



Southern California Association of Marine Invertebrate Taxonomists

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SCAMIT Newsletter

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SUBJECT: There is no meeting in July
GUEST SPEAKER:
DATE:
TIME:
LOCATION:



Mytilus sp. (juv)
ITP Regional 2708(2), 17 July 00, 37 ft.
Image by K. Barwick, 27 Feb 01

NEW LITERATURE

The activities of polychaetes are often viewed in the context of bioturbation, with examination of their burrow morphology and feeding activities demonstrating movement of materials from subsurface to surface layers. They can also alter the benthic environment in the opposite sense, causing the precipitation of particles which would otherwise drift by on bottom currents. Friedrichs et al (2000) described the effects of polychaete tube 'lawns' on bottom particle movement. The tube lawns, by the nature of their spacing, the length of tube protrusion above the sediments, and the individual tube diameter and flexibility, effectively raise the bottom (as far as the current is concerned) to the level of the tube tips. This leaves the area beneath this skimming flow subject to particle accretion from the lower edge of the current as marginal particles drop below the region of active lateral transport, stabilizing the sediments, and adding

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finer (often nutrient rich) particles to the sediment surface. Even at relatively low polychaete tube densities this effect can occur, helping to direct subsequent community evolution within the affected area through modification of the benthic environment.

So the question sometimes asked of polychaetologists ‘What good are they?’ can be answered by something other than just ‘Fish eat ‘em’. It is not clear that an equivalent variety of good uses can be attributed to peracarid crustaceans, although fish eat them as well. Takahashi et al (1999) verify this in an investigation of the feeding habits of surf zone fishes in Japan. The majority of the 25 species of fishes examined ate a variety of different surf-zone peracarid prey, some of which were important to their overall nutrition. Most of the prey species were taken in low abundance by fish predators and did not constitute a significant portion of their diet. Nearly all of this predation took place either during swimming events initiated by the prey, or during resuspension of the prey by water motion. These two risk windows lead to 1) prevalence of nocturnal swimming excursions by peracarids to minimize risk of predation by visual predators, and 2) selection for rapid reburial mechanisms in peracarid species likely to suffer dislocation by water motion in shallow-subtidal habitats.

While peracarids are clearly prey to fishes, they are predators to other small organisms. Gudmundsson et al (2000) document the consumption of foraminifers by three species of asellote isopods. They found a close correspondence between the structure of the mandibular molar and the nature of the selectively ingested prey items. Species with relatively strong tests were selected by an isopod possessing a rounded molar which could focus bite pressure on a single point of the test and lead to cracking. Two other species had more flattened molar cusps and chose to consume more fragile tested species. It appears that such small asellote isopods may specialize

in particular species or genera of forams, which form a significant portion of their diet. The considered isopods were from bathyal depths, and it may be that the heavier shells of foraminifers from shallower shelf depths are a sufficient defense against such predatory attacks.

In an attempt to elucidate the phylogeny of forcipulate asteroids Mah (2000) analyzed 25 characters of 25 taxa, using *Henricia* as an outgroup. His analysis suggested that this clade was rife with homoplasy, and that most of the morphologically defined traditional groups were probably not monophyletic. This confirmed rather than modified other recent analyses, and indicated that further analysis with a broader sampling of taxa needs to be undertaken. Characters used in the analysis also require evaluation for potential usefulness in subsequent analyses. Resolution of the relationships of family and other groups within the forcipulates remains out of reach for the moment.

The methodology of phylogenetic analyses continues to evolve. Takahashi & Nei (2000) provide a consideration of the relative efficiencies of several different search algorithms using large numbers of “taxa”. They show that there are patterns associated with each algorithm. While this article is not for the uninitiated, it is helpful for even extreme novice cladistic folk, such as your editor, to see the consequences of adopting the compared algorithms. The authors compare maximum parsimony, maximum evolution, and maximum likelihood methods of generating tree topologies. Efficiency is a most desirable criterion for judging the utility of each approach. As the number of entities considered increases into the hundreds (for instance in the cladistic analysis of the B’98 trawl dataset) computation time increases astronomically. Use of an optimization algorithm has the possibility of actually allowing completion of



the analysis before the end of the universe, or perhaps even before the death of the analyst. With larger datasets, efficiency becomes not just useful, but necessary.

Well, there is good news and bad news contained in a recent article by Armonies (2000) on the scale of changes in benthic communities. The good news is that the adoption of large-scale monitoring seems just the thing the author would recommend based on his studies. The bad news is that on the kilometer scale, changes in benthic populations between successive samplings at the same site over short intervals, can be profound. To some extent his results stem from a shallow study area (8-11m depth) exposed to more current movement than most of our Bight stations. We do sample in water this shallow, however, and need to seriously consider the impact of his findings on our own sampling. Of central importance to the magnitude of observed change is the ability of many benthic organisms to current drift in one or several of their life stages. There are also effects derived from physical factors rather than biological activities.

The Editor witnessed first hand the modifications in benthic community structure caused by a three day episode of large swell in about 5 m of water in Santa Monica Bay. Analysis of samples taken a day before and 3 days after this episode showed about a 50% change in species composition of the samples, and even larger changes in individual population abundances.

Armonies examined current data during the periods he considered, and also noted storm effects. During one two-week period of only moderate current action he found that in roughly half the populations, change over the period equaled average variation between consecutive years! The combination of these biotic and abiotic factors severely reduce the ability to predict community composition over small scales, only on regional scales can the

small scale variation average out. Armonies recommends use of random station selection over a large area to circumvent the influence of short-term small scale variability; exactly the approach taken in our current regional monitoring.

The degradation in the linearity of the Benthic Response Index in shallow water may be, at least in part, a reflection of the above noted variability. Perhaps, even with a better definition of a shallow polluted end-point, we will not be able to achieve the same Index performance in the dynamic shallow habitat examined, as has been achieved at greater depths on the shelf.

MINUTES OF THE 14 MAY MEETING

The meeting was held at the Invertebrate Laboratory of the Santa Barbara Museum of Natural History. Both Paul Scott and Gene Coan were there to discuss our comments and answer our questions on their bivalve monograph (Coan, Valentich Scott & Bernard 2000). After a brief business meeting we proceeded to address a series of issues raised by Kelvin Barwick (CSDMWWD), Don Cadien (CSDLAC), and Carol Paquette (MBC). As in past considerations of published works (such as the volumes of the Taxonomic Atlas series) we attempted to provide feedback to the authors on errors we had detected in their publication so corrections could be made in future editions, or errata issued for the current one. Paul and Gene were way ahead of us, however, and had already compiled a much more extensive list than that offered by the participants. This list is being made available on-line as a reference at

<http://www.sbnature.org/htmls/inverts.htm>

The authors would rather not put it out in a fixed form in the Newsletter, since it is an active document, and new additions are being made. The on-line form is, by definition, the current one. A printing of the list as an attachment to the Newsletter would rapidly be



out of date, leading to confusion. Those hard copy readers who desire list access but do not have internet access should be able to print out a copy for themselves at a local library, the majority of which have computers and internet access available to their patrons. Nearly all of the corrections are not very substantive, mostly dealing with misspellings, orthographic problems, etc. Gene and Paul plan to deal with more substantial changes and additions in a second list which will be made available in the future. All the changes presented in either list will be incorporated into a second edition of the book.

Several of our questions had to do with specific taxa, and required examination of specimens. One of the more difficult problem areas was with *Tellina cadieni*, whose original description in the book was at variance with the perception of it as equivalent to *Tellina* sp A of SCAMIT. Specimens of this animal from a variety of different sources were examined, as were specimens of *Tellina carpenteri*. We found that the apparent basis of the confusion was the idea of equivalence between *T. cadieni* and *T. sp A*. The editor, and several others present had assumed that they had been correctly allocating names to forms, when, in reality, they had not. The deep-water, sculptured, yellow-orangish pink form, originally treated as *T. sp A* of SCAMIT and differentiated from the broadly distributed (but generally shallower) smooth, uniform pink form for which the name *T. carpenteri* was being used, appeared to have the wrong names in SCAMIT list usage. Based on the authors' research, the deepwater, sculptured, yellow-orangish pink form is actually *T. carpenteri*. *Tellina* sp A then becomes a synonym of that species rather than *T. cadieni* which is a larger, shallow-water/embayment/harbor form that differs in hinge particulars, color pattern and sculpture from *T. sp A*. The smooth uniform pink form which had been treated as *T. carpenteri* by SCAMIT remains unaccounted for and is here referred to a second provisional species *Tellina* sp B of SCAMIT. So this form, the most abundant and

most widely distributed of the three types, confused under the *T. carpenteri* umbrella locally, remains unnamed as far as we can tell. It may be that somewhere in the extensive synonymy of *T. carpenteri* there remains an available name that might be applied to this species, but that has not yet been confirmed. We examined paratypes of *T. cadieni* (from Alamitos Bay), and examples of *T. sp A* SCAMIT from 305m depths off Palos Verdes side by side, and found only a few differences. Most prominent among these was the nature of the posterior lateral tooth, which extends in *T. cadieni* into a thornlike protuberance distally (this is visible in Plate 83 of the book) which is much better defined than the less prominent and more rounded distal protuberance in *T. carpenteri*. New voucher sheets for all three taxa are in preparation and will be distributed in a later Newsletter.

Our attention switched to mytilids, with Carol Paquette (MBC) inquiring about separation of members of the *Mytilus edulis* group by external morphological characters. Based on recent literature Don Cadien suggested this was a fairly fruitless task, and we tabled the issue again. Still within the mytilids Kelvin Barwick raised the issue of separation of juvenile *Crenella decussata* from juvenile *Solamen columbianum*. We examined specimens of equivalent size and found that the two should be easily separable based on the number of ribs (more in *Solamen*) the degree of rib divarication (more in *Crenella*), the degree of granulation of the ribs (more in *Crenella*), the shape (rounder in *Crenella*, more obliquely oval in *Solamen*), and the thickness of the shell (thinner in *Solamen*).

Carol then brought out a specimen which she had tentatively identified as *Solamen megas*. This was confirmed by Gene and Paul. This is a southern species only uncommonly taken in our area. The specimen under consideration was from Long Beach Harbor, and Carol was a bit concerned that it might be a species introduced from elsewhere. The two species



(*S. megas* and *S. columbianum*) are similar in overall appearance, but *S. megas* has a different valve profile, being more inflated under the umbos and less inflated elsewhere in the valve than *S. columbianum*. This difference is hard to see in Plate 26 of Coan et al (2000), but is evident when the two species are compared side by side.

We also spent considerable time examining small specimens of *Solen*, attempting to determine at what size we could begin to accurately separate *Solen sicarius* and *S. rostriformis* (which co-occur locally). Both species are on the SCAMIT Ed. 3 list, although the later is misspelled there as *S. rostiformis*. This is being corrected in Ed. 4. As adults the two species can be readily separated on the basis of the shape of the shell anterior and posterior ends, and on the proportions of the animal. These are well illustrated in Plate 93 in Coan et al (2000). Problems arise, however, in attempting to apply the characters which separate the adults to separation of small juveniles. We examined a number of lots selected by Kelvin from San Diego material. We checked both the proportion of the shell (ratio of length to height), and the nature of the two ends of the shell. We also examined the dentition, the structure of the pallial sinus, and the periostracum, as potential separators. Since all the material examined was shell only we were unable to examine the body itself for characters which might be useful. Don Cadien maintains that mantle pigmentation patterns and intensity varies between the two species, especially along the ventral margin. Of the examined characters, only one seemed reliable over the range of specimen sizes available - the length/height ratio. We found that all clams with a ratio of greater than 4 were *S. rostriformis*, while those with a ratio less than 4 (usually 3.25 - 3.5) were *S. sicarius*. Even so we deemed it inappropriate to attempt to separate these two species in specimens less than 10mm in overall length. These should be

reported as *Solen* sp., recognizing that the growth allometry which produces the clear differences in the adult has at this point not yet had sufficient time to express itself.

Similar reservations were expressed in determination of species for small mastrids. A lot initially identified as *Mactromeris hemphilli* was examined, and both Paul and Gene thought it better left at Mactridae. These animals were also less than 10mm, while the adult of this species, and of many of the local mastrids, was an order of magnitude larger. Additionally they questioned if *M. hemphilli* still lives in the area. No recent reports of living animals have been received, although museum specimens exist which place it historically as far north as Cayucos.

Several small animals identified with provisional names were, however, identifiable to species. Specimens of *Cymatinoa electilis*, *Sphenia luticola*, and *Kellia suborbicularis* were identified by Gene and Paul. A voucher lot of *Cymatinoa* from the City of San Deigo was also examined and found to be *Rhamphidonta retifera*. Don Cadien promised to send Kelvin additional material taken from off Palos Verdes for comparison. *Cymatinoa* can be readily separated from all other similar small rounded clams by the presence of projecting points along the ventral margin. These occur elsewhere only in such forms as pholadids and cardiids, where they are the continuation of prominent surface ribs. In *Cymatinoa* they have no corresponding ribs or ridges visible on the shell surface.

A voucher lot of *Caryocorbula porcella* was verified and the authors indicated that both this and *Juliacorbula luteola* should occur in our samples. The later is a shallower animal, however, and offshore corbulid specimens are likely to be *C. porcella* rather than *J. luteola*. Gene Coan expressed dissatisfaction with the



current generic/subgeneric allocations of Eastern Pacific species, a concern he also addressed later (in June) during his Western Society of Malacologists talk in San Diego.

Kelvin also raised other issues of uncertainty regarding local bivalves. He felt that, based on the characters used in the book, he could not reliably distinguish between *Ennucula tenuis* and *E. cardara*. Don Cadien brought out specimens from about 1150m in the Tanner Basin off southern California which he believed to be *E. cardara*. Upon examination Paul and Gene thought otherwise, finding them to be *E. tenuis*. Since *E. cardara* is found only below 1600m (as far as is known), we are unlikely to have to distinguish it from *E. tenuis* in our monitoring. The question may become more pressing if the next regional survey is pushed out into the basins. Other than the differences in shape visible in Plate 4 of Coan et al (2000) the characters listed in the character table offer little potential assistance in separating the two. The plate, however, shows *E. cardara* to have more central umbos, with a longer anterior slope. The umbos of *E. tenuis* are quite close to the anterior end of the shell, and the anterior slope is short in consequence. More critical perhaps is the ability to separate *E. tenuis* from *E. linki*, whose distributions overlap bathymetrically. Fortunately the resilifer of the latter is much smaller and less projecting than that of the other two local members of the genus, so separation should be clear.

Kelvin distributed a draft voucher sheet for a new taxon he was erecting, *Mysella* sp H. This is the species commensal on the setae of *Blepharipoda occidentalis*, and especially *Isocheles pilosus*. They are small, and had been interpreted as juveniles of *Mysella pedroana* by Don Cadien when taken in earlier shallow surveys by MBC. Kelvin sent specimens he'd discovered to Paul, who determined that though small they were mature, and the larger individuals brooding. They appear to be *Mysella* rather than

Rochefortia, and have heavy hinge teeth. Differences from other species and available ecological information on the species will be included in the sheet Kelvin is preparing.

Carol Paquette brought along a series of oysters for expert examination, having taken her best shot at their identification using the book. Oysters are one of those groups that have been both intentionally and unintentionally transported all over the world by man. The likelihood of having introduced species is thus very high in harbor situations. Carol's specimens came from various parts of the Los Angeles/Long Beach Harbor complex, and were thus suspected of being introduced. Gene tackled these with her using a draft of the new bivalve key from the next edition of Light's Manual. These seemed to be partly *Ostrea conchaphila*, the local species, and partly something else. After struggling for awhile, they concluded that they couldn't conclude anything. She also brought, for ID confirmation, a very large specimen of *Pteria sterna* which had settled and grown to maturity during the last ENSO event.

Late in the afternoon, while everyone was tired, Don Cadien brought out a series of specimens from mid-slope off Oregon for interested parties to examine. Included among the species represented were *Axinodon redondoensis*, *Mendicula ferruginosa*, and four or five other species in the Thyasiridae. Several blue iridescent pectinid valves were also present which were thought to be *Cyclopecten groenlandicus*. They proved to be juveniles of *Delectopecten vancouverensis*. The sample examined also had a single specimen of *Lyonsiella quaylei*, which is not uncommon for that region.

Most of the group managed to stay till the bitter end, and we only convened when it came time for Gene Coan to catch a flight to Mexico. Our thanks to both Paul and Gene for fielding our comments and questions on the book, and giving so graciously of their time.



THE SCOOP ON CLEANING YOUR SCOPE

Member Tom Parker (CSDLAC) sent in the following helpful discussion of an unavoidable task confronting us all from time to time.

“Highlights from the magazine *Microscopy Today* include descriptions for effectively cleaning microscope lenses. These include:

- Never “dry” clean a lens.
- Use an aqueous solvent or liquid to loosen and remove what is on the lens.
- Use the best quality lens tissue.
- Avoid abrasion by always wetting the lens surface before rubbing with lens paper. In addition to commercial microscope lens cleaners, some microscopists use “Sparkle” or “Windex” as the solvent. If you use cotton applicator sticks, inspect them for debris and wet them prior to touching the lens. A pre-

moistened lens maybe cleaned with a drop of “Dawn” dish soap, gently worked with an applicator, and rinsed with deionized water from a squeeze bottle. Compressed gas such as CO-2 is an effective way to streaklessly remove the water.”

[the commercial products mentioned above were those mentioned in *Microscopy Today*, not those tested to be most effective by any SCAMIT member. Similar products can probably be substituted to equally good effect - even generic and store brands. As long as they contain isopropyl or ethyl alcohol they will accomplish their goals as solvents. Any cleaning product containing surfactants should produce results similar to those from the soap brand indicated above - Ed]

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