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Contributions to the study of the Entomostraca. No. IX : On Ostracoda taken amongst the Scilly Islands, and on the anatomy of Darwinula stevensoni .

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prothorax brownish black; the front and hind margins of the latter reddish brown, rather coarsely and closely punctured and rugose; the punctures most crowded on the front and epistoma of the former, which are also unisulcate down the centre: prothorax distinctly wider than long, subcordiform, a little depressed and unequal by slight irregular depressions: elytra pale brown, with a yellowish tinge, closely punctured and rugose: underside reddish brown, pubescent, finely and not closely punctured; legs and palpi pale yellow; antennæ brown.

Length $3\frac{1}{2}$ lines.

Hab. New Zealand. One example.

XV.—Contributions to the Study of the Entomostraca.

By GEORGE STEWARDSON BRADY, C.M.Z.S., and DAVID ROBERTSON, F.G.S.

No. IX. On Ostracoda taken amongst the Scilly Islands, and on the Anatomy of Darwinella Stevensoni.

[Plates IV. & V.]

IN undertaking a dredging excursion to the Scilly Islands, concerning the marine fauna of which we were unable to obtain previously any very accurate information, we anticipated finding, at any rate in the more sheltered nooks of that archipelago, a field of exploration comparable in character and richness to many of the better-known hunting-grounds of the south and south-west of England. In this, however, we were disappointed. In no part did we find any great profusion of animal life, and on the whole the district impressed us as being the most barren and hopeless for the purpose of dredging of any which we have hitherto explored. Our stay at St. Mary's was cut short by the sudden advent of stormy weather; but we nevertheless obtained dredgings from many of the most promising spots in the neighbourhood of the principal islands; nor do we believe that a protracted visit would have materially altered the character of the result. We propose in this place to record the marine Ostracoda which occurred in the various dredgings; and we may also state that an examination of the fresh- and brackish-water ponds on the islands of St. Mary and Tresco did not afford any other than species commonly found in such localities in England.

The number of species of marine Ostracoda is sixty-seven, of which three (or four?) are new to science; but the general

aspect of the group is such as we should expect in any average British dredging. There is a distinct absence of the characteristic northern forms, and an almost equal want of such species as *Cythere emaciata*, *Bairdia acanthigera*, &c., which find their greatest development on the south coast. *Cythere lutea*, a common species of both the littoral and laminarian zones in most (and more especially in the northern) districts of Britain, is also wanting.

The following list embraces all the species found in our dredgings amongst the Scilly Islands, and in a littoral gathering of muddy sand from St. Mary's. The localities dredged were as follows:—off Porcressa Bay, St. Mary's, 20–30 fathoms, hard sand; S.W. off St. Agnes, 40 fathoms, hard sand, rock, and nullipore; inside St. Mary's and St. Agnes, 8–10 fathoms, hard sand; New Grimsby Harbour, 10–14 fathoms, muddy sand.

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| Pontocypris mytiloides (Norman). | Cytherura flavescens, Brady. |
| — trigonella, G. O. Sars. | — cornuta, Brady. |
| Paracypris polita, G. O. Sars. | — gibba (Müller). |
| Cythere viridis, Müller. | — cuneata, Brady. |
| — albomaculata, Baird. | — striata, G. O. Sars. |
| — pellucida, Baird. | — angulata, Brady. |
| — castanea, G. O. Sars. | — producta, Brady. |
| — porcellanea, Brady. | — acuticostata, G. O. Sars. |
| — Macallana, B. & R. | — cellulosa (Norman). |
| — badia, Norman. | Pseudocythere caudata, G. O. Sars. |
| — crispata, Brady. | Cytheropteron nodosum, Brady. |
| — Robertsoni, Brady. | — subcircinatum, G. O. Sars. |
| — villosa (G. O. Sars). | — latissimum (Norman). |
| — convexa, Baird. | — n. sp. ? |
| — oblonga, Brady. | Bythocythere constricta, G. O. Sars. |
| — cuneiformis, Brady. | — turgida, G. O. Sars. |
| — laticarina, Brady. | Cytherideis subulata, Brady (var. |
| — emaciata, Brady. | fasciata). |
| — antiquata (Baird). | Sclerochilus contortus (Norman). |
| — semipunctata, Brady. | Paradoxostoma abbreviatum, G. O. |
| Cytheridea cornea, B. & R. | Sars. |
| — elongata, Brady. | — variabile (Baird). |
| Eucythere Argus (G. O. Sars). | — ensiforme, Brady. |
| — declivis (Norman). | — cuneatum, n. sp. |
| Loxoconcha impressa (Baird). | — hibernicum, Brady. |
| — granulata, G. O. Sars. | — Normani, Brady. |
| — multifora (Norman). | — Fischeri, G. O. Sars. |
| — tamarindus (Jones). | — arcuatum, Brady. |
| Xestoleberis depressa, G. O. Sars. | — flexuosum, Brady. |
| — labiata, n. sp. | — obliquum, G. O. Sars. |
| — aurantia (Baird). | Asterope Mariæ (Baird). |
| Cytherura nigrescens (Baird). | — teres (Norman). |
| — similis, G. O. Sars. | Philomedes interpuncta (Baird). |
| — Sarsii, Brady. | Polycocpe compressa, B. & R. |
| — fulva, n. sp. | |

Xestoleberis labiata, n. sp. Pl. IV. figs. 8-15.

Carapace of the *female*, as seen from the side, oblong, subtriangular, highest near the middle; height equal to rather more than half the length: anterior extremity narrow, sharply rounded off; posterior wide, obtusely rounded: superior margin well arched; inferior nearly straight, but produced downwards towards the posterior extremity into a bulging prominence. Seen from above the outline is broadly ovate, tapering rapidly in front to an acute point, and very broadly rounded behind; greatest width equal to the height, and situated behind the middle. The shell of the *male* seen laterally is more slender, and less tumid behind; seen from above it is much more compressed and widest near the middle, the posterior extremity being somewhat narrowly rounded. The surface of the shell is smooth, distantly studded with small elevated round papillæ. The chief peculiarity of the species, however, is a remarkable labiate projection of the postero-inferior angle of the shell, which is more distinctly visible on the right valve (fig. 15). Length $\frac{1}{16}$ inch.

Xestoleberis labiata was dredged in New Grimsby Harbour on a bottom of muddy sand, in a depth of about 14 fathoms.

Cytherura fulva, n. sp. Pl. IV. figs. 1-5.

Carapace of the *female* very tumid; seen laterally subquadrate, broadly rounded in front, produced behind into an obscure rounded subcentral beak: superior margin evenly and very slightly rounded, sloping steeply backwards towards the posterior extremity; inferior nearly straight, sinuated in front of the middle: greatest height situated in the middle and equal to rather more than half the length. Seen from below the outline is very broadly ovate, widest in the middle, the width being somewhat greater than the height; anterior extremity broadly rounded, with a distinct central mucro, posterior also broad, but tapering to a subacuminate central point. Shell of the *male* seen laterally much more elongated, with nearly straight dorsal and ventral margins, the height equal to scarcely half the length; the outline as seen from below is also much more compressed. Surface of the shell obscurely reticulated and dotted, marked also, especially on the inferior surface, with faint longitudinal furrows. Length $\frac{1}{3}$ inch.

C. fulva was dredged pretty abundantly on a bottom of hard granitic sand, in a depth of 10-40 fathoms, off St. Mary's and St. Agnes.

Cytherura Sarsii, Brady. Pl. IV. figs. 6, 7.

We figure here what appears to be a local variety of this species, the outline being somewhat less angular than usual.

Cytherideis subulata, var. *fasciata*, nobis. Pl. V. figs. 1-5.

This differs from the typical form in having a conspicuous broad black band across the shell in front of the middle, and also in the reticulated structure of the shell, which is represented in fig. 5. The anterior margins of the valves (fig. 4) are crenulated.

Paradoxostoma cuneatum, n. sp. Pl. V. figs. 6, 7.

Carapace, seen laterally, oblong, subreniform, rather higher behind than in front; height equal to less than half the length; anterior extremity evenly, posterior obliquely, rounded; superior margin gently and evenly arched, inferior slightly sinuated in the middle. Seen from above, the outline is compressed, cuneate, greatest width near the posterior extremity and equal to one third of the length, tapering gently toward the anterior and abruptly toward the posterior extremity, both of which are subacuminate. Surface of the shell smooth. Length $\frac{1}{4}$ inch.

A few specimens of this species were dredged at New Grimsby Harbour and inside St. Mary's in depths of from 10-15 fathoms.

Note on the Anatomy of *Darwinella* * *Stevensoni*.

Our first description † of this curious Entomostracan being made from specimens which had been dried, and in which the contained animal could be very imperfectly seen, was incorrect in several important particulars. We propose now to rectify as far as we can our former errors, having, through the kindness of the Rev. J. Gunn of Norwich, been supplied with specimens of *Darwinella* in the fresh state. To that gentleman we wish here to express our cordial thanks for the assistance which he has both now and on other occasions given to us.

From the details of structure given below it will be seen that *Darwinella* occupies a position intermediate between the two families Cypridæ and Cytheridæ, though more nearly approaching the latter family. The points of divergence are

* Our first generic name *Polycheles* having been previously appropriated, was withdrawn in favour of *Darwinella* (see Ann. & Mag. Nat. Hist. ser. 4, vol. ix. p. 50, January 1872).

† Ann. & Mag. Nat. Hist. July 1870, p. 25.

found chiefly in the mouth-apparatus; but the lower antennæ also are abnormal, being quite destitute of the poison-gland and urticating setæ of the Cytheridæ. The mandible differs much in structure from any similar organ known to us in either family. The first pair of jaws presents no special peculiarity; but in the second pair (which in the Cytheridæ is converted, by the great development of the palp and atrophy of the jaw-apparatus, into a simple foot with a mere trace of its jaw origin in the form of a few bristles) we find a pediform palp extremely well developed, combined with a large jaw, which is armed with cutting-teeth and bears a fully developed branchial plate. The palp of the second jaw we described in our former paper as the "first foot;" the mandibles and first pair of jaws were also misunderstood, and indeed had not then been seen except very imperfectly. The following description gives, we believe, a true account of the structure of the animal:—

Antennæ very short and stout, strongly armed with curved claws and bristles: superior antennæ six-jointed, having all the joints as broad as or broader than long, and beset with short curved setæ; inferior four-jointed, of nearly equal thickness throughout: apex armed with four or five strong, slightly curved, claws; entirely destitute of poison-gland or urticating setæ, the place of which is occupied by a simple curved seta of moderate length. Mandible (Pl. V. fig. 8) broad, truncate at the free extremity, which is provided with six or seven small, slender, spiniform teeth; palp three-jointed, its basal joint very wide, beset with a series of nine curved setæ, and giving attachment to a small subrescens lamina which is fringed with about ten branchial filaments; second joint slender, nearly four times as long as broad, slightly curved and dilated at the distal extremity, where it bears one long and two small setæ; terminal joint more slender, about two thirds the length of the foregoing, and bearing at its truncate apex about six slender curved spines. Grasping portion of the first jaw (Pl. V. fig. 9) divided into four short setiferous segments, and bearing a very large oblong palp, which is fringed above with about twenty-four long branchial filaments, and has also four long deflexed setæ attached near its base. Second jaw (Pl. V. fig. 10) simple, short and wide, truncate at the apex, and divided into several slender curved spines, bearing a large three-jointed pediform palp and an ovate branchial appendage of moderate size. Two pairs of feet of moderate length, five-jointed; the second pair much the longest, and having the last joint armed with one long and two small curved setæ; first three joints of nearly equal length, fourth and fifth respectively

about one half and one third as long as the preceding. Abdomen ending in a short conical process. Copulative organs of the male of complex structure, the basal portion on each side consisting of a subrhomboidal acuminate lamina, the apical portion of an irregularly shaped plate produced laterally into an aliform process, and on the distal margin into a short strong hook. Female probably viviparous.

EXPLANATION OF THE PLATES.

PLATE IV.

- Fig. 1. *Cytherura fulva*, male, seen from right side.
 Fig. 2. The same, male, seen from above.
 Fig. 3. The same, male, seen from end. } × 84.
 Fig. 4. The same, female, seen from right side.
 Fig. 5. The same, female, seen from below.
 Fig. 6. *Cytherura Sarsii*, seen from right side. } × 84.
 Fig. 7. The same, seen from above.
 Fig. 8. *Xestoleberis labiata*, female, seen from left side.
 Fig. 9. The same, female, seen from above.
 Fig. 10. The same, female, seen from below.
 Fig. 11. The same, female, seen from end. } × 50.
 Fig. 12. The same, male, seen from left side.
 Fig. 13. The same, male, seen from below.
 Fig. 14. The same, left valve, seen from inside.
 Fig. 15. The same, right valve, seen from inside.

PLATE V.

- Fig. 1. *Cytherideis subulata*, var., seen from right side. } × 50.
 Fig. 2. The same, var., seen from above.
 Fig. 3. The same, var., seen from below.
 Fig. 4. The same, anterior margin of shell. × 84.
 Fig. 5. The same, shell-structure. × 100.
 Fig. 6. *Paradoxostoma cuneatum*, seen from right side. } × 50.
 Fig. 7. The same, seen from below.
 Fig. 8. *Darwinella Stevensoni*, mandible and palp: *a*, mandible; *b*, palp; *c*, branchial plate.
 Fig. 9. The same, first jaw: *a*, incisive lobes; *b*, branchial plate. } × 220.
 Fig. 10. The same, second jaw: *a*, maxilla; *b*, pediform palp; *c*, branchial plate.

XVI.—*On the Generic Affinities of the New-England Chitons.*
By PHILIP P. CARPENTER, of Montreal*.

It has been common, with conchologists even of the "advanced" school, to call every mollusk with eight valves a *Chiton*, except the vermiform species, which Lamarck sepa-

* Communicated by the Author, having been read at the Meeting of the American Association for the Advancement of Science, held at Portland, August 1873.



