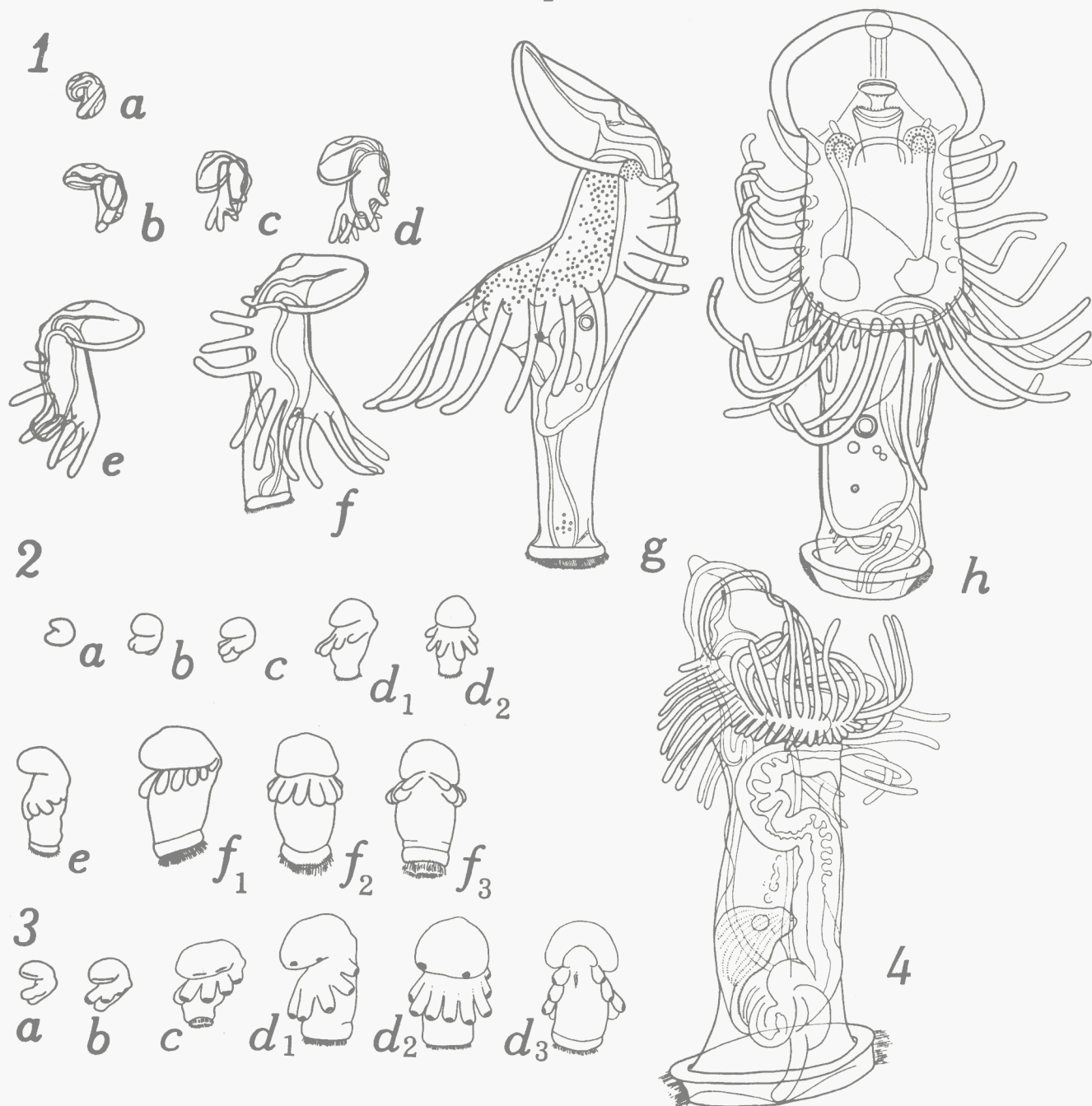


CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 69

PHORONIDEA
Family Phoronidae
ACTINOTROCHA LARVAE
By Liliana Forneris¹⁾
1957

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1. *Actinotrocha branchiata* — Stages of development: a) — four days larva, left side; b) — larva with four tentacles, left side; c) — larva with six tentacles, left side; d) — larva with ten tentacles, left side; e) — larva with twelve tentacles, right side; f) — larva with twenty tentacles, right side; g) — larva with twenty-four tentacles, left side; h) — fully developed larva with twenty-eight larval tentacles and twenty-four definitive ones. $\times 60$ (after Selys Longchamps, 1903, redrawn).
2. *Actinotrocha pallida* — Stages of development: a) — larva devoid of tentacles; b) — larva with two tentacles, left side; c) — larva with four tentacles, left side; d₁ — larva with six tentacles, left side; d₂ — the same, ventral side; e) — larva with eight tentacles, left side; f₁ — larva with ten tentacles, left side; f₂ — f₃ — the same ventral and dorsal sides. $\times 48$ (after Silén, 1954, redrawn).
3. *Actinotrocha hippocrepiia* — Stages of development: a) — larva with four tentacles, left side; b) — larva with six tentacles, left side; c) — larva with eight tentacles, left side; d₁, d₂, d₃ — larva with ten tentacles in left, ventral and dorsal sides. $\times 48$ (after Silén, 1954, redrawn).
4. *Actinotrocha brownei*, right side. $\times 40$ (after Selys Longchamps, 1907, redrawn).

ACTINOTROCHAE

1. *Actinotrocha branchiata* Müller 1846 (technical name).

General characters: — An enormous larva up to more than 2 mm. in length; body transparent with pigmentiferous amebocytes. Up to 16 pairs of larval tentacles; one pair of sanguinary globules, which merge into one at metamorphosis; large stomach with one pair of diverticles. The sensory organ, in front of the apical plate protrudes into a sharp point. Definitive tentacles are formed in two zones under the row of the larval ones, and therefore are divided into two groups of 13 tentacles each. Upon nearing metamorphosis the larva becomes opaque.

Adult: — *Phoronis mülleri* Selys Longchamps 1903, non brood-protecting species.

Stages of Development

| Number of larval tentacles | 0 | 4 | 6 | 10 | 12 | 20 | 24 | 28 | 30—32 |
|----------------------------|-------------------|--|--------|----------------|--|---------------------------------------|--------------------------------|------|---|
| Size (mm.) | 0.11—0.12 | 0.18 | 0.21* | 0.28* | 0.3—0.4 | 0.7 | 1.4 | 1.4 | 2.00 |
| Pigmentiferous amebocytes | — | — | — | — | Present in the hood, around the base of the tentacles and near the anal ciliary ring | idem | idem | idem | idem |
| Anal papilla | Little developed | idem | idem | Well developed | idem | idem | idem | idem | idem |
| Peri-anal ciliated ring | Absent | idem | idem | idem | Present | Fully developed | idem | idem | idem with a diameter of 0.3—0.5 mm. |
| Metasoma | Absent | Absent | Absent | Absent | Present as an ectodermal thickening | Present as a short invagination | Present as an invaginated tube | idem | Present as an inv. tube that involves the stomach |
| Definitive tentacles | — | — | — | — | — | — | — | 24 | 26—28 |
| Stomach diverticles | — | — | — | — | — | — | One pair | idem | idem |
| Sanguinary globules | Absent | idem | idem | idem | idem | idem | One pair | idem | idem |
| Muscles | Absent | idem | idem | idem | idem | Present one pair in the collar region | idem | idem | idem |
| Nephridia | Primordia present | Terminal nephridia open under the anus | idem | idem | Nephridia open ventrally behind the tentacles | idem | idem | idem | idem |

*) deduced from figures.

2. *Actinotrocha pallida* Schneider 1862 (technical name).

General characters: — A small larva up to 0.6 mm. in length, opaque, wholly devoid of pigmentiferous amebocytes; about 5—6 pairs of larval tentacles, only a single sanguinary globule, one non-vacuolated stomach diverticle and one pair of trunk muscles. Definitive tentacles arise from the stumps of the larval ones.

Adult: — *Phoronis pallida* Silén 1952, non brood-protecting species.

Stages of Development

| Number of larval tentacles | 0 | 2—4 | 6 | 8 | 10—12 |
|----------------------------|--------|------------|--------------------|-----------------|--|
| Size (mm.) | 0.09* | 0.13—0.15* | 0.26* | 0.35—0.45* | Live 0.6 Fix. 0.217—0.3 |
| Peri-anal ciliated ring | — | — | — | — | Present? |
| Metasoma | Absent | idem | Primordium present | Fully developed | idem |
| Stomach diverticle | — | — | — | — | A single |
| Sanguinary globules | — | — | — | — | One, on the ventral side anterior to the stomach |
| Muscles | — | — | — | — | One pair in the trunk |

*) deduced from figures.

3. *Actinotrocha hippocrepia* Silén 1954 (technical name).

General characters: — Small larva up to 0.7 mm. in length, more slender and more translucent than the anterior larva; pigment grains present but diffusely assembled; the maximum number of larval tentacles is 5 pairs; there are two sanguinary globules that merge into one in older specimens.

Adult: — *Phoronis hippocrepia* Wright 1856, brood-protecting species.

Stages of Development

| Number of larval tentacles | 4 | 6 | 8 | 10 |
|----------------------------|---------------------|--------------------------------|--------------------|-----------------|
| Size (mm.) | 0.14* | 0.38* | 0.40* | 0.70 |
| Pigment | Present in the hood | idem and also in the tentacles | idem | idem |
| Peri-anal ciliated ring | Absent | Present | idem | idem |
| Metasoma | Absent | idem | Primordium present | Fully developed |
| Sanguinary globules | — | — | — | Two |

*) deduced from figures.

4. *Actinotrocha brownei* Selys Longchamps 1907 (technical name).

General characters: — This larva was insufficiently described; it has as many as 40 larval tentacles and a peri-anal ring of 0.8 mm. in diameter.

Adult: — Unknown.

5. *Actinotrocha* A and B described by Schepotieff are insufficiently characterized.

Further Information on Identification

Generally young larvae swim near the surface and mature ones near the bottom.

1. *A. branchiata*. The larva possesses orange pigment round the base of the tentacles, yellow spots in the hood and near the anal ciliary ring; brown pigment frequently occurs in the stomach diverticula. It swims slowly around, shows no heliotropism and has a pelagic life of 17—20 days. Occurs July to December, maximum August to September. Selys Longchamps, 1903, p. 33, Pl. I, Figs. 3—13; 1907, p. 189, Pl. II, Figs. 23—28. Cori, 1932, p. 129, Figs. 13—15. Thorson, 1946, p. 153, Fig. 85. Silén, 1954, p. 228, Figs. 1, 2.
2. *A. pallida*. Yellowish-white in colour. It is very active, rushing with its tentacles contracted and floating with them expanded. It shows no heliotropism and has a pelagic life of 17—20 days. Occurs July to December, maximum in September. Schneider, 1862, Fig. 3. Selys Longchamps, 1903, p. 45, Pl. I, Figs. 14, 15; 1907, p. 190, Pl. XI, Figs. 21, 22. Cori, 1932, Fig. 21. Silén, 1954, p. 229, Fig. 3.
3. *A. hippocrepia*. It has a translucent body which is light brown in colour with dark brown pigment spots. It behaves like *A. pallida* but shows heliotropism. Its pelagic life lasts 12—14 days. It develops inside the parents' tentacular crown until it has developed four tentacles. Occurs in second half of August and in September. Selys Longchamps, 1907, Pl. XI, Figs. 18, 19. Cori, 1932, Fig. 12. Silén, 1954, p. 231, Fig. 4.
4. *A. brownei*. Selys Longchamps, 1907, p. 190, Pl. XI, Fig. 31.

Distribution Species

| | |
|---|------------|
| Gulf of Bothnia | — |
| Gulf of Finland | — |
| Baltic proper | 1 |
| Belt Sea | 1 |
| Kattegat | 1, 2 |
| Skagerak | 1, 2, 3 |
| Northern North Sea | 1 |
| Southern North Sea | 1, 2, ?3 |
| English Channel (eastern) | 3 |
| English Channel (western) | 1, 2, 3, 4 |
| Bristol Channel and Irish Sea | 1, 3* |
| South and West Ireland and Atlantic | 1, 4 |
| Faroe—Shetland Area | 1 |
| Faroe—Iceland Area | — |
| Norwegian Sea | 1, 5 |
| Barents Sea | — |

*) only adult recorded.

References to Work on Biology

Thorson (1946) 1; Silén (1954) 1, 2, 3.

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