

FICHES D'IDENTIFICATION DU ZOOPLANCTON

Rédigées par
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CRUSTACEA DECAPODA: LARVAE

VIII. Nephropidea, Palinuridea, and Eryonidea

by

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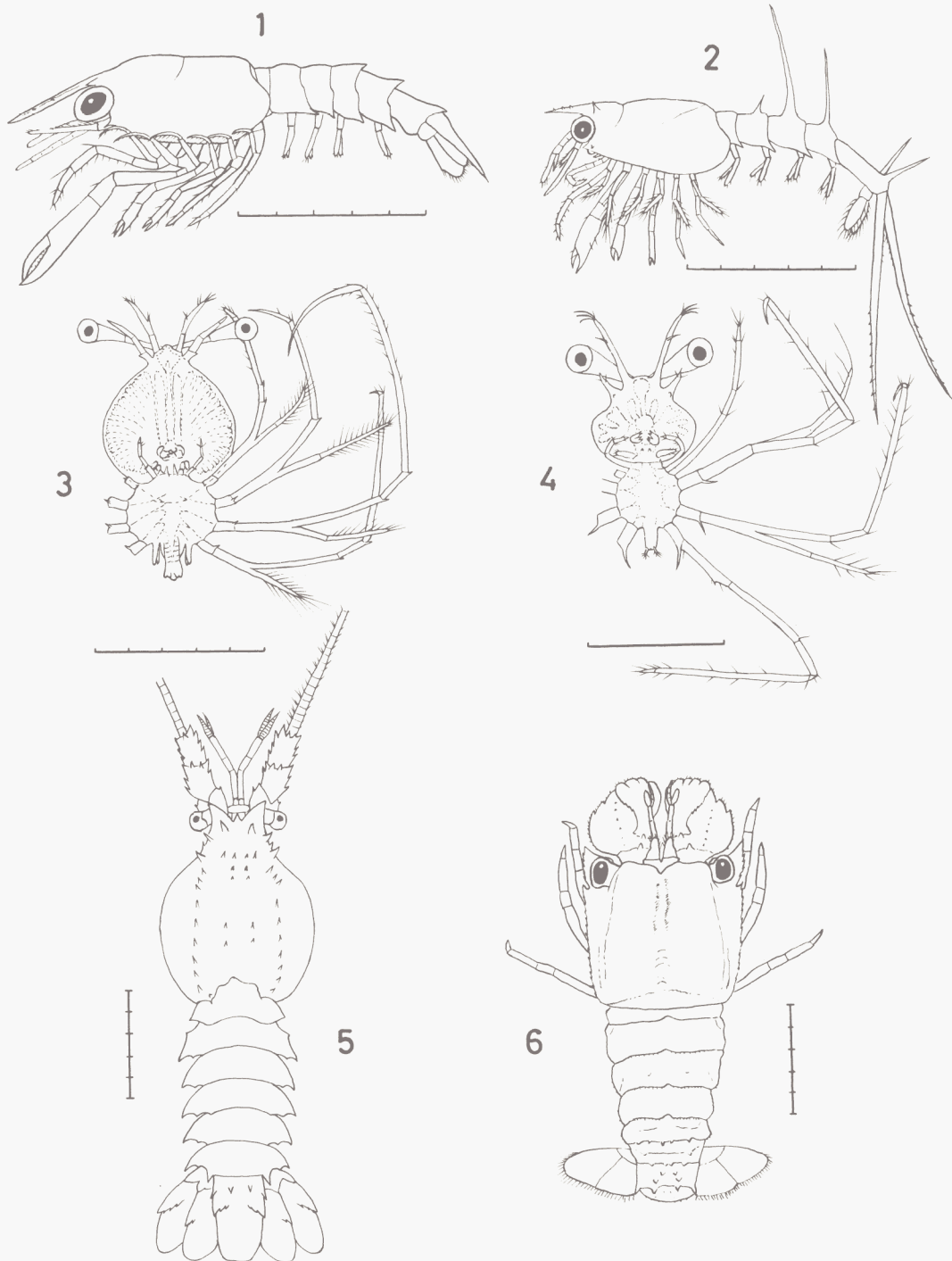
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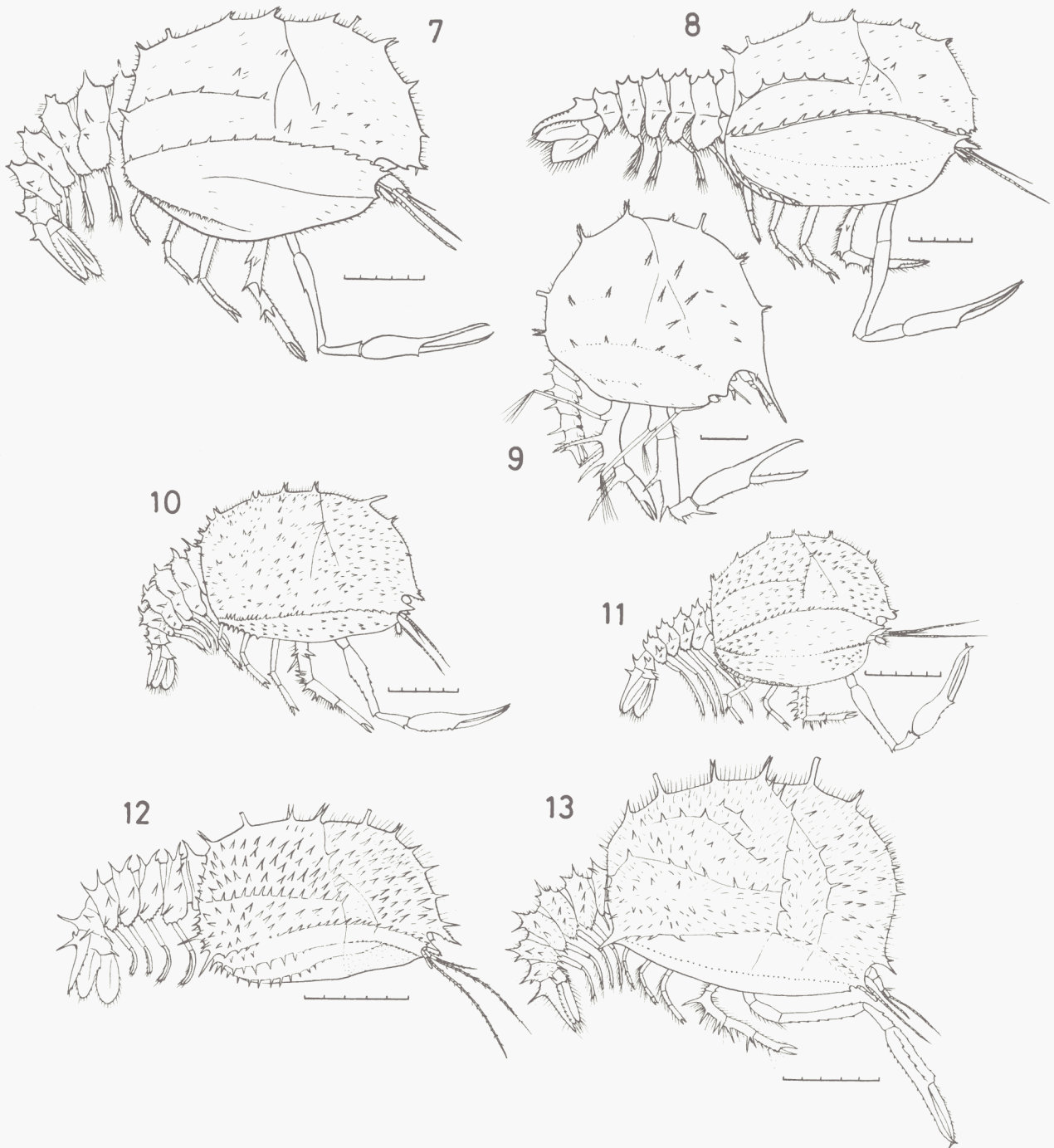
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Figures 1–6: Nephropidea and Palinuridea. 1. *Homarus gammarus*, zoea III. 2. *Nephrops norvegicus*, zoea III. 3. *Palinurus elephas*, phyllosoma III. 4. *Scyllarus arctus*, phyllosoma I. 5. *P. elephas*, puerulus. 6. *S. arctus*, puerulus. Scale of 1 mm shown for Figure 4, 5 mm for all other figures. Figure 1 original; 2 redrawn from Jorgensen (1925); 3,4 from Gurney (1942); 5 from Bouvier (1914); 6 from Fedele (1926).



Figures 7–13: Eryonidea, all in megalopal or juvenile stages except 9. 7. *Eryoneicus spinoculatus*. 8. *E. faxoni*. 9. Zoeal stage, probably of *E. faxoni*. 10. *E. scharffi*. 11. *E. kempfi*. 12. *E. puritanii*. 13. *E. richardi*. Scale of 1 mm shown for Figure 9, 5 mm for all other figures. Figures 7–11 redrawn from Selbie (1914); 12,13 from Bouvier (1917).

NEPHROPIDEA

Nephropidae

Normally three zoeal stages, occasionally four. All zoeal stages with all five pairs of legs segmented, legs 1–3 chelate, legs 1–5 with setose exopods, telson with median spine. Megalopa shows general resemblance to adult.

Homarus Weber

Zoeal stages with dorsal abdominal spines about equal to or shorter than depth of abdomen. Angles of telson not greatly extended; telson shorter than remainder of abdomen.

1. *H. gammarus* (L.). (Fig. 1).

Zoea I, 8–10 mm; zoea III about 12 mm. Sars (1875), Plates 1,2 (as *H. vulgaris*). Chadwick (1905), Figures 1–6. H.C. Williamson (1905), Plates 1–4 (as *H. vulgaris*); (1915), Figures 202–205 (as *Astacus gammarus*, after Williamson, 1905). All publications show zoeal stages and megalopa.

Nephrops Leach

Zoeal stages with dorsal spines on abdominal somites 4–6 much longer than depth of abdomen. Telson a narrow crescent, each half longer than remainder of abdomen.

2. *N. norvegicus* (L.). (Fig. 2).

Zoea I about 6.5 mm; zoea III about 10 mm (excluding prolongations of telson). Sars (1884), Plate 7 (zoea II); (1890), Plate 7, Figure 27 (zoea III). H.C. Williamson (1915), Figures 206, 207 (zoea II, after Sars, as *Astacus norvegicus*). Jorgensen (1925), Plates 1,2 (zoeal stages and megalopa). Santucci (1926a), Plates 1–4 (zoeal stages and megalopa); (1927), Figures 1–22 (zoea I and megalopa). Gurney (1942), Figure 87 (zoea III). Korschelt (1944), Figure 823 (zoea I, after Santucci).

Nephropsis Wood Mason

3. *N. atlantica* Norman. Larvae not described.

PALINURIDEA (= SCYLLARIDEA)

European species pass through at least eight phyllosoma stages: highly modified zoeas in which head and thorax are extremely flattened, abdomen small in early stages. Puerulus (megalopa, nisto, natant stage) shows general resemblance to adult.

Palinuridae

Antenna (A_2) projects beyond eye in phyllosoma IV and all subsequent stages, longer than body in puerulus. Maxilliped 3 with exopod in all phyllosoma stages.

Palinurus Weber

4. *P. elephas* (Fabricius) [= *P. vulgaris* Latreille]. (Figs. 3,5).

Phyllosoma I, 2.9–3.9 mm; last phyllosoma, 20–22 mm. Carapace longer than broad in late phyllosoma stages. Cunningham (1891), Plates 8,9 (phyllosomas I and III). Bouvier (1913a), Figure 1 (puerulus); (1913 b), Figure 1 (puerulus); (1913c), Figure 1 (puerulus); (1914), Figures 1–6 (late phyllosoma stages and puerulus). H. C. Williamson (1915), Figures 193, 194 (phyllosomas I and III, after Cunningham). Santucci (1925a), no figures (9 phyllosoma stages described); (1929b), Plates 1,2 (puerulus). Gurney (1942), Figure 92 (phyllosoma III). Korschelt (1944), Figures 820,821

(last phyllosoma and puerulus, after Bouvier and Santucci). Demirhindi (1959), Figures 2,3, Plates 1–3 (phyllosoma stages and puerulus, some after Williamson and Korschelt).

5. *P. mauritanicus* Gruvel. Larvae not described.

Scyllaridae

Antenna (A_2) shorter than eye in phyllosoma stages, shorter than carapace in puerulus. Maxilliped 3 without setose exopod in phyllosoma stages.

Scyllarus Fabricius

6. *S. arctus* (L.). (Figs. 4,6).

Phyllosoma I, 1.1–1.5 mm; last phyllosoma, 20–28 mm. Carapace broader than long in all phyllosoma stages. Claus (1863), Plate 25, Figures 2–4 (phyllosoma I); Plate 27, Figures 11,12 (phyllosoma VIII) (as *Phyllosoma mediterranea*). Dohrn (1870), Plate 16, Figures 8–10 (phyllosoma stages). Bouvier (1917), Plate 10, Figures 1,2; Plate 11, Figures 1,2 (puerulus, as *Nisto asper* and *N. laevis*); (1940), Plate 3, Figures 6,7 (puerulus, after Bouvier, 1917). Stephensen (1923), Figures 21–24 (phyllosoma stages and puerulus). Santucci (1925b), Plate I (phyllosoma stages). Fedele (1926), Figures 1,2 (last phyllosoma and puerulus). Gurney (1942), Figure 90 (phyllosoma I). Kurian (1956), Figures 127–139 (phyllosoma stages). Demirhindi (1959), Figures 4–6 (after Stephensen), Plates 1,2,4,5 (phyllosoma stages and puerulus); (1960), Plates 1,2 (phyllosoma stages).

ERYONIDEA

Polychelidae

Polycheles Heller and *Stereomastis* Bate

P. typhlops Heller, *P. granulatus* Faxon, *S. sculpta* (S.I. Smith), and *S. grimaldii* (Bouvier) recorded from the ICES area. For identification of larvae and planktonic juveniles, see *Eryoneicus* (below).

Eryoneicus Bate

Species of *Eryoneicus* are planktonic stages in development of species of *Polycheles* and *Stereomastis*, but in some cases specific links between pelagic and benthic forms are unknown or uncertain. Two species of *Eryoneicus* from the ICES area have no known benthic counterpart and two have been linked with *P. typhlops*.

Hatching prezoaeas of *P. granulatus*, total length about 1.4 mm, show most of characters of zoal stage shown in Figure 9 but no appendages behind second legs. All planktonic stages have inflated carapace and at least two pairs of chelate legs. Zoal stages (Fig. 9) have rostrum projecting well beyond antennules, natatory exopods on maxillipeds and legs 1 and 2, other legs and pleopods rudimentary or absent. Megalopal and juvenile stages (Figs. 7, 8, 10–13) have rostrum shorter than antennular peduncle (median rostral spine may be absent but pair of small spines at base of zoal rostrum usually persist), no natatory exopods, legs 1–4 chelate, leg 5 imperfectly chelate or simple, pleopods and uropods functional. Pleopods 1 and 2 may show secondary sexual characters in larger males.

KEY TO SPECIES IN MEGALOPAL AND JUVENILE STAGES

1. Carapace with less than 100 spines, mostly in well-defined rows (Figs. 7, 8) 2
 Carapace with more than 180 spines, some in rows but many scattered between rows (Figs. 10–13) 3
2. Rostral group comprises pair of spines directed anteriorly and small median spine directed ventrally; 1,1,2 frontal spines in mid-line behind rostral group (Fig. 7)..... *E. spinoculatus*
 Rostral group comprises pair of spines directed anteriorly but no median spine; 1,2 frontal spines in mid-line behind rostral group (Fig. 8) *E. faxoni*
3. Rostral group with no median spine; carapace spines between dorsal and lateral carinas not grouped in rows (Fig. 10) *E. scharffi*
 Rostral group includes median spine; at least one spiny carina on branchial region of carapace (Figs. 11–13) 4
4. Rostral group of three spines, of which median spine points ventrally (hidden by projection at inner angle of ocular orbit in Fig. 11) *E. kempi*
 Single rostral spine points anteriorly (Figs. 12, 13) 5
5. Carapace pear-shaped in dorsal view, narrowing anteriorly; spiny process at inner angle of ocular orbit (Fig. 12) *E. puritanii*.
 Carapace almost circular in dorsal view (posterior margin slightly concave); smooth process at inner angle of ocular orbit (Fig. 13) *E. richardi*

ADDITIONAL CHARACTERS AND REFERENCES TO PUBLISHED DESCRIPTIONS

Recorded range of total length given, but smaller zoeal stages probably exist for most species, and complete development not known for any species. Formula gives minimum number of spines and blunt tubercles on mid-dorsal carapace: first figure refers to rostral group; one or two additional single spines may occur on frontal region of some older specimens; t,t = anterior and posterior dorsal tubercles, but these not distinguishable from spines in some species;) = cervical groove. Published descriptions are of megalopal or juvenile stages, except where otherwise stated.

7. *E. spinoculatus* Bouvier. (Fig. 7). 2.3 mm (zoea) – 43 mm. 3,1,1,2,t,1)2,2,t,2. Ascribed to *Stereomastis grimaldii* by Sund (1915). Selbie (1914), Plate 5, Figures 1,2 (as *Eryonicus hibernicus*). Bouvier (1917), Plate 3, Figures 5–8; Plate 4, Figures 1–12. Stephensen (1935), Figures 17–19 (zoea, probably of this species, as *E. groenlandicus*). Bernard (1953), Figures 20(1–4),24 (5,6) (zoeas and older larvae). Belloc and Lorillou (1961), Figures 5,6 (after Bouvier).
8. *E. faxoni* Bouvier. (Figs. 8,9). 3 mm (zoea) – 69 mm. 2,1,2,t,1)2,2,t,2. Ascribed to *Stereomastis sculpta* by Sund (1915). Selbie (1914), Plate 4, Figures 1–5 (as *Eryonicus faxoni*); Plate 4, Figures 6–9 (zoea, probably of this species, as *Eryonicus* sp. juv.). Lenz and Strunk (1914), Plates 13, 14 (as *Eryonicus atlanticus*). Bouvier (1917), Plate 4, Figures 14, 15; Plate 5, Figures 13–16. Gurney (1942), Figure 89 (zoea, after Selbie). Bernard (1953), Figures 20 (5–11), 23(1–7), 24 (7,8) (zoeas and older larvae, some as *E. atlanticus*). Zariquiey Alvarez (1968), Figure 84 b (after Selbie).
9. *E. scharffi* Selbie. (Fig. 10). 26.5 mm (single specimen). 2,2,t)2,2,1,1,2,1,2,2. Selbie (1914), Plate 5, Figures 9–12 (as *Eryonicus scharffi*).
10. *E. kempi* Selbie. (Fig. 11). 25–33 mm. 3,1,1,1,2,1)2,2,1,2. Ascribed to *Polychelus typhlops* by Sund (1915). Selbie (1914), Plate 5, Figures 3–8 (as *Eryonicus kempi*). Zariquiey Alvarez (1968), Figure 84 a (after Selbie).
11. *E. puritanii* Lo Bianco. (Fig. 12). 4.4 mm (zoea) – 28 mm. 1,1,1,1,2,t)2,2,t,2. Ascribed to *Polychelus typhlops* by Bouvier (1940) and Kotthaus (1966). Lo Bianco (1903), Plate 8, Figures 24,25. Bouvier (1917), Plate 4, Figure 13; Plate 5, Figures 1–12; Plate 6, Figures 1,2. Bernard (1953), Figures 21, 24(1,2) (zoea and older larva).

12. *E. richardi* Bouvier. (Fig. 13). 4 mm (zoea) – 33 mm. 1,1,1,1,1,1,2,t)2,2,t,1,1. Bouvier (1917), Plate 6, Figures 3–10; Plate 7, Figures 1–4. Bernard (1953), Figures 22, 24(3,4) (zoeas and older larva). Belloc and Lorillou (1961), Figures 7,8 (after Bouvier).

DISTRIBUTION

Region	Species
Baltic (including Gulf of Bothnia and Gulf of Finland)	—
Belt Sea	(1)
Kattegat	1, 2
Skagerrak	1, 2
Northern North Sea	1, 2, (4)
Southern North Sea	1, (4)
Bristol Channel, Irish Sea, Southwestern Scotland . .	1, 2, 4
Faroe, Shetland, Northern Scotland	1, 2, 3, (4), 7
Faroe-Iceland Area	2, 7, 11
Western Ireland and Atlantic	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12
Bay of Biscay	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12
Barents Sea	—
Norwegian Sea	1, 2, (4)

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