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CRANGONIDÆ

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SOME NOTES ON THE SCOTTISH CRANGONIDÆ.

By THOMAS SCOTT, F.L.S.

THE chief purpose of the following notes is to bring together the various scattered records of the Scottish species of the family Crangonidæ that have been published from time to time.

The best-known species of the family is the common shrimp, *Crangon vulgaris* (Linn.), which the Rev. Mr. Stebbing describes in his felicitous style as being "apparently in the zoological ideas of many persons not only the typical shrimp, the shrimp *par excellence*, but the only shrimp."¹

At the time of the publication of Professor Bell's "History of the British Stalk-eyed Crustacea," little appears to have been known regarding the distribution of the Crangonidæ in the Scottish seas, for although six species are described by that author, the only direct reference made to Scotland is in connection with *Crangon spinosus* (Leach), where, at page 262, he remarks: "I have a specimen taken by my friends Professor Forbes and Mr. M'Andrew, off Shetland." But since Professor Bell's day many observers have been in the field, and the distribution of the Crangonidæ in the Scottish seas has received much attention, with the result that ten species are now included in the marine fauna of Scotland; they comprise nine species of *Crangon*, together with *Sabinea septemcarinata*.

I will briefly mention in their order a few of the works published subsequent to that of Professor Bell, in which more or less prominence is given to the Scottish Crangonidæ.

1. The Rev. A. M. Norman, "Last Report on Dredging among the Shetland Isles" (published in the Report of the British Association for 1868), records *Crangon vulgaris*, *C. Allmanni*, *C. fasciatus*, *C. trispinosus*, *C. spinosus*, *C. echinulatus*, and *Sabinea septemcarinata*.

2. Prof. MacIntosh, "The Marine Invertebrates and Fishes of St. Andrews," published in 1875, records only *Crangon vulgaris*.

¹ "A History of Crustacea," vol. lxxiv. of the International Scientific Series, p. 225.

3. In Smiles' "Life of Thomas Edward," published in 1877, five species of *Crangon* are included in the list of Moray Firth Crustacea, viz.—*C. vulgaris*, *C. spinosus*, *C. sculptus*, *C. trispinosus*, and *C. Allmanni*.

4. "The Invertebrate Fauna of the Firth of Forth," by Leslie and Herdman, published in 1881, contains records of *Crangon vulgaris*, *C. Allmanni*, and *C. nanus*.

5. "The Decapod and Schizopod Crustacea of the Firth of Clyde," by Dr. J. R. Henderson, published in 1886, contains records of *Crangon vulgaris*, *C. spinosus*, *C. sculptus*, *C. nanus*, *C. Allmanni*, *C. echinulatus*.

6. In the "Fourth Annual Report of the Fishery Board for Scotland," Appendix F, No. viii. 1886, is a paper by the Rev. A. M. Norman, containing interesting observations on *Crangon neglectus* and *C. fasciatus*.

Several other papers, including some by myself, published in the Annual Reports of the Fishery Board for Scotland, will be referred to, where necessary.

Dr. Henderson, in his work on the Clyde Crustacea, includes the genus *Nika* in the family Crangonidæ, but Bell, Spence Bate ("Challenger" Macrura), and the Rev. T. R. R. Stebbing, exclude it. Professor Bell places *Nika* in the family Alpheidæ, but the other two authors named make it the type of the family Nikidæ.

The nine species of *Crangon* recorded from Scottish waters are by some writers grouped under four genera, viz. : CRANGON, Fabricius, represented by *Crangon vulgaris* and *Crangon Allmanni*. PONTOPHILUS, Leach, represented by *Crangon spinosus*. CHERAPHILUS, Kinahan, represented by *Crangon trispinosus*, *Crangon echinulatus*, *Crangon neglectus*, and *Crangon nanus*. And EGEON, Risso, to which is assigned *Crangon fasciatus* and *Crangon sculptus*. I propose, however, to treat of them all under the old and more familiar name of *Crangon*; the *Sabinea*, for which there appears to be but the one record, being kept separate.

REMARKS ON THE SPECIES.

CRANGON VULGARIS (*Linn.*).—This is one of the largest as well as the commonest of the Scottish species of *Crangon*. It is a littoral species, and is found all around our shores where the beach is sandy.

The rostrum is moderately broad at the base, but tapers towards the apex, which is rounded. The carapace, or shield, is comparatively smooth, and is furnished in front with three moderately prominent spine-like teeth, one on each side, and one in the middle behind the rostrum; the three teeth are nearly in line, but the middle one is slightly posterior to the others. The remaining segments are smooth and evenly rounded on the dorsal surface, except that in some specimens there is a slight flattening or depression along the middle dorsal aspect of the last segment. The colour is usually a "speckled grey." One of the largest specimens, with ova, in our collection measures 70 millimeters from the point of the rostrum to the extremity of the "tail"; but larger specimens may sometimes be observed.

CRANGON ALLMANI, *Kinahan*.—This is also a common species, and is perhaps as common and generally distributed as the last, but being confined to deeper water is not as frequently noticed by the casual observer. It has a moderately close resemblance to *C. vulgaris*, but scarcely attains so large a size. The carapace, as in *vulgaris*, is comparatively smooth, and has similar spine-like teeth in front; the remaining segments are also smooth, except that in the last one there is a distinct groove bordered on each side by a prominent ridge which extends the whole length or nearly so of its dorsal aspect. Moreover, the rostrum is not only distinctly narrower, but it is more cylindrical; the specimens are also usually of a brownish colour rather than grey. The largest ova-bearing specimens in our collection range from 55 to 58 millimeters in length from the point of the rostrum to the end of the tail.

CRANGON TRISPINOSUS (*Hailstone*).—This species resembles in some respects a small *Crangon vulgaris*, especially in the armature of the carapace, or shield, but the colour is somewhat different, and so also is the form of the rostrum. In this species the rostrum is comparatively short and broad, its sides are nearly parallel, and the apex, instead of being rounded, is subtriangular. Moreover, the arrangement of the three spines on the front of the carapace is somewhat different from that usually observed in *Crangon vulgaris*, in which species the middle spine is slightly posterior to those at the sides, while in *C. trispinosus* the two side spines are slightly posterior to the middle one—a difference readily noticed if one looks across the back of the specimen; the same difference is observable between *C. trispinosus* and *C. Allmanni*. The abdominal segments are all comparatively smooth, and evenly rounded on the dorsal aspect, but a shallow groove extends along the middle of the proximal half of the telson, or middle tail-piece. A female with ova taken in Aberdeen Bay measured about 26 millimeters from the extremity of the rostrum to the end of the telson.

I have examined specimens of *C. trispinosus* from the Firth of

Forth, Aberdeen Bay, and the Moray Firth. It is one of the species recorded by Thomas Edward, of Banff, and the Rev. A. M. Norman has recorded it from Shetland, but it has not yet been observed in the Clyde, nor do I know of any record of it from any place on the west of Scotland.

CRANGON FASCIATUS, *Risso*.—In this species the rostrum is comparatively short and broad, with an abruptly truncate apex, in fact the apex, instead of being rounded, is sometimes slightly concave. The carapace bears a single central spine, situated a short distance behind the base of the rostrum: "on either side of the spine and between it and the margin are three slight lobe-like folds. Between this portion of the carapace and its hinder margin is a deeply-cut sulcus, arching forwards at the sides. There are two transverse bands of dark brown, one across the fourth segment of the abdomen and the other across the telson and uropods."¹

This is apparently a rare species in the Scottish seas. I know of only two localities where it has been obtained; these are—Shetland, where five specimens were obtained by the Rev. A. M. Norman in 1868; and off Musselburgh, Firth of Forth, where two specimens were captured in four to five fathoms.² It is a small species; the specimen recorded by Prof. Bell measured six-tenths of an inch (15 mm.) in length, but the Musselburgh specimens measure scarcely more than 10 mm.

CRANGON NEGLECTUS, *G. O. Sars*.—The rostrum in this species, as in the last, is moderately broad, but instead of having the apex abruptly truncate, it is distinctly and evenly rounded. The carapace has a single central spine situated as in *C. fasciatus*, and a "second small tubercle-like spine on the central line behind it"; but the lobe-like folds are wanting, while "the sulcus which in that species defines their lateral regions is much less distinct and deep." This species, like the previous one, has the fourth abdominal segment, and the telson and uropods, adorned with transverse coloured bands, but they are more of a chestnut colour than dark brown.

This small species was first observed in Loch Tarbert (Loch Fyne) in 1886, and afterwards in Largo Bay, Firth of Forth, in eight to nine fathoms, in 1891. One of the Largo Bay specimens in my collection measures about 18 mm. from the apex of the rostrum to the end of the tail. In part iii. of the "Nineteenth Annual Report of the Fishery Board for Scotland," p. 278, I have recorded this species from the Bay of Nigg and the Moray Firth; this was an error, for these specimens were really referable to *Crangon trispinosus*.

CRANGON NANUS, *Kroyer* (= *C. BISPINOSUS*, *Hailstone*, of Bell's "British Stalk-eyed Crustacea").—In this species the rostrum is

¹ See Norman's paper in the "Fourth Annual Report of the Fishery Board for Scotland," 1886, i. p. 156.

² "Ninth Annual Report of the Fishery Board for Scotland," 1891, iii. p. 309.

small and tapers gradually to the narrow but boldly-rounded apex. The carapace is armed with two small spines on the median line, one being situated a short distance from the base of the rostrum, while the other is intermediate between it and the posterior margin. The carapace is also adorned with numerous minute tubercles arranged more or less in longitudinal lines, which look like indistinct ridges, the principal one being in line with the two spines already alluded to. The two median spines are more prominent in some specimens than in others, and appear more distinct when the carapace is viewed from the side; the arrangement of the tubercles is also more conspicuous when the specimen is partially dried.

Crangon nanus appears to be generally distributed round the Scottish coasts. It has been recorded from the Firth of Forth (Leslie and Herdman, and others); off Aberdeen; the Firth of Clyde (Robertson and myself); Shetland Islands (Norman, who describes it as common in 40-50 fathoms 5-8 miles east of Balta; also Whalsey Skerries Haddock Ground, and occasionally elsewhere). Two females (with ova) which I measured did not exceed 11 mm. in length.

CRANGON SPINOSUS, *Leach*.—This and the next two species have a spiniferous carapace. The rostrum in *C. spinosus* has a strong spine on each side near its base, so that it has somewhat of a trifid appearance; its apex is bluntly rounded. The carapace is armed with five spiniferous ridges; the central ridge and the one on each side of it usually extend close to the posterior margin, and each is usually provided with three spines; the other two ridges are less complete. The last two segments of the abdomen are flattened along the median dorsal line, the flattened part being bounded on either side by a slightly raised border; a second pair of raised lines are observable on the same segments outside of those already referred to, but these are indistinct unless in partly-dried specimens; the other abdominal segments are very faintly keeled. The telson is flattened or slightly grooved.

Crangon spinosus has been recorded from various Scottish localities. It has not been recorded from the Firth of Forth or St. Andrews Bay, but Sim obtained it off Aberdeen in 1871-72;¹ and it has been taken in the same neighbourhood during the recent investigations on behalf of the Fishery Board for Scotland. It is one of the species recorded for the Moray Firth in Smiles' "Life of Thomas Edward." It is described by Henderson as being "not uncommon in the Clyde," and it is also one of the species recorded by Alex. Patience;² while in his Shetland Report Norman describes

¹ "Scottish Naturalist," vol. i. p. 184.

² "Millport Mar. Biol. Stat. Communications" (Nov. 1900), p. 30.

it as common. The larger specimens in our collection range from 45 to fully 50 mm. in length from the apex of the rostrum to the extremity of the tail.

CRANGON ECHINULATUS, *M. Sars* (= *C. SERRATUS*, *Norman*¹). This species was discovered about the same time by M. Sars and Norman, unknown to each other, but Sars' description appears to have been first published.

In this species the rostrum is nearly as in *C. vulgaris*, being moderately narrow, and tapering to the somewhat acute apex. The armature of the carapace resembles that of *C. spinosus*. Five ridges, one central and two on each side, extend nearly the whole length of it, while posteriorly a short ridge terminating in a small tooth at its anterior end occurs on each side of the central ridge. The central ridge is usually armed with three teeth, and the principal ridge on each side of it with five or six, but the other two lateral ridges have usually only two teeth near the proximal end. All these teeth are depressed and directed forwards. The third, fourth, and fifth abdominal segments are keeled along the median dorsal line; the dorsal surface of the sixth is flattened and slightly grooved, and the telson is also slightly grooved at the base.

The species appears to be widely distributed, but the only localities from which it has been recorded are the Shetland Islands and the Hebrides, where it was discovered by the Rev. A. M. Norman; off Skate Island, Loch Fyne, where Dr. Henderson obtained a single specimen; and near the mouth of the Clyde estuary, where it was found moderately frequent by the fishery steamer *Garland*.

A female (with ova) measured 34 mm., and another specimen (without ova) 45 mm. in length.

CRANGON SCULPTUS, *Bell*.—This species, which appears to be rare in Scottish waters, I have not seen. The only Scottish records known to me are the following:—(1) two specimens were captured in five fathoms in Lamlash Bay, Firth of Clyde (Norman); (2) a single specimen was dredged in twenty fathoms off Muggie Point, Little Cumbrae (Henderson); and (3) the species is recorded for the Moray Firth in Smiles' "Life of Thomas Edward."

The following brief description of the species is derived from Bell's "British Stalk-eyed Crustacea":—Rostrum short and comparatively broad, and abruptly truncate at the apex. The armature of the carapace resembles that of *C. spinosus*. The abdominal segments have their dorsal surface distinctly sculptured, the raised portions being polished, while the depressions are slightly pubescent. The third, fourth, and fifth segments are distinctly keeled, but the sixth segment and telson are channelled. The rostrum in this species appears to resemble very closely that of *C. fasciatus*.

¹ "British Assoc. Rept. for 1861" (pub. 1862), p. 151.

SABINEA SEPTEMCARINATA, *Sabine*.—One of the principal points of difference between *Sabinea* and *Crangon* is that in the former the second pair of thoracic legs are not chelate but simple. The only known British example of this species was captured in 1861 by the Rev. A. M. Norman sixty miles east of Shetland, at a depth of eighty to ninety fathoms. This is the only species among those enumerated here that has peculiarly arctic distribution; and probably when the seas around the Shetland Islands come to be more thoroughly examined other arctic forms may be obtained.

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