I.R.T.U. / ECSA WORKSHOP
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ASYM92

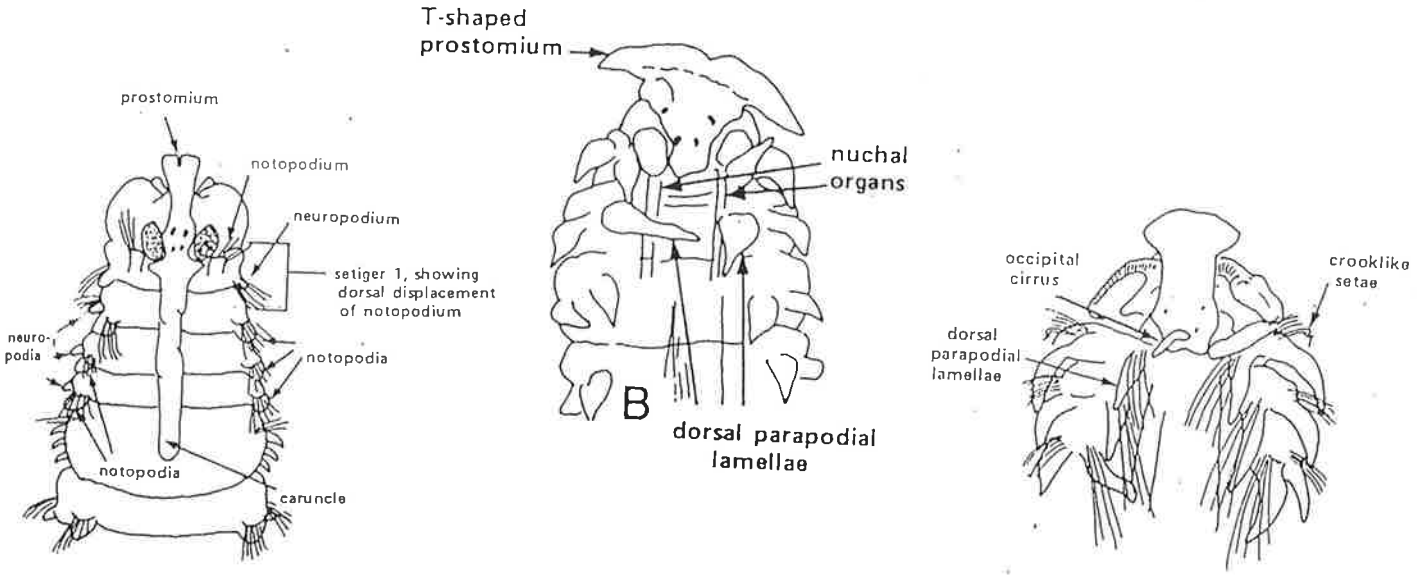
SPIONIDAE

The correct identification of spionids depends (or should depend) on the examination of a number of characteristics. Unfortunately, however, many original descriptions are poor and our identifications may have to rest on single characters. The result is that in some genera considerable confusion reigns as to the identities of the species present in our waters. With detailed re-examinations and revisions the number of recognised species in European waters will undoubtedly increase. An important factor in this will be the need to study variation within, and between, populations and the elucidation of size-related variables.

IMPORTANT TAXONOMIC CHARACTERS

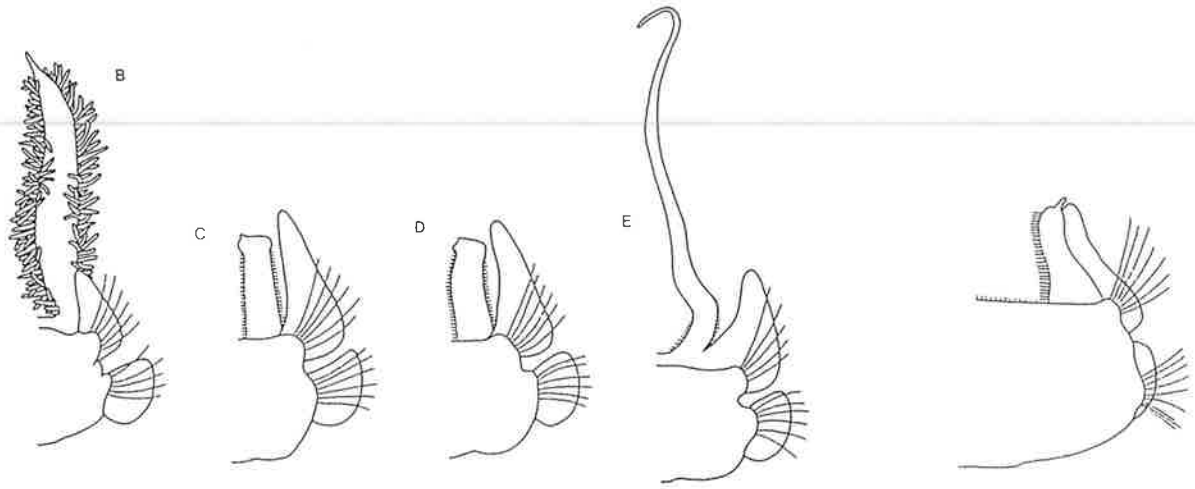
Prostomium — The shape and development of the prostomium are commonly used to define taxa at both the generic and specific level. Within certain limits this seems to hold up, though I believe some modifications to its use at the generic level may be necessary to accommodate 'acceptable' intrageneric variation. In some cases this is already evident. For example, in *Spiophanes*, the prostomium varies from narrow bell-shaped through to T-shaped.

Features related to the prostomium are presence or absence of eyes, an occipital antenna and a caruncle (posterior extension of prostomium). The use of these features is variable within the family. They can be important at either generic or specific level, or at both, or at neither.



Examples of Prostomia and associated structures

Branchiae — The gills in spionids are of great use taxonomically. Their presence, absence, distribution and form should be noted. The setiger of their first occurrence is generally regarded as important at the generic level (but see *Aurospio* and *Prionospio* below). Concerning form, they may be short and strap-like through to long and filiform. They can be adorned with pinnules or lamellate plates, wrinkled or 'smooth' (even simple cirriform branchiae are generally ciliated). Additionally they can be completely independent, or variously fused, to the notopodial postsetal lamellae. In several genera (*Dispio* & some *Scolelepis*) small accessory branchiae may be present basally.



Form of branchiae

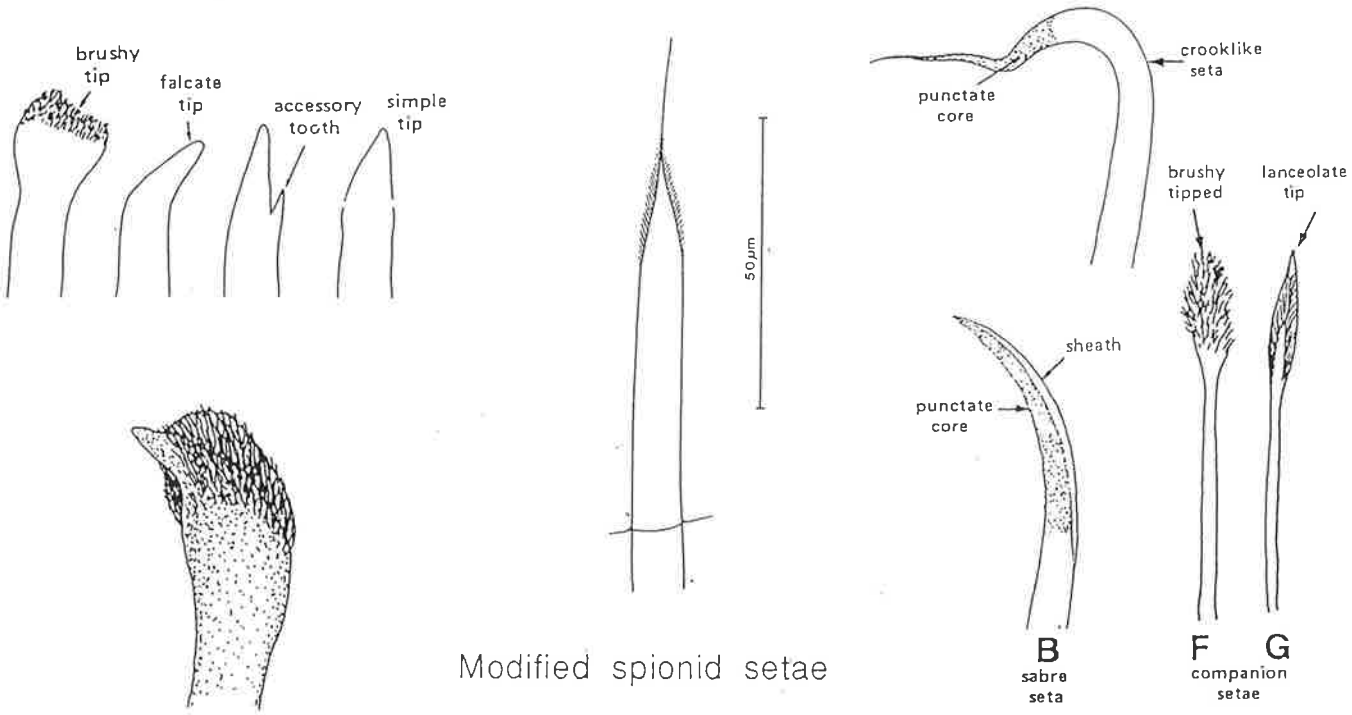
Parapodia — The parapodia of setiger 1 (segment II) can be variously developed. In the most extreme case segment II is completely fused with segment I (peristomium) and totally lacks lobes, lamellae or setae (e.g. *Paraprionospio*). The development of setiger 1 therefore is an important feature and it should be remembered that, between taxa, the first visible setiger may actually relate to different segments.

With the parapodia the most common features of importance concern the shape and development of the lamellae (particularly the postsetal ones), their degree of fusion with any branchiae and the possible occurrence of their continuation across the dorsum as low crests or high folds. Interparapodial pouches (IP) may be present between the neuropodia in some species.

Setae — All spionids have capillary setae and consequently these are of limited taxonomic value. Of more importance are the hooded hooks. Their form, position of occurrence and number are commonly employed to distinguish taxa.

In addition, spionids often have particular modified setae which can be readily be used in the identification process. Common examples of these are the large crook-like setae in the first neuropodia of *Spiophanes*, the heavy curved sabre setae in the lowermost part of the neuropodia (e.g. *Prionospio*, *Laonice*) and the posterior notopodial spines/hooks of some polydorids.

Perhaps the most obvious modified setae are those of setiger 5 in members of the *Polydora*-complex. In *Polydora* itself setiger 5 is often swollen and very obviously different from the other setigers. The setae associated with this setiger can be highly distinctive. In a parallel situation the spionids of the *Atherospio*-complex often also have modified setae on some anterior setiger(s). In this case such setae are clearly neuropodial and not notopodial as in the polydorids.



Modified spionid setae

Pygidium — The form of the anal segment can provide clues to the affinities of the species. As examples; members of the *Prionospio*-complex have one medial dorsal cirrus and two small lateral lobes, species of *Spio* have four lobes, polydorids have an anal funnel (sometimes funnel is lobulate), species of *Scolelepis* have a ventral cushion-like lobe and those of *Laonice* and *Malacoceros*.have many anal cirri.

The following key to genera and subgenera has been compiled primarily for UK waters. For a more complete worldwide key see Blake & Kudenov (1978), but note that a number of additional genera (e.g. *Amphipolydora*, *Aurospio*, *Atherospio*, *Laubieriellus*, *Pygospiopsis*, *Xandaros*) have been described since and are not included in this publication.

1. Neuropodia of setiger 1 include 1 or 2 large curved spines ..... *Spiophanes*
-- Neuropodia of setiger 1 lacking spines 2

2. Some other anterior setigers with modified setae 3
-- Anterior setigers lacking modified setae 9

3. Modified setae notopodial (*Polydora* -complex) 4
-- Modified setae neuropodial (Note: conspicuous postsetal lamellae on all anterior setigers) 7

4. Branchiae commence on setiger 2 5
-- Branchiae commence posterior to setiger 5 6

5. Major spines on setiger 5: one type with smaller companion setae ..... *Boccardiella*
-- Major spines on setiger 5: two types in 2 rows ..... *Boccardia*

6. Setiger 5 with spines of two types arranged in U or J-shape (Note: lower notosetae of setigers 4 & 6 may also be so arranged). Hooded hooks with secondary tooth closely applied to main fang ..... *Pseudopolydora*
-- Setiger 5 greatly modified with major spines of one type (with or without companion setae) arranged in curved 'horizontal' row. Hooded hooks with prominent angle between teeth ..... *Polydora*

7. Neuropodia of setigers 4 & 5 with aristate spines in short vertical rows. Occipital antenna present ..... *Atherospio*
-- Modified neurosetae on setiger 5 only. Occipital antenna absent 8

8. Modified neurosetae of one type (aristate) in vertical row. Posterior notopodial spines absent ..... Genus A
-- Modified neurosetae of two types. Posterior notopodial spines present ..... Genus B

9. Prostomium distally pointed 10
-- Prostomium otherwise 13

10. Branchiae from setiger 1 (accessory branchiae present) ..... *Dispio*
-- Branchiae from setiger 2 (accessory branchiae usually absent) 11

11. Branchiae fused (at least in part) to notopodial lamellae, continuing to posterior region.....*Scolelepis*.....12
-- Branchiae completely free from notopodial lamellae and confined to anterior region.....*Aonides*

12. Hooded hooks falcate with 0-2 small apical teeth and straight shaft.....*Scolelepis* (*Scolelepis*)
-- Hooded hooks multidentate with several apical teeth above large main fang and curved shaft.....*Scolelepis* (*Parascolelepis*)

13. Prostomium with frontal horns (T or Y-shaped).....*Malacoceros*
-- Prostomium rounded or truncate.....14

14. Branchiae limited to middle and posterior setigers (except for an additional pair on setiger 2 of males).....*Pygospio*
-- Branchiae from setiger 1, 2 or 3 for variable number of setigers.....15

15. Branchiae present for most of body length.....16
-- Branchiae limited to anterior 14 setigers.....19

16. Branchiae from setiger 1.....17
-- Branchiae from setiger 2.....18

17. Hooded hooks in neuropodia only.....*Spio*
-- Hooded hooks in neuropodia and notopodia.....*Marenzelleria*

18. Prostomium broadly rounded or truncate, caruncle extending as dorsal sensory ridge to at least setiger 8.....*Laonice*
-- Prostomium narrow, rounded (or bilobed); caruncle not greatly extended posteriorly.....*Microspio*

19. Single pair of branchiae on setiger 1 only. Setiger 2 with dorsal fold .....*Streblospio*
-- At least 2 pairs of branchiae from setiger 2 or 3.....20

20. Branchiae from setiger 3 (2 or 3 pairs).....*Aurospio*
-- Branchiae from setiger 2 (4-13 pairs).....21

21. Notopodial hooks present.....*Prionospio* 22
-- Notopodial hooks lacking (branchiae apinnate).....*Laubieriellus*

22. Branchiae apinnate.....*Prionospio* (*Minuspio*)
-- Branchiae apinnate and pinnate.....*Prionospio* (*Prionospio*)

Aonides CLAPAREDE, 1864

Sometimes confused with *Prionospio* (*Minuspio*) spp., but the prostomium, hooks and anal cirri differ.

1. Occipital antenna present; up to 30 pairs of branchiae; hooks bidentate; numerous anal cirri.....*A. oxycephala* (SARS, 1862)
-- Occipital antenna absent; up to 11 pairs of branchiae; hooks tridentate; only 4 anal cirri.....*A. paucibranchiata* SOUTHERN, 1914

Atherospio MACKIE & DUFF, 1986

Two species present in area: *A. disticha* MACKIE & DUFF, 1986 and an undescribed species (Mackie, in prep.). The latter differs in having more than 6 pairs of branchiae. Unfortunately, as yet, I have been unable to secure suitable specimens for a full description to be made. *A. disticha* occurs in the muddy sediments of Loch Tuirnaig on the west coast of Scotland and in the Celtic Deep WSW of Milford Haven. The other species occurs off the south coast of England.

GENUS A MACKIE (in prep.)

Very similar to *Atherospio* , differing primarily as in key. Occurs in muddy sediments of Cardigan Bay and off the south coast of England.

GENUS B MACKIE (in prep.)

Differs from GENUS A as in key. This genus includes *Polydora guillei* LAUBIER & RAMOS, 1974. The species under investigation occurs in muddy sediments of Cardigan Bay and off the south coast of England. It may be identical to *P. guillei*, but entire Mediterranean material is required to enable this to be determined.

Aurospio MACIOLEK, 1981a

A member of the *Prionospio*-complex, this genus was described for a deep-water Atlantic species *A. dibranchiata* MACIOLEK, 1981a. The distinguishing feature is the presence of apinnate branchiae (2 or 3 pairs) from setiger 3, not setiger 2. *Prionospio banyulensis* LAUBIER, 1968 agrees with the generic diagnosis of *Aurospio*, though Pleijel (1985: as *P. ockelmanni*) and Sigvaldadottir (1992) prefer to incorporate it in an enlarged diagnosis for *Prionospio* .

Boccardia CARAZZI, 1893

One species: *B.* cf. *polybranchia* (HASWELL, 1885).
This was originally described from Australia. The status of European specimens therefore needs to be clarified.

Boccardiella BLAKE & KUDENOV, 1978

One species: *B. ligerica* (FERRONIERE,1898).
Another species, *Polydora redeki* HORST, 1920 has been synonymised with *B. ligerica* (see BLAKE & WOODWICK, 1971)

Dispio HARTMAN, 1951

One species: *D.* cf. *uncinata* HARTMAN, 1951.
Dispio uncinata has been recorded from Morrocco and Spain. I have collected specimens from Blacksod Bay on the west coast of Ireland. The species was originally described from the Gulf of Mexico.

Laubieriellus MACIOLEK, 1981b

Not yet recorded from UK waters. One species, *L. salzi* (LAUBIER,1970), present in the Mediterranean. Status of the genus questionable; perhaps it should be included in *Prionospio* .

Laonice MALMGREN, 1867

Definitely 2 species present (*L. bahusiensis* & *L. sarsi*) in UK waters, but up to 4 species may be present. The key is derived from Söderström(1920). See also Orrhage & Sundberg (1990) for a recent examination of the status of some species.

1. Caruncle extends back as a dorsal sense organ to setiger 8-13.....2
-- Caruncle extends back to about setiger 27-31.....3
2. Eyes present; notopodial hooks present.....*L. sarsi* SÖDERSTRÖM, 1920
-- Eyes absent; notopodial hooks absent(?)....*L. appelloefi* SÖDERSTRÖM, 1920
3. Branchiae 35-44 pairs; neuropodial hooks from setiger 40-45; inferior sabre setae from setiger 22-25; interparapodial pouches from setiger 28-35.....*L.cirrata* (SARS, 1851)
-- Branchiae 28-32 pairs; neuropodial hooks from setiger 27-32; inferior sabre setae from setiger 14-16; interparapodial pouches from setiger 12-17.....*L.bahusiensis* SÖDERSTRÖM, 1920

Malacoceros QUATREFAGES,1843

The number of species present in European waters is unclear. Three species are recorded, but it would seem more are present (e.g. see Guérin & Kerambrun, 1984). All the European species need to be re-described in detail. The key is from Hartmann-Schröder (1971).

1. Hooks tridentate in profile; 20-25 per neuropodium; 15-30 anal cirri.....*M. vulgaris* (JOHNSTON,1827)
-- Hooks bidentate in profile; less than 20 per neuropodium; less than 10 anal cirri.....2
2. Neuropodia with 7-12 hooks; anterior margin of prostomium not indented.....*M. tetracerus* (SCHMARDA, 1861)
Neuropodia with 4-5 hooks; anterior margin of prostomium slightly indented.....*M. fuliginosus* (CLAPAREDE, 1868)

Marenzelleria MESNIL, 1896

Two species: *M. wireni* AUGENER, 1913 & *M.* cf. *viridis* (VERRILL, 1873)
The identity of the former is somewhat confused and the latter has recently been recorded from estuarine areas in Europe (e.g. Atkins*et al.*, 1987). The status of the European specimens of *M.* cf. *viridis* is being examined (Garwood, in prep.). The key is derived from the review of Maciolek (1984).

1. Notosetae of setigers 1 & 2 include some very long and conspicuous capillaries. Branchiae absent from posterior half of body.....*M. viridis*
-- Notosetae of setigers 1 & 2 include only 2 or 3 long, but inconspicuous, capillaries. Branchiae absent from posterior third of body at most.....*M. wireni*

Microspio MESNIL, 1896

One species: *M. mecznikowianus* (CLAPAREDE,1869)
Spio atlantica LANGERHANS, 1880 is sometimes considered a separate species, but I tend to believe it is a junior synonym of Claparède's species.

Polydora BOSC, 1802

Around 12 species supposedly present in UK waters. Some species require detailed re-description (especially the *P. ciliata*-complex of *P. ciliata*, *P. limicola*, *P. ligni*). Mustaquim (1986) published a study of morphological variation in the *P. ciliata* complex and Blake & Maciolek (1987) redescribed *P. cornuta* BOSC making *P. ligni* a junior synonym. There may also be more than one species confused under the name *P. caeca*. See Hartmann-Schröder (1971) and Ramberg & Schram (1983) for keys. The key below is only based on those species most likely to be found. The northern European species of the genus are in need of re-examination.

1. Large modified spines of setiger 5 with distal tuft of bristles.....2
-- Large spines of setiger 5 smooth.....3

2. Large spines of setiger 5 bidentate with bristles arising between teeth.....*P. quadrilobata* JACOBI, 1883
-- Large spines of setiger 5 with bent tip; bristles cover entire distal margin.....*P. caulleryi* MESNIL, 1897

3. Posterior notopodia with emergent spines.....4
-- Posterior notopodia lacking emergent spines.....5

4. Large spines of setiger 5 unidentate; preserved specimens colourless.....*P. caeca* (Örsted, 1843)
-- Large spines of setiger 5 unidentate; preserved specimens with black pigment spots.....Undescribed species

5. Large spines of setiger 5 unidentate; median notopodia with dense bundles of fine embedded setae (sometimes hard to see; either seen in slide preparations or by turning specimen under zoom microscope and observing them shining as they catch the light).....*P. flava* CLAPARÉDE, 1870
-- Large spines of setiger 5 bidentate (subterminal tooth small and may be worn down leaving only small flange). No bundles of fine embedded setae.....6

6. Companion setae of setiger 5 lanceolate.....*P. ciliata* (JOHNSTON, 1838)
-- Companion setae of setiger 5 feathered (i.e. distally ragged).....*P. cornuta* BOSC, 1802)

Prionospio MALMGREN, 1867

There are 5 species present in UK waters. A further 2 (*P. caspersi* & *P. ehlersi*) occur in southern European waters and are included in the key below. The *Prionospio*-complex has been reviewed by Maciolek (1985) however, as some of her synonymies and descriptions differ from the opinions of several other workers (e.g. Mackie, Pleijel, Wilson), the identities/names of the north European species in the key below are unchanged in relation to previous works. See also *Aurospio* comments for *P. banyulensis* (=*P. ockelmanni)*

A. ***Prionospio (Minuspio)*** species

1. Neuropodial postsetal lamellae of setiger 2 ventrally prolonged. Branchiae 5 or 6 pairs.....*P. cirrifera* WIREN, 1883
-- Neuropodial postsetal lamellae of setiger 2 not ventrally prolonged. Branchiae number up to 13 pairs.....*P.* cf *multibranchiata* BERKELEY, 1927

B. ***Prionospio (Prionospio)*** species

1. Branchiae 1 and 4 pinnate, 2 and 3 apinnate.....2
-- Pinnate/apinnate branchiae in other combination.....3
2. Pinnate branchiae all of similar length. Setiger 7 with high dorsal crest.....*P. fallax* (SÖDERSTRÖM, 1920) =[*P. malmgreni* of Hartmann-Schröder etc]
-- Branchiae 1 much larger than 4. Setiger 7 without high dorsal crest.....*P. "steenstrupi"* MALMGREN, 1867*
3. Only one setiger with pinnate branchiae.....4
-- Three setigers (1, 2 & 4) with pinnate branchiae.....*P. plumosa* (SARS, 1867)
4. Branchiae 1 pinnate.....*P. ehlersi* FAUVEL, 1928
-- Branchiae 4 pinnate.....*P. caspersi* LAUBIER,1962

*Sigvaldadottir & Mackie currently re-examining the *P. steenstrupi*-complex. *P. steenstrupi* probably does not occur in UK waters. However, *P. dubia* MACIOLEK, 1985 does and is often described as P. steenstrupi

Pseudopolydora CZERNIAVSKY, 1881

Three species reported from northern European waters.

1. Prostomium bilobed. Branchiae numerous (19-24 pairs).....,.....2
-- Prostomium narrow rounded. Branchiae few.....*P.* cf. *paucibranchiata* (OKUDA,1937)
2. Prostomium deeply incised. Anterior dorsum lacking dark pigmentation.....*P. antennata* (CLAPAREDE, 1870)
Prostomium weakly incised. Anterior dorsum with heavy dark pigmentation.....*P. pulchra* (CARAZZI, 1895)

Pygospio CLAPAREDE, 1863

One species: *P. elegans* CLAPAREDE, 1863

Scolelepis BLAINVILLE,1828

There is some confusion over how many species are present in northern European waters. There may be more species than those in the key. The genus was divided into 2 genera by Maciolek (1987).

A. ***Scolelepis (Parascolelepis)*** species

1. Posterior branchiae with superior flag-like process.....*S.* cf. *gilchristi* (DAY, 1961)
-- Posterior branchiae lacking superior flag-like process.....*S. tridentata* (SOUTHERN,1914)

B. ***Scolelepis*** *(Scolelepis)* species

1. Anterior branchiae completely fused to notopodial postsetal lamellae.....*S. foliosus* (AUDOUIN & MILNE EDWARDS, 1833)
-- Anterior branchiae distally free of notopodial postsetal lamellae.....2
2. Superior portion of notopodial lamellae (anterior setigers) pointed.....3
-- Superior portion of notopodial lamellae (anterior setigers) blunt.....*S. squamata* (ABILDGAARD,1806)
3. Hooks tridentate.....*S. mesnili* BELLAN & LAGARDERE, 1971
-- Hooks unidentate (Note: bidentate in juveniles).....*S. bonnieri* (MESNIL,1896)

Spio FABRICIUS, 1785

The species of this genus are also confused. There are certainly more species present in northern European waters than either those mentioned in standard identification works or in the key presented below. Gudmundsson (ex Dove Marine Laboratory) is investigating the identities of the northern European species. The key is therefore rather tentative.

1. Neuropodial hooks tridentate,from setiger 11. anterior dorsum and venter with black pigmentation.....*Spio* sp. (questionably *S. decorata* BOBRETZKY, 1871)
-- Neuropodial hooks bidentate.....2
2. Neuropodial hooks from setiger 11.....*S. filicornis* (MÜLLER, 1766)
-- Neuropodial hooks from setiger 13-16.....3
3. Small light brown pigmentation patches on posteriormost part of prostomium and mid-dorsally on setigers 2-12; laterally a darker slender curved pigmented line just anterior to setiger 1.....*S. armata* (THULIN, 1957)
-- Brown pigmentation absent.....*S. martinensis* MESNIL, 1896

Spiophanes GRUBE, 1860

Three species present in northern European waters. *S. wigleyi* is an American species, hence the identity of the UK material needs to be confirmed by reference back to the type specimens.

1. Prostomium anteriorly truncate; occipital antenna present.....*S. kroyeri* GRUBE, 1860
-- Prostomium otherwise; occipital antenna absent.....2
2. Prostomium T-shaped.....*S. bombyx* (CLAPAREDE, 1870)
-- Prostomium anteriorly rounded.....*S.* cf. *wigleyi* PETTIBONE, 1962

Streblospio WEBSTER, 1879

One species: *S. shrubsolii* (BUCHANAN, 1890)
Status of *S. dekhuyzeni* HORST, 1909 needs re-investigation. The American species, *S. benedicti* WEBSTER, 1879, has been recorded in France. There is a strong possibility that several species may be present in northern European waters.

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