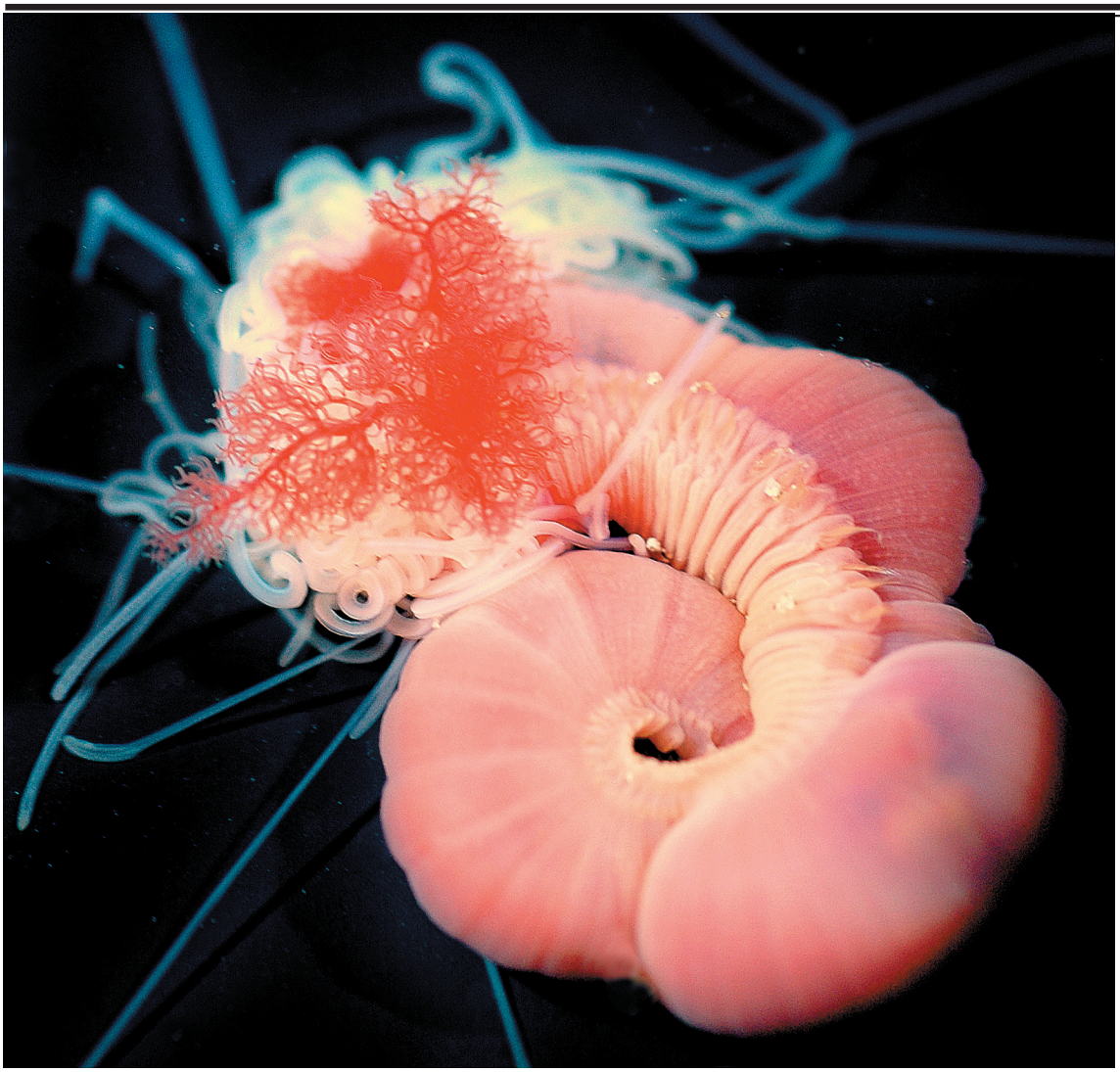
SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

July/August, 2006 SCAMIT Newsletter Vol. 25, No. 2



Amphitrite robusta Johnson 1901 from CSD trawl SD8 9Feb2007 99m. Collected by K. Barwick Imaged and Identified by R. Rowe.
The specimen is 7 mm maximum width preserved and is full of developing gametes. In the tube with the worm was a specimen of ***Lepidasthenia longicirrata*** Berkeley 1923.
Please see the attached sheet at the end of the Newsletter for more information on this species.

TEREBELLIDS – JULY 10 2006

The meeting on Terebellids was led by Leslie Harris and was held at the Los Angeles County Museum polychaete collections room. President Kelvin Barwick opened the meeting. Leslie announced upcoming meetings which are listed on the SCAMIT website and below.

Treasurer Cheryl Brantley called for a meeting to update the SCAMIT Species List and prepare for the next edition. There was some discussion about how much this meeting should include. Will Edition 5 be more inclusive? Will it contain provisionals? Will it include other surveys? It was decided to have a series of four meetings to cover all the taxa for the Species List update. The polychaetes will be addressed on March 12, 2007 at the Los Angeles County Sanitation District. The mollusks and echinoderms will be covered on March 26, 2007 at the City of San Diego. The crustaceans will be addressed on April 9, 2007 at the Los Angeles County Sanitation District. The miscellaneous phyla will be reviewed on April 23, 2007 at the City of San Diego.

Upcoming Meetings

*March 12 - SCAMIT Invert List ed. 5 review, Polychaetes at LACSD

March 26 - SCAMIT Invert List ed. 5 review, Mollusks and Echinoderms at CSD

*April 9 - SCAMIT Invert List ed. 5 review, Crustacea at LACSD

April 23 - SCAMIT Invert List ed. 5 review, Misc. Phyla at CSD

May 14 - TBA

June 11 - Cirratulids with Rick & Tony at TBA

*There are two meetings planned for both March and April.

Leslie then started on the topic of the morning, problems with *Pista*. Leslie has examined most of the type specimens of species of *Pista* that occur in the Northeast Pacific Ocean. She has categorized the species into two distinct groups. The first group is *Pista cristata* sensu stricto, the "classic *cristata*". Species in this group have two pairs of branchiae and three pairs of nephridia. The second group is represented by *Betapista dekkerae* holotype which has three pairs of branchiae and multiple pairs of nephridia. Banse's specimen was aberrant in which the branchiae start on segment 2, but he described it as starting on segment 3 which places it back into *Pista*.

Leslie went on to compare different character states of these two species groups such as the shape of uncini and ventral shield structure. Leslie believes that *Betapista* is a good name. Specimens are characterized by 3 pairs of branchiae, starting on segment 2, multiple pairs of nephridia, uncini with a large hook on a long shaft, and heavily crenulated and convoluted ventral shields. Under this scheme, *Pista elongata*, *P. dekkerae*, *P. moorei*, and *P. pacifica* would move into *Betapista*.

Leslie explained that *P. agassizi* should change to *P. brevibranchiata* Moore 1923 and that it agreed with ICZN 1999 in using the first available name. The holotype of *P. agassizi* is Mendocino, California. Leslie has come across specimens recently while working on an outer coast survey. *P. agassizi* is a good species and lives in the intertidal and subtidal on hard bottom habitats. In comparison, *P. brevibranchiata* lives in soft bottom habitats, has thicker, more rigid tubes, has thousands of small eggs, and has a different staining pattern of the ventral shields and

dorsum.

Leslie presented a list of the current species of *Pista* and their status based on her recent research:

P. agassizi – goes to *P. brevibranchiata* Moore 1923
P. alata – valid
P. bansei – goes to *P. estevanica*
P. brevibranchia – goes to *P. brevibranchiata* Moore 1923
P. cristata – not on this coast
P. disjuncta – still in question
P. elongata – Group 2 *elongata*
P. estevanica – valid
P. fasciata - ?? type specimen in poor shape
P. moorei - goes to Group 2 *moorei*
P. pacifica – goes to Group 2 *pacifica*
P. percyi – goes to *P. brevibranchiata*
P. wui – valid
Betapista dekkerae - valid

After lunch, we viewed many specimens under the microscope. First up was *Pista* sp SF 1 from San Francisco Bay collected by Dot Norris. This specimen had dorsal staining only on setiger 1, branchiae with brown pigment, and eyes. Leslie offered to send an e-mail to the SCAMIT list-server with an attachment of the image.

Next up was *Nicolea* sp A Harris 1985. There is a voucher sheet for this species in the SCAMIT newsletter Volume 4 No. 11, 1985. Rick Rowe (CSD) also showed us his photo sheet for this species. Leslie showed us a chart of described species of *Nicolea*. The genus needs to be revised because several of the characters used to separate the species are not good, such as the number of teeth above the main fang, number of denticles, and size of nephridial pores. Leslie has only found *Nicolea* in harbors and suggested that it may be introduced. We viewed a specimen of *Nicolea* sp A and observed the nephridial papillae on segments 3, 6, and 7.

Kelvin then showed us a specimen of *Lysilla* sp SD 1 Barwick 2006 collected from San Diego Point Loma outfall station E-5(2) in 99 meters of water. It has 6 pairs of thoracic notopodia with simple capillaries that do not project out from the individual podia. The tentacular lobe is expanded. The inflated lower lip has longitudinal groves. The thorax is papillated as well as annulated whereas the abdomen is only annulated. Only one incomplete specimen was found.

In the eastern Pacific, *Lysilla loveni* Malmgren, 1866 has been reported from British Columbia and Washington (Banse, 1980). The type is from Sweden and has also been reported from Greenland, Iceland, the Bering and Chukchi Seas, and the Canadian Arctic (Holthe, 1986). It is similar to *L*. sp SD1 in that it also has 6 pairs of thoracic notopodia. Holthe describes *L. loveni* having a gutter like lower lip and short oral tentacles. *L*. sp SD1 has an expanded lower lip with longitudinal groves and the oral tentacles are longer. Ushakov (1955) illustrates the anterior thorax of *L. loveni* as inflated to over twice the diameter of the following posterior segments. The thorax of *L*. sp SD1 is only slightly more inflated that the posterior segments.

Leslie had brought a new polycirrinae, *Amaeana* sp A Harris 2004. It was collected from soft bottoms in San Francisco Bay. The specimen had large nephridial papillae and the posterior was striped like a “tiger tail”. Some specimens also had less intense striping in the anterior. Leslie told

us that this animal produces blue bioluminescent slime.

Discussed next was *Polycirrus californicus* and *P. perplexus* Moore 1923. These two species are found in different habitats; *P. californicus* is found in soft bottoms and *P. perplexus* is found on kelp holdfasts and scrapings from hard substrates. Rick showed us pictures of the staining patterns of these species which are distinct. We viewed a specimen of *P. perplexus* of Leslie's from shallow water scrapings. The dorsum is rugose and there is a light methyl green staining ventral peristomial patch. In addition there are approximately 3 segments where the middle ventral scutes stain lighter than the nearby scutes.

Larry Lovell handed out copies of a table that he made comparing which characters have been used for *Polycirrus* by various authors. A copy of the table is included with this newsletter. We discussed the characters and commented on which ones were best to use in identifying species of *Polycirrus*. There was a discussion about regenerating heads. When *Polycirrus* are stressed or about to be eaten, they often lose their tentacles and head which serve as a distraction and allow the rest of the animal to escape. Therefore, we often get specimens with regenerating anterior ends and consequently the number of thoracic setigers can be variable. We concluded that this is not a good character to use in species determination.

Images of several provisional *Polycirrus* species were passed around including *P.* sp OC1, *P.* sp SD1, *P.* sp SD2, and *P.* SD3.

Moving from Terebellids to Spionids we next viewed a specimen of *Polydora hoplura* that Leslie had recently identified from a San Diego Bay sample. It normally occurs on the East Coast. Klapare described *P. hoplura* from Europe. The anterior end looks remarkably like *Bocardiella* with pigment on both sides of the prostomium. There were no branchiae on the 5th setiger, and the spines on the 5th were simple. Unlike *Bocardiella* though, *P. hoplura* has large spines in the posterior.

Lastly, we examined the holotype of *Cirratulus dillonensis*.

DECIPHERING *PINNIXA* AND GNATHIDS; AUGUST 14, 2006

Bill Furlong and I were happy to host the August 14, 2006 SCAMIT meeting at LACSD touching on two large topics, the crab genus *Pinnixa* and the isopod family Gnathiidae. We started off the meeting discussing several new species of gnathiid isopods and reviewing the characters that distinguished them as separate from other known taxa in our region. In the March/April SCAMIT newsletter I published a large manuscript on gnathiid isopods, covering re-descriptions of well-known taxa and providing detailed descriptions of new species encountered. Additionally, I provided keys to both males and females along with digital images for all taxa described. In this research effort, it was my intention to find a reliable way to link previously unidentified females with readily identified males. At the SCAMIT meeting, I presented a PowerPoint presentation outlining the methodology I propose using to accomplish this. That presentation can be found, along with character tables and keys, under the Taxonomic Tools section of the SCAMIT webpage. Since the material had been published before the August meeting, taxonomists from outside LACSD were able to review that work and provide valuable feedback at the meeting. I believe I convinced people that linking males with females is indeed possible and it is my hope that SCAMIT members will test out the methodology proposed and let me know how it worked for them. For more information on gnathiid isopods and their associated taxonomic tools, please refer to the March/April newsletter (Volume 24, No. 6) and the SCAMIT webpage.

After a tasty Thai lunch, Bill Furlong dove into the continually confusing problem of distinguishing *Pinnixa occidentalis* from *Pinnixa scamit*. We have had several meetings on this subject over the last three years without much resolution. Bill presented a Power Point presentation that will also be posted under the Taxonomic Tools section of the SCAMIT webpage for the reader's reference. Our three-year investigation of *Pinnixa* started simply as a discussion regarding the validity of the species *Pinnixa scamit*. Taxonomists from some agencies clearly saw this as a valid species while others did not recognize it at all. This created inconsistency in the previous Bight '03 effort and we had hoped to find some resolution to this controversy by sitting down and investigating the concerns of various taxonomists in regards to the two species. In using the published keys to separate the two species, many agencies noticed that smaller individuals were typically identified as *P. scamit* and larger ones as *P. occidentalis*. So the obvious question came to be: Is *P. scamit* just representative of juvenile *P. occidentalis* specimens? After sitting down and looking at many samples, we realized that this question could not be answered morphologically.

I reached out to a molecular geneticist postdoc, Scott Harrison, working at SCRIPPS, who had previous experience with this troublesome group of crabs on the east coast and had success in discriminating among closely related species in that region. Scott agreed to take on our cause in his spare time and with his own funding, which was truly amazing and generous. LA City, LA County, and City of San Diego all submitted representative formalin fixed specimens of what we each believed to be either *P. scamit* or *P. occidentalis*. The formalin fixation procedure unfortunately fragments the DNA of most animals, meaning that much smaller fragments of gene sequences are extractable from each specimen. Scott, with some perseverance, was successful though in obtaining usable sequences from each specimen submitted and when using mitochondrial Cytochrome B found there to be no significant difference in gene divergence between the individuals submitted. Scott presented these results at a former SCAMIT meeting but stated that these sequences were really too small (200 or so base pairs, compared to 500-600 typically analyzed in most studies) and wanted to see if he could find a better primer set and methodology for extracting DNA from formalin fixed material. He also pointed out that Cytochrome B was typically a better tool for demonstrating differences in species that had been well separated for a good deal of time. This gene did not typically work well for distinguishing species that were recently diverged or diverging. He suggested that further genetic work would need to be done before a real decision could be made on the group. Other genes, such as Cytochrome Oxidase Subunit One (CO1, a mitochondrial gene), Internal Transcribed Spacer Region – 1 (ITS-1, a nuclear gene), and 12Sr another mitochondrial gene, were all more appropriate for investigating gene distinctions in recently evolving species. Scott, however, did not have the time or money to take our study to this next level.

The following year, Bill Furlong began doing some more investigative work and found aberrant males mixed in with the LACSD *P. occidentalis* lots. These males had chelae that were much more like females of *P. occidentalis* and not at all typical of a male *P. occidentalis*. He also noted that the morphology of the folded abdomen was more rounded in these aberrant males than the typical *Pinnixa* male configuration. He began to wonder if we had a feminized male. This certainly piqued our interest and I began plucking penes from various males in the lot. What I found was striking differences in size and structure between a typical *P. occidentalis* male and the aberrant males. The aberrant male penes were twice the size in length and width of the typical *P. occidentalis* male. Certainly not feminized……just the opposite, but unfortunately creating much more confusion.

I began discussing this issue with Dr. Peter Castro from California State Polytechnic University in Pomona, who is having similar issues with goneplacid crabs, though his problem seems even more complicated. Whereas we show slight morphological variation in chelae and carapace morphology, Castro says the only morphological distinctions he finds are in the pene structures themselves. Just like us, he can identify aberrant males based on pene morphology but could not associate the corresponding females. He has noticed however that the vulva of goneplacids show many different patterns, but nothing that will allow him to link them to corresponding males. This has created a similar situation that was found in the gnathiid isopod group where only males could be identified and females were left as unidentified/sp. Although genetics may be helpful in understanding this problem, it would not help the taxonomists who rely on morphological features/distinctions to make identifications. Molecular lab set ups are still out of reach for most of us in our tool sets at the monitoring agencies.

We did send the aberrant male specimens that Bill found to Scott Harrison and he again ran with a Cytochrome B gene and still found no significant difference in base pairs between these and the other specimens that he ran earlier. But again, he thinks that these are possibly recently diverged species and Cytochromee B is not the best gene to differentiate at the level we need. This has been further demonstrated by the recent paper published by Ernesto Campos: "Systematics of the genus *Scleroplax* Rathbun, 1893 (Crustacea: Brachyura: Pinnotheridae)" wherein Ernesto provides a re-diagnosis of the monotypic genus *Scleroplax* based on morphology. While Scott was at SCRIPPS, he also ran Cytochromee B on *Scleroplax* specimens from Southern California and again found no distinct differences between the genera *Scleroplax* and *Pinnixa*. This is likely due to the fact that Cytochrome B is more often used in mammalian studies and may not be the best method for distinguishing fine level differences/divergences in crustaceans.

Scott has since moved on and taken a permanent faculty position back east. Our questions about the group remain unresolved and more complicated than when we initially started. We have three forms now that cannot be easily distinguished and lack the appropriate genetic analyses to make a real decision. It was therefore the recommendation of SCAMIT members attending the meeting, to refer to *Pinnixa occidentalis* as a complex of several unresolved species and incorporate *Pinnixa scamit* into that mix (not recognizing it as a separate species). Species complexes within the Pinnotheridae family are not uncommon and found around the world. There is the *Pinnixa cristat*a complex in the western Atlantic and a *Disodactylus* species complex known from both the Atlantic and Gulf of California. Scott Harrison remains interested in this project and we hope to entice one of his graduate students to pursue this question further with one of the three genes mentioned above (CO1, ITS-1, and/or 12Sr). Please find the Power Point that Bill Furlong gave on *Pinnixa* as a supplement to this newsletter, along with a review of the three morphologies we have documented in the *Pinnixa occidentalis* CMPLX.

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Ushakov, P. V. 1955. [Polychaeta of the Far Eastern Seas of the USSR]. (In Russian) Zoological Institute of the Academy of Sciences of the USSR. pp. 419 (Translated 1965 Israel Program for Scientific Translations, Jerusalem)

Please visit the SCAMIT Website at: www.scamit.org

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Volumes 1 - 4 (compilation)	$ 30.00
Volumes 5 - 7 (compilation)	$ 15.00
Volumes 8 - 15	$ 20.00/vol.

Single back issues are also available at cost.

The SCAMIT newsletter is published every two months and is distributed freely through the web site at www.scamit.org. Membership is $15 for the electronic copy available via the web site and $30 to receive a printed copy via USPS. Institutional membership, which includes a mailed printed copy, is $60. All new members receive a printed copy of the most current edition of "A Taxonomic Listing of Soft Bottom Macro- and Megainvertebrates … in the Southern California Bight." The current edition, the fourth, contains 2,067 species with partial synonyms. All correspondences can be sent to the Secretary at the email address above or to:

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Source	# pairs of notopodia (gross diff)	Segment with 1st notosetae (2 or 3)	1st setiger with uncini (range)	Dorsum (smooth or rugose)	Number & form of ventral pads	Form of notosetae (plumose, hirsute)	Form of uncini and range of dentition	Thoracic parapodial lobes (presence pre- & postsetal lobes, length)	Frontal view uncini dentition	# of nephridia	Methyl green staining patterns
Hutchings & Glasby 1986	**yes ***	***not listed among most important diagnostic characters but useful***	**yes ****	**yes**	**yes**	**yes**	**yes**	***highly variable, not reliable***	***not used, highly variable***	***Use with caution, size and maturity dependent***	***not mentioned***
Banse, 1980	**yes**		***no***	***no***	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	***not mentioned***
Lovell 1995 (Puget Sound handout)	**yes**		**yes**	**yes**	**yes**	**yes**	***no***	**yes**	***no***	***no***	**yes**
Barwick 2003 (SCAMIT handout)	**yes**		**yes**	**yes**	**yes**	**yes**	**yes**	***no***	***no***	***no***	***no***
Parker - key derived from Barwick's table	**yes**		**yes**	**yes**	**yes**	**yes**	***no***	***no***	***no***	***no***	***no***
Harris 2006 (SCAMIT meeting talk)	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**	**not used, other characters preferred**	***no***	**not used, other characters preferred**	**yes**	**yes**

* "the absolute # of pairs tends to decrease with increasing body size"
** "absolute # of uncini per row tends to increase with body size"

Amphitrite robusta Johnson 1901 070212RCR

City of San Diego Regional 2121 8/17/2006 84m. Large, entire specimen in RCRpersColl
City of San Diego Trawl SD8 2/9/2007 99 m. Single large (7 mm max. width) specimen imaged live in RCRpersColl

SCAMIT recognizes the synonymy of *Neoamphitrite* with *Amphitrite* by Hutchings & Glasby 1988. That synonymy is also cited in Table 4 page 494 of Hutchings 1997, The Terebellidae from the Wallabi Group.

Harris, in a preliminary description of Neoamphitrite sp SFA 2K (personal email comm. to D. Norris and R. Rowe), noted that she was going to place her San Francisco Bay provisional species in *Terebella* (because of its 41-43 setigers), but that Glasby (pers. comm. to Harris) felt that the presence of lateral lappets were far more significant at the generic level than the setiger count.

Should the Harris provisional species from San Francisco Bay and locally reported species Amphitritnae sp. SD1 of Barwick 1999 (note that the subfamily name is misspelled on that voucher sheet, and that the period after "sp" violates SCAMIT naming conventions) be considered species of *Amphitrite* sensu stricto? The Harris and Barwick provisionals might be synonymous.

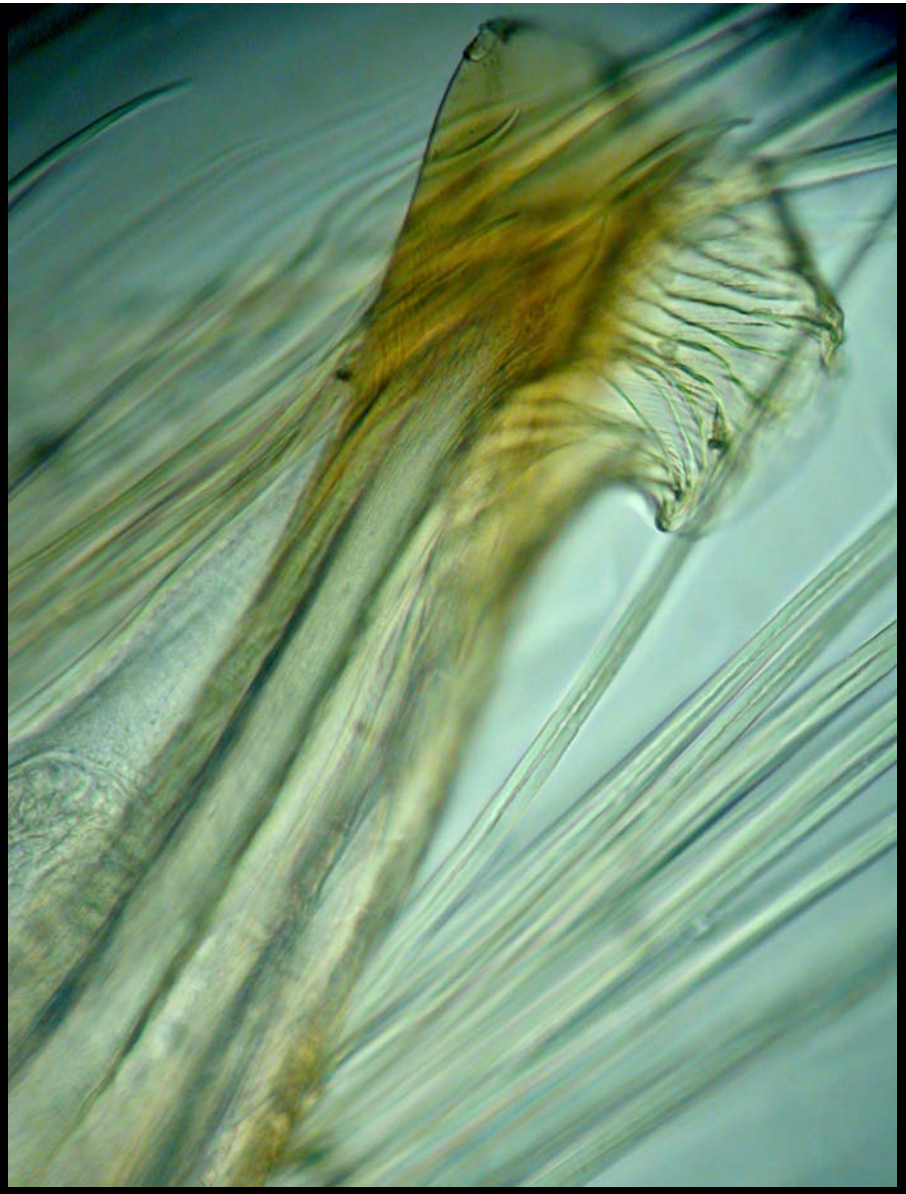
Amphitrite robusta can be keyed in Hartman '69 Atlas and Hobson and Banse 1981 (as Neoamphitrite)

- Three pairs of branching branchiae
- 17 notosetigers
- Notosetae distally dentate (look in posterior thoracic setigers)
- Uncini begin on second notosetiger, all are short handled, and all are avicular
- Last branchiae on first setiger
- Six setigers with single row of uncini followed by ten with double rows
- The last midventral pad is reduced in size and is followed by the last six thoracic setigers that lack midventral pads
- A thick, low lappet is present laterally below the first branchia and an additional shorter lappet is present on the following segment
- Eyespots absent
- Some very small speckles of methyl green stain on the dorsum with darkest stain on the midventral pads

Male P. occidentalis Male Pinnixa sp.

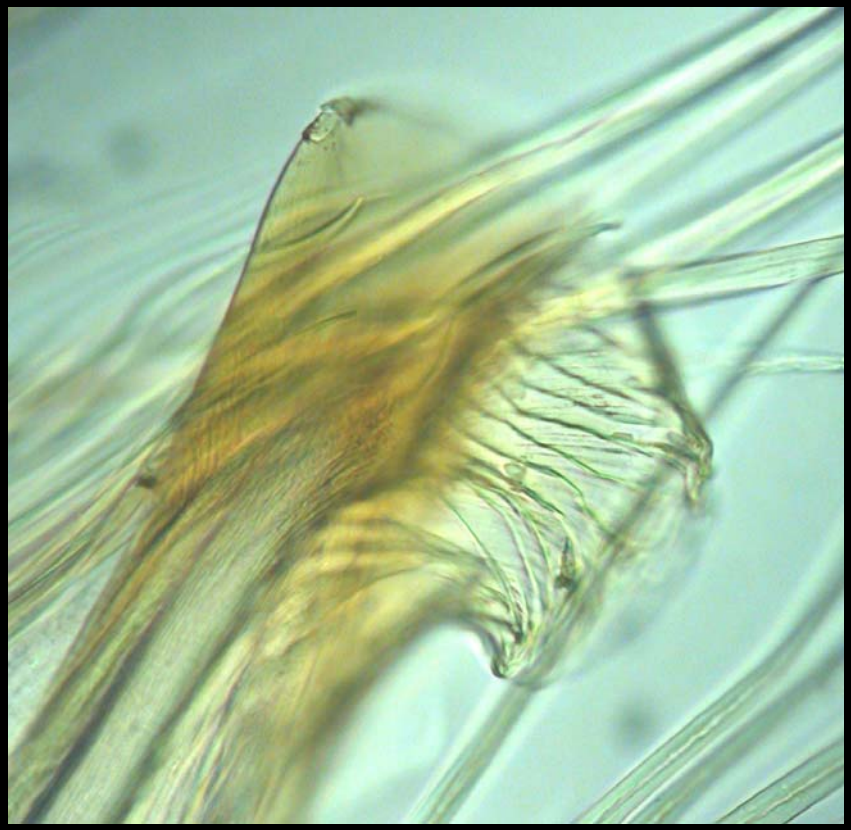
Male P. occidentalis

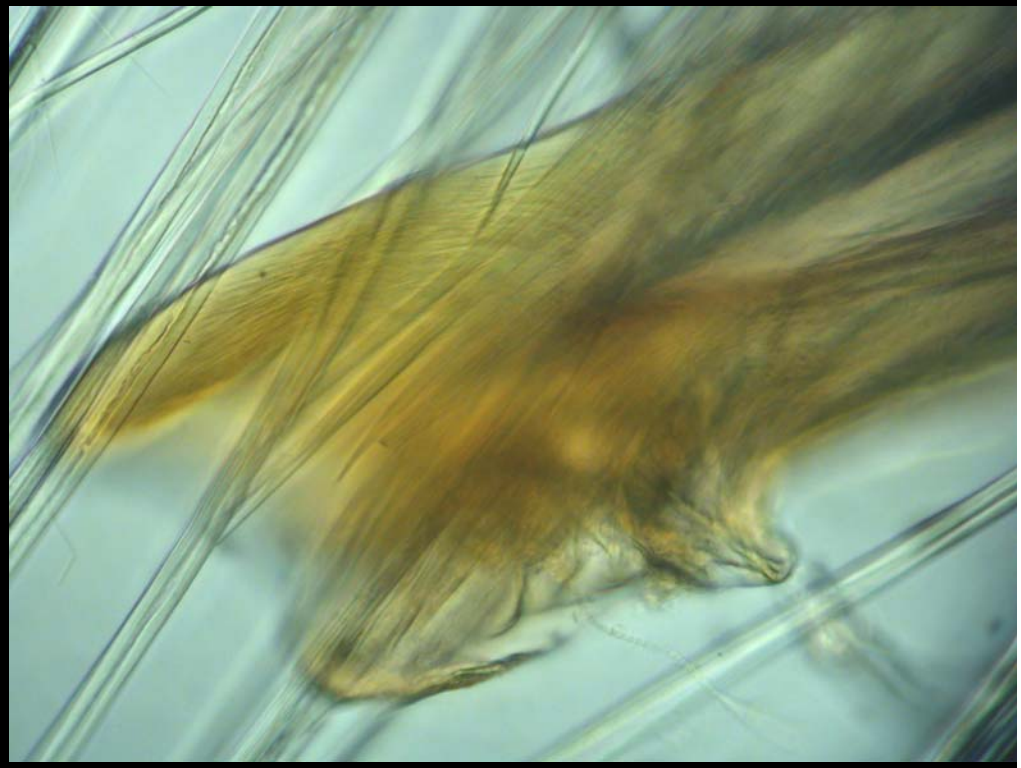
Male Pinnixa sp.



Male P. occidentalis

Male Pinnixa sp.

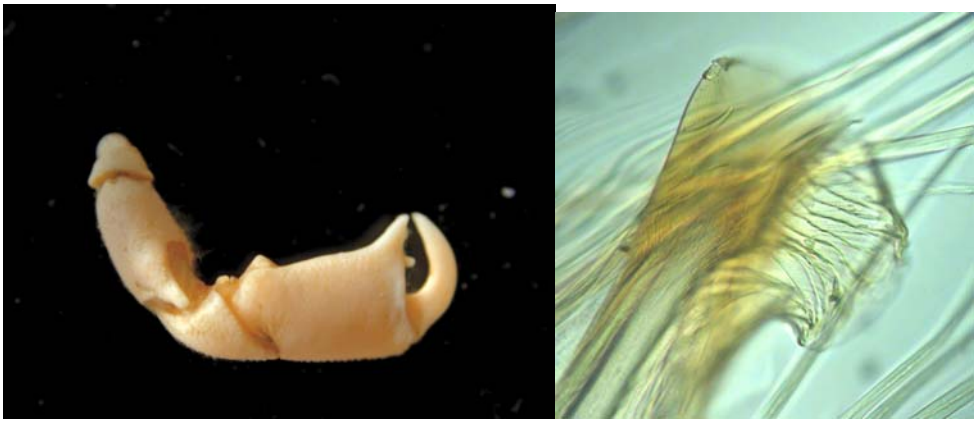




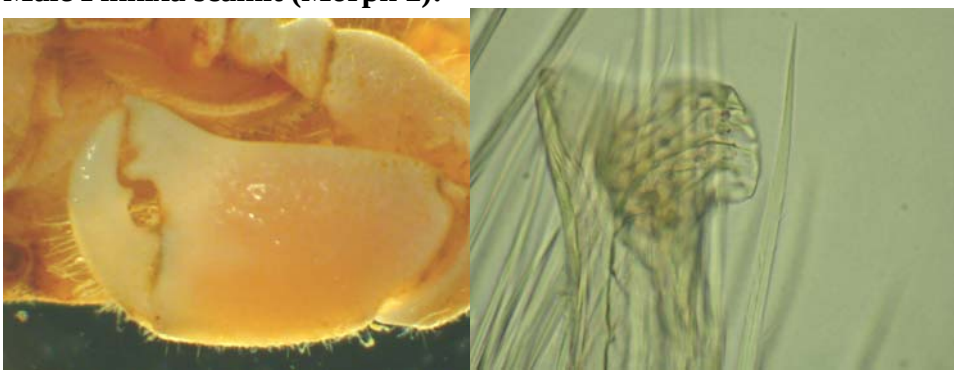
Male P. occidentalis Male Pinnixa sp.

Documented Morphologies within the Pinnixa occidentalis CMPLX

Typical Male Pinnixa occidentalis (Morph 1):



Male Pinnixa scamit (Morph 2):



Male Pinnixa sp. (Morph 3):