



Southern California Association of Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

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SCAMIT Newsletter

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SUBJECT:	General Polychaete Problems
GUEST SPEAKER:	None
DATE:	14 February 2000
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	Los Angeles County Museum of Natural History Worm Lab 900 Exposition Blvd. Los Angeles, CA



Chaetoderma marinelli (Schwabl, 1963)
Spicules viewed using cross polarizers on a
light microscope. Tick marks = 0.01 mm
Photo by K. Barwick, 1/2000

BEEN THERE: DONE WHAT?

Last year, as the week, month, year, decade, century and millennium drew to a close we were all bombarded with ruminative analyses of what had preceded the moment, and what would follow. My turn!

SCAMIT is a child of the Twentieth Century. Although we have been around for nearly two decades now, we are still quite a young organization (on the elephant, not the mayfly scale). What most of the members do as persons engaged in monitoring of the marine environment, is also an invention of the Twentieth Century. Even the biota itself, in terms of taxonomy, is largely a product of the century. Only a small portion of the subtidal biota of the Southern California Bight, primarily mollusks, large crustaceans, and large echinoderms was described prior to 1900. Much still remains to be described in the new millennium.

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We have begun the process through preparation of uniform provisional species sheets which are distributed through the organization. Individual agencies also have internal sheets giving aids to recognition of forms believed or known to be undescribed. These have helped create a more stable regional taxonomy, one of the original aims of the organization. SCAMIT was available to function in the two full-scale trials of the regional monitoring concept which have been undertaken locally - the SCBPP in 1994, and Bight'98 in 1998. In both we contributed to program quality assurance and quality control. With increasingly diverse participation such control assumes a larger and larger role in the success of regional initiatives. Much of the credibility of the resulting analyses and reports will be due to rigorous pursuit of uniform and demonstrably high quality data throughout the effort. As we proceeded with these efforts we were forced to consider what was, and what was not, an accurate identification of a given organism, and how taxonomic sufficiency should be judged.

Our success as an organization and the tangible benefits to local taxonomic practice has stimulated efforts to create similar groups in other areas. In the mid-eighties efforts were made to form a SCAMIT-like group on the East Coast. Since nearly all of the taxonomists in that area were employed by competing commercial firms, self-interest stymied the exchange of views and information essential to our success, and no viable organization could be created. In the nineties a more successful effort was undertaken in the Pacific Northwest, resulting in the creation of our sister organization NAMIT.

During SCAMIT's brief existence we have witnessed a strong trend of change in the taxonomy we practice. At our beginning there was a general belief that many of the animals we encountered were the same as those described in other portions of the world. Cosmopolitanism, based either on broad tolerance to environmental variability or to

transport by human agency, was viewed as a normal distributional pattern. Now it is viewed as something to be proven, and assumed untrue until such proof is offered. While we have become increasingly aware of how often anthropogenic transport has inoculated one biota with species from another, it is also patent that only the very exceptional species is truly cosmopolitan (or even tropicopolitan).

As the mind set of local taxonomists has changed, more and more species have been recognized as only grossly similar to related European congeners. While this can be fluffed off as part of the "lumpers vs. splitters" debate, I think that it represents something else; a closer attention to detail and a better understanding (often experimentally gained) of the limits of variation within a given population. Not that the members of SCAMIT are ever in unanimity, they continue to have different and non-compatible views on most issues. Because of this diversity of opinion and experience within the membership, the organization has admirably served its purpose of increasing and facilitating dialogue on taxonomic issues.

Since our inception we have been a small, local organization of limited and specialized membership. Over the past few years, and with our expansion into the digital domain via the World Wide Web, we have begun to reach a wider audience. The majority of our membership is now electronic, and the number of members from outside the southern California uniopolis of Santa Barbara/Los Angeles/San Diego is greater than ever before. Webmaster Jay Shrake's recent posting of the hit list for the website over one period demonstrated that only a minority of SCAMIT home-page visits originate in southern California. This is both an encouragement and a significant challenge.



Physical presence at SCAMIT's monthly or bimonthly meetings is clearly not an option for most members. There has been a major effort from members in the San Francisco Bay area to come to our meetings in Southern California, and this is a wonderful development. But it is difficult for them to plan in advance, and even less possible for others of our more scattered members to be present. This makes communication through the NL (and SCAMIT's on-line presence) of increasing importance to our more and more diffuse membership.

The secretary (and others who assist her with minutes) and editor will continue to try to provide "virtual" attendance by reporting in detail the activities of the meetings, but **we cannot speak for those not in attendance**. We strongly encourage distant members to voice via e-mail or letter (or phone or fax) the comments, questions, problems, and concerns they were not able to express at a meeting. Previously unconsidered problems are also of interest and are solicited of the members. We also solicit the involvement of non-members who find something in the NL or on the Website interesting, provocative, or just plain wrong. Your comments are welcomed as well.

We have enjoyed the support of several different commercial, governmental and academic agencies. In the early years we approached oil companies who were engaged in exploration off California's coast and were interested in promoting taxonomy for both altruistic and business motives, for financial support. Financial grants were received from several firms, allowing us to function (paying expenses for printing and distribution of the Newsletter) and permitting the beginnings of our publications support activities. Later, an opportunity arose to pool our expertise in production of a listing of marine benthic invertebrates (the first SCAMIT list) for EPA in support of their oversight of marine discharges in Region 9. This resulted in SCAMIT receiving a monetary grant which allowed us to

expand our publications support, and become more adventurous in NL production. It also provided the capital which allowed our transition onto the WWW by giving us the means to purchase ISP services, a bit of software, and our domain name. This major increase in the SCAMIT coffers was arranged by SCCWRP, a longtime proponent and staunch supporter of our organization. We are still functioning in the black because of this grant, even though membership dues have not covered costs for many years. Our non-profit status helps, but our monetary reserves are dwindling. We need to explore other outside funding options in the new millennium [Editors opinion - if yours differs please express it for inclusion in a later NL], or face the prospect of increasing dues to an unprecedented (and unacceptable) level.

Our policy of financially supporting production of papers describing our fauna in the peer-reviewed literature has been modestly successful. SCAMIT has partially financed the preparation or publication of 14 contributions over the years, and has even had a species named after it (*Pinnixa scamit* of Martin & Zmarzly 1994). Journal costs have been rising rapidly, the availability of page-cost-free publication dwindling, and the size of SCAMIT publication grants increasing. If this program is to continue and expand we will need to funnel more funds into our coffers for distribution in our Publications Support mode.

SCAMIT has had friends in many places. We lost one strong supporter with the death of Dr. J. L. Barnard in 1991. He had offered unwavering support for us from our earliest days through a series of workshops, and in a number of other ways. We have had similar support in smaller doses from Dr. J. D. Thomas, Dr. P. Scott, Dr. F. G. Hochberg, Dr. J. H. McLean, Dr. J. W. Martin, Dr. R. Brusca, Dr. E. L. Bousfield, Dr. D. J. Reish, Dr. J. Blake, Dr. M. Wicksten, Dr. L. Watling, and Dr. C. Staude, all of whom have been involved in workshops conducted by SCAMIT over the



years. Many other outside experts (and “inside” experts, since some are SCAMIT members) have also contributed to our growth as taxonomists by speaking to our group, answering questions about particular taxa, or working with SCAMIT members to resolve vexing problems.

We have had continuing institutional support from SCCWRP, and from the Cabrillo Marine Aquarium, our mailing address and erstwhile organizational home-base. Cabrillo has helped us since before they were an Aquarium, when they were known as the Cabrillo Marine Museum. They served as our usual meeting place for many years. In the last few years we have not been able to use their facilities for many meetings because of scheduling conflicts with other educational uses of the Aquarium. Hopefully we can return more often in future. We have continued our tradition of having the SCAMIT Christmas Party at the Aquarium, a great boon to us, and a unique opportunity for SCAMITeers to enjoy the facility in a leisurely fashion. They also have offered us storage space for our library and specimen collections over the years, and continue to do so. Without this support we would have been in considerable difficulty, and would probably have had to rent a space, or dispose of the materials (neither appealing options). We have also benefitted from use of the Natural History Museum of Los Angeles County, SCCWRP, MBC Applied Environmental Sciences, the Marine Lab of the City of San Diego Metropolitan Wastewater Department, MEC Analytical Systems, the Santa Barbara Museum of Natural History, Orange County Sanitation District, the San Diego Natural History Museum, the Marine Biology Lab of the County Sanitation Districts of Los Angeles County, and Dancing Coyote Ranch as venues for meetings and workshops.

All of the above individuals and organizations have contributed to our continuing existence and success. We thank them all for their gracious assistance to our fledgling

organization and their furthering of our organizational goals. The real core of SCAMIT and its accomplishments is, however, the volunteer work of its officers, active members, and committee persons over the years. In the beginning I was a doubter. John Shisko (CLAEMD) circulated a prospectus calling for the establishment of the organization which became SCAMIT among local agency and consultant groups. I immediately rejected the idea as impractical; monthly meetings on taxonomic issues - nobody could possibly do that!!!

How glad I am that I was very wrong. All of the people who worked to make SCAMIT happen deserve our thanks, as do the employers who allowed (and even sometimes encouraged) their participation. That it has continued to survive is a tribute to the many who have participated by volunteering their time, or by just being there. As the traditional stalwarts age we need some new blood to come forward. Secretary Megan Lilly is one of these new recruits, and hopefully will continue to contribute for some time. Others in the audience need to try and find the time to become involved in the organization and its continuance. Wider involvement has been a priority over the years, and remains so. The broader the spectrum of opinion represented by the active participants the better SCAMIT fulfills its purpose. A big THANK YOU to those who have served in the past, and those who are doing so now. SCAMIT would not be possible without you. It can't continue unless those who have not yet served fill the positions left by departing functionaries. Finding the hands to receive the passed torch is likely to be the most significant challenge of the new millennium for our organization.

[The above has been the Editor's attempt to briefly summarize what he sees as SCAMIT's pertinent history. Comments from others who have been a part of it are welcome, as are divergent views of our future direction. Voice 'em if you got 'em. - Don Cadien (CSDLAC)]



NEW LITERATURE

Our consideration of speciation in local *Mytilus* has just begun. In the last NL an e-mail from Dr. Jim Carlton opined that there was no morphological basis for separation of the species in the “edulis” group - *M. edulis*, *M. galloprovincialis*, and *M. trossulus*. He asserted that these three were morphologically one, and only separable genetically. Martel et al (1999) disagree, at least as far as juveniles are concerned, and present data to substantiate their claim of a method which allows identification of *M. galloprovincialis*, *M. trossulus*, and *M. californianus* juveniles (*M. edulis* was not included in their study). Separation of adult *M. californianus* from the remaining three species is not usually a problem as the former has shell ribbing absent in the other three. This is, however, not present in the newly recruited juveniles, and these have previously been identified as *Mytilus* spp. juveniles.

Separation of the species hinges on only a few characters, although others might possibly be developed. Five characters were found to be useful: the location of the dorsal apex along the dorsal shell margin, the size of the posterior adductor scar, the relative distance of the posterior adductor scar from a line dropped from the dorsal apex, the dorsal angle of the dissoconch, and the presence/number of lateral hinge tooth demarcations. Identity of all the individuals used in the morphometric analysis was verified by DNA analysis. Statistically significant differences were found between species based on the selected characters, while differences between geographically separated populations of *M. californianus* were not significant.

The samples examined were taken from areas which should support pure stands of either *M. trossulus* or *M. galloprovincialis*, and did not include areas of known hybridization of the two species along the Pacific coast. It remains to be shown that hybrids can be

morphologically distinguished from the parent forms, and accurately assessed as hybrids. Previous work with adults in Europe, however, suggests that this may be the case. While not a completely definitive answer to our *Mytilus* dilemma, the present work represents a significant improvement in our ability to deal with this difficult group of animals. Additional work on Estuarine and intertidal communities in Southern California will give us all a chance to apply the techniques developed by Martel et al, and see if we can make them work .

Imajima (1999) continues his long series of revisionary works on the Japanese polychaete fauna with a treatment of the Onuphidae (except the genus *Onuphis* itself). While many of the generic level taxa appear to be those represented in the Southern California Bight, there is little overlap at the specific level between our fauna and that of Japan. Dr. Imajima describes 10 new species in the monograph, and reports others from Japanese waters for the first time. The provided keys deal only with the Japanese fauna, and will not allow easy comparison of the Japanese species to a broader spectrum of species in each considered genus. Local workers should familiarize themselves with this fauna, which is sometimes introduced into local waters by the incessant flow of vessels from Japan to California ports.

The small sipunculan worm *Apionsoma misakianum* is commonly reported from shallow coarse sediments in the Southern California Bight. It is also reported to occur in other widely separated areas of the Pacific, Atlantic, and Caribbean. Previous studies of early development in juveniles spawned by morphologically indistinguishable adults collected in eastern Florida suggested that large developmental differences existed within the populations of this species. Staton & Rice (1999) recently conducted an additional investigation to examine these differences using allozyme characterization of animals from different sources relative to the Florida



Current. The current which flows through the Strait of Florida between the Florida mainland and keys and adjacent areas of the Bahamas is quite strong, and continuously flowing. Although the geographic separation across the Strait is not large, the zoogeographic separation is considerable. Teleplanic larvae spawned on one side of this current are not likely to make it to the other side. The authors allozyme results suggest that this may be the case with populations of "*A. misakianum*" on opposing sides of the current. Their data supports the suggestion that this species is actually a complex of cryptospecies which are (as yet) morphologically indistinguishable as adults.

Existence of cryptic species which form an *Apionsoma misakianum* complex in the western tropical Atlantic cast doubt on the identity of *A. misakianum* populations elsewhere in the world, including our own. Further investigations of separated populations elsewhere, especially those where the rather uninformative adult morphology is combined with DNA and further allozyme analyses, are needed to test for crypto-species in other oceans. Stay tuned.

The reliability of traditionally used morphological characters has come under increasingly close examination of late. Case in point is the radula of gastropod mollusks. Several studies have suggested that this structure, whose characteristic tooth shapes and numbers have been the basis of erection of many taxa, is subject to ecophenotypic variation. Reid & Mak (1999) found this to be true in species of the genus *Littoraria*, where substrate on which individuals were collected strongly influenced some aspects of the radular teeth. Different substrate forms of radulae were found within a number of species, further substantiating the ecophenotypic plasticity of the structure in question.

The recent trend in mollusk taxonomy is to rely less on hard parts (shell and radula) and more on the organization of soft tissues in definition of species and higher taxa. The original dependence on shell characters developed in large part from the lack of soft tissues in most mollusks brought back during the major explorations of the last two centuries. There was no alternative to study of just the shell. Then researchers began to extract radulae from dried animals still in live collected shells. These were assumed to vary little within a species, an assumption that usually went untested. It is only recently that the study of preserved animals has called into question the reliability of hard parts (shells, jaws, and radula) as defining characters of mollusk taxa. Studies such as the present one show that increasing emphasis on whole animal rather than just hard structure characters is not just desirable, but necessary.

Passamonti et al (1999) used allozyme analysis on a number of Mediterranean venerid clams in a preliminary assessment of the systematics of the family. They found the current arrangement of genera based on morphology of the shell is very likely incorrect. Once again environmental influences have led to significant amounts of convergence in shell shape and ornamentation among species whose chemotaxonomy suggests they are only distantly related. The present allozyme results are in substantial agreement to earlier examinations using 16s ribosomal DNA or satellite DNA. Further examination of a broader range of taxa within the family should provide a good basis for a reassessment of the systematics of the group, and refinement of the existing morphology based classification.

A phylogenetic analysis of the gastropod mollusk family Columbellidae (de Maintenon, 1999)



showed substantial, but not total, agreement with the current conchologically based taxonomy. She also found the clades indicated in the analysis to reflect the change in diet from carnivory to herbivory in this family. Internal evidence of strength of relationship was used to propose a series of nomenclatural changes, often reviving long unused but available names. None of our local species were affected by these proposed changes.

The examination of the ecology of living hexactinellid sponges made possible by the existence of relatively shallow-water populations of *Rhabdocalypus dawsoni* in British Columbia is continued by Wyeth (1999). Video documentation of feeding in thin sponge sections sandwiched between cover slips was carried out, as well as transmission EM examination of fixed sections. The study demonstrated that this species, and probably other hexactinellids, were non-specific particle feeders. They differ from demosponges in not having appreciable particle phagocytosis by collar bodies.

Potential ecosystem impacts of the introduction of the European Green Crab, *Carcinus maenas*, into the Pacific Northwest are considered by Jamieson et al (1998). They suggest that the feeding of *Carcinus* on a variety of invertebrates in the intertidal and shallow sublittoral is likely to impact both the mariculture of bivalves, and the nutrition of migratory exploited populations such as salmon. They urge baseline surveys of areas currently not reached by the crab so that impacts, when this invasive species arrives, can be better documented.

As invertebrate biologists we see it all; asexual reproduction by fragmentation, by fission, by gemmulation, by parthenogenesis, as well as a variety of sexual reproductive modes. Leonard (1999) examines hermaphroditism in light of the Modern Portfolio Theory, an economic

theory with potential application to sex allocation. Those interested in sex in the theoretical sense may find this discussion of some interest. There are no pictures, however.

While still deeply immersed in data production for Bight '98, those of us involved in the SCBPP and in development of the Benthic Response Index (BRI) look forward to the completion of the data generation portion of the program and the beginning of analysis. We want to try the BRI on the B'98 data to see if our attempt at honing a new analytic tool has succeeded. Engle & Summers (1999) present a somewhat different type of analysis for use with estuaries in the Gulf of Mexico. The end intent is the same; production of an index reflecting the degree of degradation of the considered ecosystem. The implication here, and in the BRI, is anthropogenic impact, although natural impacts are not a priori excluded. The BRI and the index created by Engle & Summers differ strongly in structure, however. Theirs is a multimetric index similar in design to those used in shallow Estuarine areas of the eastern U.S.(i.e. Weisberg et al 1997), and initially attempted here. Engle and Summers demonstrate its application, and provide validation testing to confirm its utility.

XMAS PARTY

The SCAMIT Christmas Party was held on Saturday, 11 December at the Cabrillo Marine Aquarium. A small but joyful gathering once again ate to repletion on succulent viands provided by those in attendance and by SCAMIT itself. Vice-President Leslie Harris (despite being under the weather) not only coordinated the festivities but provided another beautifully crafted worm-cake. Santa did not make an appearance this year but the youth in attendance (none under 12) did not mind his being occupied elsewhere. For a small group we seemed to make a rather loud noise, at least while talking. Later, when he began to sing carols to the instrumental accompaniment of Ann Dalkey (flute) and Larry Lovell



(trombone), the volume was more subdued. Dr. Don Reish used this occasion to donate to SCAMIT members papers culled from his reprint collection. Don Cadien, Tony Phillips, John Ljubenkov and Larry Lovell were the most active literature hounds. Larry was acting on behalf of the SIO Invertebrate Collection library which he says can use some fleshing out in taxonomic source literature. Dr. Reish only got through the "M"s, but will finish the job at a later date. Thanks to him on behalf of those present, and from SCAMIT in general for sharing his riches with us. We finally folded our tents and headed home about 10PM, still full and flushed with enjoyment at a nice opportunity to get together with good friends and celebrate the season. Hope more of you can join the celebration in 2000.

13 DECEMBER MEETING

The polychaete meeting scheduled for the 13th of December was canceled at the last minute. Calls to likely participants discovered that regular attendees would not be able to make this meeting. Vice-President Leslie Harris then called the remaining persons who might be coming and informed them of the cancellation. This worked well, but not perfectly. Hyperion was in the process of changing their voice mail system, so Tony Phillips did not get his message, and came to the non-meeting. Two folks from the Orange County Sanitation District, Mike McCarthy and Christina Thomas were also not informed and came to the meeting. A small polychaete oriented discussion was held, but only in the morning. We were to have had a guest speaker, Dr. Sepalika Jayamanne - an ecologist from Sri Lanka who was visiting the museum. Her sigh of relief at not having to present a program was palpable. I later met her at Leslie's house where she had been staying since her arrival. A very nice lady whose doctoral work and present employ are both related to decapod aquaculture. She is Senior Research Officer

and Officer in Charge of the Regional Center of NARA (the National Aquatic Resources Research & Development Agency) in Sri Lanka.

PRO BONO

Dr. Amy Wagner of EPA Region 9 has alerted us to the availability of benthic samples from the Monterey Bay National Marine Sanctuary. These are subsamples of grabs taken by the U.S. Geological Survey in the sanctuary's northern portion from 1995-1997. She provided a description of the amount of material involved (large numbers of samples with only a few organisms in each). The EPA lab is attempting to find some way to get the samples worked up, but currently has no funding for the effort (still diligently looking for money though). Some interest in looking at them was expressed by the group at Moss Landing Marine Lab, which has considerable experience in the area. Dr. Wagner is also aware of SCAMIT and thought that some of us SCAMites might be interested in participating in some way (perhaps as QC or overflow taxonomists). Since they don't currently have funding, any such effort should be considered pro bono until proven otherwise. Interested parties can get more information or volunteer their help by contacting Dr. Amy Wagner, USEPA Region 9 Laboratory, 1337 S. 46th St., Bldg. 201, Richmond, CA, 94804 (Tel: 510-412-2329, FAX: 510-412-2304). Our thanks to Ann Dalkey (CLAEMD) who initiated contact on this issue.



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