

 Puget Sound Polychaetes:
Family Cirratulidae

Family Cirratulidae

General characters (from Blake, 1996)

- Body elongate and cylindrical in cross-section with numerous segments; anterior thoracic and posterior pre-pygidial regions often inflated; mid-abdominal segments may be moniliform (bead-like).
- Parapodia biramous, with indistinct lobes; noto- and neuropodial bundles of setae apparent.
- Prostomium conical, with or without eyes; bearing no appendages.
- Peristomial segment achaetous, with one or more transverse furrows or annulations. Can extend back dorsally over some of the body segments.
- A single pair of thickened dorsal palps or paired patches of palps present on the posterior margin of the peristomium.
- Paired gill filaments present on each setiger throughout the length of the body, usually inserted just dorsal of the notopodial setae.

Genus-level characters

- Number of palps - single pair vs. patches of palps.
- Type of setae - all have smooth or denticulate capillaries, but can additionally have acicular spines, knobbed setae, or bidentate hooks. Modified setae usually in the posterior end, so if you only get the anterior, can't be sure if it's *Aphelochaeta* or another genus with modified setae.

General notes

- Challenging family due to similarity of species as well as a high number of undescribed species.
- Need anterior and posterior ends to definitively identify to genus.
- It's helpful to have anteriors and posteriors, even if they are not attached to each other.
- California species are distinct from Washington species.
- Jim Blake currently describing several new cirratulid species from northern Alaska and WA...now done for 3 different Puget Sound species – a *Tharyx*, *Chaetezone* nr. *setosa*, one more (a *Monticellina*)...he is currently writing this paper.
- Kathy Welch and Gene Ruff are continuing to call them what they have been called historically in Puget Sound for consistency, but be aware that these are provisional names and many will be changed in the near future.
- Some genera with one pair of palps attached in peristomial region, some with patches of palps...distinguishes genera ...used for feeding...often fall off.

Family Cirratulidae

- Gills – generally one pair per segment inserted just dorsal to the notosetae...usually throughout the length of the body...often fall off.

List of Species – Use key in Santa Barbara Taxonomic Atlas handout, but realize that the Washington species are distinctive from the California species and several are currently being examined and described by Jim Blake. We also have DNA barcoding material sent out for processing for some of these species.

Genus *Aphelochaeta*

- **Anterior end with a single pair of long, grooved dorsal palps.**
- **Setae all smooth capillaries.**
- We recognize 4 species, most of them provisional, and we are consistent with our identifications.
- Jim Blake has postulated that the species of Cirratulidae differ in every local...good candidate for DNA barcoding.

Aphelochaeta monilaris (Hartman, 1960)

- Inflated anterior and posterior ends.
- Moniliform (beadlike) middle setigers.
- All smooth capillary setae.
- 2 palps.



Lateral anterior, inflated (l); ventral thorax, methyl green staining pattern (r)

Family Cirratulidae



Whole body, dorsal view of thorax (l); whole body, lateral view of thorax (r), note moniliform setigers in mid-section of body



Inflated posterior end

Aphelochaeta sp. N5 NAMIT* provisional species

- Body large, with many setigers in the anterior and posterior inflated regions.
- Anterior region inflated with about 25 crowded setigers.
- Inflated posterior region with a ventral groove.
- Filiform branchiae beginning on setiger one and limited to the thoracic region
- Median setigers cylindrical.
- Median neurosetae narrower than the notosetae.
- Methyl green stain retained only on the anterior ventrum; tip of the prostomium does not retain methyl green stain.
- Looks like a "buff" *A. monilaris*.
- *NAMIT = Northern Association of Marine Invertebrate Taxonomists

Family Cirratulidae

Aphelochaeta glandaria complex Blake, 1996

Includes *Aphelochaeta glandaria* together with species that fit the description of *A. glandaria*, including *Tharyx* sp C, *Tharyx* sp. F, *A. sp A*, *A. sp. N1*. In the past, members of this complex have been erroneously identified as *Tharyx multifilis*, *A. multifilis*, *Tharyx marioni*, *Aphelochaeta marioni*.

- Robust throughout body.
- No moniliform middle setigers.
- Somewhat inflated anterior/posterior, but middle of body is not thin.
- Palps usually yellow, golden, or orange, attached medially on setiger 1.
- Ventrum of thorax has creamy glandular area...doesn't stain with methyl green, while rest of body does.
- Unlike the original description of *A. glandaria*, Puget Sound representatives appear to have faint eyes on prostomium.
- Smooth, capillary setae throughout the body.



Whole body, lateral, note robust appearance (l,r)



Whole body, lateral (l); anterior end with one pair of palps and many pairs of branchiae (r)

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Anterior end, ventral, note glandular ventral thorax (l); anterior end, dorsal, palps missing (r)



Anterior end, ventral, note glandular ventral thorax (l); methyl green staining, note no stain in glandular ventral thorax (r)

Genus *Monticellina*

- Anterior end with a single pair of long, grooved dorsal palps.
- Setae include both simple smooth capillaries and setae with basally flattened, broad blades and with fine to coarse denticles along one edge.

Monticellina serratiseta (Banse and Hobson, 1968)

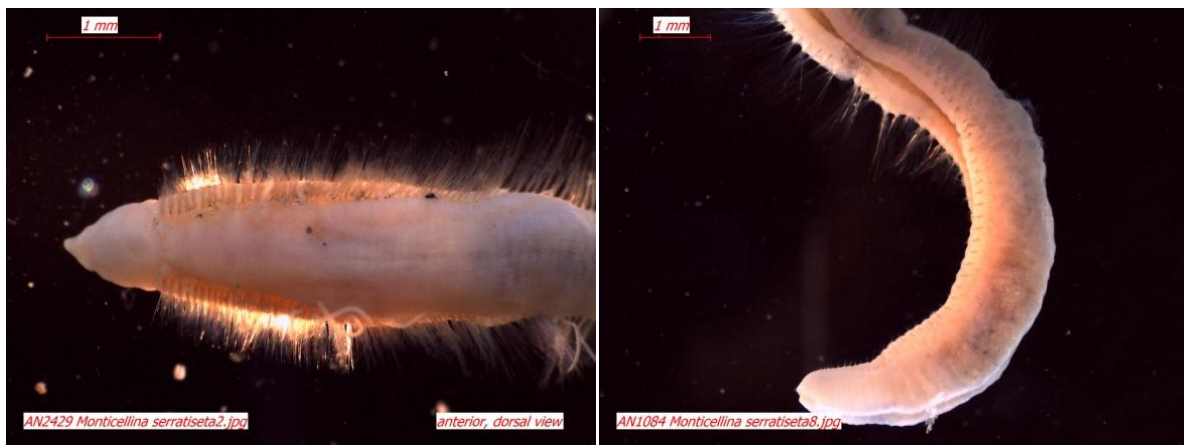
- Two palps on anterior end.
- Capillary setae flattened with fine teeth on the end (need 63x, phase contrast, and/or 100x oil immersion to see).
- Large species; body robust throughout.
- Anterior end with 3 ventral grooves running along body.
- Mid-posterior segments with distinct ventral groove.

Family Cirratulidae

- Setae look “furry”, natatory-like setae.



Whole body, dorsal (l), ventral (r)

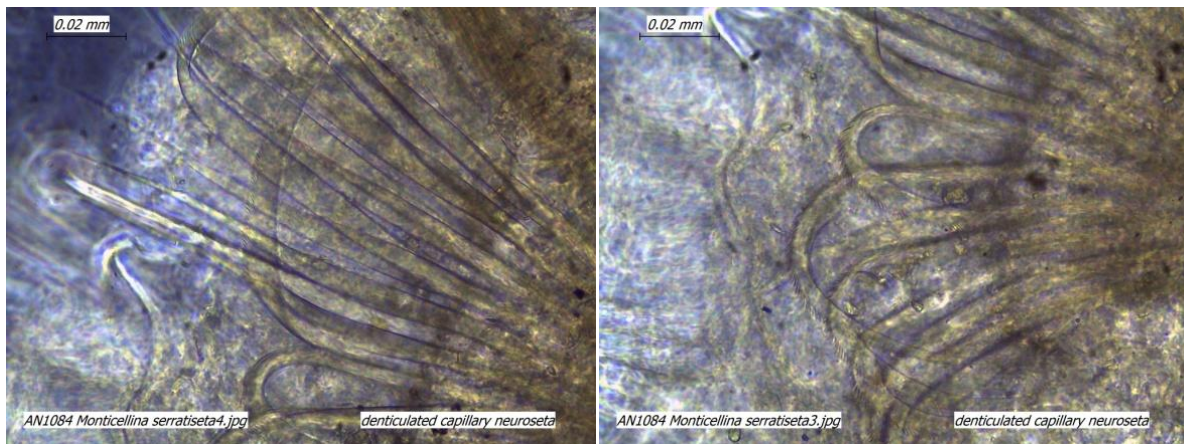


Anterior end, dorsal, note silky, natatory-like setae; palp scars (l), posterior end with ventral groove (r)

Family Cirratulidae



Anterior, ventral (l); whole body, note 3 ventral grooves in anterior, single in posterior (r)



Posterior neurosetae, note capillary setae flattened with fine teeth on the end (they are bent in both photos) (l,r)

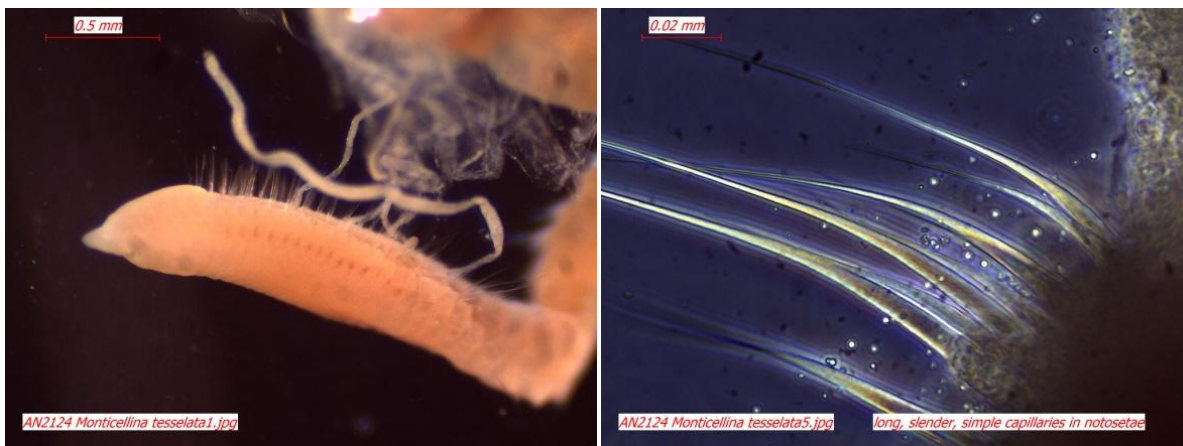
Monticellina tessellata (Hartman, 1960)

- Easy to recognize in its tube. Tube has numerous thin, membranous lateral extensions through which the branchiae protrude.
- Body long, narrow; anterior and posterior ends inflated, segments numerous and crowded; middle body segments longer, narrower, weakly moniliform.
- Narrow mid-dorsal ridge present from posterior edge of peristomium through the thoracic region.
- Notosetae smooth capillaries throughout the body.
- Neurosetae smooth capillaries in thoracic region, replaced by shorter, thicker saw-toothed capillaries in the middle and posterior setigers.

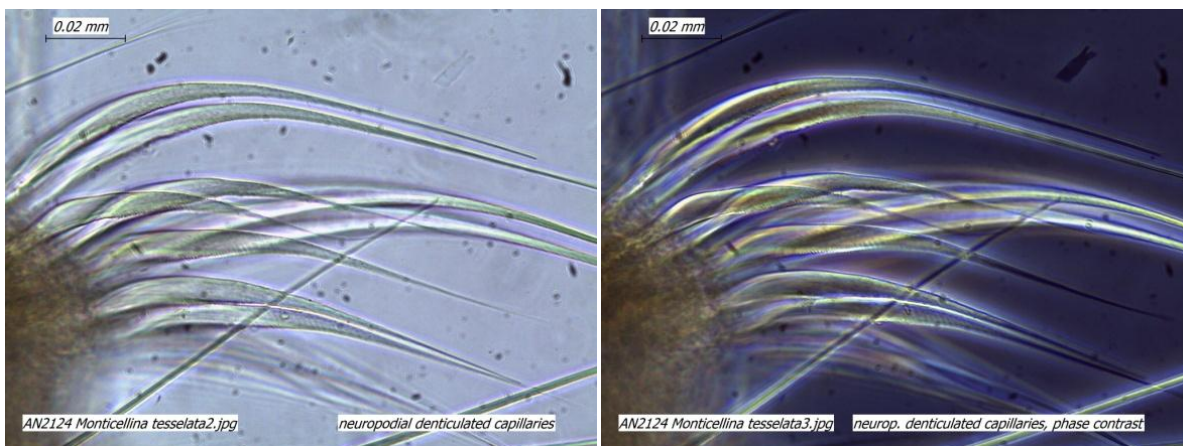
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Individual in tube (l), anterior end separated from tube (r) (arrows point to prostomium)



Anterior end, lateral view (l); long, slender, simple capillaries in notosetae (r)

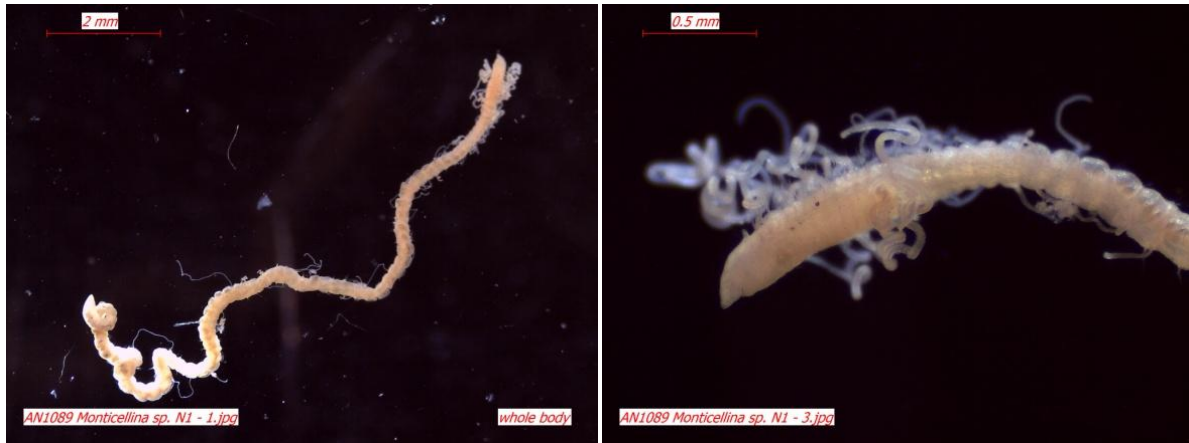


Posterior neuropodial denticulated capillary setae (l), in phase contrast (r)

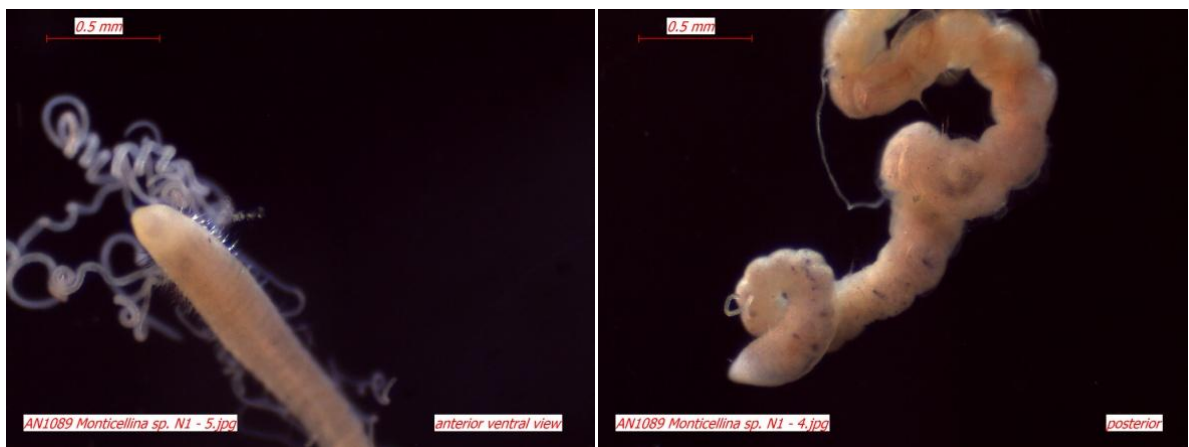
Family Cirratulidae

Monticellina sp. N1 NAMIT provisional species

- Long, slender, fragile body, anteriorly and posteriorly expanded.
- White, glandular bands in anterior ventrum, stain a deep green with methyl green.
- Setae include both simple smooth capillaries and setae with basally flattened, broad blades and with fine to coarse denticles along one edge.



Whole body (l); anterior lateral view (r)



Anterior ventrum (l); posterior end (r)

Genus *Chaetozone*

- **Anterior end with a single pair of long, grooved dorsal palps.**
- Smooth capillary setae present throughout the body.
- **Modified setae distally entire acicular spines; spines of posterior setigers arranged in cinctures.**
- Integument appears “shiny.”
- Prostomium acutely pointed, not bluntly rounded as in *Aphelochaeta*.

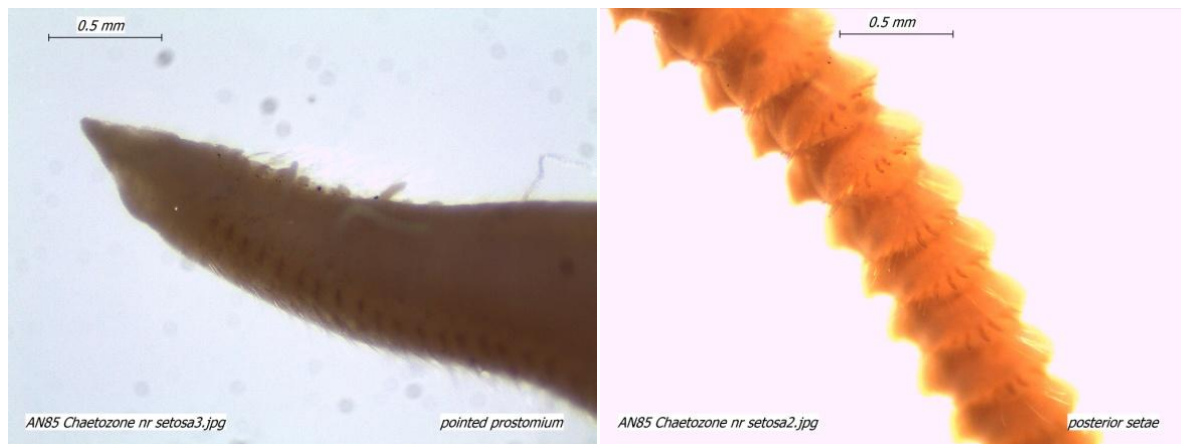
Family Cirratulidae

Chaetozone setosa complex SCAMIT

- Dorsal tentacles and first pair of branchiae arising on peristomium, anterior to first setiger.
- Posterior acicular spines composing almost complete cinctures around the posterior end of the body (looks like a Christmas tree).
- One of the more common *Chaetozone* species in Puget Sound.
- Distinctive enough not to need staining.
- Jim Blake says this is a new species and is in the process of describing it.

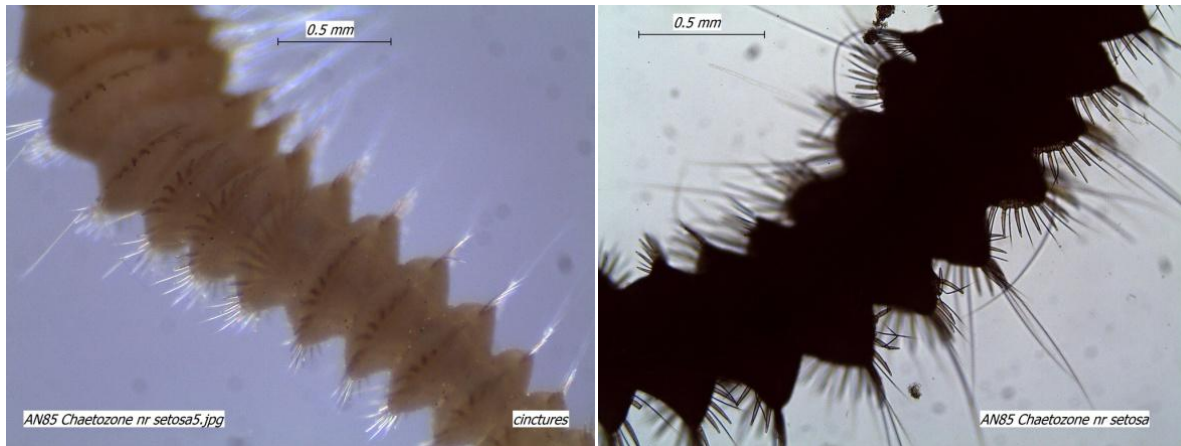


Whole body (l); anterior end, lateral view (r)

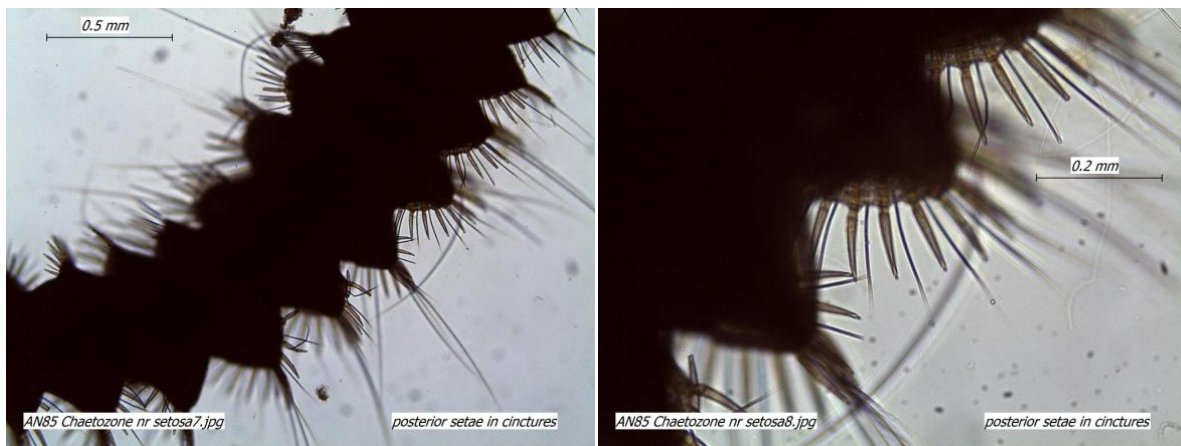


Anterior, lateral (l); posterior acicular spines composing cinctures (r)

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Cinctures of posterior acicular spines (l, r)



Cinctures of posterior acicular spines (l, r)

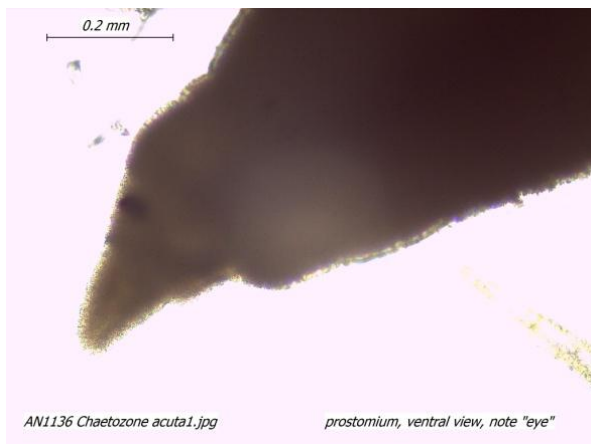
Chaetozone acuta (Banse and Hobson, 1969)

- Second most common *Chaetozone* species in Puget Sound; originally described from Puget Sound.
- Prostomium with a pair of conspicuous cup-shaped, deeply-set eyes.
- Notopodial spines beginning about setiger 55; neuropodial spines beginning in mid-body, about setiger 18-40.
- Posterior spines and capillaries forming incomplete cinctures.

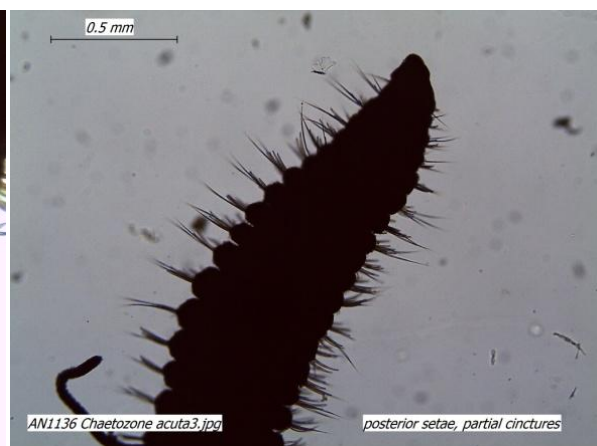
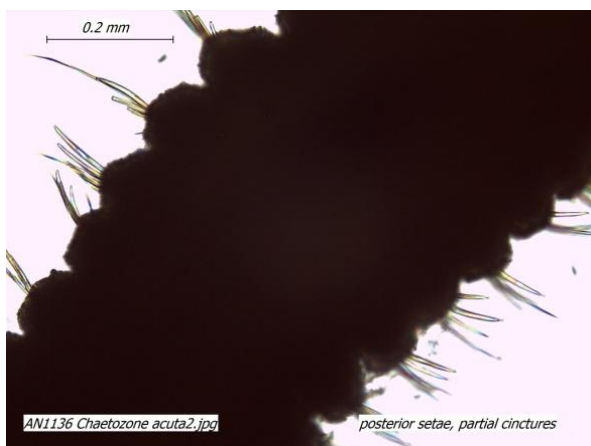
Family Cirratulidae



Whole body, dorsal view (l); anterior, dorsal view, note eye spots (r)



Prostomium, lateral view, note eye (l); posterior setae, partial cinctures (r)



Posterior setae, partial cinctures (l,r)

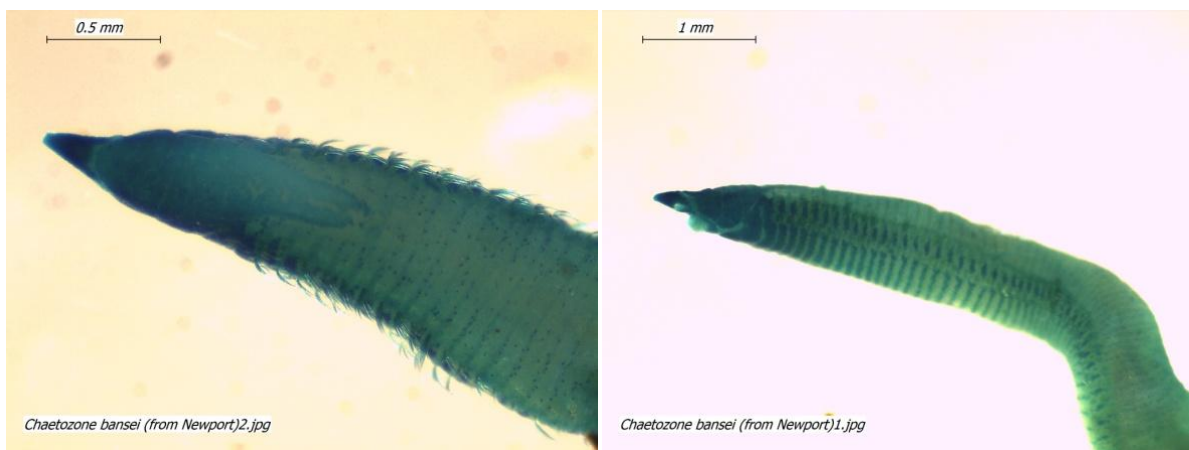
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Chaetozone bansei (Blake, 1996)

- Common in Oregon, including Newport, but we don't have any voucher specimens from Puget Sound.
- Peristomium extends back over dorsal segments.
- Palps (paired dorsal tentacles) first present from setiger 4-7, pretentacular region glandular, staining intensely with methyl green.
- Setae on posterior end arranged in incomplete cinctures.
- Methyl green staining pattern distinctive.
- Found in high energy, sandy habitat (mouth of SF Bay, wave energy project off Newport, OR).



Whole body, note palps starting on more posterior setigers (not setiger 1) (l); anterior, dorsal – note staining on tip of prostomium and stained peristomium extending over many setigers (r)



Anterior, dorsal, note distinctive staining pattern (l,r)

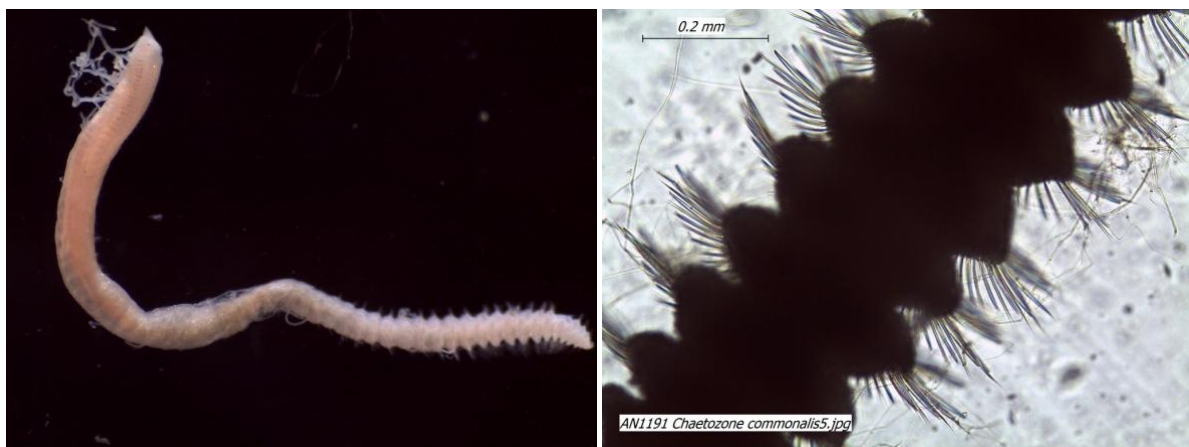
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Anterior, lateral, note insertion of palps on more posterior (i.e., not first) setiger (l); posterior end with incomplete cinctures (r)

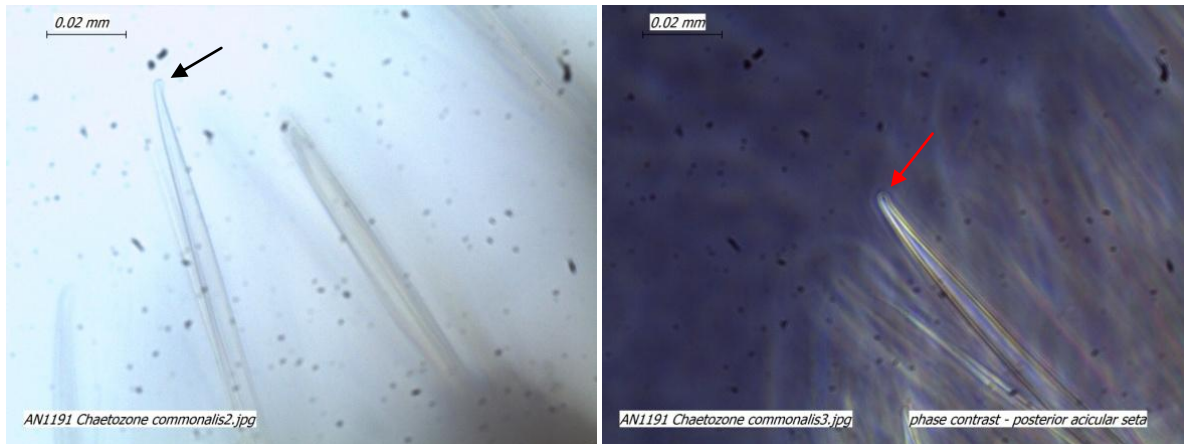
Chaetozone commonalis (Blake, 1996)

- Something similar to this species occurs in Puget Sound, but according to Jim Blake it isn't really *C. commonalis*. Blake is in the process of describing it. We currently call the Puget Sound species *C. commonalis* until the new description is complete.
- Posterior neuropodial spines have a curved tip that attaches back to the shaft.
- Prostomium points upward (dorsally).
- Branchiae first present from setiger 1.
- Pygidium is a flattened, saucer-like lobe.
- No distinctive methyl green staining pattern.



Whole organism, lateral view of anterior, note upturned prostomium (l); posterior neuropodial spines arranged in cinctures (r)

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Posterior neuropodial spines with curved tip that attaches back to the shaft (l), under phase contrast (r)

Genus *Caulleriella*

- Anterior end with a single pair of long, grooved dorsal palps.
- Modified setae bidentate crochet-like hooks, not arranged in cinctures in posterior setigers.

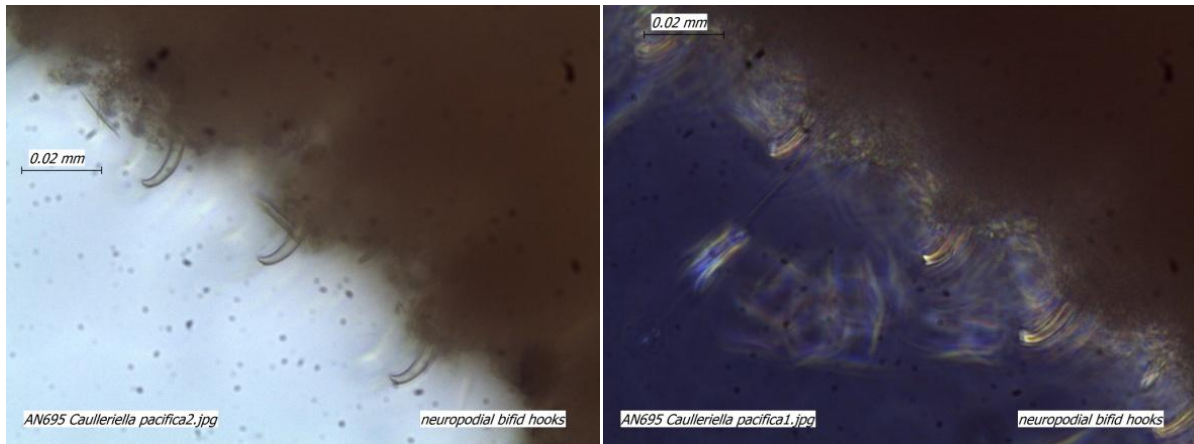
Caulleriella pacifica E. Berkeley, 1929

- This is the only species of *Caulleriella* in Puget Sound.
- Body robust, widest anteriorly, tapering posteriorly; all setigers short, crowded together.
- Prostomium conical and pointed anteriorly, with one pair of eyes.
- Noto- and neuropodia widely separated from each other.
- Notosetae capillaries from setiger 1, with bifid hooks from about setiger 50; neurosetae bidentate hooks from setiger 1.



Whole body, lateral view, note eyespots (es) and crowded setigers (set) (l,r)

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Neuropodial bifid hooks (l), under phase contrast (r)

Genus *Tharyx*

- Anterior end with a single pair of long, grooved dorsal palps.
- Modified setae with irregular knoblike or sub-bidentate tips, never arranged in cinctures.
- This genus used to include *Aphelochaeta*; Jim Blake redefined the genera of cirratulids in the 1996 Santa Barbara Taxonomic Atlas, and separated them based on types of setae.
- Two species found in Puget Sound:
 - *Tharyx* sp. N1
 - *Tharyx parvus* – brackish, shallow water (intertidal to shallow subtidal); tend to be found more in coastal embayments...e.g., Willapa Bay, Tillamook Bay; occasionally but not commonly found in Puget Sound.

Tharyx sp N1 NAMIT provisional species

Description:

- A small, slender species (~12-mm for 60+ segments).
- Conical prostomium short, pointed, without eyes.
- Cylindrical peristomium larger than prostomium, elongated, with 2 indistinct annulations and a dorsal keel; palps inserted on the posterior dorsal peristomial margin.
- Thoracic setigers only slightly swollen and crowded; median setigers terete and about twice as wide as long.
- Body gradually tapering to a long, narrow posterior region.
- Branchiae inserted just above and behind the notopodia from setiger one, and continuing dorsolaterally above the notopodia into the median region.
- Long and short smooth capillary setae present on low, rounded parapodia through the thorax and median setigers; longer capillaries natatory in appearance and up to the body width in length.
- Posterior region with straight, sharply pointed setae in the notopodia, and geniculate, bifid-tipped spines confined to the neuropodia.

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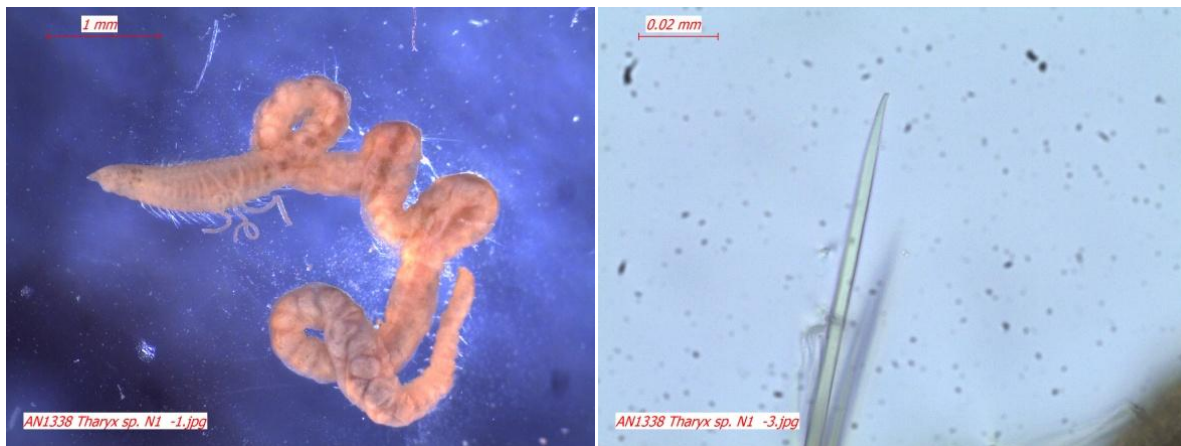
- Pygidium low and rounded. Tapering, rather than bluntly ending as in *T. parvus*.
- Bifid-tipped spines start more anteriorly than they do in *Tharyx parvus*.

Diagnostic Characters:

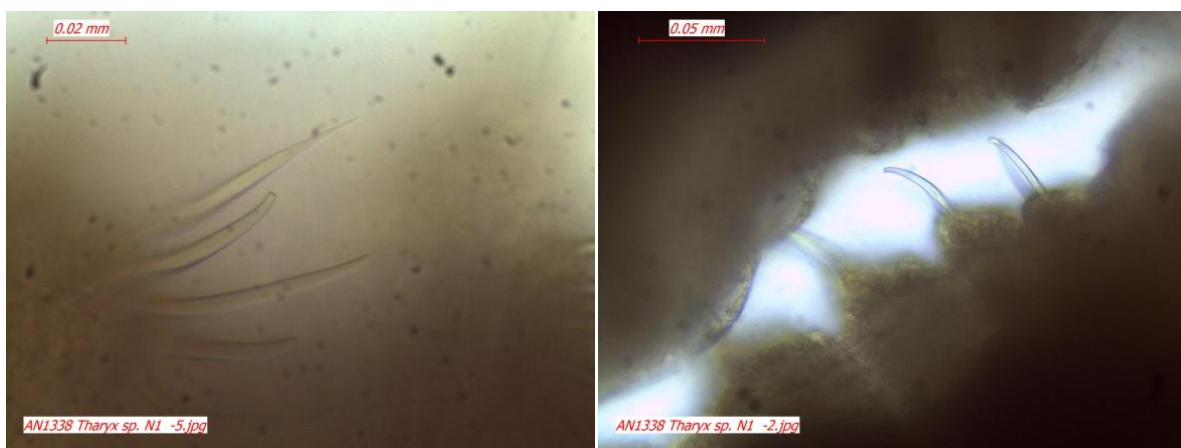
- Posterior region narrow and tapering, with no sign of inflation.
- Posterior notopodia with straight, pointed setae only; modified spines lacking.
- Posterior neuropodia with modified spines and without straight, pointed setae.

Remarks:

- When treated with methyl green the posterior portion of anterior ventrum staining with vague transverse bars.



Whole body, lateral view (l), note tapered posterior end; mid-body neuropodial setae (appears to be transitional between capillary and modified spine) (r)



Geniculate, bifid-tipped neuropodial spines (l, r)

Family Cirratulidae



Geniculate, bifid-tipped neuropodial spines (l, r)

Tharyx parvus Berkeley, 1929

- A few knobbed neurosetae present at far posterior end; not arranged in cinctures.
- See page 315-316 in Santa Barbara Taxonomic Atlas for description and illustrations.
- No distinct methyl green staining pattern.
- Posterior end abruptly tapered, unlike *Tharyx* sp. N1.



Whole body, lateral view, note abruptly tapered pygidium (l), posterior knobbed neuroseta (r)

Genus *Cirratulus*

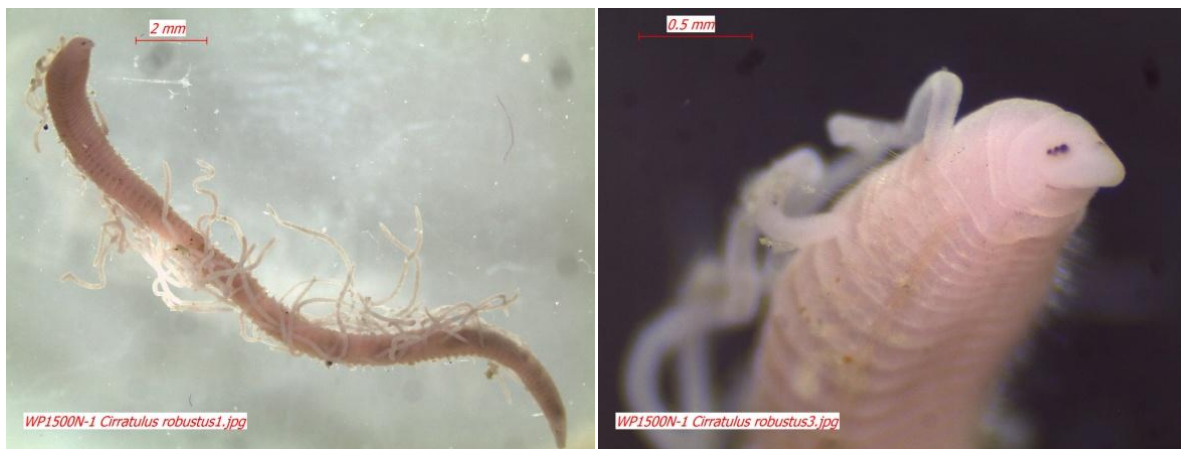
- Anterior end with numerous palps arising from a single segment on either side of the dorsum, usually from the posterior edge of the peristomium or on one of setigers 1-7; first pair of branchiae inserted on same segment and continuing over most of the body to the posterior end. Patches of palps!
- Prostomium bluntly wedge-shaped, usually with eyes (usually in a line on each side); peristomium with one or more transverse annulations.

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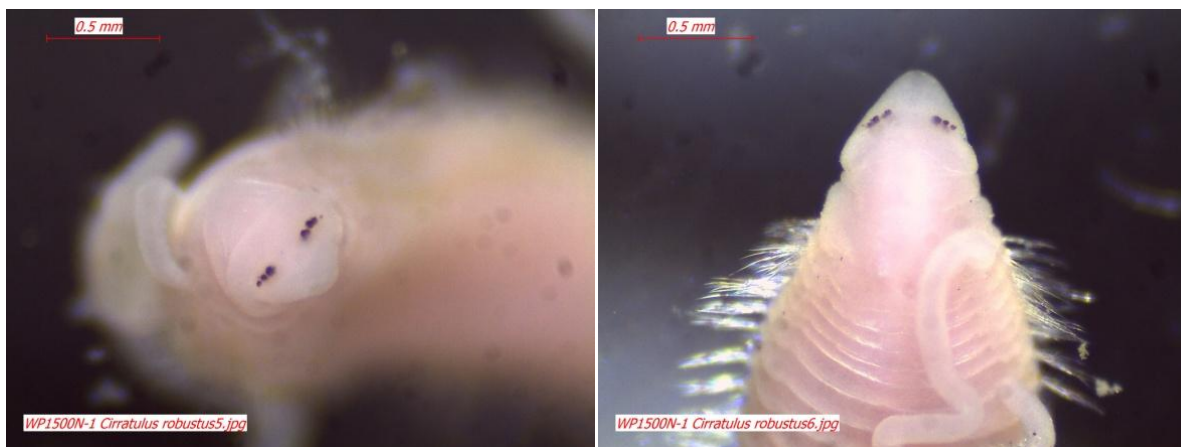
- Setae include smooth capillary setae and acicular spines; similar to *Chaetazone* spines, but not arranged in cinctures.
- 2 species in Puget Sound:
 - *C. robustus* – the larger of the two species
 - *C. spectabilis* – the smaller of the two species

Cirratulus robustus Johnson, 1901

- Prostomium with 2 transverse rows of 5-6 reddish eyes.
- Neuropodial acicular spines beginning on setiger 16-17.



Whole body (l), anterior end with eyespots on prostomium (r)

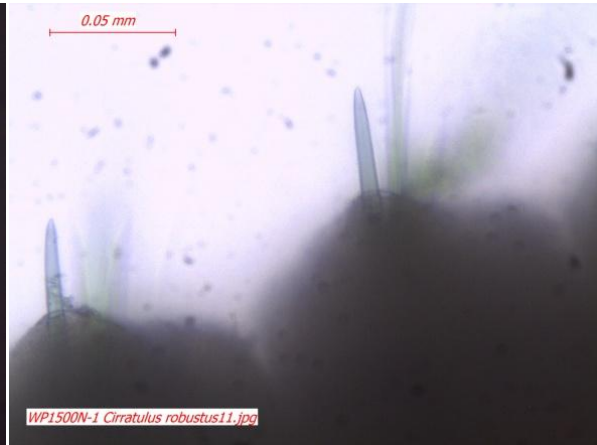


Prostomium, anterior view, with eyespots (l), anterior end, dorsal view, with eyespots (r)

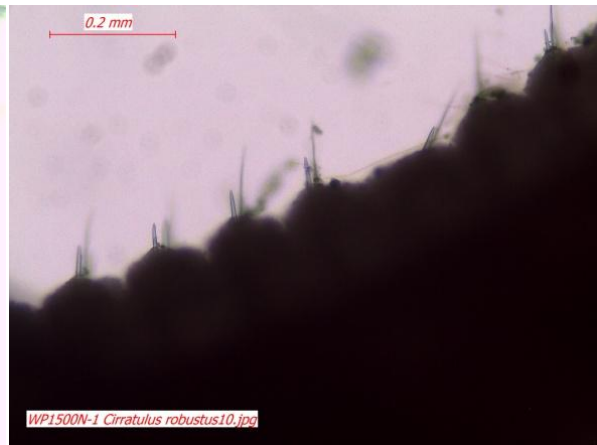
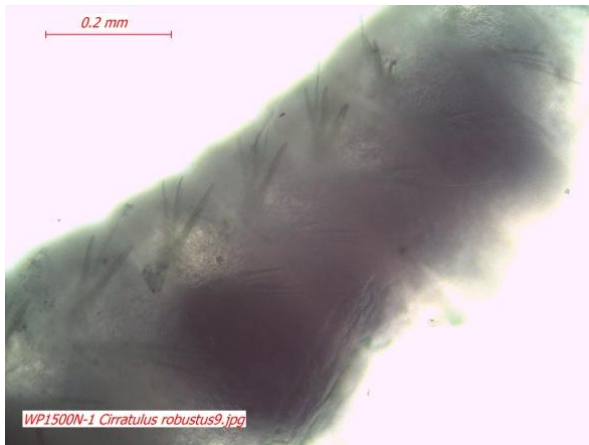
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Anterior end, lateral view, methyl green stain, note darker patches of methyl green staining on peristomium where patches of palps had been attached (l,r)



Posterior end, ventrolateral view (l); neuropodial acicular spines in posterior setigers (r)



Neuropodial acicular spines in posterior setigers (l, r)

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Cirratulus spectabilis (Kinberg, 1866)

- Neuropodial acicular spines beginning on setiger 7-10.
- Prostomium with 2 transverse rows of 2-3 black eyes.



Whole body, dorsal view (l); whole body, ventral view, note eyespots (r)

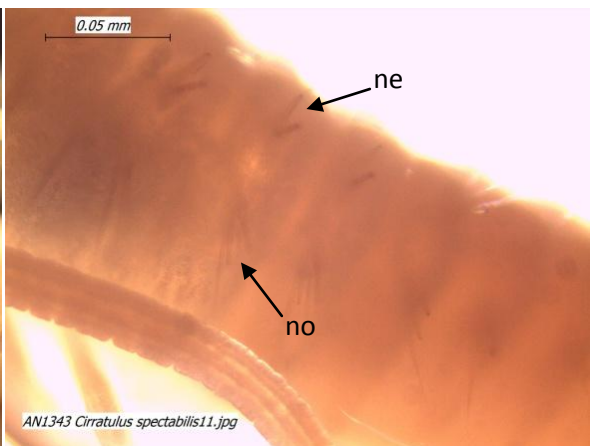


Anterior end, dorsal view, patches of palps on first setigers (l,r); note eyespots (r)

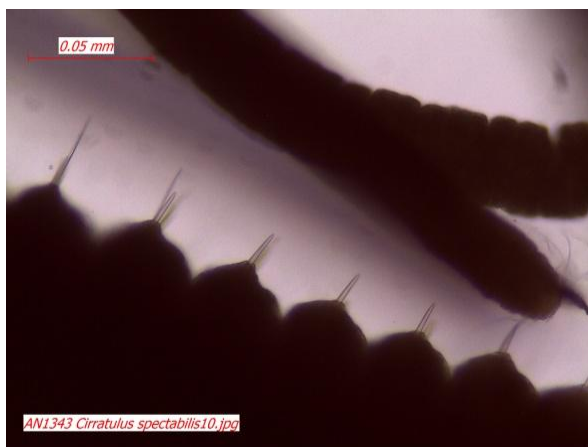
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Anterior end, dorsal view, patches of palps on first setigers (l); anterior end, ventral view (r)



Anterior end, ventrolateral view, palps arising on first setigers (l); mid-body setigers, notosetae (no) and neurosetae (ne) (r)



Posterior acicular neurosetae

Family Cirratulidae

Differences between *C. robustus* and *C. spectabilis*:

- Difficult to see the difference between the color of the eye spots for the two species.
- Possible that the two “species” we find in Puget Sound may be the same species, but the large and small ones are being called different species names.
- Sometimes the acicular spines start in between the designated setigers for the two species, in which case, the specimen is called *Cirratulus* sp.

Additional species of Cirratulidae found in Puget Sound

Aphelochaeta sp N6

Monticellina secunda

Literature

Blake, J.A. 1996. Chapter 8, Family Cirratulidae Ryckholdt, 1851. Pages 263-384. IN: Blake, J.A.; B. Hilbig; and P.H. Valentich-Scott (editors). Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. Volume 6 - The Annelida Part 3. Polychaeta: Orbiniidae to Cossuridae. Santa Barbara Museum of Natural History. Santa Barbara, California. ISBN 0-93649-11-5.

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/1403232.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 January 22 and 29, and February 5, 2014 at the Department of Ecology.