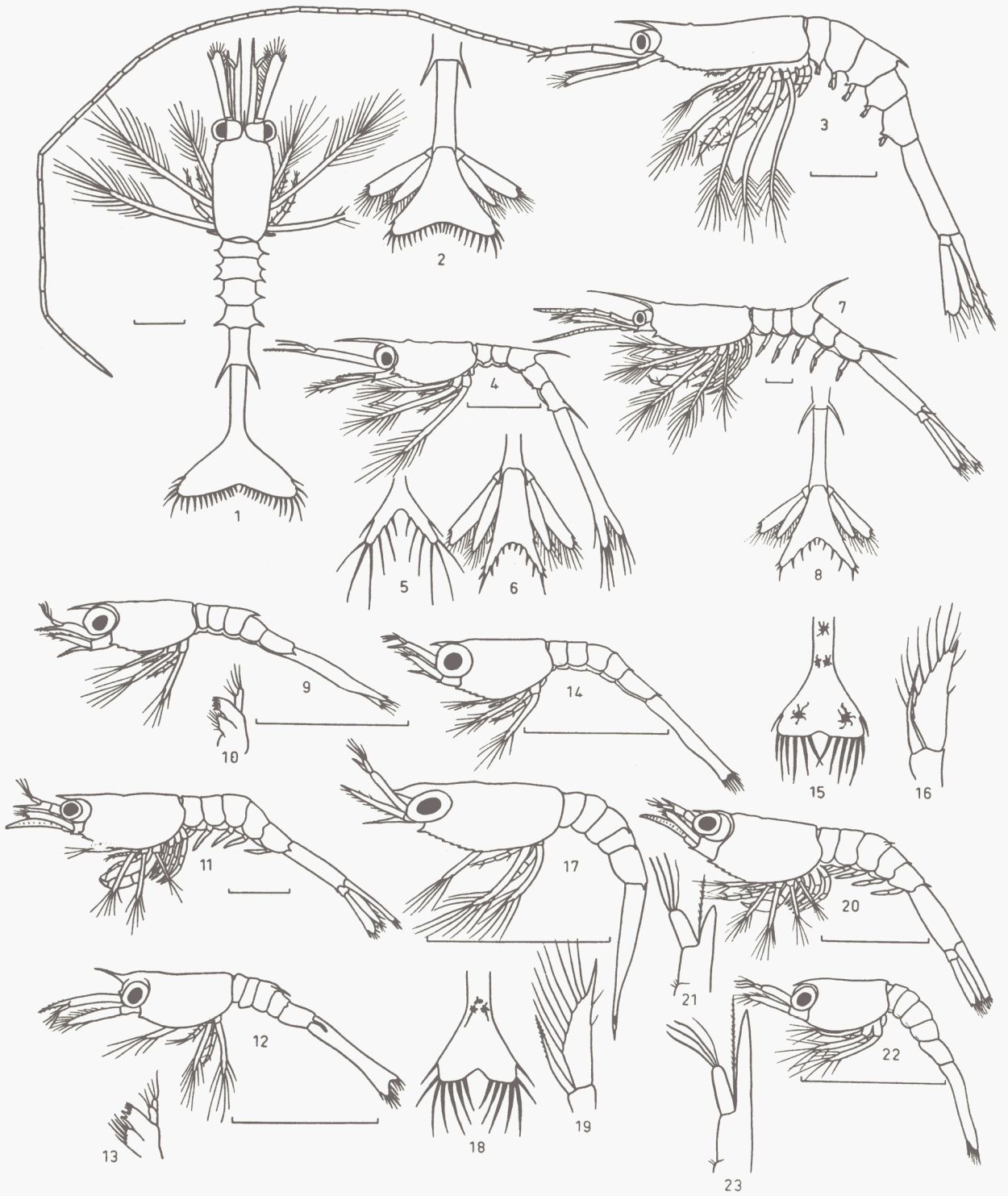


CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 90

CRUSTACEA
DECAPODA: LARVAE
VII. CARIDEA,
Family Crangonidae
STENOPODIDEA
(By D. I. Williamson)
1960



CRANGONIDAE

Key to Genera

- I. Telson with more than 8+8 marginal spines (Figs. 1, 2); larvae longer than 7 mm and without a dorsal spine on abd. 3 SABINEA
Telson with not more than 8+8 marginal spines; those larvae which exceed 7 mm have a dorsal spine on abd. 3 II
- II. Flagellum of antennule at least as long as carapace and segmented in all stages (Fig. 3) PONTOCARIS
Flagellum of antennule shorter than carapace, not segmented or segmented in last stage only III
- III. Telson large, with broad and deep posterior indentation; larvae longer than 5.5 mm and with a prominent dorsal spine on abd. 3 (Figs. 4—8) PONTOPHILUS
Telson normal, with small posterior indentation; the only species which can exceed 5.5 mm lacks spines on abd. 3 IV
- IV. Paired lateral or dorso-lateral spines on abd. 5 only; with or without median dorsal spine on abd. 3; late stages with exopods on maxillipeds and leg 1 only; palp of maxillule 1-segmented (Figs. 9—11) CRANGON
Paired spines (but no median spine) on each of somites 3—5, or no abdominal spines, or pair of small spines on abd. 5 only; late stages with exopods on maxillipeds and on legs 1 and 2; palp of maxillule 2-segmented (Figs. 12—23) PHILOCHERAS

Additional Generic Characters, Identification of Species, and References to Published Descriptions

The approximate range in length between average first stage and average last stage larvae is given where known. Individuals may differ from these averages by up to $\pm 15\%$ in most species.

SABINEA J. C. Ross

Three zoeal stages. Telson very large, with shallow indentation. Palp of maxillule 1- or 2-segmented. No exopods on legs 2—5.

1. *S. septemcarinata* (Sabine). (Figs. 1, 2). Antero-ventral margin of carapace with about 7 denticles. Abdominal pleura 1—4 with 1, 2, 1, 1 ventral spines respectively, that of abd. 5 with a postero-lateral spine. Telson with 16+16 spines in stage I, 13+13 spines in stage III. 7.7—11.5 mm.

Sars, 1890, Pl. V, Figs. 1—23, Pl. VI, Figs. 1—13. Williamson, 1915, Figs. 167—172 (as *Crangon septemcarinatus*, after Sars).

2. *S. sarsi* S. I. Smith. Development undescribed.
3. *S. hystrix* (A. Milne Edwards). Development undescribed.

PONTOCARIS Bate [= EGEON Bosc, = AEGEON Auct.]

Probably 5 zoeal stages. Flagellum of antennule much longer than body in late stages. Palp of maxillule 2-segmented. Exopods develop on legs 1 and 2.

4. *P. lacazei* (Gourret). Larvae undescribed, but probably similar to those of *P. cataphractus*. [*P. cataphractus* (Olivi). (Fig. 3). Mediterranean and Indian Ocean. Antero-ventral margin of carapace denticulate. Abdominal pleura 1—5 each with 1 ventral spine. Dorsal spine on abd. 3.

Caroli, 1921, p. 16 (no fig.).]

Figs. 1, 2. *Sabinea septemcarinata*: 1, stage I; 2, telson of last stage (= III).

Fig. 3. *Pontocaris cataphractus*, stage IV (?), specimen from Naples.

Figs. 4—6. *Pontophilus spinosus*: 4, stage I; 5, telson of same; 6, telson of last stage (=V).

Figs. 7, 8. *P. norvegicus*: 7, last stage (=V); 8, telson of same.

Figs. 9, 10. *Crangon crangon*: 9, stage I; 10, maxillule of same.

Fig. 11. *C. allmanni*, last stage (=V).

Figs. 12, 13. *Philocheras fuscatus*: 12, stage I; 13, maxillule of same.

Figs. 14—16. *P. echinulatus*: 14, stage I; 15, telson of same; 16, antenna of same.

Figs. 17—19. *P. sculptus*: 17, stage I; 18, telson of same; 19, antenna of same.

Fig. 20. *P. bispinosus bispinosus*, last stage (=V).

Fig. 21. *P. bispinosus neglectus*, end of antennule of last stage (=V).

Figs. 22, 23. *P. trispinosus*: 22, stage I; 23, end of antennule of last stage (=V).

Each scale line represents 1 mm (approx.).

[1, 2, 4—11, 14—16 after Sars; 12, 13, 22 after Gurney; 3, 17—21, 23 original.]

PONTOPHILUS Leach

- Five zoeal stages. Abd. 5 bears a pair of prominent dorso-lateral spines. Palp of maxillule 2-segmented. Exopods develop on legs 1 and 2.
5. *P. spinosus* (Leach). (Figs. 4—6). Ventral margin of carapace with about 5 denticles behind anterior spine. Ventral margins of abdominal somites 1—5 each with from 1 to 5 small spines or denticles; no dorsal denticles. 5.5—11.5 mm.
Sars, 1890, Pl. III, Figs. 1—20 (stages I and V). Williamson, 1915, Figs. 174—179 (as *Crangon*, after Sars). Gurney, 1942, Fig. 83 (stage I only).
6. *P. norvegicus* (M. Sars). (Figs. 7, 8). Ventral margin of carapace with about 10 denticles behind anterior spine. Ventral margins of abdominal somites 1—5 and dorsal margins of somites 1—4 each with many denticles. 9.5—16.0 mm.
Sars, 1890, Pl. IV, Figs. 1—20 (stages II, V and megalopa). Williamson, 1915, Figs. 164, 165 (stages II and megalopa, as *Crangon*, after Sars).

CRANGON Fabricius [= CRAGO Lamarck]

Five zoeal stages. Antero-ventral margin of carapace denticulate.

7. *C. crangon* (L.) [= *C. vulgaris* Fabricius]. (Figs. 9, 10). Median dorsal spine on posterior margin of abd. 3. 2.2—4.7 mm.
Sars, 1890, Pl. I, Figs. 1—28. Ehrenbaum, 1890, Pls. I—IV. Williamson, 1901, Pls. I—VI; 1915, Figs. 184—191. Lebour, 1931, Pl. I, Fig. 1, Pl. III, Fig. 2 (stage I only).
8. *C. allmanni* Kinahan. (Fig. 11). No spine on abd. 3. Spines on abd. 5 rather variable in size. 2.8—6.5 mm.
Sars, 1890, Pl. I, Figs. 29—31 (stage V only). Williamson, 1915, Figs. 145—147 (after Sars). Lebour, 1931, Pl. I, Fig. 2, Pl. 2, Figs. 1—8.

PHILOCHERAS Stebbing

Five zoeal stages.

Key to Species

- I. A pair of spines on each of abd. somites 3—5 (Figs. 12, 14, 17, 20) II
Abd. somites without spines (Fig. 22), or a pair of small spines on abd. 5 only V
- II. Spines on abd. 5 blunt, curved at tip and as long as width of abdomen; ventral margin
of carapace without denticles (Fig. 12) *P. fasciatus*
Spines on abd. 5 pointed, straight and shorter than width of abdomen; ventral margin
of carapace denticulate (Figs. 14, 17, 20) III
- III. Ventral margin of carapace with 8—11 denticles behind anterior spine (Fig. 17); without prominent
chromatophores on posterior half of telson (Fig. 18) *P. sculptus*
Ventral margin of carapace with 4—6 denticles behind spine (Figs. 14, 20); a pair of prominent
chromatophores on posterior half of telson (Fig. 15) IV
- IV. The spines on abd. 3 arise from the posterior margin (Fig. 14) *P. echinulatus*
The spines on abd. 3 arise in front of the posterior margin (Fig. 20) *P. bispinosus bispinosus*
- V. Inner ramus of antennule 1—1.5 times as long as outer ramus (Fig. 21) *P. bispinosus neglectus*
Inner ramus of antennule 1.5—2.5 times as long as outer ramus (Fig. 23) *P. trispinosus*

9. *P. fasciatus* (Risso). (Figs. 12, 13). Spines on abd. 4 short and often blunt. 2.2—4.0 mm.
Gurney, 1903, Pl. V, Figs. 1—5, Pl. VI, Fig. 6 (stage I and antennule of stage V, as *Aegeon*). Williamson, 1915, Figs. 152—154 (as *Crangon*, after Gurney). Lebour, 1931, Pl. II, Fig. 9 (stage II only).
10. *P. echinulatus* (M. Sars). (Figs. 14—16). Antennal scale with small terminal spine. 2.5—5.0 mm.
Sars, 1890, Pl. II, Figs. 1—21 (stages I and V, as *Cheraphilus*). Williamson, 1915, Figs. 148—151 (stage I only, as *Crangon*, after Sars).
11. *P. sculptus* (Bell). (Figs. 17—19). Known in stages I and II only. Sometimes with small dorso-lateral spines on abd. 2, as well as on abd. 3—5. Antennal scale with prominent spine. Stage I 2.2 mm.
Lebour, 1931, Pl. I, Fig. 3, Pl. III, Fig. 3 (stage I only).
12. *P. bispinosus* (Hailstone). The smallest known crangonid larvae. 1.3—3.5 mm.
- 12a. *P. bispinosus bispinosus* (Hailstone). (Fig. 20). The spines on abd. 3 arise close to the posterior margin in stage I, further forward in later stages.
Sars, 1890, Pl. II, Figs. 22—27 (stages V and megalopa, as *Cheraphilus nanus*). Williamson, 1915, Figs. 159—163 (as *Crangon nanus*, after Sars). Lebour, 1931, Pl. I, Fig. 5 (stage I only), Pike & Williamson (in the press), Fig. 2 a, b (stage V only).
- 12b. *P. bispinosus neglectus* (G. O. Sars). (Fig. 21). No spines or denticles on ventral carapace margin or abdomen. Antennal scale about 4 times as long as broad in stage I, about 3 times in stage V.
Pike & Williamson (in the press), Figs. 1 a—h, 2 b, c.
- In some areas larvae occur which are intermediate between *P. b. bispinosus* and *P. b. neglectus* (Pike & Williamson (in the press), Fig. 2 f—j). Some have very small spines on abd. 5 only, and some have very small spines on abd. 3—5 and 2 or 3 denticles on ventral carapace margin. Other variants more scarce.

13. *P. trispinosus* (Hailstone). (Figs. 23, 23). Usually without abd. spines, but some specimens have small dorso-lateral spines on abd. 5. Antennal scale about 4 times as long as broad in stage I, about 5 times in stage V. 2.0—4.6 mm.
Gurney, 1903, Pl. VI, Figs. 7—9, 11—14 (as *Aegeon*). Lebour, 1931, Pl. I, Fig. 4, Pl. III, Fig. I (stages I and V).
Williamson, 1910, Pl. I, Fig. 5 (stage I only, as *Crangon*); 1915, Figs. 180—183 (stage I only, as *Crangon*). Pike & Williamson, in preparation, Fig. 2 d, e (antennule and antenna of stage V only).

SCLEROCRANGON G. O. Sars

Larvae do not swim, but cling to pleopods of female. They resemble adult except that uropods are not free and pleopods not fully setose in stage I.

14. *S. boreas* (Phipps). Sars, 1890, Pl. VI, Figs. 14—31.
15. *S. ferox* (G. O. Sars). Koelbel, 1886, p. 51 (no fig.). Wollebaek, 1906, Figs. 1—18.
16. *S. jacqueti* (A. Milne Edwards). Larvae not described.

STENOPODIDEA (= STENOPIDEA)

Stenopus and some other genera hatch without posterior legs and pleopods, and pass through many zoeal stages. Although not recorded from ICES area, larvae of this group may occasionally occur. For keys and descriptions see Gurney (1936) and Lebour (1941). In the two genera recorded, development is abbreviated.

RICHARDINA A. Milne Edwards

17. *R. spinicineta* A. Milne Edwards. Ripe eggs 2.0 × 1.5 mm. Late embryo has all appendages except uropods; telson deeply cleft.
Kemp, 1910a, p. 168 (no fig.) (late embryo only).

SPONGICOLOIDES Hansen

18. *S. koehlerii* (Caullery). Stage I: telson slightly emarginate distally; eyes unpigmented; legs 1—3 chelate, 3rd pair chelae very large; all legs segmented; pleopods "well formed" (probably not setose); uropods not free; 8 mm. Other stages not described.
Caullery, 1896, p. 382 (no fig.) (late embryo only). Kemp, 1910b, p. 409 (no fig.) (newly hatched young only).
19. *S. profundus* Hansen. Eggs few and large. Neither embryo nor larvae described.

References

- Caroli, E., 1921. Rend. 12^a Assemb. Unione Zool. Ital. Trieste, pp. 377—440.
Caullery, M., 1896. In: Koehler, R., Ann. Univ. Lyon, 26: 365—419.
Ehrenbaum, E., 1890. Mitt. Sect. f. Küsten- u. Hochseefischerei, 1890, 124 pp.
Gurney, R., 1903. Proc. zool. Soc. Lond., 1903: 24—30.
— 1936. Discovery Rep. Cambridge, 12: 377—440.
— 1942. *Larvae of Decapod Crustacea*. Ray Soc. Lond., 306 pp.
Kemp, S. W., 1910a. Sci. Invest. Fish. Br. Ire., 1908 (1): 1—190.
— 1910b. J. mar. biol. Ass. U. K., 8: 407—20.
Koelbel, C., 1886. Beob. Ergebn., 3: 51.
Lebour, M. V., 1931. Proc. zool. Soc. Lond., 1931: 1—9.
— 1941. In: Gurney, R., & Lebour, M. V., J. Linn. Soc. Zool., 41: 89—181.
Pike, R. B., & Williamson, D. I., in the press.
Sars, G. O., 1890. Arch. Math. Naturv., 14: 132—95.
Williamson, H. C., 1901. 19th Rep. Fish. Bd. Scot., III, Sci. Invest., pp. 92—120.
— 1910. 28th Rep. Fish. Bd. Scot., III, Sci. Invest., pp. 1—20.
— 1915. Nordisches Plankton, 18, VI Decapoden, I Teil (Larven), pp. 315—588.
Wollebaek, A., 1906. Bergens Mus. Aarb., 11: 1—9.

Distribution of Adults

Region	Species
Gulf of Bothnia	Gulf of Finland 7
Baltic proper	..... 7
Belt Sea	..... 7, 8, 12a
Kattegat	..... 5, 7, 8, 12a
Skagerak	..... 2, 5, 6, 7, 8, 12a
Northern North Sea	..... 5, 7, 8, 9, 10, (11), 12a, 12b, 13
Southern North Sea	..... 5, 7, 8, 9, 12a, 13
English Channel	..... 5, 7, 8, 9, 11, 12a, 13
Bristol Ch., Irish Sea, S.W.Scotland	..... 5, 7, 8, 9, 10, 11, 12a, 12b, 13
Faroe, Shetland, N.Scotland	..... (2), 5, 7, 8, 10, 12a, 12b, 13, 15, 16
Faroe-Iceland area	..... 1, 2, (3), 5, 6, 7, 8, 12b, 14, 15, (19)
W. Ireland and Atlantic	..... 4, 5, 6, 7, 8, 9, 10, 11, 12a, 13, 16, 17
Bay of Biscay	..... 4, 5, 7, 8, 9, 10, 11, 12a, 12b, 13, 17, 18
Norwegian Sea	..... 1, 2, 5, 6, 7, 8, (9), 10, 12a, 12b, 14, 15
Barents Sea	..... 1, 2, 6, 7, 8, 14, 15