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NOTES ON SCOTTISH CUMACEANS

By THOMAS SCOTT, F.L.S.

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## NOTES ON SCOTTISH CUMACEANS.

By THOMAS SCOTT, F.L.S.

THE new work on the Cumacea of Norway by Professor G. O. Sars, which is now in course of publication, will tend greatly to facilitate the study of this aberrant, but peculiarly interesting group of Crustaceans. This work, which forms volume iii. of Professor Sars' "Crustacea of Norway," will, like the two preceding volumes, be found indispensable to students of the British Crustacea, because the majority of the species hitherto observed in our seas are also represented

in the fauna of Norway, which in these volumes is being so fully described and figured.

With the assistance of the published parts of volume iii., I have been enabled to prepare the following notes on Scottish Cumacea, which may not be without interest to those who are devoting some attention to these curious animals. In these notes I have generally adopted the names and the arrangement of the species employed by Professor Sars, while among other books and papers which have been consulted are the following, viz. :—Middlehavet's "Invertebrate Fauna," part ii. ; "Cumacea," by Professor G. O. Sars ; 'Notice of Thirteen Cumacea from the Firth of Clyde,' by the late Dr. Robertson of Millport (published in part i. vol. iii. (N.S.) of the "Proceedings and Transactions of the Natural History Society of Glasgow," 1889) ; "A History of Crustacea," by the Rev. T. R. R. Stebbing, F.R.S. ; 'On a Crangon, some Schizopoda and Cumacea new to or rare in the British Seas,' by the Rev. Canon A. M. Norman, M.A., etc. (published in the "Fourth Annual Report of the Fishery Board for Scotland," 1886) ; and various papers on Crustacea by the present writer, published in the Annual Reports of the Fishery Board for Scotland, in the "Annals of Scottish Natural History," and elsewhere.

In a paper on the fauna of Loch Fyne, by the late George Brook and myself, published in the "Fourth Annual Report of the Fishery Board for Scotland" (1886), *Hemilamprops uniplicata* is recorded, but somewhat doubtfully, amongst a few Cumaceans observed in East Loch Tarbert. The specimens supposed to belong to *Hemilamprops uniplicata* were immature, and as no adult specimens, which could satisfactorily be ascribed to this species, have yet been observed in the Clyde or anywhere else around the Scottish coasts, I have excluded it from the present list.

Professor Sars divides the Cumacea into nine families, eight of which are represented here, viz.—the CUMIDÆ, VAUNTHOMPSONIIDÆ, LAMPROPIDÆ, LEUCONIDÆ, DIASTYLIDÆ, PSEUDOCUMIDÆ, NANNASTACIDÆ, and CAMPYLASPIDÆ. The PLATYASPIDÆ—the third family in Professor Sars' arrangement—is not represented in the Scottish cumacean fauna.

## Fam. I. CUMIDÆ.

Gen. CUMA, *M. Edwards*, 1828.

(1) CUMA SCORPIOIDES (*Mont.*).—Firth of Forth (recorded by Goodsir under the name of *Bodotria arenosa*). Firth of Clyde—"taken in surface-net after sunset; depth 4-5 fathoms, Blackwater-foot, Arran" (Robertson). I have not myself observed this species in any gatherings of Scottish Crustacea. In it the inner ramus of the uropods is composed of a single piece. The form described and figured by Goodsir as *Bodotria arenosa* is evidently a male, as the abdominal segments are provided with what appear to be fully developed pleopods.

(2) CUMA EDWARDSII, *Goodsir*.—Firth of Forth (Goodsir; Leslie and Herdman). This species, which has the inner as well as the outer uropods two-jointed, appears to be generally distributed along the east coast of Scotland. I have records of its occurrence in the Firth of Forth, off Aberdeen, and in the Dornoch Firth. I have, however, no record from the west coast.

(3) CUMA PULCHELLA, *G. O. Sars*.—Appears to have a wide distribution, but being a small species, is easily overlooked. It was observed for the first time in Scotland in the Firth of Forth, where it was obtained in 1889-90. For several years this was the only Scottish locality in which it was known to occur; recently, however, I have been enabled to record its occurrence in the Clyde, having obtained one or two specimens in a gathering of Crustacea collected in the vicinity of the island of Sanda.<sup>1</sup>

Gen. IPHINOË, *Spence Bate*, 1856.

(4) IPHINOË TRISPINOSA (*Goodsir*).—Firth of Forth (Goodsir). Firth of Clyde—taken plentifully in Kames Bay, Millport (a little beyond low water, and in the surface-net), and Loch Ranza (Robertson). I have taken it in the Firth of Forth, where at times it is moderately frequent, especially in bottom tow-net gatherings; and also occasionally in Loch Fyne, and in Kilbrennan Sound. *Iphinoë* (*Venilia*) *gracilis*, Spence Bate, is the male of this species.

(5) IPHINOË SERRATA, *Norman*.—I obtained this species in moderately deep water in Port Bannatyne Bay, Firth of Clyde, in March 1887. Also in a tow-net gathering, from 40 fathoms, collected in the Moray Firth in June 1898; and in a gathering made off Ballantrae, Firth of Clyde, in July 1899. I have not observed this *Iphinoë* in the Firth of Forth.

<sup>1</sup> "Seventeenth Annual Report of the Fishery Board for Scotland," part iii. p. 267 (1899).

(6) *IPHINOË TENELLA*, *G. O. Sars*.—Rev. T. R. R. Stebbing, F.R.S., in his useful work, entitled “A History of Crustacea” (published in 1893), states at page 303 that *Iphinoë tenella*, Sars, has recently been taken in the Clyde. This is a smaller species than either of the other two recorded here, being scarcely more than half the size of *I. trispinosa*. Like *Cuma pulchella*, it is a Mediterranean species, and I have not yet observed it; perhaps its distribution is more local than some of the others.

Gen. CUMOPSIS, *G. O. Sars*, 1879.

(7) CUMOPSIS EDWARDSII (*Spence Bate*).—This species has at various times been recorded under the name of *Cumopsis goodsiri*. It seems to prefer shallow bays where the bottom consists of fine sand, or of sand and mud; and in such situations it does not appear to be very rare. I have records of its occurrence in the Firth of Forth and in the Firth of Clyde. It was moderately frequent in shore gathering from a sandy bay, in front of Millport, Cumbrae, collected in May 1899; and in July of the same year it was observed in a gathering collected near Ballantrae. Dr. Dohrn collected this species at Millport in 1869, as well as the species to be next referred to.

(8) CUMOPSIS LONGIPES (*Dohrn*) (*Cumopsis lævis*, *G. O. Sars*).—This Cumacean was discovered by Dr. Dohrn mixed up with the more common form just referred to. In this species the cephalothoracic shield is devoid of the lateral folds or *plicæ* which adorn the shield of the other. I have obtained specimens near Millport, Cumbrae; and the late Dr. Robertson also records it from the same place.

Fam. II. VAUNTHOMPSONIIDÆ.

Gen. VAUNTHOMPSONIA, *Spence Bate*, 1858.

(9) VAUNTHOMPSONIA CRISTATA, *Spence Bate*.—I obtained this species in East Loch Tarbert, Loch Fyne, in 1886; and I have also taken it in the vicinity of May Island, Firth of Forth. I have recently observed a single specimen—a male—in a gathering collected off Ballantrae, Firth of Clyde, on 19th July 1899, in 15-20 fathoms. *V. cristata* appears to be a somewhat rare species, but being small, it may easily be overlooked. It is apparently the only British representative of the family.

Fam. III. PLATYASPIDÆ.

[No Scottish representative of this family has yet been observed.]

## Fam. IV. LAMPROPIDÆ.

Gen. LAMPROPS, *G. O. Sars.*

(10) LAMPROPS FASCIATA, *G. O. Sars.*—This appears to be a moderately common species on various parts of the Scottish coast, especially in shallow sandy bays. The following are a few of the places where it has been obtained—East Loch Tarbert, Loch Fyne; shore at Hunterston and at Inverkip, Firth of Clyde; near Invergordon, Cromarty Firth; and at Muckle Ferry, Dornoch Firth; at various parts of the Firth of Forth. In this species the telson is furnished with five terminal spines, two of which are shorter than the others. Adult specimens appear to vary in size.

Gen. HEMILAMPROPS, *G. O. Sars*, 1882.

(11) HEMILAMPROPS ROSEA (*Norman*).—I have seen this species on one or two occasions, and only in Clyde tow-net gatherings. It is readily distinguished from other Lampropidæ, recorded from our shores, by the greater number of terminal spines on the telson. A single specimen was taken in the bottom tow-net between Inverae and Furnace, Upper Loch Fyne. In this specimen, the telson was provided with eight terminal spines.<sup>1</sup> Last year the species was obtained in Kilbrennan Sound.<sup>2</sup>

(12) HEMILAMPROPS CRISTATA, *G. O. Sars.*—This species is stated to have been obtained in the Firth of Clyde in 1860, by the late Dr. Robertson,<sup>3</sup> but does not appear to have been observed since. The telson is furnished with three terminal spines. It must be remembered, however, that the number of terminal spines in this and other species is not a safe guide if the specimens be immature.

## Fam. V. LEUCONIDÆ.

Gen. LEUCON, *Krøyer*, 1846.

(13) LEUCON NASICUS, *Krøyer*.—I have found this moderately common in gatherings from the Firths of Forth and Clyde, as well as from other parts of the Scottish coasts. The gatherings in which specimens most frequently occurred were collected in comparatively deep water, *i.e.* from 20 to 40 fathoms and upwards. Those examined showed a tendency to vary in the size of the serratures of the lower margins of the dorsal shield; and the front margins of the rostral projection were also, in some examples, distinctly serrate,

<sup>1</sup> "Fifteenth Annual Report of the Fishery Board for Scotland," part iii. p. 134 (1897).

<sup>2</sup> "Seventeenth Annual Report," part iii. p. 267 (1899).

<sup>3</sup> Norman, "Fourth Annual Report of the Fishery Board for Scotland," Appendix F, No. viii. p. 164 (1886).

being similar in this respect to *L. nasicooides*, Lillj., a species, however, which is not only considerably smaller than *L. nasicus*, but has the rostral projection almost truncate, instead of being decidedly oblique.

Gen. EUDORELLA, *Spence Bate*, 1867.

(14) EUDORELLA EMARGINATA (*Krøyer*).—This is the largest of the two species of *Eudorella* noticed here, adult female specimens measuring nearly half an inch in length. The late Dr. Robertson records it from Rothesay Bay, Bute, where it was dredged in 12 fathoms, and it has been obtained on several occasions in tow-net gatherings collected by the s.s. "Garland" in the deep water between Arran and the coast of Ayrshire, as well as in other parts of the Clyde district. This species has also been obtained in gatherings of Crustacea from the Firth of Forth.

(15) EUDORELLA TRUNCATULA, *Spence Bate*.—I have obtained this species in the Firth of Forth, in the Moray Firth, and in the estuary of the Clyde; but it appears to be less frequent than *Eudorella emarginata*. It is also scarcely half the size of that species.

Gen. EUDORELLOPSIS, *G. O. Sars*, 1882.

(16) EUDORELLOPSIS DEFORMIS (*Krøyer*).—This curious little Cumacean was first observed in the Firth of Forth, during 1889-90, and is recorded in the "Eighth Annual Report of the Fishery Board for Scotland," part iii. p. 329 (1890). Since that time the species has been obtained in gatherings collected off Aberdeen, in the Moray Firth, and in the Firth of Clyde. Though apparently extensively distributed, it seems to be a rare species, as seldom more than one or two specimens are obtained in any single gathering.

Fam. VI. DIASTYLIDÆ.

Gen. DIASTYLIS, *Say*, 1818.

(17) DIASTYLIS RATHKEI (*Krøyer*).—This appears to be the largest of the British species of *Diastylis*, some of the specimens in my collection measuring about 15 millimetres in length. It has been obtained in the Firth of Forth, in the Moray Firth, and at Tarbert, Loch Fyne.

(18) DIASTYLIS RUGOSA, *G. O. Sars*.—This seems to be more widely distributed than the last. I obtained it in East Loch Tarbert in 1886. The late Dr. Robertson records it from Loch Ranza and Blackwaterfoot, Arran, and it has been captured in Loch Etive, the Firth of Forth, and one or two other places, but nowhere very plentifully.

(19) *DIASTYLIS LUCIFERA* (*Krøyer*).—I have notes of this species from the Clyde district, and also from the Firth of Forth. It was recorded for the Moray Firth district by the late T. Edward of Banff; and quite recently it was captured, along with some other interesting organisms, by Mr. H. C. Williamson, while tow-netting in the Bay of Nigg, near Aberdeen.

(20) *DIASTYLIS ROSTRATA* (*Goodsir*).—According to Sars, the *Alauna rostrata* of Goodsir is identical with *Diastylis levis*, Norman, and, being the older name, is adopted by him. This Cumacean was recorded for the Firth of Forth by Henderson in December 1884.<sup>1</sup> It was dredged at Blackwaterfoot, Arran, in 20 fathoms, by the late Dr. Robertson; and it has been obtained in some gatherings collected by tow-net off Aberdeen by the Fishery steamer "Garland."

(21) *DIASTYLIS TUMIDA* (*Lilljeborg*).—This somewhat rare species was dredged at Blackwaterfoot, Arran, in 20 fathoms, by the late Dr. Robertson. A specimen from the Moray Firth, from 130 fathoms, measures fully 7 millimetres in length. This species has the basal portion of the telson cylindrical, and nearly as long as the tapering distal portion.

(22) *DIASTYLIS ECHINATA*, *Spence Bate*.—This species is recorded for the Moray Firth by the late T. Edward of Banff.<sup>2</sup>

(23) *DIASTYLIS SPINOSA*, *Norman*.—Taken at Blackwaterfoot, Arran, in 20 fathoms, and at low water on the west side of Helensburgh pier (Robertson). One or two specimens of a *Diastylis* which appear to belong to this species were dredged at the mouth of the Clyde, in 64 fathoms, between the Mull of Cantyre and Corsewall. I have *D. spinosa* also from the Firth of Forth, collected off North Berwick, 10-15 fathoms, in March 1891, but it has only recently been identified.

#### Gen. *DIASTYLOIDES*, *G. O. Sars*, 1900.

(24) *DIASTYLOIDES BIPPLICATA*, *G. O. Sars*.—This appears to be a moderately frequent as well as generally distributed species around the Scottish coasts. The late Dr. Robertson records it from Blackwaterfoot, Arran, where it was dredged in 20 fathoms. I have obtained a number of specimens in the deep water (40 fathoms) between Arran and the Ayrshire coast; in 64 fathoms at the mouth of the Clyde estuary; and it has also been dredged near the head of Loch Fyne. On the east coast I have obtained it in moderate abundance in a gathering from 50 fathoms, collected about 7 miles east by south of Girdleness; and in considerably over 100 fathoms in the Moray Forth, off Rosehearty. The *Diastylis lamellata*, Norman, is a synonym of this species.

<sup>1</sup> "Proc. Roy. Phys. Soc.," vol. viii. p. 311 (1883-1885).

<sup>2</sup> "Life of a Scotch Naturalist," by Samuel Smiles, p. 431 (1877).

Gen. LEPTOSTYLIS, *G. O. Sars*, 1869.

(25) LEPTOSTYLIS VILLOSA, *G. O. Sars*.—A number of specimens of this small Cumacean were obtained in a tow-net gathering collected in April 1896, in about 40 fathoms, between Arran and the coast of Ayrshire. There is no previous record of this species from the Firth of Clyde, and it is also an addition to the British fauna. The members of this genus have a much smaller telson than *Diastylis*, and the abdomen and uropods are proportionally more slender. In *Leptostylis villosa* the serration of the antero-lateral margins of the carapace is peculiar; the “teeth” are not like those of a saw, but are rather hatchet-shaped; the margins here are perforated at slight intervals, and each perforation widens inwardly and ends in a rounded base, and thus each “tooth” is wider at the outside edge than it is inside. Sars describes these serrations as *lamellar*.

## Fam. VII. PSEUDOCUMIDÆ.

Gen. PSEUDOCUMA, *G. O. Sars*, 1865.

(26) PSEUDOCUMA CERCARIA (*van Beneden*).—This is a generally distributed and moderately common species, and is generally more frequent in shallow sandy bays, but is also found in deep water. I have notes of its occurrence from almost every portion of the Scottish coast examined by me, *i.e.* the Firth of Forth, the Moray Firth, the Firth of Clyde, etc.

(27) PSEUDOCUMA SIMILIS, *G. O. Sars*.—I have obtained this species in a gathering of Crustacea from moderately deep water near the mouth of the Firth of Clyde, collected on 7th December 1899, but only recently examined, only a single specimen—a female—was observed. This species resembles *Pseudocuma cercaria* so closely, that it has only lately been recognised and described by Professor Sars. Now that its characters have been disclosed, its identification, when examined under the microscope with a  $\frac{1}{2}$  or  $\frac{1}{4}$  inch objective, is comparatively easy. It may be distinguished from *Pseudocuma cercaria* by the following characters: (1) the rostrum (*pseudorostral projection*) is less produced, and therefore its lateral margins are much less oblique, being nearly at right angles to the dorsal edge; (2) at the antero-lateral corners of the *pseudorostral projection*, where the oblique lateral plicæ of the carapace terminate, there are three small but distinct teeth; (3) the basal stem of the uropods is proportionally longer, being at least equal in length, if not fully longer than the branches.

Gen. PETALOSARSIA, *Stebbing*, 1893.

(28) PETALOSARSIA DECLIVIS (*G. O. Sars*).—This small species was taken in the Firth of Forth (Largo Bay) in March 1891, in the

Moray Firth in 1893, and about 6 to 7 miles east by south of Girdleness, in 50 fathoms, in May 1898. In this last gathering *Petalosarsia* was moderately frequent, and both males and females were obtained. This Cumacean was described in the earlier Scottish records under the name of *Petalomera declivis*, but *Petalomera* was found to be preoccupied, and Rev. Mr. Stebbing proposed *Petalosarsia* as a substitute.

### Fam. VIII. NANNASTACIDÆ.

#### Gen. NANNASTACUS, *Spence Bate*, 1865.

(29) NANNASTACUS UNGUICULATA, *Spence Bate*.—The only records of this species are for the Clyde; I have not yet observed it on the east coast of Scotland, nor do I know of any record of it from the east side. The late Dr. Robertson describes it as “moderately common” about Cumbrae, and the investigations carried on by the Fishery Board for Scotland have shown it to be present in Loch Fyne, in Kilbrennan Sound, and other parts of the Clyde estuary.

#### Gen. CUMELLA, *G. O. Sars*, 1865.

(30) CUMELLA PYGMÆA, *G. O. Sars*.—This diminutive species has apparently a wide distribution around our coasts. The late Dr. Robertson records having “taken it plentifully” at low water, Cumbrae. I have notes of its occurrence at Tarbert, Loch Fyne, in Kilbrennan Sound, and other places in the Firth of Clyde. It was obtained in the Moray Firth in November 1897; in the Firth of Forth in 1890, but only recently identified; and in a gathering of Crustacea, etc., collected by Mr. H. C. Williamson, in Aberdeen Bay, on the 9th of August last (1900).

### Fam. IX. CAMPYLASPIDÆ.

#### Gen. CAMPYLASPIS, *G. O. Sars*, 1864.

(31) CAMPYLASPIS RUBICUNDA (*Lilljeborg*).—This species, which forms the type of an interesting group of Cumaceans, was first noticed in the Firth of Forth, in the vicinity of the Bass Rock, in 1889, and was recorded doubtfully as *Campylaspis affinis*, *G. O. Sars*.<sup>1</sup> Since that time this species has been observed in various other parts of Scotland. It was obtained in the Moray Firth in

<sup>1</sup> “Eighth Annual Report of the Fishery Board for Scotland,” part iii. p. 330 (1890).

1893, along with several other interesting Crustaceans;<sup>1</sup> and afterwards in various parts of the Clyde area, as near Lowburn (Upper Loch Fyne<sup>2</sup>), at Tarbert Bank (Lower Loch Fyne) in moderately deep water (40 fathoms), between Arran and the Coast of Ayrshire,<sup>3</sup> off Ballantrae in 15-20 fathoms, and near the mouth of the Clyde estuary in 64 fathoms. This and the next species have usually been captured on a muddy bottom in moderately deep water, and never in shallow sandy bays. In this species the cephalic shield is smooth, and the colour of the whole animal when alive is bright reddish or purplish, which to the unaided eye appears to be uniform, but under the microscope it breaks up into numerous minute points of colour on a lighter background.

(32) *CAMPYLASPIS COSTATA*, *G. O. Sars*.—This appears to be a rarer species than the last. It was first observed in some material dredged at the mouth of Port Bannatyne Bay, Bute, in November 1866, and, as far as I know, the only other places where it has been obtained are: (1) Tarbert Bank, Loch Fyne, in 17-20 fathoms, amongst some material dredged in December 1899 and March 1900, and kindly forwarded to me by Mr. F. G. Pearcey of the Fishery steamer "Garland"; and (2) in Loch Aber (north-east end of Loch Linnhe), in material dredged in 82 fathoms by the "Garland," and sent to me for examination. The specimens were of a reddish colour.

Thirty-two species of Cumacea are recorded in these notes, but this number would probably be considerably increased if a more thorough investigation were made of the Crustacea around our shores. Many of the Cumaceans are very small and easily overlooked; and the characters which distinguish the different species are correspondingly minute and not easily detected. A careful examination is therefore desirable, even of forms that have a close superficial resemblance to each other, in order to avoid mistaking the one species for the other.

<sup>1</sup> "Annals of Scottish Natural History," 1893, p. 250.

<sup>2</sup> "Fifteenth Annual Report of the Fishery Board for Scotland," part iii. p. 135 (1897).

<sup>3</sup> "Seventeenth Annual Report of the Fishery Board for Scotland," part iii. p. 267 (1899).







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