Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

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SCAMIT Newsletter

Vol. 18, No. 12

SUBJECT:	Spionid Polychaetes
GUEST SPEAKER:	Vasily Radashevsky
DATE:	30 May 2000
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Los Angeles County Museum of Natural History Worm Lab 900 Exposition Blvd

Tubulanus sp SD 1
San Deigo Bay, 7/98
Photo by D. Pasko

The May meeting was held on 8 May at SCCWRP in Fountain Valley. It was used to combine information from attendees on changes to the Edition 3 SCAMIT list prior to final preparations for issuance of Edition 4 later this year. We will inaugurate our new slate of officers at the May meeting. Please either attend with your comments, additions, and corrections to the existing list, or send your comments to either Don Cadien (dcadien@lacsd.org) or Dave Montagne (dmontagne@lacsd.org) or via snailmail to either at Marine Biology Lab, JWPCP, 24501 S. Figueroa St., Carson, Ca., 90745.

NBII NEWSLETTER

Tom Parker (CSDLAC) recently received a copy of the National Biological Information Infrastructure (NBII) newsletter “Access”. It is the first number of Volume 3, so it hasn’t been around too long. The newsletter provides a

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contact point and information transfer medium for those dealing with biological databases. An interesting and useful item. You can also log on to the NBII website and find much the same content.

WWW.nbii.gov

SO THAT'S HOW...

Among SCAMIT's membership are several individuals who have already crossed over one particular Rubicon, describing a new taxon. Each has approached the task in their own fashion, using the work of a predecessor as a model to emulate. Winston (1999) has now produced a way for all descriptive activity to be approached by fully prepared taxonomists. All they have to do is read and digest her book. She managed to produce a work of over 500 pages dealing with the description of new biological taxa, and not by padding. It is quite thorough, examining all aspects of the process, providing both a practical and theoretical basis for anyone to use in preparing a new taxon description.

Although most attention is paid to species, higher levels and the concerns peculiar to erection of new taxa above species, are also addressed. The author uses numerous examples throughout the text, usually providing several for each topic considered so a range of solutions is offered for each problem. She considers the entire process, from first suspicion that an animal may be new, verification that it is, analyzing material, handling literature, applying nomenclatural codes, and preparing a verbal and pictorial description of the organism concerned, to getting published. Along the way she deals with a series of topics pertinent to any practicing taxonomist.

The book is recommended to all SCAMIT members as a fine summary of how to go about their work, whether they are considering description of new species or not. It is accessibly and engagingly written, and logically laid out. Emphasis is on traditional morphological systematics, but cladistic and molecular methods are discussed, and the reader is pointed to sources for more complete discussion of these evolving disciplines. At $65 you will have to give more than pin money for the book, but it is a worthwhile investment. Also in paperback at $35 from Columbia University Press at,

http://www.columbia.edu/cu/cup/catalog/idx_lists.html

or from bookshops, or from on-line book purveyors (at last check it was back-ordered on Amazon.com). My favorable impression seems to be echoed elsewhere; the book was released last October, and is already in a second printing. [Thanks to Tom Parker for loaning me his copy to examine; he's the first person on my block to have one].

NEW LITERATURE

Valdés & Gosliner (1999) use morphological data in an analysis of the relationships of the radula-less dorids; traditionally treated together as the Porostomata. Since porostome species seem so unlike in other respects, there have been misgivings about the group since its establishment by Bergh at the end of the 19th century. The current analysis shows such concerns to be unfounded It indicates loss of the radula has occurred only once among the dorids, and all radula-less dorids form a monophyletic group. Discovery of a new species with a dorsal gill-plume but lacking a radula, allowed resolution of the difficulties in earlier analyses. This animal (*Mandelia microcornata*), placed in a new family (Mandeliidae), is the sister taxon to the rest of the radula-less dorids.

The major finding of the authors is, however, that this monophyletic group lies within the cryptobranchiate dorids, rather than outside them. They retain Porostomata, for the present, as equal to and outside Cryptobranchia,

pending further analysis of the dorid nudibranchs as a whole. This leaves Cryptobranchia, at least temporarily, as a paraphyletic group.

Blue mussels, mentioned again in the last NL, were also considered by Penny & Hart (1999). There I was forced to agree with Dr. Jim Carlton that a recent paper did not provide the evidence to allow separation of *Mytilus trossulus* from *M. galloprovincialis* on our coast without chemotaxonomic information on each specimen - a dour prospect. Penney & Hart, while dealing with *M. trossulus* and *M. edulis* in Newfoundland, report similar findings from a different perspective. They found that genotype and phenotype covaried, and that the genotype of hybrids was directly demonstrated in intermediate shell morphologies. Although it is not necessary to do chemotaxonomic analyses to establish the genetic composition of the specimen, there is a continuum of morphological variability. Any distinction between the species is likely to be reflected only statistically. Such a situation, while it may be helpful to the commercial shellfish industry in Newfoundland, won't help us tell what species any given specimen belongs to. Somewhere in the morass of morphological variability may lie a series of key characters, even morphometric ones, which will allow accurate speciation of individuals. For now these remain obscure, although clearly, species identity is represented by shell characters even in these closely related congeners. More papers are coming on this issue.

Dietary preferences of juvenile red octopus, *Octopus rubescens*, were examined by Anderson et al (1999). The animals they investigated averaged less than 2cm in mantle length, so were much smaller than most *O. rubescens* we encounter in trawl monitoring efforts. They were sampled and evaluated while using beer-bottle dens in Puget Sound at depths between 20-25m. The animals, at least at this stage, seem to be mollusk specialists, eating mostly small gastropods with the occasional clam thrown in. Some of the shells may actually have hosted hermit crabs, but no evidence of crab remains was found in investigated dens. The bottles were experimentally manipulated and rates of consumption could be calculated from the results of placement and subsequent harvest of bottles with known soak times.

On deeper soft bottoms in the southern California bight the animals can also be taken in bottles, cans, and other partially enclosed debris, but also have been seen to use shallow depressions in the soft bottom as refuges. When approached in a submersible they attempt to hide in these depressions. If the approach continues they stand up tall and try to bluff the intruder away prior to fleeing themselves. These may be only temporary housing while hunting, but the possibility exists that shallow water object denning is a response to visual predation risk not present in darker waters offshore. It would certainly be less limiting to the animal to be able to hide in any unoccupied burrow mouth in the complex biologically altered bottoms at 200+ feet. Where den material is in short supply, temporary denning in irregular bottom features may be a common, if not optimal, condition [these latter comments are based on the editors experience with the species, and are not part of the paper].

Predator avoidance and food gathering both play roles in a thesis advanced by Marcotte (1999) concerning the importance of visual perception in generating diversity in the geologic past. He hypothesizes that high oceanic turbidity, fluctuating cyclically on a 400my scale, lead to major extinction events, and major changes in evolution of at least the arthropods in the phanerozoic.

Turbidity is only the proximal agent and it reflects large scale changes in the ocean-atmosphere system and in tectonic plate arrangements. During periods of plate convergence and fusion, turbidity and

sedimentation in the ocean were minimal since sediment produced by erosion during orogeny was at least partially contained on land. During periods of plate divergence maxima of turbidity and sedimentation was obtained. These maximal and minimal periods correlate with a number of biological trends, and offer explanations for many inadequately explained evolutionary events. Marcotte marshals a diverse array of information drawn from various disciplines in support of his hypothesis. A number of points, considering the information provided in support, click with a "oh, that seems obvious" sort of reaction. Whether or not this hypothesis survives the challenges that will undoubtedly be brought against it, the article is a stimulating one which no one interested in the history of life will fail to enjoy.

Giribet & Wheeler (1999), in a reanalysis of the dataset used earlier to place arthropods among other metazoans (Giribet & Ribera, 1998), suggest some changes in the previous analysis. They use an iterative method called "the parsimony rachet" in this effort, a sequential optimization strategy that significantly reduces the time to locate shorter tree lengths. In this paper they confirmed many of their previous conclusions and resolved a series of polychotomies in the earlier strict consensus tree, but it was unclear in the result if Tr chozoa represented a clade or a grade. Existence of Ecdysozoa, deuterostomes, and acoelomate platyhelminth clades within the Bilateria were supported by the analysis, but the included taxa sample was apparently not sufficient to fully resolve the status of the Trochozoa. The authors were very satisfied with the 18S rDNA gene as a substrate for high level analysis of metazoan relationships, but felt that it alone would not provide good resolution of relationships within the major clades. Wägele et al (1999) raise questions about the 18S rDNA evidence based on subsequent analyses, and are not sure that Ecdysozoa is valid, especially since the competing Articulata concept is well supported on long established morphological bases.

The differing interpretations of 18S rDNA evidence mentioned above highlight the continuing methodological debates in cladistic analysis. Even more basic are the philosophical points discussed by Härlin, 1999 in consideration of the logical impropriety of emphasis on characters rather than trees in phylogenetic taxonomy.

It has long been assumed that release of planktonic larvae results in relatively unconstrained dispersal of a population and good gene flow between subpopulations occupying disjunct habitat. Of late this assumption has been tested, sometimes with unexpected results. Cowen et al (2000) correctly note that the assumed genetic exchange is a vital part of studies concerning population dynamics of any individual species, and an essential basis for fishery management and environmental policy decisions. They then test the assumptions of the traditional "open system" concept of larval dispersal in the sea with computer modeling. Their model suggests dispersion can be up to 9 orders of magnitude less than would have been predicted from an unconstrained model if behavioral and additional oceanographic factors are included. This difference would yield a far different picture of the resulting population, and would dictate different management approaches for its control and exploitation. These results call for a reexamination of the assumptions of fishery management models, and could in part explain why performance of most fisheries under management has been so poor.

Communication between investigators has always been an important part of advancement of knowledge. Standardization of terminology for description of the environment is a major advance in such communication. Just such a standardization is made possible by Greene et

al (1999), who propose a set of concepts and terms whose use could make description of marine habitats uniform. They have concentrated on the deep sea, but also mention continental shelf structure as well. Examples of application of the scheme are provided and seem satisfying. They carefully consider structures on the hierarchical basis of megahabitat, mesohabitat, macrohabitat, microhabitat, which spans from kilometer to centimeter scales. The resulting descriptions are succinct and explicit, and (most important of all) comparable to those provided by other investigators in other disciplines who use the same system. Since the proposed system is logical, well conceived, and comprehensive it can provide the standard which has eluded us previously.

Sheppard (1999) provides a nice overview of power analysis designed to answer questions about sampling adequacy in monitoring programs. Most SCAMIT members do not have to deal with such questions, being instead handed a program and told to execute it. Those who have the opportunity of providing feedback at some point in the process may want to utilize the ideas and methods covered by Sheppard in evaluating whether too much (or not enough) sampling is currently done to provide data of the precision necessary to the program design. Numerous other sources are available to consider power analysis, but the present review is recent and easily accessible.

The idea of Taxonomic Sufficiency (or TS, a seemingly appropriate acronym), an end-driven approach which assumes full analysis of environmental samples has no utility other than final statistical analysis, is discussed by Maurer (2000). He points out that significant portions of the Emperor's attire are missing in TS , and that considerations of biodiversity, ecology, and information retrieval and correlation are left unaddressed by such analyses. We are all sensitive to the fact that TS frees up financial resources for an agency by devoting much less to the expensive and time-consuming process of taxonomic analysis, and can understand how its application can be so tempting to a hard-pressed administrator asked to reduce expenditure while sustaining the same level of service. Maurer points out that there are, however, a number of things sacrificed on this altar of short-term economy. He also discusses the entire question of taxonomy, its practitioners, and their nurture, and notes the continuing decline of the discipline. Along the way he gives SCAMIT a friendly nod as a local solution to the problems of taxonomic training. He concludes with the hope that his statement on the "dark side" of TS can help provide the "force" to begin to remedy problems of taxonomic support. Now, if we could only lay our hands of some of Reagan's "star wars" funding...

NEWER THAN NEW

The latest edition of the ASC Newsletter (Vol. 28 No. 2) carries a notice that at long last the bivalve monograph is a reality. Coan, Scott & Bernard (2000) is announced as available for $99 [in paperback] from the Santa Barbara Museum of Natural History. This is in error, the publication is hardbacked, and is expected to ship in early June. It will go to the bindery this month.

The volume is 766pp., profusely illustrated with photos or drawings of every listed species and covers all bivalves which are known to occur from northern Alaska to southern California, and from the intertidal zone to depths of more than 4500 m. The bibliography alone is more than 4700 references. There are some keys to higher categories, but not at species level. Separation of species taxa is through comparison tables listing salient characters of each species occurring in the area within a genus or family.

Orders should be addressed to the Department of Invertebrate Zoology at 805-682-4711x335, or via e-mail to psadeghian@sbnature2.org. Copies can be pre-publication ordered using credit cards once the shipping costs [additional

to the above listed price] have been determined. They are expected to run around $7.00, depending on the exact weight of the volume when bound.

10 APRIL MEETING MINUTES

The meeting was held at the Worm Lab at the Los Angeles County Museum of Natural History. President Ron Velarde started the business portion of the meeting by announcing several upcoming meetings. On May 8, there will be a meeting at SCCWRP to update Edition 4 of the SCAMIT species list. On May 30, there will be a polychaete meeting at the Los Angeles County Museum of Natural History. The guest speaker will be spioniform specialist Vasily Radashevsky from the Institute of Marine Biology, Vladivostok, Russia. His talk's tentative title is "Spionida (Annelida: Polychaeta): from observations of specimens to phylogenetic analysis (and a little bit more!)". Our northern members will be pleased to know that Vasily will also speak at a NAMIT meeting on May 24th, to be held at the University of Washington's Tacoma campus. Email Val Macdonald, NAMIT secretary, for details: <val@biologica.bc.ca>. For both meetings people are encouraged to bring their problem spionida specimens - Spionidae, Poecilochaetidae, Trochochaetidae, Uncispionidae and Longosomatidae - for examination.

The annual Southern California Academy of Sciences meeting will be held at the University of Southern California on May 19-20. On June 12, there will be a non-polychaete SCAMIT meeting; the location has not yet been determined.

Literature circulated at the meeting included one of the classic ecological references for southern California monitoring, Gary Smith's 1974 Ph.D. thesis, "Some effects of sewage discharge to the marine environment" (UCSD, 334 pp.). The specimens from this study are housed at LACM. When Leslie Harris tried to find a copy of the thesis to accompany the collection, she was greatly surprised to find none was available thru any of the local monitoring labs. Another classic brought out by Leslie, this one concerning polychaetes, was "A Catalogue of the British Non-parasitical worms in the collection of the British Museum by George Johnston", M.D. Edin., London 1865.

Don talked about the May meeting at SCCWRP. He encouraged everyone to attend and bring changes and comments for Edition 4. People who have new taxa which they would like to be included in Edition 4 must first distribute voucher sheets. It was suggested that a topic for discussion at the meeting should be whether to include species that were newly encountered during the Bight'98 project.

We were then treated to a slide show from Leslie Harris. In March she visited our colleague Dr. Viviane Solis-Weiss at her lab in the Instituto de Ciencias del Mar y Limnologia, U.N.A.M., Mexico. The primary reason for her trip was to pick up samples that Viviane very generously donated to LACM's worm collection, and to promote future collaboration between the polychaete sections at LACM and ICML. Secondary was a quick trip to Acapulco with Viviane and some of her students to samples worms at sites visited by Dr. Enrique Rioja. All of Rioja's type specimens have been lost, and neotypes need to be established to stabilize the taxonomy of his species. The beaches where Rioja sampled 50-60 years ago have undergone considerable development in the intervening years. Where once there were small villages and minimal tourist accommodations are now continuous rows of high-rise hotels, restaurants, shops, and very crowded beaches. The group was forced to travel several hours north of Acapulco to find beaches comparable to what Rioja would have seen. They brought back samples which were split for sorting between LACM and ICML. With luck, new specimens of Rioja's species will be found in the samples which will serve as neotypes.

Next, our guest speaker, Sergio Salazar-Vallejo, took the floor and gave us a very interesting presentation on the work he's been doing on pilargids. Most of his current work is centered on faunal studies of Caribbean polychaetes, leaving less time then he would like for pilargids. Sergio has been working on this group since 1986 and is interested in all aspects of the group - morphology, life history, taxonomy, and phylogeny. Included in the newsletter bibliography are Sergio's publications pertaining to pilargids. He had prepared packets of handouts ahead of time for all the attendees of the meeting. They were composites of some of his work as well as other authors' work that compared and contrasted different characters among various species. Sergio used techniques such as SEM and histology to investigate the finer exterior and interior structures of pilargids.

At the end of his presentation, we viewed the SEM and histological X-section images on Sergio's laptop computer. There were SEM micrographs of *Sigambra grubii*, *Parandalia tricuspis*, and *Loandalia riojai*. There were also several images of *Talehsapia annandalei* Fauvel 1932, an unusual pilargid that Sergio received from Thailand. Previous authors (Emerson & Fauchald 1971) considered the genus to be *incertae sedis* and not a member of the pilargidae due to the presence of jaws and its prostomial features. Cross sections of the anterior region of the pharynx revealed a jaw-like structure on the inside surface. A discussion ensued as to whether this was a true jaw or a scleratized region that was present on the inside of the pharynx. Sergio's conclusion, after examining syllid pharynxes, was that the structure had been mis-interpreted by Fauvel and was indeed a scleratized region. A similar structure was found in an undescribed species of *Litocorsa* from the Gulf of Thailand.

A recurring problematic topic of local polychaete taxonomy has been the variation of characters in *Pilargis berkeleyae*, especially in the size and location of papillae, and the extent of the glandular material in the dorsal cirrophores. Sergio's handouts included illustrations of *P. berkeleyae* from several authors (Monro 1933, Hartman 1947, Wolf 1984, and Imajima 1987). There was considerable variation in the size and location of the papillae shown by these authors. In order to solve this mystery once and for all, Leslie (who has been working on the local species) had previously borrowed the holotype of *Pilargis berkeleyae* from the British Museum. Included in our packets were Leslie's illustrations of this animal. The papillae were extremely small, and only began to be visible at 40X magnification. This character was consistent in all of the specimens Leslie examined, which included topotype material sent to Hartman by Edith Berkeley, the collector of the holotype. Publications that illustrate large papillae on *P. berkeleyae* (Wolf 1984, Imajima 1987, and Blake 1997) are incorrect; these specimens are probably undescribed species. No doubt these illustrations have led to mis-identifications for many years. Also, many *P. berkeleyae* have been mis-identified as *P. maculata*. *P. maculata* is an intertidal species, and *P. berkeleyae* inhabits subtidal, soft bottom substrata. Nearly all of the *P. maculata* specimens held by LACM and examined by Leslie have turned out to be *P. berkeleyae*.

Leslie gave some examples of variable characters that she noted for *P. berkeleyae*. One was the ratio of lengths of ventral to dorsal tentacular cirri; they ranged from 1:3 to subequal. Another variable character was the length of the dorsal cirrus on setiger 1 compared to the other dorsal cirri; it ranged from 3:1 to subequal. Leslie noted that the only consistent character she found in the anterior region was that ventral tentacular cirri were always basally thinner than the dorsal tentacular cirri.

Leslie went on to explain that there are two types of tissue contributing to the pigmentation on the cirrophores in *P. berkeleyae* and *P. maculata*. The first is subdermal, golden-brown clusters of glandular cells. Second, are dark-brown or black pigmented cells, also subdermal, but on top of the glandular cells and arranged in a single plane.

Next we compared the cirrophores from the topotype specimen of *Pilargis berkeleyae* and the holotype of *P. maculata*. The cirrophores of *P. berkeleyae* were completely encircled subdermally by the glandular cells, with a few dark pigmented cells; there were a few, small papillae visible at 40X magnification. The cirrophores of *P. maculata* have an oval patch of the subdermal glandular cells on the dorso-anterior side of the parapodia, and dark brown areas of pigment cells were present. The papillae on the cirrophores of *P. maculata* were even smaller than those of *P. maculata* , visible at 100X magnification. Both species appear smooth when viewed at normal sorting magnifications.

Leslie retrieved the specimens of *Pilargis berkeleyae* that Hartman (1947) had used for her description and illustrations. They had minute papillae (visible at 40X) that were located on the head region, dorsum, and parapodia. The ventrum lacked papillae. The largest papillae on the animal were on the last few segments and pygidial cirri. In Hartman's illustration the size of the papillae were exaggerated. Consequently, many taxonomists were led to believe that *P. berkeleyae* had larger, more prominent papillae, and over the years, numerous pilargid specimens have been mis-identified based on this illustration. To add to the confusion, these specimens were strongly corrugated due to contraction, especially posteriorly. These corrugations could be mistaken for large, densely-packed papillae.

There are 2 additional species of *Pilargis* on this coast, both undescribed. Both of them are densely covered with distinct papillae on both dorsum and ventrum; the papillae are largest in the mid-dorsal region. They are similar to the animal described as *P. berkeleyae* in Imajima 1987. Specimens of both species were brought in by Rick Rowe (CSDMWWD) and Tony Phillips (Hyperion) from San Diego Bay and Santa Monica Bay respectively. The specimen brought by Rick Rowe lacked pigment, had large papillae over all of the body, the dorsal tentacular cirri were longer than the ventral cirri, and the dorsal tentacular cirrus on setiger 1 was longer than on subsequent setigers. This animal turned out to be *Pilargis* sp B of Harris. *P.* sp. A Harris has subdermal brown or black pigment cells on the dorso-anterior side of most cirrophores but lacks the golden-brown glandular material. Sergio and Leslie are now working on a paper on Pacific coast *Pilargis*, including another new species from Baja.

Next we examined a specimen of Pilargidae genus A Williams 1984 brought in by Rick Rowe. It was from Catalina Island at a depth of 50 meters, and has also been recorded from Tanner Bank, Santa Rosa Island, and Santa Cruz Island at shelf depth in medium to coarse sand. It was noted that this specimen was similar to *Synelmis dineti* in having bidentate hooks and lacking biarticulated palps. The animal will be described by Sergio, who has all of LACM's specimens of this species (originally identified by Sue).

Rick had another pilargid to examine, a specimen identified as *Sigambra setosa*? from International Treatment Plant station 2651 at a depth of 487 feet. It was commented that this station was probably too shallow for *S. setosa*; however, we could not put an identification on this animal.

Larry Lovell presented an unusual specimen of *Spiophanes fimbriata* collected during sampling of the LA County monitoring program. This specimen had a total of four antennae emanating from the prostomium

MY LIFE AS A BIOLOGIST

by Donald J. Reish
Chapter 19: The Graduate Students

During my academic career I had 57 students complete their masters under my direction. Most of the students came up the ranks by way of taking invert zool. or invert systematics. Some came from other universities after completing their bachelors. Kathy King, Scott Carr, and Fred Piltz came from UCI; Bob Galbraith from UCSB; Phil Oshida and Tom Kauwling from UC Berkeley; Wayne Davis from Cal Poly San Luis Obispo; Ken Schiff from San Diego State; Dave Russell from Pomona; Tom Gerlinger from Ohio State; Tom Biksey fom Pennsylvania; Tom McDonnell and Terry McCoppin from Loyola-Marymount; Eric Gonzalez from Panama University; Joe Tarfaro from Louisiana State University; I don't remember where Rivian Lande, Don Moore, Wayne Brannon, Doug Morgan, or Al Stone went as an undergraduate.

What were my criteria for the selection of a potential graduate student? For those who did well in my classes, the choice was easy. I also considered such things as their curiosity, their ability to think creatively, and finally my gut feeling. I had 15 graduate students working under my direction at the same time. People would ask me how I handled this number of students. Basically, I would spend some time with them at the beginning and again at the end of their research and thesis writing. Grad students further along would help the beginners. During the time of my EPA grant Mike Martin worked for me full time and helped a lot. Joe LeMay did the same when I had the large Army Corps grant. While I didn't spend much time with them during the "middle" period, I would talk with them. I think that a student just starting on a graduate program needs some attention. The slow part always seemed to be writing up their research. Some were good writers and others had to go through several drafts. How did we select a topic for their research? Partly it depended upon their interest and partly on my grants and contracts at the time. For example, there were several studies on the effect of reduced DO on an organism; we then went through a period of culturing polychaetes, and lastly toxicity studies. I think the one thing I miss most since retiring is the contact with the graduate students. I see many each year, but I have lost contact with others. Now for the roster [student, date of their Masters completion, thesis subject, and post-student life - with a ? if I lost track]:

1. Al Stone, 1960. Effect of rain runoff on Estuarine polychaetes. High school teacher, then manager of a flower shop
2. Bob Galbraith, 1961. Homing in limpets. Crofton CC.
3. Dr. Dean Bok, 1965. *Limnoria* cytology. Faculty at UCLA in anatomy.
4. Dr. Jack Anderson, 1966. 3 species of *Limnoria* - temperature effects, published. Consulting firm.
5. Dr. Tom Richards, 1966. Life history of *Stauronereis*, published. Faculty at Cal Poly SLO.
6. Rivian Lande, 1966. Movement of *Ophiodromus* on starfish, published. Retired from faculty at Long Beach City College.
7. Don Moore, 1967. Seasonal reproduction in *Mytilus edulis*, published. ?.
8. Dr. Alan Mearns, 1967. Amino acids in *Neanthes succinea*, published. With NOAA.
9. Joe Tarfaro, 1967. Polychaetes of Palos Verdes Peninsula. With New Orleans P.D.
10. Dr. Don Perkins, 1968. Protozoa. Faculty at Oklahoma State.
11. Dr. Robert Crippen. 1968. Polychaetes on boat floats in LA Harbor, published. Consulting Firm in Canada.

12. Ken Hilger, 1968. *Halosydna* setal regeneration, published. High school teacher.
13. Dr. Kevin Eckelbarger, 1969. Life history of *Lyrodus*, published. Director of Marine Program, University of Maine.
14. Dr. Wayne Davis, 1969. Effect of low DO on *Neanthes*, published. At EPA in Rhode Island.
15. Dr. Marty Raps, 1969. Low DO and hemoglobin compensation, published. ?.
16. Dr. Norman Shields, 1971. Effect of pressure on Protozoa. ?.
17. Dr. Raymond Cripps, 1971. *Neanthes* physiology. In Australia.
18. John Abati, 1971. Free amino acid in stressed *Neanthes*, published. Died 1974.
19. Robin Finley, 1971. Environmental effects on *Hydroides* life history. Died 1994
20. Tom Kauwling, 1972. Benthic polychaetes in Huntington Harbor, published. High school teacher in Long Beach.
21. Wayne Brannon, 1973. *Limnoria* and effect of low DO. ?.
22. Dr. Steve Rossi, 1973. *Mytilus* physiology, published. Researcher at UCSD Med School.
23. Dr. Fred Piltz, 1974. Effect of Cu on *Neanthes*. With MMS in Ventura.
24. Tray Schreiber, 1974. Benthic polychaetes in Huntington Harbor. ?.
25. Lee Hill, 1974. Polychaetes in Long Beach Naval Station. ?.
26. Mike Martin, 1974. *Neanthes succinea* population comparisons. ?.
27. Glenn Reilly, 1974. *Neanthes succinea* population comparisons. High school teacher.
28. Dr. Jack Word, 1974. Effect of Zn on *Neanthes*. Consulting firm.
29. Rick Rowe, 1974. Polychaetes at San Clemente Is., published. CSDMWWD
30. Dr. John Dorsey, 1974. Polychaetes at San Clemente Is., published. City of Los Angeles.
31. Dr. Stan Rice, 1975. Life history of *Polydora ligni*, published. Faculty at U. of Tampa.
32. John Shisko, 1975. Life history of *Dexiospira brasiliensis*. CLAEMD.
33. Doug Morgan, 1975. Life history of *Cirriformia luxuriosa* & *C. spirobrancha*. Consulting firm.
34. Dr. Phil Oshida, 1975. Temperature effects on *Neanthes*, published. EPA in Washington D.C.
35. Kathy King, 1976. Life history of *Boccardia proboscidea*. Consulting firm, then 2 kids. Husband just accepted a Dean position at U. of Wisconsin.
36. Dr. Scott Carr, 1976. Effect of oil on small polychaetes. With USGS in Corpus Christi.
37. Mark Rossi, 1976. Life history of *Halosydna johnsoni*. High school teacher.
38. Randy McGlade, 1977. Effect of metals on *Neanthes*. Consulting firm - first in biology then after a masters in business in the business end.
39. Steve Petrich, 1978. Effect of Al and Ni on polychaetes, published. CLAEMD.
40. Rick Ware, 1979. Food habits of white croaker, published. Owns consulting firm.
41. Tom Gerlinger, 1979. Effect of mine tailings on polychaetes, published. Retired from OCSD, moved to Michigan. Owns consulting firm.
42. Sue Williams, 1979. Systematics of terebellids, published. Teacher and consultant in Ventura.
43. Dr. David Russell, 1980. *Polydora nuchalis* digestive tract. EPA in Maryland.
44. Ricky James, 1981. Seasonal benthic population in LA River, published. ?.
45. Steve Bay, 1982. Cr uptake in *Neanthes*. SCCWRP. Husband of Cathy Crouch.
46. Tom McDonnell, 1982. Effect of metals on amphipods. Consulting firm.
47. Ann Martin [now Dalkey], 1982. Effect of sewage on *Neanthes*. CLAEMD.
48. Joe LeMay, 1983. Cd from *Neanthes* to arrow goby, published. Owns consulting firm.
49. Terry McCoppin-Frohoff, 1983. Metals and reproduction in *Neanthes*. Teaching in community colleges.

50. Karen Green. 1984. Systematics of maldanids, published. Consulting firm.
51. Jim Shubsda, 1984. Cd effects on *Neanthes*. Last I heard he was in optometry college.
52. Cathy Crouch, 1984. Seasonal study of polychaetes in sea grass roots, published. Working on PhD at UCLA. Wife of #45.
53. Tom Biksey, 1987. Benthic study in outer LA Harbor, published. Consulting firm in Philadelphia.
54. Peter Striplin, 1987. Food habits of *Astropecten*. With wife's consulting firm in Washington.
55. Ken Schiff, 1988. Effect of DDT on *Capitella capitata*. Consulting firm, then SCCWRP.
56. Stan Asato, 1988. Effect of metals on mysids, published. CLAEMD.
57. Eric Gonzalez, 1988. Intertidal polychaetes in Panama. L.A. City Health Dept.

As you note, I have lost track of several of my graduate students. If any of you know the whereabouts of any of them, I would appreciate learning their address. [contact Dr. Reish at 562-985-4846]

VOUCHER SHEET

Please visit the Taxonomic Tools section of the SCAMIT website to view a voucher sheet for *Fauveliopsis* sp SD 1, produced by Kathy Langan (CSDMWWD).

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Single back issues are also available at cost.

SCAMIT TREASURY SUMMARY, 1999-2000

During the past fiscal year, April 1999 though March 2000, expenses totaled $1101.85. The major expenses covered publishing costs for producing the newsletter, $1,599.10 for hard copies (including printing, postage, and supplies) and $299.40 for online publishing, approximately 33% less than the 1998-99 fiscal year. The savings account was closed in May in order to open a money market account and a certificate of deposit account. This change substantially increased SCAMIT's interest earnings, this year $626.20 of which $552.09 came from the CD.

SCAMIT accepted a contract from SCCWRP to perform identifications on specialty groups for the Bight'98 project with the purpose of SCAMIT arranging subcontracts for the work. A 50% deposit was received in the amount of $8,866.50. Two subcontracts were given; Larry Lovell ($6,187.50) for Lumbrinerids and Euclyminids and John Ljubenkov ($2,679.00) for Edwardsiids and Ceriantherids. Grants and workshops will continue to be funded from the money collected for creating the Taxonomic Listing for SCCWRP during the 1994-95 fiscal year.

The following is a summary of the expenses and income:

Expenses

Newsletter	$1,599.10
Online publishing	$299.40
Publications	$0.00
Grants	$0.00
Miscellaneous	$309.11
Contract awards	$8,866.50
Total	**$11074.11**

Income

Dues	$2,085.00
Interest	$626.20
T-Shirts and miscellaneous	$0.00
Donations	$0.00
Contract	$8,866.50
Total	**$11,258.08**

Account balances (March 31, 2000)

Checking	$195.58
Savings	$0.00
Money Market	$3,461.95
Certificate of Deposit	$8,552.09
Total	**$11,882.77**