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ISOPODS

By THOMAS SCOTT, F.L.S.

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NOTES ON SOME SCOTTISH MARINE ISOPODS

By THOMAS SCOTT, F.L.S.,

Naturalist to the Fishery Board for Scotland.

SEVERAL small marine Isopods have occasionally been observed in gatherings of dredged and other material collected during the past six or seven years, but the study of them was for various reasons allowed to stand over. The second volume of Professor G. O. Sars's valuable work on the "Crustacea of Norway," though not yet completed, has been of much assistance to me in the discrimination of these small Isopods, and has permitted of the satisfactory identification of, at least, some of them. The following notes have been prepared with the assistance of the work alluded to, and include references to a few rare species already recorded for Scotland, extending in some cases their distribution in the Scottish seas. A few others are referred to that do not appear to have been previously recorded from any locality in Scotland: one or two of these are also additions to the British fauna.

Changes in the nomenclature of some of the species already recorded are also noticed. For details as to general distribution, etc., the reader is referred to Sars's work mentioned above, as my notes have reference chiefly to Scotland.

APSEUDES TALPA (*Montagu*).

This species is recorded by the late Dr. Robertson of Millport as having been taken amongst the roots of *Laminaria* at the Tan, Cumbrae, in seven fathoms; ¹ so far, this is the only Scottish record for Montagu's species known to me.

TANAIS TOMENTOSUS, *Kroyer*.

This is the *Tanais vittatus* of Bate and Westwood's "British Sessile-eyed Crustacea," and it has been recorded for the Clyde under that name. Professor Sars has shown, however, that Kroyer's name—*Tanais tomentosus*—was published in 1842, whereas Rathke's *Crossurus (Tanais) vittatus* was not published till the following year.

¹ "Amphipoda and Isopoda of the Clyde," Second Part, p. 28. (Dr. Robertson's catalogue is frequently referred to in these notes.)

I found *Tanais tomentosus* more or less common amongst living and dead barnacles on rocks, near low water, at the mouth of East Loch Tarbert, Loch Fyne, in 1886. Dr. Robertson obtained the same species on the wood piles of Millport pier, and on rocks, near low water, Cumbrae.

PARATANAIS BATEI, *G. O. Sars.*

According to Professor Sars, the *Paratanais forcipatus* of Spence Bate is not Lilljeborg's species of that name, but is one previously undescribed; and as it was therefore necessary to rechristen the species, he has named it as above. Thomas Edward is said to have obtained *Paratanais Batei* at Banff, and Dr. Robertson records its occurrence at Cumbrae between tide-marks. I have it from Whiting Bay, Arran, where it was collected in November 1895, and from Tarbert Bank, Loch Fyne, collected in May 1896. The Firth of Forth has also now to be added to the list of Scottish localities for this Isopod—a specimen having been obtained amongst a lot of other Tanaidæ collected off North Berwick in December 1892. It is quite possible there may be some confusion among previous records of *Paratanais Batei*, and that both it and Lilljeborg's species may have been included under Spence Bate's name of *Paratanais forcipatus*. There is, however, one very obvious difference between these two Isopods—*Paratanais Batei* has small but conspicuous black eyes, that are quite distinct even in specimens that have been some years in spirit; in the other species the eyes appear to be altogether wanting, at any rate they are not perceptible in specimens that have been preserved in spirit. The form of the *chela* in these two Isopods is also very different.

LEPTOGNATHIA LILLJEBORGI, *Stebbing.*

This species was described and figured in the "Annals and Magazine of Natural History" for October 1891 by the Rev. T. R. R. Stebbing, from specimens obtained in the sands at Lee and Woolacomb, North Devon, in August 1890. A number of specimens of what is undoubtedly the same species have been taken in the Firth of Forth at various times, and the species seems to be generally distributed in that estuary. In May 1891 it was obtained both in Largo Bay and off Musselburgh. It occurred off North Berwick in December 1892, and off Aberdeen in November 1893; but I have no special records of it since that time. *Leptognathia Lilljeborgi* appears to be somewhat out of place among the species of that genus described by Sars: these all have the "superior antennæ in the female distinctly 4-articulate," whereas in this one the fourth joint is described as "quite rudimentary." In the specimens from the Firth of Forth I have been unable to satisfac-

torily make out a fourth joint; in one or two instances where there was the appearance of a fourth joint examination with a "higher" objective showed that the appearance was produced by the approximation of the bases of the subterminal setæ; for this reason I was inclined at first to consider the species as a member of the genus *Typhlotanais*, the females of which have the superior antennæ 3-articulate, but as the general structure of the antennæ in the male and female, together with the form of the chelæ, do not fit in well with either genus, it is perhaps better to leave this Isopod where it is for the present. In the female the first joint of the superior antennæ is long, but the other joints are short, and the second appears to be hinged to the first joint, for in some of my specimens the short end-joints bend over at nearly right angles to the first, as if the antennæ were being used as grasping organs.

LEPTOGNATHIA LONGIREMIS (*Lilljeborg*).

This species has been obtained in the Firth of Forth, in the Moray Firth, and also in one or two places in the Clyde district. It was first observed in a gathering of micro-crustacea collected off North Berwick in December 1892, and in another gathering from the same locality collected in January 1894. It was obtained in a similar gathering from Guillam Bank, Moray Firth, collected in 1895, and in another collected in June last, by Mr. F. G. Pearcey, at Smith Bank. Moreover, the same species was taken at Tarbert Bank, Loch Fyne, in 1896, and more recently near the head of the same loch. In this species, as well as in the two that follow, the upper antennæ in the female are "distinctly 4-articulate," and show in this respect and in general structure a marked difference from *L. Lilljeborgi*.

LEPTOGNATHIA BREVIREMIS (*Lilljeborg*).

This species, which is smaller than the last, was obtained in the same gatherings with it from the Firth of Forth and the Moray Firth. A few specimens—two of them with ova—were also observed in a gathering collected at Tarbert Bank, Loch Fyne, in 1896. The length of the Forth specimens measured about one and a quarter millimeter.

LEPTOGNATHIA BREVIMANA (*Lilljeborg*).

In this species the outer ramus of the uropods appears as if it were merely a spine-like prolongation of the basal joint, and not a distinct branch. This structural peculiarity forms one of the characters of the species. *Leptognathia brevimana* is comparatively a large species: a few of the specimens from the Firth of Forth measured about 2.7 millimeters, exclusive of antennæ or uropods.

I have specimens that were collected in the Firth of Forth in 1891 and 1892; it has also occurred in material dredged at Guillam Bank, Moray Firth, in 1895, and more recently in a gathering collected by Mr. F. G. Pearcey at Smith Bank.

LEPTOGNATHIA RIGIDA (*Spence Bate*).

Professor G. O. Sars, in his work on the Isopods of Norway (page 26), states that *Paratanais rigidus*, Spence Bate, ought to be referred to *Leptognathia*. Dr. Robertson records this species for the Clyde; it was taken at the roots of *Laminaria* in seven to eight fathoms, near the Tan Buoy, Cumbrae. And I have recorded it for the Firth of Forth; no specimens of the species are, however, in my collection, and it is therefore probable that *Leptognathia Lilljeborgi*, or some other species, has been mistaken by me for this one.

TANAOPSIS LATICAUDATA, *G. O. Sars*.

Professor Sars first described this as a *Leptognathia*, but afterwards changed its name to *Tanaopsis*. Dr. Robertson recorded this species (under the older name) in 1892, from Fairland Point, Cumbrae; and the Rev. Mr. Stebbing, in his paper on *L. Lilljeborgi*, refers to its occurrence at Kames Bay, also in the neighbourhood of Cumbrae. *Tanaopsis laticaudata* appears to be widely distributed around the coast of Scotland. I found it fairly common, and of large size, in Loch Gair (Loch Fyne). Professor Sars gives 2.6 millimeters as the average size of the species, but some of the Loch Gair specimens measure fully 3.5 millimeters. I have observed the species in other parts of the Clyde district, and also off Arisaig as well as in the Moray Firth and in the Firth of Forth: specimens from the latter estuary have been in my collection since 1891.

PSEUDOTANAIIS FORCIPATUS, *Lilljeborg*.

This species was moderately common in some material dredged at Guillam Bank in August 1895: both males and females occurred in this material. A few specimens were also observed in a small gathering of micro-crustacea from Smith Bank collected by F. G. Pearcey in June last. These appear to be the only Scottish records of this species hitherto; but, as has been already said, the *Paratanais forcipatus* recorded from the Clyde and from Banff may include both *Paratanais Batei* and the present species.¹

¹ After these Notes had gone to press I obtained a few specimens of *Pseudotanaeis forcipatus* in a gathering of small Crustacea from Tarbert Bank, Loch Fyne, collected 31st March 1897.

GNATHIA MAXILLARIS (*Montagu*).

This Isopod, which is moderately common, is more familiar under the name of *Anceus maxillaris*. *Gnathia* is the generic name established by Leach in 1814, and must, as stated by Professor Sars, be preferred to that of *Anceus* or *Praniza*. *Anceus* (*Praniza*) *Edwardii*, Spence Bate, is, according to Sars, only the female of *Gnathia maxillaris*.

CIROLANA BOREALIS, *Lilljeborg*.

This is the form described in Bate and Westwood's "Sessile-eyed Crustacea" as *Cirolana spinipes*. Dr. Robertson records it from the Clyde, and Mr. Gregor has taken it in the Moray Firth. I have also observed it in both these districts. (*Cirolana Chranichii*, Leach, has also been recorded from the Clyde by Dr. Robertson, but this species I have not yet observed.)

IDOTHEA BALTICA, *Pallas*.

This Isopod is more generally known under the name of *Idothea tricuspidata*, Desmarest. Professor Sars adopts Pallas's name as being prior to that of Desmarest, and also in preference to *Idothea* (*Oniscus*) *marina*, Linné, because he considers it very doubtful if the Linnean name refers to this species. *Idothea baltica*, it is hardly necessary to add, is the most common of our "Sea-sclaters."

IDOTHEA PELAGICA, *Leach*.

The present form has been included with *I. baltica* under the common name of *I. marina* as not being specifically distinct; but Professor Sars remarks that it could not have been the true Leachian species that had been under examination, as it is impossible to confound that species with *I. baltica*. *Idothea pelagica* appears to be much less common than the other; it is also considerably smaller in the adult stage. Dr. Robertson records this species from Cumbræ, Firth of Clyde, and states that it has been taken at various localities on the English, Scottish, and Irish coasts. In 1886 I collected a number of specimens, male and female, at East Loch Larbert, Loch Fyne. Some of the latter which carried ova did not exceed 7 millimeters in length.

I would note in passing that there are two other species of *Idothea* described by Professor Sars that may also occur on the coast of Scotland, viz. *Idothea neglecta*, G. O. Sars, and *Idothea viridis* (Slabber). The first is not unlike *I. pelagica* in general appearance, but is larger, and has the inferior antennæ longer and more slender; this species is more or less abundant along the whole Norwegian

coast. The second has been taken "rather plentifully in the Christiania Fjord in quite shallow water among eel-grass"; it is also recorded by Hoek from both the Dutch and French coasts. *I. viridis* is nearly of the same length as *I. pelagica*, but is much narrower, "being more than four times as long as broad," and is of a uniformly greenish colour.

ASTACILLA LONGICORNIS (*Sowerby*).

This is the *Arcturus longicornis* of Bate and Westwood's "Sessile-eyed Crustacea." It has been shown, however, that *Arcturus* is not only of later date than *Astacilla*, but refers to a different genus. *Astacilla longicornis* is, under the name of *Arcturus*, recorded from several Scottish localities. Sars considers the *Arcturus gracilis* of Goodsir to be the adult male of *A. longicornis*.

ARCTURELLA DILATATA, *G. O. Sars*.

The late Dr. Robertson records this for the Clyde under the name of *Leacia dilatata*. Professor Sars has, for reasons stated by him, established a new genus (*Arcturella*) for this Isopod. Dr. Robertson's is the only Scottish record known to me for this species.

IÆRA MARINA (*Fabricius*).

Professor Sars adopts Fabricius' specific name in preference to *albifrons* of Leach. "There cannot," he says, "be any doubt that the *Oniscus marinus* of O. Fabricius is this species," and, being the older name, ought to be preferred to that of Leach. He is also doubtful if the *Iæra Nordmanna* figured by Bate and Westwood is Rathke's species of that name; it seems rather to be the male of *I. marina*.

MUNNA BOECKI, *Kroyer*.

This species may be distinguished from *Munna Kroyeri* by its greater size, and especially by the structure of the superior antennæ in the adult and by the armature of the caudal segment. The flagellum of the superior antennæ in the adult is usually six-jointed, but in immature specimens the number of joints is less; the caudal segment resembles that of *M. Kroyeri* in having the anterior portion of both margins armed with a few prominent spiniform teeth, but differs in having the apical lamellæ also coarsely serrated. A number of specimens of *M. Boeckii* with ova occurred in a gathering of the micro-crustacea from the vicinity of Ailsa Craig, Firth of Clyde, collected in April 1897, and it has also been obtained in Kilbrennan Sound. In the Moray Firth and in the Firth of Forth immature specimens apparently belonging to the same species have also been observed.

MUNNA KROYERI, *Goodsir*.

Goodsir described this species from specimens obtained in the Firth of Forth, where I have also taken it. Dr. Robertson records *M. Kroyeri* from the vicinity of Cumbrae, Firth of Clyde; it does not appear to be a very common species. *Munna Whiteana*, Spence Bate and Westwood, which has also been recorded for the Clyde, is, according to Sars, only the female of *M. Kroyeri*. This species, it may be noted, has the anterior portion of the margins of the caudal segment toothed as in *M. Boeckii*, but the apical lamellæ are not serrate.

PARAMUNNA BILOBATA, *G. O. Sars*.

I collected a number of specimens of this Isopod in East Loch Tarbert, Loch Fyne, in 1886, but being unable at that time to determine the species, they were put aside and forgotten. Last year, when examining a small gathering of micro-crustacea collected by F. G. Pearcey at Otter Spit, Loch Fyne, I observed this species, and recorded it in "The Annals of Scottish Natural History" for January last, stating that it appeared to be new to the British fauna; shortly afterwards the East Loch Tarbert specimens collected in 1886 turned up. Besides these Clyde records, I have now also to record *Paramunna* for the Firth of Forth, having found it in gatherings of micro-crustacea collected in that estuary in 1894 and 1895.

PLEUROGONIUM RUBICUNDUM, *G. O. Sars*.

I have obtained this little Isopod in gatherings of micro-crustacea from the Firth of Forth collected in 1894 and 1895, and also from Aberdeen Bay, but it seems to be a scarce species. In this species the lateral extremities of the four anterior segments of the mesosome are rounded or only slightly angular, and have each a short, straight, and blunt-pointed spine projecting from the middle of them. I have not yet observed this species in the Clyde, but it may likely occur there also. Off Montrose, 1892.

PLEUROGONIUM INERME, *G. O. Sars*.

The late Dr. Robertson has dredged this species off Farland Point, Cumbrae, Firth of Clyde, and records it in the second part of his catalogue of Clyde Amphipods and Isopods. It also occurred amongst some micro-crustacea from South Bay, Firth of Forth, collected in April 1891, of which this is the first record: one or two of the Forth specimens carried ova. *Pleurogonium inerme* is somewhat like the last species, but it wants the lateral spines; it appears to be rare in the Scottish seas. Also in Moray Firth, May 1893.

PLEROGONIUM SPINOSISSIMUM, *G. O. Sars.*

Dr. Robertson records this species also from the Clyde, having obtained it in the same locality with the other. This appears to be the only Scottish record of the species hitherto. Though no specimens of *Pleurogonium spinosissimum* have yet been observed during our researches round the coasts of Scotland, I have had the opportunity of examining specimens from other places. The extremities of the body segments are remarkably angular in *P. spinosissimum*. In all the three species the body is comparatively broad and considerably depressed, and as the legs are slender and easily broken perfect specimens are hardly obtainable.

PSEUDARACHNA HIRSUTA, *G. O. Sars.*

This is another of the curious Isopod species that have been discovered by Professor Sars. A single specimen of a Crustacean apparently belonging to this species was obtained in a small gathering collected by F. G. Pearcey in the Moray Firth in June last; it was taken on a muddy bottom, in about 40 fathoms, north-east of Lossiemouth. In this species the forehead is broadly rounded and is sparsely fringed with short hairs.

EURYCOPE (?) PHALANGIUM, *G. O. Sars.*

In my "Fishes and Invertebrates of Loch Fyne," published last year, I record *Eurycope phalangium*. I have now obtained what appears to be the same species in a gathering of micro-crustacea from the Firth of Forth collected in 1895: it appears to be a rare species.

There are still one or two other small Isopods to record, but they require further study and will have to stand over for a short time.

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