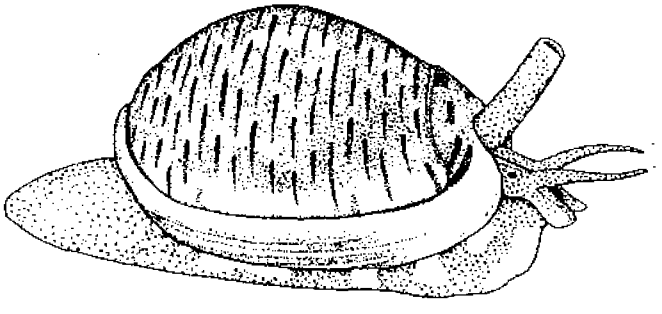
May, 1996 SCAMIT Newsletter Vol. 15, No.1

NEXT MEETING:	Revisions to Prosobranch Gastropods
GUEST SPEAKER:	Dr. James H. McLean
DATE:	10 June 1996
TIME:	0930-1600 (Dr. McLean will join us in the afternoon)
LOCATION:	Times-Mirror Room, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles



The cystiscid *Persicula interruptolineata*
(from Coovert and Coovert 1995)

JUNE 10 MEETING

While mainly addressing the new Prosobranch gastropod review by Dr. Jim McLean in the Taxonomic Atlas of the Santa Maria Basin and Western Santa Barbara Channel, the June 10th meeting will also include an introduction to some of the proposed changes in higher classification of gastropods. SCAMIT is currently using a "traditional" classification. Over the past two decades a number of new findings have lead to significant rearrangements of the gastropods, some of which are now very widely (if not universally) considered to be correct. A number of these changes were included by Dr. McLean in his work, and this is a convenient time for us to begin to consider a revised classification.

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.

NEW LITERATURE

Volume 8- (part 1 of the Mollusca) of the MMS Taxonomic Atlas has been published and members with subscriptions should be receiving their copies soon, if not already.

This volume contains two sections: The Prosobranchia (J. H. McLean) and The Opisthobranchia (T. M. Gosliner). We will be discussing the first of these at the June Meeting (see above), but will reserve the second for our second meeting on Cephalaspidea later this year, with Dr. Gosliner as guest speaker. Although not a full treatment (Dr. McLean excluded discussion of the pyramidellids) the prosobranch section is full of new information, and provides the first illustrations of a number of species described by Dall in the early years of this century. If you have any interest in this volume I recommend you attend the June meeting, where Dr. McLean will be in attendance to answer any questions we have on this revisionary review.

A major revision of the marginellid gastropods was also received recently (Coovert and Coovert 1995). This formed two numbers of the journal The Nautilus last year and covers all supra-specific taxonomy of the Marginellidae, including the raising of the subfamily Cystiscinae to full family status as the Cystiscidae. This extremely detailed analysis draws together all the known information on these animals, which have often been described only from shells. It replaces the past system (based nearly exclusively on shells) with one based on a combination of shell, radula, and soft anatomical characters. Significant changes to the existing system result.

Late 1995 also produced an interesting article on the feeding of *Octopus rubescens* on euphausid shrimp (Laidig *et al* 1995). The observations of this behavior were made *in situ* with an ROV off Santa Cruz, California. The authors provide a useful summary of previous observational reports of *Octopus* feeding methods and prey.

Volume 2(2) of Amphipacifica has also been published. As in past issues it consists of a limited number of large monographic reviews. This issue contains major papers on systematics of amphipods in the group of genera including *Melita* in Family Melitidae (Jarrett and Bousfield 1996), and on species in the generic complexes around *Monoculodes* and *Synchelidium* in the Family Oedicerotidae (Bousfield and Chevrier 1996). Each of these is a comprehensive review of the groups in the north-east Pacific from mid-California northward, but may not address species present in the Southern California Bight. In all cases new genera are erected, generic limits of existing genera are re-defined, new species are proposed and efforts are made to establish a coherent approach to taxonomy of the groups in question.

Some problems have been found with the latter paper, and we suggest that application of the new genera erected in it be postponed until the authors have an opportunity to rectify them in print. It will take some time for all the proposed changes to be evaluated, and related to the southern California fauna. Efforts are underway (reexamination of J. L. Barnard's MS *Synchelidium* species in light of the character states introduced by Bousfield and Chevrier, for instance) at this time, and will be presented at a future meeting. We request that any amphipod workers evaluating these new monographs share their findings and opinions with others through the Newsletter.

In a continuation of research on the taxonomy of the nemerteans by European investigations Envall (1996) described a new *Ototyphlonemertes* and reviewed the genus. *Ototyphlonemertes spiralis* has been recorded locally, and these records can now be reevaluated based on more complete descriptive information

NEWSLETTER SUGGESTIONS

At the May meeting the cost of publishing the SCAMIT newsletter was addressed. As reported

in last month's newsletter (Vol.14 No. 12) the costs associated with publishing the newsletter (printing, postage, and supplies) have increased substantially due to more lengthy newsletters in the last 2 years. This past year the cost of producing the newsletter and the 2nd edition of the Taxonomic Listing was approximately $4,000, which was the major expense SCAMIT incurred in its 1995-96 fiscal year. Membership dues in the past have been able to offset this expense, but this year at approx. $1500 didn't even cover half the expense. It is clear that SCAMIT needs to find a way to increase our income or decrease our expenses. The members present at the meeting decided that cutting down on the length of the newsletter was not the answer. However, several suggestions were made. They are:

1. Raise membership dues. Members present felt this should be held as a last resort.

2. Solicit past supporters (Arco, Chevron, and Texaco, that we routinely credit in the newsletter) for a yearly donation or grant to cover the cost of the newsletter and/or the cost of the future editions of the Taxonomic Listing.

3. Put the newsletter on-line to save not only printing and stationery supply costs, but postage as well. (Not to mention trees.) The major disadvantage to this solution is then why would anyone become a member if they could get our information for free. It was even suggested that SCAMIT could have its own home page, perhaps thru the Natural History Museum. This, however, presents the problem of finding a volunteer to manage and update the page. As usual, every solution has its own set of problems.

This newsletter expense problem will be addressed at an executive committee meeting later this year. Until then, the SCAMIT officers welcome (and even *plead* for) your suggestions, comments, and opinions. Please feel free to contact any of them by phone, fax, e-mail, and even the old-fashioned way, letter.

CORRECTIONS

A few corrections to past newsletters were noted at the last meeting. The header on all pages subsequent to the first one of the April newsletter (Vol. 14 No. 12) mistakenly reads February, 1996 Vol. 14 No. 10. The newsletter staff regrets this error because the whole purpose of adding the header in the first place was to make it convenient to refer to any page in the newsletter even if its pages are separated. It has also been suggested that the date and volume of the newsletter be added to all handouts that are attached, not just voucher sheets, and so we have begun this practice for this issue. We always welcome any suggestions (and even constructive criticisms) on ways to improve the quality of the newsletter.

An error in content was made in the March newsletter (Vol. 14 No. 11) on page 4. Larry Lovell's comment on where interramal cirri begin in *Nephtys cornuta* was wrongly interpreted. It should read *parapodia* of the *first* setiger are uniramous, reduced in size and directed forward. For this reason, they are sometimes missed when counting setigers to determine if interramal cirri begin on 5 or 6.

NEW Paramunna

During examination of materials collected by Dr. Eric Vetter of Scripps a new isopod of the genus *Paramunna* was encountered. The sample in which it was found was taken off Del Mar at 100m depth in relatively coarse sediments. The animal thus qualifies as a member of the off-shore coarse sediment "Shelf-Break" community. It is easily distinguished from other small munnid type asellote isopods from our area by the following characteristics:

☞from all asellotes except *Paramunna quadratifrons* by the serrate (or dentate) lateral margins of the pereonal segments.

☞from *Paramunna quadratifrons* by a rounded granulate frons ("forehead") and two granulate cephalic tubercles on the head over the insertion of the antennae. Denticles or teeth are present only on the basal 2/3 of the pleotelson, not continuous as in *P. quadratifrons*.

These are very small animals (adult at slightly over 1mm) so they are easy to miss. Those sampling in the appropriate habitat are enjoined to keep their eyes open for them. Additional specimens would be wonderful, although I currently have enough for an adequate description of this new form, and will be working on it in the near future.

- Don Cadien

SCAS MEETING

The annual meeting of the Southern California Academy of Sciences was held May 3-4 at Loyola Marymount University in Westchester. A session entitled "Regional Marine Monitoring of the Southern California Bight" was held on the 3rd. It dealt with the preliminary results of the Southern California Bight Pilot Project, offering presentations on the Project as a whole, on the design and implementation of a regional database, the results of the SCBPP trawling program, and experiences in other regional programs in San Francisco and off-shore (CalCOFI). Several papers also addressed large-scale monitoring of kelp, a subject not addressed in the SCBPP. Although SCAMIT was not directly involved in this session, a number of SCAMIT members were, and gave informative and well-received presentations. All those involved deserve applause and the appreciation of those of us who enjoyed their efforts from the audience.

Those who were not able to attend missed a priceless comment by Chairperson Bob Grove of Southern California Edison (and SCAS) which cannot effectively be repeated out of context here. Sorry, there <u>are</u> things you just can't get by reading the abstracts!

MINUTES FROM MAY 13-14 MEETINGS

Day One (May 13) -

The guest speaker was Dr. Danny Eibye-Jacobsen from the Zoological Museum in Copenhagen. When Dr. Eibye-Jacobsen revised the phyllodocid polychaete genus *Eumida* in 1991 he had not examined much Californian material. He recently had the opportunity to examine a large amount of material from the Natural History Museum and presented his findings at this meeting. Included with this newsletter is a set of handouts that Danny distributed to members at the meeting.

Three species of *Eumida* have been reported from California, *Eumida longicornuta*, *Eumida sanguinea*, and *Eumida tubiformis* by Hartman (1936). Dr. Eibye-Jacobsen has not seen any specimens from California that fit the description of *E. sanguinea*. The MMS survey of the Santa Maria Basin and western Santa Barbara Channel did not yield any specimens of *E. sanguinea* either as reported by Blake (1994). The material that Danny examined from the Natural History Museum only contained specimens of *E. longicornuta* and *E. tubiformis*, which are the two species that have been the most difficult to distinguish between.

The main diagnostic characteristics of the genus *Eumida* are the presence of 5 antennae on the prostomium (4 frontal and 1 median), a large proboscis with oral papillae on the distal end that are each adorned with rows of micropapillae, and the large leaf-like dorsal cirri, for which the family is named. However, there are not very many distinct characteristics for differentiating between species of *Eumida*. While the genus *Eumida* has distinct setae, with small denticles on the rostrum of the shaft, they are not species specific. Most of the useful information separating species relates to the shape and size of structures such as antennae, proboscis, tentacular, dorsal, ventral, and anal cirri, all of which are highly dependant on the method of fixation and preservation.

Phyllodocids in general don't always fix well because of all the mucous they secrete to protect them from predation. Danny uses magnesium chloride as a relaxant before fixing his specimens. This helps provide specimens in optimum condition for identification. He also cautioned members about speciating juveniles due to the many growth related changes (2mm in size is too small)!

The diagnostic characters that Danny has used in distinguishing between *Eumida* species are:

1) Position of median antenna - not very consistent due to methods of fixation.

2) Neuropodial morphology - bilobate neuropodia, but not always distinct. Supraacicular lobe is larger than subacicular lobe.

3) Shape of the dorsal cirri - most consistent character. The anterior dorsal cirri are asymmetrical with either the dorsal or ventral margin longer.

Dr. Eibye-Jacobsen showed us several slides of some European phyllodocids and then slides of *Eumida sanguinea*, which has been reported from all over the world and originally described from Denmark (Ørsted, 1843). The original type specimens were never deposited at the Zoological Museum of Copenhagen, but drawings of the types were and we saw slides that were taken of them. The name "sanguinea" means blood-red, however, the drawings illustrated a salmon-colored worm. Also, Danny has never seen any *E. sanguinea* worms that are blood-red in color. For his revision of *Eumida* (1991) Danny described a neotype fitting the description of *E. sanguinea* from the same location in Denmark. The neotype had large, clear dark-red eyes and ventral cirri on segment 2 that were flattened in shape. Danny's revision reduced the geographic distribution of *E. sanguinea* to both sides of the North Atlantic, which would include Greenland and the east coast of the U.S., eastern Russia and Japan.

After lunch we examined specimens of *Eumida tubiformis* and *Eumida longicornuta* and Dr. Eibye-Jacobsen pointed out their diagnostic features.

Eumida tubiformis-

This is a deep water species with relatively large eyes. However, the large eyes should not be used as a diagnostic character because sometimes damage to the eye cup causes the pigment to leak out and the eye may look larger than it is, or the pigment may be diffused so it looks lighter in color. *E. tubiformis* has elongated presetal neuropodial lobes, which differs from *E. longicornuta*'s bluntly rounded neuropodial lobes. *E. tubiformis* has asymmetrical anterior dorsal cirri with a longer dorsal margin. The dorsal cirri gradually become more symmetrical by midbody and broader than long. Danny commented that if a typical shaped dorsal cirrus (fig. 1A and B of his handouts) could not be found on a specimen then it is probably not *E. tubiformis*. Danny also cautioned members to keep track of which side is the dorsal margin and which is the ventral if a dorsal cirrus is removed from a specimen.

Eumida longicornuta-

The name "longicornuta" means long antennae and the type specimens have very long uncharacteristic antennae. Generally, the length of the antennae are not remarkable. Dorsal cirri are also asymmetrical, but it is the ventral margin that is longer. The asymmetrical dorsal cirri should be examined from segment 20 - 30 since the cirri become more symmetrical farther back on the body. (Segment 25 is a good segment to examine for purposes of consistency.) The asymmetrical dorsal cirri are also drawn out into an acute tip for most of the length of the worm. This is very different than *E. tubiformis*, which has a much larger angle at the tip. Two color morphs appear to exist in this species, but many intermediate variations have also been seen. Shallower water specimens of *E. longicornuta* tend to have a uniform brown pigment with lighter antennae and cirri and red eyes, similar in coloration to *E. tubiformis*. The

other color morph has a dark area on the prostomium posterior to the frontal antennae and in front of the eyes and a brown transverse band on each segment with dark brown/black eyes. There may also be a central pigment spot on each dorsal cirrus. There is no pigment band on segment 2, like that illustrated by Blake in vol. 4 of the MMS atlas. Danny examined 50 specimens of this species and only found one with a *slight* pigment band on segment 2. This color morph may also have a superficial layer of small greenish-black dots over the pigmentation. This striped color morph is generally seen in deeper water animals.

Dr. Eibye-Jacobsen also had a few comments to make about the physiology and ecology of phyllodocids in general. The dorsal cirri of phyllodocids have no blood vessels in them so they can not act as gill structures, but they do have the mucous glands located here. As mentioned earlier, the mucous helps deter predation. These worms also have bands of cilia down their bodies that help push water along their bodies, where the dorsal cirri act similar to the scales of polynoids.

Phyllodocids are mainly carnivorous, but also opportunistic. If they find a dead or dying animal they will eat it. Phyllodocids reproduce by pseudocopulation where they lie next to each other and release their gametes into the water and fertilization is instantaneous. Generally, this occurs on the bottom, but it may also occur in the water column during periods of swarming.

Day Two (May 14) -

The second day's presentation began with an introduction to the upcoming marine invertebrate survey planned at the Phuket Marine Biological Center in Thailand. A new 120 foot research vessel, R. V. Chakartong Tongyai, together with a project from the Copenhagen Zoological Museum will result in three extensive cruises to survey and inventory the Thai coastal waters in the Andaman Sea. Two "bioshelf" surveys, each 25 days long, will be conducted in 1997 and 1998. This will be followed by a " biodeep" survey in waters up to 2000 meters in 1999. The sampling will include both qualitative and quantitative sampling with various devices for benthic and epibenthic sampling.

Following the surveys will be several focused workshops with taxonomic specialists for each of the major groups within the polychaetes, molluscs, and crustaceans. These workshops will be held in Thailand at the Phuket Marine Biological Center and will include support for invited specialists during the workshops. Follow-up work is expected and collected specimens will be exported to researchers involved in this phase of the work. Publications from these workshops are a requirement of the program and many new descriptions and taxa are expected due to the relatively unexplored fauna and currently known diversity. For those interested in keeping abreast in the planning for this survey and subsequent scheduling please contact Dr. Eibye-Jacobsen at:

Zoological Museum
Universitetsparken 15
DK - 2100 Copenhagen O
Denmark
dejacobsen@zmuc.ku.dk
http://www.aki.ku.dk/zmuc/inv/staff/dej.htm

Additionally, Dr. Eibye-Jacobsen brought specimens representing some of the undescribed fauna already collected from the Andaman Sea. These included: 5 new *Typosyllis*; a new syllid close to *Trypanosyllis*; a new *Clavisyllis*; a new species of *Glycera* similar to *G. alba*; a new *Scoloplos*, a new *Lumbrineris* similar to *L. impatiens*; a new *Augneria*; a new *Scolelepis* similar to *S. squamata*, a new *Scolelepis* similar to *S. lingulata*; a new *Dispio* similar to *uncinata*; and specimens of *Scoloplos marsupialis* Southern 1921, a soon-to-be-published new species of *Scolelepis*, a *Goniadopsis incerta* Fauvel 1932, and *Tylonereis bogoyawlensky* Fauvel 1911.

Dr. Eibye-Jacobsen distributed handouts on all these new species, which the newsletter editor has a copy of for anyone that may be interested.

TWO'S COMPANY, THREE'S A CROWD
by Tom Parker (CSDLAC)

Gaul was divided into three parts, but scientific names have been long divided on the two part formulation: *Genus species*. Nonetheless various authors have occasionally assigned subgeneric or subspecies names for specimens that slightly differ from a base taxa description. It is common for these designations to be later removed through elevation to a new species name or expanding definitions to accommodate the sub-taxa conditions. Maintaining three part names via subspecies or subgenera is typically not a benefit to a group's taxonomy and can result in confusion in taxonomic and ecological analysis. Though *Nephtys cornuta franciscana* has been recently pruned to *Nephtys cornuta*, a few triple deckers still lurk out there. The phyllodocid *Hesionura coineaui difficilis* is one such example. In the 1994 volume # 4 MMS Atlas, Blake pointed out that this subspecies description has sufficient differences from the stem species to justify its own species name. Unfortunately, no named or provisional species designation has been proposed. When examining specimens of this taxon, please note distribution of body pigment (overall vs. ventral cirri) and length of setal blades (subequal vs. double length). Once tabulated, a collection of reports can be used to establish a new species or provisional name for these local specimens.

SO... WE DO HAVE *Sosanopsis*, AND SOME OF US HAVE *Sosane* AS WELL!
by Tom Parker

At least some of you do. Several specimens of local *Sosanopsis* have been demonstrated at this last meeting. Pt. Loma also brought specimens that clearly fit the definition of *Sosane occidentalis*. So... please check any ampharetids with modified 13th setigers. Look for the palea. The combination of these two character states will be your key to determining both *Sosane* and *Sosanopsis*. The voucher sheet for the local *Sosanopsis* provisional species will be distributed shortly.

"THE BEAST"
by Megan Lilly (CSDMWWD)

[Editor's note: The following is the first of what I hope will be a series of reviews of the more popular attempts to integrate natural history into the entertainment industry. For those of you who witnessed the event in question what follows will be clear. For those who did not, let me say that this review can best be considered an exercise in sarcasm.]

I would like to comment on the showing last month of the wonderful, "Made for TV" movie of "Beast", a novel by Peter Benchley. As a marine biologist with a particular interest in cephalopods, I would just like to say that it was refreshing to finally see a movie which took the time to actually investigate the ecology and nature of the animal portrayed. The realism with which *Architeuthis* was displayed simply took my breath away; what more can I say?

There are a few particular points that I would like to touch on, since they were obviously well researched during the development of this film. First, the realistic screeching noises that the female emitted during periods of rage and attack. Amazing how well this sound was mimicked, considering that scientists have never seen a live *Architeuthis* much less heard one. But, we <u>all</u> know that cephalopods are extremely social animals, and depend on sound for communication over long distances in the ocean. Since they have a beak they must obviously make some sort of bird-like screeching noise.

Secondly, and by far the best angle of the whole film, was the heart-felt portrayal of the strong maternal instinct a mother squid would feel for her young. Since giant squid only produce one young per birth, (with an occasional rare, but

exciting occurrence of twins!), energy investment in the offspring is high. Female *Architeuthis* are extremely protective of their young, usually not letting them leave their side for at least the first 6 months of life. Here the screeching noise also comes in handy when a mother must call her baby back from its playful and curious wanderings. The female nurses her youngster while teaching it to hunt on its own. The hunting skills of *Architeuthis* take some time to master, but with patient tutelage the juveniles usually kill their first sperm whale near the end of the first year of life.

After all this energy investment and love exchange one could readily imagine the rage and despair the female *Architeuthis* would experience from the capture and subsequent death of her only baby. A friend of mine pointed out that the mother was very likely suffering from milk fever as well. Good point, since the nursing of the young would have been cut short, the rich ammoniacal milk secretions would have built up in the mother's mammary glands and blood stream, causing fever and pain. This condition could have only increased her rage and the severity of the attacks on the hapless (as always) humans.

So, all in all, I would just like to say "Bravo!" to Hollywood and the producers of this film. Once again, as with Jaws, they have done a wonderful job with the difficult task of making an exciting film for the general public, but at the same time, keeping the scientific details concerning the nature of the animals true to life. If it wasn't for such diligence on the part of the movie industry, people might actually misunderstand and form incorrect opinions about some of the marine life that exists in our oceans and, heaven help us then...

Two thumbs [oops, sorry -clubs] and eight tentacles up. Bound to be on my list of the ten-best cephalopod films of the year!

[Editors postscript - Is there a relationship between the movie Jaws and the recent listing of the great white shark as an endangered species?]

SCAMIT OFFICERS:

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

			e-mail address
President	Ron Velarde	(619)692-4903	rgv@sddpc.sannet.gov
Vice-President	Don Cadien	(310)830-2400 ext. 403	mblcsdla@netcom.com
Secretary	Cheryl Brantley	(310)830-2400 ext. 403	mblcsdla@netcom.com
Treasurer	Ann Dalkey	(310)648-5611	cam@san.ci.la.ca.us

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.

BIBLIOGRAPHY

BLAKE, JAMES A. 1994. Chapter 4. Family Phyllodocidae Savigny, 1818. Pp. 115-186 *in*: Blake, James A. and B. Hilbig (eds.). 1994. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel, Volume 4: Oligochaeta and Polychaeta - Phyllodocida (Phyllodocidae to Paralacydoniidae). 377pp.

BOUSFIELD, EDWARD L. and Andrée Chevrier. 1996. The amphipod family Oedicerotidae on the Pacific Coast of North America. Part 1. The Monoculodes and Synchelidium generic complexes: systematics and distributional ecology. Amphipacifica 2(2):75-148.

COOVERT, GARY A. and Holly K. Coovert. 1995. Revision of the sub(sic)raspecific classification of marginelliform gastropods. The Nautilus 109(2/3):43-110.

EIBYE-JACOBSEN, DANNY. 1991. A Revision of Eumida Malmgren, 1865 (Polychaeta: Phyllodocidae). Steenstrupia 17(3):81-140.

ENVALL, MATS. 1996. Ototyphlonemertes correae sp nov and a redescription of O. duplex (Nemertea: Monostilifera: Ototyphlonemertidae), with a phylogenetic consideration of the genus. Journal of Zoology 238(Part 2):253-277.

GOSLINER, TERRENCE M. 1996. Chapter 2. The Opisthobranchia. Pp. 161-213 *in*: Scott, Paul H., J. A. Blake, and A. L. Lissner (eds.). 1996. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel, Volume 9: The Mollusca Part 2 - The Gastropoda. 228pp.

HARTMAN, OLGA. 1936. A Review of the Phyllodocidae (Annelida Polychaeta) of the Coast of California, with Descriptions of Nine New Species. University of California Publications in Zoology 41(10):117-132.

JARRETT, NORMA E. and E. L. Bousfield. 1996. The amphipod superfamily Hadzioidea on the Pacific Coast of North America: family Melitidae. Part I. The Melita group: systematics and distributional ecology. Amphipacifica 2(2):3-74.

LAIDIG, THOMAS E., P. B. Adams, C. H. Baxter, and J. L. Butler. 1995. Feeding on euphausiids by Octopus rubescens. California Fish and Game 81(2):77-79.

McLEAN, JAMES H. 1996. Chapter 1. The Prosobranchia. Pp. 1-160 *in*: Scott, Paul H., J. A. Blake, and A. L. Lissner (eds.). 1996. Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel, Volume 9: The Mollusca Part 2 - The Gastropoda. 228pp.

ØRSTED, ANDERS S. 1843. Annulatorum danicorum conspectus, Fascicle 1. Maricolae. Copenhagen, 52pp.

The status of *Eumida* in California

When I revised the phyllodocid polychaete genus *Eumida* Malmgren, 1865 in 1991, little Californian material was studied: the type material of *E.tubiformis* Moore, 1909 (4 specimens) and *E.longicornuta* (Moore, 1906) (2 specimens).

Recently, I received a large amount of material of Californian *Eumida* from the Los Angeles County Museum for further study. In this material, only two different species of *Eumida* could be identified with confidence: *E.tubiformis* and *E.longicornuta*. Six lots, however, contained animals that could neither be identified as belonging to one of these species nor referred to any other known species. Whether some of them represent new species is not clear: the lots in question are just too small and in too poor a condition to tell at this time. In any case, two species for California is a suspiciously low number and work remains to be done in this area.

Below I will attempt to characterize *E.tubiformis* and *E.longicornuta*, paying particular attention to characters that are useful in either distinguishing the two or heightening confidence in the identification.

Eumida tubiformis Moore, 1909

Up to 90 mm long, with up to 135 segments (holotype).

Prostomium: Rounded pentangular, broader than long. Eyes relatively large, red to dark red. Median antenna inserted between the eyes or slightly further forward.

Proboscis: Smooth, in large animals with a few micropapillae in 6 longitudinal bands, strongest developed distally. Small animals with 17-19 oral papillae, large animals with as many as 26. Oral papillae with obvious micropapillae.

Tentacular cirri: Dorsal tentacular cirri of segments 2 and 3 longest, reaching to segment 8-11. The ventral tentacular cirri of segment 2 have no tendency to be flattened.

Dorsal cirri: Dorsal cirrophores large. **On anterior segments dorsal cirri are asymmetrical with the dorsal margin longest (Fig. 1B), on large animals extremely asymmetrical** (Fig. 1A). Dorsal cirri gradually become more symmetrical (Fig. 1C) and **on the midbody they are almost symmetrical, broadly cordate, about as broad as long** (Fig. 1D, 1F), sometimes much broader (Fig. 1E), but this is not typical (note: Fig. 1E is of the dorsal cirrus immediately following the one on 1D). On posterior segments the dorsal cirri are slightly longer than broad and more acute (Fig. 1G). In general, **the tip of the dorsal cirrus is rarely acute and the angle at the tip is usually about 80° or more.** The ventral margin of median dorsal cirri may have a subterminal notch (Fig. 1D).

Neuropodia: **The supra- and subacicular lips of the presetal lobe may be elongated and diverging.** This is usually **best seen on anterior segments,** sometimes also on posterior ones. These diverging lips may resemble large, dorsally and ventrally placed papillae.

Setae: Valuable in identifying most polychaetes, of no help here.

Ventral cirri: Relatively broad, especially on large animals, but not much broader than in *E.longicornuta*.

Pygidium: Anal cirri still unknown. Median pygidial papilla absent.

Pigmentation: Dorsum uniformly brown, cirri and antennae lighter. Dark blotches may be present on prostomium. Very weak transverse banding may be present on anterior segments.

Remarks: Figures in Blake 1994 are excellent (certainly better than those in Eibye-Jacobsen 1991), but it must be pointed out that they depict the holotype, a huge animal. **Smaller specimens may be recognized by the shape of the dorsal cirri (large angle at the tip), but preferably by their neuropodial morphology.** Eibye-Jacobsen (1991) placed too much emphasis on the dorsal cirri being broader than long.

Eumida longicornuta (Moore, 1906)

Up to 300 mm long (N-480) with up to 117 segments.

Prostomium: Rounded pentangular, broader than long. Eyes of typical size (for *Eumida*), of varying colour (see below). Median antenna usually inserted between the anterior halves of the eyes, often further forward (observing a living specimen of *Eumida* shows you just how worthless this character is). Note: the length of the antennae is usually not remarkable, despite the species name *longicornuta*. They are very long (relaxed) on both type specimens, but this is not typical of the species.

Proboscis: Smooth, a few micropapillae may be present on the surface. Usually with 17-19 oral papillae (16 observed in one juvenile), in large animals up to 24. Oral papillae with micropapillae.

Tentacular cirri: Dorsal tentacular cirri of segments 2 and 3 longest, reaching to segment 8-13 (sic). The ventral tentacular cirri on segment 2 have no tendency to be flattened.

Dorsal cirri: Dorsal cirrophore large. **On anterior segments dorsal cirri are strongly asymmetrical, with the ventral margin much longer than the dorsal one** (Fig. 2A, 2B). **About one third of the way down the body (in terms of the total number of segments) the dorsal cirri have a shape not known for any other species of the genus** (Fig. 3A, 3B): **strongly asymmetrical, ventral margin much longer than the dorsal one, distally with a drawn out, acute tip at a small angle, usually less than 60°. The ventral margin usually has a subterminal concavity,** which is why the tip appears to be drawn out. On middle segments the dorsal cirri become more symmetrical, at first almost triangular (Fig. 2C), then more broadly cordate (Fig. 2D), but still with a drawn out tip. Further back the dorsal cirri begin to elongate, become once again more triangular, at first with a drawn out tip (Fig. 2E), towards the end of the body about 1½ times as long as broad (Fig. 2F).

On large animals the dorsal cirri of the region from one third to one half of the way down the body may develop what can best be described as an extra ventral lobe (Fig. 3C) or the ventral

portion appears to be extremely elongated (Fig. 3D). Such dorsal cirri are, as far as I know, unknown in other species of the genus.

For routine identification work, I suggest that the dorsal cirri of segments 20-30 be studied in detail as a standard (Fig. 2B, 2C, 3A, 3B).

Note: there is a serious error in Eibye-Jacobsen 1991, as partly pointed out in Blake 1994. In stating that dorsal cirri on posterior segments are longer than broad in *E.longicornuta* (which is correct), Eibye-Jacobsen referred to his Figure 6D. However, Figure 6D shows a dorsal cirrus from segment 33 of the holotype, which is complete and has a total of 76 segments! The parapodium illustrated on his Figure 6C is from segment 27 of the holotype.

Neuropodia: These are of the standard *Eumida* type, with the supra- and subacicular lips of the presetal lobe rounded and weakly separated, the dorsal one usually slightly larger than the ventral one, in large animals often clearly larger and "angular" or "truncate".

Setae: As in *E.tubiformis*.

Ventral cirri: Relatively broad for a species of *Eumida*, but slightly less so than in *E.tubiformis*. However, the difference is so subtle that this character is not helpful.

Pygidium: Anal cirri (still?) unknown. Pygidial papilla absent.

Pigmentation: There appear to be **two colour morphs** of this species, but every imaginable intermediate stage seems to exist. **One is uniformly brown, with lighter antennae and cirri, without a dark spot on each dorsal cirrus, and dark red (but clearly red) eyes.** This form is very similar in colouration to *E.tubiformis*. **The other morph is light-bodied, dorsally with a prominent green-brown or brown transverse band on each segment (green on living animals?), dark pigmentation on the prostomium between the frontal antennae and the eyes, the eyes themselves being very dark brown, almost black (at least in preserved animals), and with a central dark spot of pigment on each dorsal cirrus.** Note that in this last morph, the eyes become lighter with age, as the grow in absolute size, but the basic colour is the same (not red). Furthermore, **in the latter morph all this colouration can be partly covered by a more superficial layer of small dark green to dark brown or black dots.**

Remarks: The holotype (USNM, Washington DC) and paratype (ANSP, Philadelphia) are both of the first colour morph. The second morph was not mentioned in the revision of *Eumida* by Eibye-Jacobsen 1991, having only studied the type material. The holotype and the paratype were both taken in shallow water in Washington state. Station data for the newly received material is patchy, but does not contradict a hypothesis whereby the uniformly coloured form is found in shallow water, the striped form in deeper water (beyond 15 m?).

The differences in pigmentation between these two forms is so great that one may find it difficult to accept the hypothesis that they belong to the same species. However, any number of intermediates exist, and many of these could not be classified as belonging to one or the other with confidence. Furthermore, and most importantly, **no morphological differences could be found between the two, both showing dorsal cirri of a shape that is quite distinctive in the genus.**

During the study of these colour variations, one peculiarity was noted **in the striped form: segment 2 does not have a transverse band** (segment 2 = the first visible segment on the dorsum behind the prostomium). Segment 2 is thus significantly lighter than the following segments. Note, however, that if the animal happens to be one of those with an "overlay" of small, blackish dots, you have to "look through" the dots to realize that segment 2 does not have a transverse band. Because of this peculiarity, I strongly doubt that Figure 4.17A in Blake (1994) shows a specimen of *E.longicornuta*, as that animal has a transverse band on segment 2 (species of *Sige*?). On the other hand, Blake's Figure 4.18 B is fine.

Note on ***Eumida sanguinea*** and California

Following the revision of *Eumida*, the range of distribution of the type species, *E.sanguinea*, was reduced to the North Atlantic (both sides), ~~Siberia~~, eastern Russia, and Japan (Eibye-Jacobsen, 1991). I have yet to see specimens from the western coast of North America that could reasonably be identified as *E.sanguinea*.

In particular, *E.longicornuta* differs from *E.sanguinea* in:

- having much more asymmetrical dorsal cirri
- not having a tendency for the ventral tentacular cirri of segment 2 to be flattened
- often having a concentration of pigment on the prostomium
- often having very dark eyes
- often having strong transverse banding

Danny Eibye-Jacobsen
Zoologisk Museum
Copenhagen, Denmark
dejacobsen@zmuc.ku.dk
http://www.aki.ku.dk/zmuc/inv/staff/dej.htm

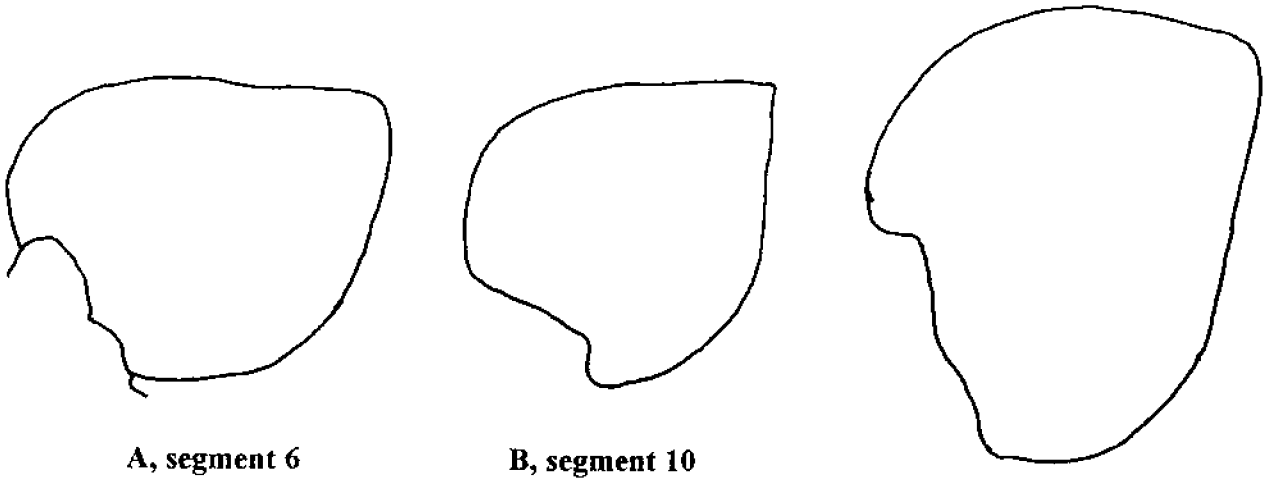
Figure legends

Figure 1: Dorsal cirri of *Eumida tubiformis* Moore, 1909. **A** from segment 6, **B** segment 10, **C** segment 25, **D** segment 45, **E** segment 46, **F** segment 60, **G** segment 112. A + D-G from holotype, B from specimen in sample N-4478, C from specimen in sample 1498-42.

Figure 2: Dorsal cirri of *Eumida longicornuta* (Moore, 1906). **A** from segment 10, **B** segment 20, **C** segment 30, **D** segment 40, **E** segment 50, **F** segment 60. All figures from one specimen in sample 3049-55, a 15 mm long, 1.1 mm broad (excluding parapodia), complete animal with 67 segments.

Figure 3: Dorsal cirri of *Eumida longicornuta* (Moore, 1906). **A** from segment 25, **B** segment 25, **C** segment 24, **D** segment 35. A from specimen in sample N-480. B from specimen in sample 1464-42. C and D from specimen in sample N-5030.

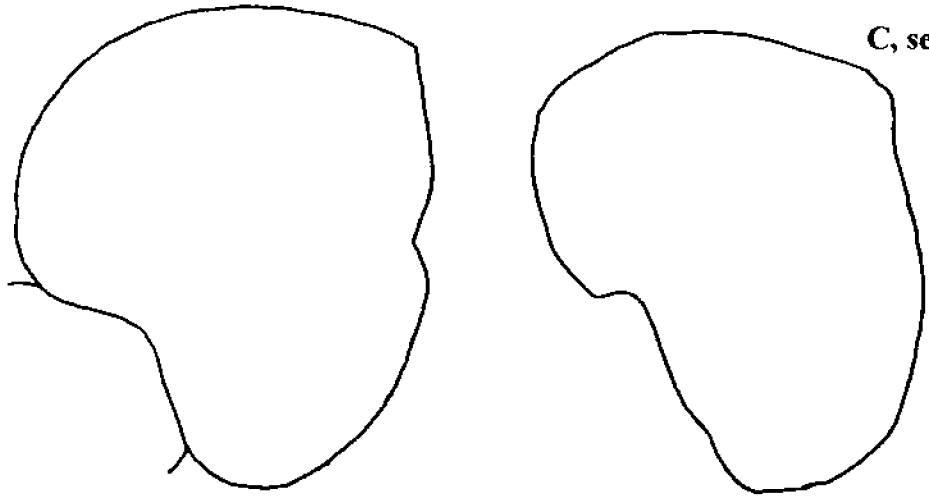
Figure 1: Dorsal cirri of *Eumida tubiformis* Moore, 1909



A, segment 6

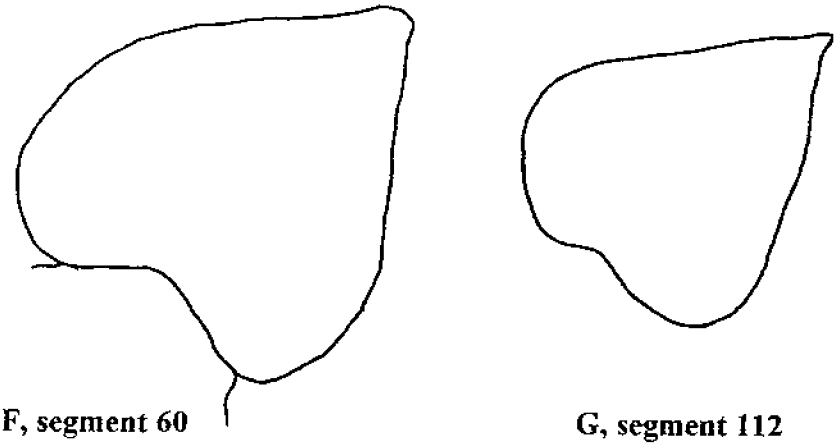
B, segment 10

C, segment 25



D, segment 45

E, segment 46



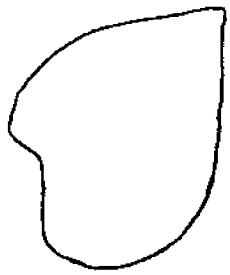
F, segment 60

G, segment 112

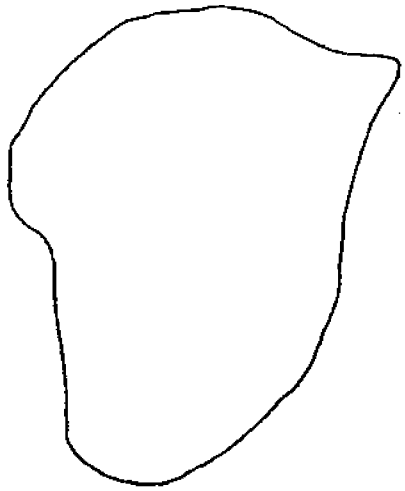
A, D, E, F, G
all drawn from
holotype

B, C
drawn from
other specimen

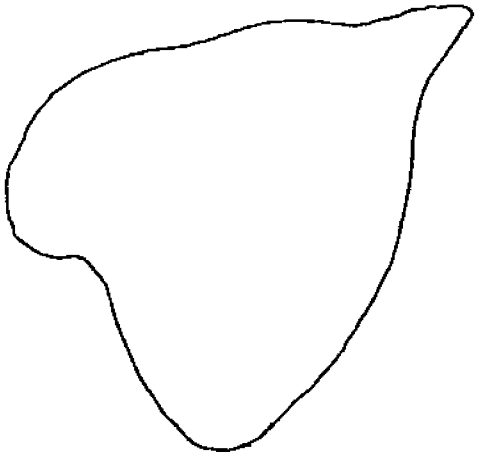
Figure 2: Dorsal cirri of *Eumida longicornuta* (Moore, 1906)



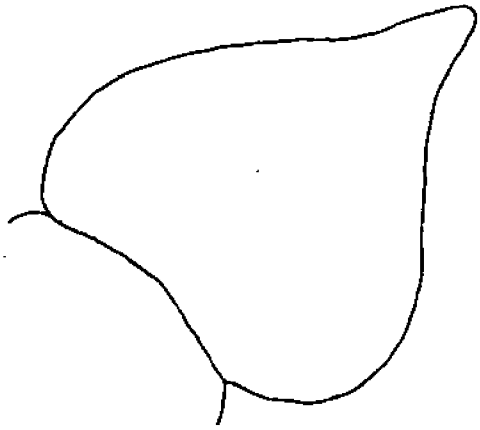
A, segment 10



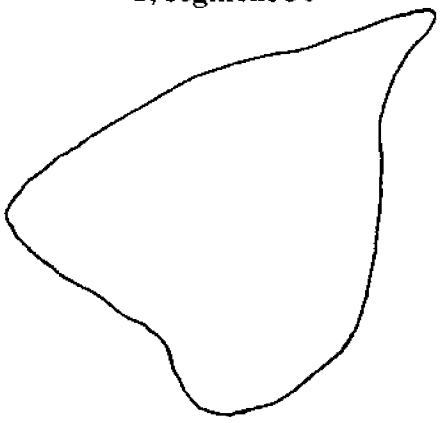
B, segment 20



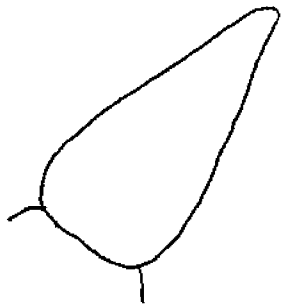
C, segment 30



D, segment 40

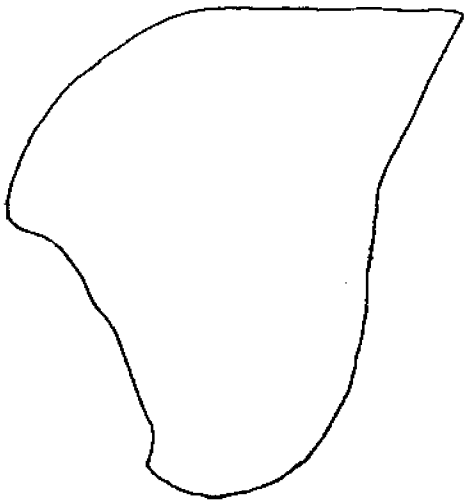


E, segment 60

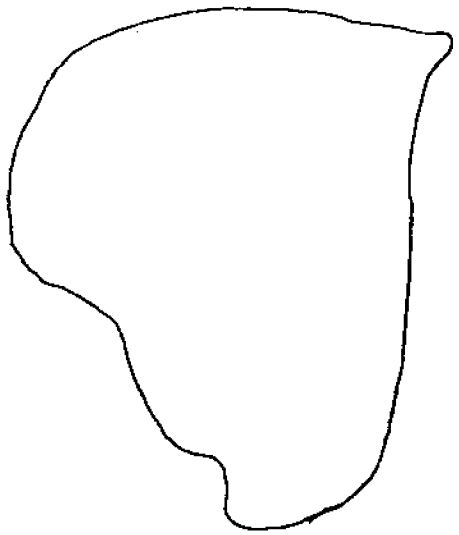


F, segment 60

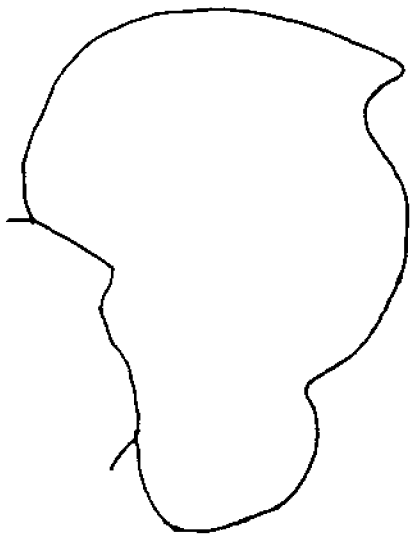
Figure 3: Dorsal cirri of *Eumida longicornuta* (Moore, 1906)



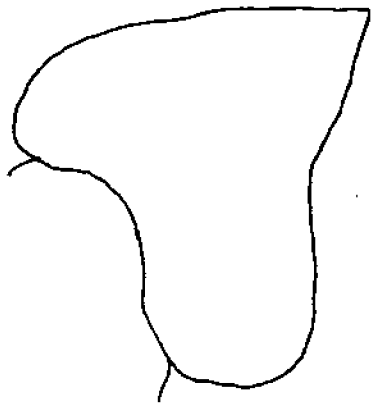
A, segment 25



B, segment 25



C, segment 24



D, segment 35

Date Reviewed: March 1996
Voucher Sheet by: T. Parker

Synonymy: *Owenia collaris Hartman 1955*
Owenia fusiformis collaris Hartman 1955

Literature: Dauvin, J.C., E. Thiebaut. 1994. Is *Owenia fusiformis* Delle Chiaje a cosmpolitan species? In: J. C. Dauvin, L. Laubier, D.J. Reish(eds). Actes de la 4eme Conference internationale des Polychaetes. Mem. Mus. natn. Hist. nat. 162:383-404. Paris.

Diagnostic Characters: (see Figures 1,2,3, & 4)

1. Anterior end with branchial lobes that increase in complexity with age and become a highly branched tentacular crown. Crown often with bands of brown pigment.

2. Small specimens and juveniles have a slightly produced collar that often requires close inspection or manipulation with a fine probe to view. Larger or more mature specimens have a clearly visible collar.

3. Latero-ventral eyespots commonly are seen at base of crown near collar in most specimens. These spots may be absent or diminished in size and density. In many specimens these eyespots appear as small round concentrations of pigment.

Comments:

Differences between tube structure is likely related to the specimen's habitat and is not a taxonomic character. Uncinal characteristics such as tooth arrangement and shoulder prominence have been observed with SEM techniques. Though some slight differences can be detected, they are not diagnostic of a species concept. There are no morphological conditions which justify a separation between *O. collaris* and *O. fusiformis*. *O. collaris* is a junior synonym of *O. fusiformis*.

Distribution: Cosmopolitan, abundant in shallow waters (0-40 meters). Also recorded to 2,325 meters.

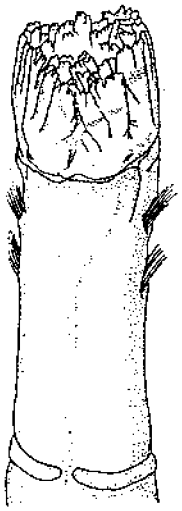


Figure 1. ventral
(Imajima & Morita 1987)

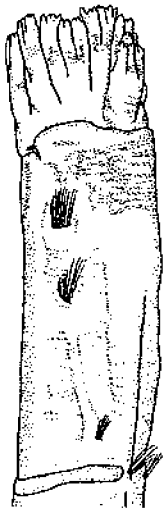


Figure 2. lateral
(Imajima & Morita 1987)

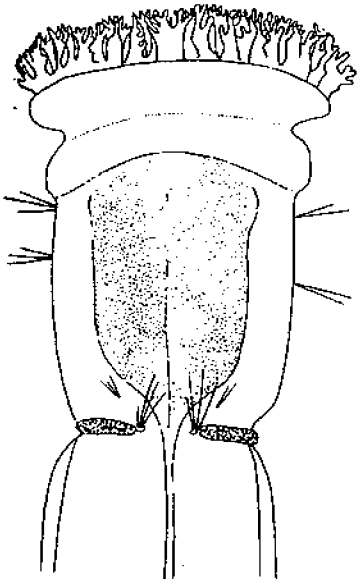


Figure 3. dorsum
(Hartman 1969)

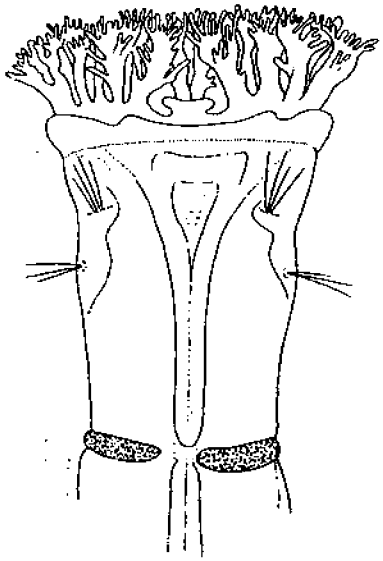


Figure 4. ventrum
(Hartman 1969)