadth  $1\frac{1}{2}$  inch.

*Hab.* New Zealand.

A specimen in the British-Museum collection from Australia resembles the foregoing, but has in addition two spines on the carapace at base of front, two longitudinal series of eight spines each on the upper and posterior surface of the arm, and the upper margin of the mobile finger spinulous. For this species I propose the name of *P. australiensis*.

##### *Eupagurus spinulimanus*, n. sp. Type, B.M.

Carapace with the median rostral tooth nearly obsolete. Eye-peduncles slender, longer than the front margin of the carapace, their basal scales small, with a short spine at the antero-internal angles. External antennæ with a short spine external to the basal scale, which is slender, linear, ciliated at

the extremity, and shorter than the eyes; flagella alternately annulated with red and white. Anterior legs clothed with short dense hairs; wrist and hand spinulose; wrist with a series of larger spines on its upper inner margin; larger hand ovate, with the spinules arranged in two longitudinal lines reaching to the base of the upper margin of the fingers, and elsewhere scattered; smaller hand with a group of larger spinules in the centre of the upper surface of the palm. Ambulatory legs hairy; hairs more dense on the tarsi, which are slender, longer than the penultimate joint. Antepenultimate joint of legs of second pair with a series of spinules on its upper surface. Colour (in dried specimen) light pink, with here and there spots of a darker colour.

Length of carapace about 1 inch.

*Hab.* New Zealand.

The abdomen is unfortunately destroyed in the only specimen I have seen. This, however, is evidently a much larger species than *E. novæ-zealandicæ*. From *E. japonicus*, Stimpson, this species differs in its longer, slender tarsi. *E. acantholepis* of the same author has the wrist canaliculate above. *E. constans* has a prominent rostral tooth. In none of these species is mention made of the two series of spinules upon the palm.

*Gebia Danai*, n. sp.

B.M.

*Gebia hirtifrons*, Dana, U. S. Expl. Exp. xiii. Crust. i. p. 511, pl. xxxii. fig. 2 (1852), nec White.

Scabrous surface of front part of carapace not reaching more than halfway to dorsal suture, and the points mostly in six nearly longitudinal lines. Hand with the outer surface smooth, no spinules or denticulations, and few hairs on the upper margin, on lower margin small denticulations, and rather hairy; lower finger slender and somewhat incurved; caudal segment not broader than long. Flagella of inner antennæ a little shorter than the last joint of base. Outer antennæ about as long as abdomen. A spine at lower apex of carpus.

Length nearly 2 inches.

*Hab.* New Zealand, Bay of Islands (*Dana*); south side of Davis Straits (*coll. Brit. Mus.*).

I have given above Dana's description of the species he refers to *G. hirtifrons*, White. A specimen in the British-Museum collection agrees well with it. The front is strongly 3-lobed, the lobes triangular, acute, the middle one the longest. The immobile finger is large; the palm high and compressed.

In the typical specimen of *G. hirtifrons* in the British Museum the front is triangular, hairy, and scabrous, hardly,

if at all, 3-lobed; the hand slender, hairy on its outer surface, and not denticulated below; the immobile finger quite rudimentary; carpus with a spine at its upper apex and one on the inner surface, but none at its lower apex. The specimen was obtained during the Antarctic Expedition, but is without any definite indication of habitat.

*Virbius bifidirostris*, n. sp. Type, B.M.

Carapace smooth, with two minute spines on each side below the eyes. Rostrum slender, longer than the carapace, and nearly as long as the scale of the external antennæ, with two teeth on the upper margin placed at some distance from one another, and another, minute one near the apex, which thus appears bifid; lower margin with seven teeth. Scale of the external antennæ without a spine at base, but with a small spine at the distal extremity of the outer margin. External maxillipeds about reaching to the end of the peduncle of the outer antennæ; terminal joint dilated, minutely spinulous. First pair of legs very short when directed forward, not reaching to the end of the external maxillipeds. Second pair of legs with the joints of the carpus short, the second the shortest. Terminal segment of abdomen and caudal appendages slender.

Length  $1\frac{1}{2}$  inch.

*Hab.* New Zealand.

*Alpheus novæ-zealandiæ*, n. sp. Type, B.M.

Rostrum triangular, acute, rising at a considerable distance behind the bases of the eyes, separated from the orbits by a deep and wide groove, and projecting beyond the frontal margin of the carapace nearly to the extremity of the first joint of the inner antennæ. Interocular part of the frontal margin of the carapace straight, without spinules, considerably more prominent than the part exterior to the eyes. External antennæ with a very short spine at base, and another at the end of the last joint of the peduncle; the basal scale about equalling the length of the peduncle. Anterior legs with the larger hand elongate, twisted somewhat outwardly, with an obscure oblique ridge above and below, without grooves or notches, except a short transverse groove behind the base of the mobile finger, which is short, rounded above, and compressed. Wrist of the second pair of legs with the first and second joints long, nearly equal, together exceeding in length the last three joints. Legs clothed with scattered hairs.

Length about 2 inches.

*Hab.* New Zealand.

This species seems to be allied to *A. gracilipes*, Stm., from Tahiti, which, however, has the larger hand straight and the orbits acute in front.

*Idotea elongata*. Type, B.M.

*Idotea elongata*, List Crust. Brit. Mus. p. 95 (1847), sine descr.

Elongate, linear, regularly rounded so as to appear cylindrical from above. Segments of pereion longer than broad, with the epimeral pieces in a lateral view very narrow-linear, and coalescent with the segments, the lines of union indicated by sutures on the sides; beneath greatly developed and sheathing the base of the legs. Head usually coalescent with the first segment of the pereion. Antennæ as in *I. affinis*, the flagella about 22-jointed. Terminal segment of the pleon with a rather deep rounded excavation at its extremity, and with the latero-posterior angles rounded.

Length  $1\frac{5}{8}$  inch, breadth not quite  $\frac{1}{4}$  inch.

*Hab.* Auckland Islands.

Distinguished by its very narrow convex body, with long segments and very narrow epimera, which are linear in a lateral view.

*Armadillo inconspicuus*, n. sp. Type, B.M.

Convex, with the sides parallel, very finely and closely punctate. Head transverse; eyes small. Posterior margins of the segments of the pereion straight; first segment broadest, lateral margins with a groove for the reception of the second segment when the animal is rolled up; following segments of about equal width, sides rounded. Segments of the pleon very short and closely applied to one another, sides truncate; terminal segment very little broader at the base than at the extremity, sides concave. Terminal (lateral) joint of the pleonal appendages minute; basal produced portion of the penultimate joint rounded, not rectangular. The antennæ are imperfect.

Length  $1\frac{5}{2}$  inch.

*Hab.* New Zealand.

Distinguished by the punctulations of the thorax and the form of the terminal segment and caudal appendages.

*Cubaris rugulosus*, n. sp. Type, B.M.

Moderately convex, rather loosely articulated; surface of the segments uneven, faintly rugose. Head very broad and transverse, front margin revolute. First segment of the pereion with two slight depressions diverging anteriorly on the upper



surface, sides of the segment directed obliquely backward, so that the lower half of the posterior margin forms a distinct angle with the upper half; following segments very narrow transverse, each with an impressed line running parallel to the posterior margin; the second, third, fourth, and fifth segments narrowed on the sides, which have their inferior margins rounded; the sixth and seventh segments broader on the sides, with the inferior margins truncate. Pleon very short, with the segments (the last two excepted) nearly linear-transverse; terminal segment much the broadest at base, with the sides at first suddenly converging and then parallel. Appendages of the penultimate segment with the inner (terminal) joint reaching to the end of the produced portion of the penultimate joint.

Length  $\frac{1}{3}$  inch.

*Hab.* New Zealand.

*Porcellio graniger*, n. sp. Type, B.M.

*Porcellio graniger*, List Crust. Brit. Mus. p. 99 (1847), sine descr.

Oblong-oval, moderately convex, granulate, the granules seriate along the posterior margin of each segment, and partly seriate elsewhere. Head transverse, with the antero-lateral lobes narrow and very prominent. Eyes small, black. Segments of the pereion slightly tending backward at their latero-posterior angles. Segments of the pleon very short, smooth on the sides, and with the latero-posterior angles acute, directed backward; terminal segment triangular, acute, concave above, narrowed posteriorly, scarcely reaching beyond the latero-posterior angles of the penultimate segment. Appendages of the penultimate segment very short, reaching a little beyond the apex of the terminal segment; the larger (exserted) ramus ovate. Legs armed with slender acute spines. Colour light chestnut-brown.

Length  $\frac{3}{8}$  inch.

*Hab.* New Zealand.

Very nearly allied to *P. gemmulatus*, Dana, from California, but differs in the much shorter, broader, ovate pleonal appendages, and in the spines of the legs not being laminated.

*Porcellio zealandicus*. Type, B.M.

*Porcellio zealandicus*, List Crust. Brit. Mus. p. 99 (1847), sine descr.

Elongate-oblong, finely granulous, the granules seriate on the posterior margin of each segment. Head small, transversely oblong, with the latero-anterior angles not prominent. Segments of the pereion (the last excepted) with the posterior

and lateral margins straight, the latero-posterior angles obtuse; last segment broad, with the posterior margin concave, the lateral margin straight, the latero-posterior angle acute. Segments of the pleon considerably narrower than those of the pereion, short; terminal segment equilaterally triangular, slightly concave above, sides straight. Pleonal appendages with the base shorter than the terminal segment; the longer (exserted) ramus narrow, acute, projecting far beyond the terminal segment. External antennæ very long and hairy.

Length nearly  $\frac{1}{3}$  inch.

*Hab.* New Zealand.

*Scyphax intermedius*, n. sp. Type, B.M.

Resembles *S. ornatus*, Dana, but with the terminal segment of the pleon broadest at base, covering the base of the appendages of the penultimate segment, then suddenly narrowing, subacute at the extremity, with the lateral margins concave, the part between the bases of the appendages of the penultimate segment being triangular, with a slight depression on its upper surface.

*Hab.* New Zealand.

The bases of the appendages of the penultimate segment of the pleon are much less widely separated than in Dana's species. But the broad and truncate terminal segment of *S. ornatus* is so unlike the usual form of this segment in the Oniscidæ, that I think there may be some error in the figure and description of Dana.

*Ceratothoa lineata*, n. sp. Type, B.M.

Moderately convex, nearly smooth, terminal segment faintly punctulated. Head small, narrowed anteriorly, front slightly curved downward. Eyes large. First segment of the pereion longer than the rest, antero-lateral lobes produced slightly forward and obtuse; epimeral pieces (coxæ) of the last four segments of the pereion large. Terminal segment of the pleon large, almost semicircular in outline, rather broader than long, with a faintly marked, raised, longitudinal median line. Rami of the appendages of the penultimate segment slender, projecting slightly beyond the posterior margin of the last segment, outer rather the longest. Antennæ slender. Femoral joints of the ambulatory legs scarcely enlarged.

Length  $\frac{5}{8}$  inch.

*Hab.* New Zealand.

Distinguished by the form and markings of the terminal segments of the pleon.

*Lironeca novæ-zealandiæ*, n. sp.

*Cymothoa novæ-zealandiæ*, List Crust. Brit. Mus. p. 110 (1847), sine descr.

Moderately convex. Head small, about as long as broad, widest in the middle, with the sides converging to the back and front, deeply encased within the first segment of the pereion. The seven segments of the pereion of nearly equal width, each with a faintly marked groove produced for a short distance inward and obliquely forward from the lateral margin. Segments of the pleon (the last excepted) very narrow; last segment transverse, surface uniformly and faintly wrinkled, posterior margin with a nearly semicircular outline, entire. Rami of the appendages of the penultimate segment very small, outer slightly the larger. Colour dark brown.

Length  $1\frac{1}{3}$  inch.

*Hab.* New Zealand.

*Cirolana Rossii*, n. sp. Type, B.M.

*Cirolana Rossii*, List Crust. Brit. Mus. p. 106 (1847), sine descr.

Convex, smooth. Head quadrangular, broader than long, encased in the first segment of the pereion. Eyes narrow-oblong, black, extending along the sides of the head from the front margin of the first segment of the body nearly to the bases of the antennæ. Segments of the pereion smooth, the first the widest. Last segment of the pleon slightly rounded on the sides, obtuse at the apex. Legs hairy, the hairs more dense on the four last pairs, which are not spinous. Appendages of the penultimate segment ciliate, the outer narrower, acute at the extremity.

Length nearly 1 inch.

*Hab.* New Zealand; Auckland Islands.

Distinguished from *C. spinipes* of Europe by the narrow oblong eyes, and from *C. hirtipes* in the form of the head, which is broader than long.

## ISOCLADUS, n. gen.

Convex, somewhat widening posteriorly. Seventh segment of the pereion in the male with a long median dorsal spine. Terminal segment of the pleon narrowing posteriorly, and acute at the extremity. Appendages of the pleon subequal, of a slightly sigmoid shape, and acute at the extremity.

A genus nearly allied to *Zuzara*, Leach (Dict. Sci. Nat. xii. p. 344, 1818), which differs in having unequal pleonal appen-

dages and the abdomen truncate at the extremity, with a median terminal spine. *Cyclura* of Stebbing (Journ. Linn. Soc. xii. p. 146, 1874) has the appendages of the pleon broad, unequal, and rounded at the extremity.

The genus *Isocladus* includes the *Sphæroma armata*, M.-Edw., and *S. spinigera* of Dana, specimens of which, from New Zealand, are in the collection of the British Museum.

*Cymodocea granulata*, n. sp. Type, B.M.

Moderately convex, nearly smooth. Head small; frontal lobe very small, obtuse. Lateral margins of the segments of the pereion all with a narrow marginal line, with the postero-lateral angles acute. Antero-lateral lobe of the first segment of the pereion narrow triangular, acute, produced forward beneath and beyond the eyes. Postero-lateral lobe of the last segment of the pereion produced backward, and terminating in a short spine curving upward; posterior margin of the segment nearly straight. Last segment of the pleon broad, convex, granulous, and slightly hairy, with a more distinctly granulated elevation on its upper surface near its base, and with the terminal notch quadrangular, with a narrow median lobe. Rami of appendages of the penultimate segment unequal, the inner not quite reaching to the extremity of the segment; broad truncate at the end, the outer nearly as long again and narrowing to its extremity, which is acute.

*Hab.* New Zealand; Tasmania; Flinders Island.

*Cymodocea convexa*, n. sp. Type, B.M.

More convex than *C. granulata*, and not so narrow in front. Head larger. Seventh segment of the pereion without a postero-lateral lobe or spine on each side. Terminal segment of the pleon very large, more convex in its anterior half, which has usually four obscure tubercles in a transverse series; posterior notch wider, and not so deep as in *C. granulata*, with the median lobe triangular. Appendages of the penultimate segment not reaching nearly to the posterior emargination; rami subequal, obtuse at the extremity.

Length nearly  $\frac{1}{2}$  inch.

*Hab.* New Zealand.

The *C. tuberculosa* of Stebbing, from Australia, differs from the two foregoing species in the tuberculated segments of the pereion.