

Guide to identification of Lumbrineridae (Polychaeta) in north east Atlantic waters

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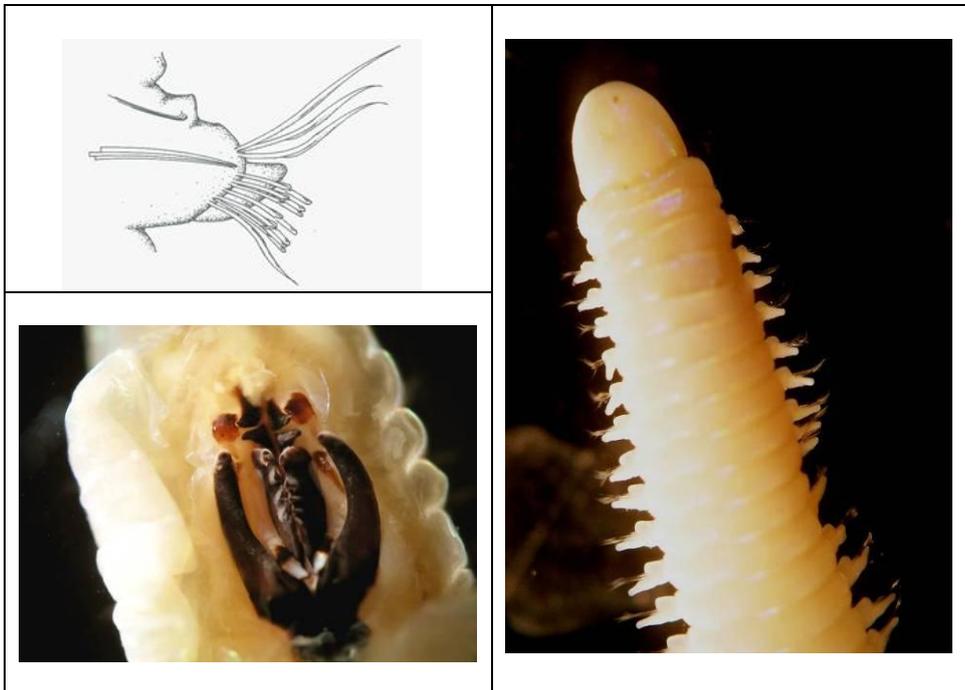


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Introduction

The Lumbrineridae are generally long cylindrical bristle worms of small to medium size with rather simple external morphology. The largest species in European waters may reach a length of about 35 cm, but most species are 2-10 cm in length. Lumbrinerids are mostly found in soft-sediment environments where they burrow into the substrate. They are largely considered to be carnivores, but some species have been reported to feed on plant fragments or detritus (Fauchald & Jumars 1979).

The lumbrinerids belong in the 'eunicid' group of polychaetes which is characterised by the presence of a complicated jaw apparatus in the pharynx. The jaw apparatus is of the 'labidognath' type (Orensanz 1990) and is basically similar to the jaws found in Eunicidae and Onuphidae. In traditional faunal works the eunicid group has been treated as an order (e.g. Fauchald 1977, Hartmann-Schröder 1996), whereas in newer taxonomy the group has been placed without particular rank within the main division Aciculata (Rouse & Pleijel 2001).

The most important taxonomic characters are found in jaw structures, types and shapes of chaetae, colour of aciculae and shape of parapodial lobes. Jaw characters have been extensively used for definition of genera in recent years, which has led to a more stable and consistent system for species classification in the family. As a consequence, several new genera have been erected whereas extant genera have been redefined (see Orensanz 1973, 1990; Frame 1992; Carrera-Parra 2006a). Orensanz (1990), Frame (1992) and Hilbig (1995) have accounted for the taxonomic history of the family and have discussed the importance of the diagnostic characters.

A remarkably large number of species of lumbrinerids have been described worldwide (*i.e.*, more than 200). Many of the descriptions, however, especially in the older literature, are rather general and do not mention characters which presently are known to be vital for species discrimination. This has led to much confusion about species identities and synonymies. Whereas several species problems have been clarified over the years, many species are still insufficiently characterised and of uncertain status.

Morphology

Lumbrinerids have a long cylindrical body with generally similar segments (Figure 1). In most species the width gradually decreases towards the pygidium. The prostomium is well-developed and is usually without eyes or appendages, but in some genera small occipital antennae may be found in the fold between prostomium and peristomium. The peristomium consists of two rings (not true segments) without parapodia or chaetae. Tentacular cirri are absent. The following chaetigers carry parapodia which are mostly uniramous, but often a bundle of thin notoaciculae and a short knoblike notopodium are present. Ventral cirri are absent. Chaetae include simple limbate chaetae, composite spinigers, and simple and composite hooded hooks (Figure 1).

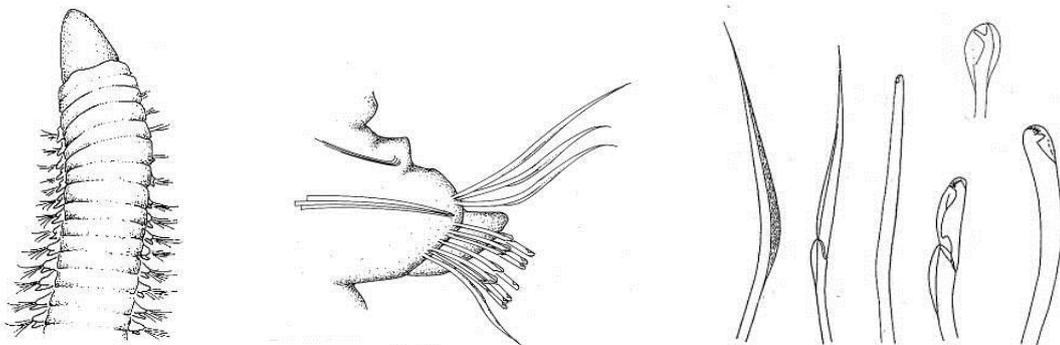


Figure 1. Features of Lumbrineridae: anterior body (*Lumbrineris*), parapod from anterior body (*Lumbrineris*), chaetae (limbate chaeta, composite spiniger (*Lumbricalus*), long-bladed simple hook, multidentate composite hook, bidentate hook (top, *Lumbrinerides*), simple multidentate hook)

The jaw apparatus is comprised of dorsal maxillae and ventral mandibles (Figure 2). The maxillae consist of a pair of posterior carriers and four or five pairs of maxillary plates. The carriers are broad, mostly short, and are attached to the most posterior pair of maxillae (mx I) by a firm 'click-joint' connection (labidognath arrangement). The maxillary plates are usually referred to by numbers (roman numerals) from I to V (note that in older literature different numbering systems were often used). In addition to the numbered plates other more or less well-developed structures may be found, variously referred to as ligaments, bridles or attachment lamellae. The mandibles are generally of simple structure and formed as rods with flared anterior ends (Figure 2). Morphological variation of maxillae among genera found in North Atlantic waters is shown in Figure 3.

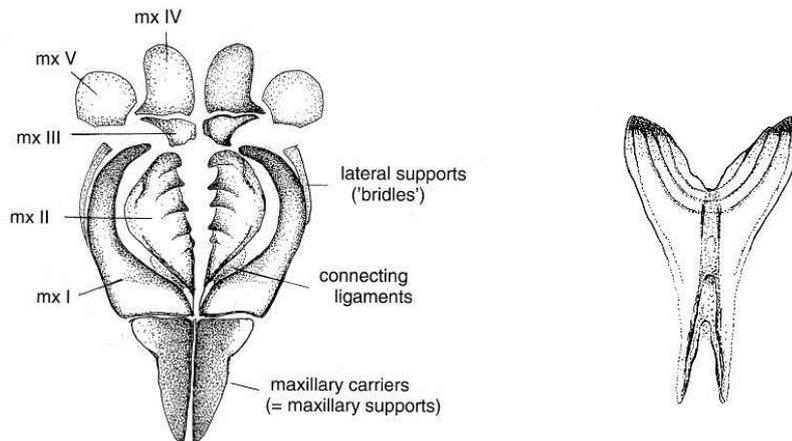


Figure 2. Jaw apparatus of Lumbrineridae. Left: maxillae (from *Lumbrineris*). Right: mandibles (from *Lumbrineris*). Roman numerals indicate established numbering system for maxillary elements.

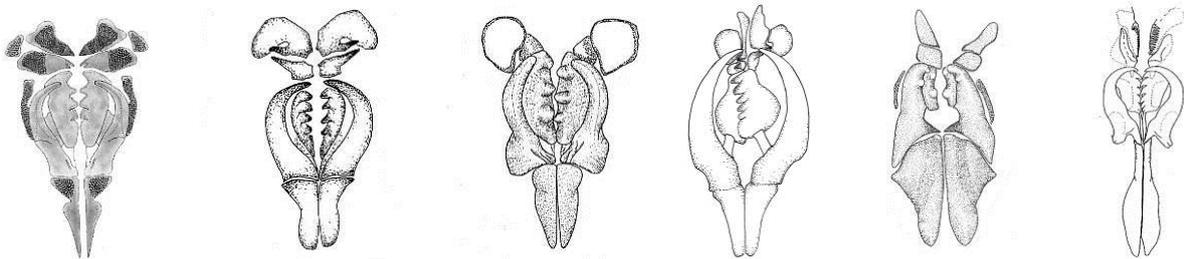


Figure 3. Maxillae of Lumbrineridae. Left to right: *Lumbrineris*, *Abyssoninoe*, *Augeneria*, *Eranno*, *Lumbrinerides*, *Lumbrineriopsis*

Identification

Maxillary structures can most conveniently be examined by making a dorsal incision in the region of chaetiger 1-2 to 5-6 (Figure 4). The most important structures, mx III and mx IV, are usually oriented more or less vertically with teeth projecting upwards just in front of the tip of mx I (Figure 4 right). In cases when the pharynx is partly protruded and the maxillae appear in the mouth opening, a ventral incision at the side of the midline may be made instead of a dorsal incision. However, it is then usually necessary to break off the anterior part of the mandibles to examine mx III and IV.

Important characters of parapodia and chaetae are mostly found in anterior part of the body, usually from chaetiger 1 to chaetiger 20-30. Chaetae should be examined using a compound microscope (400x). In small specimens, chaetae can be viewed directly from specimens placed with the ventral side uppermost under a cover-slip. In larger specimens it is usually necessary to remove a parapodium for examination. This also applies to examining the colour of the aciculae. In some cases parapodial lobes on posterior chaetigers should also be examined.

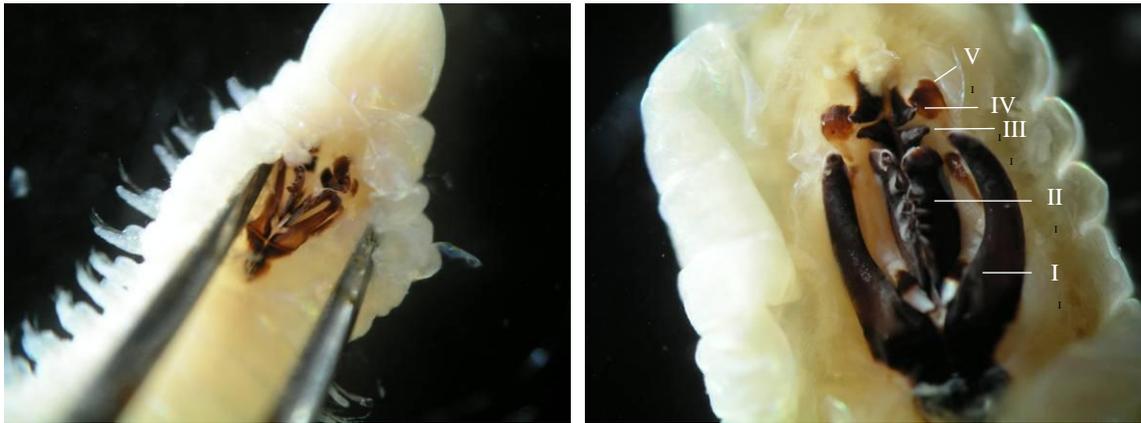


Figure 4. Left: Dorsal incision to expose maxillae, *Lumbrineris* near *coccinea*, western Greenland. Right: *Lumbrineris latreilli*, east of Iceland. Numbering of maxillae indicated. Photo: Eivind Oug

Geographical area

The area covered by this guide encompasses European waters from the Bay of Biscay to western Norway and the Norwegian Sea. This covers coastal inshore waters, continental shelves and deep sea areas in the north-east North Atlantic and the Norwegian Sea. In addition, some species from nearby areas (Barents Sea and Arctic waters, north-west North Atlantic) which may be found in the area have been included.

About 30 lumbrinerid species are known from the area. The highest number of species is reported from the English Channel, the North Sea and shelf areas of the Faroes and Iceland.

General faunistic works treating lumbrinerids in North East Atlantic waters include Fauvel (1923), Hartmann-Schröder (1971, 1996), Miura (1980), Winsnes (1980), George & Hartmann-Schröder (1985) and Kirkegaard (1992). Several of the species found in the area are not included in the ‘standard’ works used for species identification.

Data for the distribution of the species have been assembled from i.a. Fauvel (1923), Hartman (1965), Hartman & Fauchald (1971), Miura (1980), Winsnes (1980), Frame (1992), Mackie & Erséus (1997), Hansson (1998), Brattegard & Holthe (2001), Dauvin et al. (2003), Oug (2005), Carrera-Parra (2006a, b), and Aguirrezabalaga & Carrera-Parra (2006). In addition, my own observations on material from the North Sea and Norwegian coastal waters have also been taken into account.

Status of the taxonomy

Several of the species in the area are insufficiently characterised. In some cases, current descriptions in ‘standard’ identification literature may seem to mix characters from several similar species making species identification problematical. In addition, specimens with specific characters that do not fit with the current species descriptions are regularly found. Whether such specimens represent intraspecific variants or separate species is not known. The genera with most problems are *Abyssoninoe*, *Augeneria* and *Lumbrineris*. The present guide mostly comprises named species with good diagnostic characters, but some regularly found forms of uncertain status also are included (referred to as ‘cf’ or ‘near’ related species). A few currently un-named forms are also included.

Explanation of terms

Acicula – supporting bristle embedded in the parapodium

Attachment lamellae – additional pieces of the maxillary apparatus, usually situated lateral to or below the individual maxillae. Rod-shaped attachment lamellae situated lateral to mx I are by some authors referred to as “bridles”.

Bidentate hook – hook with two strong distinctly separated teeth

Branchial lobe – cylindrical to short digitiform process extending from the parapodium and equipped with capillary blood vessels for gas exchange. Present in some genera and species.

Carrier – part of the maxillary apparatus situated posterior to the first maxillae (mx I) and connected to it by a ‘click-joint’

Chaetiger – segment bearing chaetae

Composite hooded hook – hook with a distinct subdistal joint separating the outer part (blade) from the shaft. Hood with a more or less distinct constriction at the position of the joint.

Composite spiniger – simple gradually tapering chaeta provided with a joint

Connecting ligament – additional piece placed between and connecting the bases of mx I and mx II. Also referred to as connecting lamella.

Limbate chaeta – simple gradually tapering chaeta provided with a brim along most of the length, often gently curved. Found in anterior body of all species.

Maxillae – paired and usually the most prominent elements of the maxillary apparatus. Maxillae are generally numbered from I to V from behind and forwards (different numbering systems may be found in older literature).

Maxillary apparatus – dorsal part of the jaws consisting of several individual elements: four or five pairs of maxillae, carrier, connecting ligaments and attachment lamellae

Maxillary teeth – well-defined projections on the maxillae directed inwards or upwards. In some genera knoblike projections or swellings may be found in addition to defined teeth, by some authors also referred to as teeth.

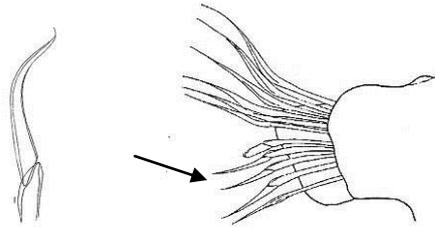
Multidentate hooded hook – hook with a rounded apex with several small teeth encapsulated by a transparent hood. Only type of chaeta in posterior body of most species.

Occipital antenna – small antenna placed posteriorly on the prostomium; in lumbrinerids in the fold between prostomium and peristomium. May also be referred to as nuchal antenna or nuchal papilla.

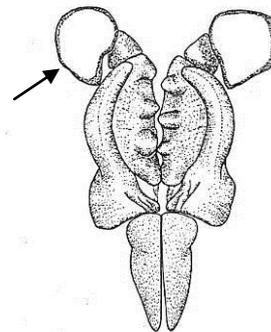
Pseudocomposite hooded hook – hook with an incomplete separation between the outer part (blade) and shaft. Usually with a constriction of the hood as in composite hooks.

Key to genera in north east Atlantic waters

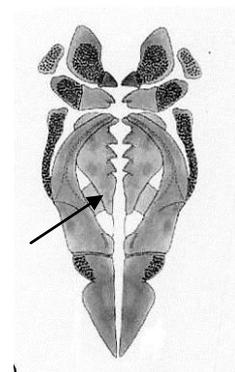
- 1. Composite or pseudocomposite hooded hooks present in anterior part of body 2
- All hooded hooks simple, anterior body may have limbate chaetae only 5
- 2. Chaetae include composite spinigers in addition to composite and simple hooded hooks
..... *Lumbricalus*



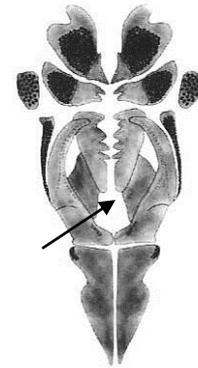
- No composite spinigers 3
- 3. Mx IV forming a squarish plate with whitish central area and black margins. Mx V absent. Occipital antennae may be present at posterior border of prostomium *Augeneria*



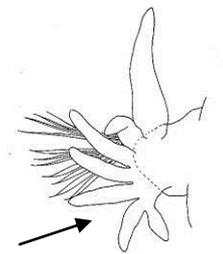
- Mx IV a triangular to oblong evenly black or brown plate with a marked tooth. Mx V present, rounded 4
- 4. Mx II almost as long as mx I (about 2/3 or 3/4 of the length), connected to mx I with narrow to moderately wide connecting ligament. Aciculae pale, brown or black *Lumbrineris*



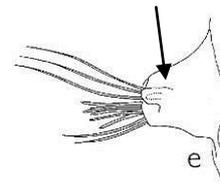
- Mx II about half as long as mx I, connected to mx I by wide connecting ligament. Aciculae yellow **Hilbigneris**



- 5. Anterior chaetigers with one or more postchaetal branchial lobes 6



Ninoe



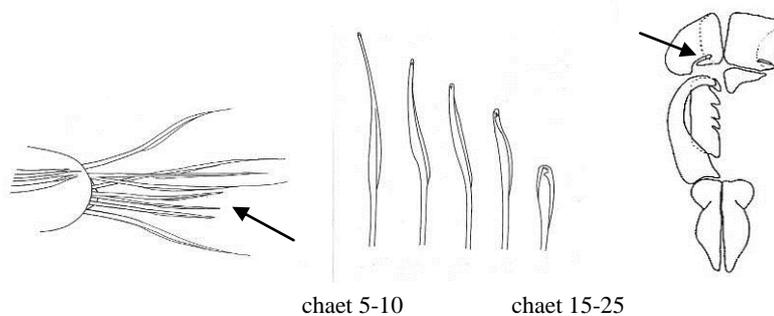
Cenogenus

- No branchial lobes in anterior chaetigers 7

- 6. Branchiae with multiple lobes. Number of lobes increasing from one at chaetiger 5-6 to four to six at chaetiger 20-30, then rapidly decreasing **Ninoe**

- One short digitiform branchia present at each chaetiger in anterior body, gradually diminishing posteriorly. Anterior parapodia usually with long slender hooded hooks. Aciculae black. **Cenogenus**

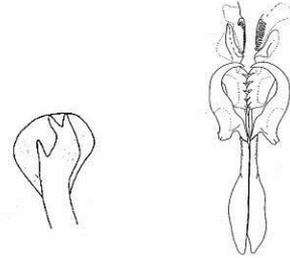
- 7. Anterior of body with limbate chaetae and modified long hooded hooks. Most anterior hooks extremely slender, resembling limbate chaetae in outline, gradually becoming shorter through following chaetigers and developing into regular hooded hooks at chaetiger 15-25. Aciculae yellow. Mx IV and V fused forming a hemispherical structure, with a strong dorsal tooth at posterior border **Abyssoninoe**



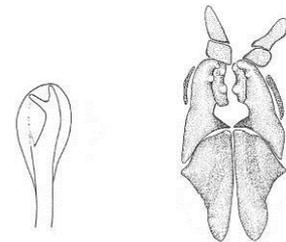
- Anterior of body with limbate chaetae and regular hooded hooks or with limbate chaetae only 8

- 8. Hooded hooks bidentate 9
- Hooded hooks multidentate 10

- 9. Hooded hooks with a subdistal tooth or spur. Mx IV with a fringe of denticles on inner margin. Carriers long and slim, with narrow anterior part **Lumbrineriopsis**

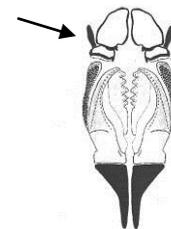


- Hooded hooks without subdistal tooth. Mx IV without teeth or denticles. Carriers wide, with arcuate anterior border. **Lumbrinerides**

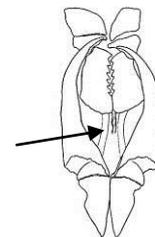


- 10. Maxillary apparatus with five pairs of maxillae 11

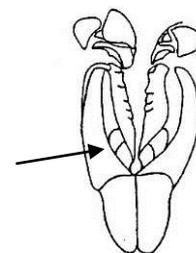
- Maxillary apparatus with four pairs of maxillae, mx III and mx IV with whitish central area **Helmutneris**



- 11. Mx II short, about half the length of mx I, with distinct rather narrow connecting ligament from the base of mx II to posterior part of mx I **Eranno**



- Mx II almost as long as mx I, with short connecting ligament from mx II to posterior part of mx I **Scoletoma**



Abyssoninoe Orensanz, 1990

Characteristics. Prostomium conical. Parapodia uniramous, with simple limbate chaetae and simple, multidentate hooded hooks. Anterior hooks extremely long, tapering, resembling limbate chaetae, becoming gradually shorter from chaetiger 10-15, for 5 to 15 chaetigers, after which they appear as clearly defined hooks. Aciculae yellow. Mx III unidentate. Mx IV and V fused, mx IV with a tooth protruding from posterior border.

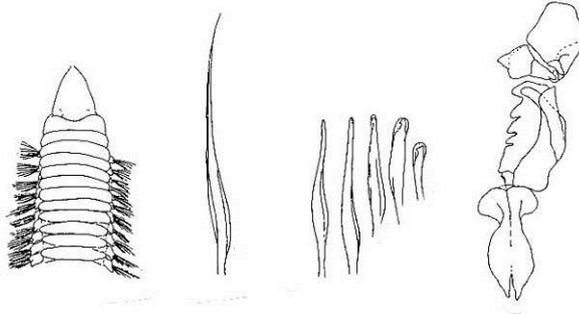
Taxonomy. The genus is rather well-defined by the modified hooded hooks in anterior chaetigers and the fusion of mx IV and V. Species discrimination is problematical, however. Characters which have been used for species separation include the most anterior position of 'normal-shaped' hooded hooks and the development of prolonged digitiform vascularised lobes in far posterior segments. *Abyssoninoe hibernica* was redescribed by Parapar et al. (1994). *Abyssoninoe scopae* was synonymised with *A. hibernica* by Parapar et al. (1994), but is here considered to be a separate species. The number of species in the region is uncertain.

1. Anterior body with prolonged tapering hooks at least to chaetiger 15, posterior parapodia with prolonged digitiform lobes 2
- Anterior body with prolonged tapering hooks to chaetiger 10-15, posterior parapodia with short rounded prechaetal and short conical postchaetal lobes *Abyssoninoe cf abyssorum* (McIntosh, 1885)

Length 30-50 mm, width 1-1.5 mm

Atlantic deep water, Norwegian Sea,
?Norwegian fjords, 500-1100 m

Figs from left: Anterior end; limbate chaeta; modified hooded hooks chaetiger 3,7,8,10; posterior hooded hook; carrier and right mx I-IV. From Orensanz (1990)



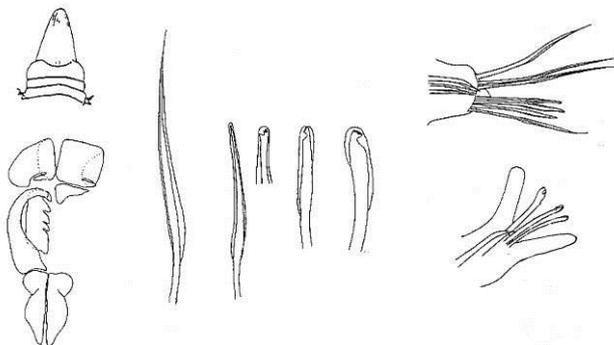
2. Clearly defined hooded hooks appear at chaetiger 15-20, far posterior parapodia with prolonged digitiform prechaetal and postchaetal lobes *Abyssoninoe hibernica* (McIntosh, 1903)

[=*A. scopae aequilobata* (Winsnes, 1981)]

Length 40-60 mm, width 1-1.4 mm

North Sea, British Isles, France, Norwegian coast, moderate depths

Figs from left: Anterior end; maxillae (left mx III and right mx I, II omitted); limbate chaeta; slender hooded hook chaetiger 8; detail of same; hooded hook chaetiger 25; posterior hooded hook; parapodium 15; far posterior parapodium. From Winsnes (1980, 1981) and Parapar et al. (1994)

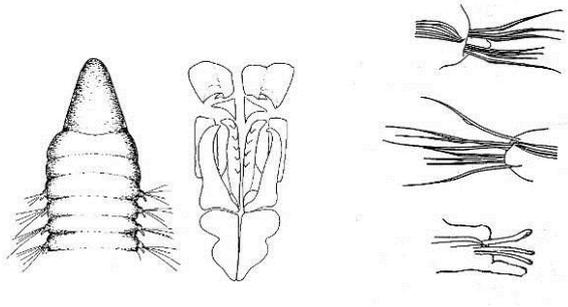


- Clearly defined hooded hooks appear at about chaetiger 25 or further back, far posterior parapodia with digitiform postchaetal lobe, prechaetal lobe small *Abyssoninoe scopae* (Fauchald, 1974)
 [= *A. pseudofragilis* (Amoureux, 1977)]

Length 30-60 mm, width 1-2 mm

Fjords in western and northern Norway, NE Atlantic deep water, Bay of Biscay, 200-1200 m.

Figs from left: Anterior end; maxillae; parapodium 2; parapodium 15; far posterior parapodium. From Fauchald (1974) and Winsnes (1980)

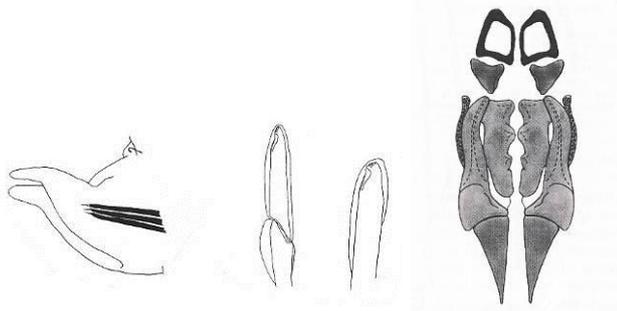


Augeneria Monro, 1930

Characteristic. Prostomium conical or broadly rounded, with or without small occipital antennae dorsally at border to peristomium. Parapodia with simple and composite multidentate hooded hooks. Mx IV squarish, with whitish central and dark peripheral areas. Mx V absent.

Taxonomy. The genus is characterised by the shape of mx IV. The number of species in the area is uncertain. Only two species, *A. algida* and *A. riojai*, are well diagnosed. Most specimens from shelf and inshore waters agree reasonably well with *Augeneria tentaculata* from southern Atlantic and Antarctic waters (Monro 1930). *Augeneria algida* was redescribed by Winsnes (1987).

- 1. Prostomium with eight small occipital antennae. Anterior parapodia with small prechaetal and rounded postchaetal lobes, parapodia from about chaetiger 15 with distinctly outdrawn prechaetal and postchaetal lobes. Aciculae dark
 ***Augeneria riojai*** Aguirrezabalaga & Carrera-Parra, 2006



Length > 100 (?) mm, width 4.5 mm

Bay of Biscay, 400-600 m

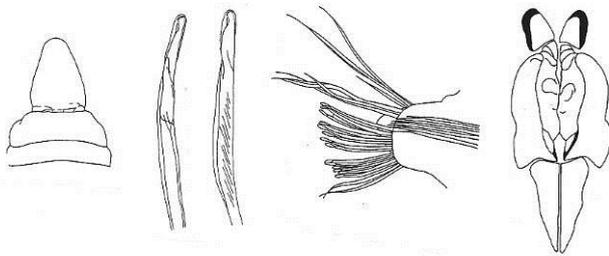
Figs from left: Parapodium 26; composite hooded hook; simple hooded hook; maxillae. From Aguirrezabalaga & Carrera-Parra (2006).

- Prostomium with three occipital antennae or without antennae. Parapodia with small prechaetal and conical postchaetal lobes. Aciculae light yellow.....2

- 2. Anterior parapodia with long pseudocomposite to composite more or less twisted hooded hooks. Simple hooks present from about chaetiger 20 ***Augeneria algida*** (Wirén, 1901)

Length > 60 mm, width 2.5-3.5 mm

Norwegian Sea, Arctic, in deep water with temperatures < 0 °C; ?Bay of Biscay



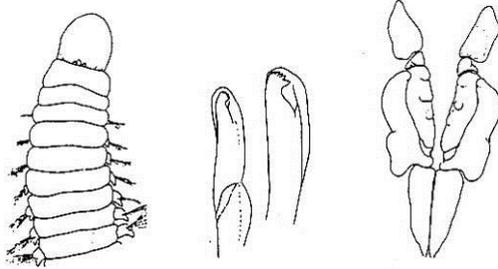
Figs from left: Anterior end; pseudocomposite hooks; parapodium 15; maxillae. From Winsnes (1987).

- Anterior parapodia with straight distinctly composite hooded hooks 3

3. Composite hooded hooks with short blades (length: width = about 5:1). Simple hooded hooks present from about chaetiger 15 *Augeneria* cf *tentaculata* *Monro, 1930*

Length 30-60 mm, width 1.5-2 mm

N Atlantic, North Sea, Norwegian coast



Figs from left: Anterior end; composite hooded hook chaetiger 5; posterior hooded hook; maxillae. From Orensanz (1990).

- Composite hooded hooks with long blades (length: width = about 8:1). Simple hooded hooks from chaetiger 15-20 *Augeneria* sp.

Length > 50 mm, width 1.5-2 mm

Norwegian Sea, in deep water (1000-2000 m) with temperatures < 0 °C.

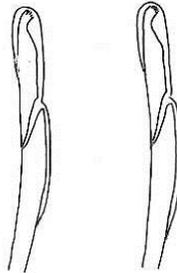


Figure: Composite hooded hooks from anterior chaetiger (original)

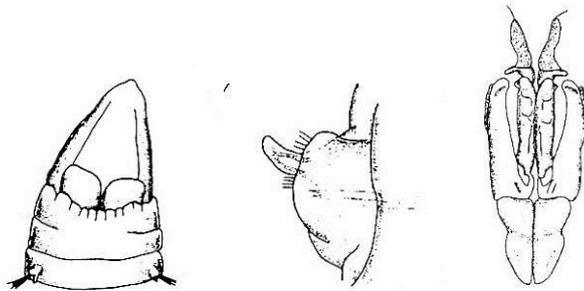
Remarks: This form may represent the same species as *Augeneria sadko* (Annenkova, 1952) from deep water in the Greenland Sea. Winsnes (1987) indicated that *A. sadko* could be synonymous with *A. algida*. They are here considered to be separate species. The taxonomy of *Augeneria* in northern and Arctic waters is unclear and needs to be further studied.

Cenogenus Chamberlin, 1919 (= *Paraninoe* Levenstein, 1977)

Characteristics. Prostomium conical, with a short occipital antenna. Chaetae include simple limbate chaetae and simple multidentate hooded hooks. Anterior parapodia with a knoblike to digitiform postchaetal branchial lobe, extending back over a variable number of median segments. Aciculae black. Mx III and IV unidentate. Mx V lacking.

Taxonomy. The genus is characterised by the presence of a postchaetal branchial lobe in anterior and mid body segments, black aciculae and the lack of mx V. Most species are found in deep water. The species in North Atlantic waters were treated by Miura (1980). The genus *Cenogenus* was reinstated and emended by Carrera-Parra (2001). *Paraninoe* Levenstein is regarded as a junior synonym of *Cenogenus*.

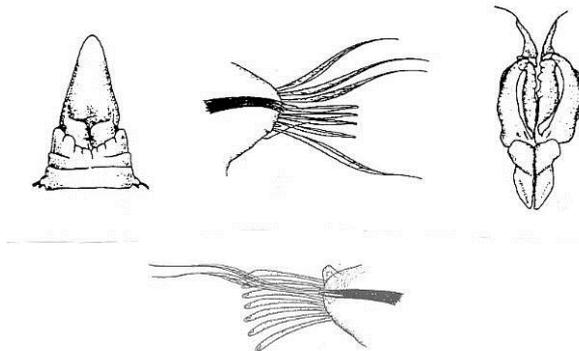
- 1. Anterior parapodia with simple limbate chaetae and long-bladed slender hooks 2
- Anterior parapodia with simple limbate chaetae only, mx II with 2 teeth *Cenogenus fusca* (Moore, 1911)



Length > 60 mm, width up to 4 mm
N Atlantic, north of Ireland, deep water to abyssal

Figs from left: Anterior end ventral; middle parapodium; maxillae. From Miura (1980).

- 2. Parapodia with a short digitiform branchial lobe, mx II with 3 teeth *Cenogenus brevipes* (McIntosh, 1903)



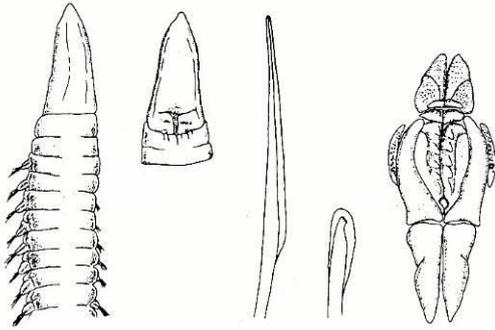
Length > 60 mm, width 1.5-2.3 mm
N Atlantic, north of Ireland, deep water to abyssal

Figs from left: Anterior end ventral; parapodium 5 (top) and parapodium 40 (bottom); maxillae. From Miura (1980) and Frame (1992).

- Parapodia with a small rudimentary branchial lobe, mx II with 4 teeth
*Cenogenus* sp. (= *Paraninoe minuta* sensu Miura 1980)

Length 20 (?) mm, width 1.2 mm

N Atlantic, north of Ireland, Bay of Biscay, deep water to abyssal



Figs from left: Anterior body; prostomium ventral; anterior hooded hook; posterior hooded hook; maxillae. From Miura (1980).

Remarks: This species may possibly belong in *Abyssoninoe*, but it is stated to have black aciculae and postchaetal branchial lobes, which are characters of *Cenogenus*

***Eranno* Kinberg, 1865**

Characteristics. Prostomium conical, occipital antenna may be present. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Mx II short, about half of length of mx I, connected to base of mx I by narrow connecting ligament. Mx V partially fused to mx IV or free.

Taxonomy. The genus is characterised by the short mx II being connected to the base of mx I with a long narrow connecting ligament. *Eranno* was treated by Orensanz (1990) and Frame (1992). Only one species is known from the area. The species was redescribed by Hartman (1948).

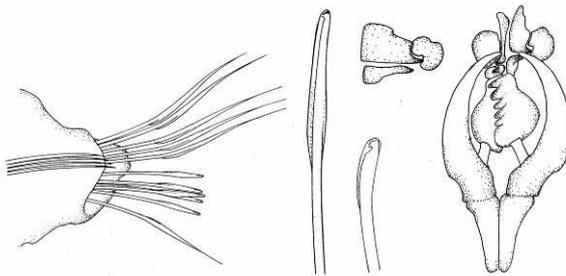
Anterior parapodia with simple limbate chaetae and long-bladed hooded hooks. Aciculae yellow. Mx II half the length of mx I, mx III unidentate ***Eranno bifrons* Kinberg, 1865**

[=*E. ehlersii tenuisetis* (McIntosh, 1885); fide Miura 1980]

Length > 60 mm, width 1.5-2 mm

N Atlantic, deep water.

Figs from left: parapodium 19; long-bladed hooded hook from parapodium 19; hooded hook from posterior chaetiger; right mx III-V; maxillae. Original drawing.



Remarks: This species is very close to *E. petersenae* Frame, 1992 from NW Atlantic. *E. petersenae* is characterised by having elongated digitate parapodial lobes in posterior body.

Helmutneris Carrera-Parra, 2006

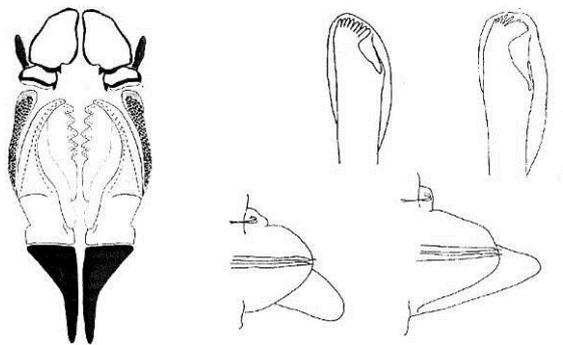
Characteristics. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Mx III and IV with whitish central area, unidentate, mx V absent.

Taxonomy. The genus is characterised by the pigmentation of mx III and mx IV and the lack of mx V. The genus has been recently established to incorporate species previously included in *Lumbrineris*. Only one species is known from the area.

Anterior parapodia with limbate chaetae (in chaetiger 1 – ca. 30) and simple hooded hooks. Most anterior hooks with up to 8 teeth of similar size, median and posterior hooks with large proximal tooth. Prechaetal lobes insignificant, postchaetal lobes well developed, digitiform to tongue-shaped. Aciculae yellow ***Helmutneris flabellicola*** (Fage, 1936)

Length > 10 mm, width 0.2-0.5 mm

Associated with deep water corals.
West coast of Ireland, Bay of Biscay



Figs from left: maxillae; hooded hook from chaetiger 4; hooded hook from chaetiger 30; parapodium 4; parapodium 20. From Carrera-Parra (2006a).

Hilbigneris Carrera-Parra, 2006

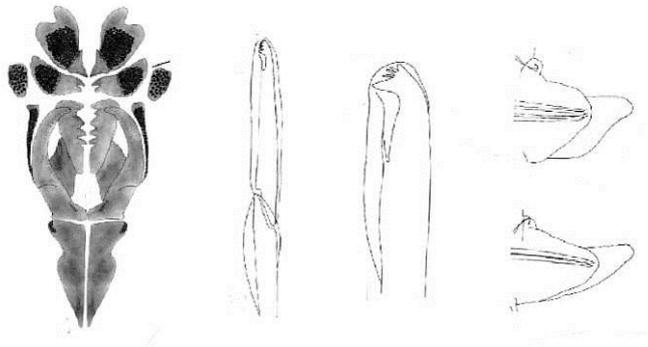
Characteristics. Parapodia uniramous, with simple limbate chaetae and composite and simple multidentate hooded hooks. Mx II distinctly shorter than mx I, connected to mx I by wide connecting ligament. Mx V small, placed outside of mx III and IV.

Taxonomy. The genus has been recently established to incorporate species previously included in *Lumbrineris*. Only one species is known from the area. The species is recently described (Carrera-Parra 2006a) from specimens previously identified as *L. latreilli*.

Anterior parapodia with tongue-shaped, obliquely conical postchaetael lobes. Composite multidentate hooded hooks in chaetiger 1- ca. 25, with long blades. Aciculae yellow. Mx III bidentate ***Hilbigneris pleijeli*** Carrera-Parra, 2006

Length 40-50 mm, width 1.6 mm

NW France, English Channel,
British Isles, shallow water



Figs from left: maxillae;
composite hooded hook; simple
hooded hook; parapodium 16;
parapodium 136. From Carrera-
Parra (2006a).

Lumbricalus Frame, 1992

Diagnosis. Prostomium conical. Parapodia uniramous, with simple limbate chaetae, composite spinigers, and composite and simple multidentate hooded hooks. Mx III with one to three teeth. Mx IV unidentate, mx V free, placed outside of mx IV.

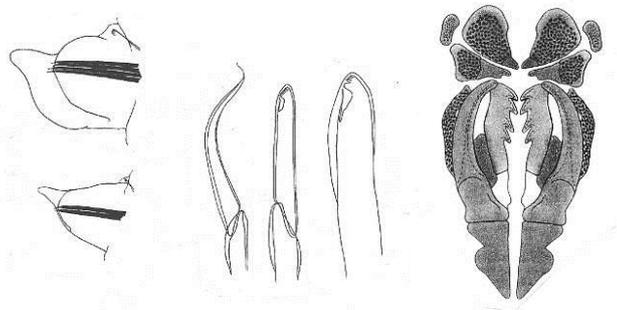
Taxonomy. The genus is characterised by the presence of composite spinigers in the anterior part of the body. The spinigers are situated in the middle part of the bundle of chaetae. The genus was revised by Carrera-Parra (2004). Most species are found in warm and temperate waters. Only one species is known from the area.

Anterior parapodia (1- ca. 30), with limbate chaetae, composite spinigers and composite hooded hooks with long blades. All chaetae reddish. Postchaetal lobe tongue-shaped, obliquely conical. Aciculae black. Mx III unidentate with a subdistal swelling
 *Lumbricalus campoyi* Aguirrezabalaga & Carrera-Parra, 2006

Length > 100 mm, width 4 mm

Bay of Biscay, 900-1000 m

Figs from left: parapodium 12; parapodium 140; composite spiniger; composite hooded hook; simple hooded hook; maxillae. From Aguirrezabalaga & Carrera-Parra (2006).



Lumbrinerides Orensanz, 1973

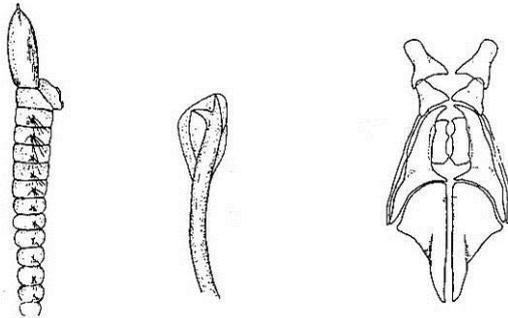
Characteristics. Prostomium long, distally pointed. Parapodia uniramous, with simple limbate chaetae and simple bidentate hooded hooks. Aciculae yellow or black. Mx I usually with 1-2 accessory teeth on inner margin. Mx III with two aliform expansions. Mx IV without teeth. Mandibles usually fused for entire length.

Taxonomy. The genus is characterised by the presence of bidentate hooded hooks and the shape of the maxillae. The species may be separated on the presence and position of small accessory teeth at the inner rim of mx I and the position of bidentate hooks. The genus was revised by Miura (1980) who reported three species from NE Atlantic waters.

1. Mx I without accessory teeth 2
 - Mx I with one accessory tooth on inner border. Prostomium long. Simple hooded hooks from chaetiger 6 *Lumbrinerides crassicephala* (Hartman, 1965)

Length 20-30 (?) mm, width 0.6 mm

North Atlantic, Faroe Islands, deep water

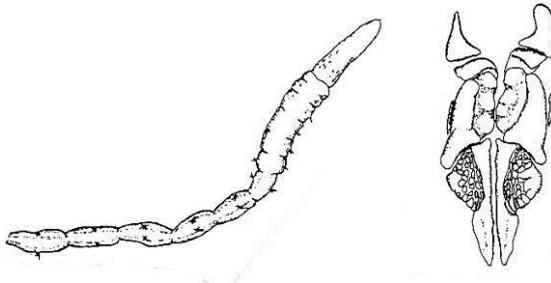


Figs from left: anterior end with pharynx slightly everted; bidentate hook; maxillae. From Hartman (1965)

2. Prostomium very long, about three times as long as wide, 3-5 anterior parapodia reduced, bidentate hooks from chaetiger 1 *Lumbrinerides laubieri* Miura, 1980

Length 20 (?) mm, width 0.3 mm

Bay of Biscay, deep water

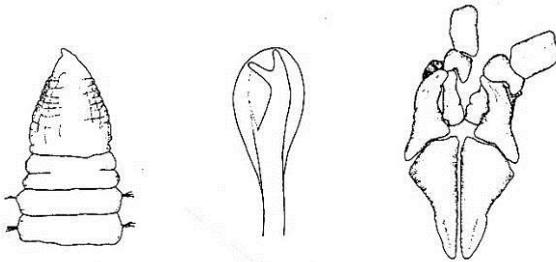


Figs: anterior part of body; maxillae. From Miura (1980).

- Prostomium about twice as long as wide, 7-9 anterior parapodia reduced, bidentate hooks from chaetiger 2-6 *Lumbrinerides amoureuxi* Miura, 1980

Length ?, width 1 mm

Bay of Biscay, shallow to deep water (1100 m).



Figs from left: anterior end; bidentate hook; maxillae. From Miura (1980).

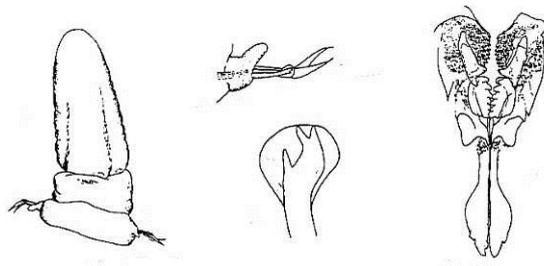
Lumbrineriopsis Orensanz, 1973

Characteristics. Parapodia uniramous, with simple limbate chaetae and simple bidentate hooded hooks. Aciculae yellow or black. Mx III with two aliform expansions. Mx IV finely denticulate. Pygidium rounded.

Taxonomy. The genus is characterised by the presence of bidentate hooded hooks and the shape of the maxillae. The genus was revised by Miura (1980). Four species are known from NE Atlantic waters.

1. Yellow aciculae 2
 - Black aciculae 3

2. Prostomium prolonged *Lumbrineriopsis paradoxa* (Saint-Joseph, 1888)

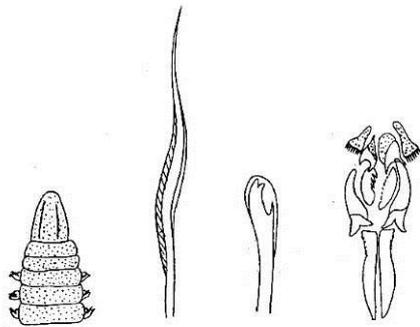


Length ?, width 0.5 mm

France, English Channel, shallow water.
 Deep water, NE Atlantic and off
 Bermuda.

Figs from left: anterior end; parapodium
 from middle body; bidentate hook;
 maxillae. From Miura (1980).

- Prostomium short, slightly longer than wide
 *Lumbrineriopsis* sp. (*L. paradoxa* sensu Fauvel 1923)

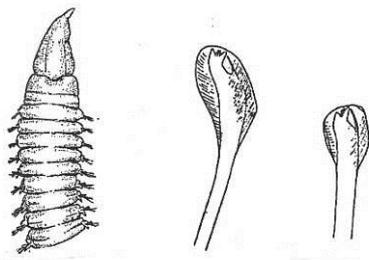


Length ?, width 1 mm

France, English Channel, shallow water

Figs from left: anterior end; limbate
 chaeta; bidentate hook; maxillae. From
 Fauvel (1923).

3. Hooded hooks with 2-5 needle-shaped denticles between the two main teeth
 *Lumbrineriopsis tsushimaensis* Imajima & Higuchi, 1975



Length 50 mm, width 1 mm

North Sea, 50-200 m

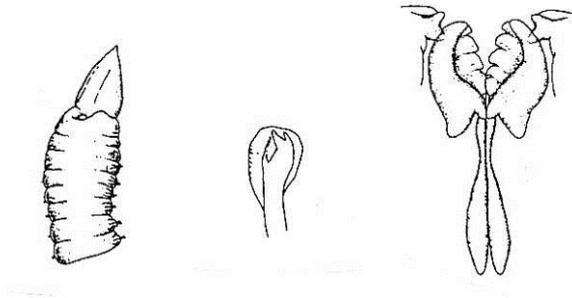
Figs from left: anterior end; bidentate
 hook chaetiger 8; bidentate hook
 posterior chaetiger. From Imajima &
 Higuchi (1975).

- Hooded hooks with an open space between the two main teeth

.....*Lumbrineriopsis gasconiensis* Miura, 1980

Length 10-20 (?) mm, width 0.9 mm

Bay of Biscay, deep water



Figs from left: anterior end; bidentate hook; maxillae. From Miura (1980).

Lumbrineris Blainville, 1828, emended Carrera-Parra 2006b

Characteristics. Prostomium conical or globular. Parapodia uniramous, with limbate chaetae and simple and composite multidentate hooded hooks. Aciculae yellow or black. Maxillary apparatus with five pairs of maxillae, mx I and II of about equal size, mx III and IV with 1-2(4) teeth. Mx V free-standing, placed outside of mx IV.

Taxonomy: The genus *Lumbrineris* was previously (e.g. Fauvel 1923) rather widely defined, but has gradually become more restricted as new genera have been erected for species with particular characteristics (Orensanz 1973, 1990; Frame 1992; Carrera-Parra 2006a, b). Several of the early described species have been imperfectly diagnosed and reported from world-wide areas (e.g. *L. latreilli*) due to confusion with similar species. The genus was revised by Carrera-Parra (2006b) who provided a new description of *Lumbrineris latreilli* based on type material. He also synonymised *L. agastos* with *L. futilis*. The number of species in the region is uncertain. Small specimens with yellow aciculae and unidentate mx III may represent a species complex.

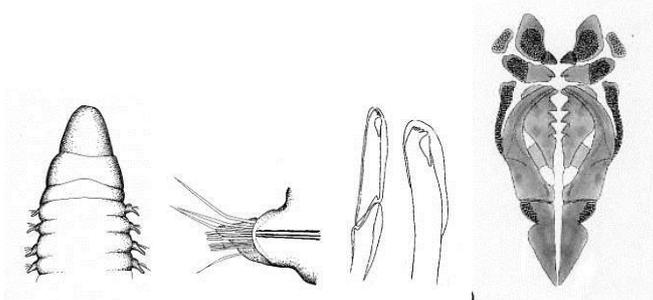
1. Yellow or light brown aciculae 2
 - Black aciculae, mx III unidentate with a subdistal knob or swelling. Composite hooded hooks in chaetigers 1-20(23), with long blades ***Lumbrineris futilis*** (Kinberg, 1865)

[= *L. agastos* Fauchald, 1974; fide Carrera-Parra 2006b]

Length > 100 mm, width 2.5-3 mm

North Sea, British Isles, Norwegian coast, Faroe Islands, Bay of Biscay, moderate depths

Figs from left: anterior end; parapodium 6; composite hooded hook; simple hooded hook; maxillae. From Fauchald (1974; as *L. agastos*) and Carrera-Parra (2006b).



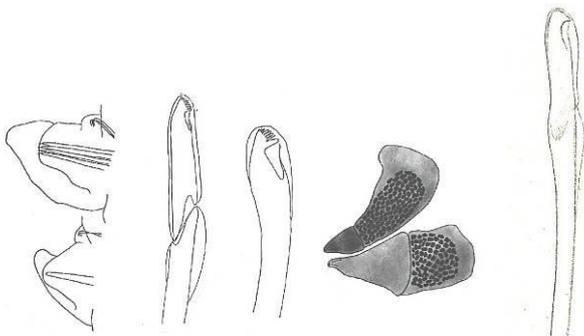
2. Mx III unidentate 3
 - Mx III bidentate 5

3. Composite hooded hooks with moderately long blade in anterior chaetigers (length: width = 5.5-8:1) ***Lumbrineris* cf. *kerгуelensis*** (Grube, 1878)

Length > 60 mm, width 1.5-2.7 mm

Central North Atlantic, north of Ireland, depth > 2000 m.

Figs from left: parapodium 15; parapodium 70; composite hooded hook, simple hooded hook; mx III-IV (from type specimen); composite hooded hook (specimen from Kerguelen). From Carrera-Parra (2006b) and McIntosh (1885).



- Composite hooded hooks with short blade in anterior chaetigers (length: width = 4-5:1) 4

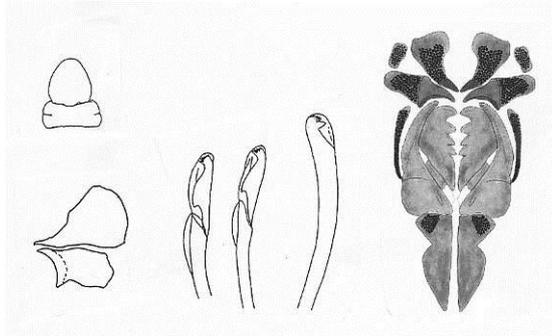
4. Mx III with arcuate cutting edge leading to a ventral expansion approaching the shape of a tooth (giving the impression of a plate with two widely separated teeth), middle and posterior simple hooded hooks with 4-8 small teeth *Lumbrineris* near *cingulata* (Ehlers, 1897)

(= *Lumbrineris gracilis* sensu Hartmann-Schröder 1996, George & Hartmann-Schröder 1985; non Ehlers, 1868)

Length 30-50 mm, width 0.8-1 mm

France, British Isles, eastern and western North Atlantic, North Sea, shelf and coastal waters in southern and western Norway.

Figs from left: Anterior end; mx III-IV; composite hooded hooks chaetiger 4; simple hook chaetiger 15; maxillae (from type of *L. cingulata*). From Winsnes (1980; as *L. gracilis*) and Carrera-Parra (2006b).

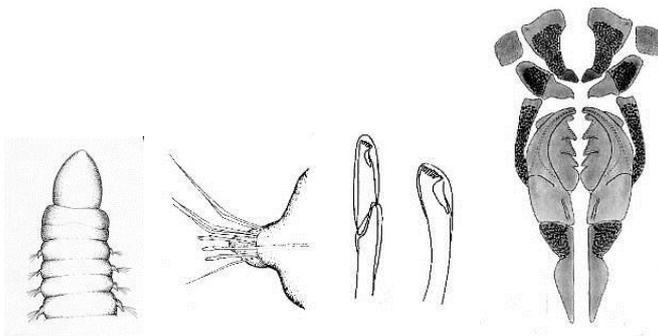


- Mx III with slightly curved cutting edge, middle and posterior simple hooded hooks with 6-10 small teeth *Lumbrineris aniara* Fauchald, 1974

Length 40-50 mm, width 0.9-1.3 mm

North Sea, southern and western Norway, shelf and coastal waters, ?Bay of Biscay

Figs from left: anterior end; anterior parapodium; composite hooded hook; simple hooded hook; maxillae. From Fauchald (1974) and Carrera-Parra (2006b).



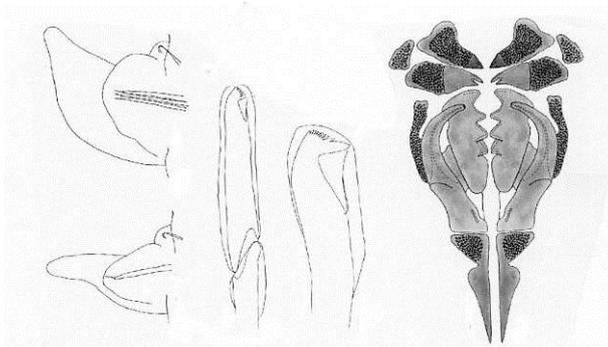
Remarks: Specimens with characters in between *L. aniara* and *L. near cingulata* are regularly found in the area. In northern waters species with both composite and simple hooded hooks in anterior chaetigers occur (*L. vanhoeffeni* (Michaelsen, 1898): Greenland; *L. mixochaeta* Oug, 1998: northern Norway, Barents Sea)

5. Prostomium conical. Composite hooded hooks on chaetigers 1-20(24), with long blades in anterior setigers *Lumbrineris latreilli* Audouin & Milne-Edwards, 1834

Length 100-200 mm, width 3-5 mm

France, British Isles, North Atlantic to Iceland, North Sea, Skagerrak, shallow to deep water.

Figs from left: parapodium 18; parapodium 150; composite hooded hook from anterior chaetiger; simple hooded hook; maxillae. From Carrera-Parra (2006b).

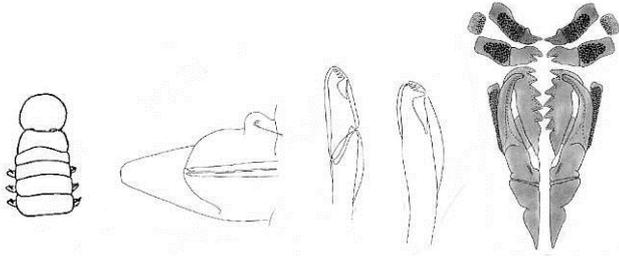


- Prostomium round, globular. Parapodia with well-developed postchaetal lobes. Blades of composite hooded hooks short, of similar length throughout
 *Lumbrineris* cf *coccinea* (Renier, 1804)

Length 50 mm, width 1.3 mm

W France, English channel, intertidal and shallow water

Figs from left: Anterior end; parapodium 12; composite hooded hook; simple hooded hook; maxillae. From Fauvel (1923) and Carrera-Parra (2006b).



Ninoe Kinberg, 1865

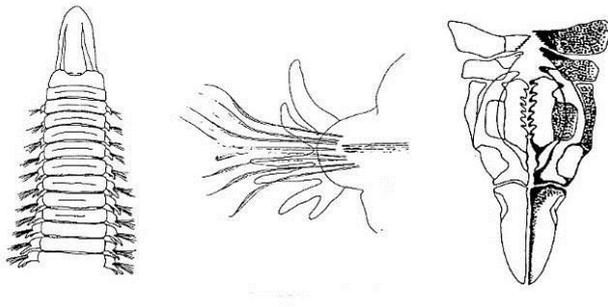
Characteristics. Prostomium conical, with a pair of dorsal slit-like organs. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Anterior parapodia with a number of digitiform postchaetal branchial lobes. Mx IV or mx III and IV with denticulate incisive edges.

Taxonomy: The genus is characterised by the branched branchial lobes in the anterior part of the body and the dentition of mx III and IV. The genus is represented by a number of species in warm waters. One species is known from the area.

Branchiae from chaetiger 5-6 to 31-39, up to five filaments from chaetiger 20, simple hooded hooks from chaetiger 7-15, mx III bidentate, mx IV with 7-8 fine teeth
 *Ninoe armoricana* Glemarec, 1968

Length 30-40 mm, width 1.5 mm

N Atlantic, Bay of Biscay,
 moderate depth



Figs from left: anterior end;
 parapodium 24, anterior view;
 maxillae. From Glémarec (1968).

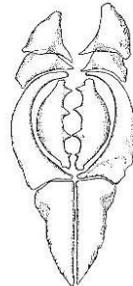
Scoletoma Blainville, 1828

Characteristics. Prostomium conical or globular, occasionally with a single occipital antenna. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Aciculae yellow or black. Mx III unidentate or bidentate. Mx V free-standing, placed outside of mx IV.

Taxonomy: Frame (1992) resurrected *Scoletoma* as a valid genus to encompass species with simple hooded hooks and simple limbate chaetae, which previously had been referred to *Lumbrineris*. As currently defined, *Scoletoma* and *Lumbrineris* are rather close, and are essentially distinguished only by the lack and presence of composite hooded hooks, respectively (Frame 1992, Carrera-Parra 2006a). *Scoletoma impatiens* (Claparède) has been synonymised with *Lumbrineris tetraura* (Schmarda) by various authors. Winsnes (1980) and Orensanz (1990), however, have clearly indicated that the two species are different. *Scoletoma funchalensis* (Kinberg) is poorly known and possibly confused.

Note: Juvenile specimens of *Lumbrineris* and *Hilbigneris* may lack composite hooded hooks and key out as *Scoletoma*.

1. Yellow or golden aciculae, mx III unidentate or bidentate 2
 - Dark brown or black aciculae, mx III unidentate or unidentate with subdistal swelling 4
2. Mx III unidentate, anterior chaetigers with limbate chaetae only, hooded hooks from chaetiger 6-15 ***Scoletoma atlantica*** sensu Hartman (1965)



Length 25 mm, width ?

Central and NW North Atlantic, deep water

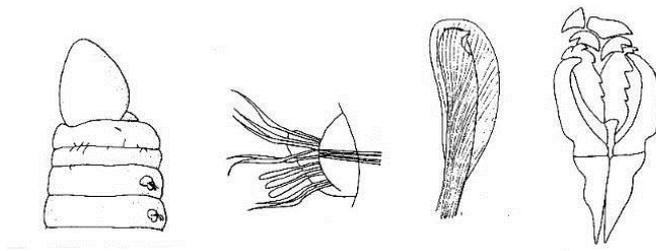
Figure: maxillae (mx V omitted)
 From Hartman (1965)

- Mx III bidentate, anterior chaetigers with limbate chaetae and hooded hooks 3
3. Capillary chaetae extending backwards to chaetiger 50-60 ***Scoletoma impatiens*** (Claparède, 1868)

[=*Lumbrineris tetraura*: Hartmann-Schröder 1996, non Schmarda, 1861]

Length > 100 mm, width 3-5 mm

North Atlantic, widely distributed

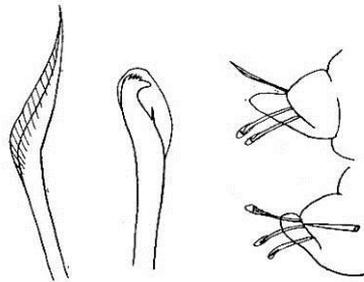


Figs from left: anterior end; parapodium 18; posterior hooded hook; maxillae. From Hartmann-Schröder (1996) (as *L. tetraura*).

- Capillary chaetae limited to the first 10-20 chaetigers
 *Scoletoma funchalensis* sensu Fauvel (1923)

Length 15-60 mm, width ?

Bay of Biscay, English channel,
British waters, shallow water



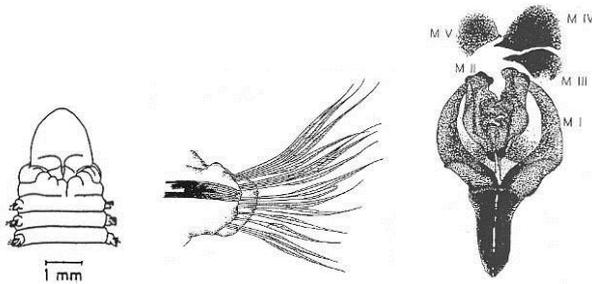
Figs from left: limbate chaeta;
hooded hook;
anterior parapod:
middle parapod. From Fauvel
(1923).

Remarks: This form could possibly represent juveniles of several species,
also including species with composite hooks (*Hilbigneris pleijeli*)

- 4. Mx III unidentate, anterior parapodia with short flap-like postchaetal lobes, occasionally with 1-2 long hooded hooks, usually with limbate chaetae only
 *Scoletoma fragilis* (O.F. Müller, 1776)

Length 100-200 mm or more,
width 4-12 mm

North Sea, ?British Isles, Faroe
Islands, Norwegian Sea, Arctic,
shallow water to moderate depth

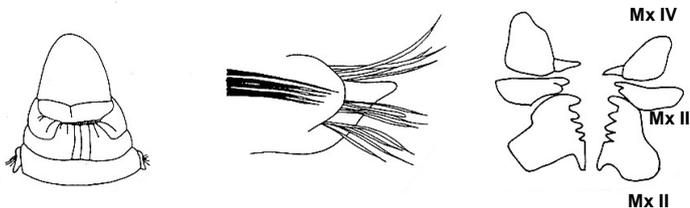


Figs from left: anterior end
ventral; parapodium 9;
maxillae
(left mx III-V omitted). From
Winsnes (1980) and Frame
(1992).

- Mx III unidentate with a subdistal knob or swelling, anterior and middle parapodia with tongue-shaped, obliquely conical postchaetael lobes, usually with one, occasionally with 2-6 long hooded hooks
 *Scoletoma magnidentata* (Winsnes, 1981)

Length 100-200 mm, width 3-
5 mm

North Sea, British Isles, Faroe
Islands, Norwegian coast to
Lofoten islands, shallow water
to moderate depth



Figs from left: anterior end
ventral; parapodium 25; mx
II-IV. From Winsnes (1981).

Remarks: Very close to *S. acicularum* (Webster & Benedict, 1887) from NW
Atlantic

Species of uncertain status

Lumbrineris minuta (Théel, 1879).

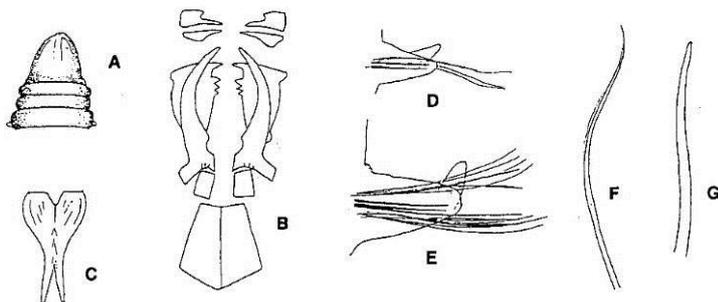
The species was described from Novaya Zemlya. The original description is comprehensive and well illustrated (Théel 1879), but apparently mixes characters from several species. Oug (1998) examined parts of the original material and confirmed that it consists of two or more species. In faunal surveys the species name appears to have been used for several small species from Arctic and North Atlantic waters belonging in *Abyssoninoe*, *Scoletoma* and *Lumbrineris*. Oug (1998) concluded that the species is indeterminate and needs to be re-examined to assess its status.

Lumbrineris labrofimbriata (Saint-Joseph, 1888)

The species was described from Brittany, France. Comments to the species and description of characters have been given by Laubier (1959) and Ramos (1976). The main characteristics are a denticulate inner margin of the mandibles and presence of both composite and simple hooded hooks in anterior chaetigers. Carrera-Parra (2006b), however, noted that these features occur during ontogenetic development in *Lumbrineris* and considered the species as invalid.

Lumbrineris cluthensis (Clark, 1953)

The species was described from Firth of Clyde, west coast of Scotland. Several specimens have later been found in British coastal waters (O'Reilly & Mackie, pers. commn). It is characterised by having blunt spine-like hooks and limbate chaetae in all chaetigers. Hooded hooks are absent. The maxillary apparatus is supported by two pairs of carriers, of which the posterior is the largest (Clark 1953, George & Hartmann-Schröder 1985). The species does not comply with the definition of the Lumbrineridae due to its lack of hooded hooks and is possibly more closely affiliated to Oeonidae.



Lumbrineris cluthensis

Figs from left: Anterior end; mandibles; maxillae; parapodium 1; parapodium 85; chaetae. From Clark (1953)

Scoletoma punctata (McIntosh, 1885)

The species was described from NW Atlantic deep water. According to the original description (McIntosh 1885), it is characterised by a prolonged triangular prostomium with six brown symmetrically arranged pigment spots at the posterior border. Hooded hooks are slender. Maxillae II are asymmetrical with two teeth on the left plate and several on the right, mx III and IV are unidentate. Mx V ('accessory plates') appear to be missing. Frame (1992) considered this species to belong in *Scoletoma*, but the shape of the prostomium, the long hooks and the possible lack of mx V may suggest that it should be referred to *Abyssoninoe* or *Cenogenus*.

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