

## Family SYLLIDAE

The syllids are a highly diverse family, which are only occasionally found in large numbers in British waters. Many are small and most are cryptic in habitat. They live amongst bryozoans, ascidians, sponges and hydroids (*Autolytus*, *Proceraea*, *Procerastea*, *Syllis*, *Eusyllis*, *Haplosyllis*), in membranous tubes on algae, larger bryozoans and hard substrates (*Autolytus*, *Proceraea*, *Eusyllis*, *Pionosyllis*) in *Laminaria* holdfasts (*Autolytus*, *Syllis*, *Pionosyllis*, *Exogone*, *Sphaerosyllis*) or in soft sediments (*Exogone*, *Sphaerosyllis*, *Streptosyllis*). They occur from the intertidal zone down to the depths of the oceans.

Identification of British syllids is made more difficult by the absence of any suitable reference work. Fauvel (1923) clearly spent little time on the family himself, though he brings together many of the older descriptions, often illustrated by original figures. Hartmann-Schröder (1971) adds little, although her coverage of the genera *Exogone* and, to some extent *Sphaerosyllis* is an improvement on what has gone before. For the genus *Autolytus*, Gidholm (1967) is excellent in many ways, though concentrating on living material and not covering all species likely to occur in Britain. Of modern works on non-British syllids, those of Imajima (1966 a-e), Ben-Eliahu (1977 a & b), Westheide (1974), Perkins (1981) and San Martin (1982) stand out.

A typical syllid has a prostomium with 3 antennae and a pair of palps, which may or may not be fused together to some degree. The peristomium bears 1 or 2 pairs of tentacular cirri, and each subsequent segment bears uniramous parapodia (sexually mature individuals or stolons develop an additional group of swimming chaetae dorsal to the parapodium). Dorsal cirri are present, as are ventral cirri in all but the subfamily Autolytinae. The pharynx is partly eversible, and may be unarmed or bear a single tooth or several smaller teeth, as well as soft papillae around its opening. The pharynx leads into a muscular organ, the proventriculus, which may be followed by the ventriculus before the intestine. Syllid chaetae are largely compound forms, though many species also have some simple chaetae. A common arrangement is for a group of compound chaetae below the aciculum and a single simple chaeta above it. In posterior segments, a simple chaeta may be found below the group of compound forms.

(Pharyngeal tooth - ring of chitinous teeth attached to a basal chitinous ring, as opposed to the ring of soft papillae which always surround the pharyngeal opening in Syllids)

Four subfamilies are recognised, the Autolytinae, the Eusyllinae, the Exogoninae and the Syllinae. It is highly likely that these subunits represent natural groupings, although some moving of species and genera from one to another will inevitably occur for some time to come.

The Autolytinae (genera *Autolytus*, *Proceraea*, *Procerastea*, *Myrianida*, *Virchowia*) is characterised by the absence of ventral cirri, appendages without joints or articulations, a long to very long pharynx with a trepan of small teeth at its opening, and by a mode of reproduction by which sexual buds or stolons are produced. In the past, much emphasis has been placed upon the details of the trepan, although no attempt has been made to relate, for instance, absolute numbers of teeth to body size. Because of the difficulties associated with examining the fine detail of such tiny structures and then in assessing the significance of observed differences, I have paid very little attention to the trepan.

The Eusyllinae (genera *Eusyllis*, *Pionosyllis*, *Syllides*, *Dioplosyllis*, *Streptosyllis*, *Opisthodontia*) is characterised by appendages without joints or articulations and a mode of reproduction in which the whole animal becomes modified at sexual maturity (epigamy). There is no doubt that the generic divisions within the subfamily are, at present, unsatisfactory in many cases, and the division between the Eusyllinae and the Exogoninae also remains a little obscure. Many species, particularly in the genus *Pionosyllis*, remain poorly known and described and much revisionary work is required. For this reason, I am not at all certain which species of several eusylline genera to include in the British fauna.

The Exogoninae (genera *Exogone*, *Brania*, *Parapionosyllis*, *Sphaerosyllis*) is characterised by smooth appendages, much reduced in the genus *Exogone*, palps fused along their whole length and epigamous reproduction, often followed by the brooding of embryos and larvae attached to the female's body. The generic divisions are reasonably well established, although there has been confusion between species of *Brania* and those of *Pionosyllis*. The single British representative of *Parapionosyllis* is very like a *Sphaerosyllis* species, but lacks any of the papillae on the body characteristic of the latter.

The Syllinae (genera *Syllis*, *Eurysyllis*, *Trypanosyllis*, *Haplosyllis*) is characterised by jointed appendages (in all genera except *Eurysyllis*, in which they are effectively reduced to one joint each), and reproduction involving the production of stolons. This subfamily is basically in a chaotic state, particularly at the species level. Within the very large genus *Syllis*, the characters that have been previously used to define species now appear to be unsatisfactory in many cases. Most records of species in this genus must be treated as doubtful, except in the cases of species such as *S. krohnii* which are sufficiently different to be readily recognisable.

## Examination and identification of British syllids

The identification of most syllids depends upon examining details of morphology under a compound microscope. In very small species such as the *Exogone*, *Sphaerosyllis*, *Brania* species, the whole animal should be mounted on a slide. The same also holds true for long thin species such as the autolytids and some of the eusylline and sylline species. In the more robust animals, appropriate parapodia, dissected pharynx etc should be mounted. Temporary mount should either be in water (for material stored in formalin) or in glycerol.

The taxonomically important characters vary somewhat between the subfamilies, so each subfamily will be considered separately:

### Autolytinae:

In the past, much emphasis has been placed on the fine detail of the pharyngeal armature, the trepan. The number and relative sizes of the teeth making up the trepan do vary between species. However, variation within a species is poorly understood, and the small size of the trepan and difficulties associated with examining it limit the usefulness of this feature. More useful are the dorsal cirri - how they vary in size, whether or not they arise from distinct cirrophores, their size relative to the cirrophores etc. Gidholm (1967) also noted differences in internal parapodial glands, separating *Autolytus prolifer* and *A. edwardsi* from other species of the genus. Two features of the chaetae are also of value - whether the simple chaetae are thinner than the shafts of the compound, or of comparable thickness, and whether the terminal tooth of the bidentate falcigers is as well developed as the secondary tooth or not. The length and degree of coiling of the pharynx are also worthy of note.

### Eusyllinae

The genera of the Eusyllinae are still relatively poorly defined, and again much has been made of the armature of the pharynx. However, this feature does seem to be of value at the generic level, although not easily seen. The pharynx may be unarmed (*Streptosyllis*, *Syllides*), armed with a single tooth (*Eusyllis*, *Dioplosyllis*, *Pionosyllis*, *Opisthodonta*) or armed with a small number of teeth (*Amblyosyllis*, *Odontosyllis*). At the species level, much emphasis is placed on the chaetae, which are predominantly compound.

### Exogoninae

Most of the genera of this subfamily have only one pair of tentacular cirri, the exception being *Brania*. The subfamily is also peculiar in that throughout its genera there are species which lack dorsal cirri on setiger 2. The significance of this is unclear. Separation of species depends on the chaetae to a large extent in the genus *Exogone*, in which there are a large variety of chaetal types. *Sphaerosyllis* is more conservative as far as chaetae are concerned, although there are differences in the lengths of chaetal blades, or the range of lengths present. The degree of development of the antennae is important in *Exogone*, as is the shape of the dorsal cirri in *Brania*.

### Syllinae

This is, in many ways, the most problematic subfamily. At the generic level, it now seems that there is little justification for retaining the gener *Langerhansia* and *Typosyllis*, and *Ehlersia* is likely to belong to the Eusyllinae. Currently, therefore, all species of Syllinae with just a single tooth in the pharynx are assigned to the genus *Syllis*, except for the one species with only simple chaetae, *Haplosyllis spongicola*. However, at the species level, big problems remain. First of all, separation of species has not occurred with any consistency, and secondly, even when separated, the application of appropriate names is extremely difficult. Many species of the genus *Syllis* are reported as having wide geographic distributions, and in certain areas of the world there seems to be an extremely diverse fauna as far as this genus is concerned. Both of these observations are in part due to our very poor understanding of characters of taxonomic importance, and consequently any identifications are likely to be tentative. My own work on the British members of the genus remains at the separation stage, although I have given species names where possible. Both the number of joints in the dorsal cirri and the maximum length of chaetal blades have been much used in the past, and certainly are valid in certain circumstances. However, in species with relatively large numbers of joints in their appendages, the actual number is, of necessity, strongly size dependent. Similarly in species with relatively long-bladed chaetae, both the actual maximum blade length and the ratio of largest to smallest blade are strongly influenced by body size. In at least some species examination of the acicula is profitable.

*Amblyosyllis formosa*

- missed out accidentally from Key.

Selected references:

- Ben-Eliahu, M.N., 1977 a & b. Polychaete cryptofauna from rims of similar intertidal vermetid reefs on the mediterranean coast of Israel and in the Gulf of Eilat: Syllinae and Eusyllinae. Isr. J. Zool., 26:1-58. Exogoninae and Autolytinae. Isr. J. Zool., 26:59-99.
- Gidholm, L., 1967. A revision of the Autolytinae (Syllidae, Polychaeta) with special reference to Scandinavian species, and with notes on external and internal morphology, reproduction and ecology. Ark. Zool., 19:157-213.
- Imajima, M., 1966. The Syllidae (Polychaetous annelids) from Japan. I Exogoninae. II Autolytinae. III Eusyllinae. IV Syllinae 1. V Syllinae 2. Publ. Seto Mar. Biol. Lab., 13: 385-404, 14:27-83, 85-111, 219-252, 253-294.
- Perkins, T.H., 1980. Syllidae (Polychaeta), principally from Florida, with descriptions of a new genus and twenty-one new species. Proc. Biol. Soc. Wash., 93:1080-1172.
- San Martin, G., 1984. Estudio Biogeografico, Faunistico y Sistemático de los Poliquetos de la familia Silidos (Syllidae: Polychaeta) en Baleares. PhD thesis Universidad Complutense de Madrid, pp. 529.
- Westheide, W., 1974. Interstitielle fauna von Galapagos XI Pisionidae, Hesionidae, Pilargidae, Syllidae (Polychaeta). Mikrofauna des Meeresbodens, 44:1-146.

Bause, Karl (1971) A new species and additions to the descriptions of six other species of Syllides Oersted (Syllidae, Polychaeta). J. Fish. Res. Bd. Canada 28: 1469-1481

Gillandt, Lisel (1979) Zur Systematik, Autökologie und Biologie der Polychaeten des Helgoländer Felskorals.  
Mitt. Hamb. Zool. Mus. Inst. 76: 19-73

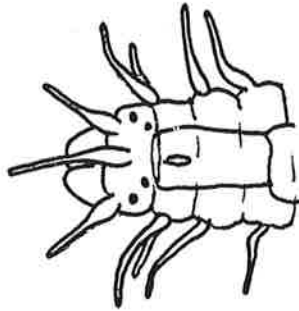
missed out: Amblyosyllis formosa

Family SYLLIDAE

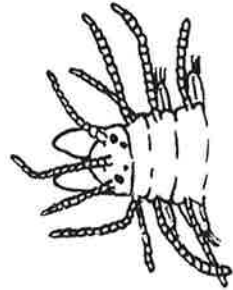
Characteristics:

1. Muscular proventriculus or gizzard posterior to pharynx
2. Typically prostomium has 3 antennae and a pair of palps
3. Form of body and appendages very variable
4. Chaetae mostly compound, though with some simple forms usually present

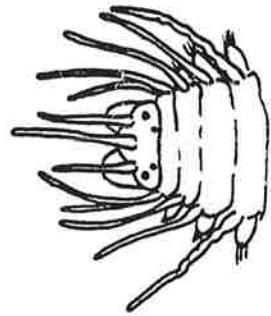
A. Species with 2 pairs of tentacular cirri



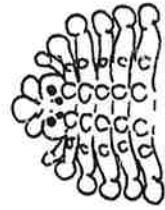
A1. Antennae, tentacular and dorsal cirri jointed



A2. Antennae, tentacular and dorsal cirri smooth or wrinkled



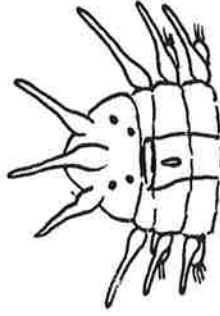
A3. Dorsal cirri globular, 4 rows of tubercles along dorsum



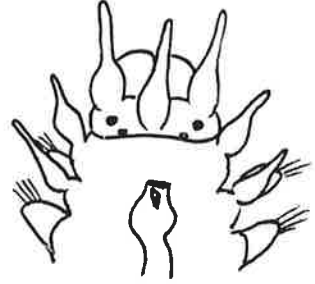
*Euryssyllis tuberculata*

N.B. In *Euryssyllis* the antennae and tentacular cirri appear beaded while the dorsal cirri are only weakly wrinkled.

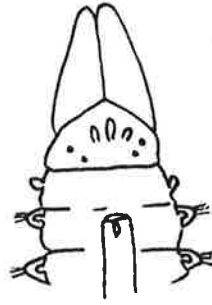
B. Species with 1 pair of tentacular cirri



B1. Antennae, tentacular and dorsal cirri well developed and flask-shaped



B2. Antennae, tentacular and dorsal cirri reduced and globular



Al.

Dorsal cirri alternating between long thick and short thin forms

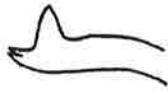


*Syllis krohnii*

Dorsal cirri alternating in length only



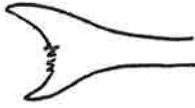
All chaetae simple



*Haplosyllis spongicola*

Some stout special simple chaetae in mid-body parapodia

Simple chaetae as shown



*Syllis gracilis*

Simple chaetae as shown



*Syllis amica*

All chaetae compound in mid-body parapodia

Body flattened, ribbon shaped; pharynx with trepan and a single tooth

Dorsum without dark pigment; dorsal cirri with fewer than 15 joints (varies with age)

*Trypanosyllis coeliaca*

Dorsum with dark pigment; dorsal cirri with more than 20 joints (varies with age)

*Trypanosyllis zebra*

Body rounded in cross-section with only a single pharyngeal tooth

Chaetae include one or two long bladed spinigers, clearly much longer than blades of falcigers



A.I.I.

No long bladed spinigers

*Syllis cornuta*  
Dorsal cirri with up to 13 articulations

*Syllis sp. A*  
Dorsal cirri with around 20 articulations

A.I.I.

Aciculum in parapodia behind proventriculus with bulbous tip



*Syllis prolifera*

Stout emergent aciculum present from setiger 1



*Syllis* sp. B

Aciculum in parapodia behind proventriculus with tapering tip



Stout emergent aciculum, if present only in post-proventricular segments

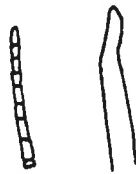
Acicula in parapodia behind proventriculus as shown (2 or 3); dorsal cirri fusiform



*Syllis armillaris*

Possible to have pigmented black lines across. Dorsal part of anterior segments.

Aciculum in parapodia behind proventriculus as shown (1 or 2); dorsal cirri thin



*Syllis hyalina*

Aciculum stout and tapering behind proventriculus



Chaetae all short, unidentate

*Syllis cf. vittata*

Longest chaetal blade 2x shortest; all bidentate

*Syllis cf. variegata*



A.2.

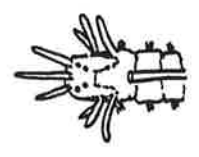
No ventral cirri; pharynx with a distinct bend or complex sinuation

Ventral cirri present; pharynx straight



Dorsal cirri absent after setiger 2

Dorsal cirri present on all setigers



*Procerastea halieziana*  
*Procerastea nematodes*

Dorsal cirri with markedly swollen tips



Dorsal cirri showing pattern of larger and smaller forms

*Virchowia clavata*

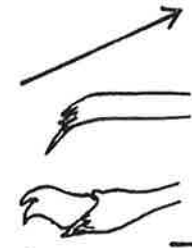
All dorsal cirri of similar length after setiger 4

*Myrianida pinnigera*

Dorsal cirri of the same width along their length



Compound chaetae accompanied by a simple chaetae in each parapodium which is as thick as the shafts of the compound forms



*Procerastea picta*

Terminal tooth of compound chaetae as large as secondary tooth; distinct colour pattern



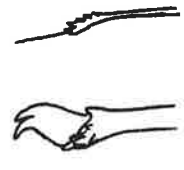
Terminal tooth of compound chaetae smaller than secondary tooth; body with longitudinal brown bands or colourless



*Procerastea prismatica*

*Procerastea aurantiaca*

Compound chaetae accompanied by a thin simple chaeta



*Procerastea cornuta*

A.2.A

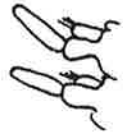
A.2.1

A-2.A.

Pharynx very long, with coils extending lateral to proventriculus



Dorsal cirri subequal in length, arising from swollen cirrophores



*Autolytus inermis*

Dorsal cirri markedly unequal length, arising from inconspicuous cirrophores



*Autolytus alexandri*

Terminal tooth of compound chaetae as large as secondary

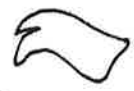


*Autolytus rubrolineatus*

Pharynx not extending lateral to proventriculus



Terminal tooth of compound chaetae smaller than secondary tooth



Median antenna and pygidial cirri white in living animals

Median antenna and pygidial cirri not distinct from the other appendages

Cirrophores of dorsal cirri not extending beyond parapodial lobes



In life, 4 red spots per segment

*Autolytus rubropunctatus*

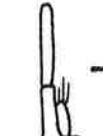
In life, body red along sides of anterior segments; white granules in a line in the gut

*Autolytus edwardsi*

No red on anterior segments; gut irregularly arranged

*Autolytus prolifera*

Cirrophores of longer dorsal cirri extending beyond parapodial lobes



Longer dorsal cirri with cirrophore longer than cirrus

*Autolytus langerhansii*

Longer dorsal cirri with cirrophore shorter than cirrus



*Autolytus brachycephalus*

A 2.1.

Anterior parapodia with enlarged knobbed acicula



Enlarged acicula in setigers 1-5; pharynx not going beyond setiger 4, with no tooth

*Streptosyllis websteri*

Enlarged acicula in setigers 1-6; pharynx not going beyond setiger 4, with no tooth

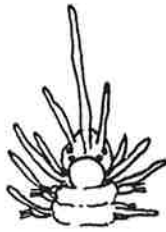
*Streptosyllis bidentata*

Enlarged acicula in setigers 1-15; pharynx going to setiger 16 with a tooth halfway along

*Opisthodonta pterochaeta*

Anterior parapodia with acicula not enlarged or knobbed

A prominent occipital flap behind the prostomium



No occipital flap

A.2.1.A

Chaetal blades long, up to 50 μm



*Odontosyllis gibba*

Chaetae unidentate



*Odontosyllis stenostoma*

Chaetal blades all short μm



Chaetae bidentate



Anterior appendages wrinkled; single tooth and minute denticulations on pharyngeal opening

*Eusyllis blomstrandii*



Anterior appendages smooth; 6-7 recurved teeth in pharynx

*Odontosyllis fulgurans*

A.2.1.A.

Palps linked by a dorsal flap



Dorsal cirri absent from setiger 2

*Brania swedmarki*

Dorsal cirri on all setigers

Dorsal cirri with tips truncated and filled with parallel rods



*Brania pusilla*

Dorsal cirri with tapering tips, containing no rods



Compound chaetae unidentate



*Brania limbata*

Compound chaetae bidentate



*Brania clavata*

Palps linked only at their bases, without dorsal flap



Pharynx with no tooth; some dorsal cirri jointed

Antennae and tentacular cirri jointed; chaetal blades all short

*Syllides articulorirrata*  
See Gill and ...

Antennae and tentacular cirri not jointed; chaetal blades showing considerable variation in length

Chaetae bidentate; dorsal simple similar in all setigers

*Syllides benedicti*

See Barse 1971

Chaetae unidentate; dorsal simple chaeta stout in anterior 4-5 setigers

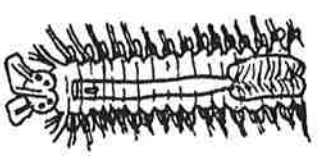
*Syllides longocirrata*

Pharynx with at least one tooth; no jointed dorsal cirri

A.2.1.A.1.

A.2.1.1.

Pharynx very long, in 11 segments, more than 2x length of proventriculus



*Dioplosyllis cirrosa*

Pharynx either very short, or if of moderate length, not longer than proventriculus

Ventral cirri of setiger 1 lamellar, meeting in mid-line



Blades of compound chaetae all of similar length

*Eusyllis lamelligera*

Blades of compound chaetae showing considerable variation in length

*Pionosyllis lamelligera*

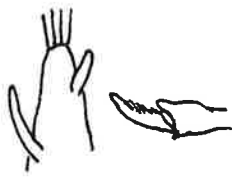
Blades of medium length from mid-body serrations at their base



*Pionosyllis serrata*

Blades of chaetae either minutely serrated or smooth

Dorsal cirri of setigers after 1st very short; chaetae short, unidentate



*Pionosyllis prope-weismanni*

Dorsal cirri of mid-body setigers long to very long; chaetae with some long blades

Opening of pharynx with denticulate chitinous ring as well as a tooth

Opening of pharynx with a smooth chitinous ring as well as a tooth

Chaetae unidentate

Chaetae bidentate

*Pionosyllis divaricata*

*Pionosyllis compacta*

*Pionosyllis pulligera*

*Pionosyllis longocirrat*

Bl.

Dorsal cirri present on all setigers

Body long; glands above most parapodia; chaetae with considerable variation in length of blades

*Parapianosyllis minuta*

Body short, grub-like; no glands; chaetal blades all short

Ociculae in straight line  
4 eyes + 2 anterior eyespots  
4 distinct rows of papillae dorsally

*Sphaerosyllis tetralix*  
also  
*S. ovigera* (Fibriller capsulae)

4 eyes, no anterior eyespots  
irregularly arranged papillae over whole body

4 eyes in a row, with 2 anterior eyespots



*Sphaerosyllis erinaceus*

Tip of aciculum bulbous, as shown difficult to see



*Sphaerosyllis bulbosa*

Parapodial bodies granular

Dorsal cirri absent from setiger 2

4 eyes in a trapezium, with or without anterior eyespots

very difficult to observe

Tip of aciculum bent at right angle



Granular bodies above most parapodia



*Sphaerosyllis magnidentata*  
Perkins 1921

Fibrillar bodies above most parapodia



*Sphaerosyllis hystrix*

Chaetal blades of varying lengths in a parapodium, max. length 30 um



Dorsal cirri short, with rounded bases

*Sphaerosyllis thomasi*  
San Martin 1934

Chaetal blades all short, max. length 15 um

Dorsal cirri longer and thinner



*Sphaerosyllis taylori*  
Perkins 1931

B2.

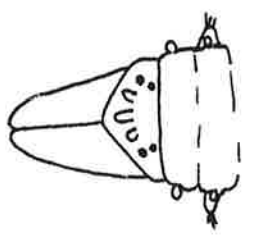
Dorsal cirri on all setigers

Dorsal cirri absent from setiger 2

*Exogone dispar*

*E. breripes*  
- poorly described  
- species - record  
from Plymouth  
dubtful.

Median and laterals reduced; chaetae include spinigers and falcigers

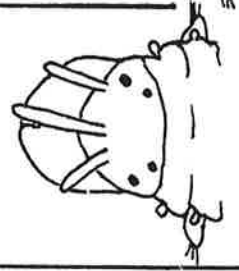


*Exogone verugera*

Proventriculus: much longer than wide



Median and laterals well developed; chaetae include spinigers and falcigers

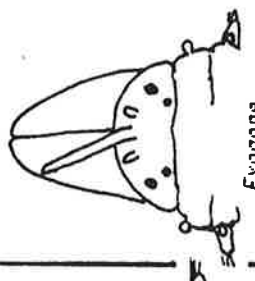


*Exogone naidina*

Proventriculus: only slightly longer than wide



Median antenna well developed laterals reduced chaetae all falcigers



*Exogone hebes*

Proventriculus: much longer than wide

