

Notes on Entomostraca found at the Roots of Laminariæ.

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(Plates 1 and 2).

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The much-branched and spreading roots or hold-fasts of *Laminariæ* afford shelter to many small animals, chiefly perhaps Crustaceans, but also Mollusca, Annelida, and other groups. On this account they supply an interesting hunting ground to the micro-zoologist. By hooking up the tangles with the stones to which they are attached, then detaching the roots and immersing them for a short time in a bucket full of sea water the animals are tempted out of their retreats, and may easily be collected by pouring off the water through a fine muslin net. In this way I have frequently made collections, and I propose now to give lists of the species which have been found in three different localities,—Holy Island (Northumberland), Gare Loch (Clyde), and Roker (Durham). These three habitats are distinguished opposite the names of the various species by the initials H, G, and R. Among these Laminarian gatherings I have met with no species quite new to science, though there are several new to our district and otherwise imperfectly known, respecting which I have given some notes and drawings. I have added also figures and description of a new Ostracod taken during the first "Stanley" expedition in 1901. But this is supplementary, and is not at all a Laminarian species.

Some observations on the early stages of growth of a very common Copepod—*Harpacticus chelifera*, O. F. Müller—have seemed to me worth brief notice and illustration. Very young specimens of this species living among laminarian roots or the very darkly coloured fuci of tide-pools have a tendency themselves to become very dark in colour, or even quite black, this condition wearing off gradually as life advances. I think, however, that *H. chelifera* seldom or never under these conditions attains the size or vigour which characterises it when living in more open situations.

LIST OF SPECIES TAKEN AT THE ROOTS OF LAMINARIÆ.

COPEPODA.

- Longipedia coronata*, Claus, H
Ectinosoma normani, T. Scott, H
Amymone rubra, Boeck, H
Stenhelia hispida, Brady, H
 „ *herdmani*, A. Scott, H
Laophonte horrida, Norman, H
 „ *serrata* (?), Claus, H
 „ *lamellifera*, Claus, R
 „ *curticauda*, Boeck, H
Cletodes longicaudata, Brady & Robertson, H
 „ *linearis*, Claus, H
 „ *similis*, T. Scott, H
Pontopolites typicus, T. Scott, H
Dactylopus brevicornis, Claus, H
 „ *platycheles*, Brady, R
 „ *tisboides*, Claus, H
Thalestris rufoviolasces (?), Claus, R
 „ *longimana*, Claus, H
 „ *forficuloides*, T. Scott, H
 „ *hibernica*, Brady and Robertson, H
 „ *rufocincta*, Norman, R
Westwoodia nobilis, Baird, R
Harpacticus chelifer (Müller), H
 „ *flexus*, Brady and Robertson, H
Zaus spinatus, Goodsir, H R
Peltidium interruptum, Goodsir, H
Idya furcata, Baird, H
Scutellidium fasciatum, Boeck, R
Cyclopicera berniciensis, Brady, H
Astrocheres boeckii, Brady, H
Temora longicornis, Müller, H
Thorellia brunnea, Boeck, H G
Cyclops salinus, Brady, H G

GENUS AMYMONÉ, Claus.

Amymoné rubra, Boeck (Plate I., fig. 13).

1872. *Amymoné rubra*, Boeck, Nye Slægter og Arter af Saltvands-Copepoder, p. 16.

I give here a figure drawn from one of a few specimens taken at Holy Island: these are identical with the species already figured and described by me in the Ray Society "Monograph of British Copepoda," under the name of *Amymoné spherica*, Claus. This, however, seems to be a mistaken reference. I now think that the form in question is referable to *A. rubra*, Boeck, and not to *A. spherica*. In this opinion Prof. G. O. Sars, who has kindly examined my specimens, agrees. The points in which the Holy Island specimens do not correspond with *A. spherica* as described by Claus are, chiefly, the shape of the hinder part of the body and the size and proportions of the antennal joints.

GENUS STENHELIA, Boeck.

Stenhelium denticulatum, I. C. Thompson.

1893. *Stenhelium denticulatum*, Thompson. Revised Report on the Copepoda of Liverpool Bay (Trans. Liverpool Biological Society), p. 30. Plate XXX., figs. 1-11.

The large tooth on the under side of the second joint of the anterior antenna is very characteristic of this species, which has been figured and described by Mr. I. C. Thompson. My specimens were taken by the dredge three miles off Whitley in a depth of twenty fathoms: I have no note of the number. I think only one or two were recognised, but it is very likely that others escaped notice.

Stenhelium herdmani, A. Scott.

Stenhelium herdmani, A. Scott. Some new and rare Copepoda from Liverpool Bay (Trans. Liverpool Biological Society), vol. V., p. 60, Plate 1, figs 1-11.

A few specimens from washings of Laminaria roots at Holy Island. Mr. Scott kindly examined my mountings, and agrees with me in referring them to this species.

Harpacticus chelifer, O. F. Müller (Plate 2, figs 9-16).

I figure here some of the appendages of young specimens of *H. chelifer* found among roots of *Laminaria*. The young of this species grown under such conditions is generally extremely melanotic: this I have noticed in specimens taken at Holy Island and Gare-loch, as well as in those taken among fuci in tide-pools at North Sunderland, and I believe that the same tendency may at times be seen in the young of other species. The dark coloration disappears gradually with the growth of the individual, and is usually entirely lost—giving place to the normal pale brown or straw-colour—before the full growth is attained. I give in Plate II. examples of these conditions as seen in a very early and in a rather later stage of development.

GENUS PONTOPOLITES, T. Scott.

Pontopolites typicus, T. Scott (Plate I., figs. 4-12).

Pontopolites typicus, Scott, Additions to the Fauna of the Firth of Forth (Twelfth Annual Report of the Fishery Board for Scotland), p. 251, Plate VIII., figs. 9-17.

This interesting species was described and figured by Mr. Scott from specimens taken off Musselburgh. But in some minor characters, chiefly connected with the setiferous armature of the limbs, my specimens appear to differ from the types: I therefore give drawings of some of the more important parts. I have not been able, with the most careful examination, to detect on the limbs any plumose hairs such as are represented in Mr. Scott's figures nor any ciliation at their joints: the setæ of the secondary branch of the posterior antennæ are considerably longer than those of the Scotch specimens. Mr. Scott describes and figures the fourth pair of feet as having a rudimentary inner branch similar to those of the second and third pairs: the Holy Island specimens, however, do not show this, but have no internal branch, unless the very minute spine indicated in fig. 10 be taken to represent one.

GENUS CYCLOPS.

Cyclops salinus, G. S. Brady (Plate I., figs. 1-3).

This species was described by me in Vol. XIII. of the "Natural History Transactions of Northumberland and Durham," from a single imperfect specimen taken at Alnmouth. Those here noticed—of which I give two amended figures—were got at Holy Island and at Gare Loch (Firth of Clyde). In each case only one example was found, so that this, like other marine forms of *Cyclops*, seems to exist in comparatively small numbers. Marine conditions do not appear favourable to the constitution of the genus.

It will be noticed that the jointing of the anterior antenna (fig. 2) is here much more distinct than in the Alnmouth specimen. I have been able also to figure the fifth foot (fig. 3) which, as to its terminal joint, much resembles *C. æquoreus*: the basal joint is, however, much larger than in that species.

OSTRACODA.

FAM. CYPRIDIDA.

GENUS ARGILLŒCIA.

Argillœcia propinqua, sp. nov. (Plate II., figs. 1-8).

Shell elongated, subovate, greatest height in the middle, equal to more than one-third of the length; seen from the side, evenly rounded in front, posterior extremity obtusely pointed below the middle, dorsal margin evenly arched, steeply curved behind, ventral slightly sinuated about the middle; seen from above the outline is somewhat cuneate, the greatest width situated posteriorly and equal to the height, lateral margins moderately curved, converging rather abruptly at the front, which is obtusely pointed; posterior extremity broadly arcuate, right valve rather larger than the left, overlapping behind, but in front slightly overlapped by the opposite valve: surface of the shell quite smooth; colour dull white. Length .52 mm.

Anterior antennæ (fig. 3) six-jointed, short and stout, third joint equal in length to the combined fourth, fifth, and sixth, which are short and nearly equal: the third joint bears two very long and three short setæ, the fourth and fifth two long and one short, and the sixth five rather short ones; the two basal joints, which are much stouter than the rest, bear also a few short setæ: posterior antennæ (fig. 4) five-jointed, terminal joint armed with a few short claw-like setæ, third joint with two rather larger, curved setæ. First pair of maxillæ of the usual four-lobed type; second pair (fig. 5) small, palp indistinctly three-jointed and bearing a long terminal claw. First and second pairs of feet nearly alike, five-jointed, first pair with two rather stout terminal claws (fig. 6), second with two apical setæ, the smaller of which bears a few second barbules on the distal half of its posterior margin (fig. 7); the last joint of both limbs extremely small. Post abdominal rami (fig. 8) very small, bearing two small apical setæ and three rather larger lateral ones.

Hab.—One specimen only (a female) taken in depth of 59 fathoms, 29 miles east of Alnmouth.

As compared with *Argillæcia cylindrica*, the only recognised British species, the shell of *A. affinis* is somewhat larger and more evenly rounded in front, while the contour as seen dorsally, instead of being regularly oval with nearly equal pointed extremities, is nearly cuneate, being slightly tapered in front and broad behind. Neither can the species be referred to any of those described by G. W. Müller in his work on the Mediterranean Ostracoda. Sars describes the anterior antennæ as five-jointed, but in this species the thick basal portion is distinctly two-jointed, the more slender apical portion four-jointed.

EXPLANATION OF PLATES.

PLATE I.

CYCLOPS SALINUS.

- Fig. 1. Female $\times 140$.
 2. Anterior antenna of same $\times 300$.
 3. Posterior " " $\times 300$.

PONTOPOLITES TYPICUS. ♀

4. Anterior antenna } $\times 360$.
 5. Posterior " }
 6. Mandible $\times 660$.
 7. Posterior footjaw $\times 360$.
 8. Foot of first pair }
 9. " third pair } $\times 360$.
 10. " fourth pair }
 11. Fifth pair of feet $\times 240$.
 12. Abdomen and tail $\times 120$.

AMYMONE RUBRA.

13. Female $\times 170$.

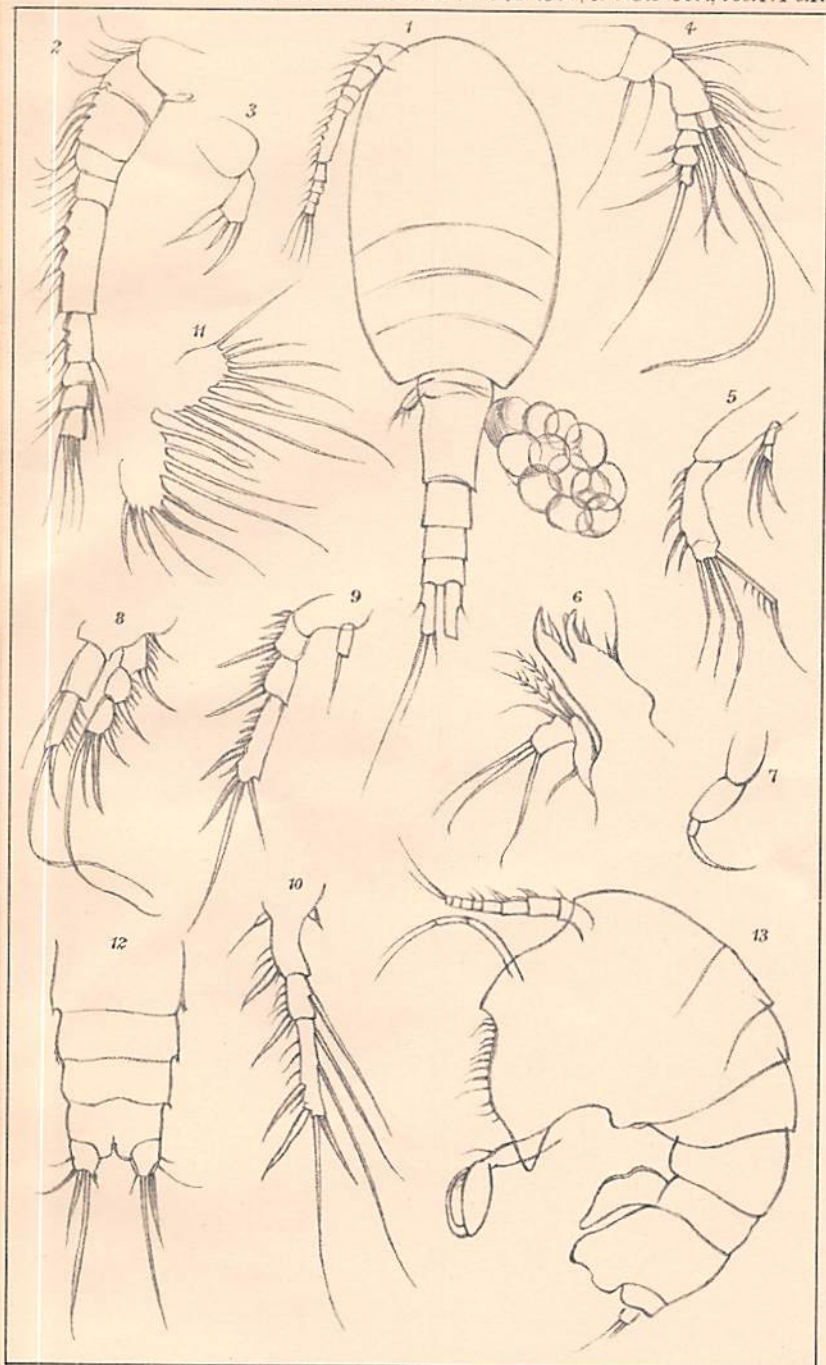
PLATE 2.

ARGILLECIA PROPINQUA.

- Fig. 1. Shell seen from right side $\times 84$.
 2. " " above $\times 84$.
 3. Anterior antenna } $\times 240$.
 4. Posterior antenna }
 5. Posterior maxilla $\times 440$.
 6. Foot of first pair } $\times 240$.
 7. " second pair }
 8. Post-abdomen $\times 320$.

HARPACTICUS CHELIFER $\times 240$.

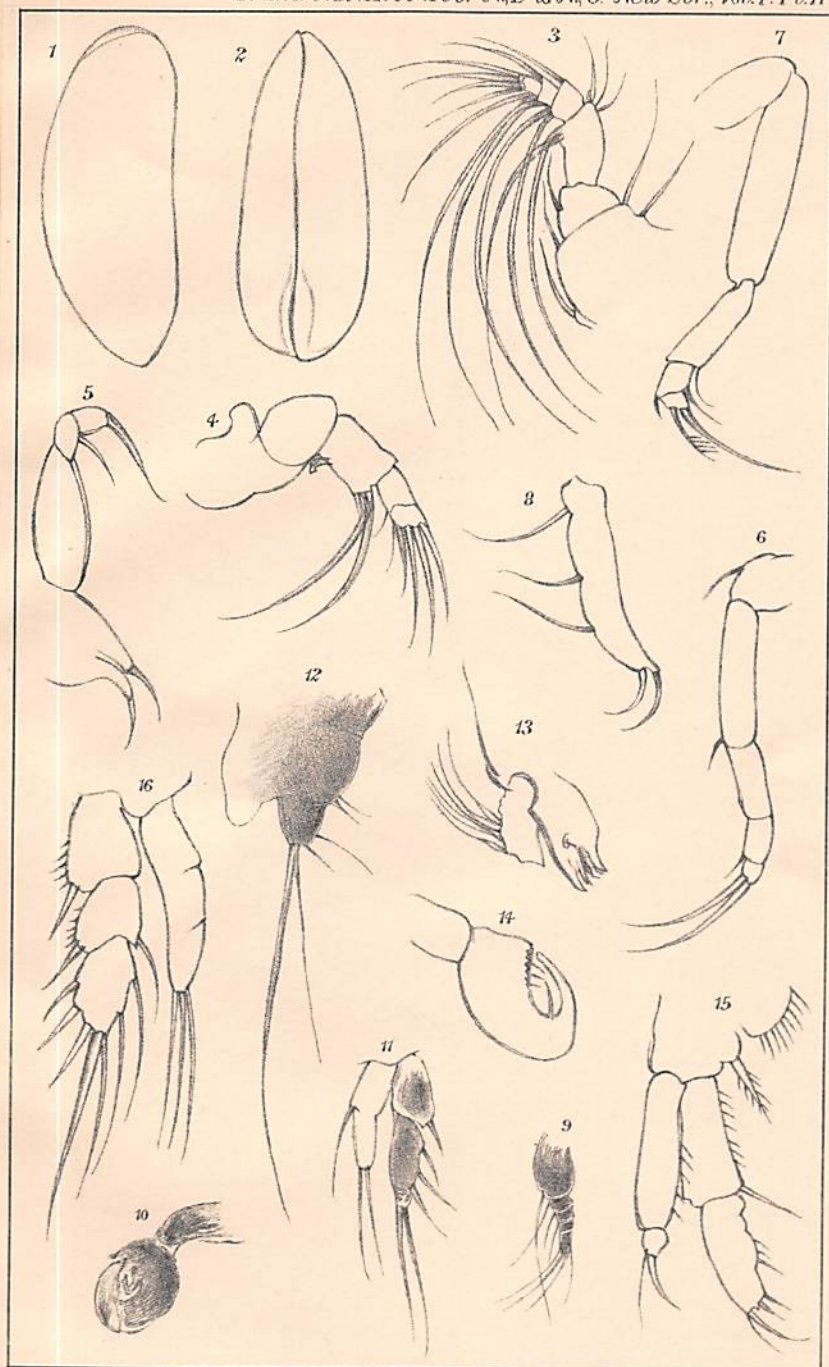
9. Anterior antenna }
 10. Posterior footjaw } Very early stage of development.
 11. Foot of first pair }
 12. Furca }
 13. Mandible }
 14. Posterior footjaw } Later stage.
 15. Foot of first pair }
 16. " third pair }



G. S. Brady del.

G. West & Sons lith.

Figs. 1-3 CYCLOPS SALINUS
" 4-12 PONTOPOLITES TYPICUS
13 AMYMONE RUBRA.



G.S.Brady del.

G. West & Sons lith.

Figs. 1-8 ARGILLŒCIA PROPINQUA
" 9-16 HARPACTICUS CHELIFER.