

**S**OUTHERN  
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**A**SSOCIATION OF  
**M**ARINE  
**I**NVERTEBRATE  
**T**AIXONOMISTS



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Bucket of crabs - Unusually large catch of *Platymera gaudichaudii* trawled up by the CSDMWWD Lab off San Diego (Photo by Kelvin Barwick)

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The SCAMIT newsletter is not deemed to be a valid publication for formal taxonomic purposes.

### A NEW LOOK?

Beginning with this volume we have redesigned the look of the newsletter. First, we have gone to a bimonthly format. This was done to save printing costs and to facilitate the publication in a more timely fashion. As you can see, we are still working on the latter. Second, we have gone from two columns to one, at the request of many of the electronic members. It is much easier to copy and paste pertinent sections from PDF files in a one column format, whereas, the two column format made this problematic. Lastly, since the front page is printed in color for hard copy members we thought we would take advantage of it by making more space available for color images. The upcoming meeting box, therefore, has been moved to page two. We also added a table of contents. None of these changes are set in stone. We welcome any and all comments and suggestions.

*KELVIN BARWICK* - President

*MEGAN LILLY* - Secretary

#### Upcoming Meetings

**September 19** - Aphroditidae at CSD Lab with Ron Velarde (CSDMWWD)

**October 10** - Nemertea at CSD Lab with Megan Lilly & Dean Pasko (CSDMWWD)

**November 9** - Polyclad flatworms at Hyperion Lab with Tony Phillips (CLAMED)

**December 12** - No Meeting

**January 9** - TBA

**February 13** - TBA

**March 12** - TBA

### MINUTES – 9 MAY 2005

The second in our series of crustacean meetings for 2005 was held at the LACSD lab in Carson. Cheryl Brantley (LACSD) began the meeting by taking nominations for SCAMIT officers. The current cast of characters were all re-nominated and elections have since been completed with everyone staying in familiar roles.

After the business meeting Bill Furlong was introduced as a new Decapod taxonomist for LACSD. He will also be taking on some Polychaete families and will be one of the few taxonomists in SCAMIT who dabbles in both worms and arthropods. Don Cadien (LACSD) then circulated some new literature and provided a synopsis of several papers.

The taxonomic portion of the meeting started with a discussion of an issue raised during the QC reanalysis of the B'03 benthic data, the identification of the local species of *Neotrypaea*. It became apparent during the QC process that different labs were using different identification resources and reaching different identifications of the same animals. Jim Roney (LACEMD) distributed photocopies of the materials he was using to separate *Neotrypaea californiensis* and *Neotrypaea gigas*; treatments by Hart (1982) and Kozloff (1987). They emphasized different characters than those used by Cadien in the key provided with the SCAMIT handout on thalassinids (1992). In that key, eye characteristics (degree of emergence, shape of eyestalk) were preferentially used to avoid the chela and leg characters stressed in most keys. This has proven less accurate or interpretable in separating *N. californiensis* and *N. gigas* than characters provided by Hart.

The key in Kozloff (1987) uses chela characters for the separation, focusing on the relative width



ratios of the merus and carpus on the small cheliped, as well as the length proportions of those articles. It is still advisable to downplay these as standard identification criteria since so many of the specimens we see are very juvenile and lacking most or all limbs. In Hart's handbook (1982) she gives descriptions and illustrations of the animals not provided in the later treatment by Kozloff. Among the characters she describes and illustrates are several of the urosome and telson. These, like the ocular characters, have the advantage of being present on nearly every specimen examined and are therefore more useful in our monitoring work. During the meeting we examined specimens provided by Jim and additional material from the LACSD voucher collection. All proved to be *N. gigas* based on the telsonic characters outlined by Hart, although all the LACSD specimens had previously been identified as *N. californiensis* based on eye characters. The telson characters that proved to be the most useful in separating the two species were the following: in *N. gigas*, the setae along the margin of the telson did not continue onto the lateral sides but were restricted to the distal margin. *N. gigas* also had enlarged groupings of paired setae coming off of the last segment of the abdomen, overlapping the telson. This character was much reduced in *N. californiensis*. We agreed that the existing Cadien key needs to be modified to reflect these characters, or should not be used at all for *Neotrypaea*. Prior identifications of *Neotrypaea* using that key need to be reexamined, as it is likely that many, if not all, are incorrect.

The thickened ribs of the uropodal exopods, which are illustrated in Hart 1982 as single in *N. gigas* and paired in *N. californiensis*, seemed to be a variable character in the specimens we identified as *N. gigas* using other characters. Sometimes the rib appeared to be doubled, sometimes not. The ribbing, upon inspection, was actually muscle articulations with the cuticle from underneath and seem to be highly variable or influenced by preservation. Based on our examination of locally collected specimens we suggest this character not be used in separation of the two species in the SCB. The chela characters stressed in both of the keys mentioned also appeared reliable in specimens that had chelae retained, and were sufficiently adult. The rostrum could also potentially be a good character in adults. The smaller size limit was not determined for distinguishing between the two species and should be further discussed.

Dot Norris (CSF) mentioned her agency might have good voucher specimens of *N. californiensis* that could be used as comparisons against the *N. gigas* material here in southern California. We were all anxious to see real-life examples of the characters illustrated by Hart. However, once Dot returned and examined the voucher material there, she believed them all to actually be *N. gigas*. So we are still on the look out for a preserved specimen of *N. californiensis* that we can photograph.

Lisa Haney (LACSD) was able to photo document the key characters of Jim Roney's excellent specimens of *N. gigas*. The photos are posted on the SCAMIT webpage under taxonomic tools.

Characters useful in separating the two taxa which were nearly always present, and easily interpretable, are listed below:

Last abdominal segment with two clusters of setae terminally, and a second pair extending obliquely rearward from the sides of the segment near its end; telson with a pair of thickened ribs extending to posterior margin; marginal setae of telson restricted to posterior ..... *Neotrypaea gigas*

Last abdominal segment with a pair of terminal setal clusters, and without a pair of posteriolateral setal clusters; telson with a pair of thickened ribs extending less than 2/3 the length of the telson; marginal setae of telson present both posteriorly and laterally on distal 1/4 of telson..... *Neotrypaea californiensis*



We next revisited earlier discussions of the separation of *Pinnixa occidentalis* and *Pinnixa scamit* begun at the B'03 synoptic data review and continued at the December 2004 meeting. Bill Furlong had prepared a comparison of the two taxa that was distributed along with copies of the original descriptions of both species. The debate has continued unresolved: is *P. scamit* really separable from the *P. occidentalis* complex, or is it an ecophenotype occupying a different host than other complex members? Scott Harrison (SIO), our speaker at the February meeting, has not yet found a molecular difference between the two. He is, however, not satisfied that the analyzed sequences were from the appropriate genes in which to detect a recent divergence. His work in this area has continued and perhaps will eventually demonstrate or refute the viability of *P. scamit* as a genetically separate taxon. Our attempts to do so morphologically are also ongoing.

One of the difficulties with this case is that no adult male of *P. scamit* was available at the time of its description by Martin & Zmarzly (1994). The types of differences found between *P. scamit* and *P. occidentalis* and stressed by them also present themselves as possibly neotenic. Opinion remains divided among the participants as to the validity of *P. scamit* as a separate species. We did get a chance to examine what seems to be the male of the species from specimens that Jim Roney brought from LA City. They were a better size fit with the female holotype of *P. scamit* and had more slender legs. In addition they also had a unique gonopod structure. We submitted some of Jim's specimens to Scott Harrison for molecular analysis and await his results. All of the specimens we have been able to provide Scott in the past have been formalin preserved initially. This tends to shorten the recoverable DNA segment length, and restrict the value of the shortened sequences. Through a great deal of effort and time, Scott was finally able to develop a primer set that enabled him to evaluate San Diego and LA County specimens. The animals that LA County had been calling *P. scamit* were genetically identical to the vouchers of *P. occidentalis* submitted by San Diego. LA County will be changing their historical data to reflect this new information. Needless to say, it will be interesting to see what the DNA results will show from the LA City "*P. scamit*" specimens. There was some discussion that perhaps *P. scamit* does not range beyond the LA City monitoring area and may explain why LA County and the City of San Diego have yet to encounter it.

A few days before the meeting Bill Furlong had discovered in vouchered LACSD material several adult males originally identified as *P. occidentalis* that differed from the males described for that species by Zmarzly (1992). In particular, their chelae appeared to match those of females rather than males, although the narrow abdomen and presence of male gonopods defined the sex of the specimens otherwise. After further examination of the details of the gonopods during the meeting it appeared that the gonopod structure, (a relatively conservative character in pinnotherids), also differed from that of more typical male *P. occidentalis* specimens examined. Did we perhaps have the true male of *P. scamit*? Probably not. It is likely that our males represent yet another species in the *P. occidentalis* complex. What their females look like remains unknown, and the males are currently being viewed as *Pinnixa* sp.; no provisional has been created to house them. Bill Furlong (LACSD) will be working on developing a provisional and hopefully will have something to distribute in a few months. Examples of this animal were also given to Scott Harrison to see how the DNA sequences compare to known sequences of *P. occidentalis* and the potential *P. scamit* specimens collected by LA City.

We also hope to examine museum collections for a large enough lot of *P. occidentalis* that we can get a better idea of its morphological variability within a single collection site. More data on variation within that species will help us determine if *P. scamit* and *Pinnixa* sp are valid taxa or merely an ecophenotype of *P. occidentalis*. Thanks to Lisa Haney for her examination of *Pinnixa*



*occidentalis* and *P. scamit* specimens (including the types) in the Natural History Museum of Los Angeles County collections and examination of gonopods during the meeting, to Bill Furlong for preparing and presenting the summaries of *P. scamit* and *P. occidentalis* used during the meeting, to Scott Harrison for his continuing efforts to recover sequence data which should finally resolve the issue, and to Jim Roney for bringing those apparently *P. scamit* males for us all to examine. The saga continues...

Next topic dealt with a follow-up to the gnathiid isopod presentation made during the December 2004 meeting. Lisa Haney (LACSD) had spent time examining material in the collections of the Natural History Museum of Los Angeles County, and had borrowed material for further examination and photography at the LACSD Carson lab. She also borrowed material from the City of San Diego lab (thank you Tim Stebbins). She was able to photograph nearly all the species of *Gnathia* and *Caecognathia* known in the North Eastern Pacific, including the new *Gnathia* species from slope depths off Oregon documented in the December 2004 presentation. The goal of these examinations is ultimately to allow identification of all forms of these species, not just the males.

Lisa distributed a table of characters for all the male gnathiids from the NEP for review by the meeting participants. She then went through the table species by species, illustrating the species and characters with projected photos. The participants made many helpful comments, and wording on the table was modified in response. The resulting table will be distributed through the Newsletter, and placed on-line under the Taxonomic tools section of the website.

During her investigations at the museum and in the materials supplied by Tim Stebbins, Lisa was able to confidently associate several more species of male gnathiids with their females. Materials were not sufficient for several of the species, but females and males of *Caecognathia crenulatifrons*, *Caecognathia sanctaecrucis*, *Gnathia* sp. CS1, *Gnathia coronadoensis*, and *Gnathia productitridens* can now be associated by common characters. The females of *Gnathia clementensis*, *Gnathia steveni*, *Gnathia tridens* and *Gnathia trilobata* remain uncertain.

The meeting ended with a brief statement from Ron Velarde that he would be revising the Pandalidae key of California that Don Cadien originated in March 1998.

### OFF THE DEEP END... STILL

In several earlier notes I have discussed the north eastern Pacific benthic fauna from depths beyond the continental shelf. I have treated the continental slope as beginning at 200m, although the actual increase in angle that marks the transition from shelf to slope may occur much more subtly in some areas. The use of this somewhat arbitrary break point between shelf and slope is strictly for purposes of discussion and analysis. For many, if not most of the animals of the outer continental shelf, the upper slope is just part of their habitat and distribution.

Now that we have completed our sample processing of the deeper samples taken during Bight'03, both official (to 500m) and unofficial (to 1000m), we can add that information to earlier data. This includes the samples taken by CSDLAC (to 960m) off Palos Verdes, earlier samples taken by SCCWRP (Orange County Deep project and LAOMA project), by the BLM (deeper stations taken during the Baseline study of the Southern California Bight undertaken in 1976-1979), samples from Eric Vetter (to 500m) taken in his investigations of submarine canyons, samples taken under Navy contract in the Tanner Basin (depths over 1100m) by MEC, and samples taken by the Allan Hancock Foundation from the canyons and nearshore basins throughout southern



California (to 1600m or more).

In addition to this sizeable body of sampling data from the Southern California Bight, data is also available from depths to about 1000m from the MMS Santa Maria Basin study (summarized in the Taxonomic Atlas series), from the Navy Gulf of the Farallones deep water dump site investigations (to over 3000m), from various samples taken by MBARI to depths of 4000m or so in the Monterey area, and to a series of investigations by Oregon State University with trawls, dredges, epibenthic sleds, and grab samplers off the Columbia River and Newport Oregon to depths of over 4000m. Information is now accumulating from the vent investigations on-going in the eastern Pacific (such as that led by Dr. Janet Voight this last winter in which Cheryl Brantley, Todd Haney, and Jody Martin participated). Most sites visited are in the 2000-3000m range, and more cruises will be forthcoming in the future. Lastly there is the data from Station M, and other sites in the deeper portion of the central North Pacific far from the western coast of North America at depths of 4000-6000m monitored in ongoing investigations of biological processes in these largely uninvestigated areas.

These data are not always easily accessible for use in a combined analysis of bathyal and abyssal communities in the NEP, but the studies generating them have begun to uncover the diversity of organisms that inhabit these depths. Many species are undescribed and have been given provisional designations by the taxonomists working on the individual collections. These are, unfortunately, not in any way standardized and/or comparable. No SCAMIT-like activity has yet been undertaken with animals from these deeper portions of the continental margin and adjacent abyssal plain.

This has not been a problem for those involved strictly in investigations of nearshore processes and communities, as most SCAMIT participating agencies are. As our interests shift to more research and less end-of-pipe monitoring iteration under the new generation of NPDES discharge permits, our attention may increasingly be focused on the inevitable movement of discharged materials downslope into the bathyal zone. We need to prepare for this by becoming more familiar with what we will encounter there. Many of the players will be familiar as distributions of many animals common at shelf depths extend onto the upper portions of the Continental Slope. Further down, at the depths of the near-shore basins and much of the submarine canyon complex, these animals are joined by an increasing number of taxa that do not occur at shelf depths.

As a non-polychaete person I am unable to provide much information on the taxa that will be encountered in the NEP at bathyal and abyssal depths. I appeal to any readers better versed in these animals to take up the gauntlet and begin to gather or to divulge information already developed on the nature of the bathyal and abyssal polychaete fauna. I can provide information on other groups, particularly the peracarid arthropods and the mollusks, to help others begin the process of preparing for future encounters with members of those groups. I distributed a list of echinoderms reported at bathyal depths in the SCB at an earlier SCAMIT meeting in preparation for trawls and grabs during B'03. I will be updating this with information from outside the SCB but within the NEP and at both deeper bathyal and abyssal depths.

I have draft lists of taxa from bathyal and abyssal depths in the NEP (and their reported or observed bathymetric range) for the Amphipoda, Isopoda, Tanaidacea, and Cumacea, that continue to change as new information is acquired. These lists are available to interested parties (contact me at [dcadien@lacsds.org](mailto:dcadien@lacsds.org)). I am still identifying material sorted from epibenthic sled samples at depths between 732 and 2830m off Oregon, and new taxa continue to be added from



this process. I would also welcome information from any readers that have identified other materials from these depths.

There is currently no central repository for such information. Some “deep” species occurrences are listed in Austin (1982), but particulars of geographic and bathymetric distribution are not. Considerable information on occurrence and distribution of bathyal and abyssal animals is included in volumes on investigations off the Columbia River (Pruter & Alverson 1972) and around the Gorda Ridge (McMurray 1990). The comprehensive mollusk list published by AFS (Turgeon et al 1998) specifically excludes species which occur only at depths greater than 200m. The soon-to-be-released peracarid volume in the series, and the existing decapod (Williams et al 1989) and cnidarian (Cairns et al 1991) volumes also exclude bathyal and abyssal species.

Individual phyla and/or classes may have been covered for the NEP in recent publications. Bivalve mollusks have been monographically reviewed by Coan, Valentich Scott & Bernard 2000, and their coverage extends to abyssal depths throughout the NEP. No such resource exists for other mollusk groups.

Maluf (1988) presents the geographic and bathymetric distributions of NEP echinoderms including those of the bathyal and abyssal zones. Extensive lists of echinoderm occurrences are available from a series of articles by Oregon researchers (Alton 1972; Astrahantseff & Alton 1965; Carey 1990; Carney & Carey 1976, 1982; McCauley 1972; McCauley & Carey 1967).

Information on arthropods is much more scattered, as is that on annelids. For smaller less speciose groups the problem is worse, with often only species level taxonomic papers available on the deep NEP fauna.

These deficiencies will only be remedied by our own actions. Readers with expertise in particular groups are encouraged to prepare lists with the same coverage (NEP – Mexico to Alaska, 200-6000m) and share them with the rest of us. Please include provisional species (with provisional author attribution and year of creation) along with the species name, and the known bathymetric distribution. Contributors to grey literature reports on samples from appropriate depths in the NEP are encouraged to contact Don Cadien with information on grey-literature records, reports (and their availability), and specimens.

*DON CADIEEN* - CSDLAC

## NEW LITERATURE

We start off with an overview of large scale systematics issues in an opinion piece written for a conference (Schram 2004). Fred Schram comments on such things as funding for systematic research, major changes in the basic approach to how systematics should be conducted, emerging methodological changes, etc. He concludes with a stimulating discussion of the very nature of systematics as a discipline, and the changing direction he sees it following. It won't help you identify your sample, but it might help you think about why and how you are doing it.

While molecular systematics is advancing continually, with major work concentrated in that area, morphology based systematics is far from dead. Larsen (1999) provides a revision to a genus of tanaids which is not yet known to occur locally, *Agathotanaid*. Knowledge of the local fauna is, however, far from perfect – especially on the outer portions of the continental shelf, and we may yet find that this genus is local. Species are already known from slope depths in the Pacific off Central America, and from the Northwest Pacific. Eight species are known world-wide, of which



three are newly described here. The genus is in the problematic family Anarthruridae, which is currently under revision, with many genera traditionally assigned to it viewed as *incertae sedis*. Since publication of Larsen 1999, the family Agathotanaidae has been revived (see for instance Anderson, Heard, & Larsen. 2005. Supraspecific Tanaidacean Taxa at <http://tidepool.st.usm.edu/tanaids/tanaidtaxa.html>) and the genus included in it. These animals look like, well.... tanaids. As usual, the devil, and the species and generic separatory criteria, are in the details. Larsen provides a key to the known species as well as detailed morphological descriptions of the new taxa.

Moving to more advanced, and probably more tasty, crustaceans we have another generic level review by Komai & Kim (2004) of the shrimp genus *Paracrangon*. They also erect another species in the genus. We do have a local representative, *Paracrangon echinata* Dana 1851, which the authors carefully redescribe based on Japanese material (the type is from Puget Sound). A key to the genus is also provided here.

Wetzer (2001) did a fascinating analysis of the relative utility of differing regions of three different genes within the mitochondrial genome 12S and 18S rDNA, and CO1 (cytochrome oxidase 1). This was the first time such heirarchical utility testing was applied in an attempt to determine which sequences were likeliest to be appropriate for testing phlogenetic hypotheses at ordinal or lower levels. She applied the results in a second paper (2002) to examine the hypothesis that phreotocid isopods were correctly identified as the most primitive group within the order as proposed by several earlier workers. Here, carefully vetted molecular data confirmed the basal position of the phreotocians, rejecting previous hypotheses that either asellotes or gnathiids had a right to that position.

Questions of even wider impact continue to be asked. Simonetta (2004), for instance, asks if traditional arthropod classes are natural, or if revision is needed. He bases his analysis on both recent and fossil morphological data. The cambrian fossil "arthropods" form one impetus for this question, and Simonetta addresses them in no little detail. He also provides examples of misconstrued homoplasy, contending that it is much more common than usually realized in this group. While portraying this discussion as only an introductory consideration of the overall theme, he does provide what he sees as a working hypothesis of phylogenetic relationships within the arthropods at the end of the paper.

Along similar lines Schram and Koenemann (2004) consider evidence from body regionation and its bearing on arthropod evolution. Although this has previously been done using strictly morphological data, the authors here add recent advancements in genetics, specifically in hox genes. While much of the evidence, and the discussion, is relatively esoteric, it leads the authors to address some interesting issues. They consider for instance, the monophyly of the Crustacea, and comment interestingly based on the perspective of their analysis.

Amongst the arthropods (a subject still in debate) the sea-spiders have always been an odd and contentious group. Bain and Govedich (2004a) comment on the reproductive behaviour of one species, *Propallene saengeri*, then proceed to a broader view of the same subject throughout the class (2004b). Sexual roles in sea-spiders are different than in peracarid crustaceans, with the males carrying the eggs through hatching of the juveniles. Females of *Propallene saengeri* are reported here to be active in mate selection, to fight over mutually desired partners, and to engage in infanticide of juveniles. Interesting enough for TV, so keep your eyes open for a nature documentary on sea-spiders in the future: interesting sexual detail can only lead to media





photodocumentation! The review and survey of published and unpublished data on the subject (2004b) suggests this is not an isolated pattern. A good read on an interesting subject.

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Please visit the SCAMIT Website at: [www.scamit.org](http://www.scamit.org)

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