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CRUSTACEA.

PART I.—DECAPODA.

BY

L. A. BORRADAILE, M.A.

(Fellow, Dean and Lecturer of Selwyn College, Cambridge; Lecturer in Zoology in the University).

WITH SIXTEEN FIGURES IN THE TEXT.



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CRUSTACEA.*

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I.—INTRODUCTION.

THE species of Decapoda obtained by the "Terra Nova" number 46 in all, and are distributed pretty evenly throughout the taxonomic divisions of the order. According to the localities in which they were taken, they fall into five groups :

- (1) Antarctic.
- (2) From New Zealand and the neighbouring waters.
- (3) From Melbourne Harbour (a single species).
- (4) From between Rio de Janeiro and South Trinidad Island.
- (5) Pelagic species from the tropical and sub-tropical Atlantic.

(1) The Antarctic species were :

Pasiphaea longispina, Lenz and Strunck, 1914.

Chorismus antarcticus (Pfeffer), 1887.

Crangon (Notocrangon) antarcticus; Pfeffer, 1887, var. *gracilis*, n.

All were taken in the Ross Sea.

* In sending to the press this paper and that which follows it, I wish to acknowledge very heartily the courtesy of the authorities of the British Museum (Natural History), who have afforded me facilities for doing at the Museum a good deal of the work which the examination of the "Terra Nova" collection has involved. In particular I am indebted to Dr. W. T. Calman for the readiness with which he has placed at my disposal not only the collections under his charge, but also his own time and knowledge. Miss G. M. Woodward's excellent illustrations owe much to the assistance which she has received from Dr. Calman in their preparation.

That there are only three of them, all previously described, is in agreement with what is known of the poverty in Decapoda of Antarctic waters. *Chorismus antarcticus* has already been reported in the Ross Sea, as well as in South Georgia and to the south of Kerguelen. It has thus an Antarctic circumpolar distribution, extending as far north as South Georgia. The same is true of *Crangon antarcticus*, with the difference that specimens of this species taken between 80° E. and 160° W. long. belong to a different variety from those of South Georgia, on the opposite side of the Antarctic region. These two species are the only Decapoda reported from South Georgia, so that, so far as this evidence goes, that island clearly belongs to the same geographical province as the Antarctic continent, and not to the adjoining South American region. I have discussed below the affinities of *Crangon antarcticus* and its bearing upon the bipolarity theory. *Pasiphaea longispina* was taken near Kaiser Wilhelm Land by the German expedition. Very probably it is also circumpolar. Two other species of *Pasiphaea*, recently described by Stebbing, but not obtained by the "Terra Nova," make up to five the total number of Antarctic Decapoda at present known.

(2) The New Zealand species were :

- Solenocera novae-zealandiae*, n. sp.
Sergestes semiarmis, Bate, 1888.
Leucifer batei, Borr., 1915.
Thalassocaris novae-zealandiae, n. sp.
Rhynchocinetes typus, H. M.-Edw., 1837.
Tozeuma novae-zealandiae, n. sp.
Periclimenes (Hamiger) novae-zealandiae, n. sp.
Aegeon cataphractus (Olivi), 1792.
Jasus, sp.
Arctus immaturus, Bate, 1888 (? sp.).
Axius novae-zealandiae, n. sp.
Galathea pusilla, Hend., 1885.
Uroptychus maori, n. sp.
 ,, *novae-zealandiae*, n. sp.
Paguristes subpilosus, Hend., 1888.
Eupagurus norae, Chilton, 1911.
 ,, *kirki*, Filhol, 1885.
 ,, *crenatus*, n. sp.
Porcellanopagurus edwardsi, Filhol, 1885 (? sp.).
Portunus corrugatus (Penn.), 1777.
Pilumnus maori, n. sp.
Pinnotheres pisum (L.), 1766.
Grapsus (Leptograpsus) variegatus (Fabr.), 1793.
Plagusia chabrui (L.), 1764.

- Elamena longirostris*, Filhol, 1885.
Echinomaia hispida, n. gen. et sp.
Paramithrax (*Paramithrax*) *latreillei*, Miers, 1879.
 „ (*Leptomithrax*) *affinis*, n. sp.
 „ *parvus*, n. sp.

All were taken at or near the north end of the North Island.

Twelve of the twenty-nine species are new. Nearly all the others have already been recorded from New Zealand waters. Of those which have not, *Aegeon cataphractus* is a very widely distributed species whose appearance here need cause little surprise. The specimen which I have doubtfully referred to *Arctus immaturus* indicates, if the reference be correct, the occurrence of a Cape Verde species near New Zealand. In the moderately deep water to the North of New Zealand there is evidently a very rich and varied decapod fauna, which well deserves the attention of New Zealand zoologists.

(3) The single species from Melbourne Harbour was *Leucifer hanseni*, Nobili, 1905.

(4) The tropical Atlantic species from near Rio de Janeiro and South Trinidad Island comprise :

- Pandalus paucidens*, Miers, 1881.
Neptunus (*Hellenus*) *spinicarpus* (Stm.), 1870.
Goneplax hirsutus, n. sp.
Gecarcinus lagostoma, H. M.-Edw., 1837.
Eurypodius latreillei, Guérin, 1828.
Persephona (*Myropsis*) *laevis*, n. sp.

Geographically speaking they are a mixed assemblage. *Persephona laevis* and *Neptunus spinicarpus* indicate West Indian affinities for the fauna, *Goneplax hirsutus* is a link with the North, while *Pandalus paucidens* and *Eurypodius latreillei* are Magellanic. *Gecarcinus lagostoma* is the only land decapod taken by the expedition. Some of the pelagic Sergestidae mentioned below were taken in this region.

(5) The pelagic species from the Atlantic were the following Sergestidae :

- Sergestes atlanticus*, H. M.-Edw., 1830.
 „ *pacificus*, Stm., 1860.
 „ *cornutus*, Kr., 1859.
 „ *corniculum*, Kr., 1859.
 „ *edwardsi*, Kr., 1859.
 „ *vigilax*, Stm., 1860.
Leucifer batei, Borr., 1915.
 „ *faxonii*, Borr., 1915.

There is nothing remarkable in the occurrence of any of them.

The most interesting species contained in the collection were the very handsome new spider-crab *Echinomaia hispida*, belonging to the remarkable group of genera which includes *Cyrtomaia* and *Platymaia*, and the peculiar carcinized hermit-crab *Porcellanopagurus*.

LIST OF STATIONS.

1. ANTARCTIC (ROSS SEA AREA).

- Station 276. 71° 41' S., 166° 47' W., 0-1,750 metres, Jan. 5, 1913, Plankton.
 ,, 294. 74° 25' S., 179° 3' E., 289 metres (158 faths.), Jan. 15, 1913, Bottom fauna:
 ,, 314. 5 miles N. of Inaccessible Island, McMurdo Sound, 406-441 metres (222-241 faths.),
 Jan. 23, 1911, Bottom fauna.
 ,, 316. Off Glacier Tongue, about 8 miles N. of Hut Point, McMurdo Sound, 348-457 metres
 (190-250 faths.), Feb. 9, 1911, Bottom fauna.
 ,, 318. Hole in ice between Cape Evans and Inaccessible Island, 130-180 metres, June 13-
 Sept. 16, 1911, Bottom fauna.
 ,, 338. 77° 13' S., 164° 18' E., 379 metres (207 faths.), Jan. 23, 1912, Bottom fauna.
 ,, 339. 77° 5' S., 164° 17' E., 256 metres (140 faths.), Jan. 24, 1912, Bottom fauna.
 ,, 340. 76° 56' S., 164° 12' E., 293 metres (160 faths.), Jan. 25, 1912, Bottom fauna.
 ,, 348. Off Barne Glacier, McMurdo Sound, 366 metres (200 faths.), Feb. 13, 1912, Bottom
 fauna.
 ,, 355. 77° 46' S., 166° 8' E., 547 metres (300 faths.), Jan. 20, 1913, Bottom fauna.
 ,, 356. Off Granite Harbour, entrance to McMurdo Sound, 92 metres (50 faths.), Jan. 22,
 1913, Bottom fauna.

Stomach of Albatross, locality not stated.

2. NEW ZEALAND AND THE NEIGHBOURING WATERS.

- Station 90. From Summit, Gt. King, Three Kings Islands, S. 14° W., 8 miles, 183 metres (100
 faths.), July 25, 1911, Bottom fauna.
 ,, 96. 7 miles E. of North Cape, New Zealand, 128 metres (70 faths.), Aug. 3, 1911, Bottom
 fauna.
 ,, 109. 34° 15' S., 172° 0' E., 3 metres, Aug. 5, 1911, Plankton.
 ,, 112. 33° 37' S., 171° 30' E., 3 metres, Aug. 8, 1911, Plankton.
 ,, 126. 34° 13' S., 172° 15' E., Surface, Aug. 24, 1911, Plankton.
 ,, 127. Off Three Kings Islands, Surface, Aug. 25, 1911, Plankton.
 ,, 131. Off Three Kings Islands, Surface, Aug. 27, 1911, Plankton.
 ,, 133. Spirits Bay, near North Cape, 20 metres, Aug. 30, 1911, Plankton.
 ,, 134. Spirits Bay, near North Cape, 20-37 metres (11-20 faths.), Aug. 31, 1911.
 ,, 135. Spirits Bay, near North Cape, 3 metres, Sept. 1, 1911, Plankton.
 Nelson.
 Bay of Islands.
 Elmsley Bay.

3. MELBOURNE HARBOUR.

4. NEAR RIO DE JANEIRO AND SOUTH TRINIDAD ISLAND.

- Station 36. South Trinidad Island, July 26-30, 1910, Shore collecting.
 ,, 41. 22° 56' S., 41° 34' W., Surface, May 2, 1913, Plankton.
 ,, 42. 22° 56' S., 41° 34' W., 73 metres (40 faths.), May 2, 1913, Bottom fauna.

5. PELAGIC STATIONS IN THE ATLANTIC OCEAN.

- Stations 39 and 40. Six miles off mouth of Rio de Janeiro Harbour, 2 metres, April 27, 1913.
 Station 44. 21° S., 37° 50' W., Surface, May 4, 1913.
 ,, 45. 21° S., 37° 50' W., Surface, May 4, 1913.
 ,, 46. 20° 30' S., 36° 30' W., Surface, May 4, 1913.
 ,, 47. 20° 30' S., 36° 30' W., Surface, May 4, 1913.
 ,, 49. 18° 51' S., 33° 40' W., Surface, May 6, 1913.

Station	50.	18° S., 31° 45' W., Surface, May 7, 1913.
	„	53. 5° S., 27° 15' W., 2 metres, May 12, 1913.
	„	60. 2° N., 24° 45' W., Surface, May 17, 1913.
	„	61. 2° N., 24° 45' W., Surface, May 17, 1913.
	„	62. 4° 50' N., 24° W., Surface, May 18, 1913.
	„	63. 6° 10' N., 24° 5' W., Surface, May 19, 1913.
	„	64. 23° 28' N., 34° 45' W., Surface, May 26, 1913.
	„	65. 23° 28' N., 34° 45' W., Surface, May 26, 1913.
	„	66. 25° 35' N., 34° 10' W., Surface, May 27, 1913.
	„	67. 25° 35' N., 34° 10' W., Surface, May 27, 1913.
	„	68. 27° 22' N., 33° 40' W., Surface, May 28, 1913.

II.—DESCRIPTIONS OF SPECIES.

SUB-ORDER NATANTIA.

TRIBE PENAEIDES.

FAMILY PENAEIDAE.

SUB-FAMILY PENAEINAE.

1. *Solenocera novae-zealandiae*, n. sp. Fig. 1.

The collection contains a single specimen, unfortunately somewhat damaged, of a new *Solenocera* dredged off New Zealand in 70 fathoms of water. The rostrum is short,

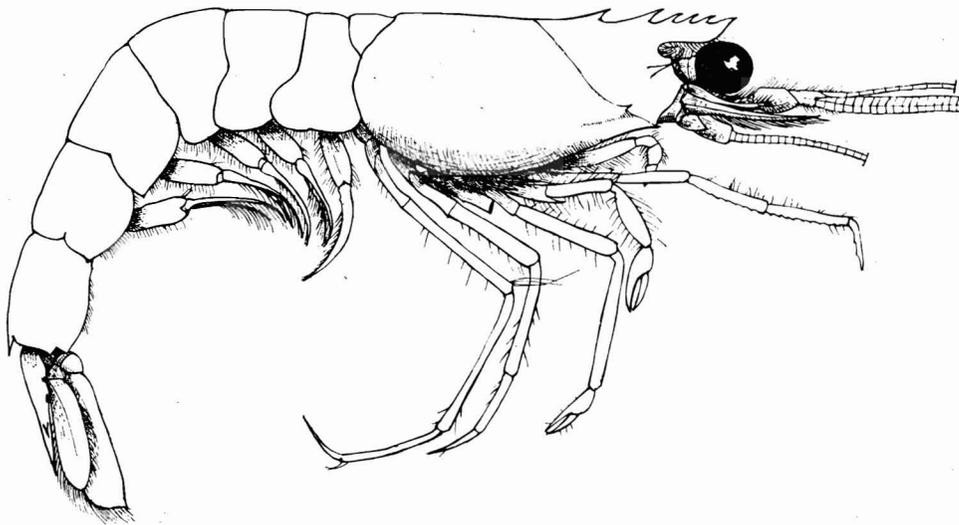


FIG. 1.—*Solenocera novae-zealandiae*, n. sp. Male, $\times 2$.

ending before the middle of the cornea. Its crest bears five teeth, of which two stand behind the orbit. Supraorbital, antennal, branchiostegal and pterygostomial spines are present. The second joint of the antennular stalk is shorter than the first, but longer than the third. The antennal stalk does not reach the end of the eye. The

antennal scale slightly outreaches the antennular stalk, narrowing to a rounded end, which is barely outreached by the subterminal spine. All the flagella are broken short in the specimen. The third maxilliped outreaches the antennal scale by the whole of its slender, pointed end-joint and a small part of the penultimate joint, which is about one-third longer than the end-joint. The first leg slightly outreaches the antennal stalk. Its fingers are not quite twice as long as the palm, its wrist longer than the hand. The second leg reaches the end of the antennular stalk. The third leg is missing on both sides of the specimen. The fourth leg nearly reaches the end of the first joint of the antennular stalk. The fifth leg slightly outreaches the whole stalk. The legs are smooth save for a few scattered hairs. The petasma is slender and simple, and probably not fully formed in the specimen. The abdominal segments are simple in shape, but the sixth bears a spine in the middle of the hinder edge. The telson is shorter than either branch of the uropods. It is slender and ends in a sharp spine. Its upper surface is marked by a deep groove to within about one-third of its length from the free end, where two strong, fixed lateral spines stand.

Length, 7 cm.

One specimen, from Station 96.

FAMILY SERGESTIDAE.

SUB-FAMILY SERGESTINAE.

2. *Sergestes atlanticus*, H. M.-Edw., 1830.

Sergestes atlanticus, H. M.-Edwards, Ann. Sci. Nat. (1) XIX, p. 349, pl. X, figs. 1-9; Hansen, Proc. Zool. Soc. Lond., 1896, p. 949.

The Expedition took no adult members of this species, but at three stations in the North Atlantic there were obtained specimens of *S. ancylops*, Kr., 1859, which, according to Hansen, is a young form of *S. atlanticus*.

Ten specimens were taken at Stations 45, 46, 66.

3. *Sergestes pacificus*, Stm., 1860.

Sergestes pacificus, Stimpson, Proc. Acad. Philadelphia, 1860, p. 45; Ortmann, Ergebn. Plankton-Exped., II, G, b, p. 30 (1893).

This form has not hitherto been recorded from the Atlantic. Hansen merges it in *S. atlanticus*, but according to Ortmann the possession of a supraocular spine differentiates it from the latter species, and this is borne out by the figures of Bate ("Challenger" Macrura, pl. XVIII) and Krøyer (*S. frisii*, K. Dansk. Videnskab. Selsk. Skr. (5) IV, pl. 1), which both show *S. atlanticus* without the spine. A similar case occurs among the Pontoniinae, where *Periclimenes spiniferus* differs from *P. petithouarsi* only by the possession of a supraocular spine.

Eight specimens were taken at Stations 49, 50, 68.

4. *Sergestes cornutus*, Kr., 1859.

Sergestes cornutus, Krøyer, K. Dansk. Videnskab. Selsk. Skr. (5), IV, pp. 249 and 277, pl. II, fig. 2; Ortmann, Ergebn. Plankton-Exped., II, G, b, pp. 30 and 34 (1893); Hansen, Proc. Zool. Soc. Lond. 1896, pp. 949 and 952.

Nine specimens were taken at Stations 46, 50, 62, 66.

5. *Sergestes corniculum*, Kr., 1859.

Sergestes corniculum, Krøyer, K. Dansk. Videnskab. Selsk. Skr. (5), IV, pp. 252 and 278, pl. III, fig. 4; Ortmann, Ergebn. Plankton-Exped., II, G, b, pp. 31 and 34 (1893); Hansen, Proc. Zool. Soc. Lond. 1896, pp. 950 and 957.

S. laciniatus, Krøyer, *loc. cit.*, pp. 272 and 284, pl. V, fig. 15.

Two specimens were taken at Stations 46, 49.

6. *Sergestes semiarmis*, Bate, 1888.

Sergestes semiarmis, Bate, "Challenger" Macrura, p. 423, pl. LXVII, fig. 1; Ortmann, Ergebn. Plankton-Exped., II, G, b, pp. 32 and 36 (1893).

It seems not unlikely that this larval form is a stage of *S. corniculum*. One specimen was taken with a crowd of earlier larvae, from the *Acanthosoma* stage onwards, perhaps of the same species.*

Numerous specimens were taken at Stations 112, 127, 131.

7. *Sergestes edwardsi*, Kr., 1859.

Sergestes edwardsi, Krøyer, K. Dansk. Videnskab. Selsk. Skr. (5), II, pp. 246 and 277, pl. IV, fig. 9; Ortmann, Ergebn. Plankton-Exped., II, G, b, pp. 30 and 32 (1893); Hansen, Proc. Zool. Soc. Lond. 1896, pp. 950 and 961.

Two specimens were taken at Station 63.

8. *Sergestes vigilax*, Stm., 1860.

Sergestes vigilax, Stimpson, Proc. Acad. Philadelphia, 1860, p. 45; Ortmann, Ergebn. Plankton-Exped., II, G, b, pp. 32 and 36 (1893); Hansen, Proc. Zool. Soc. Lond. 1896, pp. 951 and 964.

One immature specimen was taken by the Expedition.

Station 49.

* The larvae collected by the Expedition are not described in the present report. All that need here be said in regard to those found with *S. semiarmis* is that Ortmann (*loc. cit.*) records a similar case, but that my larvae differ from his in several respects, notably in the presence of a procurved, median, dorsal spine at the hinder end of the carapace, and in having on each side of the carapace two spines, not three, as in Ortmann's species. The assemblage examined by Ortmann contained *Elaphocaris* of two species. Possibly my *Acanthosoma* and his represent the same two species. It does not appear which, if either, of them belongs to *S. semiarmis*, but it is remarkable that on two occasions the latter should have been taken in company with larval swarms.

SUB-FAMILY LEUCIFERINAE.

9. *Leucifer batei*, Borr., 1915.

Lucifer reynaudii, Bate, "Challenger" Macrura, p. 466, pl. LXXXIV (1888); Ortmann, *Ergebn. Plankton-Exped.*, II, G, b, p. 40 (1893).

Lucifer batei, Borradaile, *Ann. Mag. Nat. Hist.* (8), XVI, p. 228 (1915).

I have already (*loc. cit.*) given reasons for holding this species to be distinct from *L. ancestra*, Dana, 1852, with which it has been identified by Kemp (*Trans. Linn. Soc. Lond.* (2), Zool., XVI, i, p. 58, 1913). Kemp, however, has recently (*Mem. Ind. Mus. V*, p. 323) maintained his views, on the ground that the differences which I believed to exist between the two species were discovered only by means of the figures given by Dana and Bate. It is, of course, now impossible to refer to Dana's specimens, and in the case of his species one is compelled to form a judgment upon the evidence given by his description and very clear figures, but Mr. Kemp appears to have overlooked my express statement that I had had specimens of Bate's *L. reynaudii* in my hands. Both the "Terra Nova" examples and those of Bate, now in the British Museum, agree closely with Bate's figures and description, and differ from those of Dana in the points I have specified. In one point, indeed, Bate is more exact than my key (*loc. cit.*, p. 230). In the male, the length of the sixth abdominal segment is as I have stated. In the female, it is a little *longer* than the uropod. This is shown by Bate. He also shows the characteristic difference in the shape of the end of the exopodite of the uropod in the two sexes. In the female, the spine on the outer side is placed a little before the end; in the male it arises from the outer angle of the subtruncate end. As some of my specimens are nearly as long as Dana's ($\frac{9}{16}$, as against $\frac{5}{8}$, of an inch), it is not likely that the very marked departures from his description which they show are due to their being in a different stage of growth. In these circumstances it seems inadvisable to refer them to Dana's species, and I have therefore called them *L. batei*.

Dana's *L. reynaudi* is, as Kemp rightly points out, a different species from that to which Bate gave the same name. Kemp now identifies it with "*L. typus auct.*," therein reversing a previous decision of his own (*Linn. Trans. loc. cit.*). But in truth there is no "*L. typus auct.*," at least in the sense of a single species, recognizably the same in the works of a number of authors. I have already (*loc. cit.*) pointed out the lack of agreement between the forms known as "*L. typus*" by various writers, and, believing that the latter have probably in most cases given a correct account of the specimens before them, have proposed to treat as species the various forms which the descriptions seem to reveal. Such a procedure, if it run the risk of temporarily burdening science with the necessity of observing distinctions which have little significance, has on the other hand the advantage of leading more speedily to the analysis of the problem, and so to its solution. Kemp has cited in particular Bate and Ortmann as sponsors for the *L. typus*, which he refers to *L. reynaudi*, Dana. In view of the new evidence he adduces, it is very likely that he is right in regarding Bate's species as identical with the true

L. reynaudi. I would point out, however, that the differences between these species have not yet been wholly disposed of. Bate's specimens, which are quite faithfully represented by the figure in the "Challenger" Report, still fail to agree with Kemp's redescription (Linn. Trans. *loc. cit.*) of Dana's species. In them the last leg does not nearly reach the end of the neck, and the latter is from once and three-quarters to more than twice as long as the rest of the cephalothorax. The size of the specimens makes it impossible for these discrepancies to be due to differences in age, but it is quite possible that they may be accounted for by variation. In any case, however, the matter needs further investigation.

Numerous specimens of *L. batei* were taken by the Expedition at Stations 45, 46, 47, 50, 53, 61, 63, 64, 65, 66, 67, 68, and 126.

10. *Leucifer faxoni*, Borr., 1915.

Lucifer typus?, Faxon, Stud. Chesapeake Zool. Lab. Sci. Res. 1878 (1879).

Lucifer sp., Brooks, Phil. Trans. Roy. Soc. 1882, I., p. 87, pl. VII.

Lucifer faxoni, Borradaile, Ann. Mag. Nat. Hist. (8), XVI, p. 228 (1915).

Specimens taken in the sub-tropical Atlantic by the Expedition evidently belong to the species described by Faxon and Brooks from more northerly waters of the same ocean.

Twelve specimens were taken at Stations 39, 40.

11. *Leucifer hanseni*, Nobili, 1905.

Lucifer hanseni, Nobili, Bull. Mus. Paris, 1905, p. 394; Ann. Sci. Nat. Zool. (9), IV, p. 25, pl. II., fig. 1, and text-fig. 3b (1906); Kemp, Mem. Ind. Mus. V., p. 324, text-fig. 37a (1915).

Lucifer inermis, Borradaile, Ann. Mag. Nat. Hist. (8), XVI, p. 229 (1915).

I regret to have altogether overlooked Nobili's papers in my recent enumeration of the species of *Leucifer*.

Numerous specimens were taken in Melbourne Harbour.

TRIBE CARIDES.

FAMILY PASIPHAEIDAE.

12. *Pasiphaea longispina*, Lenz and Strunck, 1914.

Pasiphaea longispina, Lenz and Strunck, Deutsche Südpolar Exp. XV, iii, p. 315, pl. XIX.

Lenz and Strunck's specimen was damaged. Those which were taken by the "Terra Nova" enable me to add the following facts to the German authors' description.

The rostrum slightly outreaches the eye, and has a sharp, downwardly hooked tip. The length, in the mid-dorsal line, of the sixth abdominal segment equals that of the telson, and is twice that of the second segment. The sixth segment has no spine behind. The telson is little shorter than the sharp-tipped endopodite, and a good deal shorter than the round-ended exopodite of the uropod. Its dorsal surface is deeply

grooved. It is narrow, and its sides converge gradually towards the hinder end, where they diverge on the arms of a Y, whose deep, backwardly directed cleft contains on each side seven spines, the whole structure having a remarkably larval appearance, though the specimens are quite adult. Thus, *P. longispina* would belong to the sub-genus *Phye*, were the latter worth maintaining in view of the complete gradation of form shown by the telson in the several species of *Pasiphaea*.

One specimen was taken at Station 276, the other from the stomach of an albatross, at a locality which is not stated, but must have been considerably further north.

FAMILY PANDALIDAE.

SUB-FAMILY THALASSOCARIDINAE.

13. *Thalassocaris novae-zealandiae*, n. sp. Fig. 2.

Diagnosis.—Rostrum almost straight, very slightly upturned towards the tip; its formula $\frac{10}{4}$, four of the teeth standing behind the orbit. A spine below the eye and one behind the antenna present on the carapace. Antennular stalk reaching end

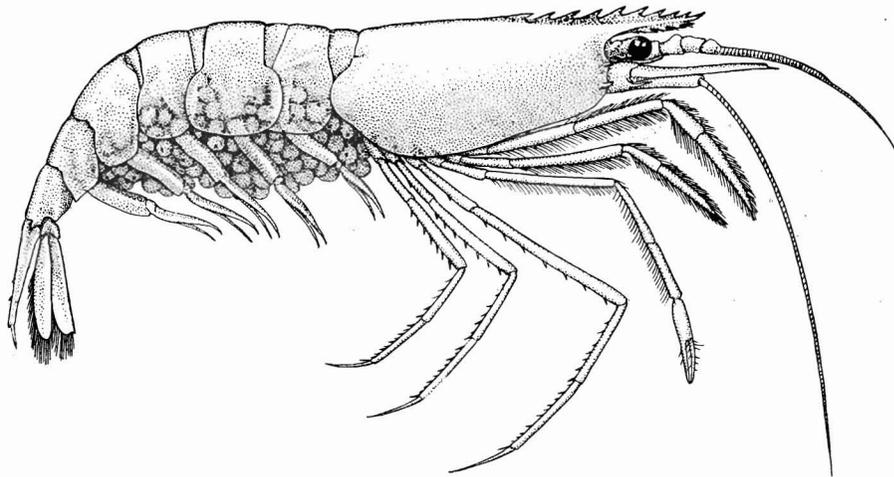


FIG. 2.—*Thalassocaris novae-zealandiae*, n. sp., $\times 2\frac{1}{2}$.

of rostrum; its last two joints subequal, together shorter than first. Antennal scale as long again as antennular stalk, without teeth on outer edge, its inner edge converging towards terminal spine, which projects freely. Antennal stalk slightly longer than antennular. Third maxilliped outreaching antennal scale by about one-third, and first leg by about one-half, of its end-joint. Second leg slightly outreaching third maxilliped, its chela slender and simple, its wrist longer than its hand, but divided into two by a joint slightly beyond the middle of its length. Third leg longest of all, fourth a little outreached by second, fifth by first. Legs 3–5 with slender, naked end-joints, but a row of spines under meropodite, carpopodite, and propodite, and

legs 3 and 4 with a spine under ischiopodite. Abdominal segments without keels or spines. Telson nearly as long as uropods, which have exopodite and endopodite equal, and a blunt tooth at end of outer edge of exopodite.

Length of longest specimen, 45 mm.

Three specimens were taken at Station 96.

SUB-FAMILY PANDALINAE.

GENUS PANDALUS.

SUB-GENUS PANDALUS.

The name *Dichelopandalus* (Caullery, 1896) has been proposed for those members of this sub-genus in which the first leg is minutely chelate, and that of *Stylopandalus* (Coutière, 1905) for those in which it is simple. Until, however, it is shown that the groups of species thus designated are in other respects natural divisions of *Pandalus*, it will be well to retain the type-subgenus intact.

14. *Pandalus (Pandalus) paucidens*, Miers, 1881.

Pandalus paucidens, Miers, Proc. Zool. Soc. Lond., 1881, p. 74, pl. VII, figs. 6, 7.

The gill-formula of this species is that of *P. montagui*, and the first leg is minutely chelate.

Fourteen specimens were taken at Station 41.

FAMILY RHYNCHOCINETIDAE.

15. *Rhynchocinetes typus*, H. M.-Edw., 1837.

Rhynchocinetes typus, H. M.-Edwards, Ann. Sci. Nat. (2) VII, p. 165, pl. IV, fig. c; Miers, Cat. N. Zealand Crust., p. 77 (1876).

One specimen was taken at Station 96.

FAMILY HIPPOLYTIDAE.

16. *Chorismus antarcticus* (Pfeffer), 1887.

Hippolyte antarctica, Pfeffer, Jahrb. Hamburg. Wiss. Anst. IV, p. 51, pl. I, figs. 22-27 (1887).

Chorismus antarcticus, Calman, Rep. Nat. Antarctic Exp. 1901-4, Nat. Hist., II, Crust. Decap. p. 1 (1907); Lenz and Strunck, Deutsche Südpolar Exp. XV, iii, p. 318 (1914).

The specimens agree perfectly with the descriptions of Pfeffer and Calman, but the rostral formula may be higher than is stated by them. In a surprising number of the specimens the rostrum is damaged,* but several of the specimens show that the formula may reach $\frac{10}{10}$. There is no constant relation between the numbers of teeth above and below the rostrum, and their spacing shows a good deal of variation. There is more often one than two teeth near the tip. The rostrum is usually a little longer, but may

* This appears to have been the case with that figured by Pfeffer.

be a little shorter, than the antennal scale. The relative lengths of the last two joints of the third maxilliped and also those of the wrist and hand of the first leg vary a little. The wrist does not exceed the hand in length. The telson is seldom perfect, but in undamaged specimens it may be seen to bear at the end two pairs of spines—a small lateral and a long intermediate pair—and between the intermediate spines five bristles.

I can detect no constant difference between the "Terra Nova" specimens and South Georgian examples.

Numerous specimens were taken at Stations 294, 314, 316, 318, 338, 339, 340, 348, 355, 356.

17. *Tozeuma novae-zealandiae*, n. sp. Fig. 3.

Diagnosis.—Body sparsely hairy all over. Rostrum as long as rest of carapace, slightly upcurved, with a ridge along each side, but rounded above except at the tip,

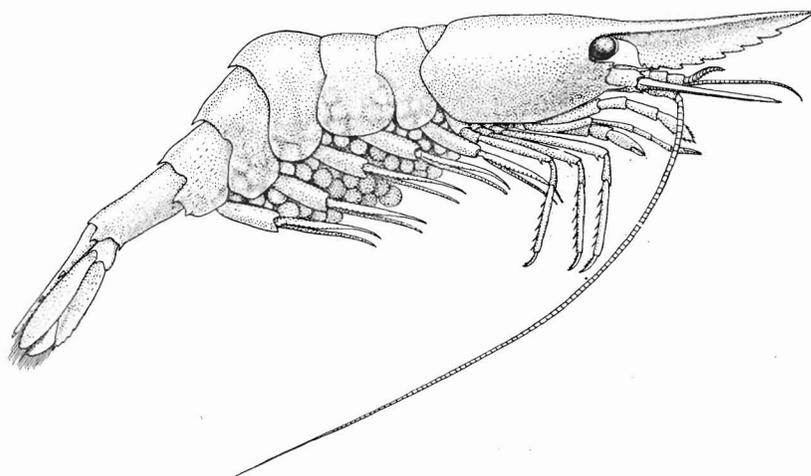


FIG. 3.—*Tozeuma novae-zealandiae*, n. sp. Female, $\times 2\frac{1}{2}$.

where it is prismatic; bearing below seven teeth, of which the first is subdivided into three smaller teeth. Carapace with antennal and pterygostomian spines. Abdomen strongly bent; the third to fifth segments keeled and bearing a median spine behind, the fifth also with two spines on each pleuron, the sixth long, with a lobe bearing a spine projecting backwards on each side. Uropod slightly longer than telson, its endopodite and exopodite subequal. Telson longer than sixth segment, diminishing evenly to the end, which is truncate, with a median tooth. Antennular stalk about one-third length of rostrum, its second and third joints subequal, together shorter than first joint, which has a strong stylocerite projecting beyond it; upper flagellum reaches just beyond middle of rostrum, lower just outreaches antennal scale. Antennal stalk nearly as long as antennular. Antennal scale four-fifths length of rostrum, its sides converging towards a narrow truncate end, at one side of which stands the terminal spine. Third maxilliped outreaching antennular stalk; its end-joint sharply pointed,

ending in a spine. First leg barely reaching last joint of third maxilliped, its palm short and stout. Second leg outreaching third maxilliped. Last three legs with dactylopodites serrate, half a dozen spines under propodites, and a strong spine near end of meropodites.

Length of single specimen (a female with eggs), 5 cm.

Station 96.

FAMILY PALAEMONIDAE.

SUB-FAMILY PONTONIINAE.

GENUS PERICLIMENES.

SUB-GENUS HAMIGER, n. sub-gen.

A new pontoniine prawn, of which two specimens were dredged in 70 fathoms off the North Cape of New Zealand, appears from most of its organization to be a *Periclimenes*, but shows certain features that are very rare in that genus, and others that are shared by none of its known species. In the circumstances it seems best that, for the present at least, the new prawn should represent a distinct sub-genus.* The features which it exhibits that are unusual in *Periclimenes* are the absence of a hepatic spine (which is missing only in a few cases, such as *P. lifuensis*, *P. parasiticus*, and *P. brevinaris*), and a broadening of the ischiomeropodite of the third maxilliped, such as is found in *P. brocki* alone. The unique features are presented by the two pairs of chelipeds, of which the first bears a feathery tuft of hairs on the fingers, while one of the second is of great size and has an abnormal configuration of the fingers. These peculiarities, however, are hardly of generic value, for there are considerable variations in the structure of both pairs of chelipeds in *Periclimenes*. The name which I propose for the new sub-genus has reference to the hooked fingers of the great cheliped.

18. *Periclimenes (Hamiger) novae-zealandiae*, n. sp. Fig. 4.

Diagnosis.—Rostrum straight, its tip faintly upcurved, its formula $\frac{3}{2}$, three of the teeth standing behind the orbit. Antennal spine alone present on the carapace. Antennular stalk slightly outreaching the rostrum, its last two joints subequal and together shorter than the first, which has a strong distal spine and a rather slender stylocerite reaching about the middle of its length. Outer antennular flagellum cleft to a distance about equal to the length of the uncleft region. Antennal stalk equal to first joint of antennular. Antennal scale slightly outreaching antennular stalk; its sides subparallel, its end broadly rounded, its subterminal spine not projecting. Third maxilliped a little outreaching antennal stalk; its end-joint nearly as long as that which precedes it; these two together longer than ischiomeropodite, which is broad,

* For the sub-genera of *Periclimenes* see Ann. Mag. Nat. Hist. (8), XV, p. 207 (1915).

though not so broad as in *Pontonia*. First leg outreaching antennal scale by the hand; its fingers longer than the palm and bearing on their median sides each a row of long curled hairs. Second legs unequal; the smaller of normal shape with slender, toothless fingers as long as the palm; the larger with hand a little longer than carapace including rostrum, broadest at distal end, its fingers bent towards the middle line of the body, the movable one slender and toothless, outreaching the fixed finger, which is stout and strongly hooked, and bears at its base on the upper side a crest composed of two stout

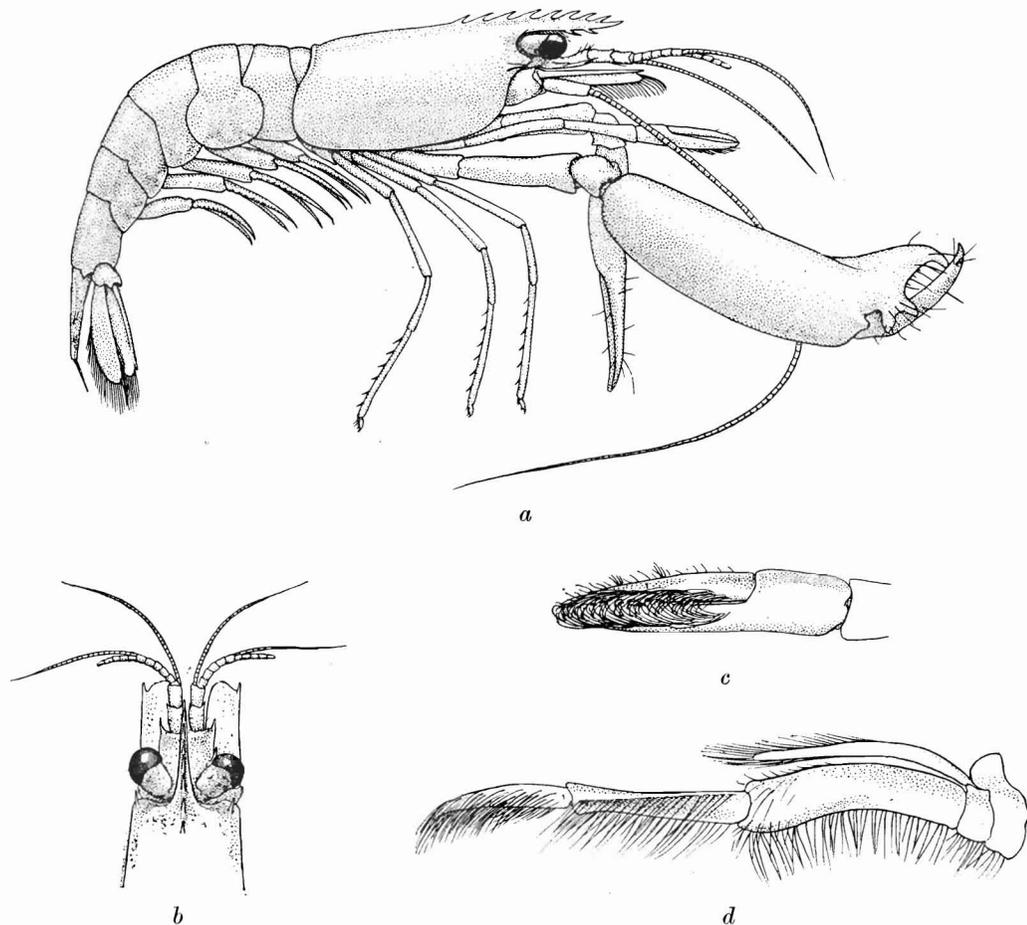


FIG. 4.—*Periclimenes* (*Hamiger*) *novae-zealandiae*, n. sp. Male. (a) Side view, $\times 4$; (b) dorsal view of head, $\times 4$; (c) end of first leg, $\times 12$; (d) third maxilliped, $\times 12\frac{1}{2}$.

teeth. Last three legs slender, rather short, biunguiculate, with a row of small teeth under the short, stout end-joint, and six movable spines under the propodite. Uropods with exopodite and endopodite broad, rounded, subequal. Telson shorter than uropods; its spines long and slender.

Two specimens, male and female, taken together. The female has lost the larger cheliped. Length of female, 27 mm.

Station 96.

FAMILY CRANGONIDAE.

19. *Crangon (Notocrangon) antarcticus*, Pfeffer, 1887, var. *gracilis*, n. var.

Crangon antarcticus, Pfeffer, Jahrb. Hamburg. Wiss. Anst., IV, p. 45, pl. I, figs. 1-21 (1887); Ortmann, Proc. Ac. Philadelphia, 1895, pp. 177, 181, 190; Coutière, Bull. Mus. Paris, XVI, p. 240 (1900); Calman, Rep. Nat. Antarctic Exp., 1901-4, Nat. Hist. II, Crust. Decap. p. 3 (1907); Lenz and Strunck, Deutsche Südpolar Exp., XV, iii, p. 324 (1914).
Crangon (Notocrangon) antarcticus, Coutière, C. R. Ac. Sci. Paris, CXXX, p. 1640 (1900).

The affinities of this shrimp are of considerable interest, in view of the support which its distribution has been held to afford to the theory of bipolarity. There can be no doubt that it is more nearly related to the species of *Crangon* than to those of any other genus of Crangonidae. The resemblance in habit of body to the deep-water species of *Pontophilus*, noticed by Coutière, is purely superficial, and is not really very striking. The small gill-formula (5), the long second leg, the broad stylocerite, and the stout, narrow rami of the pleopods, with only the basal projection left to represent the endopodite of the second pair in the male, are enough to separate *C. antarcticus* widely from *Pontophilus*. No near relationship to any other genus, save to *Crangon*, can well be suggested, in view of the condition of the legs, gills, armature of the carapace, and eyes. Within the genus *Crangon*, the Antarctic species has been supposed by Ortmann to be most nearly related to the Californian *C. franciscorum*, a member of the typical sub-genus, but Calman has shown that this view is negated by its gill-formula and the strong sculpture of its carapace. From its nearest geographical neighbour, *C. capensis*, Stm., also a member of the typical sub-genus, it is still further differentiated by the absence in the Cape species of the lateral spines on the carapace. On the whole, its affinities would seem, in view of its loss of the arthrobranch of the third maxilliped, and the strong sculpture of its carapace, to be with *Sclerocrangon*, rather than with *Crangon*, *sensu stricto*. It is not possible, however, to place *C. antarcticus* in *Sclerocrangon*. The presence of only one spine on the median keel of the carapace is not much more than a technical objection to this course, but the peculiarity of the second pleopod of the male is a more serious obstacle. In this respect the Antarctic species differs also from the sub-genus *Crangon*. Nor is its habit of body altogether that either of *Crangon* or of *Sclerocrangon*, while in the combination of a simple but salient arrangement of ridges and spines on the carapace with a smooth abdomen it is intermediate between the two sub-genera. The best solution of the problem of expressing its affinities in the terms of Systematic Zoology is that of Coutière, who has proposed to institute for it a new sub-genus, *Notocrangon*. The facts suggest that the common ancestor of *Crangon* gave rise on the one hand to *Crangon s. str.*, and on the other to a stock from which *Notocrangon* has departed less far than *Sclerocrangon*. On the face of it, this theory lends some support to the hypothesis of bipolarity, though that is of course not its only possible explanation.

The "Terra Nova" specimens belong undoubtedly to the form described by Calman from the same part of the Antarctic. All the peculiarities mentioned by

him recur in the examples in my hands. A further feature, not mentioned by Calman, is the elongation of the last two joints of the third maxilliped, each of which is more than half the length of the basipodite and ischiomeropodite together. It is evident that we have here a distinct local race, characterized by greater length and slenderness of many of its parts. I propose for it the varietal name of *gracilis*. The same variety was taken near Kaiser Wilhelm Land by the German South Polar Expedition of 1901-03. On the other hand, South Georgian examples in the British Museum, which I have had the opportunity of examining, prove the correctness of Pfeffer's original description, and it would seem that those taken by the "Belgica" in long. 80° W. belonged to his form. If that be the case, the type variety is at present known to extend from about 30° W. to about 90° W., and var. *gracilis* from about 80° E. Eastwards to about 160° W. Further information as to the distribution of these forms will be of interest.

Numerous specimens were taken at Stations 294, 314, 316, 338, 339, 348, 355.

20. *Aegeon cataphractus* (Olivi), 1792.

Aegeon cataphractus (Olivi), Zool. Adriat., pl. III., fig. 1; Heller, Crust. Südl. Europa, p. 230, pl. VII, figs. 12-15 (1863).

The specimens, which are from New Zealand waters, differ from the Mediterranean form as it is described by Heller only in the almost complete loss of indications of the double nature of the keels of the second and third abdominal segments. It is probable that some of the supposed species of *Aegeon* will prove to be merely varieties of this extraordinarily widespread member of the genus.

Two specimens were taken at Station 96.

SUB-ORDER REPTANTIA.

TRIBE PALINURA.

FAMILY PALINURIDAE.

21. *Jasus*, sp. ? *J. verreauxi*.

The collection contains one specimen of a *Jasus*, in the natant stage.

Similar specimens from Stewart Island in the collection of the British Museum are referred by a label on the bottle, in the handwriting of Professor E.-L. Bouvier, to *J. verreauxi*, which is a New Zealand species.

One specimen, Station 96.

FAMILY SCYLLARIDAE.

22. *Arctus immaturus*, Bate, 1888. (?)

Arctus immaturus, Bate, "Challenger" Macrura, p. 71, pl. X, fig. 3.

The specimens differ from Bate's in that the antennular stalks are shorter, not reaching the end of the antennae. They have appendages on all the

abdominal segments except the first. I refer them somewhat doubtfully to this species.

Two specimens were taken at Stations 133, 135.

TRIBE ANOMURA.

SUPER-FAMILY THALASSINIDEA.

23. *Axius* (*Axius*) *novae-zealandiae*, n. sp. Fig. 5.

Diagnosis.—Cephalothorax deep and strongly compressed, with back continuously curved fore and aft, falling to the rostrum rather steeply, but not so abruptly as in *Scytoleptus*. Cervical groove well marked on the back, but less so at the sides. Flat

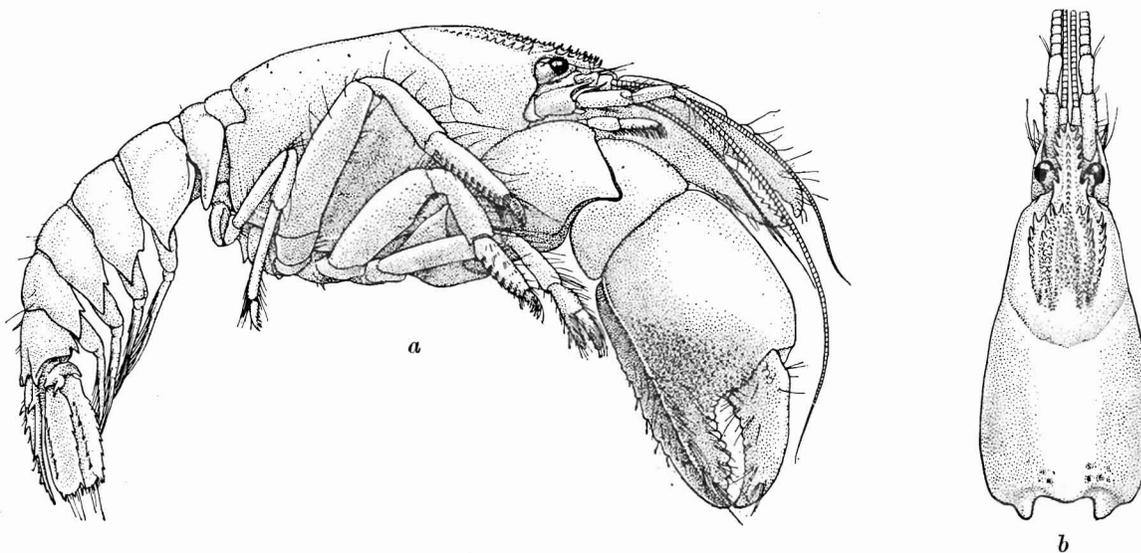


FIG. 5.—*Axius* (*Axius*) *novae-zealandiae*, n. sp. (a) Side view, $\times 2\frac{1}{2}$; (b) dorsal view of cephalothorax, $\times 2\frac{1}{2}$.

area of back with, in the middle, an elongate-triangular patch of granules, which narrows forwards to become the middle keel of the rostrum, where its granules pass into a single row of about a dozen spines. At each side of this patch a strip of granules, which just behind base of rostrum become spines. Outside this again the edging-keel of the flat area, bearing from seven to ten spines, which are small behind, but grow larger in front till the last is a stout thorn at some distance from base of rostrum. Beyond this thorn, keel continued till it becomes side keel of rostrum, where it bears six long spines. Rostrum thus bears above three spined keels. It ends in an upcurved spine. Eyes well pigmented, reaching barely half-way along rostrum. Antennular stalk outreaching rostrum by its end-joint. Second and third joints subequal, and together shorter than first. Basicerite of antenna equal to first joint

of antennule ; ischiocerite outreaching, by about half of its length, antennular stalk. Fixed and movable spines of antenna well developed, the latter a little longer than the former, and both a little outreaching the rostrum. Antenna a little longer than carapace including the rostrum. Third maxilliped outreaching rostrum by its last two joints, the last joint being a little longer than the preceding. Legs of the first pair unequal ; that on right side, which is the larger, outreaching rostrum by its wrist and hand. Palm square, fingers nearly as long as the palm, fixed finger with a row of about ten blunt teeth. Inside of palm covered with fine pearly granules except near the wrist, and a patch of similar granules on the outside at the base of the fixed finger. Above, sides of palm slope to a sharp edge ; lower side flat, with on outer side a sharp keel, continued along fixed finger. Smaller hand resembling larger, but more slender. Both sparsely hairy. Second leg outreaching rostrum by its hand, whose fingers are a little longer than the palm, and hairy all over the outer side. In third and fourth legs, propodite with some spines below in short transverse rows, more numerous on fourth leg than on third, and at the end a tuft of hairs, the dactylopodite having two longitudinal rows of spines and a sharp end-claw. In last leg only the distal two spine-rows on the propodite remain, hair-tuft longer, and broadened dactylopodite bites against a process of end of propodite, so that a clumsy subchela exists. Abdomen smooth. In male, each pleuron ends in a sharp point, and third to sixth bear each a spine on the fore edge. In female, pleura are broader but have a sharply cut hinder angle, except on sixth segment, and bear some hairs. Endopodite of the uropod with one, and exopodite with two keels ; endopodite with about half a dozen spines on its outer edge and the same number on its keel ; exopodite with the same arrangement on its outer edge and outer keel, but its inner keel smooth. Telson with, in its basal part, two marginal and four dorsal spines, in its distal part on each side two marginal spines, and on the broad, rounded end a group of three small spines on each side and a longer median spine.

Length of largest specimen, 6 cm.

Six specimens were taken at Station 96.

SUPER-FAMILY GALATHEIDEA.

FAMILY GALATHEIDAE.

24. *Galathea pusilla*, Hend., 1885.

Galathea pusilla, Henderson, Ann. Mag. Nat. Hist. (5) XVI, p. 407 ; "Challenger"
Anomura, p. 121, pl. XII, fig. 1 (1888).

Seven specimens were taken at Stations 90 and 96.

25. *Uroptychus maori*, n. sp. Fig. 6.

Closely related to *U. nitidus* (A. M.-Edw.), 1886, but differs in that (1) the antennal scale is only as long as the eye, and broader than in *U. nitidus* ; (2) the

ischium of the cheliped bears distally a fairly strong, straight spine below, and a very strong, curved spine above; (3) the fingers of the big chela are irregularly dentate with coarse and fine teeth, while those of the small chela are finely and regularly dentate save for a single big tooth on the movable finger.

One specimen was taken at Station 90.

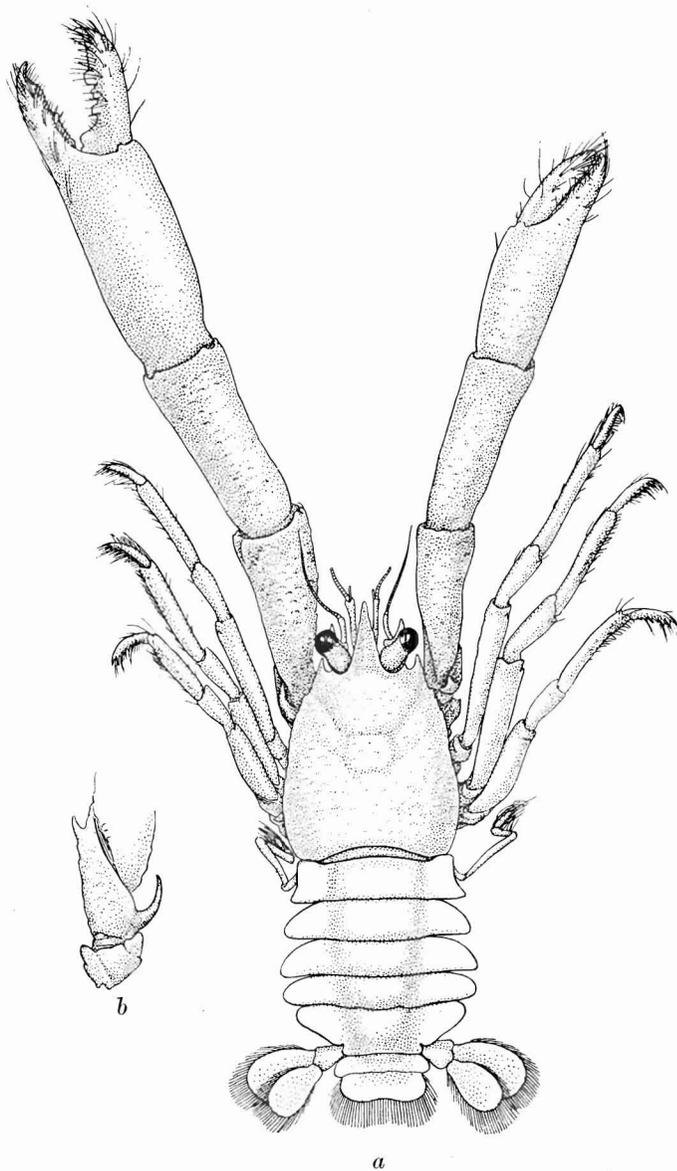


FIG. 6.—*Uroptychus maori*, n. sp. (a) Dorsal view, $\times 2\frac{1}{2}$; (b) externoventral view of ischium of great cheliped, $\times 2\frac{1}{2}$.

26. *Uroptychus novae-zealandiae*, n. sp. Fig. 7.

Diagnosis.—Carapace perfectly smooth and unarmed save for one spine at the anterolateral angle and a larger one at a short distance behind it; regions ill-marked;

rostrum slightly outreaching eyes, unarmed, hollow above. Eystalks long, sub-cylindrical; eyes small. Antennule outreaching rostrum by flagella. Antenna outreaching rostrum by nearly the whole of the narrow region of its flagellum. All flagella short. Abdomen smooth. Third maxilliped outreaching eyes by end-joint and half propodite, polished, little hairy except near the tip. Cheliped of good length; hand equal to rest of limb; meropodite spiny only where it articulates with carpopodite,

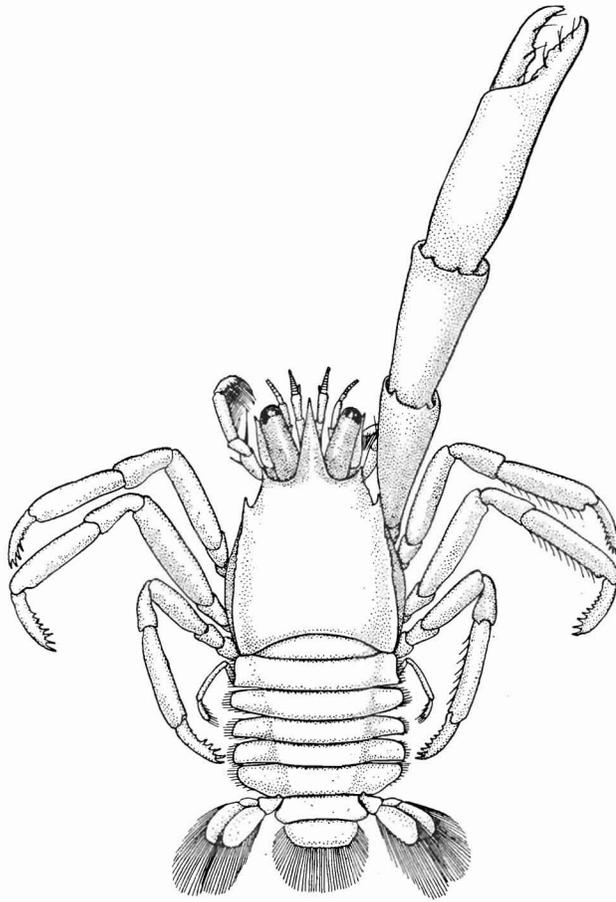


FIG. 7.—*Uroptychus novae-zealandiae*, n. sp., $\times 7$.

which has also two spines at distal end; rest of limb smooth and unarmed; fingers shorter than palm, with faint traces of teeth. Second, third, and fourth legs smooth, unarmed save for a few slender spines at end of propodite, and a row of strong spines under dactylopodite.

Length, 8 mm.

One specimen was taken at Station 96.

SUPER-FAMILY PAGURIDEA.

FAMILY PAGURIDAE.

SUB-FAMILY PAGURINAE.

27. *Paguristes subpilosus*, Hend., 1888.

Paguristes subpilosus, Henderson, "Challenger" Macrura, p. 77, pl. VIII, fig. 2.

The specimens would agree equally well with the description of *P. barbatus* (Heller) (Ortmann, Zool. Jahrb. VI, Syst., p. 279) were it not that the dactylopodites of the second and third legs are a good deal longer than the propodites and do not show a distinct continuation of the hairy line on the outside of the latter.

Four specimens were taken at Stations 90 and 96.

SUB-FAMILY EUPAGURINAE.

28. *Eupagurus norae*, Chilton, 1911.

Eupagurus edwardsii, Filhol, Bull. Soc. Philomath. Paris (7), VIII, p. 66 (1883); Miss. Ile Campbell, III, ii, p. 412, pl. LII, figs. 1, 2 (1885); Thomson, Trans. N.Z. Inst. 1898, pp. 173, 182.

Eupagurus norae, Chilton, Rec. Canterbury Mus. I, p. 299 (1911).

The specimens agree closely with Thomson's description, but in most, though not in all, the teeth on the fingers of the great chela are obsolescent.

Many of both sexes were dredged in shallow water at Station 134, off New Zealand.

29. *Eupagurus kirki*, Filhol, 1885.

Eupagurus kirki, Filhol, Miss. Ile Campbell, III, ii, p. 416, pl. LI, fig. 5; Thomson, Trans. N.Z. Inst. 1898, p. 175, pl. XX, figs. 8-10.

According to Thomson, the antennular stalk should be one-fourth shorter than the eyestalk. In the three specimens taken by the Expedition the antennular stalk slightly outreaches the eye.

Station 134.

30. *Eupagurus crenatus*,* n. sp. Fig. 8.

Diagnosis.—Carapace smooth, with a few sparse hairs. Rostrum low, broad, not covering eye somite. Length of eyestalks moderate, less than width of carapace just behind antennae. Antennular stalk outreaching eye by nearly all its last joint. Antennal scale outreaches eye; flagellum outreaching, by a little, second leg. Third maxilliped a little outreaching antennule. First legs unequal. In the right, which is the larger of the two, meropodite hatchet-shaped in side view, its outer surface scaly, a spine at distal end of its upper edge and a row of smaller spines along lower edge; wrist faintly granular on outer side, strongly so above, some of the granules rising into

* In allusion to the crenate ridges on the hands of the chelipeds.

blunt spines, a smooth strip near the inner side of the upper surface and a row of spines along the upper edge; hand granular all over, except inner surface, which is polished and pitted; a regular row of granules sweeping along lower edge but turning upwards near base of palm, where a more irregular row of oblong granules marks the extreme lower edge, another irregular row running along outer side of palm and fixed finger, and a strong row slanting downwards across upper part of palm to base of movable finger, along which it is continued by a granular ridge; upper edge of palm and movable finger sharp and irregularly granular. Smaller hand subprismatic, with

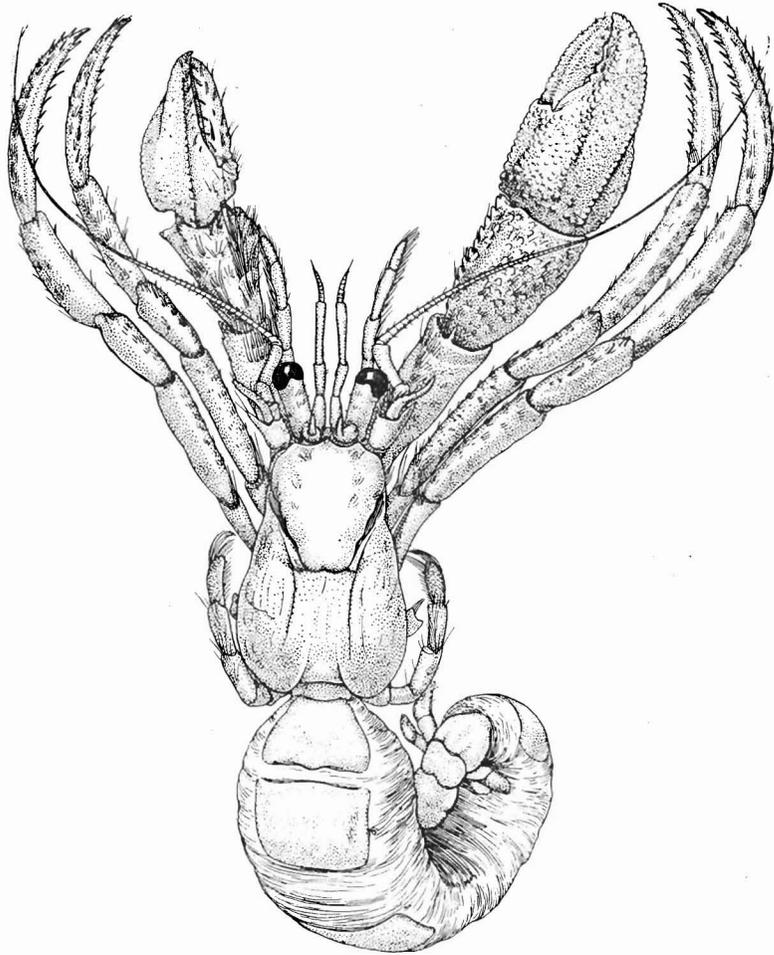


FIG. 8.—*Eupagurus crenatus*, n. sp. Male, $\times 3$.

sharp, granulate ridges along upper and lower edges, and another along palm and fixed finger. Second and third legs outreaching great chela by about half of their dactylopodites, those of left side a little smaller than those of right; dactylopodites bear a row of fine spines below, carpopodites a spine above at end. All legs rather sparsely hairy.

Length of single specimen (a male), 4 cm.

Station 90.

31. *Porcellanopagurus edwardsi*, Filhol, 1885. (? sp.).

Porcellanopagurus edwardsi, Filhol, Bull. Soc. Philomath. Paris (7) IX, p. 48; Miss. Ile Campbell, III, ii, p. 410, pl. XLIX, figs. 2-4 (1885); Thomson, Trans. N.Z. Inst. XXXI, p. 187 (1899); Chilton, Subant. Is. N. Zealand, XXVI, p. 610 (1909).

The collection contains a single female specimen, taken at Station 96, off the north end of New Zealand, of a species of the very interesting genus *Porcellanopagurus*. It probably belongs to *P. edwardsi*, but its great chela differs considerably from that of the male specimen described and figured by Chilton. The scales on the wrist are coarser and less regular, the upper edge of the palm has a well-marked, though irregular, crest of sharp granules or teeth, and along the lower edge there runs a strong, regular line of fine granules, such as appears to be present in *P. japonicus*, Balss, 1913. Very possibly these differences are sexual, and in any case the examination of a series of examples would be necessary before a new species could be established for the form taken by the "Terra Nova." The specimen forms the subject of a separate report (p. 111 below).

TRIBE BRACHYURA.**SUB-TRIBE BRACHYGNATHA.****SUPER-FAMILY BRACHYRHYNCHA.****FAMILY PORTUNIDAE.****SUB-FAMILY PORTUNINAE.**32. *Portunus corrugatus* (Penn.), 1777. Fig. 9.

Cancer corrugatus, Pennant, Brit. Zool. IV, p. 5, pl. V, fig. 9.

Portunus corrugatus, Bell, Brit. Stalk-eyed Crust., p. 94 (1853); Miers, "Challenger" Brachyura, p. 200 (1886).

The collection contains a female specimen of this very widespread species, dredged in moderately deep water off New Zealand. It is of small size (7 mm. long), but closely resembles a rather larger British specimen with which I have compared it, and also, as the accompanying figure shows, the representation given by Bell. The only respect in which it differs from the British form is a greater indistinctness of the regions of the carapace. It does not agree with the variety *subcorrugatus*, A. M.-Edw., 1861, from the Red Sea in the features in which that variety is unlike the type. Specimens from Australia and Japan have the regions of the carapace strongly marked, but show no constant difference from the British form.

Station 134.

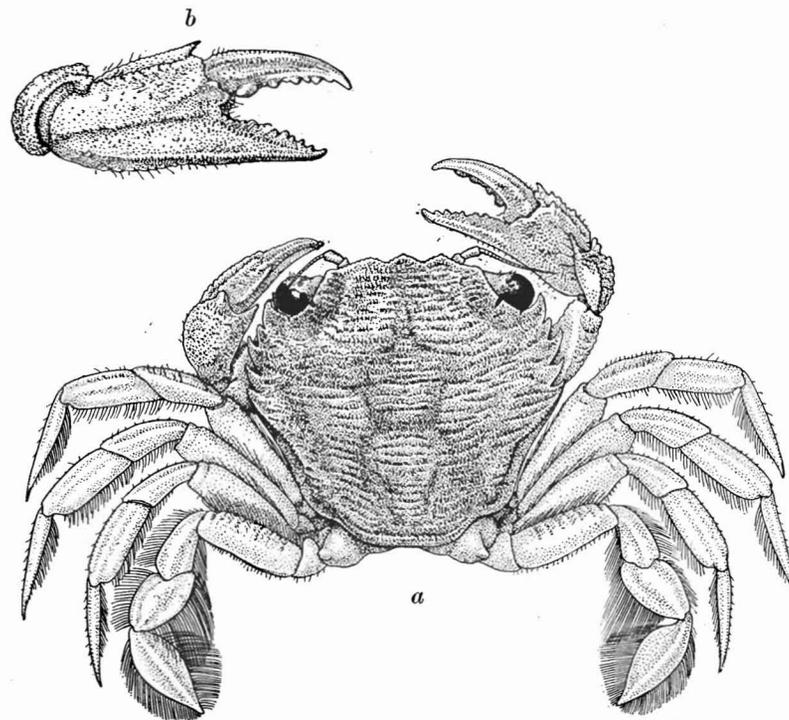


FIG. 9.—*Portunus corrugatus* (Penn.), 1777. Female specimen taken by the Expedition in New Zealand. (a) Dorsal view, $\times 5$; (b) right cheliped from outer side, $\times 7\frac{1}{2}$.

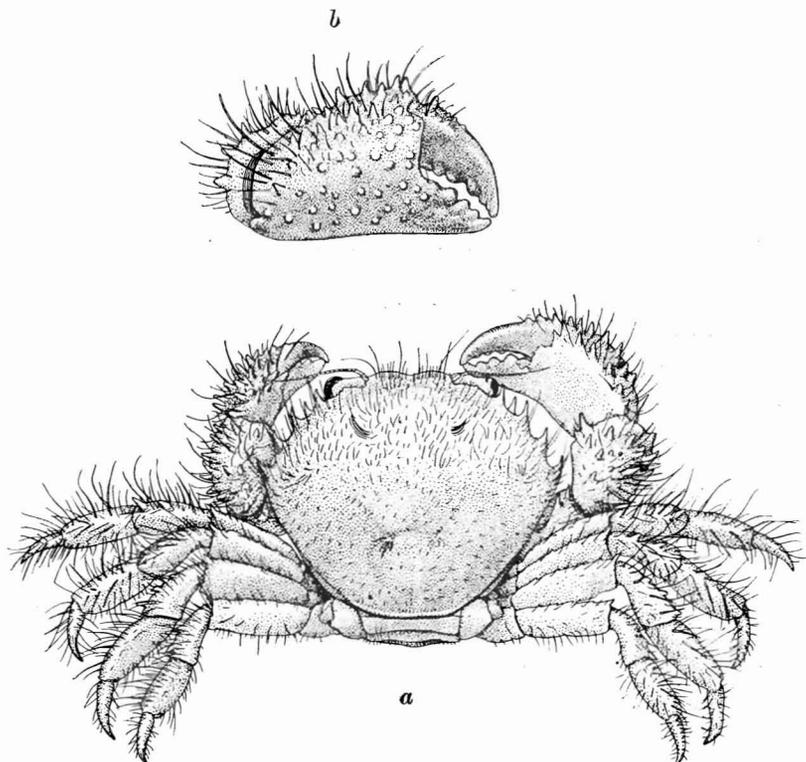


FIG. 10.—*Pilumnus maori*, n. sp. Male. (a) Dorsal view, $\times 5$; (b) right cheliped from outer side, $\times 5$.

33. *Neptunus (Hellenus) spinicarpus* (Stm.), 1870.

Achelous spinicarpus, Stimpson, Bull. Mus. Comp. Zool. II, p. 148 (1870).

Neptunus (Hellenus) spinicarpus, A. Milne-Edwards, Miss. Sci. Mexique, Crust., p. 221, pl. XL, fig. 1 (1879); Miers, "Challenger" Brachyura, p. 182 (1886).

Very numerous specimens taken at Station 42.

FAMILY XANTHIDAE.

SUB-FAMILY MENIPPINAE.

34. *Pilumnus maori*, n. sp. Fig. 10.

A *Pilumnus*, dredged in 70 fathoms off New Zealand, does not appear to belong to any of the described species of the genus, and I am therefore reluctantly compelled to add one more to the already long list of local forms of these crabs.

Diagnosis.—Body and legs covered thickly in front and above, but more sparsely behind and below, with coarse hairs, yellowish in colour when preserved in spirit, some of the hairs much longer than the rest; body otherwise smooth save for five sharp anterolateral spines of the carapace, of which the first stands at the angle of the orbit, and the second is smaller than the rest, and very slightly more ventrally placed. Regions of carapace rather faintly marked. Length of carapace in middle line three-quarters of greatest breadth, which is at base of last side-spine; width between orbits rather more than one-third of greatest breadth. Distance from outer angle of orbit to base of last side-spine somewhat less than that from base of same spine to hinder edge of carapace. Carapace strongly convex in front. Upper surface of front marked by a shallow groove, its edge with a faint median notch, and at its ends a forward trend to orbital edge, which bears below some sharp teeth irregularly set, and above some blunt tubercles and a shallow notch. No subhepatic spine. Flagellum of antenna naked. Chelipeds alike, but unequal, the right the larger; arms with two spines near end of upper edge, wrists spinous on exposed surface, palms spinous above and on upper part of outer side, granulate on its lower part, the granules not in regular rows. Fingers black and distinctly toothed. Walking legs stout, with spine at end of upper edge of meropodite, two or three spines on upper edge of carpodite, and a small, sharp end-claw.

Length of single specimen (a male), 6 mm.

Station 96.

FAMILY GONEPLACIDAE.

SUB-FAMILY GONEPLACINAE.

35. *Goneplax hirsutus*, n. sp. Fig. 11.

Diagnosis.—Carapace about two-thirds as long as broad; its greatest width at base of extraorbital spines; its regions faintly marked except for a pronounced

H-shaped depression in the middle; its sides converging backwards from the sharp extraorbital spines, behind each of which, and nearer to it than in *G. angulatus*, stands a smaller, very sharp spine. Front almost straight, with a shallow median notch, in which stands a rostral prominence. Orbital margin sinuous, sloping backward; width of orbit about equal to that of front. Chelipeds almost equal, the right very slightly the larger; arm in female and (? young) male about two-thirds length of carapace, deep, with a spine a little beyond middle of upper edge; wrist about two-thirds length of arm, rather broader than long; hand longer than rest of limb; fingers about equal to palm, irregularly toothed, not gaping; a long and dense tuft of hair on outside of

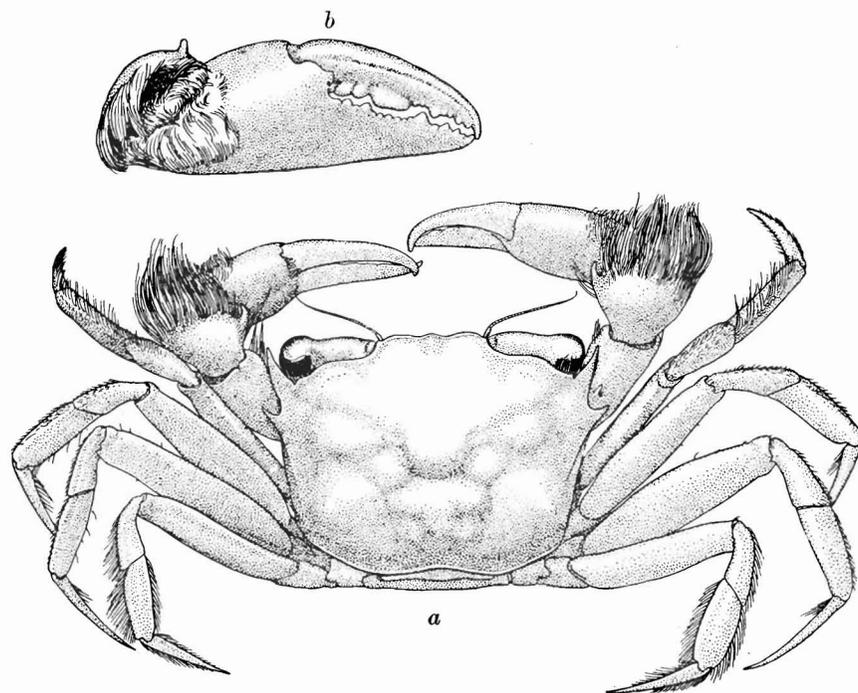


FIG. 11.—*Goneplax hirsutus*, n. sp. (a) Dorsal view, $\times 2\frac{1}{2}$;
(b) right cheliped from outer side, $\times 2\frac{1}{2}$.

distal half of wrist and base of palm, and a fringe of similar hairs along inner side of arm. Walking legs slender, simple, fringed with hairs, much like those of *G. angulatus*, but without spine on meropodite. Abdomen of (? young) male narrow, like that of *G. maldivensis*, Rathb.

Length of largest specimen, 13 mm.

Two specimens (male and female) taken at Station 42.

FAMILY PINNOTHERIDAE.

36. *Pinnotheres pisum* (L.), 1766. Fig. 12.

Cancer pisum, Linnaeus, Syst. Nat. XII, p. 1069 (1766).

Pinnotheres pisum, Latreille, Hist. Nat. Crust. VI, p. 85 (1803); Leach, Malacost. Pod. Brit. pl. XIV (1815); Miers, Cat. Crust. N. Zealand, p. 48 (1876).

Pinnotheres mytilorum, H. Milne-Edwards, Ann. Sci. Nat. (3) XX, p. 217, pl. X, fig. 1 (1853).

The figures given by Leach and Milne-Edwards do not accurately represent the third maxilliped of this species. The propodite is articulated to the outer angle of the distal end of the ischiomeropodite, and does not project beyond its inner edge. In this, as in all other respects, the New Zealand specimens agree with British examples.

Two female specimens from D'Urville Island, and one from Nelson, New Zealand, all taken in mussels.

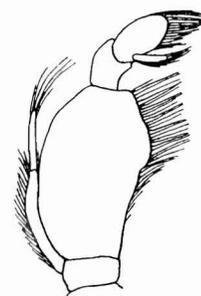


FIG. 12.
Pinnotheres pisum
(L.), 1766. Third
maxilliped, $\times 9$.

FAMILY GRAPSIDAE.

SUB-FAMILY GRAPSINAE.

37. *Grapsus (Leptograpsus) variegatus* (Fabr.), 1793.

Cancer variegatus, Fabricius, Ent. Syst., p. 450 (1793).

Grapsus variegatus, H. Milne-Edwards, Hist. Nat. Crust. II, p. 87 (1837); Miers, Cat. Crust. N. Zealand, p. 36 (1876).

Leptograpsus variegatus, H. Milne-Edwards, Ann. Sci. Nat. (3), X, p. 171 (1853); Kingsley, Proc. Ac. Philadelphia, 1880, p. 196.

One male specimen from the Bay of Islands, New Zealand.

SUB-FAMILY PLAGUSIINAE.

38. *Plagusia chabrus* (L.), 1764.

Cancer chabrus, Linnaeus, Mus. Lud. Ur., p. 438 (1764).

Plagusia tomentosa, H. Milne-Edwards, Hist. Nat. Crust. II, p. 92 (1837).

Plagusia chabrus, Miers, Ann. Mag. Nat. Hist. (5), I, p. 152 (1878); Cat. Crust. N. Zealand, p. 45 (1876).

Alcock (J. As. Soc. Bengal LXIX, ii, 3, p. 437, 1900) states that the exognath of the third maxilliped of *Plagusia* has no flagellum. In the present species a small but distinct flagellum is present.

One male specimen from Elmsley Bay, New Zealand.

FAMILY GECARCINIDAE.

39. *Gecarcinus lagostoma*, H. M.-Edw., 1837.

Gecarcinus lagostoma, H. Milne-Edwards, Hist. Nat. Crust. II, p. 27; Miers, "Challenger" Brachyura, p. 218, pl. XVIII, fig. 2 (1886).

One male specimen from South Trinidad Island (Station 36).

SUPER-FAMILY OXYRHYNCHA.

FAMILY HYMENOSOMATIDAE.

40. *Elamena longirostris*, Filhol, 1885.

Elamena longirostris, Filhol, Miss. Ile Campbell, p. 403, pl. XLVI, fig. 7.

A small and much damaged specimen which appears to belong to this species was taken with plankton near New Zealand, probably clinging to the body of some pelagic

organism or other floating object. The surface of its body is not hairy, but this may be due to immaturity, or the hairs may have been rubbed off. There are traces of longish hairs on the legs.

One specimen, Station 109.

FAMILY MAIIDAE.

SUB-FAMILY INACHINAE.

GENUS *ECHINOMAIA*, n. gen.

Two male specimens, dredged in 100 fathoms north of New Zealand, belong to a species new to science, related to those of *Cyrtomaia* and *Platymaia*, but differing from each of them in points which appear important enough to demand the institution of a new genus for its reception. This may be diagnosed as follows:—

Carapace subpyriform, as broad as long, with well-marked and somewhat swollen regions, naked, porcellanous, sprinkled irregularly with granules of various sizes, and bearing also large and small, blunt spines. Sternum and abdomen also sprinkled with granules, among which small, sharp spines are regularly arranged. Abdomen of male seven-jointed. Rostrum three-toothed; its middle tooth a spout-like outgrowth of the interantennular septum directed obliquely downwards; its other two teeth sharp, hooked, and standing erect on the hood-like antennular fossettes. Eye-hood prominent. No pre- or supra-ocular, but a strong postocular spine, not hollowed to receive the eye. Epistome broader than long, concave, lozenge-shaped. Edges of mouth-frame projecting strongly, and rising at each outer angle into a lobe. Eyestalks long; cornea somewhat ventral, bearing a papilla at the end and [2] others on the upper side. Basal joint of antenna of moderate width, reaching fore edge of eye-hood, not fused with surrounding structures, but firmly fixed; its ventral side flat, bearing at end two jagged lobes; last two joints of stalk spreading on their outer sides each into a large, leaf-like flange [flagella wanting in both specimens]. Third maxilliped subpediform, merognathite being narrower than ischiognathite and palp strong; exognathite well developed and only its flagellum hidden. Legs long, slender, subcylindrical, with compressed end-joints; first two bearing many sharp spines, fourth smooth [fifth wanting in both specimens]. Chelipeds shorter than walking legs, stouter, though still slender, and more spiny. Hands narrow, subprismatic, with fingers bent somewhat downwards on palm.

In the shape of the rostrum and the compression of the last joint of the walking legs, *Echinomaia* resembles *Platymaia*. The profile of its carapace is much like that of *P. turbynei*, Stebb., 1902. In regard to the eyes, the spines of the carapace, and the shape of the hands, it is more like *Cyrtomaia*. In the stalk of its antenna it differs considerably from both genera. *Echinoplax* appears to be a related genus, and so perhaps is *Macrocheira*. It would be interesting to know the habits of this remarkable group of crabs, but on account of their deep-water habitat little more than conjecture

is possible. As they have not the characteristic hooked hairs of the Maiidae, it cannot be their practice to cover themselves with sessile organisms. Nor is the texture of their carapace that of a weed- or sponge-haunting crab. In that respect they are far more like the sand- and mud-dwelling Oxystomes or Parthenopids, which they also resemble not a little in the shape of their chelipeds, while the forepart of the carapace

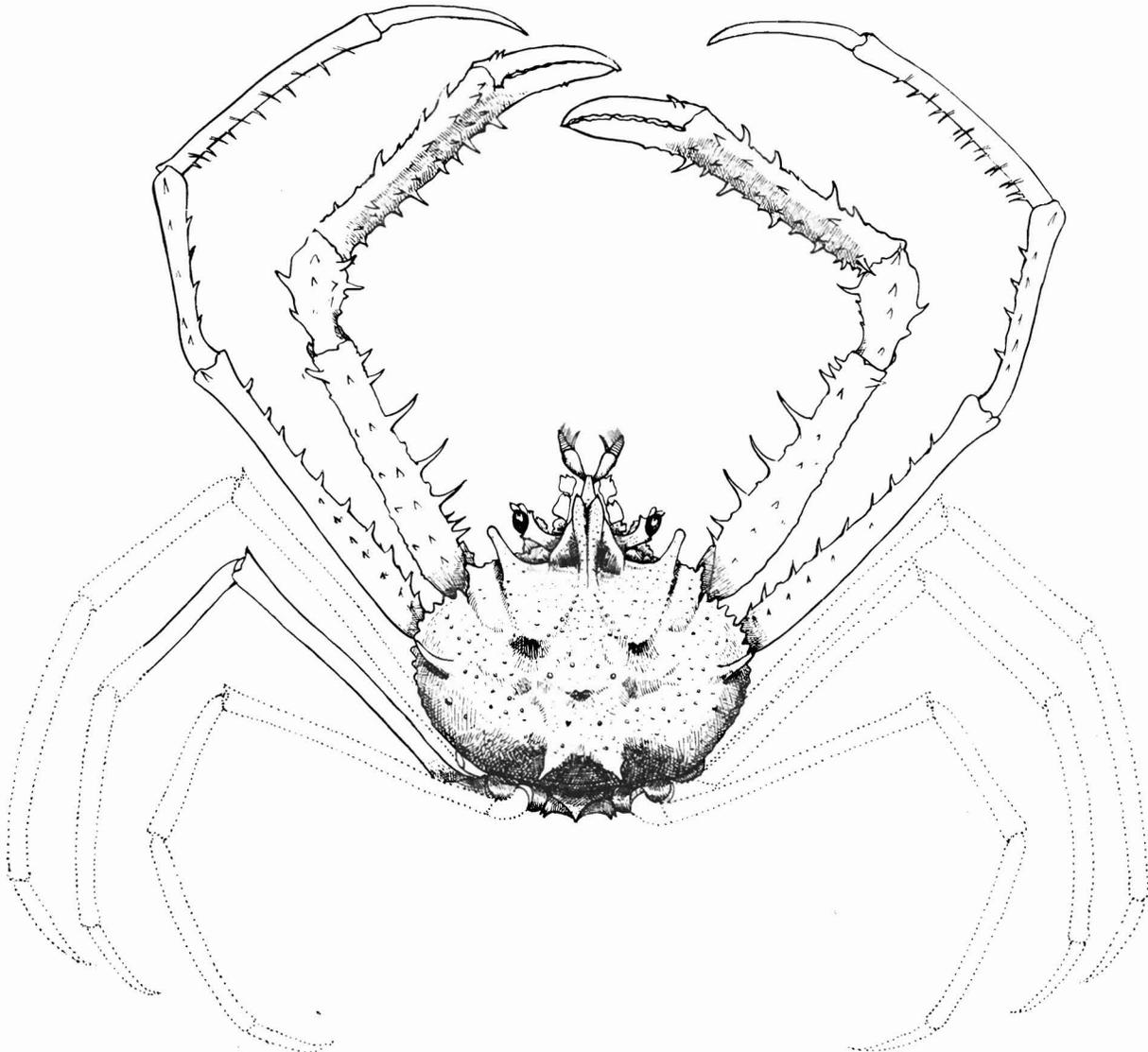


FIG. 13.—*Echinomaia hispida*, n. sp. Male, $\times 3$.

is strongly reminiscent of the snout-like region that *Leucosia* thrusts up to the surface of the sand. The kind of ground upon which specimens have been taken has not always been recorded, but in the instances I have been able to trace it has always been "mud" of some sort, except in the present case. The new crabs were taken by the "Terra Nova" on "rock," but such a bottom often contains pockets of sand in which a characteristic sand fauna lives.

41. *Echinomataia hispida*, n. sp. Fig. 13.

Diagnosis.—Large spines of carapace, nine in number, arranged as follows: two postocular, two at the sides of the gastric region, each joined by a ridge to the postocular of the same side, two on the branchial regions, one median on the hinder part of the gastric region, two on the cardiac region. A somewhat smaller spine on the first abdominal segment, and three smaller still on the second. On each hepatic region, postocular succeeded by a smaller tooth. On each branchial region a row of about fifteen small regular teeth. Cheliped of male reaching middle of propodite of first walking leg; its fingers shorter than palm, very slightly gaping, irregularly toothed; palm with six rows of spines—two above, two below, one on inner and one on outer surface. Wrist about half length of palm, bearing a number of spines; arm with three rows of spines on inner side and a spine above near end. Meropodite of first walking leg similarly provided, but with smaller spines; those on carpopodite and propodite similarly placed, but still smaller; dactylopodite about half length of propodite, smooth. Third walking leg smooth, except for a spine above at end of meropodite. Second and fourth walking leg wanting in both specimens.

Length of longer specimen, 16 mm.

Two specimens, Station 90.

42. *Eurypodius latreillei*, Guérin, 1828.

Eurypodius latreillei, Guérin, Mem. Mus. Hist. Nat. Paris, XVI, p. 384, pl. XIV; Miers, Proc. Zool. Soc. Lond. 1881, p. 64.

In the three specimens (one male and two female) the rostrum is straight, its spines diverging a little at the tip, the spines on the branchial region rather small, the propodites of the walking legs longer than the carpopodites and moderately dilated. The male belongs to Miers' form A.

Station 42.

SUB-FAMILY MAIINAE.

43. *Paramithrax (Paramithrax) latreillei*, Miers, 1879.

Paramithrax barbicornis or *P. latreillei*, Miers, Cat. Crust. N. Zealand, p. 6, pl. I, fig. 2.

Paramithrax latreillei, Chilton, Rec. Canterbury Mus. I, iii, p. 289 (1911).

Paramithrax latreillei, Thomson, Trans. N. Zealand Inst. XLV, p. 236 (1912).

Two male specimens from Elmsley Bay, New Zealand.

44. *Paramithrax (Leptomithrax) affinis*, n. sp. Fig. 14.

A female specimen dredged in 100 fathoms north of New Zealand, resembles *P. (L.) longimanus*, Filhol, 1885, but differs from it in the following respects:—

- (i) The cheliped is barely as long as the first walking leg, its wrist is smooth, and its arm less tuberculate than in Filhol's species. These may be merely sexual differences.

- (ii) The rostral horns are wider apart, and show no tendency to converge distally. Unfortunately their tips are broken off in the specimen.
- (iii) Each of the meropodites of the legs, including that of the cheliped, bears a small spine above at the distal end.
- (iv) There is a sharp spine on the edge of the merognathite of the third maxilliped, just outside the articulation of the carpopodite.

It seems probable that the specimen represents a form which is related to, but specifically distinct from, *P. longimanus*, and I am accordingly proposing for it the above name.

Its length is 34 mm.

Station 90.

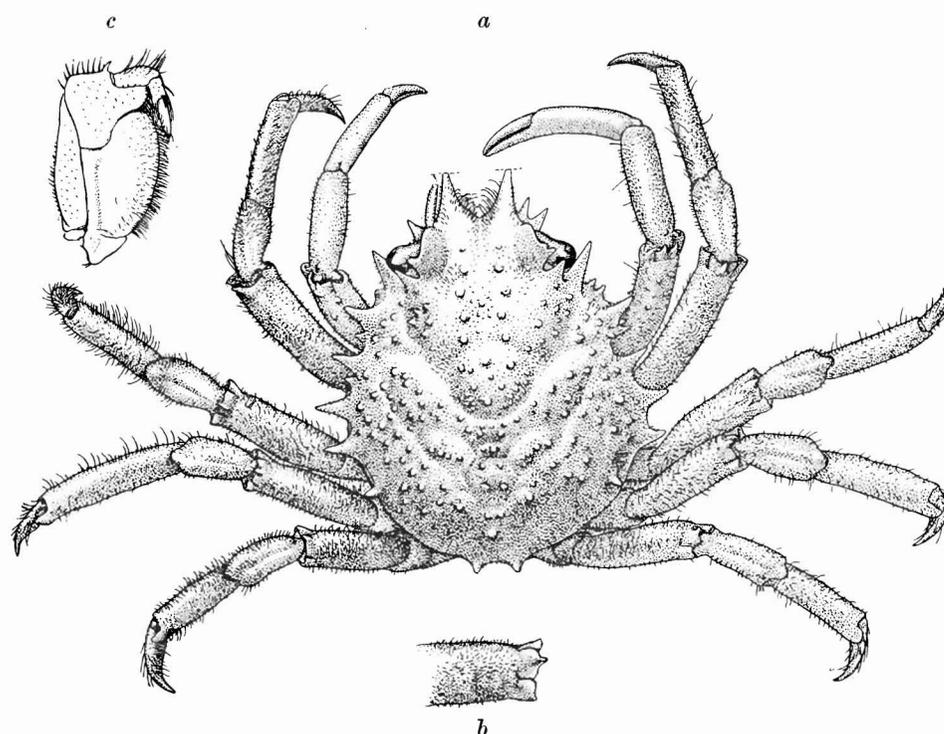


FIG. 14.—*Paramithrax (Leptomithrax) affinis*, n. sp. Female. (a) Dorsal view, $\times 1\frac{1}{2}$; (b) end of meropodite of walking leg, $\times 2$; (c) third maxilliped, $\times 3$.

45. *Paramithrax parvus*, n. sp. Fig. 15.

A small *Paramithrax*, dredged in 70 fathoms off the North Cape of New Zealand, is probably closely related to *P. minor*, Filhol, 1888 (Miss. Ile Campbell, III, ii, p. 356, pl. XL, fig. 4), but is clearly of a distinct species. It differs from Filhol's species in the following points:—

- (i) The rostral horns are shorter (about one-sixth the length of the rest of the carapace) and broader.

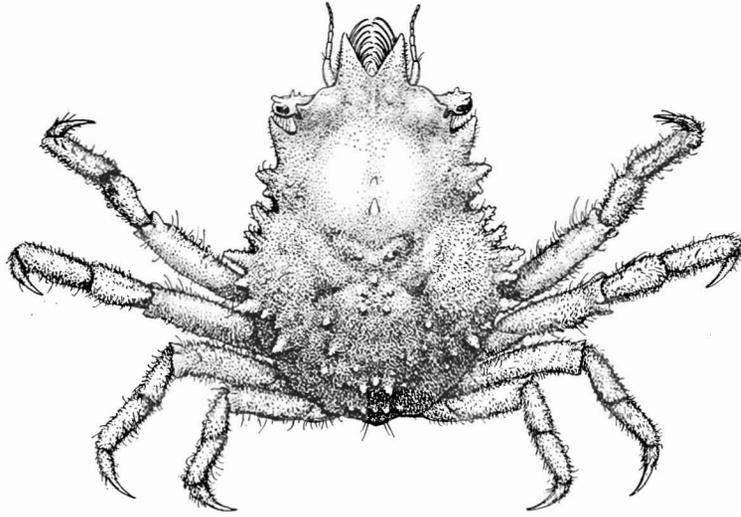


FIG. 15.—*Paramithrax parvus*, n. sp. Female, $\times 5$.

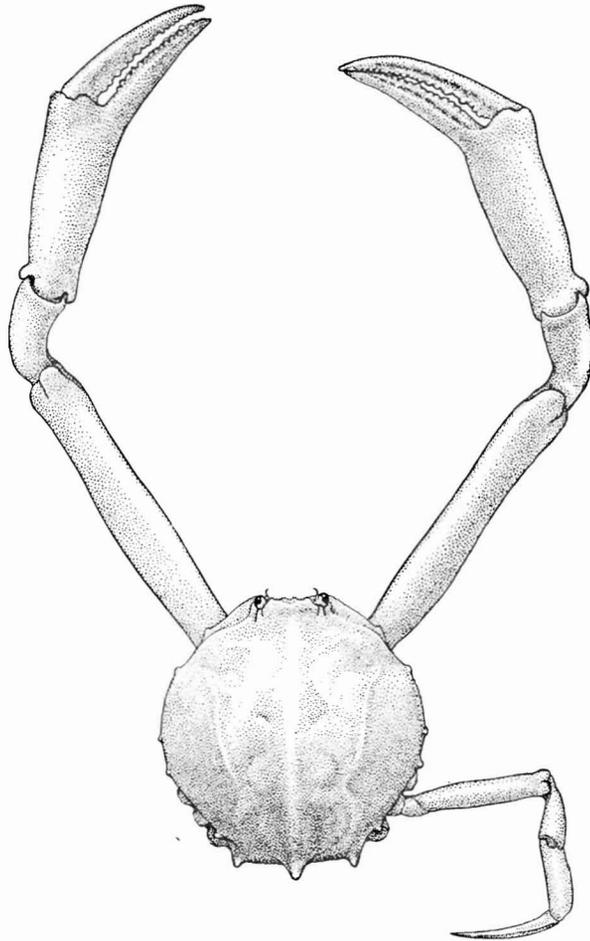


FIG. 16.—*Persephona (Myropsis) laevis*, n. sp. Male, $\times 1\frac{3}{4}$.

- (ii) The postocular spines are shorter (not reaching the tip of the spine of the eye-hood) and stouter.
- (iii) The gastric region of the carapace is only very faintly tuberculate.
- (iv) The last spine on the hepatic region is smaller than that before it.
- (v) The basal joint of the antennal stalk has a strong spine directed forwards as well as outwards, and serrate on its outer side.

The specimen (a female) measures 1 cm. in length.

Unfortunately the chelipeds are wanting. Probably the species belongs to the type-subgenus.

Station 96.

SUB-TRIBE OXYSTOMATA.

FAMILY LEUCOSIIDAE.

SUB-FAMILY LEUCOSIINAE.

46. *Persephona (Myropsis) laevis*, n. sp. Fig. 16.

Diagnosis.—Carapace longer than broad, smooth and minutely pitted, except on the hinder edge, where it is granulate, with a marked median keel, indications of the regions, and a very shallow notch between the hepatic and branchial regions. Front with a median notch between two slightly swollen projections; its edge fringed with hair, barely hiding mouth-frame. Fissures of orbit well marked. Of five spines in hinder region of carapace all somewhat upcurved, median and laterals fairly slender, intermediates little more than rectangular corners of hinder edge. Besides these, three blunt spines on branchial and one on hepatic region. Exopodite of third maxilliped about as wide as endopodite, its outer edge gently curved. All legs quite smooth and unarmed. Chelipeds of male a little less than three times length of carapace, fingers finely but irregularly toothed, gaping a little at base, nearly as long as palm, which is about one-third as wide again as wrist. Walking legs short, slender, about one-fifth longer than arm of cheliped; dactylopodite equal to propodite with about half of carpopodite.

Length of single (male) specimen, 24 mm.

Placed in a bottle with *Gecarcinus* from South Trinidad Island, and therefore probably taken near the island. Its condition somewhat suggests its having been picked up dead on the shore.

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