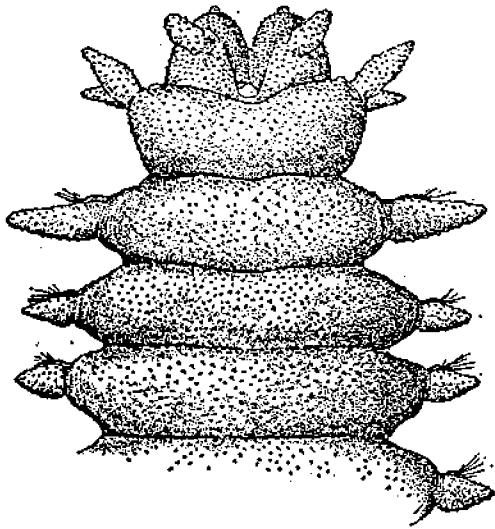


June, 1996

## SCAMIT Newsletter

Vol. 15, No.2

<b>NEXT MEETING:</b>	N.E. Pacific phyllodocids and syllids
<b>GUEST SPEAKER:</b>	Leslie Harris Natural History Museum of Los Angeles County
<b>DATE:</b>	July 8, 1996
<b>TIME:</b>	9:30AM - 3:30PM
<b>LOCATION:</b>	Worm Lab, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles



*Pilargis berkeleyae*  
(from Hartman 1947)

### JULY 8 MEETING

The July meeting will be presented by Leslie Harris, and will reprise her presentation to NAMIT at their recent polychaete workshop. She will brief us on the workshop as well. Leslie has examined the type of *Pilargis berkeleyae* and has resolved the confusion between *P. berkeleyae* and *P. maculata* as a result. She requests you bring specimens of your *Pilargis* for comparison. Also any problem phyllodocids or syllids are welcome.



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FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE  
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.  
*SCAMIT Newsletter is not deemed to be a valid publication for formal taxonomic purposes.*

### NEW LITERATURE

Several newly received papers on ecology or taxonomy were circulated at the meeting .

Desqueyroux-Faundez and Van Soest (1996) review the sponge families Iophonidae, Myxillidae and Tedaniidae in the southeast Pacific - primarily from Chile and Peru. While there is little overlap in the sponge fauna between northeast and southeast Pacific there are comments in this paper which bear on several of our local species.

Two papers on the crab *Pyromaia tuberculata* (Furota 1996a, b) provide the results of life cycle studies on the egg and larval stages, and on the crab stage and reproduction. This crab is introduced in Japan. To my knowledge there have been no equivalently detailed studies done here, where it is endemic. Furota found year-round breeding, and production of 2-3 generations/yr. in the Japanese population studied.

The relationship between cumaceans and organic enrichment was examined by Corbera and Cardell (1996), who found several species to be tolerant of enriched conditions. They also found vertical displacement of bathyal species into normally sandy shelf sediments when they were enriched with finer particles and organics.

Two papers on the ecology of mytilid bivalves were also circulated. The first (Peña *et al.* 1995) deals with the biometrics of the clam *Modiolus capax* in a population from Costa Rica. The second addresses the introduced *Musculista senhousia* in Mission Bay (Crooks 1996). Recruitment, growth, distribution, biomass, longevity and mortality of the species in Mission Bay were discussed and found generally similar to that shown in it's home range.

A paper apropos the gastropod revisionary theme of the meeting was also examined. Hickman (1995) presented a discussion of a potentially

very informative portion of the life of gastropods: that in which the larvae metamorphose. She studied a Hawaiian turrid by hatching larvae in the laboratory; providing access to numerous larvae throughout the critical metamorphosis period. Changes at the protoconch/teleoconch shell boundary were examined by SEM, and showed details of the process which may provide meaningful characters for future cladistic analysis.

It should also be noted that the last number of the Bulletin of the Southern California Academy of Sciences (Volume 95[1], April 1996) presented the proceedings of a symposium on Coastal Watersheds and their Effects on the Ocean Environment held at the 1995 SCAS meeting. Several members contributed to this including Ann Dalkey, John Shisko, Steve Bay, Darrin Greenstein, Ken Schiff, and John Dorsey.

Subscribers to Annelida on the net have already heard of the following, but we felt we should bring them to the attention of our unconnected members. Pleijel and Eide (1996) discuss the phylogeny of the polychaete genus *Ophryotrocha* with some members of *Dorvillea*, *Ougia* and *Protodorvillea* used as outgroups. A mixture of morphological, biochemical and reproductive characters were used in the analysis.

A new cladistic analysis of the animal kingdom at the phylum level (Nielsen *et al.* 1996) advocates monophyly for both the Spiralia and Articulata (which in this analysis includes mollusks). The analytic results are compared with those of other recent attempts to objectify the high level organization of the animal kingdom.

### FINANCIAL MATTERS

In the last Newsletter we presented the status of SCAMIT finances via a summary of the Treasurer's Report, and mentioned points brought up during discussion of financial matters at the May meeting. We now have additional

members who have yet to make their views known (and do not find them represented either here or in the last issue) to speak out and be heard.

It has been suggested that SCAMIT should not solicit donations from any outside sources until it spends the money it has, especially since it has more than \$18,000 currently due to monies received for work done through SCCWRP for EPA. This seems appropriate and at the current rate of expenditure it would take a number of years for the organization to use these funds up. However, since expenses have gone up every year in the past as we continue to improve the quality of work produced by the membership these funds may not last as long as we would hope for. Several members feel that it would not be unreasonable to ask our past supporters such as Arco, Chevron, and Texaco for a donation to offset costs associated with producing our newsletter and/or annual Taxonomic Listing (the major expenditures of the organization), especially since we credit them every month for funds that have long since been used up. After all, the worst they can do is say no. Support of this type would allow us to retain most or all of our current balance as a sort of endowment generating interest income to support the activities of the group.

It has also been suggested that SCAMIT could add a place for donations from its own membership on the annual membership renewal notice. Many members have their membership dues paid for by their employers and perhaps would not be adverse to making a donation from their own pocket, especially one that is tax-deductible.

Also, while SCAMIT's April Fool's edition of the newsletter was well received by most members it was suggested that perhaps we should not waste money on a repeat edition. The newsletter staff would like to inform members that we are not planning more than a few additional pages to next year's April newsletter and will definitely keep the expense of printing

and mailing in mind. However, it won't hurt our feelings if members would prefer we kept our sense of humor to ourselves, or at least out of print.

### NEW INDEX

A new index to the contents of the Newsletter (attached) has been prepared to include all issues through the end of Volume 14. Our thanks again to member Faith Cole (EPA) for the labor necessary to make this helpful tool available to us all.

### MINUTES OF THE 10 JUNE MEETING

The meeting was opened with a brief discussion of a non-marine invertebrate topic. John Ljubenkov (MEC) brought several examples of an insect he had captured in his hot-tub at Rancho Cuca in northern San Diego County (where our Nemertean Workshop was held last October). He had tentatively identified them as a described species of firefly, but could find no mention of the occurrence of fireflies in southern California. He had observed their behavior in response to the red LED indicator lights on his hot-tub - an obvious mating dance - and had seen them flash upon falling into the tub. [John later took them to the Museum's entomologists, who concurred with his ID]. We also mentioned other luminous occurrences of earthworms and a few other animals before we settled down to marine invert business.

President Ron Velarde relayed some information from Paul Scott (SBMNH), editor of the Taxonomic Atlas of the Santa Maria Basin series. Paul indicated that some of the issues of the series had been much in demand, and as a result were out of print. Among these was Vol. 4 - Annelida Pt. 1. A second printing is being prepared, and it may contain errata which have come to the Editor's attention since initial publication; including comments put together by SCAMIT members on errors of omission and

commission. More radical changes may be made when Volume 1-Introduction... is reprinted.

It is not yet clear if these errata sheets will be distributed to previous purchasers of the volume, or only included in the reissue copies. It may be that errata sheets will be distributed to Series subscribers only, in which case SCAMIT can serve as a distribution point for those who have purchased only selected volumes.

He also mentioned that the City of San Diego MWWWD will be conducting a second year of investigations this year, part of "before" data collection prior to construction of the International Treatment Plant just north of the U.S./Mexico border.

They are also engaged in a sort of continuation of the SCBPP on a localized basis. These data will provide an interesting continuous series to connect the results of the SCBPP with the Southern California Bight Demonstration Project currently scheduled for summer 1997.

Analysis of the SCBPP data is in its final stages. Along the way much was learned about the problems in analysis of datasets derived from different sources, even using standardized procedures. Data standardization has been performed in a series of sequential passes. In the current set data from other surveys have been integrated with that of the SCBPP for comparison and for QC of the analytical methodology. This has necessitated another round of taxonomic standardization which is nearly complete. Final analysis of the SCBPP data should be completed within the next few weeks. Several different methods are being used, including the ecological application of cladistic methodology employed by the Hyperion Lab (CLAEMD) in recent years.

Members were reminded of the upcoming meetings of the Western Society of Malacologists and Crustacean Society in San Diego; which take place 23-27 June and 14-18 July, respectively. Members should consult Newsletter Volume 14 #11 and #10 for additional details.

More advance notice is offered of the 7th International Symposium on Aquatic Oligochaetes, scheduled for 18-22 August 1997 in Presque Isle, Maine. Few of us currently work with this group; perhaps this is the opportunity to begin to do so. Registration information is attached.

Another meeting scheduled for 1997 is the California and The World Ocean (CWO '97) Conference to be held in San Diego March 24-27 1997. This event is intended to bring together representatives of a broad spectrum of disciplines for discussions of ocean and coastal resource management along the entire California coast. A preliminary notice and call for papers and/or sponsorship is attached.

The 2nd NAMIT Polychaete workshop was held immediately after the May SCAMIT meeting, and will be reported on at our July meeting by Leslie Harris, the only southern California SCAMIT member in attendance.

After these preliminary subjects we began to address the primary purpose of the meeting; examination and evaluation of the new prosobranch gastropod section of the Taxonomic Atlas (Vol. 9 - The Mollusca Part 2). As indicated by the author (Dr. James McLean, Curator of Mollusks at the Natural History Museum of Los Angeles County), this publication was based on more than the collections from the Santa Maria Basin and Western Santa Barbara Channel which form the putative basis of the series.

He chose to examine the offshore gastropod fauna of the Southern California Bight as a complement to his previous handbook on its inshore mollusk fauna (McLean 1969, rev. 1978). This is the first critical reexamination of the offshore mollusk fauna in well over 50 years, and consequently many nomenclatural and taxonomic changes are drawn together here for the first time. A number of these have not previously been applied to our fauna by SCAMIT members, so there are numerous differences

SCAMIT Taxonomic Listing (ed. 2) and this review (see attached tabular summary).

Members had a minimum of several weeks for examination of the new volume prior to the meeting, and were asked to detail any concerns or questions which had arisen during their examinations. They were also asked to report detected errors at the meeting. We listed a number of areas in which the changes introduced prompted questions. These are detailed below along with the responses to these questions by Dr. McLean.

Aside from a few minor typographic and spelling errors, we were unable to find mistakes in the volume.

Although indicating that full discussion of higher classification and molluscan phylogeny was omitted as not appropriate to the nature of the volume (primarily an identification manual), Dr. McLean did utilize many of the results of recent cladistic reevaluations of gastropod phylogeny. In consequence there are many inconsistencies between the hierarchies used in his work, and in the SCAMIT Taxonomic Listing (ed. 2). [A placement of the species included in the SCAMIT listing and those mentioned by Dr. McLean in the new volume into the hierarchy used by him is attached].

We discussed the advisability of adopting these changes, since the higher classification of the gastropods is still in flux, and several basic questions are still hotly debated. Knowing that Dr. McLean was working on a comprehensive reexamination of the fauna (including both inshore and offshore members and descriptions of several hundred new species) it was suggested that SCAMIT might wait to adopt a new higher category classification until its completion. Although there would still be instability in some portions, the comprehensive review would serve as a reference point for regional standardization for many years.

After lunch Dr. McLean joined us and fielded our questions concerning his portion of the volume (questions on the Opisthobranch portion were deferred until we can directly address them to it's author, Dr. Terry Gosliner, later this year).

One initial query had to do with the timing of adoption of higher taxonomic changes; do it now or await greater stability - as discussed earlier. He seemed to see no impediment to adoption of at least the changes embodied in his present volume, and recommended that we not delay. A copy of the proposed modifications as distributed at the meeting (and attached here) is being reviewed by him for appropriateness. A bibliography of some recent summaries and/or discussions of higher level taxonomy in the gastropoda is attached.

Questions posed to Dr. McLean (and his answers to them):

1) *Alvania tumida* is one-half the size of *Alvania rosana*, and this size difference forms the basis of separation of the two species in the key. Is there any other characteristic to distinguish these two species from one another besides size? *A. tumida* has a finer clathrate sculpture. *Alvania compacta* is another species that occurs in so. Calif., but in shallow waters. *A. compacta* closely resembles *A. rosana* in sculpture, but is less inflated and has a deeper suture. A number of other species placed by Bartsch in *Alvania* bear strongly sculptured nuclear whorls, and are being transferred to *Alvinia*.

2) Why remove *Crepidula glottidiarum* from the synonymy of *C. nummaria*? *Crepidula glottidiarum*, is a slipper limpet commonly seen by SCAMIT members, who had until now been following Hoagland (1977) in relegating it to the status of a *situs* form of *Crepidula nummaria*. Members generally agreed that this was more than a *situs* form, and with it's removal from synonymy and elevation back to specific status. Differences in shape and periostracum development and nature seemed to us consistent

throughout growth in this animal. Dr. McLean would like information on the range extension for this species, especially from San Diego.

3) Why revive *Crepidatella*? The revival of use of the genus *Crepidatella*, which had been submerged within *Crepidula* by Hoagland (1977) was also addressed. Don Cadien expressed the position (espoused by Hoagland) that detachment of the deck along one side which characterizes *Crepidatella* is only the end point of a gradient in indentation of the deck along one side. Dr. McLean disagreed, indicating that this was a series of discrete steps, not a gradient, that each was characteristic of a different subgenus within *Crepidula*, and that the total detachment of *Crepidatella* was worthy of generic level separation.

4) What is the basis of the generic names in the family Eulimidae? We were interested in the generic level changes in the family Eulimidae which were incorporated into the new volume. Dr. McLean indicated he was following Warén in generic separations. Use of the tongue-twister *Polygireulima* was necessary because Warén considers each genus to occur on only a single class of host. Since *Balcis* is parasitic on holothurians, the asteroid-associated *B. rutila* must go to a different genus. Members present at the meeting surprised Dr. McLean by informing him that they commonly see this species occurring on asteroids as well as sea cucumbers.

Either Warén is wrong in his assertion of class fidelity within genus, or we have two different species in two different genera, confounded locally. Don Cadien suggested that members re-examine their specimens of *Balcis oldroydae* and perhaps submit them to Dr. McLean for confirmation. A similar multi-class host situation was mentioned for the genus *Vitreolina*, but in that case these seems good separation of the genus on shell morphology as well.

5) What happened with the epitoniids, why are we dropping the generic designations introduced

locally by DuShane? Use of these previously subgeneric taxa as genera was not supported in DuShane (1979), only implemented. Since then work in the north Atlantic (Bouchet and Warén 1986) has indicated that these are better left as subgenera, a course adopted in the Atlas. Members should note that changes in the synonymies of two species are introduced in the Atlas, and these may affect names they are currently using in their data.

6) What happened with the ovulids, why are we dropping the generic designations introduced locally by Cate? The elevation of subgenera to genera practiced by Cate in his revisions was considered unwarranted by Dr. McLean, who has returned all local species to the genus *Neosimnia* in the Atlas.

7) Can you explain the basis of the splitting of the turrids into different groups, and merging of some with the conids? Most of the rearrangement has to do with the anterior digestive tract, particularly the radula. Turrids have a reduced ribbon-like radula, while conids have venom glands associated with hollow marginal teeth that are used like hypodermic needles. There are also differences in the presence/absence of the basal membrane, and loss of the odontophore in the conids. The actual mechanics of use of the harpoon-like teeth of conids was too complex to be adequately discussed without more preparation.

8) With the description of the new species of *Crockerella* in the Atlas, are they all now described from our area? There are probably a few more *Crockerella* species occurring in the Bight than were included in the MMS Atlas because Dr. McLean only included those species he had adequate material of. There are also new species which only occur in Mexican waters, and do not range northward into the Bight (as yet).

9) Why are nearly all Coover's papers on marginelliform gastropods in his own privately published journal when his present work seems so thorough and authoritative? Coover was

working in a vacuum, largely self-taught in marginellid systematics, and assumed his observations were not that significant. He rapidly became a world-authority on the group, and his separation of the Cystiscinae from the Marginellidae at family level seem well justified. This usage is reflected in the Atlas.

10) Since you didn't deal with the pyramidellids in the Atlas, what are you doing with them for your upcoming monograph on west coast gastropods? Work on the group is now virtually complete, and a great many of the names proposed by Dall and Bartsch will fall as synonyms. They were pursuing an extreme typological concept, and assumed that any geographic distance was sufficient to warrant a new species if some morphological variability was evident. Dr. McLean commented that Dall and Bartsch worked when microphotography wasn't available, so they had to rely on an artist's drawing or enhancement of an underdeveloped photo. Often their illustrations don't look anything like the real specimen. In consequence a large number of new species were erected on inadequate characters. The number of "valid" pyramidellid names will be reduced by at least half, if not two-thirds in the monograph.

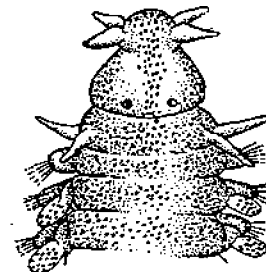
The scaphandrid synonymies listed in Table 1 of the handout attached to Newsletter Vol. 14(11), were not derived from the Atlas as had been assumed. They were included in error, as they are part of an unpublished manuscript of Dr. McLean's rather than his published works. They should not be used by SCAMIT members. The editor apologizes for the mix up, and hopes that there will be no further pre-publication usage of this work.

### POLYCHAETE PROSTOMIAL PRANKS

Much has been written about the dimensions and appearance of the prostomium in taxonomic literature. Relative position of antennae, eyes, and pigmentation have all been used as diagnostic characters by authors. Many workers now

recognize that fixation can greatly modify the true appearance of the prostomium and use such features cautiously (see last month's comments on *Eumida*). Blake (1994) provides information on the prostomial length and width that supposedly helps distinguish *Eteone californica* from *Eteone longa* in the MMS Taxonomic Atlas. His key lists the prostomium width of *Eteone californica* as equalling it's length, while the accompanying text describes the prostomium as longer than wide, and amplifies this by comparing *E. californica* to *E. longa*: "...the prostomium is slightly longer than wide instead of wider than long." So far just a straightforward conflict. The accompanying illustration allows for measurement of this ratio, and the illustrated prostomium is actually slightly wider than long! You might want to make a note of this quirk in your copy of the Atlas so you don't get the wong answer to the light problem. - Tom Parker (CSDLAC)

*Eteone californica* ⇒  
(from Blake 1994)



### A PARADE OF TEREPELLIDS

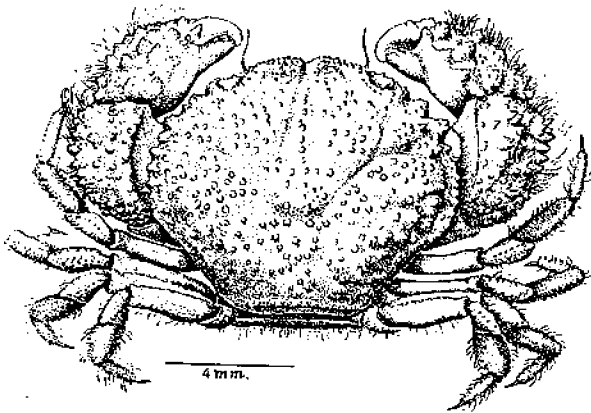
Throughout the late 1980's and into the mid 1990'S there has been a steady and large increase in the number of terebellid specimens taken in some local benthic samples. This parade has been led by *Pista* specimens and resulted in noteworthy numbers and biomass at an increased number of stations. Recently (i.e. January 1996) some samples have shown a new entrant to the parade. A great increase in the number of *Eupolymnia heterobranchia* specimens seems underway. Is this localized or just a sampling blip? If you've encountered a big increase in *Eupolymnia*, drop the editor a note or an e-mail.

--Tom Parker (CSDLAC)

### MYSTERY XANTHID ID'ed

Since its presence was first noted (Newsletter Vol. 13# 4 as *Micropanope latimanus*, a preliminary ID withdrawn in Vol. 13#5) the single specimen of the small xanthid crab taken off Pt. Loma has remained a mystery. Dr. Jody Martin, Curator of Crustacea at the Natural History Museum of Los Angeles County, has been working with this animal for some time. His initial contacts with world-wide xanthid experts were discouraging. No one could suggest the appropriate genus for the animal. More recently he has circulated his drawings of the specimen, and has received tentative identifications from two different sources. It appears to be a species described initially from southern Mexico, *Pilumnoides rotundus* Garth, 1940. The present specimen represents a range extension northward from the Gulf of California.

Dr. Martin has is planning a formal note on this for publication along with his new figures, which show the animals appearance more clearly than the initial illustrations in Garth (setae are not omitted). He will also be providing us a more detailed note on the animal in a future issue.



*Pilumnoides rotundus* (from Garth 1940)

### BIOLOGIST HONORED BY STAMP

One of the recent newsletters was sent out bearing a U.S. commemorative postage stamp honoring biologist Ernest E. Just. The following note was received from Dr. Reish in response -

"The picture of a man on one of the postage stamps on your letter/package is that of E. E. Just, one of the US Postal Service's Black Heritage series. The stamp of Just is the second time a scientist has been so honored in this series ([George Washington] Carver was the first). This is undoubtedly the first time that someone who worked with polychaetes has been so honored. Just published 18 papers from 1912-1935 all on fertilization and development primarily with nereids. He did his work at Woods Hole and many of his papers were published in the Biological Bulletin. He published 4 or 5 papers in German journals, but I do not know if he went to Germany. He was a professor of biology at Howard University, a black university located in Washington, D. C. According to the U.S. Postal Service, the picture of him was taken in 1940. I do not know when he died."

Our thanks to Dr. Reish for his commentary, and to the postal service for honoring one of the few black scientists working with marine organisms.

### JOB ANNOUNCEMENT

The City of San Diego has an opening for a Biologist 1 - Environmental Biologist. This is an open offering, with an unspecified closure date. Those interested should, however, apply as early as they can, since it may close at any time. A copy of the announcement is attached.

### PARAMUNNA VOUCHER

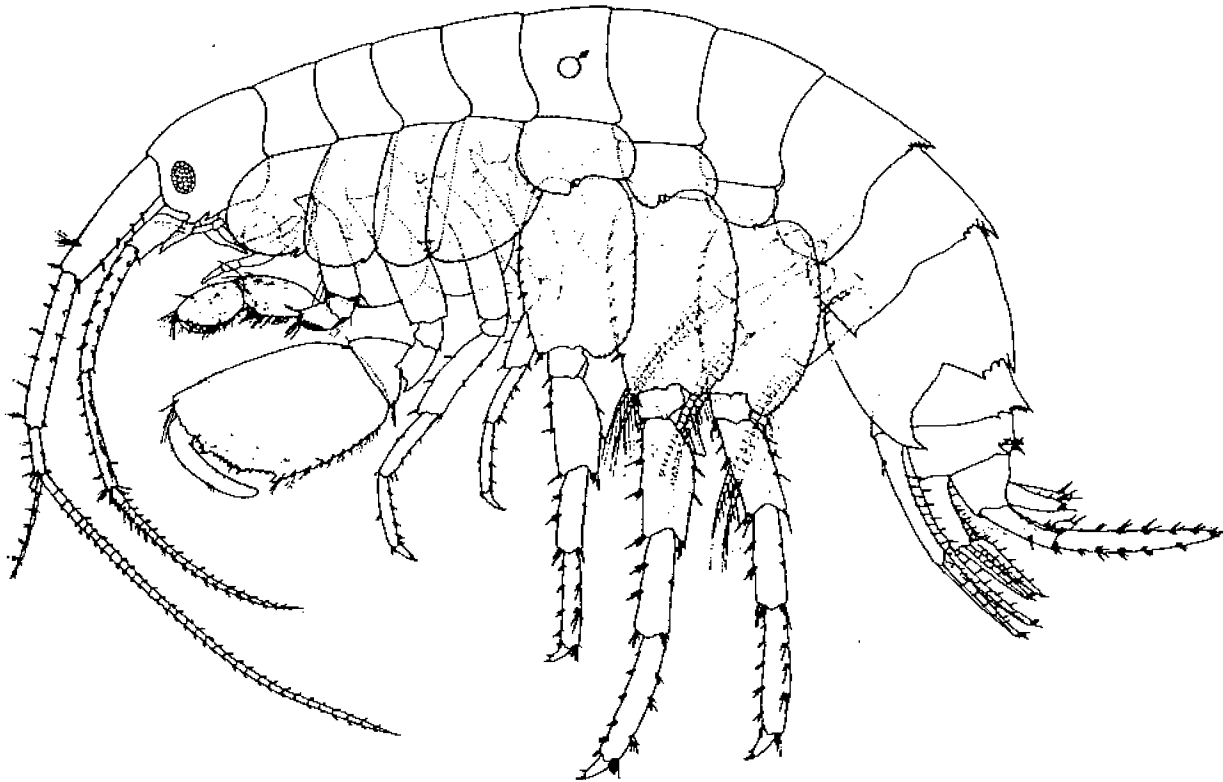
A voucher sheet for the new species of *Paramunna* mentioned in the last newsletter is provided this month. Any comments, additional information, or material is solicited by Don Cadien (CSDLAC).





## BIBLIOGRAPHY

- BLAKE, JAMES A. 1994. Chapter 4. Family Phyllodocidae Savigny, 1818. pp. 115-186 *IN*: Blake, James A. and B. Hilbig (eds.), Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel 4: Oligochaeta and Polychaeta: Phyllodocida (Phyllodocidae to Paralacydoniidae): 377pp.
- BOUCHET, P., and A. Warén. 1986. Revision of the northeast Atlantic bathyal and abyssal Aclididae, Eulimidae, Epitoniidae (Mollusca, Gastropoda). *Bollettino Malacologico*, Supplemento 2:299-576.
- CORBERA, J., and M. J. Cardell. 1995. Cumaceans as indicators of eutrophication on soft bottoms. *Scientia Marina* 59(Suppl. 1):63- 69.
- CROOKS, J. A. 1996. The population ecology of an exotic mussel, *Musculista senhousia*, in a Southern California Bay. *Estuaries* 19(1):42-50.
- DESQUEYROUX-FAUNDEZ, R., and R. W. M. Van Soest. 1996. A review of Iophonidae, Myxillidae and Tedaniidae occurring in the south east Pacific (Porifera: Poecilosclerida). *Revue Suisse de Zoologie* 103(1):3-79.
- DUSHANE, HELEN. 1979. The Family Epitoniidae (Mollusca: Gastropoda) in the Northeastern Pacific. *Veliger* 22(2):91-134.
- FUROTA, T. 1996a. Life cycle studies on the introduced spider crab *Pyromaia tuberculata* (Lockington) (Brachyura: Majidae). 1. Egg and Larval Stages. *Journal of Crustacean Biology* 16(1):71-76.
- . 1996b. Life cycle studies on the introduced spider crab *Pyromaia tuberculata* (Lockington) (Brachyura: Majidae) .2. Crab stage and reproduction. *Journal of Crustacean Biology* 16(1):77-91.
- GARTH, JOHN S. 1940. Some new species of Brachyuran crabs from Mexico and the Central and South American mainland. *Allan Hancock Pacific Expeditions* 5(3):53-127.
- HARTMAN, OLGA. 1947. Polychaetous Annelids Part VIII. Pilargiidae. *Allan Hancock Pacific Expeditions* 10(5):391-522.
- HICKMAN, CAROL S. 1995. Asynchronous construction of the protoconch/teleoconch boundary: Evidence for staged metamorphosis in a marine gastropod larva. *Invertebrate Biology* 114(4):295-306.
- HOAGLAND, K. ELAINE. 1977. Systematic review of fossil and recent *Crepidula* and discussion of evolution of the Calyptraeidae. *Malacologia* 16(2):353-420.
- McLEAN, JAMES H. 1969. Marine Shells of Southern California. Los Angeles County Museum of Natural History Science Series 24, Zoology No. 11. 98pp.
- McLEAN, JAMES H. 1996. The Prosobranchia. Pp. 1-160 *IN*: Scott, Paul H., James A. Blake and Andrew L. Lissner (eds.). 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.
- NIELSEN, CLAUS, N. Scharff, and D. Eibye-Jacobsen. 1996. Cladistic analyses of the animal kingdom. *Biological Journal of the Linnean Society* 57:385-410.
- PEÑA, J. C., R. A. Cruz, Y. S. Lopez, and M. P. Quesada. 1995. Biometry of *Modiolus capax* (Bivalvia: Mytilidae) in Ocotal Beach, Guanacaste, Costa Rica. *Revista de Biología Tropical* 43(1-3):173- 176.
- PLEIJEL, FRED, and R. Eide. 1996. The phylogeny of *Ophryotrocha* (Dorvilleidae: Eunicida: Polychaeta). *Journal of Natural History* 30(5):647-659.
- WARÉN, ANDERS. 1984. A generic revision of the family Eulimidae (Gastropoda, Prosobranchia). *The Journal of Molluscan Studies*, Supplement 13: 1-96



*Megamoera subtener* (Stimpson 1864) (from Jarrett, N. and E. 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)

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

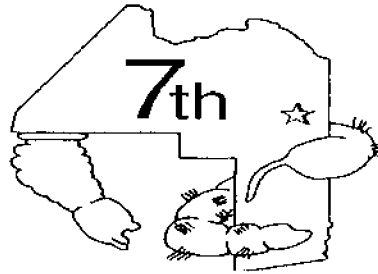
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Back issues of the newsletter are available. Prices are as follows:

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.

SEVENTH INTERNATIONAL  
SYMPOSIUM ON  
AQUATIC OLIGOCHAETES



\*\* PRESQUE ISLE \*\*  
\* MAINE, U.S.A. \*  
18 - 22 AUGUST 1997

### FIRST ANNOUNCEMENT AND CALL FOR PAPERS

Time to think of the **seventh** symposium! It will be held on the campus of the University of Maine at Presque Isle during the 18th to 22nd August 1997. You are invited to present a paper on your research in either oral or poster format, or attend and contribute to discussions on oligochaetology. The major topics of the papers in the symposium will include morphology, systematics, evolution, biogeography, ecology, pollution biology, parasite interactions, and physiology of oligochaetes. Contributions on leech phylogeny and systematics are also welcome. Please share this invitation with your colleagues.

The University of Maine at Presque Isle is one of the smaller campuses in the State University System. Most of the buildings are new and convenient to the adjacent city. Presque Isle is located in northern Maine with the Northern Maine Regional airport located only 3km from the campus. Most flights fly directly the 650km from Presque Isle into the Boston International airport. Presque Isle is situated on US Route 1, 65km north of the end of Interstate 95, and 30km west of the TransCanada Highway as it passes through Perth-Andover, New Brunswick, Canada.

Accommodation, meals and scientific sessions will be held on the campus. The accommodation is in high standard student dormitories, with two people sharing a room. Single person rooms are available at a slightly higher price. If more expensive motel accommodation is desired, this can be booked at one of two motels within 300m of the campus. Tentative prices will be a registration fee of \$100US (maximum) and about \$40US per day for food and dormitory accommodation. Accurate prices will be given in the Second Announcement.

**Please return your tentative registration form BEFORE 1 September 1996.** If you wish to make an oral or a poster presentation please indicate which on the attached form. When, and how long your oral presentation will be, will be announced later. In order to keep the mailing cost as low as possible, only tentatively registered colleagues will be sent the Second Announcement.

Please complete the enclosed form and mail it to:

Dr. S.R. Gelder  
University of Maine at Presque Isle  
181 Main Street  
Presque Isle  
ME 04769-2888  
U.S.A.

FAX: +207-768-9608

GELDER@polaris.umpi.maine.edu

I look forward to seeing you in 1997!

SEVENTH INTERNATIONAL SYMPOSIUM ON AQUATIC OLIGOCHAETES  
PRESQUE ISLE, MAINE, U.S.A. -- 18 - 22 AUGUST 1997

TENTATIVE REGISTRATION FORM

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

TEL. NO. \_\_\_\_\_ FAX: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

Please fill in one of the following:

\_\_\_\_\_ I will attend the symposium, and \_\_\_\_\_ enclose (or \_\_\_\_\_ will send latter) the registration fee.

\_\_\_\_\_ I do not think I will be able to attend, but wish to receive the Second Announcement.

\_\_\_\_\_ I will not be attending the Symposium.

NAME OF ACCOMPANYING PERSON (not participating in symposium): \_\_\_\_\_

TITLE OF ORAL PRESENTATION: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TITLE OF POSTER: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Abstracts of oral and poster presentations MUST be submitted by May 1, 1997**

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University of Maine at Presque Isle  
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**\*\* CALIFORNIA AND THE WORLD OCEAN '97 CONFERENCE\*\*  
PARTICIPANTS AND SPONSORS SOUGHT**

MIDDLETOWN, CA, U.S.A. --- The first statewide effort in over 30 years to bring together an international group of participants to improve ocean and coastal resource management along the 1,100 miles of California's spectacular coastline, the California and the World Ocean '97 Conference (CWO '97) will take place on March 24-27, 1997 at the Town & Country Hotel in San Diego.

PAPERS for presentation are invited to address such subjects as local, state, national, and international governance; ocean and coastal resource economics; habitats and ecosystem management; water quality; fisheries; shoreline erosion and processes; science, research and education; geographic information systems; ports, harbors and shipping safety; tourism and recreation; desalination; oil and gas development, transportation, spill prevention, and cleanup; and mineral resource extraction.

^ The DEADLINE for submitting abstracts is July 12, 1996. Abstracts must be submitted to Orville Magoon, Conference Chair, California and the World Ocean '97, P.O. Box 279, 21000 Butts Canyon Road, Middletown, California 95461 U.S.A.

^ Conference SPONSORS and CO-SPONSORS are being solicited for financial and in-kind contributions to conference operations in order to keep registration fees as low as possible. Current Sponsors and Co-Sponsors include local, State and Federal government agencies, non-profit organizations, private industry, and international institutions. For more information about sponsorship, please call Orville Magoon at (707) 987-0411.

^ The CWO '97 Announcement and Call for Papers is available on the INTERNET through the California Ocean Resources Management Program homepage at:

<http://ceres.ca.gov/cra/ocean/>

To receive a print copy, contact [otmagoon@aol.com](mailto:otmagoon@aol.com) or call Sheila Robertson at (707) 987-2385 extension 208.

ED2#	ED2 TAXON	McLEAN 1996 EQUIVALENT	COMMENTS
386	<i>Puncturella multistriata</i> Dall 1914	<i>Cranopsis multistriata</i> (Dall 1914)	separation of this and several other species from <i>Puncturella</i> based on anatomy
388	Superfamily Patelioidea	Superfamily Acmaeioidea	this usage is attributed to Lindberg 1988
407	<i>Calliostoma turbinum</i> Dall 1895	<i>Calliostoma turbinum</i> Dall 1895	correction to publication date of original description
410	<i>Haliastylus pupoides</i> (Carpenter 1864)	<i>Haliastylus pupoides</i> (Carpenter 1864)	correction to spelling of specific epithet
453	<i>Bittium larum</i> Bartsch 1911	<i>Lirobittium larum</i> (Bartsch 1911)	reallocation following Houbbrick's 1993 anatomical investigations
454	<i>Bittium quadrifilatum</i> Carpenter 1864	<i>Lirobittium quadrifilatum</i> (Carpenter 1864)	by implication all in the subfamily in California except <i>Stylidium</i> are in <i>Lirobittium</i>
455	<i>Bittium rugatum</i> (Carpenter 1864)	<i>Lirobittium rugatum</i> (Carpenter 1864)	reallocated as above
457	<i>Lirobittium subplanatum</i> (Bartsch 1911)	<i>Lirobittium rugatum</i> (Carpenter 1864)	new synonymy based on reexamination of types
464	Superfamily Epitonioidae	Superfamily Janthinoidea	
466	<i>Asperiscala bellastrata</i> (Carpenter 1864)	<i>Epitonium bellastratum</i> (Carpenter 1864)	in discussion of following species on pg. 68, and for the same reason
467	<i>Asperiscala lowei</i> (Dall 1906)	<i>Epitonium lowei</i> (Dall 1906)	<i>Asperiscala</i> returned to subgeneric level based on Bouchet & Waren 1986
469	<i>Nitidiscala catalinae</i> (Dall 1908)	<i>Epitonium sawinae</i> (Dall 1903)	<i>Nitidiscala</i> returned to subgeneric level based on Bouchet & Waren 1986, new synonymy
470	<i>Nitidiscala hindsi</i> (Carpenter 1865)	<i>Epitonium hindsi</i> (Carpenter 1865)	generic allocation as above, publication date of original description rectified
471	<i>Nitidiscala indianorum</i> (Carpenter 1864)	<i>Epitonium indianorum</i> (Carpenter 1864)	generic allocation as above
472	<i>Nitidiscala sawinae</i> (Dall 1903)	<i>Epitonium sawinae</i> (Dall 1903)	generic allocation as above
473	<i>Nitidiscala tinca</i> (Carpenter 1865)	<i>Epitonium tinctum</i> (Carpenter 1865)	reassignment not mentioned, but inferred from above
477	<i>Opalia spongiosa</i> (Carpenter 1866)	<i>Nodiscala spongiosa</i> (Carpenter 1864)	raised from subgeneric status to generic status here
482	<i>Eulima californica</i> Bartsch 1917	<i>Eulima raymondi</i> Rivers 1904	the Pleistocene fossil name was overlooked previously, new synonymy
483	<i>Melanella bakeri</i> Bartsch 1917	<i>Pseudosabinella bakeri</i> (Bartsch 1917)	generic reassignment in McLean 1996
484	<i>Melanella berryi</i> Bartsch 1917	<i>Balcis berryi</i> (Bartsch 1917)	reassignment based on McLean's comments on and diagnosis of <i>Balcis</i> , not explicit in his pap
485	<i>Melanella catalinensis</i> Bartsch 1917	<i>Vitreolina macra</i> (Bartsch 1917)	generic reassignment and new synonymy herein, but based on the generic concept of Waren 1
486	<i>Melanella compacta</i> Carpenter 1864	<i>Balcis compacta</i> (Carpenter 1864)	reassignment based on McLean's comments on and diagnosis of <i>Balcis</i> , not explicit in his pap
487	<i>Melanella grippi</i> Bartsch 1917	<i>Vitreolina columbiana</i> (Bartsch 1917)	generic reassignment and new synonymy herein, but based on the generic concept of Waren 1
488	<i>Melanella micans</i> (Carpenter 1864)	<i>Balcis micans</i> (Carpenter 1864)	reassignment explicit in the paper
489	<i>Melanella oldroydi</i> Bartsch 1917	<i>Balcis oldroydae</i> (Bartsch 1917)	reassignment explicit in the paper, emendation of the name to reflect dedication to Ida Oldroyd
490	<i>Melanella rutila</i> (Carpenter 1864)	<i>Polygireulima rutila</i> (Carpenter 1864)	reassignment explicit in the paper
494	Family Fossaridae	Superfamily Vanikoroidea	Family Vanikoridae not in same superfamily as family Fossaridae
495	<i>Macromphalina californica</i> Dall 1903	Family Vanikoridae	transfer of our species follows Waren and Bouchet 1988
502	<i>Crepidula dorsata</i> (Broderip 1834)	<i>Megalomphalus californicus</i> (Dall 1903)	generic synonymy follows Cougerot and Le Renard 1981
505	<i>Crepidula nummaria</i> Gould 1846	<i>Crepidipatella dorsata</i> (Broderip 1834)	genus submerged by Hoagland 1977 resurrected herein
508	<i>Crepidipatella charybdis</i> (Berry 1940)	<i>Crepidula glottidiarum</i> Dall 1905	a situs form in Hoagland 1977, raised to specific status here - nummaria still good elsewhere
524	<i>Deloronovva aequalis vidleri</i> (G. B. Sowerby II 1851)	<i>Crepidipatella orbiculata</i> (Dall 1919)	new synonymy
525	<i>Spiculata barbarensis</i> (Dall 1892)	<i>Neosimnia aequalis</i> (G. B. Sowerby I 1832)	listed under genus without other comment
526	<i>Spiculata loebbeckeana</i> (Weinkauff 1881)	<i>Neosimnia barbarensis</i> (Dall 1892)	listed with <i>Spiculata</i> in synonymy, but Cate's genus not listed as synonym under genus
532	<i>Austrotrophon carrosensis catalinensis</i> I. S. Oldroyd 1927	<i>Neosimnia loebbeckeana</i> (Weinkauff 1881)	type species of <i>Spiculata</i> , but treated as a <i>Neosimnia</i> : assume <i>Spiculata</i> used as subgenus
534	<i>Boreotrophon bentleyi</i> (Dall 1908)	<i>Austrotrophon catalinensis</i> I. S. Oldroyd 1927	returned to full specific status here
536	<i>Forerria belcheri</i> (Hinds 1843)	<i>Boreotrophon bentleyi</i> Dall 1908	correction to original allocation of species
538	<i>Ocenebra beta</i> (Dall 1919)	<i>Forerria belcheri</i> (Hinds 1844)	year of publication corrected in discussion of <i>Austrotrophon</i>
539	<i>Ocenebra foveolata</i> (Hinds 1844)	<i>Ocenebrina beta</i> (Dall 1919)	all E. Pacific species previously placed in <i>Ocenebra</i> transferred to <i>Ocenebrina</i> per Vokes
582	<i>Admete couthouyi</i> (Jay 1839)	<i>Ocenebrina foveolata</i> (Hinds 1844)	as above, + synonymy changed & <i>O. barbarensis</i> removed from <i>O. foveolata</i> synonymy
583	<i>Admete rhyssa</i> (Dall 1919)	<i>Admete gracilior</i> (Carpenter 1865)	<i>couthouyi</i> still OK, this record based on <i>couthouyi</i> <i>gracilior</i> , raised to full species status here
584	<i>Cancellaria cooperi</i> Gabb 1865	<i>Admete rhyssa</i> (Dall 1919)	new synonymy - woodwardi & settoni also submerged into <i>gracilior</i>
585	<i>Cancellaria crawfordiana</i> (Dall 1891)	<i>Cancellaria cooperi</i> Gabb 1865	<i>cooperi</i> was an unjustified emendation
594	<i>Antiplanes perversus</i> (Gabb 1865)	<i>Cancellaria crawfordiana</i> Dall 1891	correction of original designation to <i>Cancellaria</i>
595	<i>Antiplanes santarosanus</i> (Dall 1902)	<i>Antiplanes catalinae</i> (Raymond 1904)	<i>perversus</i> preoccupied, <i>catalinae</i> next available name (voyi extinct)
597	<i>Daphnella clathrata</i> (Gabb 1865)	<i>Antiplanes thalea</i> (Dall 1902)	new synonymy
598	<i>Elaeocyma empyrosia</i> (Dall 1899)	<i>Daphnella clathrata</i> (Gabb 1865)	transfer to family Conidae as per revision of Taylor et al 1993
599	<i>Kurtzia arteaga</i> (Dall & Bartsch 1910)	<i>Elaeocyma empyrosia</i> (Dall 1899)	transfer to family Pseudomelatomidae as per revision of Taylor et al 1993
600	<i>Kurtziella beta</i> (Dall 1919)	<i>Kurtzia arteaga</i> (Dall & Bartsch 1910)	transfer to family Conidae as per revision of Taylor et al 1993
601	<i>Kurtziella plumbea</i> (Hinds 1843)	<i>Kurtziella beta</i> (Dall 1919)	<i>Kurtziella</i> raised to generic status, transfer to Conidae as per above
602	<i>Kylix halocydne</i> (Dall 1919)	<i>Kurtziella plumbea</i> (Hinds 1843)	transfer to family Conidae as per revision of Taylor et al 1993
605	<i>Oeopota regulus</i> (Dall 1919)	<i>Kylix halocydne</i> (Dall 1919)	transfer to family Pseudomelatomidae as per revision of Taylor et al 1993
606	<i>Ophiidermella cancellata</i> (Carpenter 1864)	<i>Oeopota regulus</i> (Dall 1919)	transfer to family Conidae as per revision of Taylor et al 1993
607	<i>Ophiidermella fancheriae</i> (Dall 1903)	<i>Ophiidermella cancellata</i> (Carpenter 1864)	transfer to family Conidae as per revision of Taylor et al 1993
608	<i>Ophiidermella inermis</i> (Hinds 1843)	<i>Ophiidermella fancheriae</i> (Dall 1903)	transfer to family Conidae as per revision of Taylor et al 1993
609	<i>Pleurotomella herminea</i> Dall 1919	<i>Ophiidermella inermis</i> (Reeve, 1843)	authorship corrected; transfer to family Conidae as per above
610	<i>Pseudomelatomata penicillata</i> (Carpenter 1864)	delete from list	this would be transferred to the Pseudomelatomidae, but has been found to be a mis-id
		<i>Pseudomelatomata penicillata</i> (Carpenter 1864)	transfer to family Pseudomelatomidae as per revision of Taylor et al 1993

## Suggested Gastropod Hierarchy

Classification of the taxa currently placed in "Mesogastropoda" and "Neogastropoda" following Ponder and Warren 1988, with additions from Taylor et al 1993 for conids "Archaeogastropoda" follows Hazprunnar 1988 in general; with additions from Hickman & McLean 1990, and Lindberg 1988  
Opisthobranch classification from Mikkelsen 1996, and other sources

## Class Gastropoda

## Subclass Prosobranchia

## Superorder Archaeogastropoda

## Order Patellogastropoda

## Suborder Nacellina

## Superfamily Acmaeoidea

## Family Lepetidae

*Iothia lindbergi* McLean 1985

## Family Acmaeidae

*Acmaea mitra* Rathke 1833

## Family Lottiidae

*Lottia strigatella* (Carpenter 1864)

*Niveotectura funiculata* (Carpenter 1864)

## Order Vetigastropoda

## Superfamily Fissurelloidea

## Family Fissurellidae

## Subfamily Emarginulinae

*Cranopsis multistriata* (Dall 1914)

*Puncturella cooperi* Carpenter 1864

*Puncturella eyerdami* Dall 1924

*Puncturella punctocostata* Berry 1947

*Puncturella ralphi* Berry 1947

*Scelidotoma bella* (Gabb 1865)

*Hemitoma bella* (Gabb 1865)

*Subemarginula yatesii* Dall 1901

## Superfamily Scissurelloidea

## Family Scissurellidae

## Subfamily Anatominae

*Anatoma crispata* (Fleming 1832)

*Scissurella kelseyi* Dall 1905

*Scissurella chircicova* Dall 1919

## Superfamily Trochoidea

## Family Turbinidae

## Subfamily Liotiinae

*Maccrene farallonensis* (A.G. Smith 1952)

## Subfamily Colloniinae

*Homalopoma berryi* McLean 1964

*Homalopoma cordellensis* McLean 1996

*Homalopoma draperi* McLean 1984

*Homalopoma paucicostatum* (Dall, 1871)

## Subfamily Turbininae

*Lithopoma undosa* (Wood 1828)

## Subfamily Tricoliinae

*Eulithidium compta* (Gould 1855)

*Eulithidium pulloides* (Carpenter 1865)

## Suggested Gastropod Hierarchy

- Eulithidium rubrilineata Strong 1928
- Eulithidium substriata Carpenter 1864
- Family Trochidae
  - Subfamily Tegulinae
    - Norrisia norrisi (Sowerby 1838)
    - Tegula aureotincta Forbes 1850
  - Subfamily Calliotropinae
    - Bathybembix bairdii (Dall 1889)
      - Solariella oxybasis Dall 1890
    - Cidarina cidaris (Carpenter 1864)
  - Subfamily Calliostomatinae
    - Calliostoma annulatum (Lightfoot 1786)
    - Calliostoma canaliculatum (Lightfoot 1786)
    - Calliostoma gemmulatum Carpenter 1864
    - Calliostoma gloriosum Dall 1871
    - Calliostoma keenae McLean 1970
    - Calliostoma platinum Dall 1890
    - Calliostoma supragranosum Carpenter 1864
      - Calliostoma splendens Carpenter 1864
    - Calliostoma titanium McLean 1984
    - Calliostoma tricolor Gabb 1865
    - Calliostoma turbinum Dall 1896
    - Calliostoma variegatum Carpenter 1864
  - Subfamily Solariellinae
    - Solariella nuda Dall 1896
    - Solariella peramabilis Carpenter 1864
      - Solariella rhyssa Dall 1919
  - Subfamily Halistylinae
    - Halistylus pupoideus (Carpenter 1864)
  - Subfamily Lirulariinae
    - Lirularia acuticostata (Carpenter 1864)
    - Lirularia parcipicta (Carpenter 1864)
- Superorder Caenogastropoda
  - Order Neotaenioglossa
    - Suborder Discopoda
      - Superfamily Cerithioidea
        - Family Litiopidae
          - Alaba sp
        - Family Cerithiidae
          - Subfamily Bittiinae
            - Lirobittium fetellum (Bartsch 1911)
            - Lirobittium larum (Bartsch 1911)
            - Lirobittium lomaense Bartsch 1911
              - Lirobittium asperum lomaense Bartsch 1911
            - Lirobittium paganicum (Dall 1919)
            - Lirobittium quadrifilatum (Carpenter 1864)
            - Lirobittium rugatum (Carpenter 1864)
              - Lirobittium subplanatum Bartsch 1911
            - Alabina calena Dall 1919



## Suggested Gastropod Hierarchy

- Family Turritellidae
  - Subfamily Turritellinae
    - Turritella cooperi* Carpenter 1864
    - Turritella jewetti* Carpenter 1864
    - Turritella orthosymmetrica* Berry 1953
- Superfamily Littorinoidea
  - Family Littorinidae
    - Subfamily Lacuninae
      - Lacuna unifasciata* Carpenter in Gould and Carpenter 1857
- Superfamily Cingulopsidoidea
  - Family Barleeidae
    - Barleeia californica* Bartsch 1920
    - Barleeia subtenuis* Carpenter 1864
    - Lirobarleeia kelseyi* (Dall and Bartsch 1902)
  - Family Rissoidae
    - Subfamily Rissoinae
      - Alvania compacta* (Carpenter 1864)
        - Alvania acutelirata* (Carpenter 1864)
      - Alvania rosana* Bartsch 1911
        - Alvania burrdardensis* Bartsch 1921
      - Alvania tumida* Carpenter 1857
  - Family Truncatellidae
    - Cecina* sp
  - Family Vitrinellidae
    - Vitrinella berryi* Bartsch 1907
    - Vitrinella eschnauri* Bartsch 1907
      - Vitrinella eschnaurae* Abbott 1974
    - Teinostoma salvania* Dall 1919
    - Vitrinella oldroydi* Bartsch 1907
  - Family Adeorbidae
    - Subfamily Adeorbiniae
      - Circulus* sp
    - Subfamily Teinostomatinae
      - Teinostoma supravallatum* (Carpenter 1864)
  - Family Caecidae
    - Subfamily Caecinae
      - Caecum californicum* Dall in Orcutt 1885
      - Caecum crebricinctum* Carpenter 1864
        - Micranellum petroense* Bartsch 1920
        - Micranellum catalinense* Bartsch 1920
        - Micranellum profundicolum* Bartsch 1920
        - Micranellum barkleyense* Bartsch 1920
        - Micranellum oregonense* Bartsch 1920
        - Micranellum rosanum* Bartsch 1920
      - Caecum dalli* Bartsch 1920
      - Fartulum occidentale* (Bartsch 1920)
- Superfamily Vanikoroidea
  - Family Hipponicidae
    - Hipponix antiquatus* Linnaeus 1767

## Suggested Gastropod Hierarchy

- Family Vanikoridae
  - Subfamily Vanikorinae
    - Megalomphalus californicus (Dall 1903)
      - Macromphalina californica Dall 1903
    - Megalomphalus schmiederi McLean 1996
- Superfamily Calyptraeidea
  - Family Calyptraeidae
    - Calyptrea contorta (Carpenter 1865)
    - Calyptrea fastigiata Gould 1856
    - Crepidula aculeata (Gmelin 1791)
    - Crepidula adunca G. B. Sowerby I 1825
    - Crepidula glottidiarum Dall 1905
      - "Crepidula nummaria Gould 1846" auctt.
    - Crepidula naticarum Williamson 1905
    - Crepidula norrisiarum Williamson 1905
    - Crepidula onyx G.B. Sowerby I 1824
    - Crepidula perforans (Valenciennes 1846)
    - Crepidatella dorsata (Broderip 1834)
      - Crepidula lingulata Gould 1846
      - Crepidula bilobata "Gray" Reeve 1859
      - Crepidula fissurata G.B. Sowerby II 1883
    - Crepidatella orbiculata (Dall 1919)
      - Verticumbo charybdis Berry 1940
    - Crucibulum spinosum (G.B. Sowerby I 1824)
- Superfamily Vermetoidea
  - Family Vermetidae
    - Petalconchus sp
- Superfamily Cypraeoidea
  - Family Ovulidae
    - Subfamily Ovulinae
      - Neosimnia aequalis (G.B. Sowerby I 1832)
        - Delonovolva aequalis vidleri (G.B. Sowerby II 1881)
      - Neosimnia barbarenaensis (Dall 1892)
        - Spiculata barbarenaensis (Dall 1892)
        - Neosimnia catalinensis Berry 1916
      - Neosimnia loebbeckeana (Weinkauff 1881)
        - Spiculata loebbeckeana (Weinkauff 1881)
- Superfamily Lamellarioidea
  - Family Triviidae
    - Subfamily Triviinae
      - Trivia californiana (J.E. Gray 1827)
      - Trivia ritteri Raymond 1903
  - Family Lamellariidae
    - Subfamily Lamellariinae
      - Lamellaria diegoensis Dall in Orcutt 1885
- Superfamily Naticoidea
  - Family Naticidae
    - Subfamily Naticinae
      - Cryptonatica affinis (Gmelin 1791)
        - Natica clausa Broderip and G.B. Sowerby I 1829

## Suggested Gastropod Hierarchy

- Subfamily Polinicinae
  - Calinaticina oldroydii* (Dall 1897)
    - Eunaticina oldroydii* (Dall 1897)
  - Euspira pallida* (Broderip and Sowerby 1829)
  - Neverita reclusiana* (Deshayes 1839)
  - Polinices draconis* (Dall 1903)
  - Polinices lewisii* (Gould 1847)
- Subfamily Sigaretinae
  - Sinum scopulosum* (Conrad 1849)
- Superfamily Tonnoidea
  - Family Bursidae
    - Crossata californica* (Hinds 1843)
- Superfamily Triphoroidea
  - Family Cerithiopsidae
    - Cerithiopsis* sp
- Superfamily Janthinoidea
  - Family Epitoniidae
    - Subfamily Epitoniinae
      - Epitonium berryi* (Dall 1907)
        - Scala rectilaminata* Dall 1907
        - Nitidiscala catalinense* (Dall 1917)
      - Epitonium bellastriatum* (Carpenter 1864)
        - Asperiscala bellastrata* (Carpenter 1864)
      - Epitonium hindsii* (Carpenter 1856)
        - Epitonium persuturum* Dall 1917
        - Epitonium contrertasi* Jordan and Hertlein 1926
        - Epitonium cooperi* Strong 1930
      - Epitonium indianorum* (Carpenter 1864)
        - Nitidiscala indianorum* (Carpenter 1864)
        - Epitonium columbianum* Dall 1917
        - Epitonium montereyensis* Dall 1917
        - Scalaria regiomontana* Dall in DeBoury 1919
      - Epitonium lowei* (Dall 1906)
        - Asperiscala lowei* (Dall 1906)
      - Epitonium politum* (G.B. Sowerby II 1844)
        - Depressiscala polita* (G.B. Sowerby II 1844)
      - Epitonium sawinae* (Dall 1903)
        - Nitidiscala sawinae* (Dall 1903)
        - Epitonium acrostephanus* Dall 1908
        - Epitonium catalinae* Dall 1908
        - Epitonium tabulatum* Dall 1917
        - Epitonium regium* Dall 1917
      - Epitonium tinctum* (Carpenter 1865)
        - Nitidiscala tinctum* (Carpenter 1865)
    - Subfamily Nodiscalinae
      - Nodiscala spongiosa* (Carpenter 1864)
        - Opalia spongiosa* Carpenter 1864
        - Opalia retiporosa* Carpenter 1864
      - Opalia borealis* Keep 1881
      - Opalia funiculata* (Carpenter 1837)
      - Opalia montereyensis* (Dall 1907)

## Suggested Gastropod Hierarchy

## Superfamily Eulimoidea

## Family Eulimidae

- Balcis berryi (Bartsch 1917)
- Balcis compacta (Carpenter 1864)
- Balcis micans (Carpenter 1864)
  - Melanella micans (Carpenter 1864)
- Balcis oldroydae (Bartsch 1917)
  - Melanella oldroydi Bartsch 1917
  - Melanella micans borealis Bartsch 1917
- Eulima almo (Bartsch 1917)
- Eulima raymondi Rivers 1904
  - Strombiformis riversi Bartsch 1917
  - Strombiformis californica Bartsch 1917
  - Strombiformis lapazana Bartsch 1917
  - Strombiformis townsendi Bartsch 1917
- Haliella abyssicola Bartsch 1917
- Polygireulima rutila (Carpenter 1864)
  - Melanella rutila (Carpenter 1864)
- Pseudosabinella bakeri (Bartsch 1917)
  - Melanella bakeri (Bartsch 1917)
  - Alaba catalinensis Bartsch 1920
  - Alaba serrana Smith and Gordon 1948
- Vitreolina columbiana (Bartsch 1917)
  - Melanella grippi Bartsch 1917
  - Balcis titubans Berry 1956
- Vitreolina macra (Bartsch 1917)
  - Melanella macra Bartsch 1917
  - Melanella catalinensis Bartsch 1917
  - Melanella prefalcata Bartsch 1917
  - Balcis obstipa Berry 1954
- Vitreolina yod (Carpenter 1857)
  - Melanella yod (Carpenter 1857)
  - Melanella taravali Bartsch 1917

## Order Neogastropoda

## Superfamily Muricoidea

## Family Muricidae

## Subfamily Ocenebrinae

- Austrotrophon catalinensis I.S. Oldroyd 1927
  - Austrotrophon cerrosensis catalinensis of Abbott 1974
- Ceratostoma nuttalli (Conrad 1837)
- Forreria belcheri (Hinds 1844)
- Ocenebrina barbarensis (Gabb 1865)
  - Ocenebra crispatisima Berry 1953
- Ocenebrina beta (Dall 1919)
  - Tritonium luridum Middendorff 1848
  - Vitularia aspera Baird 1863
  - Ocenebra lurida var munda Carpenter 1864
- Ocenebrina foveolata (Hinds 1844)
- Pteropurpura festiva (Hinds 1844)
- Pteropurpura macroptera (DeShayes 1839)
- Pteropurpura trialata (G.B. Sowerby II 1834)
- Pteropurpura vokesae Emerson 1964

## Suggested Gastropod Hierarchy

## Subfamily Trophoninae

- Boreotrophon apolyonis (Dall 1919)
- Boreotrophon avalonensis Dall 1902
  - Neptunea callicerata Dall 1919
  - Neptunea staphylina Dall 1919
- Boreotrophon bentleyi Dall 1908
- Boreotrophon eucymatus Dall 1902
- Boreotrophon hazardi McLean 1996
- Boreotrophon kabati McLean 1996
- Boreotrophon keepi (Strong and Hertlein 1937)
- Boreotrophon multicostatus (Eschscholtz 1829)
  - Boreotrophon peregrinus Dall 1902
- Boreotrophon pedroanus (Arnold 1903)
  - Trophon stuarti var. praecursor Arnold 1903
- Boreotrophon raymondi (Moody 1916)
- Boreotrophon stuarti (E. A. Smith 1880)
  - Boreotrophon smithi Dall 1902
- Boreotrophon tolmus (Dall 1919)
- Boreotrophon triangulatus (Carpenter 1864)
  - Trophon albospinosus Willett 1931
- Oceanotrophon painei (Dall 1903)
- Scabrotrophon cerritensis (Arnold 1903)
  - Nipponotrophon scitulus (Dall 1891) of Myers and D'Attilio 1980
- Scabrotrophon clarki McLean 1996
- Scabrotrophon grovesi McLean 1996
  - "Trophon lasius (Dall 1919)" in part of Willett 1938
  - "Nipponotrophon scitulus (Dall 1891)" in part of Myers and D'Attilio 1980
- Scabrotrophon lasius (Dall 1919)
- Scabrotrophon maltzani (Kobert and Küster 1878)
  - "Trophon tenuisculpta Carpenter 1866" auct.
  - Trophon subserratus G. B. Sowerby II 1880
  - "Trophon lasius (Dall 1919)" in part of Willett 1938
  - "Trophonopsis lasius (Dall 1919)" in part of Abbott 1974
  - "Nipponotrophon lasius (Dall 1919)" of Radwin and D'Attilio 1976

## Subfamily Muricopsinae

- Maxwellia santarosana (G.B. Sowerby II 1879)

## Subfamily Coralliophilinae

- Babelomurex oldroydi (I.S. Oldroyd 1929)

## Family Turbinellidae

## Subfamily Ptychatyractinae

- Exilioidea kelseyi (Dall 1908)
- Exilioidea rectirostris (Carpenter 1864)
  - Plicifusus obsoletus Talmadge 1971

## Metzgeria sp

## Family Buccinidae

- Kelletia kelletii (Forbes 1850)
- Neptunea amianta (Dall 1890)
- Neptunea tabulata (Baird 1863)

## Family Nassariidae

- Nassarius delosi Woodring in Woodring et al 1946
- Nassarius fossatus (Gould 1849)

## Suggested Gastropod Hierarchy

- Nassarius insculptus (Carpenter 1864)
  - Alectrion insculptus var. eupleura Dall 1917
  - Nassarius insculptus gordanus Hertlein and Strong 1951
- Nassarius mendicus (Gould 1849)
  - Nassarius cooperi (Forbes 1852)
  - Nassarius indisputabilis (Oldroyd 1927)
- Nassarius perpinguis (Hinds 1844)
- Nassarius rhinetes Berry 1953
  - "Nassa californiana (Conrad 1856)" of Dall 1891
  - "Nassarius californianus" of Grant and Gale 1931
  - "Nassarius californianus" of Demond 1952
- Family Fasciolaridae
  - Fusinus barborensis (Trask 1855)
  - Fusinus luteopictus (Dall 1877)
- Family Columbellidae
  - Subfamily Pyreninae
    - Aesopus eurytoideus (Carpenter 1864)
    - Alia carinata (Hinds 1844)
    - Alia tuberosa (Carpenter 1864)
    - Amphissa bicolor Dall 1892
    - Amphissa columbiana (Dall 1916)
    - Amphissa undata (Carpenter 1864)
      - Amphissa ventricosa Arnold 1903
    - Amphissa reticulata Dall 1916
    - Amphissa versicolor Dall 1871
    - Astryris aurantiaca (Dall 1871)
    - Astryris gausapata (Gould 1850)
      - Nitidella gouldii Carpenter in Gould and Carpenter 1857
      - Columbella dalli E. A. Smith 1880
      - Nitidella ?lutulenta Dall 1919
      - Alia casciana Dall 1919
    - Astryris permodesta (Dall 1890)
    - Nassarina penicillata (Carpenter 1864)
  - Subfamily Olivellinae
    - Olivella baetica Carpenter 1864
    - Olivella biplicata (G. B. Sowerby I 1825)
    - Olivella pycna Berry 1935
- Family Marginellidae
  - Subfamily Marginellinae
    - Volvarina taeniolata (Morch 1860)
- Family Cystiscidae
  - Plesiocystiscus myrmecoon (Dall 1919)
  - Subfamily Granulininae
    - Granulina margaritula (Carpenter 1857)
- Family Mitridae
  - Subfamily Mitrinae
    - Mitra idae Melvill 1893
- Superfamily Cancellarioidea
  - Family Cancellariidae

## Suggested Gastropod Hierarchy

- Subfamily Cancellariinae
  - Cancellaria cooperii* Gabb 1865
  - Cancellaria crawfordiana* (Dall 1891)
  - Cancellaria decussata* (G. B. Sowerby II 1832)
- Subfamily Admetinae
  - Admete gracilior* (Carpenter 1869)
- Superfamily Conoidea [reorganized to reflect findings of Taylor et al 1993]
  - Family Turridae
    - Subfamily Crassispirinae
      - Crassispira semiinflata* (Grant & Gale 1931)
      - Pseudotaranis hyperia* (Dall 1919)
      - Pseudotaranis strongi* (Arnold 1903)
        - Borsonia inculta* Moody 1916
    - Subfamily Cochospirinae
      - Megasurcula carpenteriana* (Gabb 1865)
      - Megasurcula stearnsiana* (Raymond 1904)
    - Subfamily Turrinae
      - Antiplanes briseis* Dall 1919
      - Antiplanes catalinae* (Raymond 1904)
        - Pleurotoma perversa* Gabb 1865 [not Philippi 1847]
        - "*Antiplanes perversa* Gabb 1865" of Oldroyd 1927
        - Antiplanes major* Bartsch 1944
        - "*Antiplanes voyi* (Gabb 1866)" of Abbott 1974
        - Antiplanes gabbi* Kantor and Sysoev 1991
      - Antiplanes thalia* (Dall 1902)
        - Antiplanes santarosana* Dall 1902
        - Pleurotoma smithi* Arnold 1903
        - Antiplanes rotula* Dall 1921
        - Antiplanes willetti* Berry 1953
      - Carinoturris adraustica* Dall 1919
      - Carinoturris fortis* Bartsch 1944
      - Rhodopetoma dicaulax* (Dall 1908)
        - Borsonella rhodope* Dall 1919
      - Rhodopetoma renaudi* (Arnold 1903)
  - Family Pseudomelotomidae
    - Elaeocyma empyrosia* (Dall 1899)
    - Kylix halocydne* (Dall 1919)
    - Pseudomelatoma penicillata* (Carpenter 1864)
  - Family Conidae
    - Subfamily Coninae
      - Conus californicus* Hinds 1844
    - Subfamily Clathurellinae
      - Borsonella bartschi* (Arnold 1903)
        - Borsonella civitella* Dall 1919
        - Borsonella nicoli* Dall 1919
      - Borsonella coronadoi* (Dall 1908)
        - Borsonella nychia* Dall 1919
      - Borsonella hooveri* (Arnold 1903)
      - Borsonella merriami* (Arnold 1903)
      - Borsonella omphale* Dall 1919
        - Pleurotoma dalli* Arnold 1903
        - Borsonella angelena* Hanna 1924

## Suggested Gastropod Hierarchy

- Borsonella pinosensis Bartsch 1944
- Ophiidermella cancellata (Carpenter 1864)
  - Pleurotoma vancouverensis E. A. Smith 1880
  - Surcula rhines Dall 1908
  - Moniliopsis chacei Berry 1941
- Ophiidermella fancheræ (Dall 1903)
- Ophiidermella inermis (Reeve 1843)
  - Drillia incisa Carpenter 1864
  - Surcula ophioderma Dall 1908
  - Turris halcyonis Dall 1908
  - Ophiidermella montereyensis Bartsch 1944
- Subfamily Oenopotinae
  - Oenopota regulus
- Subfamily Mangeliinae
  - Crockerella castianira (Dall 1919)
  - Crockerella conradiana (Gabb 1869)
  - Crockerella crystallina (Gabb 1865)
  - Crockerella cymodoce (Dall 1919)
  - Crockerella eriphyle (Dall 1919)
  - Crockerella evadne (Dall 1919)
  - Crockerella lowei (Dall 1903)
    - "Clathurella crystallina Gabb 1865" of Abbott 1974
    - Philbertia hesione Dall 1919
  - Crockerella philodoce (Dall 1919)
  - Crockerella scotti McLean 1996
  - Crockerella tridesmia (Berry 1941)
  - Kurtzia arteaga (Dall and Bartsch 1910)
    - "Mangelia sculpturata (Dall 1887)" of Arnold
    - Mangelia arteaga roperi Dall 1919
    - Kurtzia gordonii Bartsch 1944
  - Kurtziella plumbea (Hinds 1844)
  - Kurtzina beta (Dall 1919)
  - Mangelia hexagona Gabb 1865
- Subfamily Daphnellinae
  - Daphnella clathrata Gabb 1865
- Family Terebridae
  - Terebra hemphilli Vanatta 1924
  - Terebra pedroana Dall 1908
- Subclass Heterobranchia
  - Order ? = "Lower Heterobranchia" of Mikkelsen
    - Superfamily Acteonoidea
      - Family Acteonidae
        - Acteon traskii Stearns 1898
        - Migroglyphis brevicula (Dall 1902)
        - Rictaxis painei Dall 1903
        - Rictaxis punctocaelatus (Carpenter 1864)
  - Order Heterostropha
    - Superfamily Pyramidelloidea
      - Family Pyramidellidae
        - Subfamily Odostomiinae
          - Iselica ovoidea (Gould 1853)
          - Odostomia astricta Dall & Bartsch 1907



## Suggested Gastropod Hierarchy

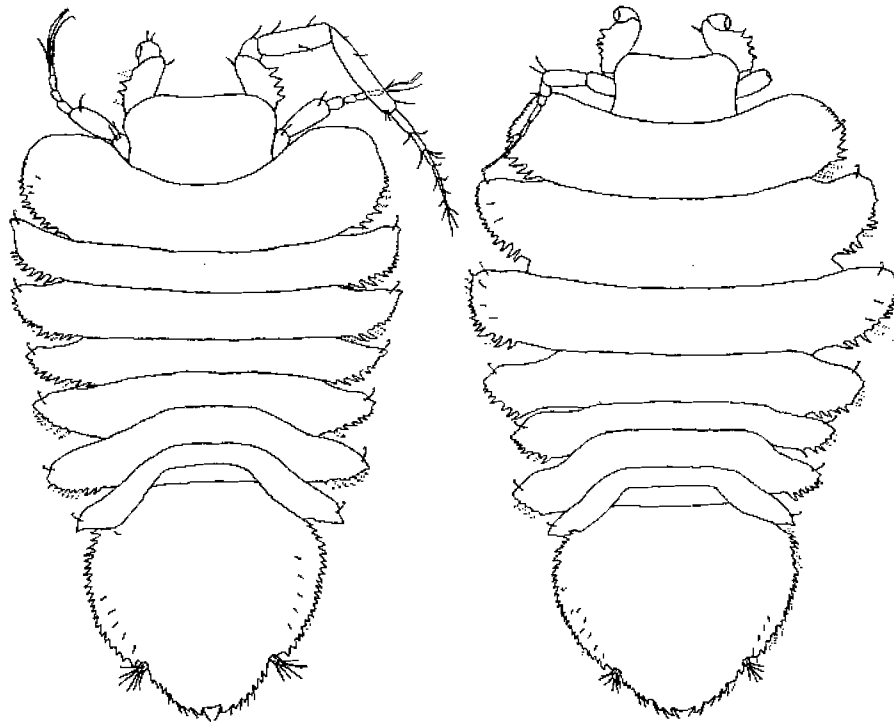
- Odostomia canfieldi Dall 1908
- Odostomia clementina Dall & Bartsch 1909
- Odostomia columbiana Dall & Bartsch 1907
- Odostomia eucosmia Dall & Bartsch 1909
- Odostomia eugena Dall & Bartsch 1909
- Odostomia gravida Gould 1852
- Odostomia laxa Dall & Bartsch 1909
- Odostomia ritteri Dall & Bartsch 1909
- Odostomia tenuisculpta Carpenter 1864
- Odostomia virginialis Dall & Bartsch 1909
- Odostomia sp D MBC 1980
- Subfamily Turbonillinae
  - Turbonilla almo Dall & Bartsch 1909
  - Turbonilla castanea Keep 1887
  - Turbonilla chocolata (Carpenter 1864)
  - Turbonilla diegensis Dall & Bartsch 1909
  - Turbonilla kelseyi Dall & Bartsch 1909
  - Turbonilla nuttingi Dall & Bartsch 1909
  - Turbonilla raymondi Dall & Bartsch 1909
  - Turbonilla regina Dall & Bartsch 1909
  - Turbonilla santarosana Dall & Bartsch 1909
  - Turbonilla tenuicula (Gould 1853)
  - Turbonilla sp A SCAMIT 1988
- Subfamily Cyclostremellinae
  - Cyclostremella californica Bartsch 1907
  - Cyclostremella coronadoensis (Arnold 1903)
- Infraclass Euthyneura
  - Superorder Opisthobranchia
    - Order "Architectibranchia"
      - Family Hydatinidae
        - Parvaplustrum sp A SCAMIT 1995
        - Parvaplustrum sp B SCAMIT 1996
    - Order Sacoglossa
      - Family Hermaeidae
        - Alderia modesta (Loven 1844)
      - Family Oleidae
        - Olea hansineensis Agersborg 1923
    - Order Anaspidea
      - Superfamily Aplysioidea
        - Family Aplysiidae
          - Aplysia californica J. G. Cooper 1863
    - Order Cephalaspidea
      - Superfamily Bulloidea
        - Family Bullidae
          - Bulla gouldiana Pilsbry 1895
        - Family Haminaeidae
          - Haminaea vesicula Gould 1855
          - Haminaea virescens (G. B. Sowerby I 1833)
      - Superfamily Philinoidea
        - Family Scaphandridae
          - Acteocina harpa (Dall 1871)
          - Acteocina inculta (Gould 1855)

## Suggested Gastropod Hierarchy

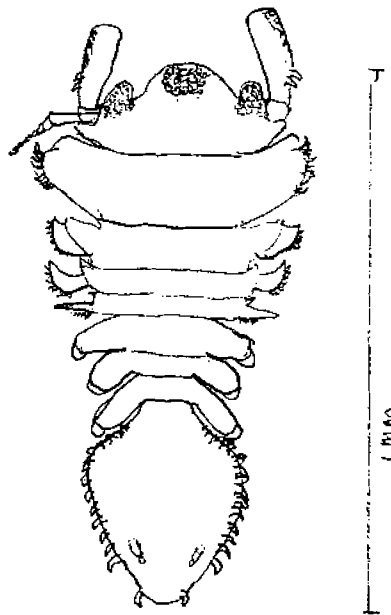
- Tornastra culcitella (Gould 1853)
- Tornastra eximia (Baird 1863)
- Family Cylichnidae
  - Cylichna diegensis (Dall 1919)
- Family Aglajidae
  - Aglaja ocelligera (Bergh 1894)
  - Melanochlamys diomedea (Bergh 1894)
  - Navanax inermis (J. G. Cooper 1863)
- Family Philinidae
  - Philine alba Mattox 1958
  - Philine auriformis Suter 1909
  - Philine bakeri Dall 1919
  - Philine californica Willett 1944
  - Philine sp A SCAMIT 1988
  - Bullomorpha sp A SCAMIT 1995
- Family Gastropteridae
  - Gastropteron pacificum Bergh 1894
- Family Retusidae
  - Sulcoretusa xystrum (Dall 1919)
  - Volvulella californica Dall 1919
  - Volvulella catharia Dall 1919
  - Volvulella cylindrica (Carpenter 1864)
  - Volvulella panamica Dall 1919
- Superfamily Diaphanoidea
  - Family Diaphanidae
    - Diaphana californica Dall 1919
- Order Notaspidea
  - Superfamily Pleurobranchoidea
    - Family Pleurobranchaeidae
      - Pleurobranchaea californica MacFarland 1966
    - Family Pleurobranchidae
      - Berthella californica (Dall 1900)
- Order Nudibranchia [no changes from current configuration]
- Superorder Pulmonata

**SELECTED REFERENCES ON GASTROPOD HIGHER CLASSIFICATION**

- BIELER, RUDIGER. 1992. Gastropod phylogeny and systematics. *Annual Review of Ecology and Systematics* (23):311-338.
- BOUCHET, PIERRE, and Anders Warén. 1986. Revision of the northeast Atlantic bathyal and abyssal Aclididae, Eulimidae, Epitoniidae (Mollusca, Gastropoda). *Bollettino Malacologico (Supplemento 2)*:299-576.
- COOVERT, GARY A., and Holly K. Covert. 1995. Revision of the supraspecific classification of marginelliform gastropods. *The Nautilus* 109(2-3):43-110.
- HASZPRUNAR, GERHARD. 1985. The Heterobranchia - a new concept of the phylogeny of the higher Gastropoda. *Zeitschrift für zoologische Systematik und Evolutionsforschung* 23:15-37.
- . 1988. On the origin and evolution of major gastropod groups, with special reference to the Streptoneura. *Journal of Molluscan Studies* 54(4):367-441.
- . 1988. A preliminary phylogenetic analysis of the streptoneurous gastropods. *Malacological Review (Supplement 4)*:7-16.
- . 1988. Comparative anatomy of cocculiniform gastropods and its bearing on archaeogastropod systematics. *Malacological Review (Supplement 4)*:64-84.
- HICKMAN, CAROLE S. 1988. Archaeogastropod evolution, phylogeny and systematics: a re-evaluation. *Malacological Review (Supplement 4)*:17-34.
- HICKMAN, CAROLE S., and James H. McLean. 1990. Systematic revision and suprageneric classification of trochacean gastropods. *Natural History Museum of Los Angeles County, Science Series* (35):1-169.
- HOUBRICK, RICHARD S. 1988. Cerithioidean phylogeny. *Malacological Review (Supplement 4)*:88-128.
- LINDBERG, DAVID R. 1988. The Patellogastropoda. *Malacological Review (Supplement 4)*:35-63.
- MIKKELSEN, PAULA M. 1996. The evolutionary relationships of Cephalaspidea s.l. (Gastropoda: Opisthobranchia): a phylogenetic analysis. *Malacologia* 37(2):375-442.
- PONDER, WINSTON F. 1988. The truncatelloidean (=Rissoacean) radiation - a preliminary phylogeny. *Malacological Review (Supplement 4)*:129-166.
- PONDER, WINSTON F., and Anders Warén. 1988. Classification of the Caenogastropoda and Heterostropha - a list of the family-group names and higher taxa. *Malacological Review (Supplement 4)*:288- 326.
- SALVINI-PLAWEN, LUITFRIED VON. 1980. A reconsideration of systematics in the Mollusca (phylogeny and higher classification). *Malacologia* 19(2):249-278.
- SALVINI-PLAWEN, LUITFRIED VON, and G. Haszprunar. 1987. The Vetigastropoda and the systematics of streptoneurous Gastropoda (Mollusca). *Journal of Zoology, London* 211(4):747-770.
- TAYLOR, JOHN D., Y. I. Kantor, and A. V. Sysoev. 1993. Foregut anatomy, feeding mechanisms, relationships and classification of the Conoidea (=Toxoglossa)(Gastropoda). *Bulletin of the Natural History Museum of London (Zoology)* 59(2):125-170.
- TAYLOR, JOHN D., N. J. Morris. 1988. Relationships of neogastropods. *Malacological Review (Supplement 4)*:167-179.
- VAUGHT, KAY CUNNINGHAM. 1989. *A Classification of the Living Mollusca*. American Malacologists, Melbourne, Florida. 189pp.
- WISE, JOHN B. 1996. Morphology and phylogenetic relationships of certain pyramidellid taxa (Heterobranchia). *Malacologia* 37(2): 443-511.



*Paramunna quadratifrons* male (left) and female (right) from Iverson and Wilson 1981



*Paramunna* sp A SCAMIT 1996 male [scale bar = 1mm] 100m off Del Mar, coarse sediment