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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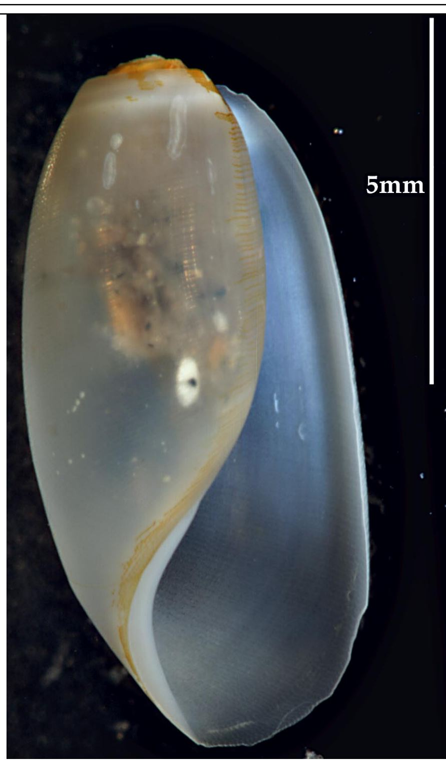
SUBJECT:	Crustacea - Leptostracans and *Lophopanopeus*
GUEST SPEAKER:	Todd Haney (NHMLAC)
DATE:	11 December 2000
TIME:	9:30 a.m. to 3:30 p. m.
LOCATION:	City of San Diego Marine Biology Lab 4918 N. Harbor Dr. #201



Acteocina eximia (Gould 1853)
Station 2040 (1), 7-20-95, 330 ft
Photo by K. Barwick 12/98

NEXT MEETING

Todd is busily engaged in reevaluating the taxonomy of the leptostracans as part of a PEET grant under Dr. Jody Martin at NHMLAC. He would be glad to see material from any attendees, and will tell us about the latest developments in nebalian taxonomy. We also plan to discuss the decapod genus *Lophopanopeus* if time permits.

NO HO HO

No official SCAMIT Christmas party will be held this year. We are taking a bye to reevaluate the wishes and needs of the membership for “extracurricular” events. The executive committee is pondering the options which include; none, continuation of a Christmas Party in December at a new venue

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or at the Cabrillo Marine Aquarium, Christmas in July, and resumption of the SCAMIT picnic. Drop them a line with your comments, concerns, and suggestions. Oh, and have a Merry Christmas. There is always room for unofficial gatherings between socially inclined SCAMITeers during the holidays, or at any time.

NEW LITERATURE

Garm & Hoeg (2000) examine the functional morphology of the mouthparts of the galatheid crab *Munida sarsi*. They combine evaluation of shape, and setal complement with a consideration of how each portion interacts functionally with the others. Some of their description of function is based on observation rather than inference; they took and examined high-resolution video of the feeding action itself. The SEM's the authors provide of setae and intact mouthparts are stunningly detailed, and absolutely clean. It becomes more and more apparent that the fine structure of the arthropod cuticle, and the setae, scales and spines is richly detailed, and serves as a good hunting ground for interesting character states; both from structural/functional and taxonomic standpoints.

Picturing a crab we think of claws; the massive crushing pliers of stone-crabs, the efficient plant nippers of grapsids, the waving semaphore claws of fiddler crabs, or the blood-letting pointed pinchers of portunids. Mariappan et al review the range of structures and uses in crab chelae, as well as questions of allometric and non-allometric growth, handedness in non-symmetrical cheliped development, and cheliped use in social encounters. A useful compact review which serves as a key to recent literature on chelae-related morphology and ecology.

One of the more interesting things that decapods do with their chelae is produce sound. Versluis et al (2000) investigate the actual process of sound generation in the alpheid shrimp *Alpheus heterochaelis*. In this species they found that the snap of this snapping shrimp was produced by the sudden collapse of a cavitation produced bubble. The sound generated is truly staggering in its intensity, but the intensity drops off fairly rapidly with distance. Myriads of these and similar shrimp turn the sea into a white-noise saturated medium. It is likely that some other species, with different chela morphology, produce sound in other ways. The present case is well documented however and the sequence of events leading to production of the sound is clear.

Gnathiids are odd gnome-like isopods with peculiar life-histories and a composite life-style; parasitic as juveniles and free-living as adults. Most descriptions are not complete, opting instead for definition of only those characters which allow separation from local congeners. Like other large genera, what were originally considered subgeneric groupings have been raised to full generic status. In consequence, most “Gnathia” are now in other genera. This is true in California where our most common gnathiids are now in the genus *Caecognathia*. Smit et al (2000) provide a detailed description of another member of this genus from South Africa, providing a good basis for comparison with local species. Their paper continues what has been, in recent years, a large upswing in literature on the family, both taxonomic and ecological.

OLD LITERATURE

In the last Newsletter we mentioned a series of publications revising the gastropod fauna of the North Atlantic. This time we revisit a massive, but under-distributed contribution to the knowledge of the isopod fauna of the North Pacific. Four volumes have appeared to date (Kussakin 1979, 1982, 1988, 1999). All these works are in Russian and like most such literature are hard to acquire and little used in the West. The exception to this is the program of joint US-Israeli publications (the ISTP or Israel Scientific Translation Program) which harnessed the power of expatriot russians to broaden access to important works by translating them into English. I don't think the program still exists, but during its run a number of important monographic treatments were translated for use in the west. Our Soviet colleagues received considerable government support (at least in the USSR era prior to the impacts of arms and space expenditures coming home to roost), and major oceanographic expeditions such as the cruises of the Vityaz provided vast collections for description by a number of researchers. Many world experts were involved, among them Dr. Kussakin.

I first actually viewed these volumes during lab work on the SCX collections at the Natural History Museum. John Chapman had brought a set with him. At the time I had ordered the volumes from an English source, but had not yet received them (I am still waiting to receive the 1988 publication). When Rick Brusca left the Natural History Museum he took his set with him, therefore, my set is probably the only one outside a library in Southern California. I'm sure they can be found in the Hancock Library, and at Scripps, perhaps at UCLA, but probably not elsewhere. Mine will be available for use by local members and I will be happy to answer questions addressed to me via e-mail or telephone regarding their content (although please remember I don't read Russian).

A number of species which occur in the North East Pacific are included, but perhaps even more useful are the taxa not currently known to occur in our area. As commerce with asian Russian ports increases, and as species introductions continue, we should find more of the species covered in these Kussakin works showing up in our waters. Like Michel Hendrickx publications on decapods from Mexico, these works help us explore the wandering boundaries of our fauna.

THE CONNECTION

In a series of papers over the last few years Michael Veccione, Bruce Collette, and various colleagues have explored the connections between taxonomy and fisheries biology (Collette 1995; Vecchione, 1994; Vecchione & Collette 1994, 1996; Vecchione et al, 2000). There does seem to be a connection through biodiversity. Fisheries biologists are busily trying to simultaneously find the most efficient way of exploiting the natural world and the least damaging way of doing so. Sometimes they attempt to go too far afield, using data from other areas to establish best population management approaches. Here taxonomy comes in, clarifying similarities or differences between organisms believed to be the same in various parts of a large range.

The authors are staff members at the National Systematics Laboratory, part of the National Marine Fisheries Service. The laboratory is housed at the Smithsonian and has, for over 50 years, offered taxonomic support for fisheries investigations in this country. Most of the work has been with commercial species of fish and invertebrates, but many non-commercial groups have also been addressed. Partly this is a recent change in emphasis which occurred when both the public and regulators focused more forcefully on biodiversity. There continues to be a need for taxonomy in the service of fisheries management (for instance the lobster tail issue described by Vecchione and Collette 1996), but evaluation of biodiversity has become a priority. Taxonomy is central to this effort. It is important in many other related biological disciplines as well (see Vecchione 1994) where it is needed to guarantee experimentalists are using the same organism in all portions of their experiments. In a sense, taxonomy is to other biological disciplines what particle physics is to other physical disciplines; the basis on which everything rests.

SEDIMENT WORKSHOP

On the 24th and 25th of October a workshop was held on-board the Queen Mary entitled "Collection, Analysis, and Interpretation of Sediment Quality Data. It was put on by SCCWRP and the San Diego, Santa Ana, and Los Angeles Regional Water Quality Control Boards. Over two days those present attended presentations from a variety of notable scientists working in sediment quality assessment. The topics covered the entire process, from the design of environmental monitoring studies, to application of analyzed results, to problems of remediation site selection. On the second day most of us participated in an exercise designed to draw on the presented concepts to solve a real-world problem involving time constraints, budgetary limits, and politics. I'm sure that all the participants learned something they did not know, regardless of the amount of experience with which they arrived. As with most meetings, one of the major benefits was the ability to talk to both the speakers and other participants during breaks and over lunch. Questions were encouraged throughout the process and in response, extensive comments were returned by some of the speakers . A broad spectrum of environment related employment was represented among the participants, drawing from dischargers, regulators, academia, and consultants. All the major POTW staffs were represented, and a number of SCAMIT members were participants. Steve Bay of SCCWRP was the major organizer of the event and should be congratulated on its success.

On the 23rd SCCWRP put on their own orientation session designed for those who normally see only data and don't get into the field. Live benthic samples from several different habitats were available for observation. We observed how the samples were organized and the various animals that were present. Preserved samples from a series of sites and sampling dates off Palos Verdes were also examined. The aim was demonstration of the degree of variability one might expect within benthic samples from different habitats, and under various degrees of impact. Fortunately Dean Pasko (CSDMWWD) was on hand to tell the participants what that was that just whizzed past their eyes under the microscope.

SYNOPTIC DATA REVIEWS

Preparation of the B'98 infaunal data approaches closure. The synoptic data review has been completed and once the final threads from that process are knotted together the database will be complete. We can then begin data analysis. Data submissions took longer than anticipated and so we are later in the year than originally scheduled for preparation of the analytical dataset.

Hopefully analysis and interpretation will be more rapid this time, as development of analytic tools - particularly the BRI - required many months during analysis of the SCBPP data. We hope to be able to use existing tools this time, rather than creating new ones.

This time around the synoptic review process has been much easier than that during preparation of the SCBPP data. All three meetings have gone well, with nearly everything resolvable during the meeting. Each time there is a small residue of action required of one or more participants, usually involving reexamination of a very limited number of specimens. These instances are usually to clarify if one or more participants were viewing things in the same manner as others. If at the meetings we think that a brief examination will allow data to be retained at a more fully identified level, and if the persons concerned are willing and have the time, decisions will be held in abeyance until such examinations take place. The process must move forward, however, and if no response is received within a week or two, a default solution (usually a lumping to generic or higher level) will be implemented. Many more species level identifications could be retained in B'98 data than in SCBPP data. This is in part, due to the advances in knowledge which have occurred in the interim. It is also due to our better understanding of how to deal with taxonomic uncertainties in the database, and our increased familiarity with the entire review process.

WEMAP

Completion of the QC analysis of the WEMAP (Western Environmental Monitoring Assessment Program) samples taken last year is nearly complete. Once the data are groomed (elimination of animals represented by too few individuals, ambiguous higher level taxon IDs, and forms with taxonomic problems) they can be analyzed. Work on this project has benefitted from our experience in southern California with the SCBPP, and with B'98. This has allowed more rapid processing of the samples and should yield a shorter period between field sampling and final report. Once data is available, it will be interesting to compare the results of the inshore samples taken in B'98 with the samples taken throughout California, Oregon, and Washington in the WEMAP program.

THE REAL ARTICLE

(Editor's Note: The article below is reprinted, with permission, verbatim and appeared recently at:)

http://chronicle.com

"The Impending Extinction of Natural History By DAVID S. WILCOVE and THOMAS EISNER

Imagine you are a naturalist with a liking for insects. You are interested in how insects make a living, in how they are fit for survival. You marvel at how protected they are as adults, when they are able to fly. And you think of how helpless they are as eggs and pupae, when they are stuck in place, unable to take evasive action. True, pupae are sometimes enclosed in protective cocoons, or hidden in dugouts in the soil, but some live out in the open, where they are exposed to a world of predators. How, for instance, do the pupae of ladybird beetles (family Coccinellidae) manage

to survive? They are typically affixed to stems or leaves, where one would imagine they don't stand a chance against ants. Might they have special weaponry? You look closely and find that they do. They have what are essentially biting devices, in the form of clefts along the backs of their abdomens that they can open and close and use to snap at ants that come too close.

As a naturalist with a Darwinian bent, you wonder whether such snapping devices are present in every ladybird-beetle pupa or whether, in the best evolutionary tradition, different ladybird species have come to possess variants of this defense. You look at different species and find that, yes indeed, the beetles of one genus, Epilachna, which includes among others the Mexican bean beetle and the squash beetle, have evolved a remarkable alternative defense. Instead of the pinching devices, Epilachna pupae have a dense covering of tiny glandular hairs, the secretion of which forms a potent deterrent to ants.

You get in touch with chemists, whom you provide with a sample of the secretion, and in due course you find out that you have stumbled upon a unique group of chemicals. The substances include some fascinating new ring structures of enormous size — so novel, in fact, that the paper you eventually write on the secretion with your colleague chemists attracts wide attention.

The discovery may look serendipitous, but it was not. It was driven by rational inference from pure, old-fashioned natural history, the close observation of organisms — their origins, their evolution, their behavior, and their relationships with other species. That kind of close, scrupulous observation of nature has a long and illustrious history, but it is now sliding into oblivion.

The scenario we describe actually happened to one of us (Thomas Eisner). The impending extinction of natural history is very real as well. In schools and universities, in government agencies and research foundations, natural history has fallen out of favor. What was once considered a noble field of inquiry — no less a figure than Charles Darwin proudly called himself a natural historian — is now viewed as a relict discipline, a holdover from the era of Victorian cabinets and private butterfly collections. A knowledge of, or even an avowed interest in, natural history is no longer a prerequisite for admission to a graduate program in ecology or any other branch of biology. Financial support for basic natural-history research has all but evaporated. Even the field trip, long a staple of science education from the primary grades through graduate school, has become increasingly uncommon.

This deinstitutionalization of natural history looms as one of the biggest scientific mistakes of our time, perpetrated by the very scientists and institutions that depend upon natural history for their well-being. What's at stake is the continued vibrancy of ecology, of animal behavior and botany, of much of molecular biology, and even of medicine and biotechnology. A knowledge of natural history enables the professional ecologist to see functional relationships in nature, to uncover the broader patterns that lead to critical scientific advances.

Natural history also provides the "nuts and bolts" information necessary for managing wildlife and other natural resources. As the president of the Society for Conservation Biology recently lamented, "How can we possibly construct ... a successful recovery plan for an endangered bird when we lack basic information on such things as what it eats, where it nests, and so on?" For the molecular biologist, natural history is often the path to finding something truly strange and wonderful, like the elaborate chemicals that protect the pupae of certain ladybird beetles. Even the search for new medicines can benefit from natural history. Was it not in his capacity as a natural historian that Alexander Fleming saw significance in the observation of a zone of bacterial inhibition around a Penicillium mold growing in a petri dish, a discovery that launched the era of antibiotics?

Perhaps the strongest argument in support of natural history is simply the magnitude of our current ignorance about nature. To date, scientists have discovered and described approximately 1.5 million species. That tally represents only a small fraction of the total number, perhaps less than a tenth. Even in the United States, where approximately 200,000 species (terrestrial, freshwater, and marine) have been described to date, an additional 100,000 to 400,000 may await discovery. And only a tiny fraction of the described species have been studied in any detail. Given how little we know about nature, it hardly makes sense to discourage its further exploration.

Several factors have contributed to the demise of natural history. As any field of scientific inquiry matures, it has a tendency to become more theoretical. Previously unconnected observations are brought together under the mantle of a set of unifying principles. Scientists who contribute to that body of theory emerge as the leaders in the field; they are the ones who are hired by research universities, who receive tenure, and who then encourage their graduate students to follow in their footsteps. (This is not to say that one cannot be both a first-rate natural historian and a first-rate theoretician, but such individuals are the exception rather than the rule. Most scientists tend to be strong in one or the other.) No one can blame the universities for wanting to hire the rising stars in each discipline, but with respect to the natural sciences, the practice has led to an unanticipated but regrettable result: The traditional natural historian has been pushed to the margins of academe. Moreover, the institutions that finance scientific research, be they governmental or private, are drawn to the leaders in any given field and may wrongly assume that the natural historian has comparatively little to contribute. Unable to obtain support for their research, the natural historians drop even lower in the academic pecking order.

At universities, the key to reversing the situation lies in hiring (and eventually granting tenure to) scientists with an abiding affection for natural history. Unfortunately, a Catch-22 applies here. Administrators and senior professors who are uninterested in or even hostile to natural history are not likely to value it when judging candidates for junior faculty positions. And without access to entry-level positions, a new generation of natural historians will never emerge to become tomorrow's administrators and senior faculty members. The institutions that pay for research, however, could assume a leadership role in rescuing natural history. Were more money available for basic natural-history studies, we are convinced that more graduate students and faculty members would incorporate natural history into their researching and teaching.

An even more fundamental step would be to reinstate natural-history studies in elementary and secondary schools. Most children are fascinated by plants and animals — from dandelions to dinosaurs. That seemingly innate interest, if nurtured by adults, can become a lifelong joy or even the path to a career. Untended, it usually atrophies as a child grows older. For the price of a stereo microscope, now less than $250, a science teacher can turn a pinch of soil into a bustling world of springtails, oribatid mites, and nematodes, creatures as bizarre and engaging as anything to appear in a Star Wars movie.

The current push to connect every classroom in America to the Internet demonstrates how quickly elected leaders and the public can be galvanized to address what is rightly perceived to be a critical educational need. Meanwhile, the demise of natural history goes unnoticed, increasing the likelihood that future generations of schoolchildren will spend even more time indoors, clicking away on their plastic mice, happily viewing images of the very plants and animals they could be finding in the woods, streams, and meadows they no longer visit."

David S. Wilcove is senior ecologist at Environmental Defense. Thomas Eisner is Schurman Professor of Chemical Ecology at Cornell University.

THE DEEP END

There has recently been some scuttlebutt [yes, it really is a word, and has some appropriate contexts for use - as here] about examining the biota of the basins which stud the Southern California Borderland like so many negative raisins in a positive fruitcake. Should some such activity be undertaken regionally, we might all be able to get a glimpse of a seldom seen fauna. There is a baseline of sorts provided by investigations of the Allan Hancock Foundation. Publications resulting from sampling in the basins in the 1950's (Hartman 1955, 1966; Hartman and Barnard 1958, 1960) provide evidence of a sparse, but interesting biota. Most samples were from nearshore basins, but limited sampling was also performed further offshore. A parallel study dealing with the fauna of submarine canyons is relevant to any basin effort, as many of the residents of the deeper portions of submarine canyons also frequent basin habitats (see Hartman 1963, Schultz 1966, Barnard 1966). Many portions of the Taxonomic Atlas of the Santa Maria Basin and Western Santa Barbara Channel also apply to the biota of the borderland basins.

Basins are actually fairly varied habitats and some, especially those far off-shore, have a partially endemic fauna. The near-shore basins have been most frequently and thoroughly investigated; after all, ship time is expensive. And not all research ships can function well in sampling of the basins. The main problem is depth. Carrying enough wire and large enough winches to handle it is not a task for a small craft. None of the monitoring vessels used along the coast has the capability of sampling the deepest basins, and benthic sampling in even the shallowest, stretches the capability of any. A regional program sampling in the basins would depend on availability of the larger vessels in the SIO, Navy, or NOAA research fleets.

There would be much to communicate in this portion of the Newsletter if regional monitoring did venture into deeper water. We would be considering taxonomic problems and solutions as yet unattempted among our members. Not that we are totally unfamiliar with the deeper fauna, it is just less familiar than that of the shelf. It is also considerably less dense and we should probably be looking to either a different benthic sampling strategy involving a biological sled, or a compound strategy of qualitative sampling with a sled, and quantitative sampling with a box core. Based on early sampling of the various basins the average density is only 39 individuals/m2, with a peak of 117/m2 recorded in the Santa Catalina Basin. Single samples in the West Cortes and San Nicolas Basins yielded only 12 macrofaunal organisms/m2 on a 1mm screen.(Hartman & Barnard 1958). A later expansion, which added half again as many samples (Hartman & Barnard 1960) yielded an average of 47/m2, still less than five animals per 0.1m2 Van Veen sample. Biosled samples cover many meters per tow and offer a better chance of getting both the rarer species, and sufficiently large samples to provide identifiable specimens (i.e. mature, complete, etc.). Use of a finer screen would also increase both the volume and diversity of the catch. I'll keep my fingers crossed.

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