

CONSEIL PERMANENT INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton

Sheet 109

CRUSTACEA

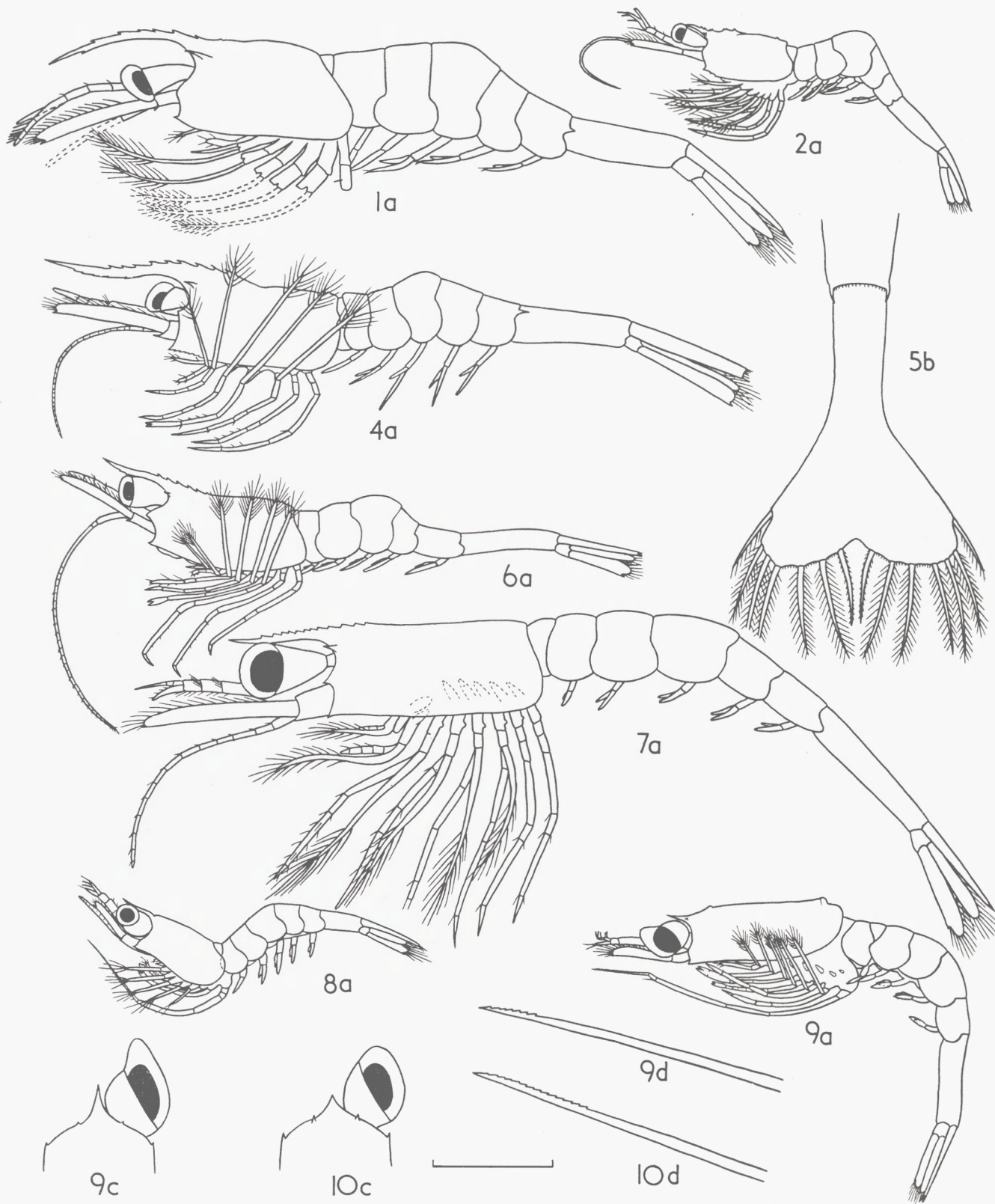
DECAPODA: LARVAE

IV. CARIDEA

Families: Pandalidae and Alpheidae

(By D. I. WILLIAMSON)

1967



1, *?Plesionika martia*. 2, *Pandalina brevisrostris*. (3, *P. profunda*, not illustrated.) 4, *Dichelopandalus bonnieri*. 5, *Pandalus propinquus*. 6, *P. montaguí*. 7, *P. borealis*. 8, *Athanas nitescens*. 9, *Alpheus glaber*. 10, *A. macrocheles*. a, lateral view of last or penultimate zoeal stage. b, dorsal view of telson, stage I. c, dorsal view of eye and front of carapace, late zoeal stage. d, end of 5th leg, late zoeal stage. Scale-line represents 1 mm in relation to fig. 8 a, about 2 mm in relation to all other lateral views. (4-6 after PIKE, 7 after BERKELEY, 8 after SARS, 10 after LEBOUR, remainder original.)

Family Pandalidae

KEY FOR DETERMINATION OF ZOEAL STAGE

1. Uropods absent.....2
Uropods present.....3
2. Eyes fused to head; telson with 7 + 7 setae.....stage I
Eyes stalked; telson with 8 + 8 setae.....stage II
3. Posterior width of telson about twice anterior width.....stage III
Posterior width of telson slightly greater than anterior width.....stage IV
Telson parallel-sided or widest in anterior half.....stage V or later

KEY TO SPECIES

1. Leg buds present from stage IV, only leg 5 uniramous;
stage I: antennal endopod with 3 terminal processes (spines + setae);
stage II and later: length of eye + stalk at least twice width of cornea.....? *Plesionika martia*
Leg buds present from stage I or II, legs 4 and 5 uniramous;
stage I: antennal endopod with 1 or 2 terminal processes;
stage II and later: length of eye + stalk less than twice width of cornea.....2
2. Pair of dorso-lateral spines on abd. 5.....3
No spines on abd. 5.....4
3. Denticles on dorsal posterior margin of abd. 5 in stage I (only); not more than 3 ventral teeth on rostrum in any stage;
no chromatophores on abd. 6, telson or uropods.....*Pandalus propinquus*
No denticles on abd. 5 in any stage; 4-6 ventral teeth on rostrum in stage V and later; chromatophores
on anal region, telson and uropods.....*Dichelopandalus bonnieri*
4.

stage I or II	stage III or IV	stage V or later	
1.5-3 mm	2.5- 4 mm	3.5- 7 mm	<i>Pandalina brevirostris</i>
3-5 mm	4.5- 7 mm	7-10 mm	<i>Pandalus montagui</i>
5-8 mm	7.5-12 mm	12-16 mm	<i>Pandalus borealis</i>

Additional Characters and References to Published Descriptions

Plesionika Bate

1. *P. martia* (A. Milne Edwards). Larva not described but probably of "*Icotopus*" type (see LÉBOUR, 1940). Nine or more zoeal stages followed by gradual transition from larval to adult characters over several moults. Larva in figure 1 a, from off northwest Scotland, may belong to this species.

Pandalina Calman

2. *P. brevirostris* (Rathke). In zoeal stages rostrum never extends beyond middle of antennular peduncle and never bears ventral teeth. Carapace sometimes with 2 marginal denticles behind each pterygostomial spine. Antennal endopod with terminal spine and seta in Stages I and II; tip of exopod segmented in Stages I-III. Leg buds present from Stage II; all exopods functional from Stage V. Seven to nine zoeal stages.
SARS, 1900, Pl. VIII, Figures 3,4 (Stage V). H. C. WILLIAMSON, 1915, Figure 48 (after SARS). LÉBOUR, 1940, Figure 3 (Stage I). GURNEY, 1942, Figure 72 (Stage I). D. I. WILLIAMSON, 1957, Figure 25 (head of Stage IV). BOURDILLON-CASANOVA, 1960, Figure 3 a-h (last zoea and megalopa). PIKE & WILLIAMSON, 1964, Figure 1 A-Q (zoeal stages).

3. *P. profunda* Holthuis. Larvae not described.

Dichelopandalus Caullery

4. *D. bonnieri* (Caullery). Rostrum reaches about to end of antennular peduncle in early zoeal stages, much longer in late stages. Carapace with 5–8 marginal denticles behind each pterygostomian spine. Antennal endopod with terminal spine and seta in Stages I and II; exopod segmented at tip in Stages I and II. Leg buds present from Stage I; all exopods functional from Stage III. Stage I about 5 mm; last zoeal stage (usually Stage VI) 12–18 mm, including rostrum of 2–3.5 mm.
LEBOUR, 1940, Figure 1 a–j (Stages I–V). PIKE & WILLIAMSON, 1964, Figure 2 A–U (zoeal stages).
Not Sars, 1900, Pl. VIII, Figures 5,6. Not H. C. WILLIAMSON, 1915, Figure 44 (after Sars). (These are both *Caridion steveni*; see Sheet 68).

Pandalus Leach

Legs 1–3 with exopods (functional in late zoeal stages) in all European species. Usually 6 zoeal stages.

5. *P. propinquus* G. O. Sars. Very similar to *D. bonnieri*; chromatophores seem to provide only clear differences in Stages II–IV.
PIKE & WILLIAMSON, 1964, Figure 3 A–E (zoeal stages). Not STEPHENSEN, 1912, Figures 22–31. Not H. C. WILLIAMSON, 1915, Figures 51–59 (partly after STEPHENSEN). Not STEPHENSEN, 1916, Figure 17. (These are *P. borealis*; see below.) Not STEPHENSEN, 1935, Figures 21,22. (Probably *D. leptocerus*.)
6. *P. montagui* Leach. Rostrum shortest in Stage III – to 1/3 length of antennular peduncle, longest in Stage I and last zoeal stage – almost as long as peduncle; with 2 ventral teeth in last zoeal stage. No denticles on carapace. Antennal endopod with spine but no seta in Stages I and II; tip of exopod segmented in Stages I–III. Leg buds present from Stage I; all exopods functional from Stage III. Sars, 1900, Pl. VII, Figures 4–11, Pl. VIII, Figures 1,2 (Stage III and last zoea). H. C. WILLIAMSON, 1915, Figures 49, 50 (after Sars). WEBB, 1921, Pl. I, Figure 2 (Stage I). LEBOUR, 1940, Figure 2 (Stage I). PIKE & WILLIAMSON, 1964, Figure 4 A–R (zoeal stages).
7. *P. borealis* Krøyer. Rostrum shortest in Stage III – to middle of antennular peduncle, longest in Stage I and last zoeal stage – to end of peduncle; without ventral teeth in zoeal stages. No denticles on carapace. Antennal endopod with spine but no seta in Stages I and II; exopod never segmented. Leg buds present from Stage I; all exopods functional from Stage II.
STEPHENSEN, 1912, Figures 22–31 (zoeal stages, as *P. propinquus*). H. C. WILLIAMSON, 1915, Figures 51–59 G (zoeal stages, as *P. propinquus*, partly after STEPHENSEN). STEPHENSEN, 1916, Figure 11 (Stage III, as "*Spirontocaris* larva Nr. 4"), Figure 17 (chelae of Stage ?IV, as *P. propinquus*). BERKELEY, 1930, Figures 7 A–P, 8 A–I (zoeal stages).

Family Alpheidae

Key given for determination of zoeal stage under Pandalidae is applicable to Alpheidae except that telson may be parallel-sided in Stage IV.

KEY TO SPECIES

1. Stages I–III less than 2 mm, Stages IV – last zoea less than 3.5 mm; legs 3–5 uniramous. *Athanas nitescens*
Stages I–III more than 2 mm, Stages IV – last zoea more than 3.5 mm; only leg 5 uniramous 2
2. Eye very pointed; dactyl of leg 5 with 6–9 serrations in late zoeal stages; dark brown chromatophores in addition to red and yellow *Alpheus glaber*
Eye almost round; dactyl of leg 5 with about 14 serrations in late zoeal stages; red and yellow chromatophores only. . . *Alpheus macrocheles*

ADDITIONAL CHARACTERS AND REFERENCES TO PUBLISHED DESCRIPTIONS

Leg 5 present from Stage I although buds of legs 3 and 4 do not appear until Stage II or III. About 9 zoeal stages.

Athanas Leach

8. *A. nitescens* (Leach). Stage I about 1.6 mm, last zoeal stage about 3 mm. Sars, 1906, Pls. I–IV (zoeal stages from Stage III and megalopa). H. C. WILLIAMSON, 1915, Figures 108–113 (zoeal stages, after Sars). LEBOUR, 1932, Pl. I, Figure 1; Pl. II, Figures 1–3 (Stages I–III). GURNEY, 1942, Figure 79 A–D (Stage III). D. I. WILLIAMSON, 1957, Figure 22 (Stage III, after GURNEY).

Alpheus Fabricius

9. *A. glaber* (Olivi). Stage I about 2.8 mm, last zoeal stage about 9 mm. COUTIÈRE, 1907, Figures 14 R, 18 (zoeal stages from Stage III, as *A. ruber*). H. C. WILLIAMSON, 1915, Figures 107–107 B (zoeal stages from Stage III, after LO BIANCO and COUTIÈRE, as *A. ruber*). LÉBOUR, 1932, Pl. I, Figure 2; Pl. II, Figures 4,18; Pl. III, Figures 7,8; Pl. IV, Figures 1, 3, 5, 7, 9–15 (zoeal stages and megalopa, as *A. ruber*).
10. *A. macrocheles* (Hailstone). Stage I about 2.4 mm, last zoeal stage about 8.5 mm.
LÉBOUR, 1932, Pl. I, Figure 3; Pl. II, Figures 5–17, 19; Pl. III, Figures 1–6,9; Pl. IV, Figures 2, 4, 6, 8 (zoeal stages and megalopa).

DISTRIBUTION OF ADULTS

Region	Species
Gulf of Bothnia, Gulf of Finland . . .	–
Baltic proper	6
Belt Sea	(2), 6, (8)
Kattegat	2, 6, (7), 8
Skagerrak	2, 6, 7, 8
Northern North Sea	2, 6, 7, 8
Southern North Sea	2, 6, (8)
English Channel	2, 6, 8, 9, 10
Bristol Ch., Irish Sea, S. W. Scotland	2, 4, 5, 6, 8, 9
Faroe, Shetland, N. Scotland	2, 3, 4, 5, 6, (7)
Faroe-Iceland Area	4, 5, 6, 7
W. Ireland and Atlantic	1, 2, 3, 4, 5, 6, 8, 9
Bay of Biscay	1, 2, 3, 4, 5, 8, 9, 10
Barents Sea	3, 6, 7
Norwegian Sea	2, 3, 4, 5, 6, 7, (8)

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