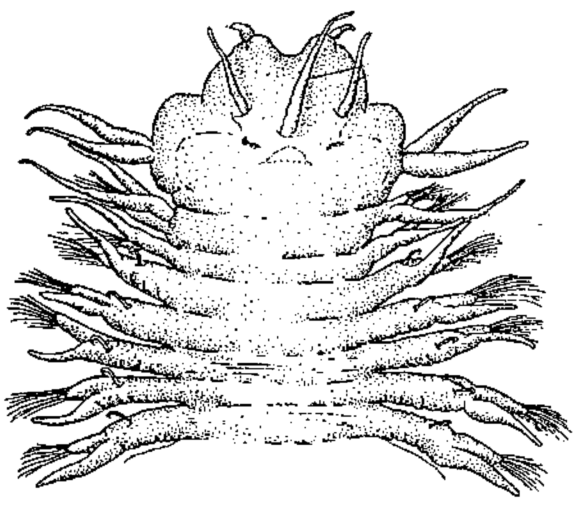
February, 1996 SCAMIT Newsletter Vol. 14, No.10

NEXT MEETING:	Pilargidae
GUEST SPEAKER:	Leslie Harris
DATE:	March 11, 1996
TIME:	9:30am - 3:30pm
LOCATION:	Worm Lab Natural History Museum of Los Angeles 900 Exposition Blvd, Los Angeles



Sigambra tentaculata
(from Blake 1994)

MARCH 11 MEETING

The March meeting will be on the polychaete family Pilargidae. It will be held at the Worm Lab of the Natural History Museum. Leslie Harris will be reviewing local species of this family. We will also discuss the recent state of *Pilargis berkeleyae* vs. *Pilargis maculata*. In the Pilargidae chapter of volume 4 of the MMS Atlas Blake reinstates *Pilargis maculata* and distinguishes it from *Pilargis berkeleyae* based on parapodial differences and body papillation. Previously Pettibone (1966) had synonymized the two species. Members

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should probably bring their specimens of *Pilargis berkeleyae* to the meeting for review and any other problem specimens. We will also spend some time discussing the most recently published polychaete volume (no. 5) of the MMS Atlas, particularly the chapter on Syllidae. Any problem syllids or species not treated in the chapter are also welcome.

REQUESTS FOR SPECIMENS

Cynthia Stonick at the Department of Ecology in Washington State is requesting that specimens of *Syllis (Typosyllis) alternata* be sent to her at:

Washington State Dept. of Ecology EILS
P.O. Box 47710
Olympia, Washington 98504-7710
Phone: (360) 497-6992
Fax: (360) 407-6884

Cynthia believes that our local *Syllis (Typosyllis) alternata* may not be the same as their local species up north. She would like some southern specimens to use for comparison.

Recent collections from off San Diego have increased the number of known but undescribed bodotriid cumaceans in the temperate eastern Pacific to 12, nine of which are in the genus *Cyclaspis*. There is very little material for over half of these species, including six of the nine *Cyclaspis*. Any unusual or atypical specimens of *Cyclaspis nubila*, *Vaunthomsonia* spp., or the provisionals *Cyclaspis* sp A, B, and C of SCAMIT would be welcomed for examination and return by Don Cadien. He can be contacted at the telephone and e-mail addresses listed on the back page of this issue or at;

Marine Biology Laboratory, JWPCP
24501 S. Figueroa St., Carson
California, 90745

Dr. Danny Eibye-Jacobsen will be visiting the area in May, and will be happy to review the polychaete genus *Eumida* with SCAMIT members. In support of this please send examples of your encountered *Eumida* spp. to Leslie Harris at NHMLAC for forwarding to Danny (or bring them to the March meeting at the museum). This will give him time to examine the material and formulate his opinions prior to meeting with us in May.

NEW LITERATURE

A noteworthy volume on the world genera of caridean shrimp has recently been received locally, although it has been out for a while. This work (Holthuis 1993) is a revised version of the author's 1955 paper dealing with the shrimp fauna worldwide. Keys are provided to infraorders, superfamilies, families and subfamilies, and to genera within each family. The nomenclatural history of each genus is provided, the type listed and illustrated (usually with a whole body illustration), but not diagnosed. The book is available from the Nationaal Natuurhistorisch Museum, Leiden, The Netherlands. This volume serves as a monument to the authors encyclopedic knowledge of this group and its literature.

The local shrimp species *Heptacarpus pictus* has recently been synonymized with a species previously thought to occur only further to the north, *Heptacarpus sitchensis* (Wicksten et al 1996). The presence or absence of an epipod on the second leg of these shrimp was shown to be a variable character, calling into question use of epipod occurrence or lack as a criterion variable for any hippolytid shrimps. Stay tuned!

There has recently been a spate of new papers dealing with the cladistic reexamination of the phylogeny of arthropods and other related phyla, in many cases arguing the value and meaning of molecular evidence (Boore et al 1995, Friedrich & Tautz 1995, Wagele 1995, and Wagele & Stanjek 1995 inter alia).

A new entry to this discussion is focussed on the annelids, but includes arthropods and other related groups (Rouse & Fauchald 1995). They conclude that the concept of "annelida" should be dropped. The scleractinian corals were also examined in a recent paper (Romano & Palumbi 1996) which found a difference between phylogenies based on morphological and molecular evidence. Interested parties will find all the above articles pertinent, if occasionally not easy reading.

ELECTION

We remind the members that their ballots on the 1996-97 slate of officers are due at the March meeting, or should be mailed to the secretary prior to that time. A number have been received so far, but we need to hear from the rest of you (hopefully with votes for write-in candidates).

CRUSTACEAN MEETING

The 1996 Summer Meeting of the Crustacean Society will be held between 14-18 July on the campus of the University of San Diego. Interested parties are urged to attend. Although the preregistration period will have passed by the time you receive your Newsletter, the meeting announcement and registration information is attached.

Olea RETAKEN

The small sacoglossan opisthobranch *Olea hansineensis* was taken off Palos Verdes during August 1995 CSDLAC benthic sampling. A single tiny individual was recovered from 30m depth on the north side of the Palos Verdes Peninsula. This animal, the sole species in the family Oleidae, is an egg predator on other opisthobranchs. It uses its sharp radular teeth to puncture the eggs, then sucks out the contents with muscular contractions of its buccal pump. This procedure is directly analogous to the suctorial feeding method used by other sacoglossans on algal cells. The species has been reported from our area on at least one previous occasion. It was found and collected in the field by divers (Ron McPeak and Dave Mulliner) during a dive at San Clemente Island; an amazing feat of *in situ* detection of an animal just a few millimeters long. Their collection forms the basis of the southern range information in Behrens (1991). All other records are from much further north. In the present collection there was no apparent egg substrate left in the picked sample. Those who encounter large opisthobranch egg masses in grabs or trawls should examine them for the presence of this animal. Specimens will generally be rendered cryptic by the coloring of the eggs already consumed, but close examination should reveal them.

MINUTES OF FEBRUARY 12 MEETING

The meeting opened with a discussion of the lumbrinerid chapter of volume 5 of the MMS Atlas. A few errors were noted.

On page 280 Hilbig states in the Taxonomic History section that the genus *Eranno* was synonymized with *Lumbrineris* by Hartman in her 1949 publication and this actually occurred in 1944. On page 282 the #3 footnote referred to in line 5A should be *Lumbrinerides platypygos* Fauchald 1970 not *Lumbrineris acutus*. On page 284 in the list of species there should be no parentheses around Moore, 1911 for *Lumbrineris index* and no parentheses around Audouin & Milne-Edwards, 1834 for *Lumbrineris latreilli*. On page 309, *Scoletoma tetraura* (Schmarda. 1861) should be listed as a new combination.

Larry Lovell began his discussion of lumbrinerids by giving us an update on what has recently occurred in the literature with our local species. There are basically three widely accepted genera that our local lumbrinerid species fall into. They are *Eranno*, *Lumbrineris*, and *Ninoe*. The genus *Scoletoma* has not yet been accepted by SCAMIT members, pending further investigation.

Eranno and *Scoletoma* are older names that have been recently resurrected. The genus, *Eranno* was erected in 1865 by Kinberg and later synonymized with *Lumbrineris* by Hartman (1944). Orensanz (1990) resurrected the genus with a different set of diagnostic characters. The genus *Scoletoma* was erected in 1828 by Blainville and was later synonymized with *Lumbrineris* by Audouin and Milne-Edwards (1833). Frame (1992) then resurrected the genus to its current status.

Traditionally, SCAMIT members have seldom used the jaw structure of lumbrinerids for identification purposes. We have relied mainly on the type of hooded hooks, color of the acicula, and the shape of the parapodial lobes. The presence or absence, along with the shape and denticulations, of the maxillae should now be taken into consideration during identification processes.

To examine the jaw structure of a lumbrinerid the tissue around the structure may be cleared using methyl salicylate (oil of wintergreen) and standard clearing techniques whereby the animal is first dehydrated in absolute or 95% alcohol. Using this technique, however, does not allow for easy manipulation so the teeth below may be viewed. Sometimes it is best to view the jaw structure by carefully making a slit dorsally with a very small scalpel and pulling back the tissue. Not only does this allow for better manipulation so that the teeth of the maxillae may be counted and viewed from different angles, but then the jaw structure is left intact with the worm for future reference.

While the maxillary formula (the number of denticulations per maxillae) is not a generic character, it may be used to assist in species identification. However, it should be used carefully since the teeth are inconsistent in juveniles and may be broken or worn in adults. Also, the maxillae V character is poorly understood for some species.

The color of the acicula in lumbrinerids is still considered an important characteristic in their identification. At the meeting several questions were raised as to what exactly is meant by the terms "yellow" and "black" or "dark". To tell the color of the acicula one should try to view the median or posterior parapodia of the lumbrinerid from the side. If the color is dark brown or black and definitely darker than the setae they should be considered "black" or "dark". If the color is clear or yellow or as light as the color of the setae then they should be considered "yellow". One should examine the whole length of the worm before determining the color of the acicula. Do not base your decision on examining only a few acicula posteriorly, but try to notice if there is any change in the color of the acicula along the length of the worm.

Another problem in the identification of lumbrinerids is broken setae. Without the presence of anterior hooded hooks the identification process can only be taken to family level. Often these setae get broken during field sampling or in the lab while sorting.

Care needs to be taken when processing benthic infaunal samples to be sure that lumbrinerids arrive at the taxonomist's microscope in the best possible condition. This may be achieved by using a relaxant like magnesium sulfate when fixing the samples with formalin, so the worms are not as stressed and don't fragment as much. Also, water pressure needs to be taken into consideration when rinsing the samples, as this too is hard on the animals and may break setae easily. The scraping of the sediment against the screen mesh while transferring to a container should also be kept to a minimum. Perhaps a float table could be used in the field and/or lab to process the samples, whereby the organisms are allowed to separate from the heavier sediment rather than being subjected to water pressure to force the excess sediment thru the screen. All these techniques should be incorporated into the benthic infaunal sampling process for the best possible condition of all the organisms and have been discussed at previous meetings.

Often times lumbrinerids have their setae intact, but are fragmented with anterior and posterior ends. Larry cautioned members at the meeting that they should not try to put the pieces back together again (all the king's men couldn't do it with Humpty Dumpty). Unless it is obvious that a particular posterior end must be that of an anterior end because either it was the only one or only large or small one in the sample, this process should not be used to further the identification level. Larry also informed members that they should be able to identify a lumbrinerid to species level with only 20 - 30 anterior setigers of a **well preserved** specimen. With that many setigers one should be able to determine what the parapodial lobes would look like posteriorly if they were present.

Larry spent the rest of the morning going over the main characteristics of the genera that occur locally. The genus *Eranno* has differential characters that include simple hooded hooks, maxillae II that is only half as long as maxillae I, and a maxillae V that is present and either partially fused to maxillae IV or free. There are two species of *Eranno* that occur locally. They are *Eranno lagunae* and *Eranno bicirrata*. Hilbig (1995) transferred *Lumbrineris bicirrata* to the genus *Eranno* because it fit Orensanz' (1990) emended generic description with the presence of all simple capillaries and hooded hooks. The main difference between *Eranno lagunae* and *Eranno bicirrata* is that *Eranno bicirrata* has black acicula as opposed to *E. lagunae*, which has yellow acicula.

The main differential characteristic of the genus *Ninoe* is the presence of branchial lobes. There are approximately 2 - 15 digitiform lobes that arise from the postsetal parapodial lobe. Larry commented that species differentiation should not be based on the number of branchial lobes alone, since this is a developmental character. It should be noted that our common *Ninoe sp. A* of Harris has been described in volume 5 of the MMS Atlas as *Ninoe tridentata*.

The genus *Scoletoma* is distinguished by having simple capillaries and hooded hooks and a maxillae V that, if present, is free standing. Hilbig (1995) seems to have transferred *Lumbrineris tetraura* to the genus *Scoletoma* even though she does not state this as a new combination. While Frame (1992) resurrected the genus *Scoletoma* she did not include *L. tetraura*. In the second edition of SCAMIT's Taxa List *Lumbrineris "tetraura"* has not changed. SCAMIT members have decided not to accept this change yet. In Hilbig's key (1995) the length of M II compared with M I is a stronger diagnostic character separating the genera *Scoletoma* and *Eranno* then that of M V being free standing or partially fused to M IV. This is because MV is often very difficult to see because of its small size and placement within the jaw apparatus. The species name "tetraura" is in quotes in the Taxa List because it is believed to be a complex of species, one of which is a provisional of Leslie Harris, *Lumbrineris sp. A*. A brief description of Leslie's three provisional lumbrinerid species is included as a handout with this newsletter. Anyone with specimens fitting these descriptions should probably pass them on to Leslie for further examination.

Most of our local lumbrinerid species belong to the genus *Lumbrineris*. They fall into Groups I and II of the old SCAMIT group designations. Group I includes those species with compound hooks and yellow acicula. They are *L. cruzensis*, *L. latreilli*, *L. inflata*, and *L. limicola*. Group II includes those species with compound hooks and black acicula. They are *L. californiensis*, *L. japonica*, *L. index*, and *L. pallida*. The shape of the parapodial lobes is a main distinguishing characteristic in both these groups. Included with this newsletter are some rough drawings that Larry did at the meeting of the posterior parapodial lobes of the common species of Group I and II. Amongst the Group II species *L. japonica* and *L. index* are very similar. However, while both *L. japonica* and *L. index* have elongated postsetal lobes, *L. japonica* has short postsetal lobes that remain about the same length throughout the body of the worm. The postsetal lobes of *L. index* are similar to *L. japonica* anteriorly, but posteriorly are much longer and digitiform. A problem arises if only the anterior end of either of these two species is all that is available for identification. During the afternoon session of the meeting we examined specimens of both these species and determined that anteriorly they were very similar. We also noticed that the blade length of the anterior compound hooks was relatively long in both species. Yet, another similarity that does not help to distinguish between anterior ends of these two species.

Within Group I species *L. latreilli* and *L. limicol*a seem to be the two most easily confused anteriorly. The difference seems to be with the denticulations of M III. *L. latreilli* has 2 teeth and *L. limicola* only 1 true tooth. Sometimes a slight boss is evident on the cutting edge of M III for *L. limicola* and because of this the teeth are not easily counted. The postsetal lobes of L. latreilli are short and rounded, whereas L. limicola has postsetal lobes that are long and tapering. We examined both of these species at the meeting and found this to be true. Hilbig (1995) suggests that only specimens with distinct bidentate M III be referred to *L. latreilli* and those with unidentate or indistinctly bidentate M III be identified as *L. limicola*.

Included with the newsletter is a key to lumbrinerid genera based on Frame (1992). With the publication of Hilbig's key (1995) this will probably not be very useful, but it has been included here since many members already had this rather simplified key in its handwritten, unrevised form unbeknownst to the author.

NAMIT Microcrustacean Meeting
By Dean Pasko

The Northern Association of Marine Invertebrate Taxonomists (NAMIT) held a microcrustacean workshop on January 25 and 26 at the University of Washington, Friday Harbor Laboratories. The meeting was hosted by Drs. Craig Staude and Jeff Cordell of the U. of W., who covered amphipods and copepods, respectively, and included Dr. Les Watling who discussed cumaceans (workshop schedule and handouts are attached.)

Our first day began with a stormy (snowy) drive and ferry ride across the Seattle area to Friday Harbor, San Juan Island. It was an unexpected pleasure to see some of the taller "hills" of the San Juan Islands covered in snow. Once we arrived however, we jumped into an entertaining *Introduction to the Amphipoda* by Craig, complete with Craig's Amazing Amphipod Cootie™ Game and real time video of live specimens. Craig tailored his lecture to the wide range of experience in the audience, from the novice taxonomist to seasoned systematist. He explained the terminology and morphology used with the Amphipoda and how to differentiate the major suborders. He described his methodology of specimen dissection and preparation of "permanent" slides. Craig prefers using a mixture of 50% glycerin in distilled water as a mounting medium. Before adding the coverslip, Craig adds a small drop of glycerin to the underside of the coverslip to prevent the formation of air bubbles. Finally he seals the edges of the coverslip with a layer of lacto-phenol. Others in the audience use nail polish, or, for the more well funded members of the group, Permamount™. Craig continued with a review of the common Gammaridea found in the area using his key in E.N. Kozloff's *Marine Invertebrates of the Pacific Northwest* as a guide. Finally, Craig handed out a revised list of the Gammaridea which includes the many new species introduced into the literature via Amphipacifica.

After a delicious dinner break at the newly opened San Juan Brewery, Jeff Cordell provided an informative and interesting lecture on the history of copepodology and copepod systematics. Jeff, a fisheries biologist with the University of Washington's School of Fisheries, described his introduction to the copepods. His interest developed when, in the course of studying the diet of salmon, he came to the understanding that harpactacoid copepods are approximately 75% of out-spawning Chum and Pink Salmon diet. This led to the (unenviable?) task of understanding copepod systematics. Jeff continued with his wonderful description of the history of copepod systematics. He discussed several excellent references for students of copepodology, the most recent and most complete of which is Huys and Boxshall (1991). He gave an excellent explanation of copepod anatomy and morphology and an overview of the major suborders.

The second day began with Les Watling's discussion of the cumacea. He opened by announcing that he has a PEET Fellowship available for a PhD candidate interested in (ideally) combining crustacean (cumacean) systematics with techniques in molecular biology. Additionally, he has nearly completed his database of the world Cumacea. It is available as an Excel file by request, and will soon be available on the world wide web via the Darling Marine laboratories Website. He also noted that 75% of all cumaceans have been seen only once! Les then provided a terrific lecture about cumacean anatomy and morphology, and the relationship of specific structures to cumacean systematics. He completed his lecture with an interesting discussion on the phylogeny of the peracarids, which led to a creative discussion of the monophyletic vs polyphyletic origin of the group. He announced that there will be a one week course (series of seminars) on the peracarids at the Darling Marine Laboratory, University of Maine, following this summer's Crustacean Society Meetings. Those interested in attending should contact Dr. Watling.

These interesting seminars were followed by a short summary of the City of San Diego's Benthic Taxonomy Training Program and their Benthic Infauna Identification Training Manual. The fourth edition of the identification manual includes 7 volumes, with one copy each donated to NAMIT and the State of Washington Department of Ecology Laboratory (a copy of the manual will soon be made available through SCAMIT). Following the morning seminars, NAMIT held a workshop to discuss problem specimens.

Amphipod notes

The amphipod portion of the workshop was run by Craig Staude. It centered around two specimens from southern California: *Aoroides* sp A (see accompanying voucher sheet) and *Photis brevipes*. *Aoroides* sp A was compared to *Aoroides columbiae* and examined for the various characters listed in Table 1 (see voucher sheet). Craig had not seen this species before. Additionally, we briefly discussed the problem between *Photis brevipes* of southern California and the description of northern Pacific specimens discussed in Conlan and Bousfield (1983) (please refer to the extensive discussion of *Photis* in the SCAMIT newsletter Vol.13, No.12, p. 6).

Ampelisca agassizi* vs. *Ampelisca romigi

Specimens of *Ampelisca agassizi* and *A. romigi* from San Diego were also examined and compared to the descriptions and key in the recent MMS volume on the Amphipoda (Watling, 1995). Several problems or discrepancies were encountered. (1) San Diego *A. romigi* were identified based primarily on the distinct uncinate inner ramus of uropod 3 (see Barnard, 1954); this character is not figured or described for the MMS *A. romigi*. (2) The relative length of antennae 1 used to distinguish these species in the MMS key and text (e.g., "short" in *A. agassizi* vs. "long" in *A. romigi*) was found to be unreliable. Both species from the San Diego area had "short" antennae 1 (i.e., A1 < A2 peduncle). (3) According to the MMS, the dorsal carina of urosomite 1 is highest in mid-segment in *A. agassizi* and highest posteriorly in *A. romigi*. The carina appears highest posteriorly in both species from San Diego. (4) The presence/absence of a notch on the distal anterior margin of article 5 of pereopod 7 is also used to differentiate these species in the MMS volume. This character may prove to be the most useful diagnostic feature. *A. romigi* appears to have a distinct "step-like" notch, similar to that seen in *A. pugetica*. No such "step-like" notch appears to occur in *A. agassizi*, although there may be a small setal insertion dimple at this location. One last note. Les Watling was surprised at the relative large size of the southern California *A. agassizi* compared to the common specimens he sees in Maine. He is sending some Atlantic specimens to compare with our critters.

Cumacean Notes

The cumacean portion of the workshop focused on a number of specimens from the Puget Sound area plus a couple of specimens from San Diego. Although none of the northern specimens appeared new, several (e.g., *Diastylis santamariensis* Watling & McCann, n. Sp.) represented range extensions for newly described species in the forthcoming MMS volume. *Diastylis paraspinulosa* was also verified and appeared to be quite common for this region. More information on the northern cumacean specimens may appear in a future NAMIT newsletter.

Between the Friday Harbor workshop and a follow-up the next week at the NHMLAC, Les examined specimens and verified San Diego records for a number of species, including several of the new MMS species. These included: the leuconid *Leucon* sp A (= *L. falcicosta* Watling & McCann n. sp.); the nannastacids *Campylaspis hartae, Campylaspis rubromaculata, Campylaspis* sp E (= *C. blakei* Watling & McCann n. sp.), *Cumella* sp A (= *C. californica* Watling & McCann n. sp.), and *Procampylaspis* sp A (= *P. caenosa* Watling & McCann n. sp.); the lampropid *Lamprops quadriplicata;* and the diastylid *Leptostylis villosa* (= *L. abditis* Watling & McCann n. sp.). On the other hand, problems arose when examining specimens of *Leptostylis* sp A from San Diego. Although we assumed these would be the new MMS species, *Leptostylis calva* Watling & McCann n. sp., Les concluded that they were in fact a distinct species, differing in the armature of the uropods and other features. Thus, the *Leptostylis* sp A in southern California may actually represent a species complex bearing further examination. Les also pointed out an additional change to earlier drafts of his MMS volume regarding the Dyastylidae. Briefly, what we call *Diastylis* sp A and *Leptostylis* sp E have been synonymized as *Diastylis crenellata* Watling & McCann n. sp. (*L.* Sp E is a juvenile of *D.* sp A).
We also took a look at *Diastylis* sp SD 1 from San Diego. Les agreed that this appeared to be a new species, although he said little could be done with it because it was a terminal molt male. Thus, it is likely that many of the diagnostic features of the species (i.e., females and subadult males) have been lost. No voucher sheet is yet available for this species. However, it can be characterized by the following traits: (1) row of large glassine spines along the lateral margins of the dorsal-ventrally compressed carapace and thoracic somites; (2) ventral margin of thoracic somite 1 obscured by anterior extension of thoracic somite 2; (3) abdominal somites spinous (e.g., various dorsal-medial, dorsal-lateral, and ventral-posterior spines; and (4) telson longer than peduncle of uropods, approximately 2.5x length of abdominal somite 6.

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SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers.

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Back issues of the newsletter are available. Prices are as follows:

Volumes 1 - 4 (compilation)................................$ 30.00
Volumes 5 - 7 (compilation)................................$ 15.00
Volumes 8 - 13 ....$ 20.00/vol.

Single back issues are also available at cost.

THE CRUSTACEAN SOCIETY

1996 Summer Meeting*

(Open to anyone interested in Crustacea)

14-18 July 1996

UNIVERSITY OF SAN DIEGO
SAN DIEGO, CALIFORNIA

* See Tim Stebbins for details

ANNOUNCING
THE CRUSTACEAN SOCIETY SUMMER MEETINGS AND
THE THIRD INTERNATIONAL LARGE BRANCHIOPOD SYMPOSIUM

The TCS Summer Meetings and the Third International Large Branchiopod Symposium (ILBS3) will be held jointly at the University of San Diego, San Diego, California USA. July 14-18, 1996. Meeting rooms will be in the University Union and are equipped for the usual audio-visual needs as well as video and computer-aided platforms. The ILBS3 proceedings will be published in a special volume of Hydrobiologia. Participants will be able to reserve a copy at the meetings. Michel Boudrias will also be organizing a Peracarid Symposium within the TCS meeting schedule.

USD is a beautiful campus overlooking the bay, just fifteen minutes from San Diego International Airport. Shuttles are available 24 hours a day for under $20. Housing will be on campus in 2 room/2 bath apartments and will include most meals and access to the swimming pool, tennis courts and weight room. Activities scheduled include a complimentary welcome to California Reception and micro-brew taster, a Volleyball Tournament followed by a California Bar-B-Que (get your teams organized), a Mixer at the Steven Birch Aquarium by the Pacific Ocean (with live Jazz) and field trips to tide pools and Scripps Institution of Oceanography. Activities will be liberally dispersed between talk and poster sessions to maximize fun. Please note the early due date for registration and housing to reserve space.

San Diego is located on the Pacific Coast just 20 minutes from the Mexican border. Participants may come in one day early to play and get your Saturday stay-over airfares. Local activities and amusements (within a half hour drive) include shopping in Mexico, the San Diego Zoo and Wild Animal Park, Sea World, surfing, sunning, parasailing, sailing, golf, hiking and other "Outdoor Lifestyle" offerings. For those who enjoy the night-life, the area is a treasure trove of international cuisine and musical entertainment on both sides of the border.

We encourage you to stay on campus. You won't need a car and a double room in this area is $80-120 per night. Plus, we have a reputation for good food.

Please leave room for your slides or poster between the sports gear in your suitcase.

International ILBS student participants! We have travel awards available for international students and recent Ph.D's who will be presenting in the symposium. These will be awarded on the basis of need. If you need support, please submit a one page letter along with your abstract describing your research, where you are in your education, how much you need and why. Include a letter of support from your major professor/advisor. You will be notified as soon as we can process the requests.

TCS and ILBS3 1996 Summer Meeting
July 14-18, 1996

Abstract Transmittal Form

Please complete (typewritten in English) and return by March 1, 1996 to: TCS/ILBS3, c/o Marie A. Simovich, Biology Department, University of San Diego, San Diego, California 92110 USA. Acknowledgment of abstract will be sent by post card or e-mail. **Please note: Due date for registration and housing is March 1.**

Author(s), last name first: ____

____

Institution of first author: ____

Address of first author: ____

____

____

Phone: ______________________ Fax: ______________________

e-mail: ____

Paper to be presented orally ________ or as a poster ________ (check one).

To be part of: ILBS3 ________ TCS ________ regular, TSC Peracarid ____________

Eligible for TCS best student paper award __________ A/V Needs: ______________

Abstract: Please use clear type no smaller than 12 pitch or 10 point. Please submit your abstract on a separate page using the box as a size guide. The entire abstract must fit within a 4" x 5" box. Follow the format shown below. For an oral presentation, please indicate the speaker with an asterix (*).

Cumberlidge, Neil. Department of Biology, Northern Michigan University, Marquette, Michigan. 49855, USA. FRESHWATER CRABS AND HUMAN LUNG DISEASE IN AFRICA.

Fresh-water crabs are involved in the transmission of human lung fluke disease (paragonimiasis) in West and Central Africa. Species of fresh-water crab..................

TCS 1996 Summer Meeting and ILBS3
Preregistration Form

Deadline for preregistration is March 1, 1996

Name to appear on your badge: ____________________

Names to appear on badges for spouse/children: ____________________
____

Your institution and mailing address: ____________________
____
____

Work phone: ____________________ Home phone: ____________________
Fax: ____________________ e-mail: ____________________

Registration: You must register in one of the following categories to attend talks.
*If you are not a TCS member, an ILBS3 presenter, or a student, you must pay this fee.

Number	Item	Total US $
______	TCS Member Registration @ $100	______
______	*Non-Member TCS Registration @ $150	______
______	ILBS3 Registration (presenters only) @ $100	______
______	Student Registration TCS or ILBS3 @ $80	______
______	Late Registration add @ $25	______

Activities: Open to registrants and families

______	Welcome Reception, Sunday Evening	Free
______	Tide Pool Trip	Free
______	Scripps Tour, Mixer and Stephen Birch Aquarium Trip, including transportation @ $20	______
______	Bar-B-Que, Thursday Evening @ $20	______
	Total Enclosed	______

Details will accompany your registration confirmation.

Make check payable (in US $) to TCS or ILBS3 as applicable.
Please mail form and payment to:

TCS/ILBS3
Marie A. Simovich
Biology Department
University of San Diego
San Diego, CA 92110 USA

Phone: (619) 260-4729
Fax: (619) 260-6804

Lovell 12 Feb 96

Members of the family Lumbrineridae listed in "A Taxonomic Listing of Soft Bottom Macroinvertebrates" 4 March 1994. (1st edition)

Eranno lagunae	(Fauchald 1970)
Lumbrinerides platypygos	(Fauchald 1970)
Lumbrineris bassi	Hartman 1944
L. bicirrata	Treadwell 1929 $\xrightarrow[\text{new combination}]{\text{Hilbig 1995}}$ Eranno bicirrata
L. californiensis	Hartman 1944
L. cruzensis	Hartman 1944
L. erecta	(Moore 1904)
L. index	Moore 1911
L. inflata	Moore 1911
L. japonica	(Marenzeller 1879)
L. latreilli	Audouin & Milne-Edwards 1834
L. limicola	Hartman 1944
L. minima	Hartman 1944
L. pallida	Hartman 1944
L. "tetraura"	
L. zonata	(Johnson, 1901)
L. sp. B	Harris 1984
Ninoe sp. A	Harris 1985 $\xrightarrow[\text{new species}]{\text{Hilbig 1995}}$ Ninoe tridentata
Paraninoe fusca	(Moore 1911)

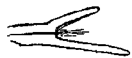
Additional taxa not listed

Lumbrineris sp. A	Harris 1984
L. sp. C	Harris

Lovell 12 Feb 96

Group I w/ composite falcigers, yellow acicula

L. cruzensis



Dorsal view

L. limicola

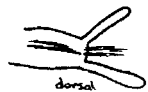
L. latreilli

Lateral view

Lovell 12 Feb 96

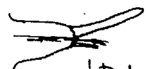
Group II - composite falcigers, black acicula (compound)

L. californiensis -



L. japonica -

L. index -



Lovell 12 Feb 96

"Lumbrineris" groupings

Group I — L. cruzensis, L. latreilli, L. inflata, L. limicola

Compound hooks
yellow acicula

Group II — L. californiensis, L. japonica, L. index, L. pallida

Compound hooks
black acicula

Group III — Eranno lagunae, Lumbrineris "tetraura", L. sp. A

Simple hooks
yellow acicula

L. sp. B, L. sp C, L. minima, L. bassi

L. erecta, L. zonata, Lumbrinerides platypygos

Group IV — (Eranno) Lumbrineris bicirrata

Simple hooks
black acicula

February 1996

Provisional *Lumbrineris* Species of L. Harris

Lumbrineris sp. A

- Simple, multidentate hooks begin on setigers 6 - 7
- Posterior postsetal lobes elongate
- Yellow acicula
- Whole worm is long and slender
- Prostomium pointed
- Some people key this to *L. tetraura* or to *L. platylobata*, based on either postsetal lobes or start of hooks
- Common in Santa Monica Bay, Goleta, Morro Bay

Lumbrineris sp. B

- Simple, multidentate hooks begin setiger 6
- Both presetal and postsetal lobes elongate in posterior
- Yellow acicula
- Pointed prostomium
- Long Beach

Lumbrineris sp. C

- Simple hooks begin setiger 1
- Both presetal and postsetal lobes elongate in posterior
- Presetal lobes longer than postsetal lobes, similar to *L. minima*
- Yellow acicula
- Rounded prostomium
- Identified by others as *L. minima*, but examination of *L. minima* holotype shows that its hooks begin on setiger 13
- Santa Monica Bay, San Diego

Key to Lumbrinerid Genera (based on Frame, 1992)

by Cheryl Brantley
Oct. 1992
(revised Feb. 1996)

1. Multidentate hooded hooks..2
   Bidentate hooded hooks..*Lumbrinerides*

2. Composite, multidentate hooded hooks..3
   Simple, multidentate hooded hooks..4

3. Composite spinigers and limbate setae..*Lumbricalus*
   Limbate setae only..*Lumbrineris*

4. With branchial filaments on postsetal lip of parapodia..5
   Without branchial filaments..6

5. Postsetal branchiae in the form of a single lobe; maxilla III amd IV with smooth cutting edges; with nuchal papilla..*Paraninoe*

   Postsetal branchiae with more than 1 filament; maxilla III and IV with cutting edges finely denticulate; without nuchal papilla..*Ninoe*

6. Partial or complete fusion of maxilla IV and V..7
   Maxilla V separate from IV..*Scoletoma*

7. With broad basal supports attached to maxilla II and long, digitate posterior postsetal lobes..*Eranno*

   Without broad basal supports attached to maxilla II..*Abyssoninoe*

* *Abyssoninoe* - Maxilla IV and V are fused with the characteristic aspect of a broad rectangular plate with tooth protruding from middle of its inferior border.

Please note: Hilbig (1995) makes comments on the genera *Abyssoninoe* and *Paraninoe* in her Lumbrinerid key, that they may be synonyms of *Scoletoma* and they are also not known from California along with the genus *Lumbricalus.*

- NAMIT MICROCRUSTACEAN WORKSHOP -
Copepods - Cumaceans - Amphipods

at Friday Harbor Laboratories on San Juan Island, WA
Thursday, January 25th, to Friday, January 26th

Schedule:

Thursday

(Ferry arrives from Sidney at 1:50pm)
3pm Introductory Remarks > Lecture Hall
3:15pm-4:45pm Amphipods - Craig Staude > Lecture Hall
(break for dinner in town)
7pm-8:30pm Copepods - Jeff Cordell > Lecture Hall

Friday

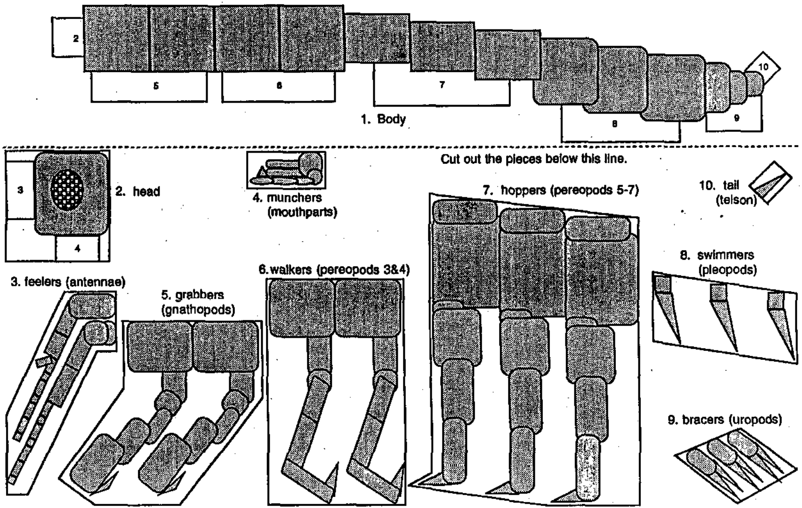
7:30am Coffee, Donuts, etc. > Lecture Hall
8am-9:30am Cumaceans - Les Watling > Lecture Hall
(Ferry leaves for Sidney at 9:50am)
10:30am-12am Open discussion/problem specimens > Lab 5
(break for lunch in town)
2pm-4pm Open discussion/problem specimens > Lab 5

Formal presentations are in the Lecture Hall. The subsequent open-discussion sessions will be held in Lab No. 5, where several microscopes are provided. (Bring your problem specimens and dissection tools.) Park at the Dining Hall near the Lecture Hall, or in the main parking lot near the entrance. BRING A FLASHLIGHT for the evening session.

Craig Staude, University of Washington, Friday Harbor Labs, 1993.

Craig's Amazing Amphipod Cootie™ Game

Roll the dice, then glue on the body part with that number. (You must add the head first. Choose any part, if you roll an 11 or 12.)



A revision of the checklist of Gammaridea in "Kozloff's Keys" (Staude, 1987[1]) compiled by Craig P. Staude, January 1996.

The species included in this list occur from S.E. Alaska to northern California, from the marine and estuarine intertidal zone to a depth of about 200 meters. As in the original, this checklist largely follows the phylogenetic scheme of Bousfield (1983)[2], with reference to the more recent papers of Bousfield and Staude (1994)[3] and Bousfield and Shih (1995)[3]. Changes since the 1987 edition appear in boldface. Taxa not present in the 1987 keys are indicated by an asterisk.

Superfamily Eusiroidea

Family Pontogeneiidae

Accedomoera vagor Barnard, 1969. Intertidal and shallow subtidal; on algae and mixed sediments.

Paramoera bousfieldi Staude, **1995**. Intertidal; sometimes near freshwater seepage; in mixed sediment (especially cobbles).

Paramoera bucki Staude, **1995**. Intertidal in freshwater seepage and in the tidal region of streams; in gravel.

Paramoera carlottensis Bousfield, 1958. Intertidal; especially in low-salinity tidepools and seepage; mixed sediment.

Paramoera columbiana Bousfield, 1958. Low intertidal; especially in situations of low salinity; in gravel and other sediments.

Paramoera leucophthalma Staude, **1995**. Subtidal; in gravel and fine sediment.

Paramoera mohri Barnard, 1952. Intertidal (rarely subtidal); in gravel.

Paramoera serrata Staude, **1995**. Low intertidal; in coarse sand and mixed sediment.

Paramoera suchaneki Staude, **1995** (fig. 18.78). Intertidal; in gravel and cobbles or in mussel beds.

Pontogeneia inermis (Krøyer, 1838). Habitat uncertain; known on this coast only from a single dubious specimen.

Pontogeneia intermedia Gurjanova, 1938. Intertidal and shallow subtidal; on algae and various sediments.

Pontogeneia cf. *ivanovi* Gurjanova, 1951 (fig. 18.15). Low intertidal and shallow subtidal; mixed sediments (especially sand); not in complete agreement with Gurjanova's description.

Pontogeneia cf. *rostrata* Gurjanova, 1938. Low intertidal and subtidal; on algae and various sediments; not in complete agreement with Gurjanova's description.

Family Eusiridae

***Eusirus columbianus* Bousfield and Hendrycks, 1995** (was cf. *longipes*). Deep subtidal; on fine sediment and probably also pelagic

***Rhachotropis barnardi* Bousfield and Hendrycks, 1995** (was *clemens*) (fig. 18.66). Deep subtidal; on fine sediment and probably also pelagic.

***Rhachotropis conlanae* Bousfield and Hendrycks, 1995**. Deep subtidal; on fine sediment and probably pelagic.

***Rhachotropis miniata* Bousfield and Hendrycks, 1995**. Deep subtidal; on fine sediment and probably also pelagic.

Rhachotropis oculata (Hansen, 1887). Deep subtidal; on fine sediment and probably also pelagic.

Family Calliopiidae

Calliopius spp. (fig. 18.76). Low intertidal to deep subtidal; on algae or mixed sediment and around docks; somewhat pelagic; there are probably 2 or 3 species in local waters, perhaps all undescribed.

Paracalliopiella pratti (Barnard, 1954). Low intertidal and subtidal; on algae, mixed sediment, and especially seagrasses; variants with atypical antennae.

Oligochinus lighti Barnard, 1969. Low intertidal; in mixed sediments and among algae.

Oradarea longimana (Boeck, 1871). Subtidal (sometimes deep); mixed mud, sand, and shell (possibly commensal).

Superfamily Oedicerotoidea

Family Oedicerotidae

Bathymedon flebilis Barnard, 1967. Subtidal; fine sediment.

Bathymedon pumilus Barnard, 1962. Subtidal; fine sediment.

Monoculodes spp. Low intertidal to deep subtidal; fine sediment; *M. zernovi* Gurjanova, 1938 (fig. 18.68) and *M. spinipes* Mills 1962 have been reported (see Mills, 1962).

Synchelidium rectipalmum Mills, 1962. Low intertidal and subtidal; sandy sediment.

Synchelidium shoemakeri Mills, 1962. Low intertidal to deep subtidal; fine sediment.

Westwoodilla caecula (Bate, 1856) (fig. 18.67). Low intertidal to deep subtidal; fine sediment.

Unidentified sp. Deep subtidal; fine sediment; an undescribes species near *Aceroides kobjakovae* Bulytscheva 1952.

Superfamily Leucothoidea

Family Pleustidae

***Chromopleustes** oculatus* (Holmes, 1908). Subtidal, habitat poorly known.

***_Chromopleustes lineatus_ Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, on rocks with algae and surfgrass.

***_Dactylopleustes echinoides_ Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, possibly commensal on echinoids.

***Gnathopleustes** den* (Barnard, 1969). Intertidal; exposed rocky beaches.

***_Gnathopleustes pachychaetus_ Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, on rocks with algae.

***Gnathopleustes** pugettensis* (Dana, 1853) group. Low intertidal to subtidal; on various substrata, and sometimes commensal; a group of species, incompletely described.

***_Gnathopleustes serratus_ Bousfield & Hendrycks, 1995.** Low intertidal rocky shores.

***_Gnathopleustes simplex_ Bousfield & Hendrycks, 1995.** Low intertidal to subtidal, on rocks with sponge and algae.

***_Gnathopleustes trichodus_ Bousfield & Hendrycks, 1995.** Subtidal, habitat unknown.

***Micropleustes** nautilus* (Barnard, 1969) (fig. 18.77). Intertidal, exposed rocky beaches.

***_Micropleustes nautiloides_ Bousfield & Hendrycks, 1995.** Intertidal and shallow subtidal algal mats and seagrass.

***_Pleustes constantinius_ Bousfield & Hendrycks, 1994.** Shallow subtidal, habitat unknown.

***_Pleustes victoriae_ Bousfield & Hendrycks, 1994.** Low intertidal to subtidal, habitat unknown.

Pleusirus secorrus Barnard, 1969. Low intertidal and subtidal; cobbles.

Pleusymtes subglaber (Barnard & Given, 1960). Subtidal; sand.

Pleusymtes sp. Shallow subtidal; sandy(?) sediment; probably undescribed.

***_Thorlaksonius borealis_ Bousfield & Hendrycks, 1994.** Low intertidal and subtidal rocks with algae.

***_Thorlaksonius brevirostris_ Bousfield & Hendrycks, 1994.** Low intertidal and subtidal, on algae and seagrass.

***_Thorlaksonius carinatus_ Bousfield & Hendrycks, 1994.** Shallow subtidal rocks with algae.

***Thorlaksonius** depressus* (Alderman, 1936) (fig. 18.65). Subtidal; on algae attached to rock surfaces, and on eelgrass.

***_Thorlaksonius grandirostris_ Bousfield & Hendrycks, 1994.** Low intertidal rocks with seagrass, probably a snail mimic.

***_Thorlaksonius subcarinatus_ Bousfield & Hendrycks, 1994.** Low intertidal and subtidal rocks with algae.

***_Thorlaksonius truncatus_ Bousfield & Hendrycks, 1994.** Shallow subtidal sand with drift algae.

***_Trachypleustes trevori_ Bousfield & Hendrycks, 1995.** Low intertidal rocks with algae.

***_Trachypleustes vancouverensis_ Bousfield & Hendrycks, 1995.** Low intertidal rocks with algae.

[Families Acanthonotozomatidae and Lafystiidae, see Superfamily Stegocephaloidea]

Family Amphilochidae

Amphilochus litoralis Stout, 1912. Low intertidal; probably commensal.
Amphilochus neapolitanus Della Valle, 1893. Low intertidal; probably commensal.
Amphilochus picadurus Barnard, 1962. Low intertidal; probably commensal.
Gitanopsis vilordes Barnard, 1962. Low intertidal; probably commensal.

Family Stenothoidae

Metopa cistella, Metopa ?dawsoni, Metopella ?carinata, Proboloides sp., and *Stenula* spp. have been reported locally. Low intertidal to deep subtidal; often commensal with anemones, hydroids, and sea pens; a poorly known group whose species are difficult to identify due to their small size and the need to examine mouthpart structure.

Family Leucothoidae

Leucothoe sp. (fig. 18.7). Low intertidal and subtidal; probably commensal; distinct from *L. alata* and *L. spinicarpa*, and probably undescribed.

Superfamily Talitroidea

Family Hyalidae

Allorchestes angusta Dana, 1856 group (at least 4 species). Intertidal and shallow subtidal; ranging into water of reduced salinity; on various substrata and among drift algae or wood chips.
Allorchestes bellabella Barnard, 1974. Intertidal (and also planktonic).
Hyale anceps (Barnard, 1969). Low intertidal; rocky beaches with algae.
Hyale frequens Stout, 1913 (fig. 18.34) group (about 10 species). Mid-intertidal to shallow subtidal; on various substrata with algae.
Hyale pugettensis (Dana, 1852). High intertidal tidepools; possibly synonymous with *H. californica* Barnard, 1969.
Hyale plumulosa (Stimpson, 1857). Low intertidal; mixed sediment (especially cobbles) with algae.
Parallorchestes spp. Intertidal to shallow subtidal; usually on rocky beaches with algae; Bousfield (1981) indicates that there are 12 species of *Parallorchestes*, including *P. ochotensis* (Brandt, 1851) and some undescribed species, along the North Pacific Rim.

Family Dogielinotidae

Proboscinotus loquax (Barnard, 1967). Intertidal, burrowing in sandy beaches of the outer coast.

Family Najnidae

Najna spp. Low intertidal and shallow subtidal; on *Alaria* and other algae, burrowing into stipes; Bousfield (1981) indicates that there are 10 species of *Najna*, including *N. kitamati* Barnard, 1979 (*N. ?consiliorum* of Barnard, 1962c), along the North Pacific Rim.

Family Talitridae

Megalorchestia californiana Brandt, 1851. High intertidal; sandy beaches of the open coast.
Megalorchestia columbiana (Bousfield, 1958). High intertidal; sandy beaches (occasionally in brackish situations).
Megalorchestia pugettensis (Dana, 1853). High intertidal; coarse to fine sand; open coast to protected estuaries.
Paciforchestia klawei (Bousfield, 1961). High intertidal; coarse sand and gravel (habitat incompletely known).
Platorchestia chathamensis Bousfield, 1982. High intertidal; among driftwood logs; known from a single specimen collected near Victoria, British Columbia.
Traskorchestia georgiana (Bousfield, 1958). High intertidal; coarse sand and gravel beaches.
Traskorchestia traskiana (Stimpson, 1857). High intertidal; widely distributed, but largely associated with gravel and rocky beaches.

Superfamily Phoxocephaloidea

Family Phoxocephalidae

***Cephalophoxoides** homilis* (Barnard, 1960). Deep subtidal; fine sediment.

Eobrolgus ***chumashi*** **Barnard & Barnard, 1981** (was *spinosus*) (fig. 18.64). Intertidal and shallow subtidal; fine sediment (especially sandy mud).

Eyakia robusta (Holmes, 1908). Subtidal; fine sediment.

Foxiphalus aleuti **Barnard & Barnard, 1982**. Subtidal to deep, sand.

Foxiphalus falciformis **Jarrett & Bousfield, 1994**. Low intertidal, sand.

Foxiphalus fucaximeus **Jarrett & Bousfield, 1994**. Low intertidal, sand.

Foxiphalus obtusidens (Alderman, 1936). Low intertidal and subtidal, fine sediment, S. of Oregon.

Foxiphalus similis (Barnard, 1960). Subtidal to deep, fine sediment.

Foxiphalus xiximeus **Barnard & Barnard, 1982**. Low intertidal to subtidal, sand.

Grandifoxus aciculatus **Coyle, 1982**. Subtidal to deep, fine sediment.

Grandifoxus dixonensis **Jarrett & Bousfield, 1994**. Deep, fine sediment.

Grandifoxus grandis (Stimpson, 1856). Intertidal and shallow subtidal; sand; synonymous with *Paraphoxus milleri* Thorsteinson, 1941.

Grandifoxus lindbergi **(Gurjanova, 1953)**. Shallow subtidal, sand.

Grandifoxus longirostris **(Gurjanova, 1938)**. Subtidal, sand.

Harpiniopsis fulgens Barnard, 1960. Deep subtidal; fine sediment.

Heterophoxus affinis **(Holmes, 1908)**. Subtidal to deep, fine sediment

Heterophoxus conlanae **Jarrett & Bousfield, 1994**. Subtidal fine sediment.

Heterophoxus ellisi **Jarrett & Bousfield, 1994**. Subtidal fine sediment.

Heterophoxus oculatus (Holmes, 1908). Subtidal (sometimes deep); mud, S. of Oregon.

***Majoxiphalus** major* (Barnard, 1960). Low intertidal to subtidal; fine sediment.

Majoxiphalus maximus **Jarrett & Bousfield, 1994.** Low intertidal and subtidal, fine sediments.

Mandibulophoxus alaskensis **Jarrett & Bousfield, 1994**. Low intertidal to subtidal, fine sediment.

Mandibulophoxus gilesi Barnard, 1957. Subtidal; fine sediment.

Mandibulophoxus mayi **Jarrett & Bousfield, 1994**. Low intertidal to subtidal, fine sediment.

Metaphoxus fultoni (Scott, 1890) (fig. 18.69). Deep subtidal; fine sediment.

Parametaphoxus qualeyi **Jarrett & Bousfield, 1994** (was *Metaphoxus frequens*). Deep subtidal; fine sediment.

~~*Paraphoxus oculatus*~~ (not confirmed from the Pacific).

Paraphoxus communis **Jarrett and Bousfield, 1994**. Low intertidal to shallow subtidal, mixed sediment.

Paraphoxus gracilis **Jarrett and Bousfield, 1994** (was *oculatus*). Subtidal to deep mud.

Paraphoxus pacificus **Jarrett and Bousfield, 1994**. Low intertidal to subtidal, mixed sediment.

Paraphoxus similis **Jarrett and Bousfield, 1994**. Subtidal, mixed sediment (not *P. similis* Barnard 1960).

Rhepoxynius abronius (Barnard, 1960). Shallow subtidal; fine sediment (especially sandy mud).

Rhepoxynius barnardi **Jarrett & Bousfield, 1994**. Subtidal, fine sediment.

Rhepoxynius bicuspidatus (Barnard, 1960). Deep subtidal; fine sediment, S. of Oregon.

Rhepoxynius ***boreovariatus*** **Jarrett and Bousfield, 1994** (was *variatus*). Subtidal; fine sediment.

Rhepoxynius daboius (Barnard, 1960). Subtidal; fine sediment.

**Rhepoxynius fatigans* (Barnard, 1960). Subtidal to deep, fine sediment.

Rhepoxynius heterocuspidatus (Barnard, 1960). Subtidal; fine sediment.

**Rhepoxynius pallidus* (Barnard, 1960). Low intertidal and subtidal; fine sediment.

Rhepoxynius tridentatus (Barnard, 1954). Low intertidal and subtidal; fine sediment.

Rhepoxynius vigitegus (Barnard, 1971). Subtidal; fine sediment.

Family Urothoidae

Urothoe* spp. Deep fjords; there are perhaps 2 or 3 species, **including *U. denticulata* Gurjanova 1951.

Superfamily Lysianassoidea

* Family Cyphocaridae

Cyphocaris challengeri Stebbing, 1888. Deep subtidal; pelagic.

Family Lysianassidae

Acidostoma ***bancocki*** **Hurley 1963**. Subtidal (sometimes deep); on soft sediment; possibly commensal.

Allogausia *recondita* Stasek, 1958. Intertidal; commensal in the gut of sea anemones; not reported north of Oregon.

Anonyx cf. *laticoxae* Gurjanova, 1962. Shallow to deep subtidal; soft sediment; some local populations mature at an unusually small size; possibly an undescribed species or pair of species.

Anonyx cf. *lilljeborgi* Boeck, 1870 (fig. 18.70). Shallow to deep subtidal; soft sediment; uropod 2 not very constricted; probably a new species.

Aristias pacificus Schellenberg, 1936. Subtidal; commensal with brachiopods and ascidians; possibly synonymous with *A veleronis* Hurley, 1963; determination uncertain.

Aruga *holmesi* Barnard, 1955. Subtidal (sometimes deep); soft sediment.

Hippomedon spp. Subtidal (sometimes deep); soft sediment; undescribed species expected (see Jarrett & Bousfield, 1982).

Koroga megalops Holmes, 1908. Subtidal (sometimes deep); soft sediment.

Lepidepecreum garthi Hurley, 1963. Deep subtidal; soft sediment.

Lepidepecreum gurjanovae Hurley, 1963 (fig. 18.71). Shallow to deep subtidal; on various substrata (kelp holdfasts to soft sediment); undescribed

Opisa tridentata Hurley, 1963. Deep subtidal, soft sediment.

Orchomene sp. Intertidal; possibly commensal with anemones; similar to *Orchomene recondita* (Stasek, 1958).

Orchomene decipiens (Hurley, 1963). Deep subtidal; soft sediment.

Orchomene obtusus (G. O. Sars, 1890). Subtidal (sometimes deep); epibenthic and on soft sediment; abundant in waters of British Columbia, but not yet reported in Washington.

Orchomene pacificus (Gurjanova, 1938). Subtidal (sometimes deep); on various substrata.

Orchomene cf. *pinguis* (Boeck, 1871). Low intertidal and subtidal; mixed sediment.

Pachynus cf. *barnardi* Hurley, 1963. Subtidal (sometimes deep); soft sediment; absence of eyes and structure of accessory flagellum do not agree with Hurley's description.

Prachynella lodo Barnard, 1964. Subtidal; mixed sediment.

Psammonyx longimerus Jarrett & Bousfield, 1982. Subtidal (sometimes deep); sandy sediment.

Schisturella cocula Barnard, 1966. Deep subtidal; soft sediment.

Wecomedon similis Jarrett & Bousfield, 1982. Intertidal and subtidal; soft sandy sediment.

Wecomedon wecomus (Barnard, 1971). Low intertidal to deep subtidal; soft sandy sediment.

Superfamily Synopioidea

Family Synopiidae

Bruzelia tuberculata G. O. Sars, 1895. Deep subtidal; soft sediment.

Syrrhoe longifrons Shoemaker, 1964. Deep subtidal; soft sediment.

Tiron biocellata Barnard, 1962 (fig. 18.62). Low intertidal to deep subtidal; various sediments.

Family Argissidae

Argissa hamatipes (Norman, 1869). Subtidal (sometimes deep); soft sediment; possibly a group of undescribed species.

Superfamily Stegocephaloidea (see disscussion of superfamily revision of Moore, 1992)

*Family Stegocephalidae

****Stegocephalexia penelope* Moore, 1992**. Subtidal.

Family Acanthonotozomatidae *sensu lato* (including families Iphimediidae and Odiidae)

***Cryptodius** kelleri* Bruggen, 1907. Subtidal; rocky substrata, especially with algae; on Amchitka Is., AK, this species co-occurs with the similar appearing species, *Imbrexodius oclairi* Moore, 1992.

***Iphimedia rickettsi* (Shoemaker, 1931)** (was *Coboldus* sp.) Subtidal; rocky substrata, especially with algae (e. g., corallines and kelp holdfasts), possibly commensal; similar to *Coboldus hedgpethi* Barnard, 1969 from California.

Family Lafystiidae

*members of this family are fish parasites (see Bousfield and Kabata, 1988, Canadian Spec. Pub. Fish. Aquat. Sci. 101)

Superfamily Pardaliscoidea

Family Stilipedidae

**Stilipes* sp. Deep fjords.

Family Pardaliscidae

***Rhynohalicella** halona* (Barnard, 1971). Subtidal (sometimes deep); soft sediment.

**Pardalisca cuspidata* Krøyer, 1842. Deep subtidal; soft sediment.

Pardalisca tenuipes G. O. Sars, 1893. Deep subtidal; soft sediment.

****Pardaliscella symmetrica* Barnard, 1959**. Deep subtidal, soft sediment.

Superfamily Dexaminoidea

Family Atylidae

****Atylus borealis* Bousfield and Kendall, 1994**. Shallow subtidal sand and eelgrass.

Atylus collingi (Gurjanova, 1938). Shallow subtidal; sand and gravel (especially with eelgrass); euryhaline.

****Atylus georgianus* Bousfield and Kendall, 1994**. Shallow subtidal sand and eelgrass.

Atylus levidensus Barnard, 1956. Low intertidal and subtidal; various sediments (especially sand).

Atylus tridens (Alderman, 1936) (fig. 18.63). Low intertidal and subtidal; associated with sand, eelgrass, and rocky bottoms; occasionally pelagic.

Family Dexaminidae

***Guernea** reduncans* (Barnard, 1957). Subtidal; soft sediments.

****Polycheria carinata* Bousfield & Kendall, 1994**. Low intertidal to subtidal, commensal on ascidians and sponges.

****Polycheria mixillae* Bousfield & Kendall, 1994**. Low intertidal to subtidal, commensal on sponges.

Polycheria osborni Calman, 1898. Low intertidal; commensal on compound ascidians.

Superfamily Ampeliscoidea

Family Ampeliscidae

Ampelisca agassizi (Judd, 1896) (fig. 18.72). Low intertidal to subtidal; tube-building in soft sediment.

Ampelisca brevisimulata Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment.

Ampelisca careyi Dickinson, 1982. Subtidal (sometimes deep); tube-building in soft sediment; Dickinson recently distinguished *A. careyi* from *A. macrocephala* Lilljeborg, 1842; some local specimens display characters that seem to be intermediate between those typical of the two species.

Ampelisca cristata Holmes, 1908. Subtidal (sometimes deep); tube-building in coarse sand.

Ampelisca fageri Dickinson, 1982. Intertidal and subtidal; tube-building in mixed sand and boulders.

Ampelisca hancocki Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment.

Ampelisca lobata Holmes, 1908. Subtidal; tube-building in mixed sand and rock, often associated with plants.

Ampelisca pugetica Stimpson, 1864. Subtidal; tube-building in sand.

Ampelisca unsocalae Barnard, 1960. Subtidal (sometimes deep); tube-building in very fine sediment.

Byblis millsi Dickinson, 1983. Subtidal (sometimes deep); tube-building in soft sediment; ramal spines of uropod 1 very small in local specimens; other species expected in depths of 200 m or more.

Byblis veleronis Barnard, 1954. Subtidal (sometimes deep); tube-building in soft sediment; other species expected in depths of 200 m or more.

Haploops tubicola Lilljeborg, 1856. Deep subtidal; tube-building in soft sediment.

Superfamily Pontoporeioidea

*Family Pontoporeiidae

***Pontoporeia femorata* Kroyer, 1842**. Shallow subtidal, soft sediment.

Family Haustoriidae

Eohaustorius brevicuspis Bosworth, 1973. Shallow subtidal; sand.

Eohaustorius estuarius Bosworth, 1973. Estuarine; sand.

Eohaustorius sawyeri Bosworth, 1973. Shallow subtidal; sand.

Eohaustorius sencillus Barnard, 1962. Shallow subtidal; sand.

Eohaustorius washingtonianus (Thorsteinson, 1941). Intertidal and shallow subtidal; sand.

Superfamily Gammaroidea

Family Anisogammaridae

Anisogammarus pugettensis (Dana, 1853). Intertidal and subtidal; various substrata, but especially associated with eelgrass, algae, and deposits of wood chips.

Eogammarus confervicolus (Stimpson, 1856) (fig. 18.75). Estuarine, intertidal, and subtidal; various substrata, but especially associated with sedges, eelgrass, algae, and deposits of wood chips.

Eogammarus oclairi Bousfield, 1979. Estuarine, intertidal, and shallow subtidal; various substrata; characters may intergrade with those of *E. confervicolus*, making identification difficult.

Locustogammarus levingsi Bousfield, 1979. Estuarine and intertidal; cobble and shingle beaches.

Ramellogammarus ramellus (Weckel, 1907). Stream mouths and high intertidal; coarse sand, stones, and wood debris.

Ramellogammarus vancouverensis Bousfield, 1979. Stream mouths and high intertidal; coarse sand, stones, and wood debris.

Family Gammaridae

Lagunogammarus setosus (Dementieva, 1931). Estuarine, intertidal, and subtidal; fine sediments.

Superfamily Melphidippoidea

Family Melphidippidae

Melphidippella and *Melphissana* have been reported locally; species of this family are rare in Washington waters, and poorly known; deep subtidal; in soft sediment.

Family Megaluropidae

Megaluropus sp. Intertidal and subtidal; associated with algae, but also planktonic; probably undescribed.

Superfamily Hadzioidea

Family Melitidae

Ceradocus spinicaudus (Holmes, 1908) (fig. 18.80). Intertidal and subtidal; cobbles.

Elasmopus spp. Intertidal; associated with algal cover on rocks; not confirmed north of California.

Maera danae Stimpson, 1853. Shallow to deep subtidal; fine sediment to gravel.

Maera loveni (Bruzelius, 1859). Subtidal; mud.

Maera simile Stout, 1913. Shallow subtidal; associated with algal cover on rocks.

Melita californica Alderman, 1936. Intertidal to deep subtidal; cobbles to fine sediment; some subtidal individuals may belong to an undescribed species.

Melita dentata (Krøyer, 1842) (fig. 18.74). Low intertidal to deep subtidal; on various substrata.

Melita desdichada Barnard, 1962. Low intertidal and subtidal; soft sediment.

Melita oregonensis Barnard, 1954. Intertidal; associated with algal cover on rocks.

Melita sulca (Stout, 1913). Low intertidal to deep subtidal; associated with algal cover on rocks.

Superfamily Corophioidea

Family Ampithoidae

Ampithoe dalli Shoemaker, 1938 (fig. 18.44). Intertidal and shallow subtidal; algae and eelgrass.

Ampithoe lacertosa Bate, 1858 (fig. 18.45). Intertidal and shallow subtidal; algae and eelgrass.

Ampithoe plumulosa Shoemaker, 1938 (fig. 18.46). Intertidal and shallow subtidal; algae and surfgrass; rare north of California.

Ampithoe sectimanus Conlan & Bousfield, 1982 (fig. 18.43). Low intertidal; exposed rocky beaches with algae.

Ampithoe simulans Alderman, 1936 (fig. 18.42). Low intertidal; various substrata, associated with algae and eelgrass.

Ampithoe valida Smith, 1873 (fig. 18.47). Low intertidal and shallow subtidal; usually on soft sediment with algae or eelgrass, somewhat estuarine.

Cymadusa uncinata (Stout, 1912) (fig. 18.41). Low intertidal and shallow subtidal; builds plant-debris nests at the base of boulders on exposed beaches, also associated with kelp and surfgrass.

Peramphithoe humeralis (Stimpson, 1864) (fig. 18.48). Low intertidal and subtidal; curls blades of kelp and eelgrass to form a tube.

Peramphithoe lindbergi (Gurjanova, 1938) (fig. 18.50). Low intertidal and shallow subtidal; eelgrass and algal holdfasts.

Peramphithoe mea (Gurjanova, 1938) (fig. 18.49). Subtidal; eelgrass.
Peramphithoe plea (Barnard, 1965) (fig. 18.51). Shallow subtidal; kelp holdfasts.
Peramphithoe tea (Barnard, 1965) (fig. 18.52). Intertidal and subtidal; algae.

Family Aoridae

Aoroides columbiae Walker, 1898. Low intertidal to deep subtidal; mixed sediment with algae.
Aoroides exilis Conlan & Bousfield, 1982. Low intertidal and subtidal; on various sediments, but especially with algae and eelgrass.
Aoroides inermis Conlan & Bousfield, 1982. Low intertidal and subtidal; sand.
Aoroides intermedius Conlan & Bousfield, 1982. Low intertidal and subtidal; sand and gravel, especially with algae and eelgrass.
Aoroides spinosus Conlan & Bousfield, 1982. Low intertidal and subtidal; on various substrata, especially with algae and debris.
Columbaora cyclocoxa Conlan & Bousfield, 1982. Low intertidal and subtidal; exposed rocky beaches with algae.

Family Cheluridae

**Chelura terebrans* Philippi, 1839. Associated with wood-boring isopods of the genus *Limnoria*; presence north of California not confirmed.

Family Isaeidae

[There are many taxonomic problems in this family, despite the useful paper of Conlan (1983).]
Cheirimedeia macrocarpa subsp. *americana* Conlan, 1983. Low intertidal; brackish and marine sandflats.
Cheirimedeia similicarpa Conlan, 1983. Subtidal; shelly sediments.
Cheirimedeia zotea (Barnard, 1962) (fig. 18.73). Low intertidal to deep; mixed sediments.
*Gammaropsis **(Gammaropsis)** ellisi* Conlan, 1983. Low intertidal and subtidal; on algae and sponges.
*Gammaropsis **(G.)** shoemakeri* Conlan, 1983. Low intertidal and subtidal; on algae and hydroids.
*Gammaropsis **(G.)** spinosa* (Shoemaker, 1942). Low intertidal and subtidal; on algae, sponges, and polychaete tubes.
*Gammaropsis **(G.)** thompsoni* (Walker, 1898). Low intertidal and subtidal; on various substrata, but especially among encrusting animals and in algal holdfasts.
***Gammaropsis** (Podoceropsis) barnardi* Kudryashov & Tsvetkova, 1975. Subtidal; mixed sediment, especially sand; not reported south of Vancouver Island.
***Gammaropsis** (P.) chionoecetophila* Conlan, 1983. Deep subtidal; commensal in egg masses of the crab *Chionoecetophila tanneri*; reported only from Alaska and Oregon.
***Gammaropsis (P.)** ociosa* (Barnard, 1962). Subtidal; sand and gravel; apparently synonymous with *Podoceropsis augustimana* Conlan, 1983.
Gammaropsis (P.) sp. A (was ?*Megamphopus* sp.) Low intertidal and subtidal; sand, possibly associated with eelgrass; an undescribed species referred to as "near *Podoceropsis inaequistylis*" by Staude *et al.*, 1977.
Photis bifurcata Barnard, 1962 (fig. 18.29). Intertidal to deep subtidal; usually on soft sediment.
Photis brevipes Shoemaker, 1942 (fig. 18.28). Low intertidal to deep subtidal; in various sediments, but especially sand.
Photis conchicola Alderman, 1936 (fig. 18.32). Intertidal and subtidal; rocky beaches with algae and surfgrass, often pagurid-like, living in empty gastropod shells; differing from *P. oligochaeta* only by its more setose coxae.
Photis lacia Barnard, 1962 (fig. 18.33). Subtidal; soft sediments.
Photis macinerneyi Conlan, 1983 (fig. 18.33). Low intertidal and subtidal; sand.
****Photis macrotica*** **Barnard 1962**. Subtidal to deep, soft sediments.
Photis oligochaeta Conlan, 1983 (fig. 18.32). Low intertidal and subtidal; sand and gravel; differing from *P. conchicola* only by its less setose coxae, a character which is size-related, according to Conlan (1983).
Photis pachydactyla Conlan, 1983 (fig. 18.30). Low intertidal and subtidal; hard substratum, and occasionally in empty barnacle shells.

Photis parvidons Conlan, 1983 (fig. 18.31). Low intertidal and subtidal; sandy sediment.

Protomedeia articulata Barnard, 1962. Low intertidal to deep subtidal; soft sediments.

Protomedeia grandimana Bruggen, 1905. Low intertidal to deep subtidal; soft sediments; not reported south of Vancouver Island.

Protomedeia penates Barnard, 1966 and *P. prudens* Barnard, 1960. Subtidal (sometimes deep); soft sediments; Conlan (1983) suggests that the 2 species are synonymous.

Family Ischyroceridae

Ischyrocerus anguipes (Krøyer, 1838) (fig. 18.36) group. Low intertidal and subtidal; tube-building on various substrata.

Ischyrocerus serratus Gurjanova, 1938 (fig. 18.39). In beds of *Mytilus californianus* on exposed rocky shores; assignment to genus doubtful.

Ischyrocerus sp. Low intertidal and subtidal; tube-building on various substrata.

***Jassa borowskyae* Conlan 1990**. Exposed rocky shores, on algae and surfgrass.

***Jassa morinoi* Conlan 1990**. Low intertidal, on rocks and algae.

***Jassa oclairi* Conlan 1990**. Low intertidal and subtidal, on algae and sponges.

***Jassa shawi* Conlan 1990**. Low intertidal and subtidal, on hard substrate and sponges.

***Jassa slatteryi* Conlan 1990**. Low intertidal and subtidal, on algae and hydroids.

***Jassa staudei* Conlan 1990**. Low intertidal and subtidal, on rocks and algae.

***Microjassa barnardi* Conlan 1995**. Subtidal, soft sediment.

***Microjassa bousfieldi* Conlan 1995**. Subtidal to deep, soft sediment.

Microjassa litotes Barnard, 1954 (fig. 18.38). Subtidal, among small algae and in holdfasts.

Family Corophiidae

Corophium acherusicum Costa, 1857 (fig. 18.27). Intertidal and subtidal; tube-building on sediment, algae, and eelgrass.

Corophium baconi Shoemaker, 1934. Intertidal and subtidal; tube-building in soft sediment; reported from Bering Sea and California.

Corophium brevis Shoemaker, 1949. Intertidal and subtidal; tube-building on various substrata.

Corophium crassicorne Bruzelius, 1859. Subtidal; tube-building in soft sediment.

Corophium insidiosum Crawford, 1939. Intertidal and subtidal; tube-building in soft sediment.

Corophium salmonis Stimpson, 1857 (fig. 18.26). Intertidal and subtidal; tube-building in soft sediment, especially in estuarine situations.

Corophium spinicorne Stimpson, 1857. Intertidal and subtidal; tube-building in soft sediment, primarily in freshwater.

Ericthonius brasiliensis Dana, 1853. Subtidal; forming mats of muddy tubes on various substrata.

Ericthonius ***rubricornis*** *(Stimpson, 1853)* (was *hunteri*). Subtidal; forming mats of muddy tubes on various substrata.

**Grandidierella japonica* Stephensen, 1938. Intertidal and subtidal; soft-sediments; probably introduced with the oyster *Crassostrea gigas*.

Family Podoceridae

Dulichia spp. Shallow to deep subtidal; on various substrata, but especially epibiotic; undescribed species are to be expected.

Dulichia rhabdoplastis McCloskey, 1970. Subtidal; commensal on the spines of the sea urchin *Strongylocentrotus franciscanus* and also occurring on soft sediment.

Dyopedos spp. Shallow to deep subtidal; on various substrata, but especially epibiotic; undescribed species expected (see Laubitz, 1977).

Paradulichia typica Boeck, 1870 (fig. 18.79). Shallow to deep subtidal; on various substrata, but especially epibiotic.

Podocerus cristatus (Thomson, 1879) group. Subtidal; on various substrata, but especially epibiotic; until this group is revised, Barnard (1979) hesitates to identify species unless they have been collected at the type localities.

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[1] Staude, C.P., 1987. Suborder Gammaridea. pp. 346-386. In: E.N. Kozloff (ed.), Marine Invertebrates of the Pacific Northwest. Univ. Washington Press, Seattle.

[2] Bousfield, E.L., 1983. An updated phyletic classification and paleohistory of the Amphipoda. *In* Schram, F. R. (ed.), Crustacean Phylogeny. Rotterdam: Balkema, pp. 257-77.

[3] See bibliography of recent taxonomic literature (next page)

Request for Feedback

I am eager to receive comments, additions, or corrections to this species checklist. To encourage wide response, it is my intention to post this list on the Internet, linked to home page of the Friday Harbor Laboratories at http://www.fhl.washington.edu.

You may respond via e-mail (staude@fhl.washington.edu) or by mail:

Dr. Craig P. Staude
Friday Harbor Laboratories
University of Washington
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Readers may also benefit from reference to the following gammaridean papers included in the **Taxonomic Atlas** of the Santa Barbara Museum of Natural History, although they fail incorporate most of the new taxa listed above:

Conlan, K.E., 1995. Superfamily Corophioidea. pp. 177-222, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Thomas, J.D., & L.D. McCann, 1995. The families Argissidae, Dexaminidae, Eusiridae, Gammaridae, Leucothoidae, Melphidippidae, Oedicerotidae, Pardaliscidae, Phoxocephalidae, Podoceridae, Stegocephalidae, Stenothoidae, Stilipedidae, Synopiidae, and Urothoidae. pp. 21-136, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Watling, L., 1995. The families Ampeliscidae, Amphilochidae, Liljeborgiidae, and Pleustidae. pp. 137-176, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

________, & J.D. Thomas, 1995. Introduction to the Amphipoda. pp. 1-20, *In:* J.A. Blake, L. Watling, and P.H. Scott (eds.), Taxonomic Altas of the Santa Maria Basin and Western Santa Barabara Channel, Vol. 12, The Crustacea Part 3, Santa Barbara Mus. of Natural Hist., Santa Barbara, CA.

Recent taxonomic literature on the northeast Pacific boreal Gammaridea [not in Kozloff's Keys (Staude, 1987)]

Barnard, J.L., & C.M. Barnard, 1981. The amphipod genera *Eobrolgus* and *Eyakia* (Crustacea: Phoxocephalidae) in the Pacific Ocean. Proc. Biol. Soc. Wash. 94: 295-313.

_______, & _______, 1982. Revision of *Foxiphalus* and *Eobrolgus* (Crustacea: Amphipoda: Phoxocephalidae) from American oceans. Smith. Contrib. Zool. 372: 1-35.

_______, & G.S. Karaman, 1991. The families and genera of marine gammaridean Amphipoda (except marine gammaroids). Records of the Australian Museum, Supplement 13, Part I (pp.1-417) and Part II (pp.419-866).

Bousfield, E.L., & E.A. Hendrycks, 1994. The amphipod superfamily Leucothoidea on the Pacific coast of N. America. Family Pleustidae: Subfamily Pleustinae. Systematics and biogeography. Amphipacifica 1(2): 3-69.

_______, & _______, 1995a. The amphipod superfamily Eusiroidea in the North American Pacific region. I. Family Eusiridae: systematics and distributional ecology. Amphipacifica 1(4): 3-59.

_______, & _______, 1995b. The amphipod family Pleustidae on the Pacific coast of North America: part III. Subfamilies Parapleustinae, Dactylopleustinae, and Pleusirinae. Systematics and distributional ecology. Amphipacifica 2(1): 65-133.

_______, & P.M. Hoover, 1995. The amphipod superfamily Pontoporeioidea on the Pacific coast of North America. I. Family Haustoriidae. Genus *Eohaustorius* J.L. Barnard: systematics and distributional ecology. Amphipacifica 2(1): 35-63.

_______, & Z. Kabata, 1988. Amphipoda, *In:* L. Margolis and Z. Kabata (eds.), Guide to the Parasites of Pacific Fishes of Canada. Part II. Crustacea. Canadian Spec. Pub. Fish. Aquat. Sci. 101: 149-163.

_______, & J.A. Kendall, 1994. The amphipod superfamily Dexaminoidea on the North American Pacific Coast; Families Atylidae and Dexaminidae: Systematics and dstributional ecology. Amphipacifica 1 (3): 3-66.

_______, & C.-t. Shih, 1994. The phyletic classification of amphipod crustaceans; problems in resolution. Amphipacifica 1(3): 76-134.

_______, & C.P. Staude, 1994. The impact of J.L. Barnard on North American Pacific amphipod research: a tribute. Amphipacifica 1(1): 3-16.

Conlan, K.E., 1990. Revision of the crustacean amphipod genus Jassa Leach (Corophioidea: Ischyroceridae). Canadian J. Zool. 68(10): 2031-2075.

_______, 1995. Thumbing doesn't always make the genus: revision of *Microjassa* Stebbing (Corophioidea: Ischyroceridae). Bull. Marine Sci. 57: 333-377.

Coyle, K.O., 1982. The amphipod genus *Grandifoxus* Barnard (Gammaridea: Phoxocephalidae) in Alaska. J. Crust. Biol. 2(3): 430-450.

Jarrett, N.E., & E.L. Bousfield, 1994a. The amphipod superfamily Phoxocephaloidea on the Pacific coast of North America. Family Phoxocephalidae. Part I. Metharpiniidae, new subfamily. Amphipacifica 1(1): 58-140.

_______, & _______, 1994b. The amphipod superfamily Phoxocephaloidea on the Pacific coast of North America. Family Phoxocephalidae. Part II. Subfamilies Pontharpiniinae, Parharpiniinae, Brolginae, Phoxocephalinae, and Harpiniinae. Systematics and distributional ecology. Amphipacifica 1(2): 71-150.

Meyers, A.A., & D. McGrath, 1984. A revision of the north-east Atlantic species of *Ericthonius* (Crustacea: Amphipoda). J.mar. biol. Ass. U.K. 64: 379-400.

Moore, P.G., 1992. A study on amphipods from the superfamily Stegocephaloidea Dana 1852 from the northeastern Pacific region: systematics and distributional ecology. J. Nat. Hist. 26: 905-936.

Staude, C.P., 1995. The amphipod genus *Paramoera* Miers (Gammaridea: Eusiroidea: Pontogeneiidae) in the eastern North Pacific. Amphipacifica 1(4): 61-102.

SCAMIT CODE: None

Date Examined: 1 February 1996
Voucher By: Tim Stebbins & Dean Pasko

SYNONYMY: *Aoroides* sp A (MEC) & *Aoroides* sp SD1 (City of San Diego, Pt. Loma)

LITERATURE:
Barnard, J.L. 1970. Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. Smith. Cntr. Zool. No. 34.

Conlan, K.E. and E.L. Bousfield. 1982. The amphipod superfamily Corophioidea in the northeastern Pacific region: 2. Family Aoridae. Systematics and distributional ecology. Natl. Mus. Nat. Sci. (Canada) Publ. Biol. Oceanogr., 10(3): 77-101.

DIAGNOSTIC CHARACTERS:

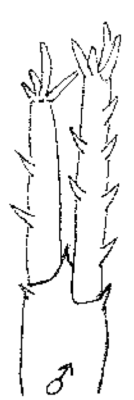
1. Body white, pigment absent.
2. Uropod 2 with minute antero-distal process ($\leq$ 1/10th the length of rami).
3. Gnathopod 1, article 2 (basis) with long, widely spaced setae, and dorsal margin of article 5 (carpus) without setae (except for 1 distal group).
4. Mandibular palp, article 2 bare.

RELATED SPECIES AND CHARACTER DIFFERENCES:

1. See Table 1 for comparisons of *Aoroides* sp A with *A. columbiae, A. exilis, A. inermis, A. intermedia, and A. spinosa.*
2. *Aoroides nahili* and *A. secundus* differ from *Aoroides* sp A in missing a distal process on the peduncle of uropod 2. Consequently, these two species are differentiated from *Aoroides* sp A in the first couplet of the *Key to North Pacific Species of Aoroides* (Conlan and Bousfield, 1982), and are not considered in the table.

DEPTH RANGE: 200-350 ft.

DISTRIBUTION: Southern California: Palos Verdes, Los Angeles to Point Loma, San Diego.



A. *Aoroides* sp A. uropod 2, ventral view (modified from Barnard, 1970, figure 32b, *Aoroides columbiae).*

Table 1. Comparison of characters of *Aoroides* spp from southern California.

	columbiae	exilis	inermis	intermedia	spinosa	Sp A
Mandibular palp, article 2 (1) setose	X		X	X		
(2) bare		X			X	X
Male gnathopod 1, article 2 (1a) posterior margin setose		X			X	
(1b) posterior margin bare	X		X	X		X
(2a) anterior margin densely setose (long setae)	X	X	X	X		long & widely spaced
(2b) anterior margin weekly setose (short setae)					X	
Male gnathopod 1, article 5 (1a) broader than article 2	X	X			X	X
(1b) not broader than article 2			X	X		
(2a) dorsal margin setose, with 8-15 setal bundles			X			
(2b) dorsal margin setose, with 5-7 setal bundles				X		
(2c) dorsal margin not setose, (except for 1 distal group)	X	X			X	X
Peraeopod 7, article 2 (1) broad (W/L $\geq$ 50%; ~60%)	~53%		~50%	~60%	~56%	*
(2) slender (W/L << 50%; ~40%)		~39%				
Uropod 2, peduncle antero-distal process (1) long ($\geq$ 1/2 length of rami)	X	X				
(2) short(<< 1/2 length of rami)			X	X	X	minute
Uropod 3, outer ramus (1) 1-3 "strong" spines		X			X	
(2) usually bare, or with 1-2 "small" spines	X		X	X		X
Body pigmentation (1) bands	X	X				
(2) speckled			X	X	X	
(3) no pigment (white)						X

* The size and shape of peraeopod 7, article 2 (basis) is unknown because no specimens have been collected with P7 attached.