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BRACHIOPODA.

Family TEREBRATULIDÆ.

MAGELLANIA Bayle, 1880.

MAGELLANIA LENTICULARIS Deshayes.

Terebratula lenticularis Desh., Revue Zool. Soc. Cuv., 1839,
p. 359.*Waldheimia lenticularis* Davidson, Trans. Linn. Soc., iv.,
1886, p. 52, pl. ix., figs. 2-13.

Station 26 or 30.

TEREBRATELLA Orbigny, 1847.

TEREBRATELLA SANGUINEA Leach.

Terebratula sanguinea Leach, Zool. Misc., 1814, p. 76, pl. xxxiii.*T. cruenta* Dillw., Cat. Rec. Shells, ii., 1817, p. 295.*Terebratella cruenta* Davidson, Trans. Linn. Soc., iv., 1887, p. 87,
pl. xiv., figs. 1-8.*Terebratula zelandica* Desh., Revue Zool. Soc. Cuv., 1839, p. 359.*T. rubra* Sow., Thes. Conch., i., 1846, p. 345, pl. lxxviii., figs. 9-11.*T. evansi* Davidson, P.Z.S., 1852, p. 77, pl. xiv., figs. 7-9.

Stations 26 or 30, 44.

TEREBRATELLA RUBICUNDA Sowerby.

Terebratella sanguinea Q. and G., Voy. "Astrolabe," Zool., iii.,
1834, p. 556, pl. lxxxv., figs. 7, 8 (not of Leach).*T. rubicunda* Sow., P.Z.S., 1852, p. 92. Davidson, Trans. Linn.
Soc., iv., 1887, p. 84, pl. xv., figs. 15-29.*T. inconspicua* Sow., P.Z.S., 1846, p. 93.*Waltonia valenciennesii* Davidson, Ann Mag. Nat. Hist. (2), v.
1850, p. 475, pl. xv., fig. 1.

Stations 6, 9.

Family RHYNCHONELLIDÆ.

HEMITHYRIS Orbigny, 1847.

HEMITHYRIS NIGRICANS Sowerby.

Rhynchonella nigricans Sow., P.Z.S., 1846, p. 91, and Thes.
Conch. i., 1846, p. 342, pl. lxxi., figs. 81, 82. Davidson,

Trans. Linn. Soc., iv., 1887, p. 169, pl. xxiv., figs. 16-19.

Stations 6, 22.

CRUSTACEA.

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Plate LVIII.*

THE collection of Crustacea is not a particularly large one, and the species collected belong mainly to the crabs, larger shrimps, etc., to which attention was naturally mainly directed. Very few of the smaller forms were obtained, the collection containing only a very few isopods and amphipods that were gathered incidentally along with the larger forms. The list contains 43 species divided among the groups of Crustacea as follows:—Decapoda 28, Stomatopoda 2, Amphipoda 4, Isopoda 5, Cirripedia 2, Parasitic Copepoda 2. All the specimens have been referred to species already described, but one species has only very recently been described, and another is new to the New Zealand fauna, while a new name is proposed for one preoccupied. The collection is nevertheless an interesting one in several respects, more particularly because it contains several forms gathered originally by the "Challenger" or by earlier collectors and not since recognised; these include one or two forms that had long been put down on the list of New Zealand Crustacea but whose right to remain on the list had been much doubted. It will be noticed that quite a large number of species belong to the *Paguridae*, some of them being species that have not been collected since they were first described by Filhol or Henderson.

From the accounts given below it will be seen that there are one or two interesting examples of commensalism connected with some of the species. Thus *Paramithrax longipes* seems to be almost invariably accompanied by specimens of *Balanus decorus* growing on its carapace, the cirripedes being in some cases so large and numerous that they exceed in size the body of the crab itself. (See plate lvii.).

* For explanation of plate see p. 312.

Eupagurus stewarti seems rather peculiar in the "house" that it occupies. The abdomen of the hermit crab is straight, and in some cases it inhabits tubes formed of a *Millepora*; in other cases the hermit crab lives in a massive calcareous Polyzoon which is very much larger than the crab, so much so that it seems doubtful if the crab can drag its large solid dwelling-place about with it. (See fig. 1). In each case the crab inhabits a cylindrical cavity in the *Millepora* or Polyzoon, and it is not quite clear how this cavity has been formed. Professor Benham, to whom I am indebted for assistance in identifying the *Millepora* and Polyzoon, suggests that they may be pieces that have grown around a circular branch of seaweed and that the crab occupies the cavity formed by the subsequent decay of the seaweed. It is already known from Dr. Alcock's investigations in Indian seas that the houses in which hermit crabs live are made of a great variety of substances, and that in some cases, as in *Paguristes typica*, we have a case of intimate commensalism, a sea-anemone of the genus *Mamillifera* settling on the hinder part of the young hermit-crab's tail and the two animals growing up together in such a way that the spreading zoophytes form a blanket which the hermit crab can either draw completely forward over its head or throw half-back as it pleases.¹

For assistance in supplying information or specimens for comparison I have to thank Mr. A. Hamilton of the Dominion Museum, Professor W. B. Benham of the Otago Museum, Mr. H. Suter, Mr. G. M. Thomson, Mr. T. Anderton, and the authorities of the Portobello Fish Hatchery. To Mr. Edgar R. Waite, Curator of the Canterbury Museum, I am indebted for the opportunity of examining the specimens, and thanks are due to him for making the collection under most unfavourable conditions during the cruise, when his main energies had to be devoted to the fishes and other groups more directly of economical importance.

I have not attempted to give the full synonymy of the species but have given only such references as seemed necessary in each case.

(1) Alcock.—*Journ. Asiatic Soc. Bengal*, 68, 1899, p. 111, and *Cat. Indian Decapod Crustacea*, Part 2, Anomura, 1905, p. 7.

LIST OF SPECIES.

BRACHYURA.

1. *Paramithrax peronii* Milne-Edwards.
2. *Paramithrax longipes* G. M. Thomson.
3. *Paramithrax latreillei* Miers.
4. *Acanthophrys filholi* A. Milne-Edwards.
5. *Prionorhynchus edwardsii* Jacquinet et Lucas.
6. *Cancer novæ-zealandiæ* (Jacquinet et Lucas).
7. *Nectocarcinus antarcticus* (Jacquinet et Lucas).
8. *Ovalipes bipustulatus* (Milne-Edwards).
9. *Ommatocarcinus macgillivrayi* White.
10. *Halicarcinus planatus* var. *tridentatus* (Jacquinet et Lucas).
11. *Halicarcinus huttoni* Filhol.
12. *Elamena producta* T. W. Kirk.
13. *Pinnotheres novæ-zealandiæ* Filhol.
14. *Ebalia lævis* (Bell).

ANOMURA.

15. *Petrocheles spinosus* Miers.
16. *Eupagurus rubricatus* Henderson.
17. *Eupagurus thomsoni* Filhol.
18. *Eupagurus stewarti* Filhol.
19. *Eupagurus noræ* nom. nov. (= *E. edwardsi* Filhol).
20. *Paguristes barbatus* (Heller).
21. *Aniculus aniculus* (Fabricius).
22. *Munida gregaria* (Fabricius).
23. *Galathea pusilla* Henderson.

MACRURA.

24. *Jasus edwardsii* (Hutton).
25. *Ibacus alticrenatus* Spence Bate.
26. *Leander affinis* (Milne-Edwards).
27. *Nauticaris marionis* Spence Bate.
28. *Pontophilus australis* (G. M. Thomson).

STOMATOPODA.

29. *Lysiosquilla spinosa* (Wood-Mason).
30. *Squilla armata* Milne-Edwards.

Paguristes subpilosus Henderson, Chall. Rep. Anomura, 1888, p. 77, pl. viii. fig. 2.

G. M. Thomson, *loc. cit.*, 1898, p. 187.

Alcock, *loc. cit.*, 1905, p. 156.

One specimen from Station 5 and one from Station 26, the latter in a *Voluta* shell. These specimens agree closely with Heller's description, and I have no doubt belong to the species described by him. They also agree equally closely with the description given by Henderson for *P. subpilosus*, and the two species must be combined. Henderson himself had pointed out the resemblance between the two, but had not combined them as Heller described the dactyls of the ambulatory legs as scarcely shorter than the corresponding propods; as a matter of fact in the specimens before me they are, as Henderson describes them, half as long again as the propods.

ANICULUS ANICULUS (Fabricius).

Pagurus aniculus Fabr. Ent. Syst. ii., 1793, p. 468, and Suppl. 1798, p. 411.

Aniculus typicus Miers, Cat. N.Z. Crust., 1876, p. 64.

Hutton, N.Z. Journ. Sci., i., 1882, p. 264.

Filhol, Mission de l'Ile Campbell, 1885, p. 424.

G. M. Thomson, Trans. N.Z. Inst., xxxi., 1898, p. 184.

A. *aniculus* Alcock, Cat. Indian Decap. Crust., part ii, Anomura, 1905, p. 94, pl. vii., fig. 6.

A. R. McCulloch, Rec. Aust. Mus. vii., 1908, p. 59.

Full synonymy of this widely distributed species will be found in Alcock's report quoted above.

One fine specimen of this species, with carapace 55mm. long in the median line, was obtained at Station 5, *i.e.*, 50 miles east of Stewart Island. This species was put down by Heller as being found at Auckland during the "Novara" Expedition. No subsequent specimens however had been obtained, and in 1882 Hutton, in the work quoted above, placed it in a list of species which he thought should be struck out of the New Zealand fauna as they had been inserted only on Heller's authority, and were all large and conspicuous forms known mainly from warmer seas. It is interesting therefore to find this species turning up so far south as Stewart Island. The single specimen must I think undoubtedly be referred to this species, and on the whole it agrees well with Alcock's description. I have been able to compare it with a specimen in the Canterbury Museum from "Polynesia," and though it differs from this and from Alcock's description in the points mentioned below, I do not think these are sufficient for specific distinction.

The specimen is a large male with carapace 55mm. long, and therefore considerably larger than the form described by Alcock, the carapace of which was only 40mm. in length, and very much larger than the specimen in the Canterbury Muuseum. The branchial region of the carapace is quite soft and membranous and the rostrum is much less prominent, the front being merely produced a little in the middle so as to be slightly convex. The ophthalmic scales have two well marked spines at the tip and the left one has two other spines well marked and one smaller one on the outer margin, while the right one has only two on the outer margin, both less distinct than the two terminal ones. The second pair of legs is only slightly longer than the chelipeds and the third pair is somewhat longer than the second; in both the dactyl is considerably longer than the propod.

The specimen in the Canterbury Museum from "Polynesia" undoubtedly belongs to this species as described by Alcock, and differs from the Nora Niven specimen in having the rostrum much better marked and acute, the eye stalks rather more slender, the dactyls of the legs shorter and the curved lines of setae extending more continuously across the joints of the legs, while in the Nora Niven specimen they are more broken, the specimen also is somewhat more hairy on the chelipeds and legs and the anterior part of the carapace. It is however only about one-third the size of the Nora Niven specimen, and the differences are perhaps due to age.

MUNIDA GREGARIA (Fabricius).

- Galathea gregaria* Fabr., Ent. Syst. ii., 1793, p. 473.
G. subrugosa White, List. Crust. Brit. Mus., 1847, p. 66.
Munida subrugosa Miers, Zool. Erebus and Terror, Crust, 1874, p. 3, pl. iii., fig. 2.
 Hutton, Trans. N.Z. Inst., xi., 1879, p. 340.
 Henderson, Chall. Rep. Anomura, 1888, p. 124.
 G. M. Thomson, Trans. N.Z. Inst., xxxi., 1899, p. 194.
 Hodgson, Southern Cross Crust., 1902, p. 232.
 Chilton, Trans. N.Z. Inst., xxxvii., 1905, p. 230, and Subant. Is. N.Z., 1909, p. 612.
 A. M.-Edw., Mission du Cap Horn, vi., 1891, p. F. 36, pl. ii., fig. 2.
Grimothea gregaria, Henderson, *loc. cit.*, 1888, p. 124.
G. novæ-zealandiæ Filhol, Mission de l'Ile Campbell, 1885, p. 426.
Munida gregaria Miers, P.Z.S., 1881, p. 73.
 A. M.-Edw., l.c., p. F. 32, pl. ii., fig. 1.

Numerous specimens of this species were taken at Stations 5, 14, 21, and 26. From Station 7 there was a large number of specimens of varying sizes up to 54mm. in length. Though these were presumably brought up by the trawl in the usual way, I think from the character of them that they were not actually living on the sea bottom, for they were all perfectly clean and free from mud, and in all of them the external maxillipeds have the elongated foliaceous character that is associated with the pelagic form known as *Grimothea regaria*. A considerable number of these specimens from Station 7 are mature, some of them being females bearing eggs. The following table gives the measurement of 8 of these specimens and also of 5 other specimens from Station 26, being females bearing eggs. From the measurements given it will be seen that while there is considerable variety in the proportionate length of the external maxillipeds these appendages are considerably shorter in the specimens from Station 26 than in those from Station 7, although both lots contained mature females. The length of the body is measured from the tip of the rostrum to the extremity of the telson.

	Body.	Chelipeds.	External Maxilliped.
	mm.	mm.	mm.
STATION 7.			
1. Female, with eggs	35	35	18
2. " " "	38	36	18
3. " " "	39	35	18
4. " " "	40	40	20
5. Male	33	33	15
6. " " "	45	45	20
7. " " "	50	58	23
8. " " "	54	—	24
STATION 26.			
9. Female, with eggs	40	42	15
10. " " "	45	—	17
11. " " "	47	—	18
12. Male	50	—	18
13. " " "	51	60	19

From the details given above it is seen that there are two forms differing in the length and character of the external maxillipeds, but that each form may grow to approximately the same size and become sexually mature; it would be therefore most natural to conclude that we have to deal with two distinct species; however, as I have pointed out elsewhere, the general resemblance between the two forms is so great and the length of the external maxillipeds is subject to so much variation that I think we really have only one species of which the pelagic form (*Grimothea*) is primarily an immature stage but under certain conditions may remain in this stage and grow to be as large as the ordinary adult stage (*Munida*) and may even become sexually mature. It is at any rate the fact that where one of these forms is found the other is also to be met with not far away.

I have given above only a few measurements, but from them and from the examination of others not included in the table I think it is clear the external maxillipeds decrease in length in proportion to the body in the larger forms while the chelipeds tend to become somewhat longer in proportion to the length of the body.

GALATHEA PUSILLA Henderson.

Galathea pusilla Henderson, Chall. Rep. Anomura, xxvii., 1888, p. 121, pl. xii, fig. 1.

G. M. Thomson, Trans. N.Z. Inst., xxxi., 1899, p. 193, pl. xxi, fig. 7.

Grant and McCulloch, Proc. Linn. Soc. N.S.W., 1906, p. 49, pl. iv., figs. 5, 5a.

One imperfect specimen from Station 30.

The species appears to be common round the New Zealand coasts at moderate depths; it is also found off the coast of Australia, and Grant and McCulloch in the reference last quoted give a description of the adult male which had previously been undescribed.

MACRURA.

JASUS EDWARDSII (Hutton).

Palinurus edwardsii Hutton, Trans. N.Z. Inst. vii., 1875, p. 279.
Miers, Cat. N.Z. Crust., 1876, p. 75.

P. lalandii Miers, *loc. cit.*, 1876, p. 74.

Jasus edwardsii T. J. Parker, Trans. N.Z. Inst. xvi., 1884, p. 297, and xix., 1887, p. 150.

J. lalandii (part), Ortmann, Zool. Jahrb. vi., 1891, p. 16.