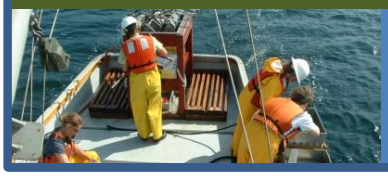


Puget Sound Polychaetes: Spionidae

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

- Branchia concentrated in anterior setigers, numbering 2-22 pairs, absent posteriorly, hooded hooks usually present in both noto-and neauropodia
    - 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

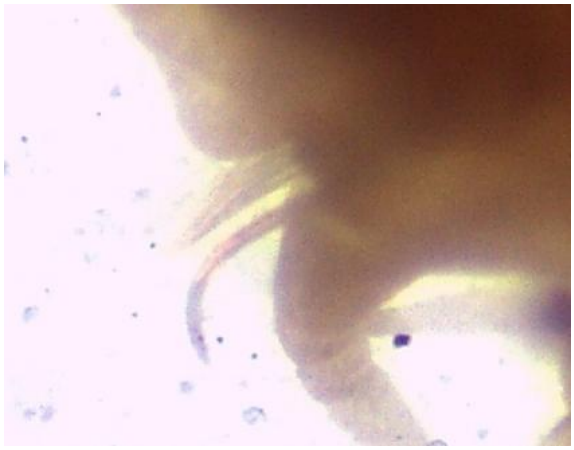
Genus *Spiophanes*

- 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.

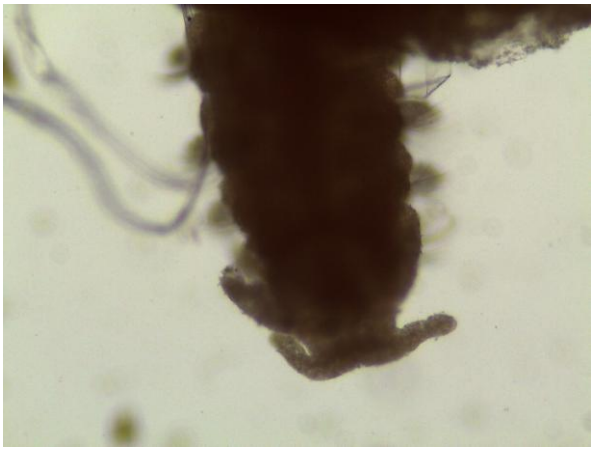
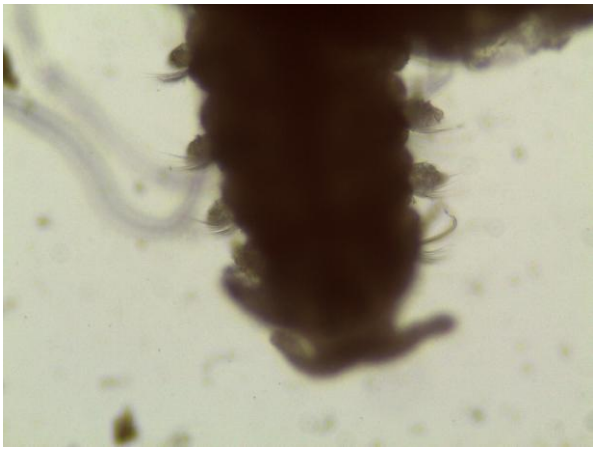
Prostomium, dorsal view (l); ventral view (r); note modified neurosetae (ne) on setiger 1



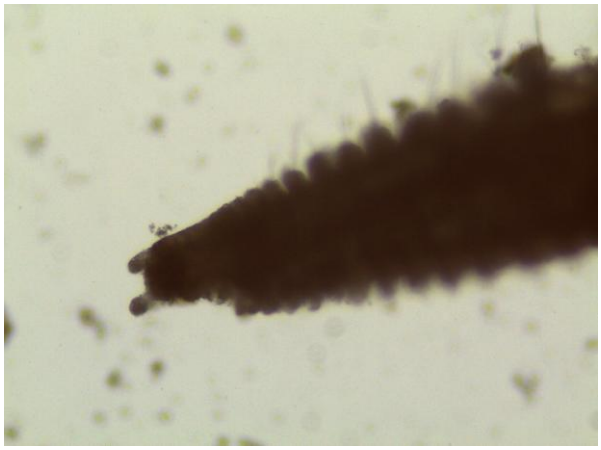
Modified neurosetae on setiger 1

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.

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



Pygidium

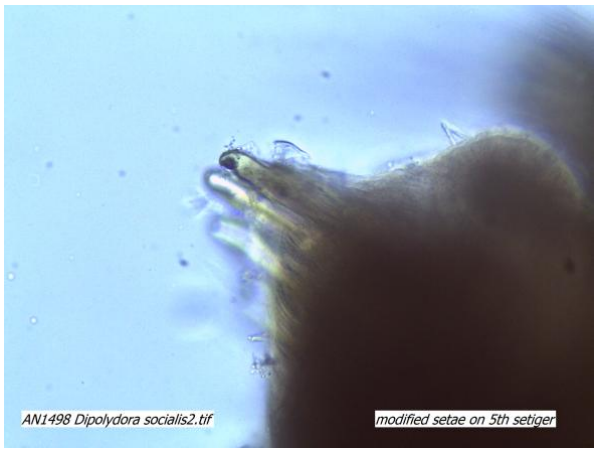
Genus *Dipolydora*

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

Dipolydora socialis – most common in Puget Sound

- Modified 5th setiger and neurosetae

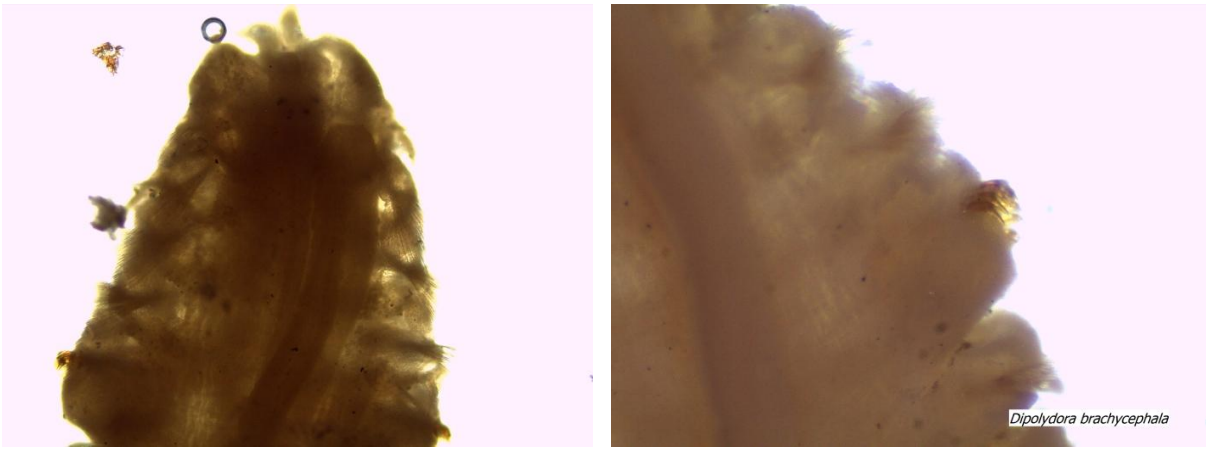
Entire animal - dorsal view (l), anterior end, dorsal view (r)



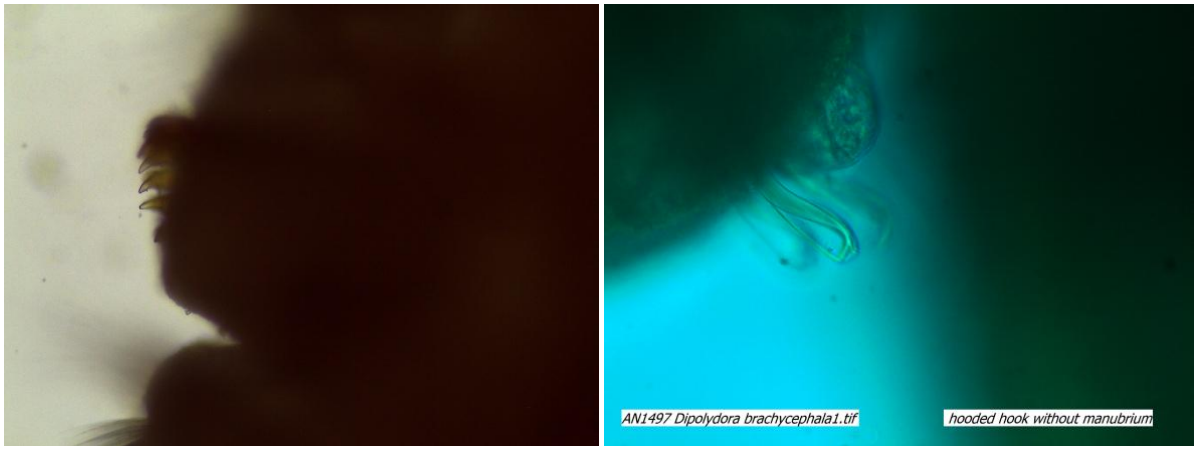
Modified setae on setiger 5 (r)

Dipolydora brachycephala

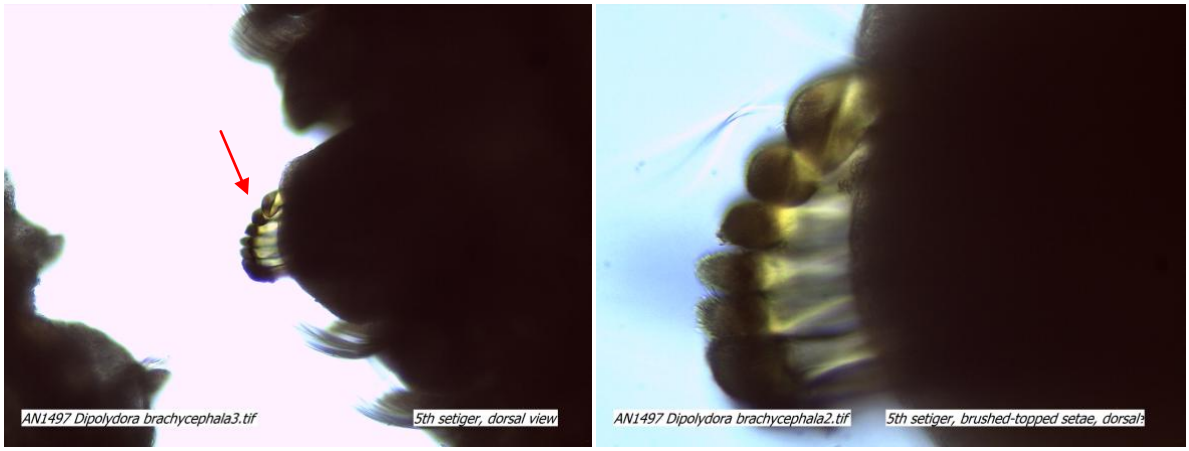
- Modified 5th setiger and neurosetae



Prostomium and modified 5th setiger and neurosetae (l); modified 5th setiger and neurosetae (r, below)



Modified 5th 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)

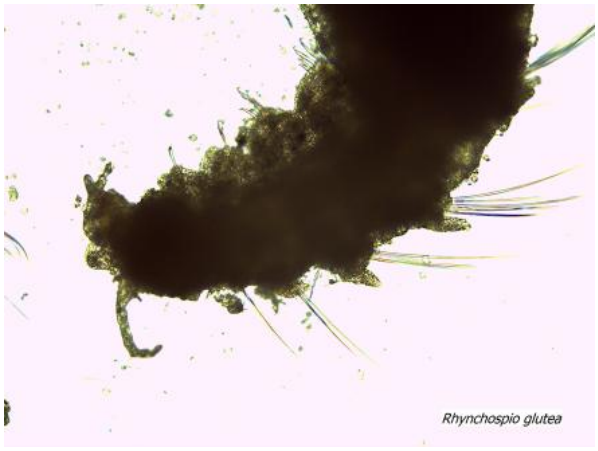
- Branchiae present.
- Setiger 1 w/o large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium with lateral or frontal horns.
- Branchiae from setiger 2.

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)

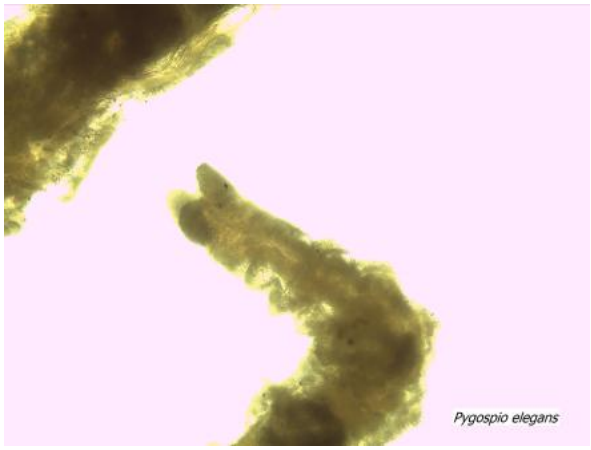
Genus *Pygospio*

- 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.

Anterior end, dorsal view (l,r)



Posterior end with pygidium

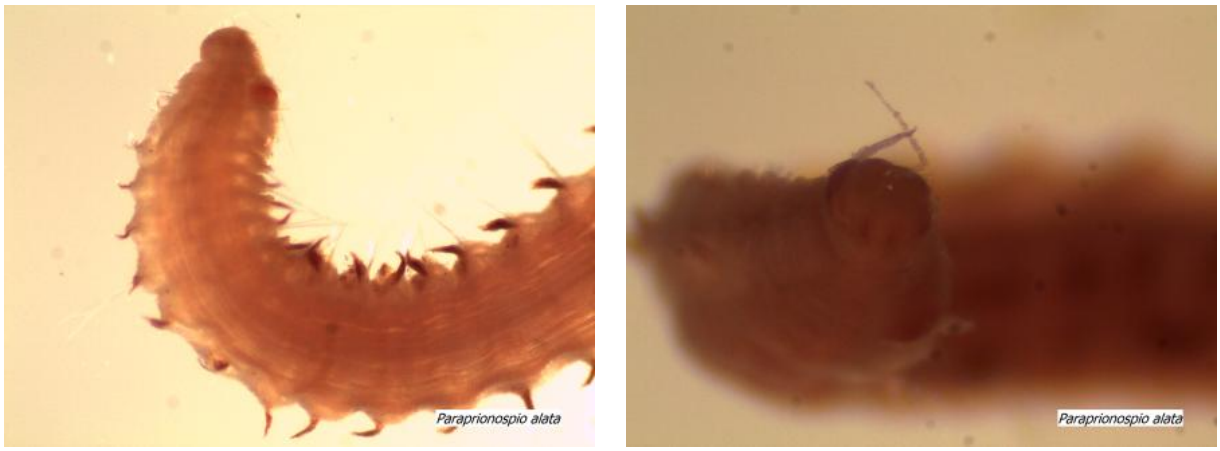
Genus *Paraprionospio*

- 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.

Paraprionospio alata

- formerly ***Paraprionospio pinnata.***
- Blake, 1996 – page 115-117.
- 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 apinnate.
- Subgenus ***Prionospio*** – branchia both apinnate and pinnate (pinnules digitiform).

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.

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.*

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

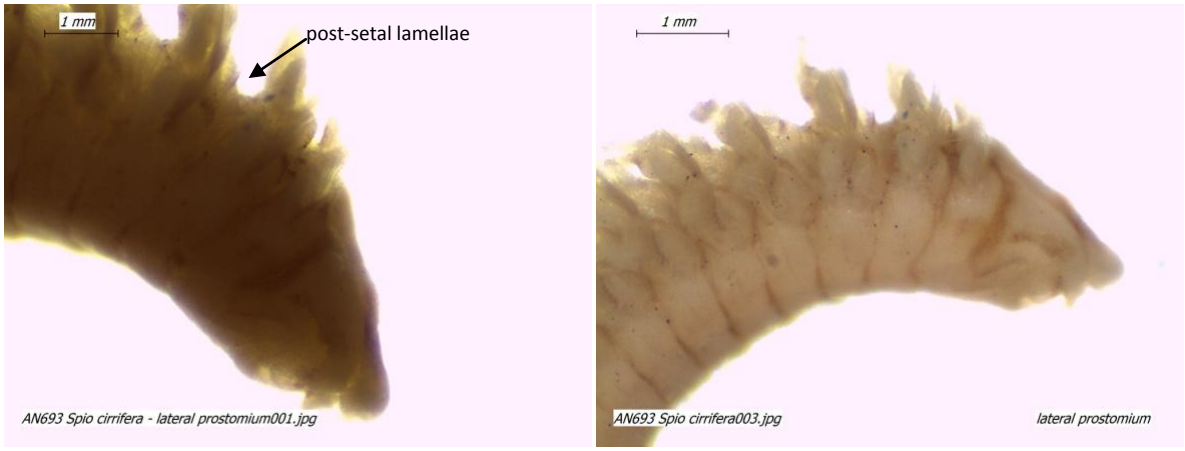
Anterior end, dorso-lateral view, with palp

Genus *Spio*

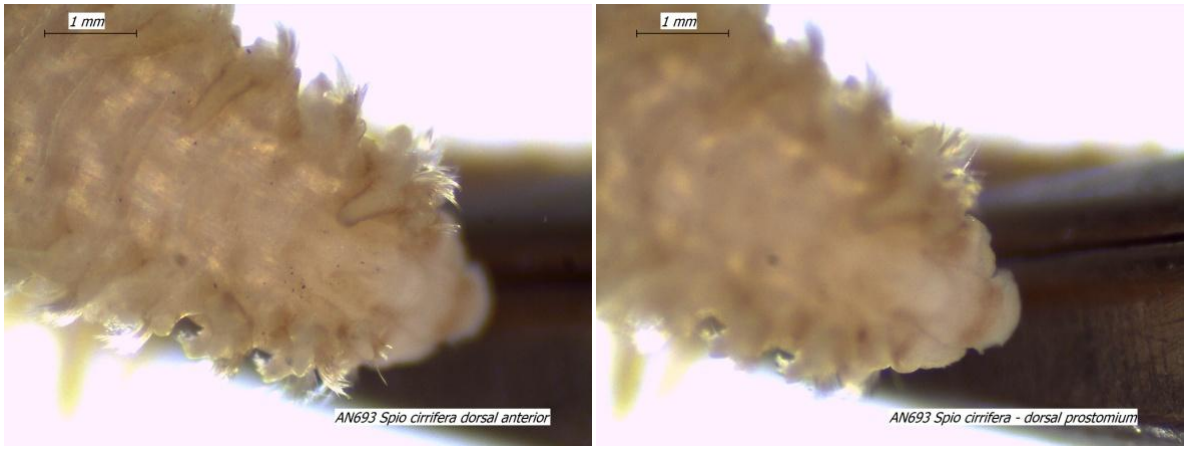
- Setiger 1 without large neuropodial hooks.
- Setiger 5 not modified.
- Prostomium broadly rounded, without lateral or frontal horns.
- Hooded hooks usually limited to neuropodia, with apical tooth (teeth) on convex side, surmounting main fang.
- Anterior neuropodia without modified setae.
- Branchiae 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.



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.

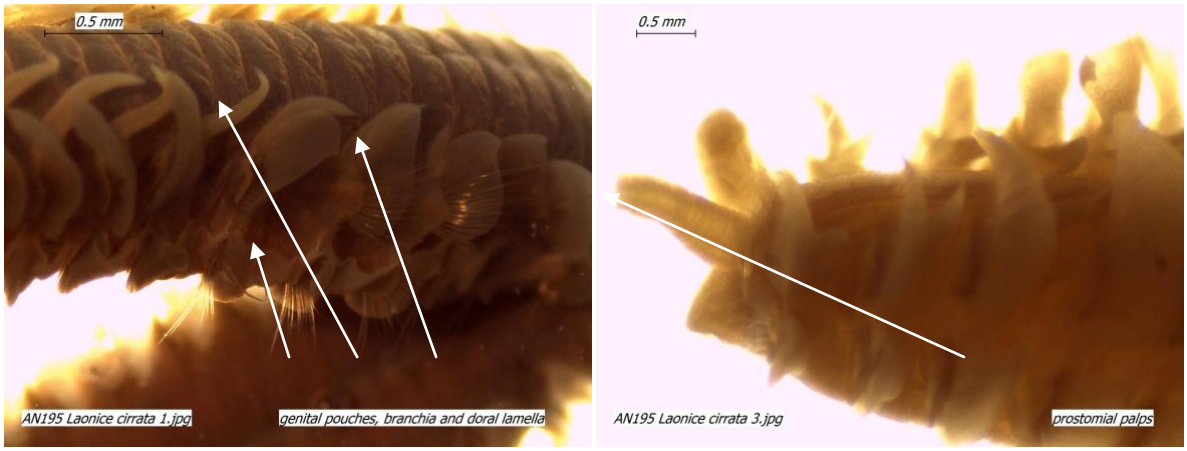
Laonice cirrata

- 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 (l,r)



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

SubFamily Polydorinae

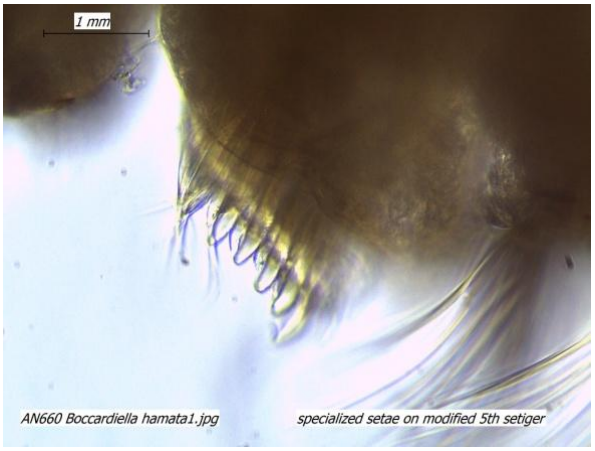
- Branchiae present; setiger 1 without large neuropodial hooks.
- Setiger 5 modified, with specialized setae.
- We get *Boccardiella*, *Boccardia*, *Polydora*, and *Dipolydora*, but not *Carazziella* in Puget Sound.

Genus *Boccardiella*

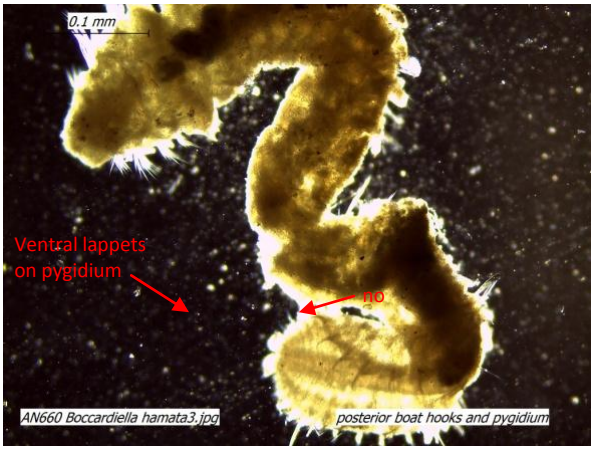
- Branchia present from setiger 2.
- Modified spines of setiger 5 of 1 type, simple, falcate, with bilimbate companion setae.
- Gills on setigers 2,3,6 and then subsequent segments (pers. obs, K. Welch).
- Pygidium with two ventral lappets (pers. obs, K. Welch).

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)



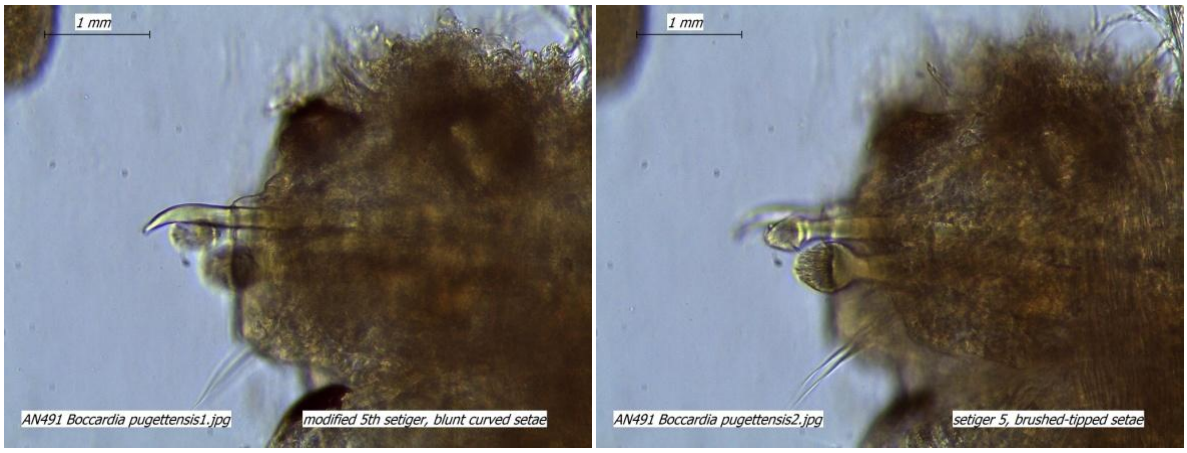
Whole body, dorsal view – posterior boat hook notosetae (no), pygidium

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)

Genus *Pseudopolydora*

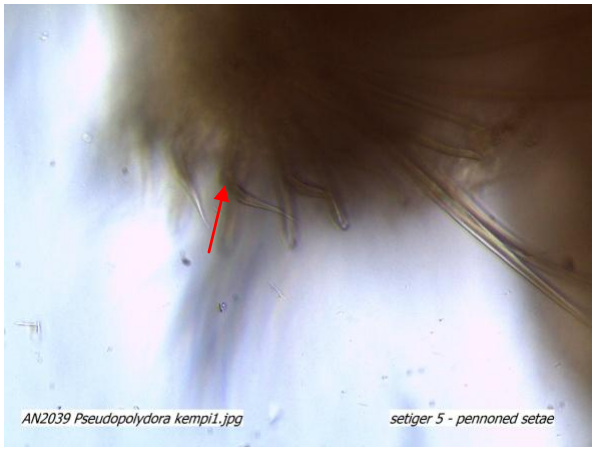
- Branchiae from setiger 6-12.
- Setiger 5 slightly to moderately modified, usually with well-developed parapodia.
- Major spines of setiger 5 of 2 types, first simple, acicular or falcate, second pennoned, with both types usually arranged in U or J-shaped double row.
- Hooded hooks with secondary tooth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

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

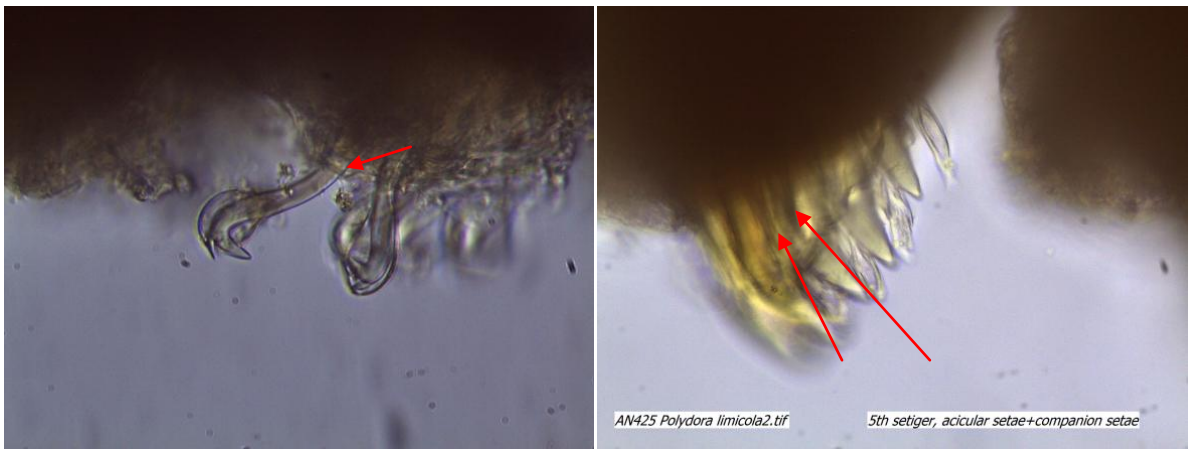
- Hooded hooks (posterior neuropodia) with constriction and manubrium on shaft (Kathy – like a little "waist" going into the body), and with main fang at more or less right angle to shaft and wide angle with apical tooth.
- Notosetae absent on setiger 1.
- Anterior part of digestive tract never interrupted by gizzard-like structure.

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); 5th setiger with acicular setae and companion setae (r)

Anterior end, ventral view

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

Blake, JA. 1996. Chapter 4. Family Spionidae Grube, 1850. Including a Review of the Genera and Specis from California and a Revision of the Genus *Polydora* Bosc, 1802. In: JA Blake, B Hilbig, and PH Scott. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and the Western Santa Barbara Channel. Volume 6. The Annelida Part 3. Polychaeta: Orbiniidae to Cossuridae. Santa Barbara Museum of Natural History. Santa Barbara, California. 418 pp.

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

Light, WJ. 1978. Invertebrates of the San Francisco Bay Estuary System. Family Spionidae (Annelida, Polychaeta). The Boxwood Press, Pacific Grove, California. 211 pp.

Radashevsky, VI. 2007. Morphology and biology of a new *Rhynchospio* species from the South China Sea, Vietnam, with the review of *Rhynchospio* taxa. Journal of Natural History. 41(17-20):985-997.

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.