Family Spionidae

Genera found in Puget Sound

- Spiophanes
- Polydora
- Boccardia
- Boccardiella
- Dipolydora
- Pseudopolydora

Genera characteristics (from Blake, 1996)

- Branchia absent, setiger 1 with 1-2 curved neuropodial hooks in addition to normal capillaries
  - Genus Spiophanes
- Branchia present; setiger 1 without large neuropodial hoods — all others
  - Setiger 5 modified, with specialized (modified) setae — Polydorinae (e.g., Polydora, Dipolydora)
  - Setiger 5 not modified
    - Prostomium pointed
      - Branchiae from set 1, notosetae of set 1 long, thin; accessory branchiae present (Dispio — we don’t get in Puget Sound)
    - Branchiae from setiger 2; notosetae of set 1 present or absent, if present, not long, thin; accessory branchiae absent
      - Branchiae fused to dorsal lamellae at least basally, to end of body (Scolelepis — we do get in Puget Sound)
      - Branchiae completely free from dorsal lamellae, present on anterior setigers, absent posteriorly (Aonides — not in Puget Sound)
    - Prostomium rounded or incised (or with lateral or frontal horns)
      - Prostomium with lateral or frontal horns
        - Branchia from setiger 1 - Malacoceros — we don’t have in Puget Sound
        - Branchia from setiger 2 - We have Rhynchospio in Puget Sound
      - Prostomium truncate, rounded, or incised on anterior margin, without lateral or frontal horns
        - Branchiae limited to middle and posterior setigers except for single pair on setiger 2 in sexually mature males — Pygospio (we do have in Puget Sound)
        - Branchiae from setiger 1, 2, or 3, continuing posteriorly for variable number of setigers
Family Spionidae

- Branchia concentrated in anterior setigers, numbering 2-22 pairs, absent posteriorly, hooded hooks usually present in both noto-and neuropodia
  - Branchiae from setiger 1, with flattened bifoliate platelike pinnules; with transverse ridge or membrane between branchial bases of setiger 1 – *Paraprionospio* (in Puget Sound)
  - Branchiae from set 2 or 3, either apinnate, pinnate with simple digitiform pinnules, or both...
    - Branchiae from set 2, with 3 or more pairs
      - Branchiae either apinnate, pinnate, or with both apinnate and pinnate types present in various combinations; pinnules digitiform (*Prionospio sensu lato*)
        - Subgenus *Minuspio* – branchiae apinnate
        - Subgenus *Prionospio* – branchiae both apinnate and pinnate

Genus *Spiophanes*

- Branchia absent, setiger 1 with 1-2 curved neuropodial hooks in addition to normal capillaries.

*Spiophanes berkeleyorum*

- Bell-shaped prostomium.
- 1-2 modified neurosetae on setiger 1 (definitive for genus).
- Sabre setae present from setiger 4 (neuropodial).
- Quadridentate hooks (neuropodial on setiger 15).
- No branchia.
- Lives in silty habitat in silty tube.
Prostomium, dorsal view (l); ventral view (r); note modified neurosetae (ne) on setiger 1

Modified neurosetae on setiger 1

**Spiophanes norrisi**

- Formerly *S. bombyx*, not a synonym.
- T-shaped prostomium (long, anterior horns).
- 1-2 modified neurosetae on setiger 1 (definitive for genus).
- Sabre setae present from setiger 4 (neuropodial).
- No branchia.
- Lives in sandy habitat in sandy tube.
Family Spionidae

T-shaped prostomium (in focus)(l); modified neurosetae on set 1 (in focus)(r)

Pygidium

**Genus Dipolydora**

- Branchia present.
- Setiger 1 without large neuropodial hoods.
- Setiger 5 modified, with specialized (modified) setae.
Family Spionidae

*Dipolydora socialis* – most common in Puget Sound

- Modified 5th setiger and neurosetae

Entire animal - dorsal view (l), anterior end, dorsal view (r)

Modified setae on setiger 5 (r)
Family Spionidae

*Dipolydora brachycephala*

- Modified 5\textsuperscript{th} setiger and neurosetae

Prostomium and modified 5\textsuperscript{th} setiger and neurosetae (l); modified 5\textsuperscript{th} setiger and neurosetae (r, below)

Modified 5\textsuperscript{th} setiger and neurosetae (l), hooded hook without manubrium (r)
5th setiger, dorsal view with brushed-topped setae (l,r)

*Dipolydora cardalia* – Kathy doesn’t think it’s a species in Puget Sound (*D. socialis* is always small, *D. cardalia* is always large).

*D. quadralobata*

*D. akaina* – When it occurs, it occurs in large numbers, may be introduced and invasive.

**Genus Scolelepis**

- Branchia present.
- Setiger 1 without large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium pointed.
- Gills start on setiger 2.
- Dorsal lamella fused to branchia.

*Scolelepis squamata*

- The only species of *Scolelepis* we get in Puget Sound.
Anterior end, lateral view (l); anterior end, dorsal view (r)

**Genus Rhynchospio**  
(page 103 in Blake, 1996)

- Branchiae present.
- Setiger 1 w/o large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium with lateral or frontal horns.
- Branchiae from setiger 2.

**Rhynchospio glutea**

- Caruncle prominent and over setiger 2, ventral pair of pygidial cirri are inflated

**Rhynchospio arenincola**

- Caruncle low, indistinct and over setiger 1, ventral pair of pygidial cirri are digitiform. Our specimens in Puget Sound are currently being called *Rhynchospio glutea*, but they don’t quite fit the description of either *R. glutea* or *R. arenincola*. This may be an undescribed species. (see Radashevsky, 2007, for review of *Rhynchospio* taxa)
Anterior end, dorsal view (l); posterior end and pygidium (r)

**Genus Pygospio**

- Branchiae present.
- Setiger 1 w/o large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium truncate, rounded, or incised on anterior margin, without lateral or frontal horns.
- Branchiae limited to middle and posterior setigers except for single pair on setiger 2 in sexually mature males.
- page 164 in Blake, 1996.

**Pygospio elegans**

- Prostomium expanded anteriorly, bluntly rounded to weakly incised along anterior margin.
- Branchia limited to middle and posterior setigers, from setiger 11-13 (except for extra single pair on set. 2 in sexually mature males).
- Hooded hooks from setiger 8-9, first 3-5 setigers with spoonlike hooks, thereafter bidentate.
- Without ventral band of pigment, but may have brown pigment on prostomium, peristomium, and borders of anterior setigers.
- 4 pygidial cirri – pointed.
Family Spionidae

Anterior end, dorsal view (l,r)

Posterior end with pygidium

**Genus Paraprionospio**

- Branchiae present.
- Setiger 1 w/o large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium elongate to spindle shaped, without posterior caruncle, eyes present or absent.
- Peristomium fused with achaetous first segment.
- Notopodial postsetal lamellae largest on first 5 setigers.
- 3 pairs of branchiae present from setiger 1, with flattened flabellate or bifoliate platelike pinnules.
- With transverse ridge or membrane between branchial bases of setiger 1.
- Hooded hooks with conspicuous striated secondary hood.
- Blake, 1996 – page 93, 114.
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**Paraprionospio alata**

- formerly *Paraprionospio pinnata*.
- Only species of *Paraprionospio* in Puget Sound.

Anterior end, dorsal view (l); lateral view (r)

Posterior end and pygidium (l); pygidial cirri (r)

**Genus Aurospio** – not present in Puget Sound

**Genus Prionospio**

- Branchiae present from setiger 2.
- setiger 1 w/o large neuropodial hooks.
- Setiger 5 not modified.
- Subgenus *Minuspio* – branchia apinate.
- Subgenus *Prionospio* – branchia both apinate and pinnate (pinnules digitiform).
Family Spionidae

**Prionospio (Minuspio) lighti**

- See Blake, 1996 for illustrations, Volume 6 page 137 Fig. 4.14.
- Branchia apinnate – 6-12 pairs, elongate, apinnate, starting on setiger 2.
- Shape of prostomium – angular corners, with marginal peaks.
- Light spot between eyes with methyl green staining.

[Image of Prionospio (Minuspio) lighti]

Anterior end, dorsolateral view

**Prionospio (Prionospio) steenstrupi**

- See Blake, 1996 for illustrations, Volume 6 page 124 Fig 4.9.
- Branchia – 4 pairs starting on setiger 2 – 1st and last are pinnate, 2nd and 3rd pairs are apinnate.
- No real staining pattern with methyl green.
- Shape of prostomium appears more rounded than *P. lighti*.

[Image of Prionospio (Prionospio) steenstrupi]

Anterior end, dorsal view (l), lateral view (r)
Family Spionidae

Anterior end, dorso-lateral view, with palp

Genus *Spio*

- Setiger 1 without large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium broadly rounded, without lateral or frontal horns.
- Hooded hooks usually limited to neuropodia, with apical tooth (teeth) on convex side, surmounting main fang.
- Anterior neuropodia without modified setae.
- Branchiae from setiger 1, entirely free from postsetal lamellae, branchiae present over most of body length.
- Anterior notopodial postsetal lamellae short, inconspicuous.
- Interparapodial genital pouches absent.
- Nuchal organs short, limited to first 1-2 setigers, or lateral to short caruncle.
- Occipital antenna present or absent.

*Spio cirrifera*

- Interparapodial genital pouches absent.
- Lateral to short caruncle; occipital antenna absent.
- Branchiae from setiger 1 and free from postsetal lamellae.
- Anterior notopodial postsetal lamellae short, inconspicuous.
- Branchiae apinnate and present over most of body length.
Family Spionidae

Anterior end, lateral view - postsetal lamellae (l); branchiae on set 1-3 (r)

Anterior end, dorsal view (l); prostomium (r)

Genus *Laonice*

- from key to genus in Blake, 1996, page 94.
- Setiger 1 without large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium broadly rounded, without lateral or frontal horns.
- Hooded hooks usually limited to neuropodia, with apical tooth (teeth) on convex side, surmounting main fang.
- Anterior neuropodia without modified setae.
- Branchiae from setiger 1, entirely free from postsetal lamellae, branchiae present over most of body length.
- Anterior notopodial postsetal lamellae large, triangular, leaflike, often surrounding setal fascicles.
- Interparapodial genital pouches present.
- Nuchal organs usually long, extending posteriorly for numerous segments.
- Occipital antenna always present.
Laonice cirrata

- This is the species of Laonice we usually get in Puget Sound.
- Anterior notopodial postsetal lamellae large, triangular, leaflike, often surrounding setal fascicles.
- Interparapodial genital pouches present.
- Occipital antenna always present.
- Branchiae from setiger 1 and free from postsetal lamellae.
- Branchiae apinnate and present over most of body length.

Controversy in PS with *L. pugettensis* vs. *L. cirrata*

- Some think it’s same species and the two species have been synonomized.
- But they look different, and genital pouches start more anteriorly in *L. pugettensis* in set 2, and farther back in *L. cirrata*.
- Gene and Kathy are keeping them separate for now.

Anterior end – dorsolateral view of prostomium with occipital antennae (I,r)
Family Spionidae

Mid-body, lateral view of genetal pouches, branchia, and dorsal lamella (l); anterior end, lateral view of prostomial palps (r)

SubFamily Polydorinae

- Branchiae present; setiger 1 without large neuropodial hooks.
- Setiger 5 modified, with specialized setae.
- We get Boccardiella, Boccadia, Polydora, and Dipolydora, but not Carazziella in Puget Sound.

Genus Boccardiella

- Branchia present from setiger 2.
- Modified spines of setiger 5 of 1 type, simple, falcate, with bilimbate companion setae.
- Gills on setigers 2, 3, 6 and then subsequent segments (pers. obs, K. Welch).
- Pygidium with two ventral lappets (pers. obs, K. Welch).

Boccardiella hamata

- Hooked setae on posterior setigers that cling to stuff like Velcro “boat hooks”.
- We find B. hamata in Puget Sound, and B. ligerica on the coast.
Setiger 5 (l); posterior notosetae “boat hooks” (r)

Whole body, dorsal view – posterior boat hook notosetae (no), pygidium
Family Spionidae

**Genus Boccardia**

- Branchia present from setiger 2.
- Modified spines of setiger 5 of 2 types, one with expanded end bearing cusps or bristles, second simple, falcate.
- Gills on setigers 2, 3, 4, 6 and then subsequent segments (pers. obs, K. Welch).

**Boccardia pugettensis**

- Most common in Puget Sound, distinctive rose bengal stain, red pattern.

![Juvenile specimen – modified 5th setiger, falcate (l) and bristled setae (r)](image)

**Genus Pseudopolydora**

- Branchiae from setiger 6-12.
- Setiger 5 slightly to moderately modified, usually with well-developed parapodia.
- Major spines of setiger 5 of 2 types, first simple, acicular or falcate, second pennoned, with both types usually arranged in U or J-shaped double row.
- Hooded hooks with secondary tooth closely applied to main fang.

**Pseudopolydora kempi, P. paucibranchiata**

- More in brackish water, introduced, invasive.
- We don’t find them frequently in Puget Sound.
- These two species can co-occur.
Family Spionidae

*Pseudopolydora kempi*

- J-shaped setal fascicle on setiger 5 distinctive for the species.

Pennoned setae on setiger 5 (l,r)

*Pseudopolydora paucibranchiata*

- Short U-shaped setal fascicle on setiger 5 distinctive for the species.

**Genus Polydora, Dipolydora**

- Branchiae from setiger 6-12.
- Setiger 5 greatly modified; major spines of 1 or 2 types in curved row, not U- or J-shaped; hooded hooks with prominent angle between teeth.
- Modified spines of setiger 5 of 1 types, variously shaped, with or without companion setae.
- Genus *Polydora* and *Dipolydora* used to be the same genus but Jim Blake divided them out based on:
  - **Genus Polydora**
    - Hooded hooks (posterior neuropodia) with constriction and manubrium on shaft (Kathy – like a little “waist” going into the body), and with main fang at more or less right angle to shaft and wide angle with apical tooth.
    - Noto setae absent on setiger 1.
    - Anterior part of digestive tract never interrupted by gizzard-like structure.
Family Spionidae

- **Genus Dipolydora**
  - Hooded hooks (posterior neuropodia) with smooth, curved shafts (Kathy - straight going in to body) with main fang directed more apically, forming wide angle with shaft and a reduced angle with apical tooth.
  - Notosetae present on setiger 1.
  - Anterior part of digestive tract sometimes interrupted by enlarged, thickened gizzard-like structure.

  Must put all individuals on compound scope to see this manubrium or lack of manubrium on shaft of hooded hooks.

*Polydora limicola*

Hooded hooks of posterior neuropodia with manubrium on shaft (l); 5\(^{th}\) setiger with acicular setae and companion setae (r)

Anterior end, ventral view
Family Spionidae

Other *Polydora* in Puget Sound

**P. cornuta**

- *P. cornuta* has a prostomial antennae.
- Tooth on 5th setiger hooks.
- Companion setae present, look like feathers, adhere to back of modified spines on 5th setiger.

**P. websteri**

**Literature**


City and County of San Francisco voucher sheets – *Spiophanes berkeleyorum, Spiophanes norrisi*


**More Information**

More information about Puget Sound benthic invertebrates is available at: http://www.ecy.wa.gov/programs/eap/sediment/

This document is available on the Department of Ecology’s website at https://fortress.wa.gov/ecy/publications/SummaryPages/1403250.html.

If you need this document in a format for the visually impaired, call (360) 407-6764. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call (877) 833-6341.

These notes were compiled by Kathy Welch and Maggie Dutch after polychaete workshops held on October 9, 14, and 23, 2013 at the Department of Ecology.