Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

April, 1992 Vol. 10, No. 12

NEXT MEETING: Provisional Species Review

GUEST SPEAKER: None

DATE: May 11, 1992
9:30am - 3:00pm

LOCATION: Cabrillo Marine Museum
San Pedro, California

The May 11 meeting will be a discussion on how to best organize committees for publishing on SCAMIT provisional species. Decisions will be made as to which species would be the quickest to publish, who has priority, if any, and what level of funding can be made available through SCAMIT. Please bring current species list from project(s) you are working on to the meeting. We will also begin cataloging SCAMIT literature. Those members with an interest are urged to attend. We will be meeting at the Cabrillo Marine Museum in San Pedro, California.

MINUTES FROM MEETING ON MARCH 9, 1992:

Don Cadien represented SCAMIT at the memorial service/amphipod workshop for J. L. Barnard in Washington, D.C. A full report from Don has been included in the newsletter.

Included in the newsletter is an open letter from SCAMIT to Dr. Brian Kensley asking that Dr. Barnard post be filled with another amphipod specialist.

Hans Kuck of LACMNH provided attending members with some information on stomatopods. Included were a list of type specimens

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at LACMNH and notes on four species reported from southern California. These have been included in the newsletter. He also recommended two publications:

Basch, L. V. and J. M. Engle, 1989. Aspects of the Ecology and Behavior of the Stomatopod Hemisquilla ensigera californiensis (Gonodactyloidea: Hemisquillidae). in: E. A. Ferrero (ed.), Biology of Stomatopoda, Selected Symposia and Monographs U.Z.I., 3 ,Mucchi, Modena. 199-212

McLaughlin, P. A., 1980. Comparative Morphology of Recent Crustacea, W. H. Freeman and Co., San Francisco. 177 pp.

Thalassinidea Workshop: Handouts from Don Cadien review of Thalassinidea of the Northeast Pacific has been included in the newsletter. Many thanks to Don for leading the meeting.

FUTURE MEETINGS:

Anybody planning to present a paper at the Polycheate conference in France is invited to present it at an upcoming SCAMIT meeting. If you are interested contact Larry Lovell.

The June 8 meeting will be on the Polychaetes Chaetopterids and Onuphids. Included in the newsletter are working copies of the Key to the Chaetopteridae of Point Loma and Key to the Onuphidae of Point Loma produced by Ron Velarde and Dean Pasko. These keys, which were designed for the general taxonomist, not the polychaete specialist, will be evaluated at the June 8 SCAMIT meeting at the Alan Hancock Foundation building. Please use them to identify your chaetopterid and onuphid specimens prior to this meeting , so that any changes and/or improvements can be made at that time. Note from the authors: Both keys were constructed based on species known to occur between 45 m and 115 m off Point Loma, California. We would like to make the keys useful to the general SCAMIT membership working in southern California, so bring your comments, suggestions, and specimens to the June meeting. As you use the keys, keep in mind that they were created using regional specimens (no type material was used) and various species descriptions. In the onuphid key, for example, you will notice that we do not distinguish between the three possible species of Diopatra. The reason for this is simple: Diopatra ornata and D. splendidissima have not occurred in our samples to date. Consequently, although Diopatra species may be easily distinguished by pigment or methyl-green staining patterns, at the time of this writing, no specimens were available to examine. We hope to rectify this inadequacy by examining AHF specimens, as well as specimens supplied by you. Thanks for your help! RV & DP

SPECIMEN REQUEST:

Don Cadien has forwarded the following request from Dr. Charles D'Asaro of the University of West Florida. He is interested in getting specimens of egg capsules of California Nassarius. Specific targets are N. fossatus, N. mendicus, and N. perpingus, but other California species would also be welcome. He has recently reported on the Thorson Collection of gastropod egg-capsules, and is attempting to confirm questionable earlier data. Where possible the adults should be retained and sent along as vouchers of the identity for the egg-capsules. Drawings of the egg-capsules are included in the newsletter, as is a sheet with adult illustrations. Fix the egg-capsules in formalin, then transfer to alcohol for preservation. Specimens can either be forwarded to Don Cadien at the L. A. County Sanitation District Marine Lab, or sent directly to Dr. D'Asaro at the following address:

Dr. Charles D'Asaro
Biology - University of West Florida
11000 University Parkway
Pensacola, Florida 32514-5771

A NAME CHANGE:

Due to her recent marriage treasurer Ann Martin will now be known as Ann Dalkey. This change has been approved by the ICZN. Congratulations Ann!

SCAMIT OFFICERS:

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

President	Ron Velarde	(619)692-4903
Vice-President	Larry Lovell	(619)945-1608
Secretary	Diane O'Donohue	(619)692-4900
Treasurer	Ann Dalkey	(213)648-5317

J.L.Barnard Memorial and Symposium, Washington D.C.

Through the good offices of both SCAMIT and L.A. County Sanitation Districts I was able to participate in the J. Laurens Barnard Memorial Service and Symposium, April 9-10 1992. I went to present a SCAMIT poster at the Symposium, to pay respects to the memory of a man who aided SCAMIT generously and frequently, to lobby for the continuation of his position with the selection committee, and to pursue some research questions with the staff and collections of the Smithsonian Institution. Others from the west coast attending were Dr. Donald J. Reish, Dr. Rick Brusca, and Regina Wetzer (San Diego Society of Natural History). All will probably enjoy talking to you about the proceedings should you see them.

I took the RED EYE flight back on the morning of the 7th, took the Metro to the museum, and began meeting and talking with the staff there. During the first afternoon I was given a tour of the Crustacea stacks by Alan Child: rather impressive considering that in the Crustacea collection alone there are 6.5 miles of shelving - little of it empty. During this first day I met and talked with Jim Thomas (Reef Foundation, Florida), Les Watling (University of Maine), Al Child (Smithsonian Support Center), Brian Kensley (Invertebrate Zoology Dept. Chairman), Marilynn Schotte (SI - isopods), Elizabeth Harrison-Nelson (J.L.B.'s assistant), and Rae Germon (SI - mollusks). I had called ahead to make arrangements for a place to work, and was put into Roger Cressey's office.

On the 8th I was able to meet with Ray Manning (SI - stomatopods, ghost shrimp), Fenner Chace (SI - alpheid shrimp), Austin Williams (SI - decapods in general, *Upogebia*), Brian Kensley (SI - axiid shrimp, anthurid isopods) about taxonomic problems in their area of expertise (and lobby them on the continuation of service in amphipods). Some of the fruits of these meetings were incorporated into the group summary on the thalassinoid shrimps given at the 20th of April meeting. I took advantage of the breaks between these meetings to take materials from the collection to examine over the weekend after the memorial and symposium.

I also managed to steal across to the East Wing (Crustacea are in the West Wing) to examine molluscan types. The type of *Philine bakeri* was nearly identical to one of the specimens I had from Long Beach Harbor. Examination of the holotype confirmed this species is as described on the *Philine sp. A* voucher sheet. Since Dall never illustrated *P. bakeri*, I was a little uneasy about my earlier conclusions based on the narrative description alone. The species which R.T. Abbott (in American Seashells) and Dave Behrens (in Pacific Coast Nudibranchs) call *Philine bakeri* is really *Philine alba* of Mattox, a very different species.

Everyone had finally arrived by the morning of the 9th, and the Memorial Service got underway promptly at 10 AM in the Waldo Schmitt Room. The place was standing room only, with about 50 in attendance (see participants from outside the Smithsonian on the attached list). The proceedings were very affectionate, despite J.L.B.'s propensity for raising administrative hackles during life. I put up the SCAMIT poster and watched the premises during lunch. The afternoon session was heavy on reminiscences of the period before I knew him, and before he began his workshops for SCAMIT. During each break the participants would mix and talk; raising such a din that restarting the proceedings after a break was tough. J.L.B. would have enjoyed this gathering.

At the end of the scheduled program a number of people got up to pass on reflections on how J.L.B. had affected their lives (uniformly to the good), and Tom Bowman gave a posthumous award of the Order of the Lobster to J.L.B. for his innovative use of the English language (Bowman was an editor of the Proceedings of the Biological Society of Washington during a period in which J.L.B. published numerous articles in that journal). In the late afternoon we were treated to wine and beer courtesy of the Director. Both J.L.B.'s collaborator and widow Charline and his son Robert were in attendance. The proceedings were videotaped by Al Child, and SCAMIT is purchasing a copy of the video for our archives. Those of you who want to experience the Memorial can do so by borrowing and viewing this tape.

The contributed paper session on the 10th began at 0830, as scheduled, and continued through the day. All were rather interesting, and several produced a number of questions. Les Watling's talk, in particular, started a lively discussion of the pro's and con's of the use of characters of questionable independence in phylogenetic analyses. The meeting drew in visiting investigators, and graduate students from Washington's many universities. Many members of the Smithsonian staff were in and out all day long. Kristian Fauchald, for instance, sat in for Jim Lowry's morning talk on the use of DELTA, and noted in passing that his recent massive *Eunice* monograph was produced using the DELTA program. The proceedings are to be published next year as an issue of the Journal of Natural History, of which P.G. Moore (an attendee) is editor. Les Watling is to serve as editor of the symposium papers.

I was fortunate enough to be invited to accompany Al Child, Jan Stock, Rick Brusca, and Regina Wetzer for luncheon in the "Castle"- the old Smithsonian building- as a guest of Al Child. The place was beautifully and elegantly restored, and packed with guests.

The number and size of the posters taxed available space severely. Our poster board was soon exhausted, despite the SCAMIT poster being downsized from 4x8 to 2x4 feet. Interaction between attendees was so strong during breaks that the posters did not get the attention they deserved. The conversations were animated and ever-shifting. In the afternoon we played the videotape of the first (1985) J.L.B./SCAMIT Amphipod Workshop, and those temporarily not in conversations paused to watch. The Meeting officially ended at 5PM since we had to vacate the room to accommodate the traditional Friday evening staff beer tasting/TGIF get together.

Despite the end of the official meetings, they continued with a slightly reduced group at the home of Elizabeth Harrison-Nelson on Saturday evening. The conversational exchange, which had been vigorous at the Smithsonian, became deafening at Elizabeth's - and could be heard (so I'm told) from two blocks away. Elizabeth, her husband Fred, and several friends provided bluegrass music during the evening, but were hard pressed to compete with the social interchange. A number of persons took advantage of their backyard to relax and talk, play horseshoes (Manning and Williams), and do a J.L.B. memorial bird watch in the freshly leaved trees (Stock and Vader, with occasional help from others). The gathering itself was a J.L.B. memorial taco party, with Charline Barnard providing the special taco innards.

A few diehards also gathered for brunch on Sunday at Paula Rothman's (also an assistant of J.L.B.'s instrumental in the memorial meeting arrangements). Jim Thomas, Trudi Krapp-Schickel, Gloria Alonso, Charline Barnard, Elva Briones, Les Watling, Jörg Köhn, Elizabeth Harrison-Nelson and I met for a last talk session before departing to our various destinations.

On both Saturday and Sunday I went in to the Smithsonian in the mornings to work on materials from the collections before breaking off to resume the unofficial meetings. I was able to examine a series of munnid and anthurid isopods, pleustid amphipods, and a few stenothoid amphipods during my stay. Types were as accessible as any other specimens in the collections, and I examined quite a few.

SCAMIT got favorably mentioned by several of the speakers in their presentations (Jim Thomas, Don Reish, Ed Bousfield). Positive comments were also received from several attendees on the basic concept of regional standardization, and on our approach. The results of the lobbying efforts will not be known for some time, although in theory a selection will be made before the end of May. The short list for the position has been announced, and there is one amphipod person on it. I hope that my attendance at the meeting to represent the position of SCAMIT to the search committee members and administration will prove fruitful. At least our poster was well received. Ron Velarde, Larry Lovell and I will put together a short paper for the symposium volume to represent the poster. My thanks to SCAMIT for sending me back as an agent. It was a truly memorable experience from which I benefited greatly.

Don Cadien - County Sanitation Districts of Los Angeles County

J. Laurens Barnard Memorial Service

1000 Welcome and Introductions. Brian F. Kensley, Chairman, Department of Invertebrate Zoology

Remarks. Frank H. Talbot, Director, National Museum of Natural History

Closing Remarks. James D. Thomas, The Reef Foundation

1130 Lunch

A Tribute to J. Laurens Barnard

Reflections and Remembrances by Friends and Colleagues

1300 Welcome and Introductions. J.D. Thomas

The Career and Professional Achievements of J. Laurens Barnard

The Early Years (California) 1928-1967. D. Reish

The Arizona Years, 1970-1974. R. Brusca

The Washington Years, 1975-1991. J. Thomas

1400 Contributions of J.L. Barnard to Southern Hemisphere Taxonomy. J. Lowry

1430 Impact of J.L. Barnard, past, present, and furute on North American Pacific Amphipod Research. E.L. Bousfield

1500 J. Laurens Barnard: Remembrances, Reflections, Humorous Anecdotes.

A Symposium in Honor of J. Laurens Barnard
April 10, 1992

0830 ***Thomas, J. D.*** Welcome and introductory remarks.

0840 ***Bousfield, E. & C. P. Staude.*** Anatomy of a proposed illustrated guide to amphipods of the North American Pacific Coast, Alaska to California.

0900 ***Lowry, J. K.*** The use of the computer program DELTA in amphipod systematics.

0930 ***Takeuchi, I.*** Are the Caprellidea a monophyletic group?

0950 Coffee

1030 ***Watling, L.*** Importance of functional morphology to phylogenetic studies.

1050 ***Myers, A. A.*** Amphipods as biogeographic models.

1110 ***Stock, J.*** Remarkable amphi-Atlantic distribution patterns in stygobiont Amphipoda.

1130 ***Holsinger, J.*** Biodiversity of subterranean amphipod crustaceans: global patterns and zoogeographic implications.

1150 Lunch

1320 ***Thomas, J. D.*** Using amphipods to assess and monitor biodiversity in tropical marine systems.

1340 ***Reish, D. J.*** Use of amphipods in marine environmental studies (Bioassay): past, present, and future.

1400 ***Conlan, K.*** Response of amphipods to environmental disturbance

1420 Coffee

1500 ***Köhn, J.*** Methods in amphipod population studies. Amphipods as indicators of soft-bottom community structure.

1520 ***Duffy, E.*** Amphipod herbivory in the organization of natural marine communities.

POSTERS

Alonso, G., J. L. Barnard & M. Mickevich. Cladistic analysis of haustorioid and phoxocephaloid Amphipoda.

Bellan-Santini, D. & J. C. Dauvin. Cladistic and biogeographic relationships in amphipods: example of the *Byblis* genus.

Cadien, D.(SCAMIT). Regional standardization of taxonomy.

Hirayama, A. An evolutionary scenario of the new subfamily Corophiinae in time and space.

Krapp-Schickel, T. Effects of water pollution on algal dwelling amphipods in Sicily.

Laubitz, D. Caprellidea: towards a new synthesis.

Steele, D. Mandible structure in *Anonyx*.

Vader, Wim History of the Amphipod Newsletter.

Watling, L. A proposed global amphipod database.

M E M O R A N D U M

DATE: April 1, 1992

TO: Brian F. Kensley, Chairman, IZ

FROM: J. D. Thomas

RE: List of J.L. Barnard Symposium Participants

===

Dra. Gloria M. Alonso
Museo Argentino de Ciencias Naturales
"Bernardino Rivadavia" - Invertebrados
Buenos Aires, **ARGENTINA**

Dr. Denise. Bellan-Santini
Centre d'Oceanologie de Marseille
Station Marine d'Endoume
Marseille, **FRANCE**

Dr. Penelope Berents
The Australian Museum
Sydney South, NSW, **AUSTRALIA**

Dr. E.L. Bousfield
Royal British Columbia Museum
Victoria, British Columbia, **CANADA**

Dr. Rick C. Brusca
Natural History Museum
Balboa Park
San Diego, CA

Mr. Donald B. Cadien
LA County Sanitation Districts
Carson, CA

Dr. Kathy Conlan
Canadian Museum of Nature
Ottawa, Ontario, **CANADA**

Dr. Jean Claude Dauvin
Museum National d'Histoire Nat.
Paris, **FRANCE**

Dr. Emmett Duffy
Marine Sciences
University of North Carolina
Chapel Hill, NC

Dra. Elva Escobar Briones
Universidad Nacional Autonoma de Mexico
Mexico, D.F., **MEXICO**

Dr. John Holsinger
Old Dominion University
Norfolk, VA

Dr. Akirai Hirayama
Asia University Biology Lab
Tokyo, **JAPAN**

Dr. Jorg Kohn
Wilhelm-Pieck-Universitat
Rostock, **GERMANY**

Dr. Gertraud Krapp-Schickel
Wachtberg - Adendorf
GERMANY

Dr. Diana R. Laubitz
Canadian Museum of Nature
Ottawa, Ontario, **CANADA**

Dr. James K. Lowry
The Australian Museum
Sydney South, NSW, **AUSTRALIA**

Dr. Mary Mickevitch
MCSE, University of Maryland
College Park, MD

P.G. Moore
University Marine Biological Station Millport
Isle of Cumbrae, **SCOTLAND**

Dr. Alan A. Myers
University College
Cork, **IRELAND**

Dr. D.J. Reish
California State College
Long Beach, CA

Dr. Mark Shih
Canadian Museum of Nature
Ottawa, Ontario, **CANADA**

Dr. Craig P. Staude
Friday Harbor Laboratories
University of Washington
Friday Harbor, WA

Dr. J.H. Stock
Institute of Taxonomic Zoology
University of Amsterdam
Amsterdam, **THE NETHERLANDS**

Dr. Ichiro Takeuchi
University of Tokyo
Tokyo, **JAPAN**

Dr. James D. Thomas
The Reef Foundation
Big Pine Key, FL

Dr. Michael H. Thurston
Institute of Oceanographic Sciences
Surrey, **ENGLAND**

Dr. W.J.M. Vader
Universitetet I Tromso
Museumsvirksomhet
Tromso, **NORWAY**

Dr. Les Watling
Ira C. Darling Center
University of Maine
Walpole, **ME**

Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

3 April 1992

Dr. Brian Kensley
Division of Crustacea
NHB 163
Smithsonian Institution
National Museum of Natural History
Washington, D. C. 20560

Dear Dr. Kensley:

It was with deep regret that the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT) learned of Dr. J. L. Barnard's death in the fall of last year. He will be missed by colleagues in invertebrate systematics worldwide. Our condolences are extended to his co-workers in the Invertebrate Zoology Department at the Smithsonian.

Dr. Barnard was a member of SCAMIT and actively supported its goals to promote the study of the marine invertebrate fauna of southern California and to develop a regionally standardized taxonomy. His attendance and leadership at our annual Amphipod Workshop was of benefit to all concerned. He was an excellent taxonomic resource, having described much of the amphipod fauna of the west coast. We would observe in awe as he would show us how to deftly pluck out miniscule mouthparts. He was always interested in the taxonomic research of local members and encouraged them to publish their findings. Dr. Barnard, himself, found these workshops to be of great value. Local SCAMIT members were able to provide him with valuable amphipod specimens and ecological information, which Dr. Barnard incorporated into Smithsonian collections and information files.

SCAMIT needs the continued support and participation of amphipod researchers if we are to achieve our goals. Amphipods are being selected by national and local envioronmental monitoring agencies as toxicity and bioassay indicators, and will remain of major interest to researchers and taxonomists in the future. It is imperitive to SCAMIT and to others involved in amphipod research that another amphipod researcher replace Dr. Barnard. We feel it is crucial that amphipod systematics and research receive continued support nationally and internationally by the Smithsonian. It would be tragic for the amphipod collections and resources established by Dr. Barnard to become inactive through lack of commitment to them by the Smithsonian.

As the chairperson of the selection committee to fill Dr.

Barnard's post, we ask that you strongly consider our request and present this information to the other committee members. If you or others should have any questions concerning this letter or SCAMIT please call Ron Velarde (City of San Diego), President, at (619) 692-4903 or Larry Lovell (Consultant), Vice-President, at (619) 945-1608. Don Cadian (Los Angeles County Sanitation Districts) will be representing SCAMIT at the Barnard Memorial Service and can answer any questions.

Sincerely,

Ronald G. Velarde

Ronald G. Velarde, President and

Lawrence L. Lovell

Lawrence L. Lovell, Vice-President

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CRISIS IN SYSTEMATIC BIOLOGY IN THE "AGE OF BIODIVERSITY"

RODNEY M. FELDMANN AND RAYMOND B. MANNING
Department of Geology, Kent State University, Kent, Ohio 44242 and
Department of Invertebrate Zoology, National Museum of Natural History,
Smithsonian Institution, Washington, D.C. 20560

IT IS TIME to address the long-term consequences of the obvious contradiction between the decline in the study of systematics in the life sciences and the international cry for the study of biodiversity. Several diverse topics in neontology and paleontology, all of which are centered upon the questions of present and past perturbations in the world's biota, have dominated recent science news. The ozone layer that envelopes (protects) our planet might well be showing signs of man's adverse influence. Wanton harvesting and destruction of the rain forests of the world may be placing an unnatural stress on the recycling of atmospheric gases. Taken together, these two processes may very well result in global warming, which could have profound consequences on the biosphere. On a longer ranging scale, questions of periodic mass extinctions have piqued the imaginations of scientists and provide an interesting backdrop for considering cyclical changes in fauna and flora. These questions, among others, have resulted in the recognition that knowledge and understanding of biodiversity have reached a higher level of importance than at any other time in the history of systematics.

Questions of biodiversity are so important, in fact, that the Systematic Biology Division of the U.S. National Science Foundation has developed a program to encourage the submission of proposals in this area and the NSF's Division of Polar Programs has noted, "The study of polar paleobiology plays an important role in defining the influence of the polar regions in the evolution of Earth's biosphere. Two current areas of interest are the history of mass extinctions as they pertain to polar regions and the history of anoxia in the basins and surrounding shelf areas" (Divisional Advisory Committee for Polar Programs, 1990, p. 16). We find it ironic that, at the same time, training of systematists and development of systematic collections are being threatened at a higher level than has ever been the case in the past. Therefore, it is important for us to recognize the magnitude of the problems facing the field of systematic biology and for all life scientists to respond to the crisis.

Systematics or taxonomy is the study of natural diversity, better known today by the catchword biodiversity, thanks to the efforts of E. O. Wilson and others (Wilson, 1985, 1988; Black et al., 1989), and it is the kind of research characteristic of museums. Systematic research is basic to any other kind of biological study involving species, whether it be fisheries or molecular biology, ecology, behavior, or paleozoogeography.

In the 1990's we seem to have reached the point where both individuals and organizations outside the systematic community, including environmentalists, legislators, and sources of research funding, recognize the fundamental importance of knowledge of species diversity, museum collections that represent baseline data over time, and traditional systematic work, and appear to be beginning to appreciate the need for museum collections and systematics more than at any time in the history of systematic research, a time period spanning almost 300 years. Museums and the systematic profession in general, instead of being prepared for such a momentous change, are facing a crisis: we are losing systematists and systematic organizations, including museums.

Part of the problem is that the science of systematics has never been accorded the stature it deserves among all sciences. "Strange as it may seem, there is less attention and regard paid to systematic work at the present time than ever before." This is not a quote from an editorial published in 1990 in *Science* or *Nature*. It was published by Waldo Schmitt in 1930, and it is just as valid today, 60 years later.

Further, even though museums are primary sources of information on species and even though we are in the "information age," automation of museums' major sources of information on species, their collections, and their libraries, lags a generation or more behind current technology. Any major grocery store chain has in its data inventory specific information, including inventory, retail cost, and cost per unit of measure, on most food items in the store. This volume of information on species of shrimps, even commercial shrimps, is generally unavailable from any museum collection, large or small, in machine retrievable form. Grocery stores routinely use bar code technology to check out groceries and prepare bills (invoices). Museums prepare invoices the old fashioned way, by hand. The technology needed by museums has existed for years. The funding and the expertise needed to implement the technology is not yet available to most museums, which in consequence are unable to manage the vast amounts of information on species available to them.

In the past 30 years we have seen a dramatic increase in numbers of recognized living and fossil species. Within the study of crustaceans this is the result of the work of a generation of specialists. In geryonid crabs, deep-sea crabs of enormous commercial potential, for example, specimens identified with *Geryon affinis* Milne Edwards and Bouvier and *Geryon quinquedens* Smith now have been assigned to at least 18 different species. Although this may not be true for other crustacean groups, we are about to lose a generation of world-class specialists in decapod crustacean systematics. Concomitant with that loss will be a decline in our ability to examine and respond to questions of biodiversity.

At the National Museum of Natural History in Washington, an internal study for the Department of Invertebrate Zoology shows that seven of the eight crustacean taxonomists now on the staff potentially will be retired by the turn of the century. Worse, there are virtually no students in critical groups now enrolled in American universities. Potentially more than half of the staff of the department will retire by the turn of the century and the operative planning buzz-word within the museum is "downsizing," a direct result of increasingly limited funding.

Furthermore, hiring practices in universities as well as in museums have been such that there has not been an orderly replacement of specialists as they retire. Thus, the crucial process of mentoring has been truncated. Vacant offices in museums the world over attest to the fact that we are in a weak, even untenable, position to tackle the questions of biodiversity. There are few replacements for the generation of systematists now in or approaching retirement, many of whom worked at the national or international level. The tragedy is that even if funding for systematics increased immediately by an order of magnitude, it would take a generation to attract and train replacements for existing systematists now nearing the ends of their careers.

Hiring practices in both universities and museums either have not addressed the problem of replacement of specialists in systematic disciplines or have replaced systematists with scientists specializing in other areas, e.g., ecology, cell or molecular biology, or, worse yet, administration. At the same time university biology and geology departments have de-emphasized courses and programs in systematics as a response to the job market—the loop must be broken. In a recent editorial in *Bioscience*, W. H. Davis (1991) lamented the decision of his university to establish a program in molecular biology, and he commented: "As the public is beginning to recognize the importance of the great diversity of organisms on Earth and the need for systematic, behavioral, physiological, and ecological studies of organisms, the enormous tragedy of the overemphasis on molecular biology during the 1980's will become evident."

Not only are we losing people, including many invertebrate systematists, we are losing institutions. The Allan Hancock Foundation, one of the large, active museums in the United States with a long tradition of research, is in the process of transferring its crustacean collections to the Los Angeles County Museum. The Natural History Museum of San Diego is changing its directions, resulting in the termination of its paleontology program and the loss of all positions for research paleontologists. The Natural History Museum in London is de-emphasizing monographic work and work on local faunas, even though one of its stated areas of emphasis is biodiversity. The government of New Zealand has disestablished the biosystematics program of the New Zealand Oceanographic Institute, leaving systematists without jobs, and both of these latter organizations appear to have reverted to a strict "pay as you go" basis.

A wide variety of reports on the needs in and importance of systematics, prepared for a variety of organizations over the past four decades (Anonymous, 1953, 1968; Mayr and Goodwin, 1956; Michener et al., 1956; Steere, 1971a, 1971b; Stuessy and Thompson, 1981; see also Brusca, 1990), all have common themes. Systematics is important, there are not enough trained systematists, systematics as a discipline ranks somewhere under flatworms in importance, and museum collections need more support. Yet the situation is much worse today than ever.

Even in the 1990's, the Decade of Biodiversity, it will take an herculean effort to raise the level of understanding of the fundamental importance of systematics, a much higher level of funding than is now available for systematics and collections, the development of national and international forms of recognition for systematic work, a cooperative effort by those in academia and museums to interest people in systematic fields and to train them, and some long-range planning by museums, planning that includes training and jobs for future generations of systematists. Unless the effort includes creating permanent jobs in systematics, including many more support positions, the situation will not improve. Karl Schmidt (*in* Anonymous, 1953) made many of the same points in an article published in 1952, and noted that E. Ray Lankester had made them in the 1880's.

More specifically, it is important that each of us exert time and effort to educating the general public and our fellow scientists in the importance of their continued maintenance of systematics, the foundation of life science. The importance of writing articles for "popular" science outlets, stressing the application of systematics to all studies in the life sciences, cannot be overstated. It is these articles that influence the nonscientific public and, in turn, may have an influence on legislators. Carefully written, interesting articles dealing with the importance and the interest and excitement of working in systematic biology and paleontology should also have the effect of drawing in young people as the core for future generations of systematists. An aggressive approach must be taken to develop the recognition in legislators and administrators of scientific institutions and funding agencies, including private foundations, that only if fundamental areas within science are nurtured will we be able to progress.

Finally, we must develop in our co-workers in biology and geology the recognition that systematics is not only a classical foundation for these subjects but that it forms the fundamental core discipline which is essential to the continued success of all others. If the foundations of our study are neglected, we will be forced to endlessly re-massage previously gathered data.

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ACCEPTED 22 MARCH 1991

WESTERN SOCIETY OF MALACOLOGISTS

1992 Annual Meeting

The 25th annual meeting of the Western Society of Malacologists will be held this year at the Asilomar Conference Center in Pacific Grove, California. The conference will commence on Tuesday afternoon, 30 June with registration and a reception and end on Friday morning, 3 July with an optional field trip. The Asilomar center was the site of the first formal meeting of the Society after its formation and also several subsequent gatherings during the 1970's.

Recently the accommodations at Asilomar have been extensively remodeled and upgraded making it a very comfortable facility both for our conference and for housing. Enclosed are details about Asilomar, its location on the Monterey peninsula and a detailed map of the conference grounds. Please note that registration upon your arrival will be at the administration building (which is also labeled "registration" on the map). Housing and our meeting area will be in Sea Galaxy nearby. However you must check-in at Administration first.

SCHEDULE

This year's program will include two symposia, contributed papers, a reception, the annual auction, a closing banquet and a field trip to the Monterey Bay Aquarium. The tentative schedule is as follows (timing may vary):

Tuesday, 30 June:	3:00 - 6:00	Registration
	6:00 - 7:00	Dinner
	7:30 -	Wine/Cheese Reception Evening slide shows
Wednesday, 1 July:	9:00 - 12:00	Cocos Island Symposium
	1:00	Group Photo
	1:30 - 5:00	Cocos Island Symposium
	7:30 -	Auction/Reprint Sale
Thursday, 2 July:	9:00 - 12:00	Opisthobranch Symp.
	1:30 - 3:00	Contributed Papers
	4:00 - 5:00	Business Meeting
	6:30 -	Reception/Banquet

This year the banquet speaker with be Dr. Charles Baxter from the Hopkins Marine Station who will be discussing his studies of the Monterey Bay marine canyon system and showing deepwater videos of the terrain and marine life.

EXPENSES

Costs for this year's meeting are based on the assumption that you will also be staying at Asilomar for three nights. Both housing and meals are included under a single charge for the duration of the conference. If you are planning only on attending for a single day, you must make other arrangements using nearby hotels. The registration fee applies to all those in attendance. There is no reduced rate for a single day. Individuals staying off the Asilomar campus can purchase meals as needed at the dining hall. .

Accomodations consist of rooms which hold up to four studio beds. Each room has a private bathroom. The double occupancy rate is $60 per day/per person, equaling $180 for the conference. If you are not registering jointly on the enclosed form, please indicate your roommate preference if known. Single occupancy is $98 per day/per person/per room, meaning that you get the whole thing to yourself for only $295.

Additional charges due with your registration and housing reservation include the banquet and the group photograph. The end of conference banquet will be a special meal that differs from the other dinners. For residents of Asilomar there will be an added cost of $14.00. If you are not staying at Asilomar, but wish to attend the banquet the cost is $25.00.

This year the group photograph will be available for an additional $8.00. Since each year we invariably end up with dozens of spare photographs, their availability is now going to be limited to those who really want one, so please indicate your preference.

AUCTION and REPRINT SALES

The annual auction of choice shells and books will be held on Wednesday, 1 July at 8PM. As the auction is a principal source of funding for the Society's activities it is an important event which deserves you support. If you have quality specimens, with data, or books which you wish to donate please send them to Henry Chaney (address below). If you are attending the meeting you can bring your donation with you, but please forward a list so that the auction can be organized.

Journals and reprints will also be available for sale under the auspices of George Kennedy. Please donate any publications or notify George at the County Museum of Natural History, 900 Exposition Blvd., Los Angeles, CA 90007.

FIELD TRIP

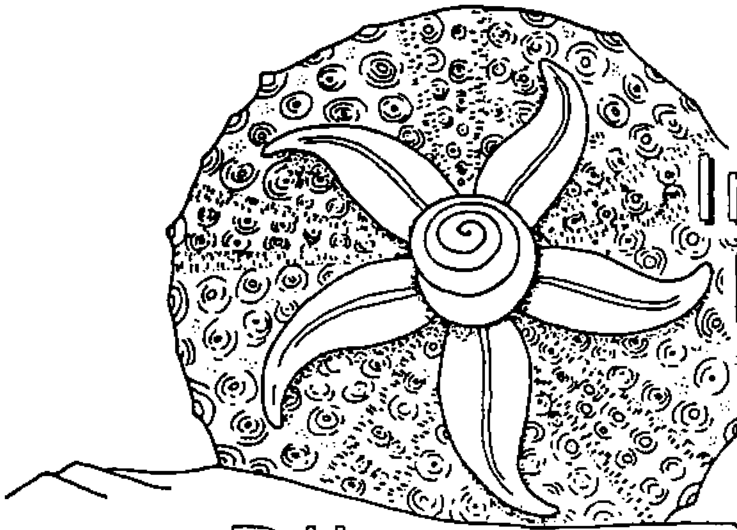
The field trip will be an excursion to the Monterey Bay Aquarium on Friday morning. A sign-up for this event will be available at the meeting and transportation will be arranged as needed.

DEADLINE

The deadline for housing reservations is **22 May 1992** after which accommodations at Asilomar cannot be guaranteed.

ADDITIONAL INFORMATION or QUESTIONS

If you have additional questions about the meeting please contact Society President Dave Mulliner (619)488-2701 or Henry Chaney (805)682-4711 x344 (day) or (805) 963-2382. A FAX number (805) 963-9679 is also available for inquiries.



8th International Echinoderm Conference

Dijon 1993

The Organizing Committee invites you to participate in the 8th I.E.C. to be held at the University of Burgundy, Dijon, on September 6 to 10, 1993.

People who are interested in receiving registration information are requested to complete and return the attached form before **September 30, 1992** to:

8th I.E.C. - Bruno DAVID
Centre des Sciences de la Terre
6, Bd. Gabriel F - 21000 DIJON
☎ 80-39-63-71 T. Fax: 80-39-50-66

✂ ....

Pre-registration form (please type or print)

Name .... Firstname ....

Institution ....

Street ....

City ....

Postal code .... Country ....

Job Announcement

Baker Environmental, Inc. (formerly Baker/TSA, Inc.), located near the Greater Pittsburgh International Airport, continues to expand, creating excellent growth opportunities for environmental assessment, design and management professionals. An Environmental Scientist position is available to a person who wants a career with one of the world's fastest growing environmental consulting companies. The position requires an M.S. in biology, ecology or ecotoxicology or strong environmental science academic credentials and 0-5 years experience in ecological assessment performance. Familiarity with CERCLA, RCRA corrective action, CWA and State regulatory programs, as they relate to ecological assessment procedures, is essential.

Knowledge/experience in field sampling, taxonomy, ecological endpoints and ecotoxicology with terrestrial and/or aquatic systems is important. Strong communication, analytical and computer skills are also necessary. Previous consulting experience is desirable.

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Filename: MANTIS
Updated: 03.JAN.92.hgk

Natural History Museum of Los Angeles County
Stomatopoda Collection

This file lists number of lots, species name, and localities represented by each species of stomatopod in the collection. It includes both the original LACMNH and the transferred AHF stomatopod collections. A large collection of stomatopods from the 1984 LACM cruise to the Galapagos Ids. are still with Dr. Raymond B. Manning at the USNM, and are not represented here.

# of lots	Specimens	Locality
1	*Acanthosquilla diqueti*	Mexico
1	*Cloridopsis dubia*	Ecuador
7	*Coronida schmitti* (6 + 16 PARATYPES)	Galapagos Ids.; Mexico
3	*Eurysquilla veleronis*	Mexico; Barbados
11	*Gonodactylus bahiahondensis*	Costa Rica; Columbia; Panama
6	*Gonodactylus festae*	Ecuador; Costa Rica; Colombia
93	*Gonodactylus oerstedii*	West Indies; Mexico; Panama; Columbia; Galapagos Ids.; Ecuador; Venezuela; Puerto Rico
1	*Gonodactylus spinulosus*	West Indies
9	*Gonodactylus stanschi*	Mexico
3	*Gonodactylus zacae*	Mexico; Galapagos Ids.
18	*Hemisquilla ensigera*	Mexico; California
1	*Lysiosquilla antillensis* (HOLOTYPE) (=*Nannosquilla*)	Venezuela
1	*Lysiosquilla hancocki* (HOLOTYPE)	Venezuela
1	*Lysiosquilla mccullochae* (HOLOTYPE) (=*Heterosquilloides*)	Mexico
3	*Lysiosquilla maculata*	Guatemala; Galapagos Ids.; Ecuador
3	*Meiosquilla polita*	Mexico; California
1	*Mesacturus dicrurus* (PARATYPES; 2 females)	Guam

7	stomatopod larva	California, central Pacific
59	unidentified Stomatopoda	Ecuador; Mexico; California; Galapagos Ids.; Bahamas; Florida; Jamaica; Guam

Total Lots: 324 (03.JAN.92.hgk)

NOTE: Per Janet Haig (AHF), this collection has never been updated as to synonomies and generic reassignments-6/89.

Hemisquilla ensigera californiensis Stephenson, 1967.
Crustacea: Hoplocarida: Stomatopoda

PL Code C-134

Date examined 22 July, 1988
Voucher by: Larry Basch

Synonomy: Hemisquilla ensigera (Owen, 1832) fide Manning, 1963
Gonodactylus ensiger, Owen, 1832
Gonodactylus styliferus H. Milne-Edwards, 1837
Hemisquilla stylifera Schmitt, 1940
Pseudosquilla bigelowi Rathbun, 1910

Literature: See the following in Stomatopod Bibliography (attached).
Basch and Engle, in press - a & b.
Basch and Engle, in press 1988 in Am.Zool.
Haderlie, et al., 1980
Manning, 1963
Manning, 1980
Schmitt, 1940
Stephenson, 1967

Diagnostic Characters:

1. Rostrum shaped like a triangle with rounded angles.
2. Eyes weakly bilobed, with distinct wide band of ommatidia six cells across, separating dorsal and ventral corneal lobes.
3. Dactylus of maxilliped 2 (thoracopod 2) without spines on inner margin. Heel of dactylus slightly inflated proximally.
4. Telson as figured in Schmitt, 1940, p. 183, and attached table.
5. Body coloration yellow-brown to tan. Distal parts of some limbs yellow. Distal of antennules, maxillipeds, pereo- and pleo-pods blue. Uropods deep blue, fringed with dark red setae.

Comments: This is the largest of the California stomatopods. It extends from Santa Barbara Co., CA, south to the Golfo di Chiriqui, Panama. Besides its large size, it is the most numerically abundant species in the region, and may occur locally in very dense populations ($1/m^2$). Recent work by Basch and Basch and Engle has provided some information on biogeography and local population distribution patterns, seasonal patterns in life history and reproductive ecology, foraging, diel and seasonal activity and other areas. Habitats range from shallow (5m or less) inshore areas commonly down to 70-100m, and to near abyssal depths, where they burrow in stable mud-sand bottom.

Nannosquilla anomala Manning, 1967.
Crustacea: Hoplocarida: Stomatopoda.

No voucher available, known only from type material. Date examined: See Manning, 1
Voucher by: See Manning, 1967

Synonomy: None.

Literature: See the following in Stomatopod Bibliography (attached).
Haderlie, et al., 1980
Manning, 1967

Diagnostic Characters:

1. Rostrum of an unusual (anomalous) shape for this taxon, rectangular, with longest axis across body and short rounded point extending anteriorally. Rostrum shape may be variable.

2. Eyes somewhat bilobed.

3. Dactylus of maxilliped 2 (thoracopod 2) armed with from 10-14 spines, including distal one, on inner margin. Outer margin rounded with proximal basal notch flanked proximally and distally by small lobe.

4. Telson and uropod as figured in Manning, 1967 and attached table. Note posteriorally projecting lateral spines on 6th abdominal segment (pleotelson).

5. Body covered with dark-brown chromatophores, clustered on midline in some specimens. Black pigmentation on anterior of carapace, anterior limbs, 6th abdominal somite and telson.

Comments: Besides the original species description, virtually nothing is known about this species. Any information or specimens of this, and other California species would be applied to a work in progress concerning ecology and distribution of the local stomatopods.

Larry Basch

Pseudosquillopsis marmorata (Lockington, 1877)
Crustacea: Hoplocarida: Stomatopoda.

Personel collection: LVB

Date examined: 22 July, 1988
Voucher by: Larry Basch

Synonomy: Squilla marmorata Lockington, 1877

Literature: See the following in Stomatopod Bibliography (attached).
Manning, 1969
Schmitt, 1940

Diagnostic Characters:

1. Rostrum tapers to a sharp point anterio-distally. Broad proximally.

2. Eyes strongly bilobed, with narrow median band of ommatidia separating corneal lobes.

3. Dactylus of maxilliped 2 (thoracopod 2) armed with 3 distinct spines, including distal one. Outer margin smooth, curving from distal tip to past the most proximal tooth.

4. Telson as figured in Manning, 1969 and attached table. Note spination and carination on telson and pleotelson (6th abdominal somite).

5. Body coloration golden-brown overall, with mottled darker brown pigmentation in places. Uropods a lighter brown background color after preservation, fringed with red-purple setae.

Comments: There is little known of this species, save for descriptions of postlarvae and juveniles (Manning, 1969). They are moderate in size of the California species, and occur in relatively shallow waters (6-18m) in sand or mixed sand-rubble habitats. They are sympatric with Hemisquilla ensigera californiensis at one station north of Santa Catalina Island, and are probably uncommon at several other sites in the Southern California Bight. They, and close relatives occur south of California.

Schmittius politus (Bigelow, 1891) fide Manning, 1972
Crustacea: Hoplocarida: Stomatopoda.

PL Code: C-212

Date examined 22 July, 198
Voucher by: Larry Basch

Synonmy: Squilla polita Bigelow, 1891
Meiosquilla polita (Bigelow, 1891)

Literature: Schmitt, W.L., 1940. The Stomatopods of the West coast of America, based on collections made by the Allan Hancock expeditions, 1933-38. Allan Hancock Pacific Expeditions, 5(4): 129-225. See p. 146 for Squilla polita Bigelow and included references. Refer also to Stomatopod Bibliography.

Diagnostic Characters:

1. Rostrum spade-shaped, posterior margin indented with small lobes extending posterio-laterally.

2. Eyes strongly bilobed, with distinct, narrow median band of ommatidia seperating lobes.

3. Dactylus of maxilliped 2 (thoracopod 2) armed with 4 distinct spines, including distal one. Outer margin smooth, curving from distal tip to past the most proximal tooth, followed by a small shoulder before the proximal heel, the latter used for hammering or crushing prey.

4. Telson as figured in Schmitt, 1940 and attached table. Note spination pattern on 6th abdominal segment (pleotelson).

5. Body coloration overall light golden brown, with darker brown pigmented chromatophores scattered randomly throughout body. Some specimens have darker pigments concentrated at the margins of thoracic and abdominal segments. Rostrum and other anterior body regions have dark brown clustered chromatophores.

Comments: This animal is not easily confused with other mantis shrimps in the California region, but has close relatives to the south. It is recorded as far north as Monterey Bay where, if this record is substantiated, it must be very rare. The southern range limit is recorded as off Punta Abreojos, Baja California, Sur, but is likely even further south. It is probably the second most abundant stomatopod in California (after Hemisquilla ensigera californiensis). Habitats range from shallow coastal lagoons in Southern California, to back bay and deep (150m) open ocean soft bottom

KEY TO THE ONUPHIDAE OF POINT LOMA
revised[1] by Dean Pasko, 11/91

1. Tentacular cirri absent; outer lateral occipital antennae clavate (club-shaped) (Fig. 1) . . . . *Hyalinoecia juvenalis*

   Tentacular cirri present; outer lateral occipital antennae cirriform (Figs. 2 & 3) 2

2. One to three anterior parapodia prolonged and directed forward (Fig. 2) 3

   Anterior parapodia not prolonged and directed forward (Fig. 3) 5

3. Setiger 1 with prolonged parapodia and auricular presetal lobes - parapodia ~2x the size of the other parapodia (Fig. 4); cirriform ventral cirri on setigers 1 & 2; eyes present . . . . *Nothria occidentalis*

   Two or three setigers with prolonged parapodia and long, distally crooked composite setae (Fig. 2); auricular presetal lobes absent; eyes absent 4

4. Setigers 1 and 2 with prolonged parapodia and cirriform ventral cirri; branchiae present from setiger 4 . . . . *Rhamphobrachium cristobalensis*

   Setigers 1-3 with prolonged parapodia and cirriform ventral cirri; branchiae present from setiger 8 . . . . *Rhamphobrachium longisetosum*

5. Branchiae large, spiral - numerous filaments arranged spirally around a central axis - and beginning on setigers 4 or 5 (Fig. 5c) . . . . *Diopatra* sp.[2]

   Branchiae simple, cirriform or pectinate, beginning on various setigers (Fig. 5a & b) 6

6. Pseudocompound hooks of setigers 1-3 with prolonged, pointed hoods (Fig. 6a); body white, lacking any pigment pattern . . . . *Paradiopatra parva*

   Pseudocompound hooks with blunt hoods (Fig. 6b & c); body usually pigmented 7

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[1] Revised from 12/84 key by D. Ituarte.

[2] This group includes *Diopatra tridentata*, *D. ornata* and *D. splendidissima*, which are not readily distinguishable except by their tubes or ecology. *D. tridentata* has a smooth, silty and annulated tube. *D. ornata* has a chitinized, parchment-like tube covered with shell and other debris. *D. splendidissima* is found in shallow waters to 20 m. The genus is presently under revision by Hannelore Paxton, at the Western Australian Museum, NSW, Australia.

7. Branchiae present after setiger 6; ceratophores with 5 or fewer rings (see Fig. 1); compound spinigers present in some anterior setigers (see below; "joint" frequently located within parapodia, mount several parapods on compound microscope) 8

Branchiae present from setiger 1; ceratophores with 10 or more rings (Fig. 3); compound spinigers absent 9

8. Branchiae present from setiger 6 or 7; dorsum generally pale with paired black spots on anterior segments; compound spinigers from setigers 7-19 . . . . . *Mooreonuphis nebulosa*

Branchiae present from setiger 19; dorsum generally pale transverse bands on anterior segments; compound spinigers from setigers 4-16 . . . . *Mooreonuphis stigmata*

9. Branchiae at least bifid, usually pectinate after setiger 18-20; ceratophores with up to 21 distinct rings; subacicular hooks first present from setiger 8 (Fig. 7) . . . . *Onuphis eremita parva*

Branchiae simple throughout; ceratophores with 15 or fewer rings that may be indistinct; subacicular hooks first present after to setiger 8 10

10. With bi- and tridentate pseudocompound hooks (Fig. 5b & c); cirriform ventral cirrus in first 5 setigers; first 5 setigers elongate. . . . . *Onuphis elegans*

All pseudocompound hooks tridentate; cirriform ventral cirrus in first 6-7 setigers; first 6-7 setigers elongate; anterior setigers iridescent 11

11. Subacicular hooks first present from setiger 9; anterior setigers with distinct transverse pigment band across the posterior half of each segment . . . . *Onuphis* sp. 1 (= *O.* "intermediates" of Pt. Loma)

Subacicular hooks first present from setiger 12 (occasionally setiger 10 in juveniles and sub-adults); pigment pattern does not include a distinct transverse pigment band across the segments, though a diffuse or light band may be present, especially in juveniles . . . . *Onuphis iridescens*

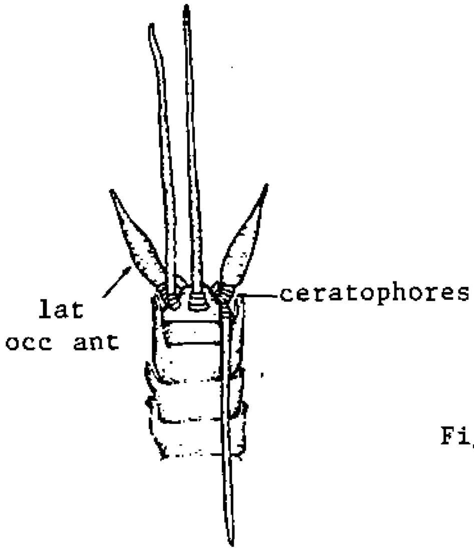


Fig. 1. <u>Hyalinoecia juvenalis</u>, anterior end.

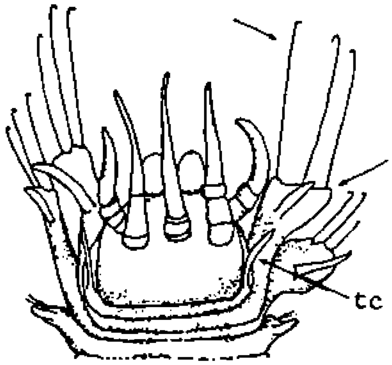


Fig. 2. <u>Rhamphobrachium cristobalensis</u>, anterior end.

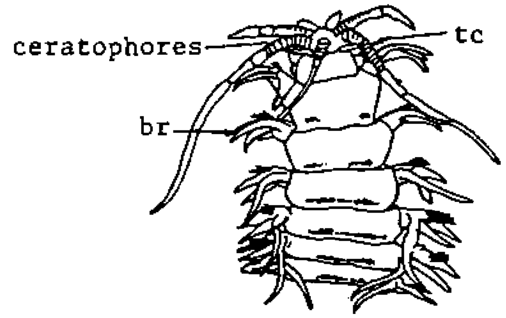


Fig. 3. <u>Onuphis</u> sp., anterior end.

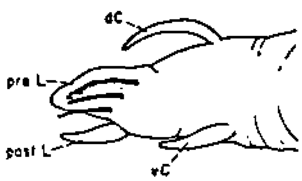
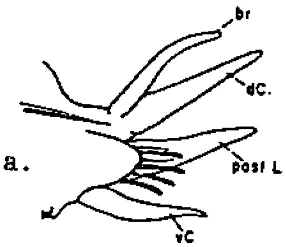


Fig. 4. <u>Nothria</u> <u>occidentalis</u>, parapod 1.



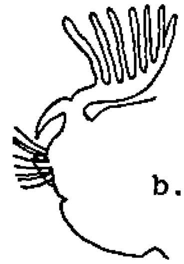


Fig. 5. Branchiae:
a) simple;
b) pectinate;
c) spiral.

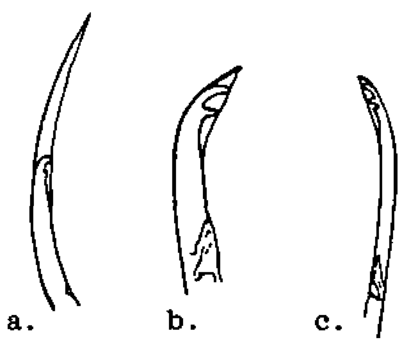


Fig. 6. Hooded hooks with:
a) prolonged, pointed hood;
b) short, blunt hood and bidentate hook;
c) short, blunt hood and tridentate hook.

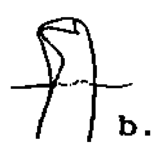


Fig. 7. a) Parapod from mid-body showing sub-acicular hook; b) sub-acicular hook.

KEY TO THE CHAETOPTERIDAE OF POINT LOMA

by Dean Pasko/Ron Velarde
2/3/92

1. Ventrum without color pattern; setigers 1-9 short, of equal length (Fig. 1); setiger 4 with several major spines . . . . *Mesochaetopterus* sp.

   Ventrum with a combination of light or dark brown and chalky white color pattern (Fig. 2); at least setiger 4 somewhat elongate; setiger 4 with one major spine 2

2. Ventrum with dark brown band on setigers 6 & 7; setigers 7-11 chalky white; peristomial flaps prominent (Fig. 2a); eyes present . . . . *Spiochaetopterus costarum*

   Ventrum with light brown band beginning on setiger 5; setigers 6-9 (occasionally 6-11) chalky white; peristomial flaps absent (Figs. 3a & 4a); eyes absent or present 3

3. Eyes present; setiger 5 light brown and setigers 6-9 (occasionally 6-11) chalky white (Fig. 3) . . . . *Phyllochaetopterus prolifica*

   Eyes absent; setigers 5 & 6 light brown and setigers 6-8 chalky white (Fig. 4) . . . . . *Phyllochaetopterus limicola*

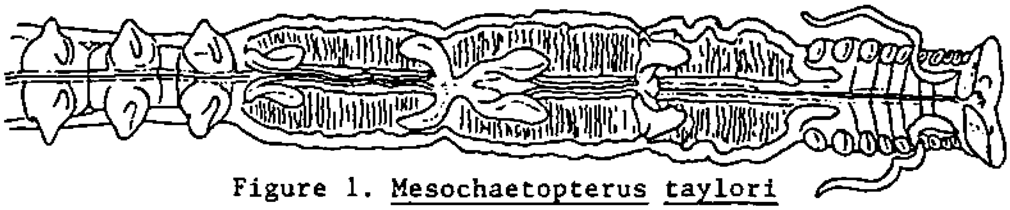


Figure 1. *Mesochaetopterus taylori*

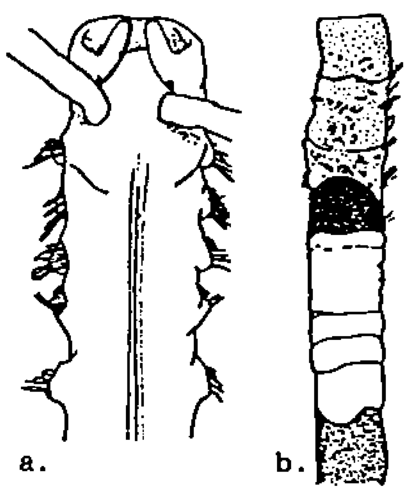


Figure 2. *Spiochaetopterus costarum*: a) anterior end, dorsal view; b) anterior end, ventral view showing color pattern.

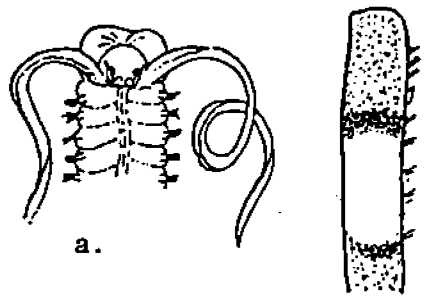


Figure 3. *Phyllochaetopterus prolifica*: a) anterior end dorsal view; b) anterior end, ventral view showing color pattern.

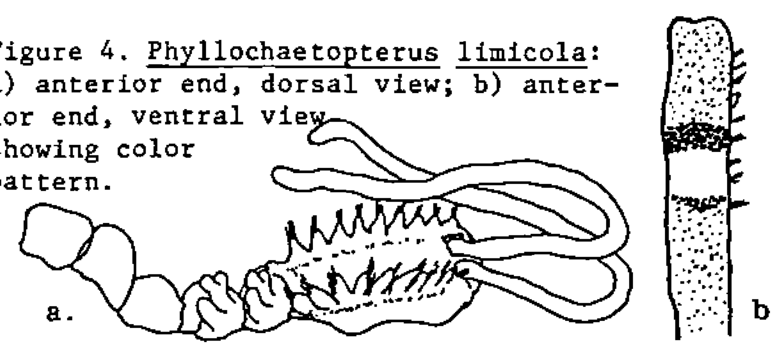


Figure 4. *Phyllochaetopterus limicola*: a) anterior end, dorsal view; b) anterior end, ventral view showing color pattern.

REFERENCES FOR ACCOMPANYING FIGURES

Figures 1, 3a and 4a — Hartman, O. 1969. Atlas of Sedentariate Polychaetous Annelids from California. Allen Hancock Foundation, University of Southern California, Los Angeles: pp. 207-220.

Figure 2 — Uebelacher, J. M., and P. G. Johnson (Editors). 1984. Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Final Report to the Minerals Management Service, contract 14-12-001-29-91. Barry A. Vittor & Associates, Inc. Mobile, Alabama. Vol. II: p. 11-7. (modified from)

THALASSINIDEA OF THE TEMPERATE NORTHEAST PACIFIC

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Thalassinoid "shrimps" have received considerable attention in the last 15 years. The group has undergone significant taxonomic revision at generic and family levels, and its ecological importance has become better recognized. The mud (or ghost) shrimps that make up this group all burrow. Estimates made over 50 years ago suggested thalassinoid bioturbation rates were high (MacGinitie 1934). The actual magnitude of their impact on benthic communities has now been experimentally established (Posey 1986, Branch & Pringle 1987, Dobbs & Guckert 1988), and is truly dramatic in many instances.

The thalassinoid families are distributed in overlapping series along a bathymetric gradient. The callianassids are primarily intertidal-shallow subtidal, but may extend to depths of more than 100m. Upogebiids and laomediids are usually found at shallow-subtidal to mid-shelf depths, with the Ctenochelidae and the closely related Axiidae and Calocarididae containing species which occur from mid-shelf to bathyal depths.

Although all thalassinoids burrow, axiids seem to construct the deepest burrows (Pemberton et al 1976), while callianassids appear to have the greatest community impact (ie. Suchanek 1983). Burrowing generally occurs in sediments although there are several species which burrow only into sponges (Williams 1987) or corals (Sakai 1970). Such specialized burrowers are all in the family Upogebiidae. Some species may not form complete burrows, opting instead for excavation of cavities under or between rocks.

Burrow structure is related to nutritive mode of the species (Griffis & Suchanek 1991), with species which filter feed, deposit feed, and detritus feed all forming distinctive burrow types. Deposit feeders may perhaps be further subdivided into those that only process sediments, and those which also intentionally groom the burrow walls to facilitate bacterial or meiofaunal growth (Dobbs & Guckert 1988).

The necessity of respiring in burrow water which may be isolated by tidal flux for long enough to become hypoxic or anoxic has led to great physiologic tolerance of low oxygen conditions in intertidal species. This same ability allows subtidal species to burrow deeply below the redox potential discontinuity layer. Despite their tolerance of low oxygen tensions, thalassinids routinely ventilate their burrows through pleopod beating. Burrow water exchange during ventilation oxygenates subsurface sediment pore water and aids elemental diagenesis in benthic sediments.

Schram (1986) indicated seven families in the Infraorder Thalassinidea: Thalassinidae, Axiidae, Laomediidae, Callianassidae, Callianideidae, Upogebiidae, and Axianassidae. This arrangement has been modified by resurrection of the family Calocarididae (Kensley 1989), by submergence of the Axianassidae within the Laomediidae (Kensley and Heard 1990), and by elevation of the callianassid subfamily Ctenochelinae to family rank (Manning and Felder 1991). All follow the basic decapod body plan, and are grossly similar. With the exception of the Axiidae (and some callianideids), they are united by possession of **linea thalassinica**, two grooves which run between the anterior and posterior carapace margins. These lines are usually most easily seen in lightly calcified forms such as callianassids. In some species they may be undetectable on the posterior portions of the carapace.

Although elongate, "shrimp-like", and popularly called shrimp, thalassinoids are "reptant" decapods rather than caridean or dendrobranchiate shrimp. Their placement among other groups within the decapods has varied over time. They have usually been included in the Anomura (and will be found there in most texts). Recent phylogenetic analyses tend to show the inclusion of the thalassinoids in the Anomura as no longer tenable (Saint Laurent, 1979; Burkenroad, 1981; McLaughlin, 1983; Schram, 1986). Their removal from the Anomura yields a more cohesive residual group for which McLaughlin (1983) suggests resurrecting the Anomala of de Haan. Brusca and Brusca (1990) place thalassinoids at the infraordinal level - on a par with Brachyura and Caridea. General structural features of the group are indicated in Figures 1 and 2.

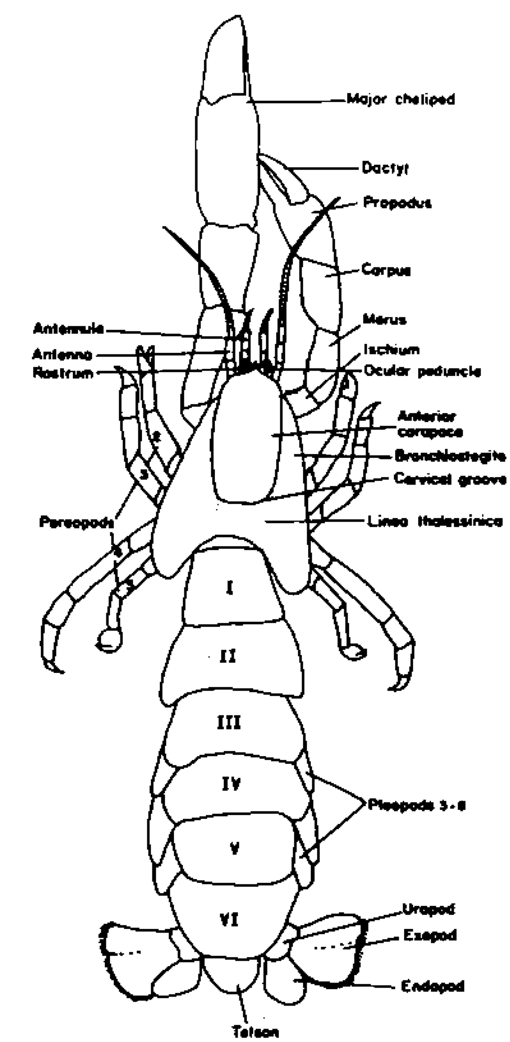
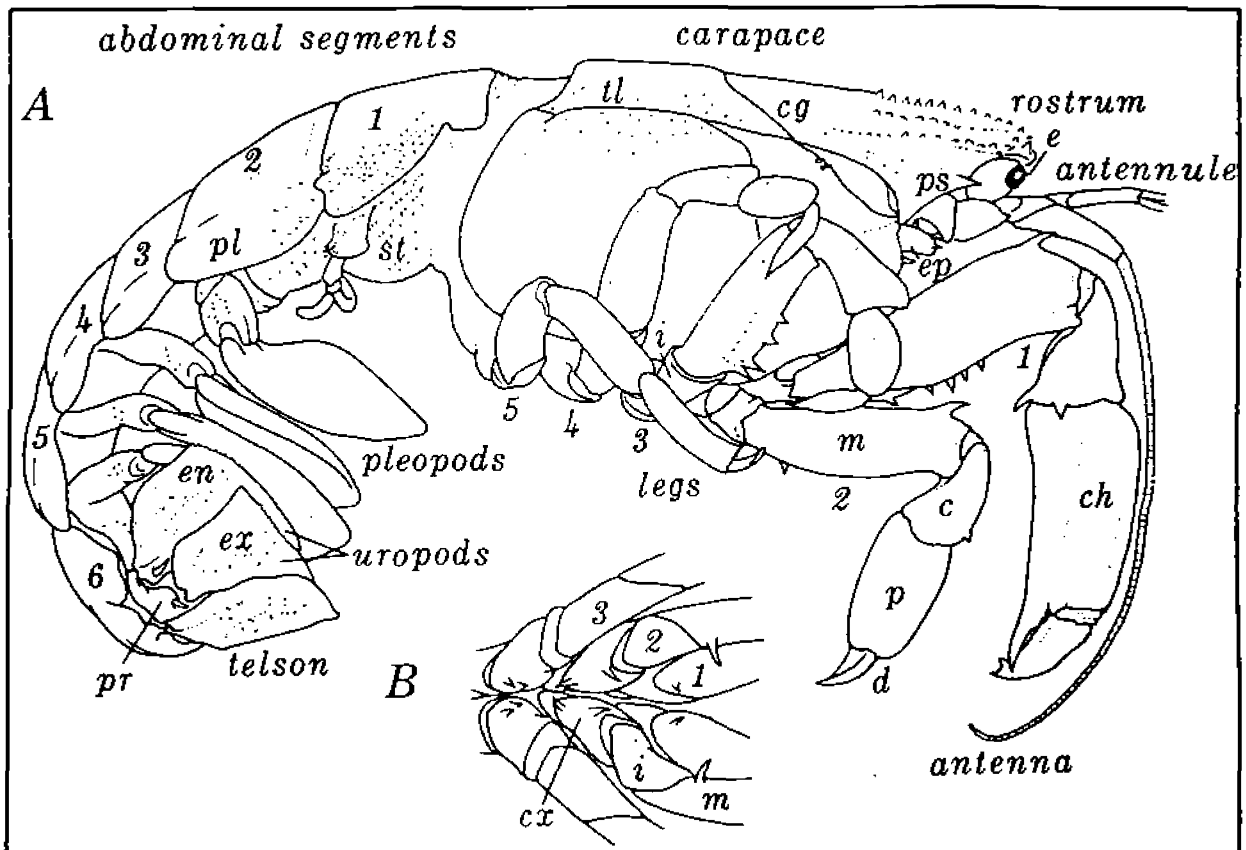


Figure 1. General anatomy of *Callianassa* in dorsal view (from McLaughlin, 1980 Comparative Morphology of Recent Crustacea)

Structures important in separation of the various thalassinoids found in our area reside primarily on the rostrum and anterior margin of the carapace; the chelae; the other four pairs of legs; the telson and uropods; the pleopods; and the antennae and antennulae. Since animals recovered in environmental monitoring samples are often without attached appendages, substitute characters have been sought which allow identification in their absence.

Species of Axiidae, Laomediidae, Calocarididae, Callianassidae, Ctenochelidae and Upogebiidae are present in the temperate to boreal waters of the Northeast Pacific. The remaining two families are more tropical in distribution. Schmitt (1921) reported nine species of thalassinoids from our area. The list of Wicksten (1980) mirrored that of Schmitt, but excluded *Calastacus investigatoris* (now *Lophaxius rathbunae*). Both lists indicated that *Callianassa longimana* of Stimpson 1857 was still a valid species. It was, however, placed in the synonymy of *Callianassa gigas* (now *Neotrypaea gigas*) by Biffar in his 1972 thesis.



Schematic drawing of *Upogebia*. *A*. Animal in lateral view; *B*. Coxa and associated articles of legs 1–3 in ventral view: *c*. Carpus; *cg*. Cervical groove; *ch*. Cheliped; *cx*. Coxa (sometimes spined); *d*. Dactyl; *e*. Eye; *en*. Endopodite; *ex*. Exopodite; *i*. Ischium; *m*. Merus (sometimes spined proximally); *p*. Propodus; *pl*. Pleuron (sometimes bearing spinules); *pr*. Protopodite; *ps*. Postorbital spine; *st*. Sternite (sometimes bearing spinules); *tl*. Thalassinidean line.

Figure 2. General anatomy of *Upogebia* in lateral/ventral views (from Williams, 1986)

Neither list included *Naushonia macginitiei* (Glassell 1938), the only member of the Laomediidae known locally. Aside from the original collection at La Jolla , I know of only two additional specimens. Both were taken during the aftermath of the strong 1982-83 El Niño event; one in San Diego Bay, and one in Long Beach Harbor. The distinctive larvae of *Naushonia* (Thompson 1903) were noted occasionally between 1969 and 1984 (Sowby, personal communication) in Alamitos Bay, Long Beach Harbor, and nearshore on the open coast as far north as Ventura; so the dearth of adult specimens probably reflects difficulty of sampling rather than the rarity or intermittent occurrence of the species. George MacGinitie's collection of the types "under stones in a small pool at extreme low water" indicates that these animals probably frequent the rock/sand ecotone, and may be most effectively sampled by divers using bait.

This species was originally described as *Homoriscus macginitiei*, but *Homoriscus* was synonymized with *Naushonia* by Chace (1939). The genus was reviewed by Goy and Provenzano (1979) whose key was modified by Martin and Abele (1982) to include an additional species from Panama.

Williams (1986) examined the genus *Upogebia* in the Northeast Pacific and recognized three new species previously confused with *Upogebia pugettensis*. Inclusion of his three new species and *Naushonia* raises the number of thalassinoids known from our area to twelve. The record of *Calastacus stilirostris* Faxon 1893 (described from off Acapulco) in waters off Washington and western Canada (Kozloff 1987), if accurate, adds a 13th thalassinoid to the temperate Northeast Pacific fauna.

Revisions of the Axiidae by Sakai and de Saint Laurent (1989), and of the Callianassidae by Saint Laurent (1974) and Manning and Felder (1991) have modified the generic placement of several of our species. These changes are reflected in the list below. Status of some species remains in flux. *Acanthaxius spinulicaudus* should apparently be transferred yet again to *Calocarides* an action to take place in a forthcoming monograph on the Axiidae (Kensley, personal communication). Unfortunately just after the revision of the American callianassids by Manning and Felder, Holthuis found *Neotrypaea affinis* was a homonym, and erected the replacement name *Neotrypaea biffari* (Manning, personal communication).

Additional changes will occur when the west coast callianassids are reexamined monographically. The necessity of this project has long been apparent. Biffar (1972) noted a number of provisional *Callianassa* species in his thesis work, but has not since published either the thesis, or papers describing his provisional forms further. Biffar's descriptions and illustrations are not referable to individual specimens, and since several of his provisional taxa were based on mixed lots (Manning, personal communication), determination of his taxa will prove difficult. Dr. Ray Manning of the Smithsonian Institution is considering such a revision, seeing it as a natural outgrowth of his recent revision of the existing American species (Manning and Felder 1991). This revision, if ultimately undertaken, is at least several years off.

Several people assisted in the gathering of the information presented here. I wish to thank Dr. Brian Kensley, Dr. Ray Manning, and Dr. Austin Williams of the Smithsonian Institution; Dr. Jody Martin of the Los Angeles County Museum; and Dr. Tom Suchanek of the University of California, Davis. Special thanks are to to Austin Williams for constructive comments on an earlier version of this article.

List of Temperate Northeast Pacific Thalassinoids
and their primary synonyms

Family Axiidae Huxley 1879

Acanthaxius spinulicaudus (Rathbun 1902)
Axiopsis spinulicauda [= *Acanthaxius spinulicaudus*]
Calastacus quinqueseriatus [= *Calocarides quinqueseriatus*]
Calocarides quinqueseriatus (Rathbun 1902)

Family Calocarididae Ortmann, 1891

Calastacus investigatoris of Rathbun 1904 and Schmitt 1921 [= *Lophaxius rathbunae*]
Calastacus stilirostris Faxon 1893
Calocaris investigatoris of Sakai and Saint Laurent, pars[=*Lophaxius rathbunae*]
Lophaxius rathbunae Kensley 1989

Family Laomediidae Borradaile, 1903

Homoriscus macginitiei [= *Naushonia macginitiei*]
Naushonia macginitiei (Glassell 1938)

Family Callianassidae Dana 1852

Callianassa affinis [= *Neotrypaea biffari*]
Callianassa californiensis [= *Neotrypaea californiensis*]
Callianassa gigas [= *Neotrypaea gigas*]
Callianassa longimana [= *Neotrypaea gigas*]
Neotrypaea affinis [=*Neotrypaea biffari*]
Neotrypaea biffari Holthuis 1991
Neotrypaea californiensis (Dana 1854)
Neotrypaea gigas (Dana 1852)

Family Ctenochelidae Manning and Felder 1991

Callianassa goniophthalma [= *Callianopsis goniophthalma*]
Callianopsis goniophthalma (Rathbun 1901)

Family Upogebiidae Borradaile 1903

Upogebia lepta Williams 1986
Upogebia macginitieorum Williams 1986
Upogebia onychion Williams 1986
Upogebia pugettensis (Dana 1852)

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KEY TO THE THALASSINIDEA OF THE TEMPERATE NORTHEAST PACIFIC

based on keys in Schmitt (1921), Williams (1986), Sakai and de Saint Laurent (1989), and Kensley (1989)

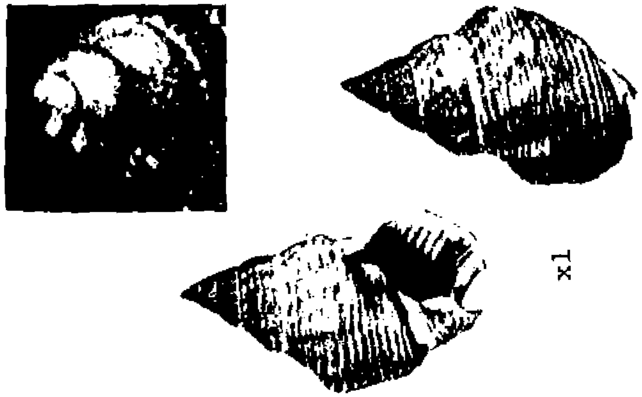
D.B.Cadien, LACSD - April 1992

1. Abdominal pleurae large, extending well below sternites (Axiidae, Calocarididae and Laomediidae) 2
   Abdominal pleurae small, not covering or barely covering sides of sternites (Callianassidae, Ctenochelidae and Upogebiidae) 6
2. Rostrum acute, longer than broad (Axiidae & Calocarididae) 3
   Rostrum as broad as long, spatulate, with serrated anterior border (Laomediidae) . . . . . *Naushonia macginitiei*
3. Hermaphroditic; pleopod 1 present in all specimens, spatulate 4
   Pleopod 1 absent in ♂, present and slender in ♀ 5
4. Carapace with anterolateral tooth and with post-cervical carina or ridge. Pleurobranchs present on pleopods 2-4 . . . . . *Lophaxius rathbunae*
   Anterolateral margin of carapace unarmed, and post-cervical carina or ridge absent. No pleurobranchs present on pleopods . . . . . *Calastacus stilirostris*
5. Rostral carina in sections continuing to gastric region; carapace lateral ridges lacking spines . . . . . *Acanthaxius spinulicaudus*
   Rostral carina unbroken to gastric region; carapace lateral ridges strongly spined . . . . . *Calocarides quinqueseriatus*
6. Rostrum large, tridentate, rough and hairy. First pereopods subequal, with very small pollex (fixed finger), tending to become subchelate; other pereopods not chelate. External maxillipeds pediform . . . . . (Upogebiidae)7
   Rostrum reduced or absent. First pereopods unequal, chelae well developed; pereopod 2 chelate. External maxillipeds operculiform . . . . . (Callianassidae & Ctenochelidae)10
7. Postocular spine absent or at most obsolescent (tiny) . . . . . *Upogebia macginitieorum*
   Postocular spine present and well developed 8
8. Pereopod 3 with inconspicuous proximoventral spines on merus; articles 1 and 2 of antennular peduncle bearing large distoventral spines . . . . . *Upogebia lepta*
   Pereopod 3 lacking meral spines; article 2 of antennular peduncle lacking large distoventral spine (small spine may be present on article 1) 9
9. Pollex (fixed finger) of chelae with slender laterally compressed tip; small spine distoventrally on article 1 of antennule . . . . . *Upogebia pugettensis*
   Pollex (fixed finger) of chelae with broad tip flattened on prehensile edge and corneous; antennular peduncle spineless . . . . . *Upogebia onychion*
10. Uropodal endopod carinate dorsally (Ctenochelidae) . . . . . *Callianopsis goniophthalma*
    Uropodal endopod lacking dorsal carina (Callianassidae) 11
11. Eyestalks with acute and divergent tips 12
    Eyestalks with tips tuberculiform and parallel . . . . . *Neotrypaea biffari*
12. Anterior carapace margin rounded medially: cornea emergent (surface above cornea definitely convex) . . . . . *Neotrypaea californiensis*
    Anterior carapace margin subacute to acute medially: cornea immersed (surface above cornea almost flat) . . . . . *Neotrypaea gigas*

This key includes thalassinid species reported from the temperate North Eastern Pacific region. Their cryptic habits make it likely other species will be taken, even in well investigated areas. Since these species may key to an existing species, use the best available description of the named species to verify the key identification.

Nassarius fossatus (Gould)

BRITISH COLOMBIA-BAJA CALIFORNIA

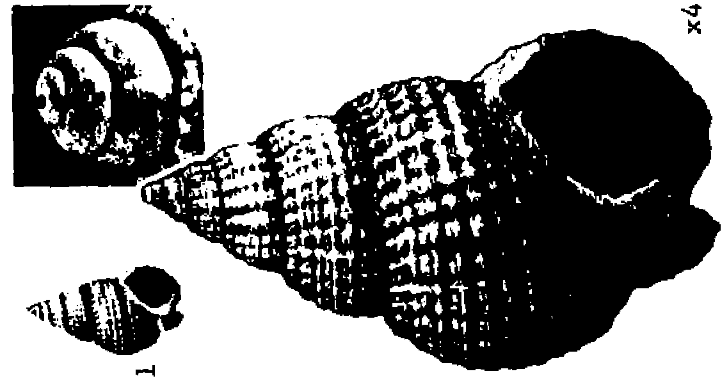


x1

Thin shelled; light to deep orange-brown; columella brownish orange; outer lip thin; to approx. 50 mm. Intertidally on mud substrate.

Nassarius perpinguis (Hinds)

WASHINGTON-BAJA CALIFORNIA



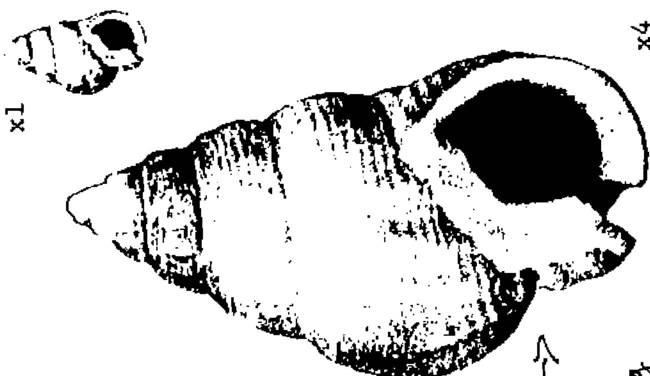
x4

x1

White with 2-3 orange-brown spiral bands; to approx. 25 mm. Intertidally and offshore.

Nassarius insculptus (Carpenter)

off So.CALIFORNIA; GULF OF CALIFORNIA



x1

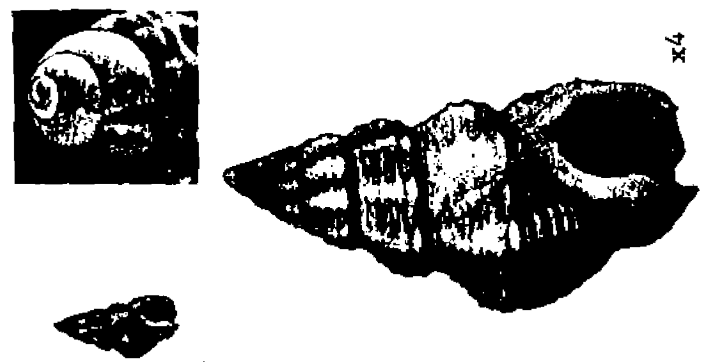
x4

Light tan; with few, evenly spaced spiral cords and low, somewhat sinuous axial ribs; to 22 mm. In shallow water and offshore.

shape of egg capsule— unknown.

Nassarius mendicus (Gould) form cooperi (Forbes)

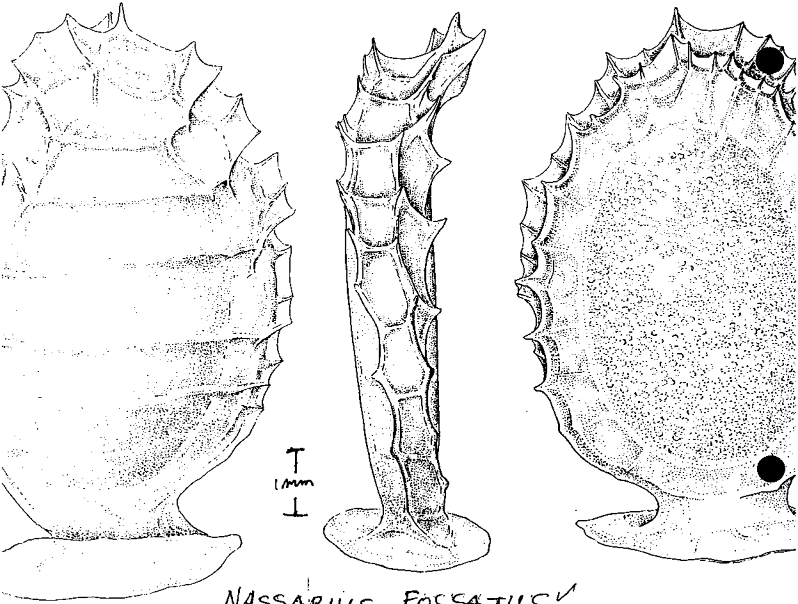
CALIFORNIA-BAJA CALIFORNIA



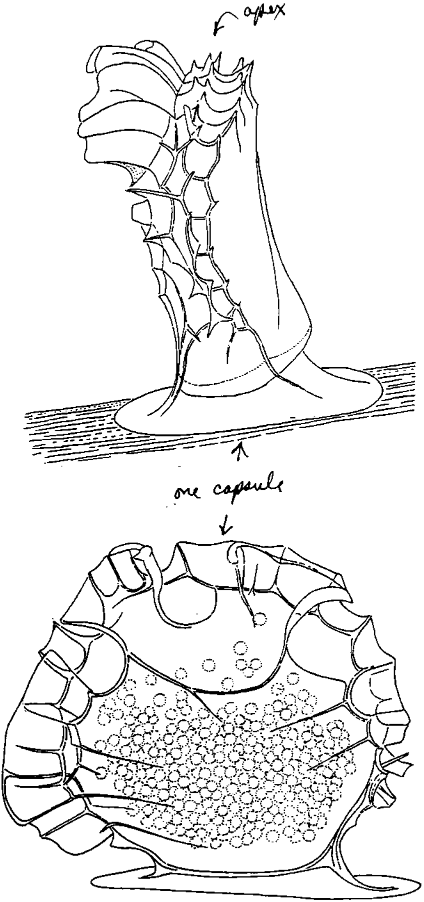
x4

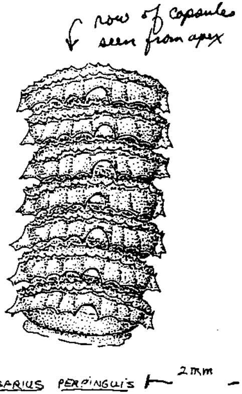
x1

Specimens from southern California are generally more angular in outline and frequently are light banded above the periphery.



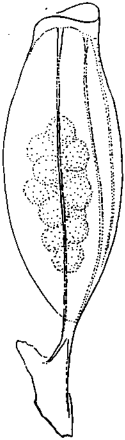
NASSARIUS FOSSATUS
egg capsules





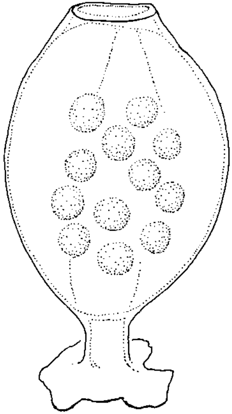
NASSARIUS PERPINGUIS ✓

egg capsules

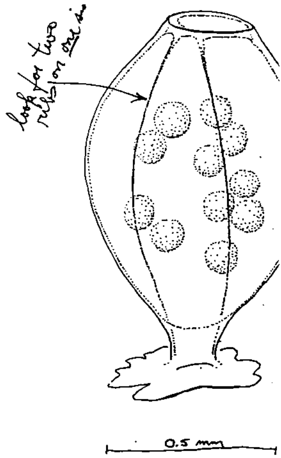


0.5 mm

Nassarius mendicus



Nassarius mendicus



Nassarius mendicus

N. mendicus egg capsules probably resemble these illustrations. They are only a little more than 1 mm in length and will occur singly or in small clusters.

NOTES ON THE STOMATOPOD CRUSTACEA (MANTIS SHRIMP) OF CALIFORNIA

L.V. Basch 25VII88

Four species of stomatopod crustaceans have been reported from the Southern California Bight. They are all usually uncommon or rare in benthic trawl and grab samples. However, dense populations of some species may occur locally. Numbers of some species appear to have increased dramatically since 1983, following the latest large El Niño. Individuals have been caught on hook and line, and all should be handled with extreme caution to avoid serious injury. When held out of water with two fingers behind the carapace and two holding the telson, they should pose little threat, and may be observed and measured if held on a flat surface.

Ranging in size from small to large: Nannosquilla anomala Manning, 1967 is known only from the type specimens taken at San Clemente Island in 5-21m depths on sand bottom over 20 years ago. No additional records are known. Schmittius politus (Bigelow, 1891) has been recorded from shallow bay depths to about 150m depth in mud to coarse sand bottom. Pseudosquillopsis marmorata Lockington, 1877 occurs from shallow (about 7m) to 110m depths on sand and mixed sand-rock substrate Specimens have been taken from impingements of electric generating stations. Hemisquilla ensigera californiensis Stephenson, 1967 have be recorded from less than 5m to a maximum of 1800m, but are more often collected from silty-sand habitats at depths shallower than 70m.

All small specimens, including postlarvae, may be easily confused. The four Californian species may be easily distinguished from one another by six characters: telson, dentition of the dactylus of the enlarged second maxilliped or thoracopod, rostrum shape, eye shape, body coloration and size (Total length). Refer to the attached table for further information on these traits. The only larval descriptions presently available are for Pseudosquillopsis (see Manning 1969). Any information and specimens of all species would be appreciate

The systematics of mantis shrimps is beginning to approach stability due mainly to the efforts of Raymond B. Manning and Frederick R. Schram. The Order Stomatopoda is contained within the Class Malacostraca and Subclass Hoplocarida. It is comprised of about 400 species in four Superfamilies, three of which are known from California: Gonodactyloidea; Lysiosquilloidea, and Squilloidea.

Morphological characters distinguishing the Stomatopods are: stalked compound eyes; well developed, laterally expanded carapace covering cephalon and anterior half of thorax; antennules with three segmented peduncle and three flagella; antennae with two segments and exopod with segment expanded as scaphocerite (= antennal scale); thoracic appendages: 8 pair, first 5 subchelate, second modified as an enlarged, powerful raptorial claw (= 2nd maxilliped), all used in feeding, thoracopods 6-8 biramous, used in locomotion; abdominal appendages: 5 pair of biramous, laminar pleopods, often with gills, sixth somite with uropods; telson: well developed, occasionally fused with 6th abdominal somite (pleotelson). usually well armored with spines somites: head with 5, excluding acron; thorax with 8; abdomen with 6, excluding telson; sexual characters: gonopores on 6th thoracic somite of female, 8th of male, male with penes median to 8th thoracopods.

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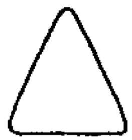
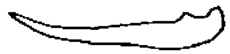
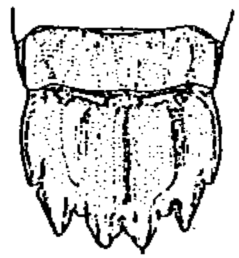
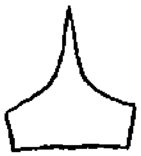
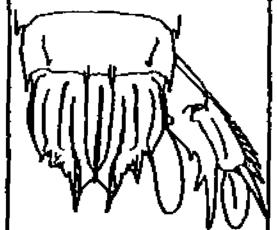
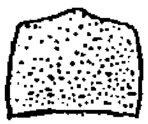
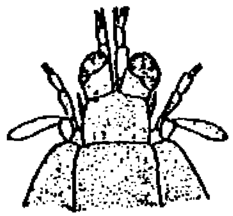
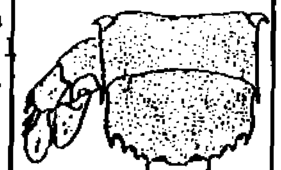
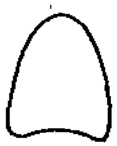
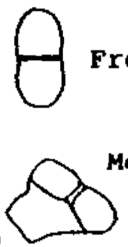
DISTINGUISHING CHARACTERISTICS OF STOMATOPOD CRUSTACEANS FROM CALIFORNIA

CHARACTER (none to scale)

L.V. Basch

SPECIES	ROSTRUM SHAPE	EYE SHAPE	DACTYLUS OF MAXILLIPED 2	TELSON	BODY COLORATION	BODY SIZE (TOTAL LENGTH)
<u>Hemisquilla ensigera californiensis</u> Stevenson, 1967		 Frontal Lateral			Overall color yellow-brown to tan. Distal parts of some limbs yellow. Distal of antennules, max-illipeds, pereo- & pleo-pods blue. Uropods deep blue with red setae.	Adults to 300mm; Post-larvae to 40mm.
<u>Pseudosquillopsis marmorata</u> Lockington, 1877		 Frontal Dorsal	 3 Spines		Overall color light golden brown w/ mottled darker brown. Uropods light with red-purple fringing setae.	Adults to 120mm; Juveniles to 50mm; Post-larvae from 25 to 33mm.
<u>Nannosquilla anomala</u> Manning, 1967		 Dorsal	10-14 spines; Outer margin rounded, with proximal basal notch flanked proximally & distally by small lobe.		Body covered w/ dark chromato-phores, clustered on midline in some spms. Black pigmentation on anterior of cara-pace, anterior limbs, 6th abdm. segment & telson.	Adults from 34 to 41.2mm.
<u>Schmittius politus</u> (Bigelow, 1891)		 Frontal Median	 4 Spines		Overall color is light golden brown with dark brown pigments scattered through whole body & some dark brown clustered chrom-atophores	Adults to 60mm; Post-larvae from 16 to 23mm.

May 11 - SCAMIT Meeting

Next month meeting June 8th - Allan Hancock.
Chaetopterids + Onuphids
Check keys before meetings for any additions

Agency
Groups make a list of different species common to S Calif. (intertidal → shelf break) Mas Dojiri already has a compilation he will distribute.
Was decided that we would each distribute our own species list to other agencies. Include all names from past synonymies etc.

Mas will send us a copy of his list compiled from several agencies. We will add to this list and discuss this list at possibly July meeting.

Next step will be to divide up the provisional species and get them published.
* Problem - some of the provisionals do not have official SCAMIT voucher sheets (example - Tharyx sp. A, B, C.) These need to be done first.

This will be done in this format

Species name (SCAMIT provisional name)	SCAMIT Voucher (vol. no.)	Authority	Publish (date + name author)

It was suggested that each agency should adopt a different method of designating in-house provisional species from SCAMIT provisional species