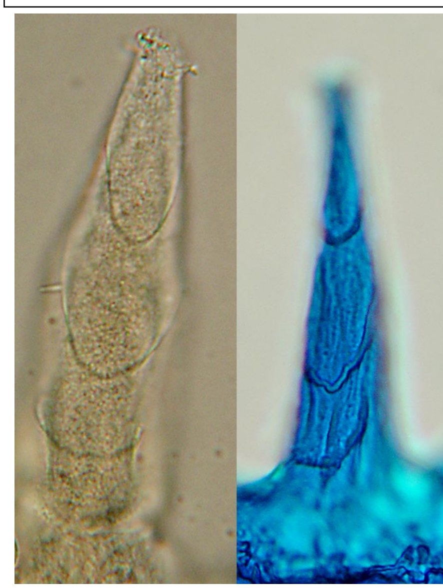
Southern California Association of Marine Invertebrate Taxonomists

November, 2002

SCAMIT Newsletter

Vol. 21, No. 7

SUBJECT:	Bight'03 Q/A meeting - Crustacea
GUEST SPEAKER:	Discussion Lead - Don Cadien
DATE:	21 January (Tuesday) 03
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	City of San Diego Marine Lab 4918 N. Harbor Dr. suite 201



Glycera pacifica Kinberg 1865
1000X (Oil immersion)
Proboscideal organs with three ridges
Right image of proboscideal organ that has been alcian blue stained and dried.
City of San Diego ITP I-35 rep 2, 15July2002 18m
Identified by R. Rowe Deposited in DLZ 2120
Images with Sony 707 Nikon Optiphot 2 by R. Rowe

UPCOMING SCAMIT MEETINGS

January 21st - Don Cadien will begin a series of Bight '03 Quality Assurance meetings. It is currently planned that benthic community sampling will be extended down the Continental Slope to 500m depths. This meeting will address slope crustaceans to familiarize SCAMIT members with the constituents of, and ways of dealing with, the slope fauna.

February 10th – President Kelvin Barwick will discuss the future direction of SCAMIT at SCCWRP.

March - A possible 3-4 day Delta workshop (that may run over a weekend) for all interested SCAMIT members regardless of what taxonomic group you work on. Dates to be decided upon. Please contact Vice President Leslie Harris ASAP if you are interested so we may see what dates work for the most people.

The SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.

Leslie is also looking for interested parties willing to lead a crustacean taxonomic workshop next year or meetings on other groups besides polychaetes.

SCUM MEETING

The annual meeting of the Southern California Unified Malacologists will be held Saturday, January 25, 2003 from 8:30am – 3:30pm at the:
City of Laguna Hills Community Center
25555 Alicia Parkway
Laguna Hills
(949) 707-2610 or (949) 707-2680

NEW LITERATURE

Last year SCAMIT held a meeting at Dancing Coyote Rancho with John Ljubenkov and Meg Daly on edwardsiid anemones. Meg was unused to having a group of people together who were actually interested in the taxonomy, ecology, and behavior of these small burrowing cnidarians. We now have the results of her microanatomical studies (Daly 2002). She investigated many character states not normally used by taxonomists approaching the animals from the outside. Little or no dissection is the norm for most of us who deal frequently with edwardsiids. We believed that we could tell them apart based on external characters of body proportion, nemathybome size and distribution, nature of the investment, and other gross characters. She provides a revision of the family Edwardsiidae based on her studies and cladistic analysis of the characters developed in her anatomical study as well as molecular characters. The two data sources were in general agreement, although there were a few slight differences in detail. The family separated into the same two subfamilies suggested earlier by Carlgren, Milneedwarsiinae and Edwardsiinae. The genus *Edwardsia* appeared paraphyletic – a grade rather than a clade, and the genus *Edwardsianthus* was validated by the results as a separate taxon containing two species previously assigned to *Edwardsia*. *Scolanthus* also seemed to separate as a clade. Several species and groups within *Edwardsia* still need to be further resolved before the paraphyly is fully removed. No nomenclatural actions are necessary in our local usage to bring it into agreement with Daly's results.

I am not one who cherishes nemerteans. It was heartening to me to find out that they are not very popular with more natural consumers either (not that my antipathy extends to eating them – which I haven't tried). McDermott (2001) reports on nemerteans as prey; he addressed their predatory behavior in an earlier paper (McDermott & Roe 1985). After a thorough canvas of the literature the author was only able to find a few species of fishes reported to consume nemerteans, mostly flatfishes. Since the frequency of identification of nemerteans in fish guts at sea was much lower than in the laboratory, part of their scarcity in guts may reflect lack of detection by observers. Consumed nemerteans were usually large heteronemertines such as *Cerebratulus* or *Micrura*. Birds and invertebrates also showed little dietary preference for nemerteans based on gut analysis, field observation, and food choice experiments. Since some tested nemerteans are toxic and/or distasteful, the infrequency with which they fall prey to other organisms seems reasonable. There was some indication that they were attractive as potential prey while swimming in the water column, but that predators that gobbled them up often regurgitated them. The author also explored the odd situation of two large species which support bait fisheries in the eastern US and in South Africa. While both appear toxic they are effective bait for some fishes and have been so for quite some time.

Biologists are notoriously difficult dinner guests to mix with a more general population of society matrons, tax accountants, professional hit men, lawyers and insurance executives. They tend to stray casually into conversational areas which appall and repulse others. Next time you are at dinner you might want to bring up for discussion Rouse 1999, a comprehensive reexamination of the cladistic value of the ultrastructural analysis of worm sperm. The author masterfully pulls together prior research and recent developments into an up-to-date presentation of the state of knowledge on the subject. 'Nuff said'.

The Chinese mitten crab, which has bedeviled the Sacramento Delta region and San Francisco Bay in recent years as an invasive exotic, is usually considered to be an estuarine species dependant for at least a portion of its life cycle on fresh or brackish water. The report of Normant et al (2002) about the status of the animal in the Gulf of Gdansk in the Baltic indicates otherwise. The authors report that the species is often taken in the open Baltic (still a partially enclosed body of water, but very open compared to a bay), and that finding berried females offshore is not uncommon. They also report that according to previous work off Finland the species breeds in the North Sea. Many of these waters are not fully saline for some or all of the year, but the report of *Eriochir sinensis* breeding in the North Sea bodes ill for us here in California. So far there has not been any indication of movement of the San Francisco Bay/Delta infestation into offshore waters. *Eriochir* was originally introduced into European waters in the 1930's however (or earlier according to some), and the current situation there is a long-term result. We must carefully watch this species in California waters, and not be complacent in its current restriction to estuarine waters and embayments. The Polish experience shows that the potential for offshore movement is present, if presently unfulfilled.

MINUTES OF 21 OCTOBER MEETING

SCAMIT members reviewed the monograph on the polychaete family Glyceridae by Markus Boggemann. He examined over 4000 specimens from around the world and concluded that of the 172 published species only 42 taxa remain valid. He includes a detailed exploration of glycerid biology, illustrated with numerous SEM photographs and line drawings. The bulk of this large work contains the scoring of 63 anatomical characters and re-characterization of valid taxa. Each taxa represented includes a detailed written description, distribution map, anatomical line drawings, and SEM photos of the proboscidial organs. Taxa names impacted by Boggemann's conclusions include several that are included in the 4th edition of the SCAMIT List. These are:

Glycera nana is considered *Glycera branchiopoda* and *Glycera capitata*.

G. nana and *G. capitata* have been the subject of several reviews discussed at SCAMIT over the last 20 years. SCAMIT has followed Hilbig's 1992 conclusion that *G. nana* is a valid taxa that fits our locally collected material and that *G. capitata* is also a valid taxa that may occur. The specimens Boggemann examined from the west coast are mostly deep material (600-1400 meters) with a single specimen near San Diego in approximately 25-80 meters. Material examined by Rick Rowe differed from Boggemann's representation. The proboscidial organ in local material appears to have a groove instead of the ridge shown in Boggemann's illustrations. Local material also has longer neuropodial presetal lobes than notopodial lobes which represents an opposite condition from that presented by Boggemann. This local material also has smaller ventral cirri than Boggemann's description. After examining the *G. nana* syntype at the SCAMIT meeting and noting that our local material did not match, it was decided that a provisional SCAMIT species would be created with a voucher sheet.

Leslie Harris commented that *G. branchiopoda* was a valid taxa. It is likely only collected from very deep samples. She also commented that the dorsal and ventral podial lobes were extremely long and not likely to be mistaken as typical for any other local *Glycera*. A specimen identifed as *G. branchipoda* was examined. It was collected from 590 meters in the San Pedro Channel by CSDLAC and appeared to fit the description available in the MMS ATLAS. The parapodia were long with very long lobes that were thin walled tubular structures resembling branchial conditions. CSDLAC routinely samples at 300m and has yet to see *G. branchipoda* there.

<u>*Glycera americana* is considered *G. pacifica*.</u>

Boggemann concludes that *G. americana* has only 2 proboscidial organ ridges, while *G. pacifica* has 3 ridges. Up until this separation the organ ridge count considered acceptable for *G. americana* included 2-3 such ridges. It is unclear if this diagnosis is reliable. Even the SEM of *G. americana* used by Boggemann (pg. 139) appears to have at least one organ with a partial 3rd ridge at its base. A specimen identified as *G. americana* from San Francisco was examined at the SCAMIT meeting and no clear ridges could be observed. With ordinary light microscopy the prominence of such ridges may be problematic, while material coated and prepared for SEM may more clearly show such features. Additionally, it should be noted that the holotype of *G. pacifica* is from the Society Islands, in 1-2 feet, between corals at a coral barrier reef. It is suspicious that such an animal would find mud in deep water a good habitat. SCAMIT members are interested in the organ ridge count and will begin a small project to examine their own *G. americana* material to create a table of ridge counts for comparison and later review. SCAMIT will continue to list *G. americana* until this review is complete.

<u>*Glycera tenuis* is considered *G. oxycephala*.</u>

Boggemann has expanded the definition of *G. oxycephala* to include specimens with 5-20 proboscidial ridges, thus removing the diagnosis that 9-10 ridges and 13-14 ridges are conditions of species diagnosis. Specimens of *G. tenuis* have only 1 presetal lobe and do not fit the *G. oxycephala* condition of two presetal lobes. SCAMIT has decided to continue listing *G. tenuis* as a separate taxa from *G. oxycephala* until further information is available.

<u>*Glycera convoluta* is considered *G. macrobranchia*.</u>

This change was previously reviewed by SCAMIT during creation of the 4th edition of the SCAMIT list and has been adopted. Members should be aware that several taxa with "fingernail" type proboscidial organs have been described, so any identification of *G. macrobranchia* should include an examination of the parapodial lobes and possibly the aileron structure.

<u>*Hemipodus* is considered a nomenclatural error and should be written *Hemipodia.*</u>

Additionally SCAMIT members discussed that local reports of *G. dibranchiata* may occur, but are to be expected mostly in shallow, intertidal, or estuarine samples. *Glycera tesselata* has been occasionally reported, but is possibly not the same animal as the Mediterranean and Southern California specimens which have a different body pigmentation pattern. A local *G. tesselata* specimen collected from 305 meters was examined. It was darkly pigmented over its body with reddish brown and biannulate body segments. Mediterranean specimens of *G. tesselata* have dorsal podial lobes noticeably shorter than the ventral podial lobes, while the local specimen has the dorsal podial lobe longer than the ventral. Also this local specimen's lobes appeared to be more angular in shape with more pointed terminal ends. Leslie Harris has seen live specimens of *G. tesselata* from the Mediterranean and they have a distinct body pigmentation that consists of a red diamond reticulation pattern, whereas live specimens of our local *G. tesselata* don't have this. For now SCAMIT has decided to keep using the *G. tesselata* name while members collect more data and specimens even though this may eventually be a different taxa.

Boggeman reports the species, *Glycera lapidum* occurring in the Gulf of California and he examined several specimens from there. He also states that an epitokous specimen reported by Ehlers 1868 from Mendocino county as *G. capitata* actually belongs as *G. lapidum*. Currently no SCAMIT members have ever seen this species in any of our samples, but according to Boggeman it does occur to the north and south of us. Rick Rowe pointed out that it would be difficult to miss the distinct ornamentation on the proboscidial organs.

Specimens of *Glycera rouxi* have been re-examined by Leslie Harris and determined to be *Glycera robusta*.

Glycera robusta remains a valid taxa with a reliable description.

Boggemnan's massive work contains some of the best illustrations of glycerid anatomy in publication and has provided the most extensive review of the family to date. Unfortunately some of the taxonomic changes are not accompanied by a thorough explanation or discussion and thus do not provide a basis for the changes. For example: When Boggemann concluded that *G. tenuis* belongs within *G. oxycephala*, he merely stated: "the holotype has been examined….and is referred to *G. oxycephala*". It would be helpful to know what features on the holotype were found identical to *G. oxycephala*. If the *G. tenuis* holotype is different from its description, it would be helpful to know how it was different. Boggemann was recently asked why should Hilbig's 1992 conclusions about *G. nana* and *G. capitata* be ignored? He replied: "…the type material of *Glycera nana* from the Puget Sound show clearly that this taxa is identical with *Glycera capitata*….some of the California material by Hilbig…belong to *Glycera branchipoda*…and the other part might be *Glycera lapidum*…" Unfortunately he did not specify the basis for this conclusion and this makes it difficult when evaluating specimens, illustrations, and descriptions.

In conclusion, Ricardo Martinez Lara (CSD) has created a table to the common shelf-depth Glyceridae in Southern California. It is attached at the end of the NL.

In the afternoon, SCAMIT members were treated to not only a presentation by a PhD student, Ana Claudia from Brazil, but a wonderful black bean stew with pork and sausage that she made for lunch. Ana is studying the phylogeny of the polychaete group, Magelonidae. She has examined lots of material from Brazil and is currently looking at material at LACMNH. She is doing a cladistic analysis and a comparative study of 56 distinct characters of the group. She is also looking at the group's biogeography, particularly with regards to the Pacific and Gulf of Mexico. For her preliminary conclusions, Ana believes that Magelonidae genera should be organized based on new phylogenetic information and that some features traditionally used in Magelonidae taxonomy (example: horns) are not useful. She has come up with a new genus, *Octomagelona* and 3 new species from Brazil. One of these new species she showed us has "arcuate" setae present in all abdominal setigers. These are curved, half-circular internal spines in the lamellae with large blunt rounded ends. Each lamella has a curved spine and they are not joined together near the body wall. They are best viewed under oil. Her research should add a great deal of knowledge to what we already understand about the Magelonidae. We greatly look forward to reading her dissertation in the future.

The Secretary would like to thank Tom Parker (CSDLAC) and Cheryl Brantley (CSDLAC) for taking the minutes at October's meeting. This unenviable task usually falls on the competent shoulders of Kathy Langan (CSD), who I would also like to thank again and into perpetuity for her continued assistance with the minutes. Since "yours truly" "doesn't do polychaetes" and therefore abhors the idea of

trying to keep up and take minutes at such meetings, any and all help is greatly appreciated, trust me.
- M. Lilly, Secretary

NEWSLETTER NOTE

The reader will notice that the box on the last page now contains additional information concerning membership dues and benefits as well as SCAMIT's new, official mailing address at the LACMNH. We have also removed the former address from the front page. In the next couple of months we will be developing a "new look" for the Newsletter so keep your eyes peeled for changes and feel free to give us your opinion.

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

SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers at their e-mail addresses:

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Treasurer	Cheyl Brantley	(310)830-2400x5500	cbrantley@lacsd.org

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 - 15 .... $ 20.00/vol.

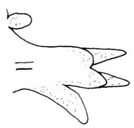
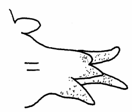
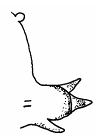
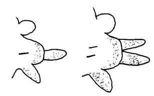
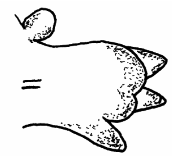
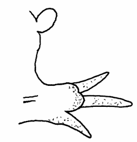
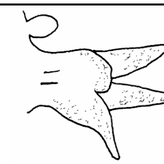
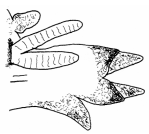
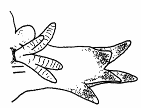
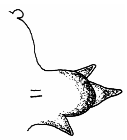
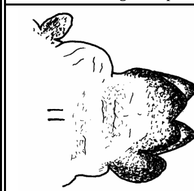
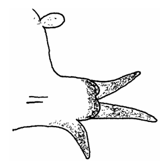
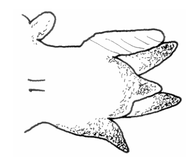
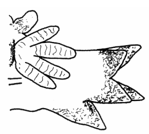
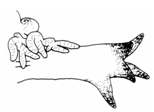
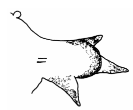
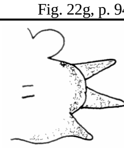
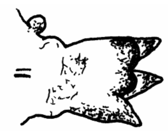
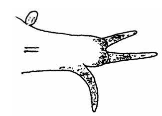
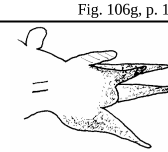
Single back issues are also available at cost.

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

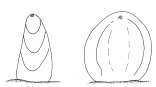
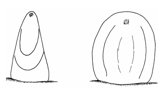
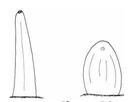
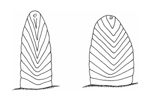
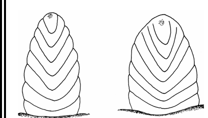
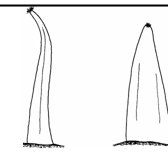
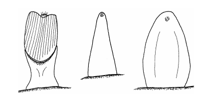
SCAMIT
C/O The Natural History Museum, Invertebrate Zoology
attn: Leslie Harris
900 Exposition Boulevard
Los Angeles, California, 90007

Annotated Tabular Guide to the common shelf-depth Glyceridae off Southern California. Page 1 of 4

R. Martinez Lara 11/02

	G. pacifica Kinberg, 1865	*G. americana* Leidy 1855	*G.* sp BB (San Diego)	*G. capitata* Ørsted 1842 (=*G. nana*)	*G. oxycephala* Ehlers 1887	*G.* sp C (Harris)	*G. robusta* Ehlers 1868	*G. tesselatta* Grube 1863	*G. macrobranchia* Moore 1911 (=*G. convoluta*)
Annotations from SCAMIT meeting 21Oct02	•Check presence of 2 or 3 ridges on proboscidial papillae. This character is potentially difficult to verify, or may be unreliable. Ideally other corroborating characters should be established. According to Böggemann *G. americana* has 2 ridges, and *G. pacifica* 3 on proboscidial papillae. •Review before adopting *G. pacifica*.		•SD material differs from Böggemann's *G. capitata*. Proboscidial papillae with groove instead of ridge. Longer neuropodial than notopodial pre-setal lobes, and smaller ventral cirri as opposed to *G. capitata*. SD material does not match, *G. nana* syntype.		•??Böggemann synonymy with *G. tenuis*. San Diego does not report *G. tenuis* (1 pre-setal lobe), but *G. oxycephala* (2 pre-setal lobes) is common. •Check for variant condition fide Harris = *Glycera* sp C from Bahía de Todos Santos.		No change in species concept.	•Harris notes SoCal. *G. tesselata* may not be the same as Mediterranean specimens, based on live material observations.	Adopted in SCAMIT 4th Ed. Species list
Anterior ppd (*All figs from Böggemann, 2002), except where noted	 Fig. 85d, p. 136	 Fig. 88d, p. 138		 Fig. 16d, p. 90	 Fig. 22d-e, p. 94		 Fig. 52d, p. 114	 Fig. 37d, p. 104	 Fig. 106d, p. 150
Median ppd	 Fig. 85g, p. 136	 Fig. 88g, p. 138		 Fig. 16g, p. 90	 Fig. 22g, p. 94		 Fig. 52g, p. 114	 Fig. 37g, p. 104	 Fig. 106g, p. 150
Posterior ppd	 Fig. 85j, p. 136	 Fig. 88j, p. 138		 Fig. 16j, p. 90	 Fig. 22j, p. 94		 Fig. 52j, p. 114	 Fig. 37j, p. 104	 Fig. 106j, p. 150
Branchie	Retractile, dendritic (emerge from posterior face of ppd)	Retractile, dendritic (emerge from posterior face of ppd)	Absent	Absent	Absent	Absent	Non-retractile, blister-like	Absent	Non-retractile, digitiform
Dorsal cirrus	On body wall Proximal	On body wall Proximal	On body wall distant	On body wall distant	Proximal on base of parapodium	Proximal on base of parapodium-triangular	On body wall Proximal	On body wall distant	On body wall Proximal
Pre-setal lobes	2	2	2 subequal	2	2-subequal	2-Superior very short	2	2	2
Post-setal lobes	2	2	1	1	1	1	2	2	2 (only 1 in Anterior)

* Böggemann, M. 2002. Revision of the Glyceridae Grube 1850 (Annelida:Polychaeta). Abh. Senckenberg. naturforsch. Ges. **555**. 1-249.

	G. pacifica Kinberg, 1865	*G. americana* Leidy 1855	*G*. sp BB (San Diego)	*G. capitata* (=*G. Nana*)	*G. oxycephala* Ehlers 1887	*G*. sp C (Harris)	*G. robusta* Ehlers 1868	*G. tesselatta* Grube 1863	*G. macrobranchia* Moore 1911 (=*G. convoluta*)
Annulations per segment (mid-body)	2	2	3	3	3	2	2	2	2
Proboscidial papillae type; and # of lateral ridges	2 Types: **1**.-Numerous conical with 3 U-shaped ridges; **2**.-Isolated oval to globular without ridges	2 Types: **1**.-Numerous conical with 2 U-shaped ridges; **2**.-Isolated oval to globular without ridges		2 Types: **1**.-Numerous digitiform with straight median, longitudinal ridge; **2**.-Isolated oval to globular without ridges	2 Types: **1**.-Numerous conical with 5-20 ridges with straight medianlongitudinal ridge; **2**.-Isolated oval to globular with 4-11 ridges	~9-10	2 Types: **1**.-Numerous conical with 4-9 ridges with straight medianlongitudinal ridge; **2**.-Isolated oval to globular with 4-8 ridges	2 Types: **1**.- Numerous digitiform with straight median, longitudinal ridge; **2**.-Isolated conical with median, longitudinal ridge	3 Types: **1**.-Numerous with terminal fingernail; **2**.- Less numerous conical; **3**.-Isolated oval to globular without ridges
Proboscidial papillae	 Fig. 85b, p. 136	 Fig. 88b, p. 138		 Fig. 16b, p. 90	 Fig. 22b, p. 94		 Fig. 52b, p. 114	 Fig. 37b, p. 104	 Fig. 106b, p. 150

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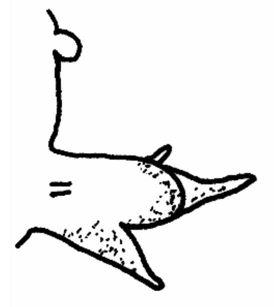
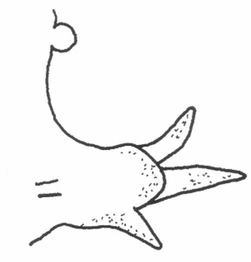
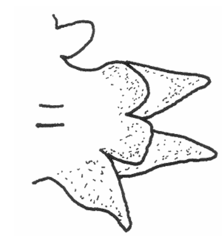
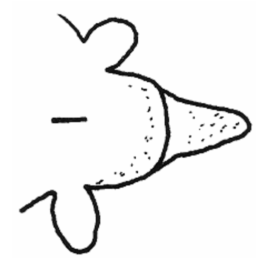
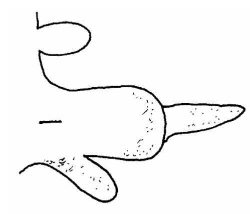
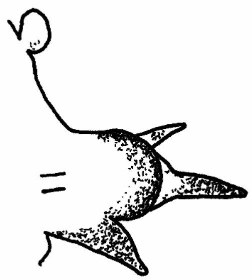
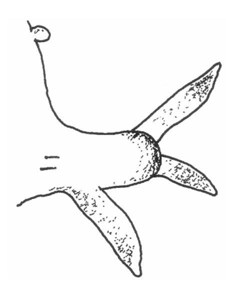
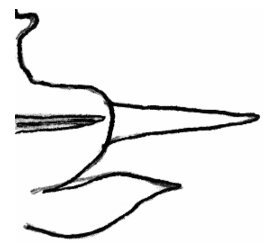
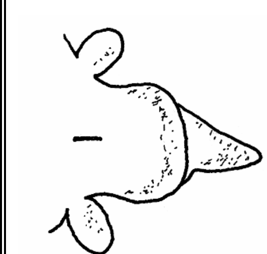
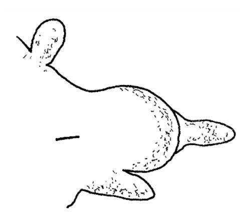
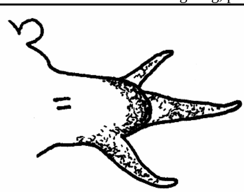
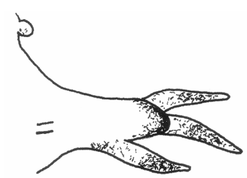
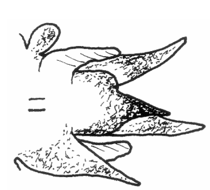
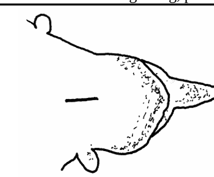
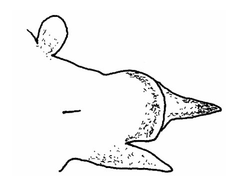
	G. lapidum Quatrefages 1866	*G. branchiopoda* Moore 1911	*G. dibranchiata* Ehlers 1868	*G.* sp LA 1 (Parker)	*Hemipodia californiensis* (Hartman 1938)	*Hemipodia simplex* (Grube 1857) (=*Hemipodus borealis*)
Annotations from SCAMIT meeting 21Oct02				Figures and character scores provided by Tom Parker •Possibly could be missidentified as G. sp BB (San Diego). Note: Dorsal cirrus on body wall distant from parapod.	Note nomenclatural change	Note nomenclatural change
Anterior ppd (*All figs from Böggemann, 2002), except where noted	 Fig. 19d, p. 92	 Fig. 25d, p. 96	 Fig. 58d, p. 118		 Fig. 133d, p. 168	 Fig. 127d, p. 164
Median ppd	 Fig. 19g, p. 92	 Fig. 25g, p. 96	 Fig. 58g, p. 118		 Fig. 133g, p. 168	 Fig. 127g, p. 164
Posterior ppd	 Fig. 19j, p. 92	 Fig. 25j, p. 96	 Fig. 58j, p. 118		 Fig. 133j, p. 168	 Fig. 127j, p. 164
Branchie	Absent	Absent	Non-retractile, simple digitiform	?	Absent	Absent
Dorsal cirrus	On body wall distant	On body wall distant	On body wall proximal	On body wall	On body wall proximal	On body wall proximal
Pre-setal lobes	2	2	2	?	1	1
Post-setal lobes	1	1	2	1	1	1

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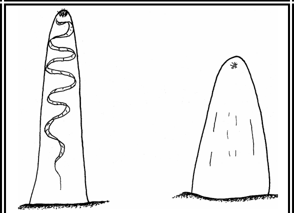
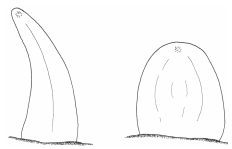
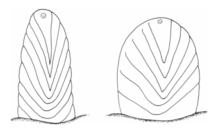
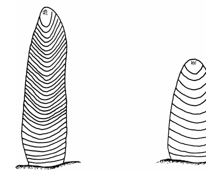
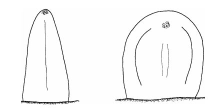
	G. lapidum Quatrefages 1866	*G. branchiopoda* Moore 1911	*G. dibranchiata* Ehlers 1868	*G.* sp LA 1 (Parker)	*Hemipodia californiensis* (Hartman 1938)	*Hemipodia simplex* (Grube 1857)
Annulations per segment	3	3	2	3	3	3
# of Ridges on Proboscidial papillae	2 Types: **1**.-Numerous digitiform with undulating ridge; **2**.-Isolated conical to oval without ridges	2 Types: **1**.-Numerous digitiform with straight, median longitudinal ridge; **2**.-Isolated oval to globular without ridges	2 Types: **1**.-Numerous conical with 4-8 ridges; **2**.-Isolated oval to globular with 3-6 ridges	2 Types No ridges	2 Types: **1**.-Numerous digitiform with 9-40 U-shaped ridges; **2**.-Isolated oval to globular with 7-15 U-shaped ridges	2 Types: **1**.-Numerous digitiform with straight, median longitudinal ridge; **2**.-Isolated oval to globular without ridges
Proboscidial papillae	 Fig. 19b, p. 92	 Fig. 25b, p. 96	 Fig. 58b, p. 118		 Fig. 133b, p. 168	 Fig. 127b, p. 164