

ICES Identification Leaflets for Plankton

Fiches d'Identification du Plancton

LEAFLET NO. 183

Polychaeta: Larvae

Family: Phyllodocidae

by

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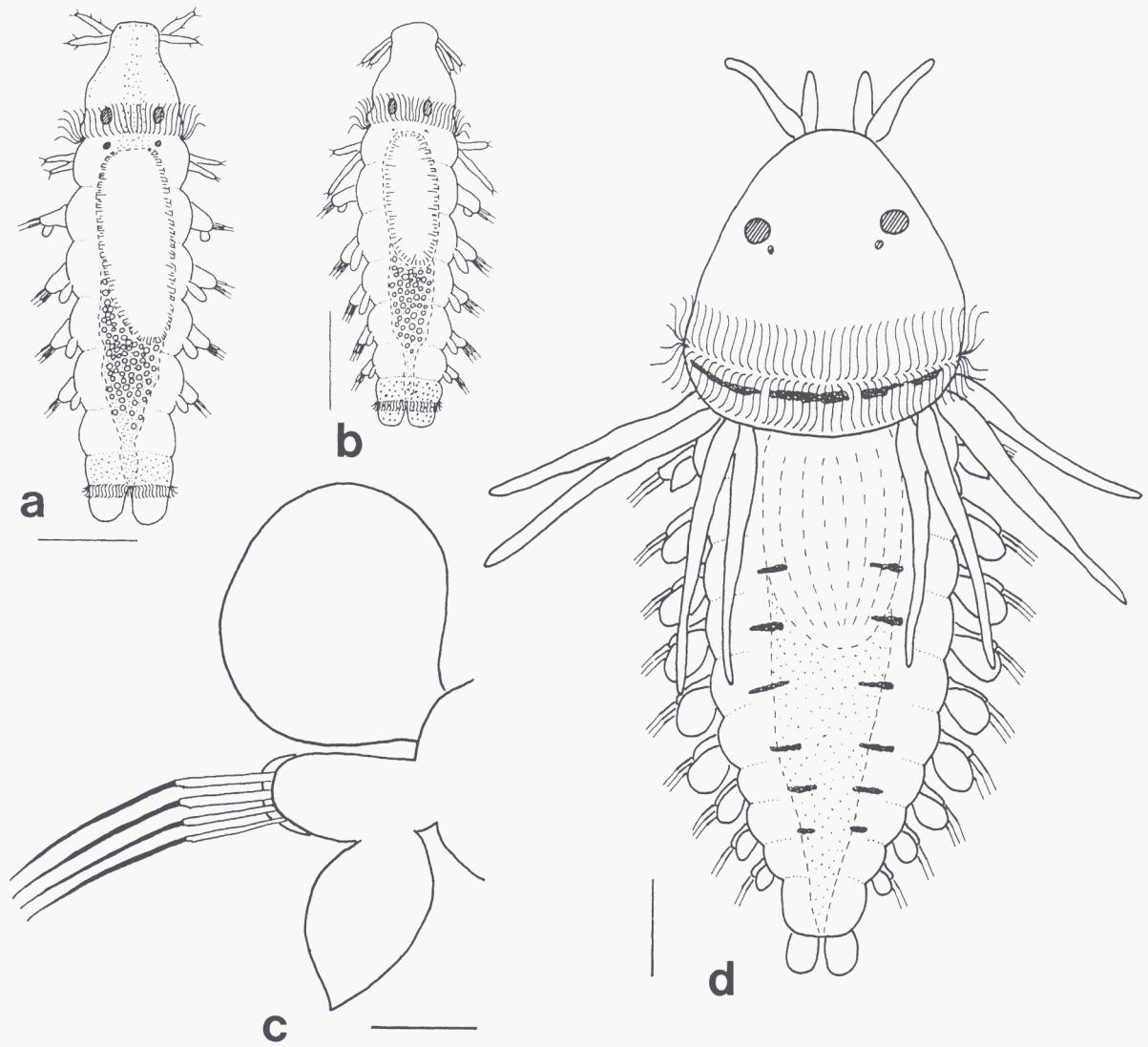


Figure 1. a: *Eteone* cf. *longa*: dorsal view of nectochaeta with 5 segments, segment 6 in formation. b: *Mysta barbata*: dorsal view of nectochaeta with 6 segments. c-d: *Phyllodoce mucosa*; c: parapodium of a median segment, lateral view; d: late metatrochophore with 12 segments, dorsal view. Scale bar: 1a, b, d: 100 μ m; 1c: 20 μ m.

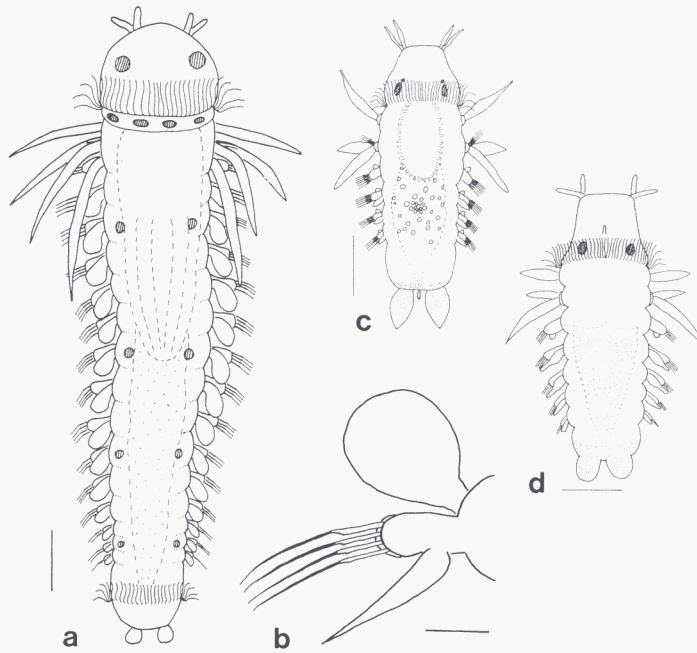


Figure 2. a–b: *Phyllococe rosea*: a: late metatrochophore with 17 segments, dorsal view; b: parapodium of a median segment, lateral view. c: *Pseudomystides limbata*: dorsal view of early nectochaeta with 6 segments. d: *Eulalia viridis*: dorsal view of nectochaeta with 7 segments. Scale bar: 2a, c, d: 100 μ m; 2b: 20 μ m.

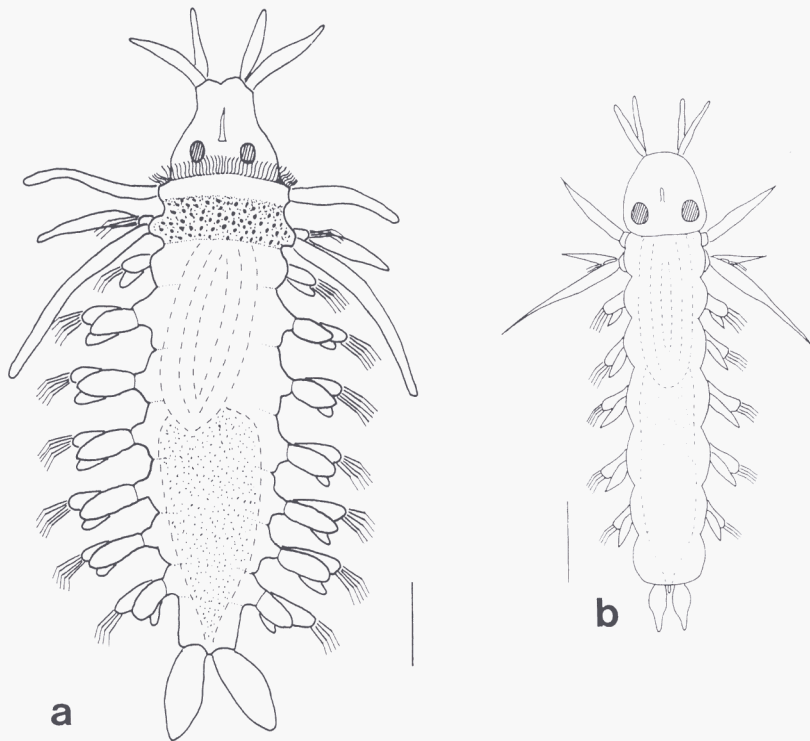


Figure 3. *Eumida sanguinea*: late nectochaeta with 9 segments, dorsal view. b: *Sige fusigera*: erpochaeta with 7 segments, dorsal view. Scale bar: 100 μ m.

Family Phyllodocidae

Introduction

Phyllodocids are very common errant polychaetes. They are distributed all over the world and inhabit all types of substrates. Spawning takes place free in the water column (Rasmussen, 1956) or the eggs are laid within protective structures (own observation). A planktonic larval stage occurs in all phyllodocid species for which reproductive details are known. Pelagic life is species-specific at different developmental stages and can last for less than two weeks or take more than one month. The larvae are lecithotrophic, planktotrophic, or variable, changing from lecithotrophic to planktotrophic. Planktotrophic larvae feed on phytoplankton and small zooplankton.

During their pelagic phase the larvae gradually develop many characteristics of the adult. This process culminates in metamorphosis to a benthic organism and is often accompanied by profound morphological changes.

An illustrated key for the larvae of eight species of Phyllodocidae occurring in the southeastern North Sea is provided. Detailed illustrated descriptions are given to ensure accurate identification. The key and the descriptions are based on the earliest or the most typical developmental stage exhibiting all features required in the identification process. Species determination may be impossible in earlier developmental stages.

Larvae were collected by horizontal near-surface sampling with a net of 75 µm mesh size. The live material was examined under a dissecting stereomicroscope at magnifications from 10 to 40×. For the observation of some morphological details a light microscope with magnifications from 40 to 1000× was used. All descriptions were based on live material. For all species, information is given on the season when the larvae are represented in the plankton of the German Bight. Further information can be found in Plate (1992) and Husemann (1992). Systematic classification and species names follow the recent revisions of Wilson (1988) and Pleijel (1991, 1993).

General characteristics of phyllodocid larvae

The earliest developmental stage identifiable is the late metatrochophora to early nectochaeta. These larvae possess 6–20 segments, a prostomium with 2–4 eyes and 4–5 antennae, 2–4 pairs of tentacular cirri and parapodia with parapodial lobes, and dorsal and ventral cirri. Setae are compound and occur from segment 2 or 3. One pair of pygidial anal cirri present. A papillate proboscis may be visible in the anterior part of the body in front of the gut.

Key to genera and species

1. Prostomium with 4 antennae;
2 pairs of tentacular cirri in the anteriormost segment; parapodia with dorsal cirri from segment 3 2
Prostomium with 4–5 antennae;
3–4 pairs of tentacular cirri in the anteriormost segments; parapodia with dorsal cirri from segment 4 3
2. Dorsal tentacular cirri as long as ventral tentacular cirri; 2 pairs of eyes (Fig. 1a) *Eteone cf. longa*
(Fabricius, 1780)
Dorsal tentacular cirri longer than ventral tentacular cirri; 1 pair of eyes (Fig. 1b) *Mysta barbata*
Malmgren, 1865
3. Metatrochophores and nectochaetae with 4 pairs of tentacular cirri and 4 antennae Genus
Phyllodoce
4
Metatrochophores with 3 pairs of tentacular cirri and 4 antennae, late nectochaetae with 3–4 pairs of tentacular cirri and 5 antennae; median antenna situated between eyes, sometimes very small 5
4. Metatrochophores and nectochaetae with less than 15 segments; yellow pigment at the prototroch and dorsally at the anteriormost segments; ventral cirri short, broad in nectochaetae (Fig. 1c–d) *Phyllodoce mucosa*
Ørsted, 1843
Metatrochophores and nectochaetae with more than 15 segments; red pigmented prototroch; 2 rows of red chromatophores may occur at the dorsum; ventral cirri slender, elongate in nectochaetae (Fig. 2a–b) *Phyllodoce rosea*
(McIntosh, 1877)
5. Segment 1 fully developed dorsally; all segments separated from each other; stout larvae; proboscis with numerous large papillae 6
Segment 1 dorsally reduced and fused with segment 2; slender larvae; proboscis without large papillae 7

6. Metatrochophores and nectochaetae with 3 pairs of tentacular cirri; ventral tentacular cirri of segment 2 flat and proximal broadened, remaining tentacular cirri cirriform; gut with yolk granules; prototroch absent in nectochaetae (Fig. 2c)

Metatrochophores with 3 pairs of tentacular cirri; late nectochaetae with 4 pairs of cirriform tentacular cirri; gut without yolk granules; prototroch persists in nectochaetae (Fig. 2d)

7. Yellow pigment at the prototroch; gut greenish-yellow; all tentacular cirri cirriform; parapodial lobe without prolongation in nectochaetae (Fig. 3a)

Prototroch unpigmented; gut dark brown; ventral tentacular cirri of segment 2 ± flat and proximal broadened, remaining tentacular cirri cirriform; prolongation of the upper presetal part of the parapodial lobe in nectochaetae (Fig. 3b)

Pseudomystides limbata
(Saint-Joseph, 1888)

Eulalia viridis
(Linnaeus, 1767)

Eumida sanguinea
(Ørsted, 1843)

Sige fusigera
Malmgren, 1865

Description of larvae

Genus *Eteone*

Eteone cf. *longa* (Fig. 1a)

Earliest pelagic stage is a trochophore; latest stage is a nectochaeta with 7 segments and length of 630 µm. Trochophores are oval; episphere dome-shaped with 1 pair of red eyes; prototroch well developed; gut with yolk granules. Late metatrochophore and nectochaeta stages with truncated, conical prostomium; 4 antennae; 2 pairs of red eyes of which the anterior pair is much larger than the posterior pair; telotroch present; 2 pairs of tentacular cirri of equal length in segment 1; setae and ventral cirri from segment 2 and dorsal cirri from segment 3; anal cirri short, ovoid. Proboscis visible in late nectochaeta stage. Larvae brown with green and brown chromatophores distributed over whole body; highest density of chromatophores in a median line on prostomium, and at pygidium. Seasonal occurrence: February to April.

Genus *Mysta*

Mysta barbata (Fig. 1b)

Synonym: *Eteone barbata* (Malmgren, 1865)

Pelagic metatrochophores with 6 segments have a length of 400 µm. Late metatrochophore and nectochaeta stages with truncated conical prostomium; 4 antennae; 1 pair of dark-red eyes; well-developed prototroch; telotroch present; 2 pairs of tentacular cirri in segment 1; setae and ventral cirri from segment 2 and dorsal cirri from segment 3; anal cirri elongated, ovoid. Dorsal tentacular cirri become 1.5 times as long as ventral cirri in late nectochaeta stage. Larvae olive-brown pigmented with darker brown pygidium. Seasonal occurrence: September.

Genus *Pseudomystides*

Pseudomystides limbata (Fig. 2c)

Synonym: *Mystides* (*Mesomystides*) *limbata*
Saint-Joseph, 1888

Earliest planktonic stage is a trochophore; latest stage is a metatrochophore with 7 segments and length of 460 µm. Trochophores are oval; round episphere, dome-shaped with 1 pair of red eyes; prototroch consists of long cilia; gut with yolk granules. Metatrochophores and nectochaetae with truncated, rectangular prostomium; 4 antennae; 2 pairs of red eyes of which the anterior pair is much smaller than the posterior pair and near to the median; 1 pair of tentacular cirri in segment 1 and 2 pairs in segment 2; ventral tentacular cirri of segment 2 are flat with proximal broadening, remaining tentacular cirri cirriform; setae from segment 2, ventral cirri from segment 3 and dorsal cirri from segment 4; anal cirri ovoid, twice as long as broad; median pygidial papilla present. All larval stages with brown pigmentation, pygidium dark-brown. Ventral tentacular cirri in segment 2 become increasingly flattened in older stages, other tentacular cirri remain cirriform. Proboscis with papillae visible in late nectochaeta stage. At time of settlement some individuals exhibit a small median antenna between the eyes. Seasonal occurrence: June to August.

Genus *Eulalia*

Eulalia viridis (Fig. 2d)

Earliest planktonic stage is a trochophore; latest stage is a metatrochophore with 6 segments and length of 350 µm. Trochophores are oval; episphere trapezoid, with 1 pair of red eyes; prototroch consists of long

cilia. Metatrochophores and nectochaetae with rectangular prostomium; 4 antennae; 1 pair of red eyes; 1 pair of cirriform tentacular cirri in segment 1 and 2 pairs of segment 2; setae from segment 2, ventral cirri from segment 3, and dorsal cirri from segment 4; 1 pair of rounded anal cirri. One median antenna arises anterior to the eyes in the late nectochaeta stage. Larvae pale, with olive-brown to dark-green gut and olive-brown pigmented pygidium. A 4th pair of tentacular cirri appears in segment 3 in benthic juveniles comprising about 19 segments. Seasonal occurrence: April to June.

Genus *Eumida*

Eumida sanguinea (Fig. 3a)

Synonym: *Eulalia sanguinea* Ørsted, 1843

Earliest planktonic stage is a trochophore; latest stage is a nectochaeta with 14 segments and length of 1.1 mm. Trochophores are oval, greenish coloured with yellow-white pigment spots arranged in a ring posterior to the prototroch. Metatrochophores and nectochaetae with conical, dome-shaped prostomium; 4 antennae; 2 pairs of red eyes of which the anterior pair is much smaller than the posterior pair and near to the median; the 2 pairs of eyes fused in the nectochaeta; prototroch present; 1 pair of cirriform tentacular cirri in segment 1 and 2 pairs in segment 2; setae present from segment 2, ventral cirri from segment 3, and dorsal cirri from segment 4. One pair of slender, tapering anal cirri. Larval body greenish with yellow-white pigment posterior to the prototroch and dark brown gut. Proboscis with a ring of distally located papillae, first differentiated in the late metatrochophore stage. A median antenna appears in the late nectochaeta, when larvae become benthic. The 4th pair of tentacular cirri originates in segment 3 in the late erpochaeta. Seasonal occurrence: June to August.

Genus *Sige*

Sige fusigera (Fig. 3b)

Earliest pelagic stage is a trochophore; latest stage is a metatrochophore with 7 segments and length of 400 µm. Trochophores are oval; episphere dome-shaped with 1 pair of red eyes; prototroch with long cilia; gut dark-brown coloured. Metatrochophores and nectochaetae with rounded, triangular prostomium; 4 antennae; 1 pair of large, red eyes; 1 pair of cirriform tentacular cirri in segment 1; ventral tentacular cirri of segment 2 sometimes flat and proximally broaden, dorsal tenta-

cular cirri cirriform; setae from segment 2, ventral cirri from segment 3, and dorsal cirri from segment 4. Upper presetal part of the parapodial lobe prolongates in the nectochaeta. One pair of slender, boddle-shaped anal cirri. Larvae pale, with dark-brown gut. Nectochaetae with median antenna between eyes; proboscis with ring of distally located papillae; small, median anal papilla. A 4th pair of tentacular cirri originating in segment 3 becomes visible in benthic juveniles with at least 9 segments. Seasonal occurrence: September to November.

Genus *Phyllodoce*

Phyllodoce mucosa (Fig. 1c–d)

Earliest planktonic stage is a trochophore; latest stage is a nectochaeta with 13 segments and length of 1.1 mm. Trochophores spherical, blue-green with a yellow pigmented ring posterior to the prototroch, with apical tuft. Metatrochophores and nectochaetae with triangular prostomium; 4 antennae; 1 pair of red eyes; prototroch present; segment 1 dorsally reduced, segments 2 and 3 dorsally fused; 4 pairs of cirriform tentacular cirri in anteriormost segments; setae from segment 2, ventral cirri from segment 3, and dorsal cirri from segment 4; 1 pair of cirriform anal cirri. The hyposphere forms a fold posterior to the prototroch, dorsally covering segments 1–3. Distal part of proboscis covered with soft papillae, visible in nectochaeta stage. Larvae have pale greenish colour, dorsally with yellow pigment in segments 2 and 3; 2 rows of yellow pigmented spots occur intersegmentally posterior to segment 5. Dorsal cirri of nectochaeta are subrectangular; ventral cirri broad distally pointed, slightly longer than setal lobe. Seasonal occurrence: March to June.

Phyllodoce rosea (Fig. 2a–b)

Synonym: *Anaitides subulifera* Eliason, 1962

Earliest planktonic stage is a trochophore; latest stage is a nectochaeta with 20 segments and length of 1.5 mm. Trochophores ovoid, pale coloured, with red pigment spots arranged in a ring posterior to well-developed prototroch. Metatrochophore and nectochaeta stages with rounded prostomium; 4 antennae; 2 pairs of red eyes of which the anterior pair is much smaller than the posterior pair and near to the median; prototroch and telotroch present; segment 1 dorsally reduced, segments 2 and 3 fused; 4 pairs of cirriform tentacular cirri in anteriormost segments; setae from segment 2, ventral cirri from segment 3, and dorsal cirri from segment 4; gut with numerous

yolk granules. Larvae nearly transparent with a ring of red pigment spots posterior to prototroch and telotroch, and additional 2 rows of red pigment spots on dorsum. Proboscis with smooth, distal part; a proximal part covered with rows of hard papillae, appearing in late metatrochophore. Nectochaetae with pair of rounded, short anal cirri; subrectangular dorsal cirri; subulate ventral cirri, more than twice as long as parapodial lobe and with extremely fine extended tips. Seasonal occurrence: June to September.

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