SOUTHERN
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Munida tenella Benedict 1902
B'13 station 9073, 7 August 2013, 182 m
Photo by N. Haring, CSD

This Issue

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SCAMIT OFFICER NEWS

Two new officers take the helm with this newsletter, Laura Terriquez takes over as Treasurer for Cheryl Brantley, and Dean Pasko takes over as Secretary for Megan Lilly. SCAMIT would like to extend its gratitude to Cheryl and Megan who have served SCAMIT well for the past 11 and 15 years, respectfully. We appreciate the time and dedication of the many volunteer hours spent by these two long time and faithful SCAMIT members.

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.

13 MAY 2013, MOLLUSCA, OCSD, KELVIN BARWICK

Attendees: Larry Lovell, Bill Power, Terra Petri, Don Cadien (LACSD); Kelvin Barwick, Danny Tang, Michael Vendrassco (OCSD); Dot Norris (City of San Francisco); Dean Pasko (Private Consultant); Wendy Enright, Ron Velarde (City San Diego); Angela Eagleston (EcoAnalysts); Craig Campbell, Greg Lyon (CLAEMD); Sarah Briley, Kim Walker (CSU Fullerton, Zacherl lab), Emilia Gonzalez (Mexico, visiting NHMLAC).

BUSINESS:

The last of the Bight'13 preparatory meetings will be June 15, and cover Arthropoda. Dean Pasko will lead the meeting.

The SCAMIT Picnic was held July 27, 2013 from 10 am – Sunset at Doheny State Beach Park. Those who attended enjoyed hot dogs, hamburgers, good snacks, good company and good conversation.

The SCAMIT Species List Committee met recently and is working on revisions for Ed 8. They are requesting that all members provide suggestions for corrections to the current list or new species to be added very soon. Comments may be sent to Don Cadien or Larry Lovell, or posted directly to the general list server (general_topics@discussion.list.scamit.org).

A meeting of interest to members is the all American Malacological Conference which will be held in Mexico City, June 23-27, 2014. Paul Valentich-Scott of SBMNH is organizing it and will include most of the major Molluscan scientific organizations in the Western Hemisphere.

SCAMIT's SCAS symposium at the May meetings was very successful, and included talks from members of our sister organizations SAFIT (Southwestern Association of Freshwater Invertebrate Taxonomists) and SCAITE (Southern California Association of Ichthyological Taxonomists and Ecologists). The talks included presentations of data as well as how SCAMIT works. There was a request that SCAMIT participate again next year.

It is membership time again and the New Membership form will be available on the SCAMIT website. Please note the new mailing address as C/O Laura Terriquez, P.O. Box 50162, Long Beach, CA. 90815. U.S.A.

SCAMIT Leadership: SCAMIT hosted the Second contractual EPA CBRAT workshop at SCCWRP May 15-18. Expert panels provided information on distributions, abundance, and ecology of species of economic value. Specifically they addressed issues of global warming, sea-level rise, changes in CO2 concentrations, etc.

The SCAMIT Newsletter was discussed. There were requests that the Newsletter include Date of Publication in header, and be published bi-monthly. In addition, as a result of the Southern California Regional Monitoring Program requirement that participating taxonomists participate in SCAMIT, a list of attendees will be included in upcoming Newsletters, as it has in the past.

Norma Emilia González, a doctoral student, from El Colegio de la Frontera Sur Chetumal, Quintana Roo Mexico then spoke about her research on eulimd gastropods that live on echinoderms. All eulimids are non-obligate parasites, endo- and ecto-parasites. However, of the 850 species and 90 genera of eulimds known, only 33 species and 15 genera have a known association with echinoderms. In other words, there is a lot of work yet-to-be done on eulmid ecology and taxonomy. For example, two different species can inhabit different parts of the same sea star (arm and internal part of disc) and in some cases, the male lives on the female as a tiny parasite.

Norma summarized the knowledge of some of these relationships. There are16 species of crinoid hosts that house nine genera of eulimds; 50 species of echinoids host 14 different eulimid genera; 25 species of asteroids accommodate eight different eulimid genera; and six species of ophiuroids host seven different eulimid genera.

When visiting museums, Norma realized that most eulimid species were difficult to identify on shell morphology alone. She hopes to use this trip to different museums in Southern California to develop a key. So far she has found it difficult to distinguishing genera, though there are many species described that are fairly distinguishable.

Some tidbits gleaned from the general discussion include that the apex and aperture of the shell can be useful because they are determined, in part, by the parasite nature of the species life-style. However, she also relies on internal characters, the radula and sex organs, as well as scars of inner whorl of the shell. Additionally, mantle color is not practical for distinguishing species, but can be used to distinguish certain genera, e.g., *Eulima* and *Melanella*

Kelvin Barwick, of the Orange County Sanitation District, then reviewed selected Mollusk Literature.

- Allcock et al (2011). Discussion of higher-level Cephalopod phylogeny, and generally good support for existing structure. For the first time it established support for monophyly of Teuthoidea. Analysis did not include any local species.
- Baez, et al (2011). Taxonomy and phylogeny of *Armina* spp.(Nudibranchia) via morphological methods, including some local species and using radula structure. Includes undescribed species
- McLean, J.H. (2011). Re-erected Subfamily Hemitominae (Fissurellidae) with descriptions of new genera based on shell and radula morphology. None of the local fauna are discussed. Differs from earlier workers using DNA.
- Bieler, R and R.E. Petit (2011). Catalogue of recent fossil Caenogastropoda “worm snails” covering Vermetidae, Siliquariidae, Turritellidae. Paper does cover some taxa found in the SCB, but mostly from hard bottom collections. No change to SCAMIT nomenclature.
- Brandt, A et al (2009). Discusses the bathymetric distribution of southern ocean species of Bivalvia, Gastropoda, Isopoda, Polychaeta, by depth and number of taxa, and provides depth distributions by class and family.

- Benaim, N P, D.C. Paone Viegas, et al (2011). Review of the features of the hinge plate of *Yoldiella* spp vs shell morphology using several taxa from Brazil, including *Y. aff. jeffreysi* and sp 1 and sp 2. They were able to obtain about 75% species discrimination based on general shell morphology, while the use of hinge morphology achieved over 85% reliable distinction among taxa.
- Haga, T, and T. Kase (2013). Reviewed and confirmed the presence of dwarf males in deep sea wood borers (Bivalvia: Pholadoidea: *Xylophaga*) relative to life history and distribution, and found an increased prevalence of dwarf males in deeper water taxa. They were previously thought to be juvenile brood.
- Paalvast, Peter and Gerard van der Velde (2013). Reviewed the main food source of shipworms (*Teredo navalis*); suggesting that the main form of feeding is filter feeding, not the ship's wood.
- Oliver, P.G. and J. Lotzen (2011). Describes a new fluid feeding bivalve of Galeommatoidea, to which they assigned the appropriate name *Draculamya porobranchiata.*
- Oliver, P.G. and J.D. Taylor (2012). Bacterial symbiosis in Nucinellidae (Bivalvia: Solemyida) is confirmed and includes a description of two new species. Includes a nice illustration of shell morphology for the newcomer to gastropod taxonomy, and differentiation between *Nucinella* and *Huxleyia.*
- Cyrus, A.Z et al (2012). Sensory ecology of swash-zone living predatory Olivoidea, *Agaronia propatula*, including discussion of predation response and interesting photos and discussion of predation on larger organisms. They rely heavily on physical encounters with prey items consuming anything they bump into. They take advantage of the swash zone to cover large areas.
- Harbo, R. et al. (2012). The feeding of *Evalea tenuisculpta (Odostomia)* on the feeding siphons of *Tresus capax.*

Problem Taxa. After lunch we discussed some of the difficult species that might create problems during Bight'13.

Tellina: *Tellina* sp B vs *T. cadieni*. The problem is that *Tellina* sp B is without voucher sheet documentation. OCSD, as well as the other monitoring agencies, call all offshore individuals *Tellina* sp B; and all bay species *T. cadieni*. The question remains should we use location (offshore vs bay) to discriminate the two for Bight'13? Paul Scott, SBNHM, did not see a difference when Ron Velarde took specimens of the two taxa from the City of San Diego. One problem is that the description of *T. cadieni* is not very detailed. The other problems lie within the history of the usage and documentation within SCAMIT. The original voucher sheet for *T. carpenteri* is actually *Tellina* sp B; whereas the original voucher sheet for *Tellina* sp A (1995) turned out to be *T. carpenteri*. This issue is discussed in the last paragraph of the Comments section (page 2) of the *Tellina* sp A voucher sheet, which states that *Tellina* sp A (1995) became *T. carpenteri*, the "rose pink" specimen from the offshore becoming the undocumented *Tellina* sp B, but does not distinguish *T. cadieni*, a bay form described by Scott (2000).

The group reviewed pictures of *T. cadieni* fide T. Phillips SMB Station FB15, 7/18/12, which everyone determined to be *Tellina* sp B. The group then compared Phillip's picture to Scott's plate of *T. cadieni* but that provided little resolution of the problem. After much discussion, everyone decided that absent a review of *Tellina* sp B and creation of a voucher sheet, offshore specimens should be referred to *Tellina* sp B and specimens from true bays and harbors should be referred to

Tellina cadieni. The noted exception being Santa Monica Bay, which is generally considered open coast.

Pyramadellids were next on the hit list, particularly *Turbonilla* sp SD1 vs. described species *Turbonilla santarosana.* See SCAMIT NL Volume 29, No. 3&4. Discussion about whether or not they one in the same, and what is the correct name to be used ensued. Generally the usage among the agencies is *Turbonilla* sp; however, two primary people are using the described names, including Tony Phillips and Carol Paquette, both of which were absent from the day's meeting. Notes describing the history of these problematic taxa can be found in SCAMIT NL Vol. 29, No 3&4. There was some discussion of leaving these identifications at the generic level (e.g., *Turbonilla* sp and *Odostomia* sp) since both are ectoparasites that do not have direct ecological implications for Bight benthic work. In the end, the group decided to allow each lab and taxonomist to proceed with usage of the taxa listed on SCAMIT Ed 8 as capable, as long as everyone remains committed to using the list-server to ensure that all other Bight molluscan taxonomists are informed if any new taxa are "found" in samples.

Cadulus and *Lirobittium* were discussed briefly and everyone was reminded to check the prior meeting minutes during which characteristics to distinguish *L. attenuatum* and *L. purpureum* were outlined. Kelvin volunteered to create voucher sheets for these (*Lirobittium* and *Cadulus*) ahead of the formal publication of the minutes for the meeting.

For eulimids, everyone is directed to the SCAMIT Tools and the eulimid voucher sheet tables and plates. Plate 1 shows confirmed *Melanella rosa.* Plate 2 shows confirmed *Polygireulima rutila.* Plate 3 illustrates *Vitrolina columbiana* and *Vitreolina macra,* **however** *Vitreolina yod* is represented by juveniles which were considered too small to be placed in a particular species. Norma confirmed this latter determination based on her knowledge of the true size of *V. yod* and the few whorls represented by the Plate 3 picture. We also reviewed the original illustration of *V. yod* which showed some differences between the original and Kelvin's photos. Among the other voucher sheets available, Figure 1 showing *Balcis* sp A was confirmed, as were *Balcis* sp SD1 and *Balcis* sp SD2.

Kelvin then helped Sarah and Kim with specific specimens that they had brought to the meeting for resolution. The meeting ended at approximately 3:00 PM.

6 JUNE 2013, POLYCHAETA, NHMLAC, SERGIO SALAZAR-VALLEJO AND LUIS CARRERA-PARRA

Attendees: Larry Lovell, Cheryl Brantley (LACSD); Kelvin Barwick, Ernest Ruckman (OCSD); Kathy Langan, Ricardo Martinez-Lara, Veronica Rodriguez-Villanueva (City San Diego); Chip Barrett (EcoAnalysts); Leslie Harris (NHMLAC); Luis Carrera-Parra, Sergio Salazar-Vallejo (ECOSUR).

Dr. Sergio Salazar-Vallejo, who works at ECOSUR in Mexico, began the polychaete review with a presentation entitled: *Sternaspids: "Wide distribution or widespread confusion?"* The presentation is based on Sergio's recent publication with Kelly Sendall (Sendall and Salazar-Vallejo, 2013), which discusses the question of whether there's a single species of *Sternaspis* with worldwide distribution or multiple species.

Sergio began with a discussion on the history of sternaspids. The first recorded mention of a sternaspid was by Janus Plancus who thought it was a sea cucumber (Plancus, 1760). Ranzani

(1817) described *Sternaspisscutata* in the genus *Thalassema*. A few years later Otto (1821) established the genus *Sternaspis*. There was initially some confusion regarding the anterior and posterior ends; the shield is located on the posterior end. The current conundrum is whether or not Otto's 1821 description of *Sternaspis thalassemoides* represents a single cosmopolitan species or one genus encompassing about 15 species.

Sergio discussed shield morphology. The shield is a fan-shaped structure in the central posterior area that can be projected or truncate. The anterior, depressed margin of the shield is 3-dimensional which makes it difficult to illustrate the morphology in two dimensions. Careful brushing of sediment from the shield is necessary for examination and identification. Change in shield shape with growth can be a confounding issue. Sergio used analogies with variability in leaf shape in trees and shell shape in bivalves to explain this. Sternapsids employ phragmosis (the use of a body part to protect the opening to a burrow: many spiders and ants of the genus *Cephalotes* employ this strategy) to protect their tubes, using the anal shield.

In sternaspids, the branchiae filaments are associated with the anal shield; consequently, the orientation of the animal must be posterior end up to keep the branchiae near the sediment/ water interface. Because of this feature, the anal shield has developed specific characteristics and has taxonomic value. In Sendall and Salazar-Vallejo (2013) three genera are established based on characteristics of the ventro-caudal shield, the introvert hooks, and number of abdominal segments.

- *Caulleryaspis* - this genus has a very soft shield with sediment embedded in it.
- *Petersenaspis* - this genus has 8 abdominal segments anterior to the shield.
- *Sternaspis* - this genus has 7 abdominal segments anterior to the shield.

Sergio showed an image with a growth series of eight specimens from the same sample. The shield is not well developed in juveniles. Chaetae along the margin start as 1 per bundle, but then additional chaetae are added to bundles as the animal grows. In addition, concentric lines develop with growth of the shield, then characteristics of the shield margin and striations.

Various types of chaetae were shown. The shape of the distal portion of the anterior hooks may be an important diagnostic character, but wear confounds the issue. Chaetae in the posterior region are thin, and of less taxonomic value.

Sergio also mentioned that the mouth papillae have patterns. Some are circular or U-shaped. In contrast, the genital papillae are not well known or defined.

Locally we get *Sternaspis affinis* in shallower water, down to about 350 m. There is new species of *Caulleryaspis* in deeper water (350^+ m), then another species in much deeper water (2500–4000 m). There are possibly other species in shallow bays or intertidal mudflats not yet known. A question was asked about the composition of the shield. Sergio explained that it is not true chitin (modified polysaccharide). Rather, it is sclerotized tissue. The animal utilizes iron compounds to give stiffness and a reddish color to the shield.

Chip Barnett brought some specimens of Eastern Mediterranean sternaspids for examination. There were two vials of *Sternaspis scutata*. One contained juveniles with reddish, comma-shaped eyespots. He also brought two specimens of *Caulleryaspis* in another vial. All of Chip's material was examined.

Sergio will provide a pdf of his presentation for SCAMIT to post on the website.

Dr. Luis Carrera-Parra, who also works at ECOSUR in Mexico, next led a discussion on Lumbrineridae. Luis began with some cautionary notes on the identification of fragments and juvenile lumbrinerid specimens. Small, complete lumbrinerids should have at least 45 segments present in order to confidently identify them. He does not identify anterior fragments to species level. In situations where a taxonomist is very familiar with a particular area and the regional fauna it may be OK to identify anterior fragments. Ideally, it's best to have about 100 segments to observe full development of the posterior lobes.

The distribution of chaetae is important. Chaetae can change along the length of the animal. In the anterior of the worm, hoods are approximately the same size whereas in the posterior of the worm, the size of the hoods can vary by a factor of 2. The chaetiger where the dorsal chaetae end is also a significant character. The length to width ratio of the blades of composite hooks is important. A long chaeta is one where the length is about 11 times the width.

Scoletoma can be problematic and Luis recommends caution in identifying species in this genus.

Although aciculae "color" – some taxonomists use yellow and black and others use the terms light and dark – is often used in conjunction with other characters for species identification, some species' aciculae change color along the length of the body. Luis recommends looking at parapodia from three different regions of the body (e.g., anterior, median, and posterior).

We then examined specimens of *Abyssoninoe* that Chip brought from deep-water samples off the Eastern Mediterranean. These specimens had long blades with limbate hooks.

Little work has been done on lumbrinerid growth patterns. Larval development is poorly documented. In some species it occurs within a jelly mass. Small specimens (less than 30 – 40 segments) will not have composite chaetae. Luis does not like to use simple chaetae as a taxonomic character because they show a high degree of variability. He has noticed that they can have a long hood, short hood, or both long and short hoods within a fascicle.

Leslie mentioned that she has recently found the Caribbean species *Lumbrineris perkinsi* in San Diego harbor in fouling habitats.

There was some discussion about the need to check hooks and jaws to confidently distinguish between *Lumbrineris* sp E and *L. latreilli.*

There was also a brief discussion of a new Terebelliformia paper elevating several subfamilies to family status (Nogueira et al. 2013). Polycirrinae is not well supported according to Kirk. The group recommended that we wait before making this change to the SCAMIT species list.

10 JUNE, ARTHROPODS, CSD, DR. TIM STEBBINS AND DEAN PASKO

Attendees: Larry Lovell, Don Cadien and Chase McDonald (LACSD); Ken Sakamoto and Danny Tang (OCSD); Ross Duggan (City and County of San Francisco); Tim Stebbins, Ron Velarde, Katie Beauchamp and Andy Davenport (City of San Diego); Matt Hill (EcoAnalysts); Craig Campbell and Greg Lyon (CLAEMD); Tony Phillips and Dean Pasko (Private Consultants).

BUSINESS:
We discussed upcoming meetings, most of which are available on the SCAMIT web-site (www.scamit.org). However, a special meeting was announced, Dr. Buz Wilson of the Australian Museum will hold an asellote isopod workshop on Monday, September 30th at the City of San Diego Marine Biology Laboratory.

On October 7th, SCAMIT's sister group for fishes, the Southern California Association of Icthyological Taxonomists and Ecologists (SCAITE), will be holding a Trawled Fish FID (specimens for further identification) review meeting at the SCCWRP Laboratory. Plans for a separate meeting for invertebrate taxa is in the works. Please send a list of potential FIDs to Larry (llovell@lacsd.org) or Don (dcadien@lacsd.org).

Finally, on November 8th, Dr. Pam Neubert and Don Cadien will host an Aplacophoran workshop at the City of San Diego laboratory.

Job openings were also announced at the City of Los Angeles (Water Biologist position) and the Orange County Sanitation District (Senior Environmental Specialist). Please see the SCAMIT web site for additional information.

It is membership time again and the New Membership form will be available on the SCAMIT website. Please note the new mailing address as C/O Laura Terriquez, PO Box 50162, Long Beach, CA 90815. USA.

Dr. Tim Stebbins presented "Review of the Southern California Mysids." Tim recently started tackling the mysids when he ran into problems trying to identify specimens collected by the City of San Diego's benthic monitoring program. Briefly, he found himself using mostly "poor quality" copies (2nd, 3rd, 4th... generation) of specimen identification sheets that left some details inadequate for confident identifications. Many of these species' old ID sheets are available in the SCAMIT Taxonomic Toolbox. Consequently, he started gathering and compiling the necessary literature and information in order to produce new clean copies of these identification guides.

Tim also noted that although several keys or draft keys exist covering southern California species, none are current or complete. For example, Tim himself prepared a "Key to the Common Mysids off Point Loma" in 1991, but which included only 11 species. A more comprehensive draft "Key to the Mysid Species Reported from California" covering about 31 species was created by Ron Velarde and others in early 1992 following Ron's Mysid workshop (see SCAMIT NL Vol. 10, No. 9). Copies of both Tim's and Ron's keys are also available in the SCAMIT Toolbox (i.e., under Order Mysida, Family Mysidae, Other Useful Tools). Several other published keys are also available that SCAMIT members may find useful, including those by Daly & Holmquist (1986: Pacific Northwest mysids), Gerken et al. (1997: Santa Maria Basin mysids), and Modlin (2007: Central California to Oregon mysids).

Tim distributed a species listing and updated comprehensive list of mysid literature, along with a table of introduced species. Although he intended to create a new key, this effort did not get beyond the concept prior to the meeting. Instead, Tim presented a new set of figure pages for most species that he intends to make available to the SCAMIT membership.

The presentation began with an introduction to the mysids and overview of their primary characteristics. His preliminary list included 35 species representing 28 genera, 8 subfamilies, and 2 families in the Southern California Bight (SCB), although some of these may eventually be excluded as being non-marine. This was followed by drafts of the various new mysid figure pages. The presentation was in draft form and not for general distribution, so Tim did not provide an electronic copy for posting at this time.

Don Cadien then reviewed the Tanaidacea literature. Most of the literature was not pertinent to SCB taxonomic issues, although he cited one very interesting publication on tanaid diversity and radiation within the world's oceans (Blazewicz-Paszkowycz, et al, 2012).

Absent other relevant issues, the session quickly deteriorated to a discussion of *Leptochelia* and the issue of *L. dubia* complex. Adding to this discussion (and confusion) are several publications by Bamber. Bamber and Costa (2009) describes *L. caldera* and revisits the confusion over *L. savignyi*. Bamber (2010) re-describes *L. savignyi* from topotype material and Bamber et al (2009) describes *L tanykeraia*, a species very similar to *L. dubia* in number and relative length of the uropodal articles. In addition, Edgar (2012) discusses the difficulty of *Leptochelia* identification as a result of ontological variability.

Don Cadien then initiated a discussion of the preliminary phylogenetic results from 12 California *L. dubia* samples analyzed with *Leptochelia* Genbank sequences from the Western Atlantic and West Africa. Katie Beauchamp, Don Cadien, Ross Duggan, and Erik Pilgrim are working on a project using a combination of molecular techniques and traditional taxonomic procedures to explore the systematic relationships of species in the genus *Leptochelia* and related taxa. Katie provided a brief summary of phylogenetic results from Tanaidomorpha taxa sequenced thus far using the mitochondrial COI gene (mt COI). These results included 12 specimens sequenced from the Southern California Bight. When compared with Genbank sequences from the Atlantic Ocean, 11 of the California *L. dubia* specimens grouped together with strong statistical support. However, one OCSD *L. dubia* specimen (Specimen #599, collected for the SCCWRP barcoding project) was outside the California clade and linked more closely with *Hargeria rapax*, and *L. dubia* from Florida. Additional mt COI and nuclear gene sequences from morphologically identified *Leptochelia* species and other taxa in the family Leptocheliidae should help clarify these preliminary findings.

Dean noted that he had also been looking into this issue, particularly focusing on the *L. dubia* – *L. savignyi* question. Dean has seen *L. savignyi* reported from northern California, specifically in Humboldt Bay. Looking at the literature, the two notable differences between the two taxa were that *L. savignyi* is reported to have a uropod with 6 articles on the ramus (excluding basis) versus *L. dubia*, which only has 5. Additionally, *L. savignyi* is reported to have 4 strong setae on the maxilliped basis, whereas *L. dubia* has 5. He confirmed the characters of *L. dubia* from several specimens from the OCSD monitoring program. [However, in subsequently looking at a larger population of specimens, Dean found quite a bit of variability in number of setae on the maxilliped basis, but a very consistent number of articles (5) on the uropod.]

Discussion then moved on to *Araphura* sp SD1. This provisional species found in the shallow waters at the head of La Jolla Canyon is very much like *A. brevaria*. It differs from *A. brevaria* in the presence of a line of granules on the ventral margin of the propodus of the chela. Ron mentioned trying to find (or create) a voucher sheet for the species.

Dean also cautioned everyone about the problems or confusion that he has experienced with members of the genus *Zeuxo* and *Synaptotanais*. He has had difficulty applying the characters used by Sieg and Winn (1981) to distinguish the genera. The issue came to a head in the Bight 2008 work. Fortunately, a true *Synaptotanais notabilis* was collected from a station in the Channel Islands (B'08 Station 7553) that confirmed the differences in the length of the uropod articles between *Zeuxo* and *Synaptotanais*; however, there was never equally clear resolution of *Zeuxo* spp. Don mentioned that he has recorded *Z. paranormani* almost exclusively. Dean agreed, but has also used *Z. normani*, and recently reported *Z. coralensis* from stations near the Sweetwater River in San Diego Bay, the latter having only 3 articles on the uropodal endopod. Don suggested that Dean contact Peter Slattery to discuss *Zeuxo*.

Somehow an isopod entered this conversation. The topic of *Boreosignum* sp A came up and Dean and Tony discussed the OCSD specimen that was a *Boreosignum* sp A look alike. They noted differences in the presence (or absence) of setae along the pleotelson margin, but couldn't remember if there were other differences. Notes on this were left at the OCSD laboratory upon Dean's retirement, and Ken Sakamoto volunteered to look for them.

Tony Phillips conducted the Cumacea literature review. Tony cautioned everyone to be careful when using the SCAMIT taxonomic tool box for information on Cumacea. There are several old voucher sheets listed with the old names, and some incorrectly listed. When looking at the tool box and specifically *Cumella* sp B (now *Cumella morion*), what is listed as *Cumella* sp B male is actually *Cumella* sp E Phillips 1995 male. He noted that Don's information on families and the included keys are very helpful. Of the many publications dealing with cumaceans, Tony mentioned the following as of potential interest to the group.

- Akiyama and Gerken (2012) deals with the Pseudocumatidae group, particularly *Petalosarsia*, noting the SCAMIT provisional *Petalosarsia* sp A Diener 1982.
- Alberico and Roccatagliata (2013) deals with the genus *Diastylis* and contains an excellent comments section at the conclusion of the paper.
- Gerken and Watling (1998) also provide a valuable review of *Diastylis* spp.
- Shalla (2011) Identification guide to the British Cumacea is an excellent overview of the cumaceans. It includes wonderful illustrations and explanations of morphological character states and useful keys to families and genera.
- Donath-Hernandez (2011) has two publications dealing with cumaceans from Baja California, Mexico.
- Pilar Haye (2007) is an excellent review of the systematics of Bodotriidae.

Dean Pasko then conducted the remainder of the review meeting. We began with a quick discussion of other pertinent literature.

- Takeuchi, I. and A. Oyamada (2012). Revisit the descriptions of *Caprella californica* Stimpson, 1857 with material from California, particularly in comparison to Japanese material. They elevate *C. scauroides* Mayer, 1903 to species level for the Japanese material and provide detailed comparative descriptions and illustrations of the two taxa.

- Wicksten, M. K. (2012). Mary has updated her 2008 decapod publication with much improved figures and images, and, from what I can tell from my initial use, re-edited and updated keys. I highly recommend that this be your starting place for most decapods.
- De-la-Ossa-Carrtero, et al (2012). This paper discusses amphipod sensitivity to sewage. It employs AMBI categories to investigate amphipod sensitivity to sewage pollution, showing a general decrease in abundance and diversity in stations close to outfalls. Some of the affected species showed some differences in level of sensitivity related to their burrowing and feeding behavior. For example, suspension and surface deposit feeders and tube builders showed less sensitivity to sewage disposal than others, and are thus even able to increase in abundance. The publication should be of interest to all of the discharging agencies as they wrestle to interpret their monitoring data.
- Lowry and Myers (2013). Provide a follow-up to their review of caprellids and corophioids, creating a new suborder of Gammaridean amphipod: Senticaudata, for those amphipods with embedded spines terminally on uropods.
- Lowry and Stoddard also produced two other 2012 publications on Lysianassids (Conicostomatinae and Pachynidae) that include family and species keys. Each includes useful keys involving local species.

Dean briefly called attention to the problems experienced with caprellid amphipods during the last Bight project, particularly *Caprella scaura, C. californica, C. simia*, and *Caprella* sp WS1. Each of these species has similarly shaped (and variable) head spines, and few other distinguishing characters. Differences used to distinguish them include the presence/absence and number of dorsal processes on several of the pereonites, although the size of these vary with size of the individual. The problem is especially keen when dealing with specimens from embayments. Dean recommended that everyone be cautious because there seem to be mixed lots, sometimes tens of specimens at varying stages of development and gender, and, of course, varied maturity of the differentiating character states. A single key representing all the possible taxa does not exist and Dean recommended using a combination of keys: Light's Manual (Watling and Carlton 2007), Laubitz (1970), and Watling (1995). A voucher sheet for *Caprella* sp WS1 has been drafted, but not finalized for distribution. Dean plans to complete and distribute the voucher sheet in time for taxonomic analysis of these samples.

Callianassids, in particular *Neotrypaea californiensis* and *N. gigas* (See Pernet et al 2010) were discussed. Although the issue was thoroughly reviewed in a previous SCAMIT meeting (SCAMIT NL Vol. 27 No. 3/4), Dean thought that revisiting the distinction between these two taxa was important with regional Bight sampling and the large number of samples collected in the various embayments. The simplest distinction between the two taxa lies in the eyestalks (See Figure 2, Pernet et al 2010):

- *N. californiensis* has short, blunt eyestalks that reach to or just beyond the article 2 of the first antenna
- *N. gigas* has long, tapered, laterally concave eyestalks that extend well beyond the article 2 of the first antenna

The key in Wicksten (2012) distinguishes these two species as well as N. *biffari*, which has an unproduced, short, blunt eyestalk.

We also discussed the leuconid cumacea *Nippoleucon hinumensis* vs. *Leucon subnasica*. The two genera are distinguished by the presence or absence (respectively) of pleopods in the male, and the females look sufficiently similar to have caused problems in the past…at least for Dean. *N. hinumensis*, an introduced species from Japan that occurs in embayments, differs from *Leucon* by the absence of pleopods in the male; a trait that offers little comfort when faced with a sample including only females. Consequently, Dean noted the following differences in females that are useful to distinguish the two taxa:

- The anteroventral corner of the antennal notch of *N. hinumensis* is blunt, whereas it is upturned and more acute in *L. subnasica;*
- In *N. hinumensis* the ischium + merus of pereopod 1 is notably longer than the propodus, whereas the two (i + m) are notably shorter than the propodus in *L. subnasica;*
- In *N. hinumensis* the basis is much more setose than in *L. subnasica* (~6 long plumose setae vs. 2-3);
- In *N. hinumensis*, the uropodal endopod is notably shorter than the exopod, but sub-equal in *L. subnasica*;
- The pattern of dorsal crest teeth is also different, but it is difficult to describe and one should compare the illustrations for this character.

Next on the list were cylindroleberid ostracods. Dean provided a mini-training on several of the characters typically used to distinguish the genera and recognized species common to the SCB. The primary characters include:

- Antenna 1 – length of sensory bristle, and presence/absence of an accessory filament;
- Mandible – the size of the exopodite, pattern of primary and secondary bristles along the anterior margin of article 2 of the endopodite, and the number and pattern of triaenid and spinose bristles on the endite;
- Sixth limb – the number and general pattern of spinose bristles along the ventral margin.

Dean also briefly described a potentially new cylindroleberid collected from the OCSD monitoring program. This taxon is represented by two specimens collected from 50 m off Orange County, and has the following characters: the sensory bristle of antenna 1 has an accessory filament and extends well beyond the tip of antenna 1; exopodite of the mandible is about one-half the length of the endopodite; there are two bristles proximal to the *a*-bristle and one between the *a*- and *b*-bristles of the mandible endopod, article 2; the endite of the mandible has 1 triaenid and 4 spinose bristles (although this character seems to vary slightly); and the 6th limb has 14 bristles along the ventral margin.

Dean distributed an updated tabular key to the Cylindroleberididae from the SCB [older versions can be found in the SCAMIT Taxonomic Toolbox]. He plans to review and update the table for greater distribution and posting.

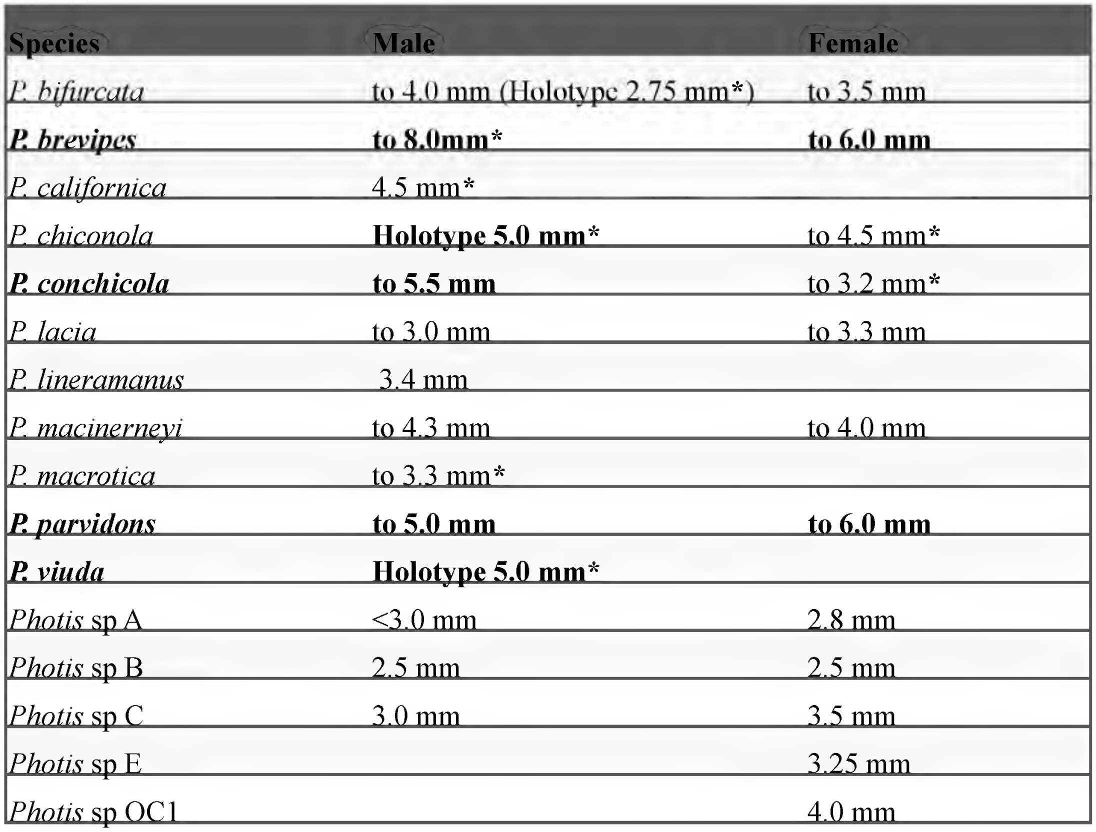
We also discussed the differences among several similar looking corophiid amphipods, the males of which have a carpochelate gnathopod 1 (*Acuminodeutopus*, *Rudilemboides*, and *Paramicrodeutopus*), and distinguishing between females *Rudilemboides* sp A vs. *R. stenopropodus*. Dean first reminded everyone not to rely on color to distinguish these species, particularly *Rudilemboides* sp A and *R. stenopropodus*. *Acuminodeutopus heteruropus* is easily distinguished from the others by the shortened outer ramus of uropod 3. In contrast, both *Paramicrodeutopus schmitti* and *Rudilemboides* have two well-developed rami on uropod 3. *P. schmitti* is easily distinguished from *Rudilemboides* by the rounded eye lobe, which is acute in *Rudilemboides*. Female *Rudilemboides* sp A can be separated from *R. stenopropodus* by the presence of spines on the anterior margin of the gnathopod 2 basis instead of setae. The males are distinguished by the presence of large teeth on the gnathopod 1 propodus and carpus in *Rudilemboides* sp A, which are absent in R. *stenopropodus.* These differences are discussed in the SCAMIT voucher sheet available in the tools section of the SCAMIT website.

Dean then moved on to another Corophioid group, the genus *Aoroides* (Aoridae), which creates some difficulty, particularly because correct identification requires examination of the teeth on the outer plate of the maxilliped. Basically, he reiterated that the key to the species of *Aoroides* in Conlan and Bousfield (1982b) works well. He relies heavily on the presence/absence of the seta on article 2 of the mandibular palp and cusps on the outer plate of the maxilliped, especially when dealing with female specimens (see Table 2 of Conlan & Bousfield 1982b). He again reminded everyone not to rely solely on color because he has noticed differences in definition of the color patterns according to location (e.g., north, central, and southern areas of the SCB). He showed several slides depicting several of the character states.

The Photids, a perplexing group that everyone loves to hate, was next on the agenda. Dean [again] emphasized the use of the particular character states used in his 1999 key to the *Photis* and not color alone. Color patterns on certain species (e.g., a stripe of color in the antenna 1 of *Photis californica*) can be a useful tool to sort specimens into species groups; but they should not be used as *the* identifying character. Over the years, Dean and others have found mixed lots of *P. brevipes* and *P. californica* where all the specimens had this "characteristic line of pigment" in the antenna and female *P. brevipes* will sometimes have pigment distally on antenna 1 peduncular articles. Photids overall do show some differentiating pigment pattern that can be used to sort the specimens into groups, and may be helpful when identifying groups of specimens from one narrow region, but these color patterns may not (and probably do not) translate across regions and therefore should not be used for species-level identification.

Dean also acknowledged the problems with his key and the difficulty some have had interpreting the character states (e.g., relative length of the anterior and posterior margins of the carpus on gnathopod 1), and indicated that he hoped to re-write and simplify the key later this year. Until then, he noted that the common taxa found within the SCB are not impossible to deal with. First, there are several taxa where the males and females are very distinctive (i.e., *Photis* sp A, *Photis* sp B, *Photis* sp C, and *P. lacia*). Second, size makes a difference when distinguishing among certain species (e.g., *P. brevipes*, *P. californica, Photis* sp OC1), and Dean provided a table that listed the reported sizes of SCAMIT Ed 7 species (Table 1). He suggested that a combination of the shape of gnathopods 1 and 2, along with certain other specific characters (setation on the coxae, or bend in antenna 2), can be employed fairly reliably with size to identify many specimens. For example, *P. brevipes* grow to 8 mm in length whereas *P. californica* mature at 4.5 mm. Males of the two are distinguished by the presence (*P. brevipes*) or absence (*P. californica*) of a tooth on the male dactyl. Immature (3–5 mm) specimens of *P. brevipes* will develop a noticeable bump on the gnathopod 2 dactyl where similarly sized specimens of *P. californica* will not. Similar comparisons can be made for the development of the concavity along the palm of gnathopod 1, or the development of the palmar tooth on gnathopod 2, etc. to distinguish other similar taxa (e.g., *P. parvidons* vs. *P. californica*). Dean then provided a slide show of several of these distinguishing characters and character states used in his key.

Table 1. Reported sizes for *Photis* spp listed in SCAMIT Ed 7. All sizes from Conlan (1983) unless noted by an "*", in which case they are from Barnard (1962). Bolded taxa are >5.0 mm in size.



Species	Male	Female
P. bifurcata	to 4.0 mm (Holotype 2.75 mm*)	to 3.5 mm
P. brevipes	**to 8.0mm***	**to 6.0 mm**
P. californica	4.5 mm*	
P. chiconola	**Holotype 5.0 mm***	to 4.5 mm*
P. conchicola	**to 5.5 mm**	to 3.2 mm*
P. lacia	to 3.0 mm	to 3.3 mm
P. lineramanus	3.4 mm	
P. macinerneyi	to 4.3 mm	to 4.0 mm
P. macrotica	to 3.3 mm*	
P. parvidons	**to 5.0 mm**	**to 6.0 mm**
P. viuda	**Holotype 5.0 mm***	
Photis sp A	<3.0 mm	2.8 mm
Photis sp B	2.5 mm	2.5 mm
Photis sp C	3.0 mm	3.5 mm
Photis sp E		3.25 mm
Photis sp OC1		4.0 mm

Members of the family Corophiidae, specifically *Grandidierella* and *Monocorophium*, are common in bay and harbor samples. Dean recommended the key in Light's Manual (Chapman 2007) for this group. This key is extremely useful and easy to follow, but noted that it takes a little bit of careful examination to understand and apply the description of the spines along the base of the antenna. He also noted that couplet 20 requires some caution. *Monocorophium insidiosum* is listed as having a "medial protrusion" (basically a triangular medial process: Plate 270, Figure V) emanating from just below the dorsal margin of the antenna 1 peduncle, article 1; however, *M. uenoi* has a similar, though smaller, medial bulge emanating from the mid-point of the antennal peduncle (i.e., distinctly below the flattened dorsal margin), which is not illustrated. *M. insidiosum* is by far the more common of the two, but the both have very similar color patterns, so one must be careful to examine the placement of the medial tooth when applying the characters of couplet 20. Dean and Tony Phillips related stories of mixed lots being very common, especially within embayment and river mouth samples; therefore ALL specimens need to be examined with immature or damaged specimens listed as "sp." Dean had one story from a Bight sample with >10,000 individual M*onocorophium* that he figured contained a single taxon. Unfortunately, at a count of about 5,000 individuals he discovered a second species with the same color pattern of the primary species, forcing him to review the entire lot to obtain an accurate count.

Ampithoe (Ampithoidae) is another corophioid that can create problems, particularly because there is no single key that includes all potential species. For example, the excellent keys in Chapman (2007) and Conlan and Bousfield (1982a) exclude two fairly common species (*A. longimana* and *A. polex*). In addition, females are particularly difficult (if not impossible) to reliably distinguish, even when mature. So all identifications should be verified against descriptions and illustrations carefully.

Pleustids (Pleustidae) are another difficult group to identify with confidence in part because of their small size and reliance on the mouthpart morphology. Dean has been particularly vexed by this group, and has found the key in Light's Manual difficult to apply, particularly with regards to several fairly common taxa within subfamily Parapleustinae: *Chromopleustes oculatus* (Holmes 1908), *Gnathopleustes den* (J.L. Barnard 1969), *G. pugettensis* (Dana 1852), and *Incisocalliope newportensis* (J.L. Barnard in J.L. Barnard & Reish 1959). Readers are referred to Don Cadien's thorough review of the group during a prior SCAMIT meeting (See SCAMIT NL Vol. 15, No 8). The cautionary message: Approach this group carefully!

Although SCAMIT Ed 7 lists only a few hyalid amphipods (four species), they are common enough in embayment samples to warrant a brief discussion. Dean has found that the characters in Light's manual (Chapman 2007) for distinguishing the species of *Protohyale* and *Apohyale* difficult to apply. For example, the length of maxillipedal palp article 4 relative to article 3 is used to distinguish members of *Protohyale*, but Dean has found variability in this character between males and females in the samples that he has processed. The same was true for the length of the gnathopod 2 palm relative to the posterior edge of the propodus for *Apohyale*. Consequently, one should be cautious when applying specific identifications for this group.

Lastly, Dean introduced a modified version of John Chapman's Key to the Families and Superfamilies of gammarid amphipods found in Light's Manual (Chapman 2007). With John's permission, Dean modified the key in an attempt to incorporate all of the families listed in SCAMIT Ed 7 [Edition 8 wasn't out at the time]. Most of the character states used in the various couplets were left intact, with the original figure references maintained. The specific couplets that required major revisions to incorporate the new families were reviewed. Draft versions of the key were distributed for comment with a request that it not be distributed further since it is still in draft form. Several insignificant editorial errors were pointed out almost immediately, and any other comments are welcomed.

Dean has the following corrections to the distributed key: Couplet 1 – Change "Caprellidae" to "Caprellida"; Couplet 2 – Change "Ingolfielllidea" to "Ingolfiellidea" (delete extra "l"); Couplet 16 both dichotomies – Change "lessor" to "lesser"; Couplet 17 first dichotomy – add "examine carefully" after "(plate 263M)" and delete "with" after "pereopods 5–7"; Couplet 19 – Change "Unicolidae" to "Unciolidae"; Couplet 32 second dichotomy – change "pereopods 2 and 3 dactyls shorter…" to "pereopods 3 and 4 dactyls shorter…"; Couplet 44 first dichotomy – add " posterior margin of coxa 4 not excavate; uropod 3 rami and telson never lined with robust spines"; Couplet 44 second dichotomy – add "coxa 4 often different size, excavate posteriorly, or lobed; if not excavate or lobed, then uropod 3 rami and telson often lined with robust spines (as in members of the Melitidae and Maeridae)"; Couplet 45 first dichotomy – add "although incisor may be prominent" after "Mandible lacking molar"; Couplet 51 second dichotomy – change "lower lip" to "upper lip"; Bottom of page 7, Footnote 2 – change "her" to "here".

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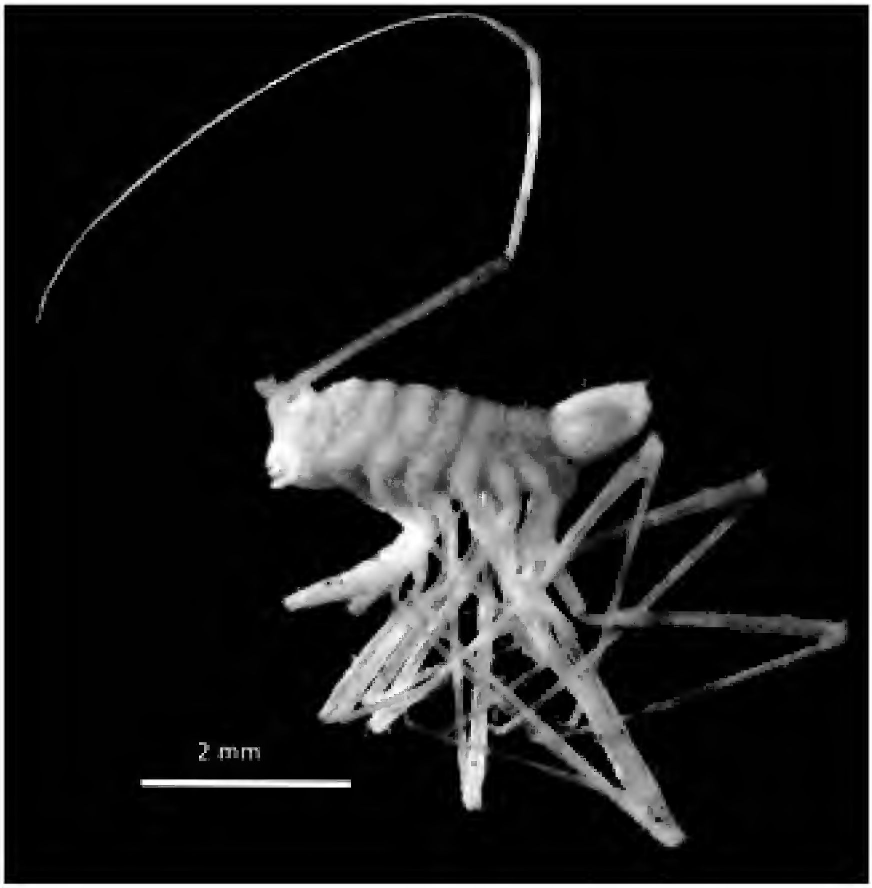
September/October, 2013 SCAMIT Newsletter Vol. 32, No. 2/3



Munnidae (*Zoromunna* sp.nov)
from the Juan de Fuca -
Gorda Ridge region.
Photo by Dr. G. (Buz) Wilson

This Issue

Publication Date: 2 December 2013

SCAMIT Vol 32, No. 2: *No meetings were held in July or August 2013 in order to accommodate the Bight'13 Regional Monitoring Program field coordination and sampling efforts. Consequently, there are no minutes for these months, which would have formed Vol. 32, No. 2 of the SCAMIT NL series.*

13 SEPTEMBER 2013, ANGEL VALDÉS, NHMLAC, OPISTHOBRANCH MOLLUSKS

Attendees: Larry Lovell, Terra Petry, Don Cadien (LACSD); Kelvin Barwick, Erica Jarvis (OCSD); Wendy Enright, Ron Velarde (CSD); Leslie Harris (NHMLAC); Angel Valdés (Presenter: Cal Poly Pomona).

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.

Business:

The SCAMIT Executive Board will hold its annual meeting later this month (9/28; minutes included in this NL). No meetings were scheduled for July or August 2013 to accommodate the Regional Bight Survey field sampling schedules.

Monday, December 9: Tony Phillips will provide a review of Cnidarians based on the collections and images of the late John Ljubenkov. The meeting will be held at the Orange County Sanitation District Laboratory. Anyone interested in attending the meeting should contact Kelvin Barwick at kbarwick@ocsd.com prior to the meeting.

Trawl invertebrate FIDs. Meetings are expected, but currently unscheduled, in November and December 2013 to address identification of B'13 trawl invertebrates. One meeting will deal with crustaceans, the other with mollusks, cnidarians, urochordates, etc. Another is planned for late January 2014 covering echinoderms and focusing on *Brisaster*.

Other upcoming meetings – CERF (Coastal and Estuarine Research Federation) Annual Conference in San Diego, November 3–7. SCAMIT efforts will be represented in presentations dealing with the development of a national AMBI.

There will be a Malacology meeting in Mexico City in June 2014. This will be a joint meeting with WSM, AMS, SMM, and ALM (the Mexican and Latin American counterparts). Paul Scott is President of both American organizations this year. The Malacological Society of South America will hold their annual meeting concurrently, making this a meeting of the Americas.

Larry introduced Dr. Valdés who began with a presentation of some recent research conducted by himself and his students. In particular he discussed their work on species complexes and the biogeography of "widespread" species. All this is right up SCAMIT's alley since we have come to distrust most reports of multi-ocean distributions. All of the work involves some measure of molecular analyses of specimens from various spots around the globe.

The first problem tackled was the reported distribution of *Doriopsilla areolata* in the Atlantic. Valdés and Orea Rato (1997) suggested segregation into subspecies, which has now been rejected based on molecular analysis (Goodheart and Valdés 2013). While there were interesting localized differences in haplotype frequency, no real reproductive isolation was indicated in the analysis, and the subspecific taxa could not be supported. Specimens identified as *D. miniata* from South Africa proved to nest within *D. areolata* in the cladogram, raising the possibility that they might prove to be synonymous. *D. areolata* is distributed through much of the Indo-Pacific, and specimens from other areas were not included in the study. It was premature to propose the synonymy, since the specimens sequenced might prove misidentified rather than characteristic of the species as a whole. Broader sampling is needed before a definitive conclusion can be reached.

The cephalaspid genus *Navanax* was the next problem area visited. We have *N. inermis* here in southern California, while *N. aenigmaticus*, a more southern species, is fairly common in the Gulf of California and rarely reported from the Southern California Bight (SCB) though it may come into the area during El Niño current flows. Within this radula-less group morphological characters to distinguish taxa are elusive. The internal shell, for example, has proven largely uninformative for species separation. Consequently external color and color patterning have sometimes been used to separate species. The value of this was tested by molecular analysis and found relatively unreliable. *Navanax aenigmaticus* has been considered circum-tropical in the past, with populations in the NEP, tropical west Africa, and the Caribbean. The analyses of Orneles-Gatdula et al (2012) demonstrated that there are actually three species, one in each geographic area. *N. aenigmaticus* is the Pacific species, *N. gemmatus* is found in the Caribbean, and *N. nyanyana* is found in tropical west Africa. This latter species has recently been suggested to be synonymous with the earlier *N. orbignyanus* (see Ortea et al 2012).

Another supposedly circum-tropical species, the sea hare *Aplysia dactylomela* was discussed next. It is widespread in the tropics (Hawaii, China, Atlantic) but representative of two clearly different genetic groups, one in the Atlantic and one in the Indo-Pacific. It was first reported as an invasive species from a small island in the southwest off Tunisia in the Mediterranean in 2002. Subsequent reports showed a rapid and steady spread to the east, a pattern at odds with the normal pattern of Lessepsian invasion through the Suez Canal. In an effort to see just where the Mediterranean species originated, Angel examined the genome. Specimens were collected from various locations for sequencing. Angel hypothesized that the invasion was from the Atlantic into the Mediterranean, rather than along the usual Red Sea-Canal pathway. His hypothesis was supported by genomic data. He found lots of genetic structure in the Atlantic, but not much in the Indo-Pacific. Oceanographic barriers such as the Canary current and strong upwelling off several parts of west Africa have become weaker with climate change, making the previously difficult invasion of the Mediterranean from the Atlantic easier. With continuing climatic shifts, such barriers will become sieves allowing the more optimally invasive taxa through, but may fail entirely with time. Once that occurs free interchange will become possible in areas formerly separated, and the homogenization of the planet's oceans will accelerate.

Our next discussion involved a nudibranch living at the ocean surface with the potential for a very broad distribution throughout entire oceans and possibly between oceans. Angel showed video of *Glaucus* feeding on Portuguese Man-of-War collected in collaboration with the University of Michigan and the National Geographic Society. Angel studied two species living in different ocean gyres. *G. marginatus* (the stouter species) is actually a complex of four cryptic species. The issue proved to be a good example of sexual selection at work since *G. marginatus* have a bursa copulatrix and regular copulation, while *G. atlanticus,* injects sperm via a penile spine. Using molecular clocks, Angel found that differences in the Atlantic vs. Indo-Pacific populations were established about 1.2 million years ago. This coincides with the onset of the Agulhas leakage around the Cape of Good Hope in South Africa. Prior to that date there had been an impervious barrier at the Cape preventing interchange between the Atlantic and Pacific populations. The leakage has varied with glacial events, currents, and temperature allowing pulses of mixing between the two oceans. The current hypothesis is that this history is reflected in the genomes of the animals affected. Investigations testing this hypothesis are in the process of publication.

Angel then went on to discuss Caribbean diversity in another cephalaspidean genus; *Chelidonura,* a coral sand dwelling form, which demonstrates a wide range of color variations in the Caribbean. Genetic analysis showed that there were two clades – one only in the Bahamas, the other throughout the Caribbean – with wide color variation in each clade. Color could not be used to separate the clades, but internal shell morphology did separate morphs. It turned out that the protoconch growth patterns reflect feeding differences and larval life style: widespread species were planktotrophic, while endemics were lecithotrophic. These data were partially presented by Orneles-Gatdula et al (2011).

Philinopsis has the same pattern of habitat with cryptic coloration; although internal shell variation was evident. A study of two different color morphs of *Philinopsis pulsa* from the same habitat showed no difference in haplotypes or burying behavior. There was no genetic basis for the color variation, and no indication of the potential source of the variation (Orneles-Gatdula and Valdés, 2012). This pattern repeats with some cryptic species of saccoglossans as well.

Angel also discussed several new species. A new *Chromodoris* from the Gulf of Mexico is aposematic, using its dorsal color pattern as a warning and defense mechanism. It feeds on red sponge, against which its coloration can clearly be seen. He also mentioned that description of the first species of *Melibe* known from Florida is underway. This is an extremely transparent member of the genus, which is virtually invisible underwater. While most species of *Melibe* have cryptic coloration and dermal elaboration, no other species has been this difficult to see.

Going back to problems with existing described species, the aeolid genus *Dondice* was addressed. Members of *Dondice* are cnidarian feeders, and *D. banyulensis, D. occidentalis*, and *D. parguerensis* look very similar but are genetically distinct. The first two species feed on hydroids, as do most aeolids, while D. *parguerensis* feed on the jellyfish *Cassiopeia.* This medusa lives upside-down on the sediments, farming symbiotic algae in its tentacles on shallow sun-lit bottoms. Why this dietary difference, and its possible consequences, are subjects of interest. Angel hopes to perform some lab experiments to test (1) if the two species that co-occur in the tropical west Atlantic (*D. occidentalis* and *D. parguerensis*) are inter-fertile, and (2) if switching prey between the two species is an option.

As an aside, Angel mentioned that although studies focused on the Aglajidae (*Aglaja*, *Navanax*, and *Chelidonura*) have shown these taxa nest together, their synonymy has not been performed. Reviewers won't support the idea of synonymizing these genera, and efforts to do so have been rebuffed.

Research on the Philinidae has been spurred locally by the invasion of several species, most notably *Philine auriformis*. In California, *Philine* have proven to be a complex in Northern California – particularly in Bodega Bay. This complex includes three fusiform species: *P. aperta*, *P. auriformis,* and *P. orientalis* (similar gizzard plates to *P. auriformis* but with tiny holes). This complex was confirmed by Pat Krug and his students. The endemic *P. alba*, a lenticular species that is also large and white, is not part of this complex. All three members of this complex are invasive; *P. aperta* from the North Atlantic, *P. orientalis* from the South China Sea, and *P. auriformis* from New Zealand.

In addition, *Dendronotus frondosus,* now *D. venustus*, was found to represent more than one species. Molecular investigations indicated that the reputedly wide-ranging *D. frondosus* should be restricted, and previously synonymized species such as *D. venustus* recognized (Stout et al 2010). Angel thinks that there may be more cryptic species locally under this name. It is an interesting group because they seem more specious in temperate areas, whereas most nudibranchs reach maximum diversity in the tropics. Five taxa are listed in SCAMIT Ed 8. *D. patricki*, not on the list, is a vent species found on whale skeletons (Stout et al 2011).

Under-reported diversity may also reside in *Polycera*. Members of the genus *Polycera* are typically shallow water species that occur in embayments. *P. atra* is the same up and down the coast, but *P. alabe* is represented by three clades with overlapping ranges that show some minor radular differences. Investigations of this situation continue.

Another interesting story, *Haminoea japonica* was first detected in Canada, down to San Francisco. It has a distinctive deep notch in the cephalic shield, along with a distinctive radula when compared to the native species. All the invaders to both Europe and North America came from one small area of intense oyster farming in northeast Japan (Hanson et al 2013). When first detected in the NEP they were described as a new species, *H. callidegenita*, by Gibson and Chia (1989). The North American populations show a different haplotype than Europe, but not enough to qualify as a different species. *H. japonica* has displaced *H. vesicula* in bay and estuaries in North America. In Europe, it has invaded several coastal lagoons previously occupied by endemic species such as *H. fusari*, *H. templadoi*, *H. orteai*, etc. In its non-native habitat, it is found in estuaries associated with bivalve aquaculture. It is not in southern California yet, but expected eventually.

Angel described a project that Jeff Goddard is pursuing (see Goddard et al 2013), and he could use help finding specimens. *Felimare californiensis* is a small opisthobranch that feeds on sponges of the genus *Dysidea*. The species has historically been found on the mainland and Channel Islands. In the mid-1980's it disappeared from the mainland, although it was recently found in Mission Bay and La Jolla. *F. californiensis* has a history of variable abundance; its congener species *F. porterae* is doing fine. Jeff is interested in seeing if the genetic diversity has changed over time, or if there are links to pollution/runoff, or variability in the availability of prey. Jeff could use specimens of *F. californiensis* for genetic analysis, BUT do not kill the specimens, a clip from the tail preserved in 95% EtOH is just fine!

Angel is also interested in members of *Melanochlamys*, *M. diomedea* being our local representative. Nine species worldwide have very tight, restricted ranges, but initial analysis showed a distinct species, *M. ezoensis* (identified as that, but actually a new species) in San Francisco Bay and Japan. Angel is still working on teasing apart the exact story. Specimens are morphologically falling out along the same lines, but he needs more material if you come across it.

He has also found a *Parvaplustrum* and *Philine* from a whale fall; their identity still unknown. The *Philine* gizzard plates were not calcified, so their purpose is rather obscure. Just another conundrum awaiting more work.

SCAMIT EXECUTIVE COMMITTEE ANNUAL MEETING, SATURDAY, SEPTEMBER 28, 2013

Attendees: Cheryl Brantley, Don Cadien, Dean Pentcheff, Megan Lilly, Larry Lovell, Dean Pasko, and Leslie Harris.

Larry Lovell began the meeting by thanking Cheryl Brantley and Megan Lilly for their many years of service to SCAMIT, and presented each with a card signed by members of the executive committee and a gift certificate of appreciation.

He then commented on SCAMIT's successful 31st year that ended with a record number of members (170), and included a full schedule of meetings, a SCAS symposium, organizing and hosting two EPA/USGS workshops, and releasing edition 8 of the SCAMIT Species List.

SCAMIT organized and co-hosted two EPA/USGS-sponsored CBRAT workshops to evaluate potential target species that could be impacted by the effects of Global Climate Change, such as warming water temperatures and changes in pH. These workshops covered crabs, bivalves, and chitons, and netted approximately $3,700.00 in 2012/13 and $4,000 for 2013/14. Several SCAMIT members were among the invited experts: Mary Wicksten, Doug Eernesse, Don Cadien, Ron Velarde, and Paul Scott. Future CBRAT workshops on annelids, arthropods, and other phyla are possible depending on EPA needs and budget demands. SCAMIT is likely to be approached to play a similar role.

Larry also mentioned that the Taxonomic Database Tool (TDT) V1 is nearly ready for release in anticipation of Bight'13 sample processing. The database tool will link taxa to SCAMIT voucher sheets, images, and keys from the SCAMIT Toolbox. The Committee discussed the fact that the Toolbox has its share of problems that need to be cleaned-up, such as duplicate voucher sheets, voucher sheets with old names, etc. The Committee suggested that each monthly meeting could dedicate a small amount of time to reviewing the information in the toolbox that relates to the taxon being covered at the meeting. In addition, these meetings could be mechanisms by which notebooks and computers could be mined for documents that could be added to the toolbox.

The discussion then migrated to SCAMIT's effort to build an image library, which was to be linked to the Taxonomic Database Tool. SCAMIT has $3,200 remaining from the OCSD funds that could be used to hire an intern to search POTW lab computers for images. Several people commented on the difficulties associated with continued submittal to Morphbank and the fact that it is not user friendly. Dean Pentcheff described Morphbank's intended use as a background repository of images that could be accessed through something like the SCAMIT Database, noting that Kelvin's aplacophoran images in the toolbox are stored in Morphbank. Despite this example of successful usage, there was much discussion about whether Morphbank would be there in the future, the complexities involved in loading images, that some of our TDT development partners at SCCWRP are not happy using Morphbank, whether there was some other option to meet our needs, and whether maintenance of a database of this type is beyond SCAMIT's area of expertise or funding. Still, the need to pull together the images was clear, and the Committee discussed hiring an intern to find material from the various agencies for potential uploading to the TDT or Morphbank. Support from SCCWRP for this effort may be on hold and Larry argued that SCCWRP needs to recognize their history with taxonomy and continue to maintain the TDT. The two organizations are linked in many ways, such as AMBI development, development of the BRI tools, the BATMAN group to maintain data consistency, DNA barcoding efforts, etc. and SCCWRP should reciprocate by supporting the TDT.

Vice-President Leslie provided a summary of the year's meetings. SCAMIT held meetings every month of the year, with two meetings in some months. There will not be a December Party since we held the summer beach party instead. Leslie is hoping to get increased support from the local museums when various experts are visiting. It would be great if during their visits these scientists could provide summaries of their work to SCAMIT.

Leslie is now looking to fill the 2014 meeting schedule which will include a fair amount of Bight-related taxonomic problems. We will likely deal with problem FID trawl animals at the beginning of the year since some Bight'13 consultants are continuing to work on their specimens post-collection. Additional discussion focused on the problem that there are fewer qualified people to perform FIDs within the agencies and consulting firms. One suggestion was that SCAMIT could fill the need for training during the trawl FID meeting(s) by facilitating the transfer of information among agencies. However, there are a lot of FIDs yet to be resolved and all of the data needs to be pulled together before they can get to the FID effort. The Committee suggested calling meetings at the end of January 2014 to get past the inertia. Plans for this meeting will be forthcoming.

Leslie then described the upcoming October meeting that will include presentations by several visiting scientists including Russell Carvalho (Texas A&M), Orlemir Carrerette (Universidad São Paulo, Brazil), Eric Stein (SCCWRP) and Ken Halanych (Auburn University). Ken will attend primarily to describe his work with WormNet, a large $4-5 million grant dedicated to the evolutionary development of polychaetes. One goal of WormNET is to reach out to polychaete workers worldwide for projects that would benefit from DNA work. The October 14 SCAMIT meeting at the museum will be followed by a separate meeting to discuss collaborative opportunities between WormNET and the various barcoding efforts that SCAMIT and its member agencies have been involved in. Ken is willing to consider any interesting project.

Megan Lilly and Dean Pasko provided the Secretary's report. The transfer of responsibilities is taking place with Dean having produced the minutes for the May and June meetings, and Megan helping get those rough drafts into production-ready format. Megan spent the day showing Dean the ins-and-outs of producing the Newsletter and graciously volunteered to continue to help with editing, etc. as the year progresses.

Because the transition will involve Dean publishing the 2013 and future meeting minutes in issues covering 2-month periods, and Megan publishing the Volume 31 backlog of 2012-13 issues, the Committee discussed and agreed to add a publication date to each newsletter.

In addition arrangements were made to have Dean Pasko purchase the required publication software (InDesign) through TechSoup, an organization that provides access to software for non-profit organizations. Once Dean has access to his own version of the software, Megan will continue working on the back issues and Dean will attempt to keep pace with current meetings. The first issue of Volume 32 should be available soon.

Treasurer Laura Terriquez's report (presented by Larry) showed that SCAMIT is healthy financially. SCAMIT's modest Operating Budget of $22,396.81 (as of June 15), not including the $3,267 remaining in the database-specific fund, leaves $5,599 available for publication grants (25% of the Operating Budget). Over the course of the year SCAMIT generated $5,723 in income. SCAMIT spent $767 on Newsletter production and distribution, meetings, and travel, and $3,382.50 of our database funds on improving the toolbox content.

The Committee discussed the desire to spend the grant money, and wished to encourage members to apply for publication support. Megan mentioned requesting support to produce a guide to the mega-benthic trawl invertebrates collected by the monitoring programs. There was discussion about whether such an effort would overlap the SCAMIT TDT, and how might the issue of photo copy-write and release be handled since many of the photos would come from public agencies. This brought the discussion back around to the issue of the SCAMIT TDT and discussion of designating the proceeds from the EPA Workshops for the specific purpose of funding the database project.

Finally, we discussed the idea of continuing to set aside some of the operating balance in certificates of deposit. Currently, SCAMIT holds a 9-month $10,000 CD that has generated $7.17 in interest. The Committee will ask Laura to shop around for the best interest rate to roll these dollars into once the current holding expires.

Dean Pentcheff provided the Webmaster report. Dean described the Advancing Digitization of Biodiversity Collections (ADBC) grant to encourage museums to digitize their collections. Gustav Paulay (Florida Museum of Natural History) is leading the effort with Regina Wetzer and Dean Pentcheff as the PIs for the Natural History Museum of Los Angeles County. Other major participating museums include the Santa Barbara Museum of Natural History and the California Academy of Sciences (CAS). The effort is being run through the CAS and is in need of taxonomic scaffolding for the listing. Dean requested that SCAMIT provide a letter of support and offer the use of the SCAMIT Species List. Dean also suggested that SCAMIT encourage ADBC grantees to work with POTWs to get data on occurrence, etc. Larry and Don mentioned that CBRAT has the entire list of invertebrate fauna from the entire coast with distributional information that might also be helpful to the ADBC effort.

We concluded the meeting with Don Cadien's report noting that SCAMIT Ed 8 was done and posted to the website, and that the planning for Ed 9 was almost ready to start. The goal for Ed 9 is a July 1 "Publication" date. The effort will likely include a lot of new information from Tony Phillip's work with John Ljubenkov's cnidarian collection and images.

SEPTEMBER 30, 2013, DR. BUZ WILSON, ASELLOTE ISOPODS

Attendees: Don Cadien, Larry Lovell, Chase McDonald (LACSD); Katie Beauchamp, Greg Welch, Paul Mattson, Ron Velarde, Andy Davenport, Tim Stebbins (CSD); Ken Sakamoto, Danny Tang (OCSD); Dean Pasko (Private Consultant); Regina Wetzer, Adam Wall (NHMLAC); George (Buz) Wilson (Australia Museum of Natural History, presenter).

Business:

The upcoming meetings (see the SCAMIT website) were briefly summarized, including discussion of SCAMIT getting more involved in the Bight'13 trawl identifications via a January 2014 Trawl FID meeting. The meeting will likely be driven by a Bight'13 Trawl Committee due date.

Larry also summarized the Executive Committee meeting, the minutes of which are included in this NL.

Some of the agencies encouraged members to watch for upcoming job openings that will be posted to the website.

Tim Stebbins then introduced Dr. George (Buz) Wilson for the presentation on asellote isopods. Buz distributed several hand-outs for the meeting, all of which are available at the SCAMIT website under the Taxonomic Toolbox: Species Listing of Munnopsidae listed in Osborn (2009), Marine Asellotes from California and adjacent regions, Key to the Superfamily Janiroidea (Asellota), Anatomical Glossary of Isopoda Asellota, and a handout including the presentation slide set: Isopod Crustaceans Suborder Asellota Superfamily Janiroidea. Tim listed several taxa that people had brought for later review.

Isopod Crustaceans Suborder Asellota Superfamily Janiroidea (presentation).

Buz's presentation covered a variety of topics including Janiroidea diversity and morphology, phylogenetic relationships among the taxa, collection techniques, what to expect to find in California, identification of asellotes and a survey of the common families, and a demonstration of a Key to the Families using the interactive DELTA INTKEY.

Buz started by saying that most Janiroidea specimens can be identified to species without dissection, at least for the purpose of pragmatic identification. All Janiroideans have a peculiar sperm transfer organ; a bent (geniculate) pleopod 2. Transfer occurs from pleopod 1 to 2 and then to a mate. The pleopods are covered by an operculum consisting of 3 segments (male) or one segment (female). Pleopod 2 of males is like a hypodermic needle, it can be a long whip-like thing or a crazy spiral.

Buz reviewed the known species richness by families. Janiroideans are primarily deepwater organisms, but there are likely many asellotes above 100 m that are simply unknown as of yet. The highest asellote diversity is sampled below 100 m with a 0.3mm screen. For example, some of the most diverse families (e.g., Munnopsidae, Desmosomatidae, Haploniscidae, Ischnomesidae, Janiridae, Munnidae, and Paramunnidae) occur almost exclusively in deep water, or both deep and shallow shelf. Buz's specialty is deep sea Munnopsidae, Paramunnidae, Dendrotionidae, Desmosomatidae, Macrostylidae, and Ischnomesidae. He estimates a possible diversity of 400,000 species in the deep sea if he were to extrapolate his data from the North Pacific to the area of the deep sea. In shallow waters, the Microparasellidae, Pleurocopidae, Munnidae, Santiidae, Janiridae, Joeropsidae, and diverse Paramunnidae predominate.

He maintains a list of isopods that can be accessed via the Smithsonian Institution website: http://invertebrates.si.edu/isopod/about.html. The list was transported to WoRMS but it is not edited well. He recommends caution when using the WoRMS listing.

We then reviewed some of the interesting adaptations of deep sea isopods. Many of these adaptations, such as body and leg type, are useful for separating families without dissection. Some of these include long legs to walk over substrate (*Munnopsurus*: Munnopsidae), or a large abdomen that inflates with water (*Paropsurus:* Munnopsidae).

Isopods have been around for a long time. The oldest known isopod fossil, *Hesslerella*, represents a fairly derived isopod. An analysis of Janiroidean relationships suggests that deep sea taxa derived from multiple ancestors, with the Janiridae likely being made up of multiple family groups.

Asellotes can be found in shallow marine habitats, on plants, or as epibiotes on sponges and tunicates. They can be successfully collected by divers, especially on algae, and bucket washes of rocks and cobbles can produce many specimens that are not easily seen otherwise. In general, asellotes tend to be highly abundant on their prefered habitat. So if one can get to the correct substrate, the collection of quality specimens is fairly certain in shallow waters. On the other hand, the success rate changes when sampling from abyssal habitats via box cores. Successful sampling in the deep sea is limited to only a few families (Ischnomesidae, Nannoniscidae, Desmosomatidae, Haploniscidae, Macrostylidae, and Munnopsidae).

When preserving specimens for analysis, sodium bicarbonate seems to work best for buffering to reduce the acidity of formalin, whereas sodium borate can macerate material, especially if its concentration is too high. Pure ethanol and cold storage works great for genetic work, but makes specimens brittle. Adding glycerin helps keep tissues more pliable and minimizes brittleness. Buz found that 85–95% ethanol and 5% glycerin worked well for nearly all groups, and DNA can still be recovered.

In general, one doesn't have to dissect Janioideans. Many can be classified by leg morphology, and even when legs are lost one can use the basis as a proxy of leg size/robustness. Munnopsids can be placed into genus by characteristics of the head. Unfortunately, many species were described by taxonomists with little asellote experience, so taxonomic characters are not well illustrated.

Some of the more important characters are summarized below. (See examples on slides 17 – 25 of Buz's presentation)

- The frontal margin of the head is important taxonomically. The presence of a rostrum – projection of dorsal surface of head – is distinct from a frontal projection or "pseudorostrum" which emanates from below the dorsal margin and may or may not project anteriorly.
- The antennulae and their direction of attachment, as well as the distance between antennulae, is of value. The basal article of antennulae and direction of emergence from head anteriorly, dorsally, or antero-dorsally is also important.
- The antennae and whether or not they are geniculate (knee-like, bent) is helpful. In Paramunnidae, article 1 is difficult to see, whereas article 3 is enlarged, and article 4 is geniculate. The Janiridae have no bend (i.e., not geniculate); whereas the Joeropsididae have geniculate antennae with a large 5th article against which distal articles can nest. Haploniscidae have a slightly geniculate juncture, but have a large dorsally directed spine.
- The relative size of the distal three articles (carpus, propodus, dactylus) of pereopod I (thoracopod 2), setation, spination, etc. is helpful. Asellidae, Stentriidae, Pseudojaniridae show primitive form with a large and prehensile propodus-dactyl and small triangular or quadrate carpus. In Munnidae and Janiridae by contrast, the carpus has become quite enlarged, representing more advanced conditions, and the grasping portion becomes the link between carpus-propodus rather than propodus-dactyl.
- The dactylar claws require a compound scope to view, but provide good clues. Note the presence and shape of sensillae (small, elongate modified seta(e) between claws). The presence of a 3rd claw, derived from spine-like seta of the Stenetriidae, is indicative of Janiridae.

- The position of coxae and how they fit into the body (i.e., do they fit "into" the body; can you see them in dorsal view, ventral view only) and setation. Deep sea isopods tend to have a narrow, elongate 4th pereonite with an anteriorly positioned coxa vs. the wider, narrower pereonite IV and a centrally positioned coxa of shallow species.
- The mouthparts, particularly the mandibular palp, which is lost differentially within families and genera. Its presence/absence can be used to narrow species search. The size of the mandible can also separate groups.
- The pleotelson shape, dimensions, and margin structure.
- The uropod shapes and relative sizes. If the uropods are broken off, it typically means that they are large and elongate, so don't try to place the specimen in a family that has small uropods, for example the Munnidae.

Buz then reviewed some of the more common eastern Pacific families and their representatives. He recommended that local workers consult the multivolume monograph by Kussakin (1979, 1982, 1988, 1999, 2003), which covers North Pacific species. All these volumes are available on-line at the Los Angeles Co. Museum Crustacea section webpage (http://research.nhm.org/publications/). Within the Janiridae, *Janiralata* is common in Eastern Pacific waters. It is a shallow-water group with sexual dimorphism of pereopod I, and characteristic notches in the coxae. The male pleopod can be helpful. All described NEP *Janiralata* are covered by Kussakin (1988). Several additional provisional species are described in Wilson (1997). *Ianiropsis*, another common taxa, has a large male maxilliped, and uropods are typically biramus, large, and easily visible; the rami are in the same plane, and the anntenna and annula are positioned pointing forward (primitive status). Adult male members of the genus *Caprias* have enormous carpus of pereopod I. Several Janirids listed in the world list are probably not among the Janirid clade: *Ectias*, *Caecianiropsis*, *Microjanira*, for example.

In species of *Joeropsis*, pigmentation can be helpful as a quick visual cue for grouping specimens for identification, especially when dealing with high numbers of individuals. In general, Joeropsids have geniculate antennae and conjoined flagellar articles, and most of the legs are maintained upon collection. Their legs, antennae, and (often) hooked uropods are all valuable taxonomic characters. Representatives of *Joeropsis* and *Rugojoeropsis* noted for the distal hooks present on the uropods, and *Scaphojoeropsis* with its anterolateral projections medially between antennae, will likely not be encountered in the SCB.

The Acanthaspidiidae have elongate biramous uropods that distinguish them from *Janiralata*. Acanthaspids represent a transitional group between shallow and deep water. They have lappets (which resemble coxae, but are actually projections of the tergites) on pereonites that are long pointed lateral projections, and the first pereopod appears to be a walking leg.

The Janirellidae are deep sea species that often have large bodies. They have large antennae and highly variable lateral lappets of the pereonites. All have broad heads with projecting lateral margins, tiny uropods, and grasping, pre-hensile pereopod I.

The Munnidae are common in the SCB. They tend to live on hard substrates, as well as sponges, plants, and soft substrate. They have long legs, large pedunculate eyes, and operculate male pleopod 1. Munnids and Paramunnids are quite similar and both are present in SCB samples.

Munnids have the anus directed posteriorly, towards the back of the pleotelson where it is covered. The anus is ventral in Paramunnidae. Paramunnidae have pereopods VI and VII sticking out laterally vs. Munnidae, which have them directed posteriorly due to compressed pereonites VI and VII. Among the common Munnids, two genera, *Munna* and *Uromunna*, can be separated by their respective presence or absence of a mandibular palp, for the most part (exceptions occur!).

We broke for lunch during which we had a vigorous discussion about *Munnogonium tillerae* (specifically from San Diego) vs. *M. erratum* (from off Palos Verdes) vs. *M. waldronense*. Buz convinced us all that they are distinct and therefore the SCAMIT Ed 8 listing synonymizing the three is incorrect. [Buz subsequently explained that he has started work on this suite of taxa. Stay tuned.]

After lunch Buz continued his summary of the major families, starting with the hard substrate Santiidae (Syn = Antiasidae). Representatives of this taxon have a propodo-carpochelate pereopod I distinctly different from pereopods II – VII, straight antennae, and unexposed anus, and large, biramus uropods. The pedunculate eyes, short antennula that is typically shorter than the head is wide, and setose dorsum, also help distinguish this group.

Paramunnids are a speciose group that include some of our common taxa (*Munnogonium tillerae* and *Pleurogonium californiense)*. In this group, pereopod I is fundamentally propodus-carpus-dactyl chelate, and the male first pereonite is enlarged – Buz likened them to having “football player shoulders.” Paramunnid species are distinguished by spine/projection pattern of body, serrations of telson, and proportions of the pereonites.

The Dendrotionidae are transitional to deep sea. The genus *Dendrotion* contains eyeless, long-legged species whose antennae are on stalks, but the uropodal endopod is highly reduced. *Acanthomunna tannerensis* is the SCB species found by the City of San Diego staff and has huge biramous uropods that are generally lost during sampling.

The Haplomunnidae are deep sea taxa related to the Dendrotionidae, that are rare in most areas. They are a heavy-bodied lot, so that they are often collected with the body fully intact. The uropods are tiny! *Haplomunna* sp has been recorded in the SCB, but it is too deep for the typical ocean monitoring programs that make up the SCAMIT species list.

The Pleurocopidae is a monotypic family, represented in southern California by *Pleurocope* sp A. They are an interesting taxon; the uropods are dorsomedial and located proximally on the pleotelson, the pereonites have lateral projections with paired setae, the body also has several long dorsal setae, while the eyes are situated on long, laterally projecting peduncles.

The Munnopsidae are good swimmers with paddle-like pereopods. Five species are represented in SCAMIT Ed 8 and most can be separated by head characters alone, such as the relative size and projection of the rostrum in *Eurycope.*

Nannoniscidae is another deep sea family that is not often found in our SCB samples. The antennule and biramous uropods are typically short, and the head has a projecting frons with cephalic keels present laterally alongside the projecting frons. All coxae are ventral and coxa VII is rotated inwards.

Desmosomatidae are also deep water, but may be found as shallow as 90 m. Two species are represented in SCAMIT Ed 8 (*Momedosa symmetrica* and *Prochelator* sp A). They have uniramous uropods and powerful anterior limbs with robust setae that are used for burrowing. The genus *Desmosoma* has a small first pereonite but is not taken locally. Reported local members have been reallocated to other genera.

Ischnomesidae are a deep sea family recognizable by their elongate pereonites IV – V, but especially pereonite V. Some genera have lost pereonite VII entirely.

The Haploniscidae have legs that are all similar and generally have the appearance of true "isopods", or pillbugs. They have a large spine on the 3rd article of the antenna, the details of which can be used to identify species. Suture lines of posterior pereonites are visible, but the pereonites are actually functionally fused.

The deep sea Macrostylidae have a large stylet-like, stiff uropod, and a large sternal spine on pereonite I behind the maxilliped. The ischium of pereopod III is diagnostic for the family and species. The Family is under revision by Torben Riehl.

Buz also briefly discussed a new family being described in Riehl et al. (in press). They look a little like members of the Macrostylidae, but differ in structures of telson and uropods, but have mandibles that are virtually identical.

Next Buz discussed DELTA and ran through an example of DELTA using IntKey. Using *Ianiropsis* as an example, the group selected character states for eyes (presence/absence), head margin (projecting/not), etc. It took nine character states to get to family Janiridae. Buz mentioned that you can also get distance matrix, and develop interactive keys via IntKey. DELTA has not been re-compiled for over 13 years, so there are some problems with the site, but it remains a useful tool. Open-source DELTA is available for all platforms, but also has some problems. Use of Buz's key requires that you know it is an Asellote because there is no hierarchical key in DELTA.

After a short break we jumped into specimen reviews:

Matt brought representatives of Desmosomatidae from the Mediterranean. They were probably *Mirabilicoxa* species. We reviewed and confirmed the City of San Diego's specimen of *Pleurocope* sp A SCAMIT 2012, which is likely to be the same as Buz's species.

Dean brought a specimen of *Munnogonium tillerae* that was confirmed, thankfully!

Tim Stebbins brought specimens of *Belonectes* and *Eurycope* from Bight'13. We initially thought Tim had a male of *Eurycope californiensis* but we found differences in the shape of the rostrum (truncate in present specimen(s) vs. rounded in *E. californiensis*). The specimen(s) seemed more similar to *E. complanata* complx from the Atlantic (See comment Wilson 1997). In all likelihood, Tim's specimens probably represent a new species because of the truncate rostrum and length of basal antennal article, which exceeds lateral projections, and length of article 2 is longer than in *E. californiensis*. The specimens were from 850 m off San Diego, the same depth range as *E. californiensis*.

The *Belonectes* sp. is also likely a new species due to do the different uropodal endopod which is long, the shape of the keel of the operculum which was sinuous and projects forward with an acuminate corner, and the more denticulate head and anterior pereonites. In addition, the pereopod basis and antenna seemed longer.

Caecianiropsis sp A specimens from LACSD and CSD were reviewed and confirmed as being distinct from *C. psammophila.* [Buz subsequently reported that his review of *Caecianiropsis* specimens from the NHMLAC suggest at least three species present in their collections.]

Ilyarachna profunda from Stebbins Bight'13 was compared to *I. acarina* from Pasko Bight'03 (334 m off SCB). Dean's "*I. acarina*" may be different. It has pedestal setae, but several subtleties seemed to distinguish it. For example, the shape of the pleotelson was similar to illustrations of *I. profunda* (not *I. acarina*), but pedestal setae were fewer and smaller. We considered whether or not this difference may be a size-related issue since we were dealing with a juvenile female. In addition, the lateral margins of pereopods V – VII were of different shape with the anterolateral margin of pereopod V being rounded. Tim brought out other *I. acarina* specimens from 260+/- m from San Diego Regional station 8038 collected in 2010. Both were determined to be different from true *I. acarina* due to the lack of regular setae between pedestal setae, relative to specimens from San Diego Regional station 2147 (1997, 638 ft), which did have both setal types. Buz confirmed these differences, but none of us were sure what to do about them since we could not be sure if any of this variability was associated with development or gender.

Dean pulled a specimen of *Janiralata* sp B from Bight'03 for review. It was also confirmed.

Don brought out several specimens of *Microcharon* sp A collected off Catalina Island that were confirmed.

A specimen identified as *Munnogonium tillerae* from 1372 m off Oregon prompted a strong "NO" from Buz, since this was way too deep and too far north for this species. His examination confirmed this was a new *Munnogonium* distinguished by, among other things, elongate abdominal somites and pleotelson.

OCTOBER 13, 2013, DRS. CARRERETTE, CARVALHO, HALANYCH, AND STEIN, NHMLAC, POLYCHAETES AND DNA BARCODING

Attendees: Ron Velarde, Kathy Langan, Veronica Rodriguez (City of San Diego); Larry Lovell (LACSD); Victoria Gray, Lindsay Fitzgerald, Tania Asef (Endemic Environmental Services); Emmanuel Riclet (CLA-EMD); Ernie Ruckman, Kelvin Barwick, Rob Gamber (OCSD); Terrance Champieux, Christine Whitcraft, Jessica Lee (CSULB); Leslie Harris (NHMLAC); Dean Pasko, Tony Phillips (DCE); Russell Carvalho (Texas A&M, presenter); Orlemir Carrerette (Universidad São Paulo, Brazil, presenter); Ken Halanych (Auburn University, presenter); Eric Stein (presenter), David Gillett (SCCWRP).

Business:

The upcoming meetings (see the SCAMIT website) were briefly summarized [again!]. Most of the 2014 meetings will likely focus on Bight'13 taxonomic issues.

Larry also noted that there are many members who have still not paid their 2013 membership dues, and some are several years behind. SCAMIT will soon drop from the email listing and general discussion list server those members who do not pay their requested dues.

Orlemir Carrerette (Universidade de São Paulo, Brazil)

Leslie Harris introduced Orlemir Carrerette, PhD. student of Dr João Nogueira from Universidade de São Paulo, Brazil. Orlemir started out describing his work on the diversity of polychaetes occurring in the intertidal zone of sandstone reefs off the states of Paraíba and

Pernambuco, northeastern Brazil, with a special focus on Terebelliformia and Sabellidae. Collections were made at low tide from reefs off fifteen beaches along these states. Algae, sponges, ascidians, and other organisms from mussel beds and similar substrates were scrapped from the rocks then examined under stereomicroscope. Polychaetes were removed from the samples, relaxed in menthol solution, preserved in 10% formalin solution and later rinsed in fresh water and transferred to 70% ethanol. He found ~5,000 specimens distributed among 13 genera and 22 species of terebelliforms and 8 genera and 13 species of sabellids. 23 of the total species found are new to science.

After a short and general explanation of his work, Orlemir presented an amazing animated slide show on some of the important morphological characters of the family Polycirridae.

The Polycirridae are a well-known group of polychaetes characterized by the absence of branchiae, presence of a circular upper lip, at least two types of buccal tentacles, and segment 2 distinctly narrower than following segments, constricting the body posterior to the mouth and separating the body into ‘head’ and ‘trunk’ regions. The trunk is further divided into an anterior part with paired ventro-lateral glandular pads, frequently densely papillated, with pairs separated by a mid-ventral groove extending posteriorly from segments 2-3, and a posterior region which only has neuropodia or is achaetous.

Polycirridae contains six genera: *Amaeana* Hartman, 1959; *Biremis* Polloni, Rowe and Teal, 1973; *Enoplobranchus* Webster, 1879; *Hauchiella* Levinsen, 1893; *Lysilla* Malmgren, 1866; and *Polycirrus* Grube, 1850.

The most important characters used in the taxonomy of the group are:

- Anterior end characters of prostomium and peristomium – Location of prostomium; Shape of distal part of prostomium; Prostomial buccal tentacles; Peristomial palps; Shape of both upper and lower lips
- Anterior segments – Glandular ventral surfaces; Paired glandular pads; Nephridial/genital papillae – number and placement
- Notopodia – Number of pairs of notopodia; Notopodia shape; Digitiform expansion on post-chaetal lobes; Notochaetal characters
- Neuropodia – Start of neuropodia relative to notopodia; Neurochaetae
- Pygidium – Smooth or papillate

Orlemir’s presentation generated a discussion on the difficulty of identifying species of polycirrids, mainly due to loss of the anterior region of body and regeneration in most specimens collected. Also there was another discussion about tube-building by some species of Polycirridae. Although most of the publications on polycirrids consider that members of this family do not produce tubes, it is possible to find some individuals inhabiting tubes, probably tubes produced by other species of polychaetes. Leslie commented that at least one undescribed west coast species preferentially lives in old isopod-burrows in *Macrocystis* holdfasts. Kelvin Barwick and others mentioned that another local species was almost always found in soft sediment tubes and would rapidly rebuild their tubes when placed in petri dishes with sediment.

Larry introduced Dr. Russell Carvallo, student of Dr Anja Shultze and recent PhD candidate from Texas A&M. Russell started out describing his work at Texas A&M. He worked on the

Deep Gulf of Mexico Benthos (DGoMB) program macrofauna and analysis, with a special focus on factors affecting macrofaunal polychaete communities in the deep Gulf of Mexico. He looked for variation in the functional diversity of the benthos, since functional diversity plays a key role in community structure and species diversity. The DGoMB collected sediment and water samples from 51 stations from 200 m to 3700 m using a box corer. Russell used the feeding guild categories from Fauchald and Jumars (1979) to characterize the polychaetes into functional group and test two hypotheses: (1) Distinct species communities would be constructed of distinct feeding guilds; and (2) The level of food supply would manifest as differences of guild structure. Russell characterized 17,881 specimens and 532 species into 16 guilds. He found three distinct groups using species composition and the number of guilds declined sharply with depth. Interestingly, he did not find a parabolic diversity curve with mid-depth-max (MDM) using species compositions, but did find an MDM using the feeding guild analysis. Russell believes that functional diversity may show the same MDM in other oceans but a large data set is required to perform the analysis.

Russell's presentation generated a nice discussion during which other tid-bits of interesting information came forward. Russell found no strong correlation between species diversity and guild diversity, however guild diversity was a good estimator of functional redundancy. As found by many of us who have looked at such things before, "depth" showed the highest correlation with diversity; but diversity was also highest at mid-depth where the diversity of habitat structure was greatest.

There was some additional discussion about whether or not categorizing species into feeding guilds is legitimate. Russell explained that the process was laborious. He went through a fair amount of trouble to expand upon Fauchald and Jumars by emailing various experts for species-specific information whenever categorization of a taxon wasn't known or multiple feeding modes were possible. Since the data set was so large, he felt that issues of uncertainty or slight mis-categorization were likely to be drowned out by sheer scope. David Gillett suggested using "interface" feeders for those taxa that show multiple feeding types. Overall, however, Russell felt that Fauchald and Jumars (1979) provides a good breakdown of species and guilds and that by determining the number of species that form a feeding guild, we can estimate the degree of functional redundancy that may be important to ecosystem resiliency. He strongly feels that the analysis of feeding guilds provides insight into food sources for polychaetes and other interactions with their environment (e.g. burrowing, bioturbation). Additionally, feeding guild diversity can be used as a proxy for ecosystem function when assessing the impact of natural and anthropogenic disturbances on benthic communities. Russell's work has been published in the research journal Deep-Sea Research I (Carvalho, et al. 2013).

Dr. Ken Halanych next spoke about Morphology, Genes, and Taxonomy Collaborative Possibilities. WormNetII is a project dedicated primarily to the evolutionary development of polychaetes and is in year 2 of its 5-year $3 million grant funding. The Project poses several questions: What is the phylogeny of Annelida? Which lineages are basal? It aims to generate a database of 2000 annelid transcriptomes, including analysis of 10 nuclear loci for >400 annelids; coordinate community-wide programs that will facilitate research in recent annelid evolution and ecology; and provide resources to all levels of annelid research.

The effort to look deep into annelid phylogeny via the use of transcriptomes is a collaborative work. Anja Shulze and Andy Anderson are tasked with the Community Sequencing Effort (outreach) in order to resolve phylogeny among closely related annelid taxa. The initial findings suggest that magelonids and oweniids are falling out at the base, along with chaetopterids. They are focusing on mitochondrial markers because they are easy to use.

They have already data based a large number of specimens and their genetic information. Ken provided the following examples of research topics that benefited from WormNetII projects.

- Investigations into and resolution of species complexes. *Neanthes acuminata* (Nereididae) – This is a large species complex that has been used historically in various toxicological studies beginning with Dr. Reish in the early 1970's. Using morphological data informed by genetic data Andy Anderson's group found that *N. acuminata* represents up to five separate taxa (work in progress). The morphology results indicate that eye color may distinguish two SCB taxa.
- Research into species boundaries. *Hermodice carunculata* (an amphinomid). – Ahrens et al. (2013) have used data from *H. carunculata* to investigate species boundaries. Eight species were synonymized under the name *H. carunculata*, but one Mediterranean species was subsequently re-instated. Ahrens et al. (2013) found very little COI diversity; although the Mediterranean species did come out as being different, it also co-occurred with other groups. The results suggested that *H. carunculata* is one taxon with a wide distribution across the Atlantic.
- Genetic variability and reproductive strategies. *Boccardia proboscidea* (Spionidae) – Oyarzun et al (2011) looked at reproductive variation in this poecilogonous species compared to geographic distribution. They examined *B. proboscidea* specimens collected from Mexico to northern Washington that showed some morphological differences and crossed known biogeographic breaks (e.g., Point Conception). Results from analyses of cytochrome b and 16S rDNA did not show distinct taxa. Though there were some genetic differences between populations by geographic region the differences supported the natural variability in reproduction of *B. proboscidea*.
- Invasive species. – Simon et al (2009) looked at impacts of *B. proboscidea* on African abalone aquaculture. When Simon et al looked at specimens of *B. proboscidea* found in South African abalone farms, they found that the worms had originated from southern California, most likely the result of oyster imports.
- Cryptic species/unrecognized species. *Diopatra* (Onuphidae) – Berke et al (2010) found an undescribed species of *Diopatra* mistaken for *D. neapolitana* while investigating *Diopatra* range shifts in western Europe. It was later described as *Diopatra biscayensis* Fauchald, Berke & Woodin (2012).
- Determining taxonomic characters. Eunicidae – Zanol, Halanych, and Fauchald (2013) first used phylogenetic analysis to establish monophyletic groups as well as the utility of both traditional and new physical characters, and were able to demonstrate which characters were the most useful for taxonomy.

After the conclusion of Ken's wonderful examples demonstrating the excellent use of genetic work, we dove into many interesting discussions about how SCAMIT members and SCAMIT member agencies could collaborate with WormNetII. SCAMIT members can provide the taxonomic expertise to resolve poor taxonomy, but many members (at least those present) work for government agencies that for a variety of reasons cannot release the resources to support the necessary work (collection, identification, storage, transport of specimens, and cost of supplies). Regina Wetzer reiterated the idea that if the agencies could participate in the collection of representative samples fixed in 95% EtOH the museum could hold them for eventual use by staff or visiting researchers. The issue is gathering the bulk samples, then figuring out the processing that would come later. Larry mentioned that SCAMIT member agencies are already working with SCCWRP to resolve different fixation techniques (such as short-term formalin exposure before transfer to 95% EtOH versus initial preservation in 95% EtOH) and argued that even the collection of special samples remains an issue because just maintaining the EtOH-preserved specimens takes time and resources. Another problem is that soft bodied creatures such as worms need special handling during fixation to maintain their shape. Polychaetes coming out of bulk-fixed 95% samples are typically too contorted and shrunken to be easily identified and may not be identifiable past genus or even family.

The group discussed several different possible goals. Regina again expressed the museum's desire to simply collect bulk samples, an approach better suited to animals with exoskeletons such as crustaceans (her particular specialty). Ken would like SCAMIT to help find interesting problems for collaborative projects. The various monitoring agencies would be grateful for help in species resolutions (e.g., *Leptochelia*, Cirratulidae, cryptic species). SCCWRP has an interest in developing a store of correctly identified and vouchered representative specimens with genetic data. We also briefly discussed how the SCAMIT Newsletter and website could be used to communicate the need for and/or availability of material that needs taxonomists or money. The challenge of WormNetII (or similar projects) reaching out to members of SCAMIT (or other consultants) is that grant money is generally restricted to in-house use, and it is often difficult to bring in outside experts after the fact. Even if the money could be written into a grant, the question still comes down to why is this taxon in southern California more important than others.

After a break for lunch, **Dr Eric Stein shared information about SCCWRP's research interests** in the use of DNA Barcoding as a tool for Marine and Freshwater Bioassessment. They are looking at Mitochondrial CO1 (cytochrome oxidase) gene as a marker. It is not excellent, but it represents a good start. SCCWRP has teamed with BOLD to establish a reference library of vouchered specimens with corresponding genetic information. However, even when complete, there remains the question, "How do we move from research to routine bioassessment?" Currently, the investigations focus on developing standard methods (preservation, reference library, efficacy of molecular approaches, test performance indices, standardization of species delimitations). Freshwater investigations have provided some good results with 20% variability. SCCWRP currently has a suite of marine samples fixed with 95% EtOH with 5% glycerin, 95% EtOH with 15% glycerin, and straight 95% EtOH. The samples have been sorted and identifications are in progress. The question is whether we can find a fixation/preservation method that works for both monitoring and DNA assessment.

SCCWRP is also building reference library through regional monitoring. In the freshwater system there are currently 3,800 recognized southern California taxa, but only 600 are actually used in the various indices. Of those, 260 are registered in BOLD. In the marine environment, 4,400 species are recognized in SCAMIT, and 1200 have been used in index development, but only 180 species are housed in BOLD. Some of the goals are to aid in marine benthos identifications to potentially streamline the assessment process and to help resolve cosmopolitan and cryptic species. For example, in their freshwater investigation of three stream types they found an increase in species richness using genetic technique vs. morphological identification (181 recorded taxa vs. 101, respectively). Part of this difference is simply a matter of some taxa being distinguishable to species by molecular methods that are routinely left at genus or family when using morphology-based taxonomy. The genetic data provided an increased resolution of differences between impacted and non-impacted sites relative to morphological data alone. In the marine environment, SCCWRP has found that some indexes (e.g., BRI and AMBI) yield similar results whether using a full data set of species and abundance or species presence/absence alone. They are also developing new Bioinformatics tools (e.g., data queries to perform specific analysis). The areas ripe for additional research include: finding additional genetic markers, improved primers, next generation sequencing, methods for processing bulk samples, evaluation of environmental DNA (surrounding contaminations), species delimitation, revised bioassessment scoring tools, additional taxonomic groups, adequate vouchering, data management and analysis.

There was some follow-up discussion about the need to have a minimum amount of replication of individuals (minimum of 10) representing each individual taxon. David Gillett raised the issue of scoring the taxa for the test of the different preservation methods. How do you rate a sample as a whole, and how do you rate the different taxa types (polychaetes in tubes vs. arthropods vs. molluscs, etc.). We also delved into issues surrounding where to take this information moving forward, and how does it get down to the taxonomy and resolutions. Concern was also expressed about the huge need to curate the regional product. There are few freezers and ultra freezers on the west cost to store the tissues and samples even if we were able to collect and analyze them.

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Please visit the SCAMIT Website at: www.scamit.org

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The SCAMIT newsletter is published every two months and is distributed freely to members in good standing**.** Membership is $15 for an electronic copy of the newsletter, available via the web site at www.scamit.org, and $30 to receive a printed copy via USPS. Institutional membership, which includes a mailed printed copy, is $60. All correspondences can be sent to the Secretary at the email address above or to:

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SOUTHERN
CALIFORNIA
ASSOCATION OF
MARINE
INVERTEBRATE
TAXONOMISTS

November/December, 2013 SCAMIT Newsletter Vol. 32, No. 4

Paguristes bakeri inhabiting a shell fully covered by the sponge *Suberites* and with an *Ophiopholis bakeri* for a neighbor.
Bight'13 Trawl Station 9287, 201.5 m
Photo by Greg Lyons, CLA-EMD

This Issue

Publication Date: 5 February 2014

APLACOPHORA, 8 NOVEMBER 2013, PAM NEUBERT, CSD

Attendees: Don Cadien, Larry Lovell (LACSD); Kelvin Barwick (OCSD); Wendy Enright, Megan Lilly, Kathy Langan, Ron Velarde, Adriano Feit (CSD); Seth Jones (Marine Taxonomic Services); N. Scott Rugh (Invertebrate Paleontologist); Pam Neubert (EcoAnalysts – Presenter), Susan Kidwell (University of Chicago – Presenter), Tony Phillips, Dean Pasko (DCE).

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.

Business:

Larry opened the meeting with his usual announcement of upcoming meetings. Tony Phillips took a minute to remind attendees that at his December 9th cnidaria review meeting, he will be dealing with infauna species and will not be discussing trawl specimens. Larry then reviewed all the upcoming B'13 trawl invertebrate review meetings which are as follows: Monday, November 18th – Arthropods at LACSD's marine biology lab in Carson. Monday, December 16th – sponges, cnidarians, mollusks, urochordates, sipunculids (if needed), echiurans, polychaetes, and ectoprocts at LACSD. Tuesday, January 7th – Wrap-up meeting for any remaining specimens for further identification (FID) not previously addressed (except Echinoderms) at LACSD.Wednesday, January 29th – Echinoderms (including assessment of all *Brisaster* specimens) to be held at CSD. Many of the 2014 SCAMIT meetings will be dealing with difficult species encountered during the processing of the Bight'13 samples. As of now there are no meetings scheduled for 2014, but that will be changing soon. There was discussion of how the meeting will handle trawl *Brisaster* identifications and how will participants deal with the large number of specimens to be identified and the mixed lots likely expected. Megan anticipated that the specimens will be segregated by depth and that the expectation of mixed lots may be overblown.

The group also discussed use of Bight'13 list server, particularly that it should be used more fully. Larry encouraged everyone to also use the list server to raise questions and issues early in the process. Kelvin reminded everyone to "respond to all" when using the list server to keep everyone in the loop. Responding to just the originator of the email can inadvertently prevent other Bight'13 taxonomists from receiving important information. We also discussed the potential of having meetings or workshops to which participants could bring the not-yet-funded specialty taxa (i.e., *Photis*, Cirratulids, Oligochaetes). Everyone was reminded that Bight'13 taxonomists should separate these groups into separate vials within their sample vial (1/4 dram would be fine), so that they could be easily pulled for the specialty taxonomy, should funds become available, or for identification "workshops" early in the year.

The need to revisit Tellinids was also suggested, but there was no resolution as to who would lead it, or when it might occur.

Finally, Larry summarized the status of the Taxonomic database tool. There is a beta version housed on the SCCWRP website that is nearly ready to release. Larry is preparing documentation to seek additional/continued support from SCCWRP and the major POTW agencies. Additionally, SCAMIT will be hiring an intern to mine images from various computers, etc., to populate the Database tool and clean-up existing vouchers and names in Taxonomic Toolbox. Some of the clean-up will require the expertise of the local taxonomists and we may dedicate portions of monthly meetings to address these issues.

Next Susan Kidwell of the University of Chicago presented a summary of her past decade of work, "Putting the dead to work..." Susan was visiting Southern California to attend the CERF conference and agreed to update SCAMIT on her recent work. Her visit to the CERF conference involved introducing this community to the value of death assemblages for ecological analysis, especially in settings with various kinds of human impacts. She has two new publications providing an overview of her team's findings: "Time Averaging and Fidelity of Modern Death Assemblages: Building a Foundation for Conservation Paleobiology," published in Paleontology, July 2013 (v56, p 487–522); and "Implications of time-averaged death assemblages for ecology and conservation biology", due out in November in the Annual Reviews of Ecology, Evolution, and Systematics (v44). She will be happy to send you pdfs if you email her (skidwell@uchicago.edu). Her team includes former post-doc Adam Tomasovych, who many of you have probably met during previous visits to southern California (he is now back home at the Slovak Institute of Geology), and new post-doc Jill Leonard-Pingel, a recent PhD out of Scripps.

Susan and her lab have been using the grunge (the shelly debris of benthic sediment samples after all the "live" animals have been removed for taxonomic identification) from the monitoring programs of the City of San Diego, Los Angeles County Sanitation District, Orange County Sanitation District and from regional Bight programs. Death assemblages are "time-averaged" accumulations of the skeletal remains of past generations of living organisms. If not too biased by loss or too influenced by exotic input, they should provide insight into local historical ecological conditions. Susan and her team have been using grunge samples from the 1975 BLM survey and Bight'03 as well as recent agency samples from 2004 through 2012, generating species data from dead mollusk assemblages to compare with living assemblages at the same sets of sites. They use far-field reference sites to evaluate the fidelity of death assemblages under relatively natural conditions, and use sets of samples along pollution gradients to evaluate the ability of dead shell remains to detect historical change in ecological conditions.

The following is a brief summary from the wealth of information presented on some very interesting research. Using radiocarbon-calibrated amino-acid racemization dating, Susan's lab can determine the absolute magnitude of time-averaging that these dead shell assemblages represent. She presented *Nuculana taphria* shell-age distributions showing some specimens from agency-sampled Southern California Bight (SCB) sediments to be 12,500 years old. Overall, however, the time-averaged assemblages usually have a L-shaped shell-age frequency distribution, with most shells being less than 100 years old. Another local species, *Parvilucina tenuisculpta*, showed a much younger profile with most shells less than 50 years old. It was interesting that both taxa had older average shell ages on the San Pedro shelf than on the other shelves (e.g., off San Diego, Santa Barbara, Orange County). This might be a signal that living populations there have been especially suppressed during the urban 20th century.

Susan then described her most recent sampling program in the SCB. Using insights into the preservation quality of currently forming death assemblages, she was able to generate a successful NSF grant application to evaluate how the reliability of shell assemblages might change with progressive sedimentary burial, using sediment cores. This work would also give her and her team a chance to reconstruct historical responses to urbanization in the marine environment, going back before the Clean Water Act. Susan collected box and sediment cores using the R/V Melville in September 2012 off Malibu (muddy sediments with no DDT), off the Palos Verdes Shelf and LACSD outfall (muddy sediments with DDT contamination), and near the OCSD outfall (sandy sediments without DDT). They are focusing first on a 50 m site along LACSD's Line 10 where cores have abundant shells. They use the bivalve portion of LACSD's "live" data from 1972 to 2009 to create a prediction of what they should find down-core if the cores are effective recorders of ecological history. In the live data, the bivalve community sampled in the 1970s and early 1980s exhibit high community stability, dominated by the indicator species *P. tenuisculpta*, a signal of anthropogenic stress (steady high nutrients). Over the next several decades, the living bivalve community has contained fewer *Parvilucina* and exhibited greater inter-annual variability in species composition: you get greater instability with cleaner environments, and these samples also had greater evenness among a larger number of functional groups. Their box cores collected sediments ranging in age from 2009 to 1954 with each 2 cm representing 5 years, based on Lead-210 age-dating by collaborator Clark Alexander. The core increments from the 1970s and early 1980s show a peak of *Parvilucina*, consistent with the known ecological history.

Moving beyond the known history since 1972, her comparative analysis showed that shell assemblages from mid-to late 2000s were comparable to those of the 1950 increment. The core thus recognizes that the PV shelf has changed remarkably from its highly degraded state when the Clean Water Act started, and specifically that its recovery has progressed to a state comparable at least to the middle of the 20th century. She and her team are now processing samples from longer vibracores at this PV site in order to get pre-outfall (1937) assemblage information and reach several additional centuries into the pre-urban past.

Susan and her colleagues have gone through extraordinary efforts to rescue historical information on living bivalve communities. For example, they have digitized 6000 pages of CSD data from pre-and post-discharge samples, by quarter and station, collected between 1962 and 1984. In addition, they have digitized the "live" Mollusca data from both the 1954-56 State Water Board and the 1975 BLM surveys along the SCB. The 1975 BLM live data along with the dead data they produced from the grunge of some of those samples is already available publicly at DRYAD (www.datadryad.org), a non-profit organization and general purpose repository of data that provides long-term storage of and access to ecological data used in publications. However, the other historical data will require some taxonomic clean-up, and she hopes that SCAMIT may be able to help in this effort. Larry mentioned that Shelly Moore of SCCWRP has built a tool based on prior SCAMIT lists to take historical data sets and match old records to current SCAMIT names.

Pam Neubert, Aplacophorans

Pam started with a little background on the Aplacophorans. The aplacophorans represent a monophyletic group that is exclusively benthic and marine, occurring across all the world's oceans. All modern forms are shell-less and form two distinct clades, Solenogastres (Neomeniomorpha) and Caudofoveata (Chaetodermatomorpha). There are currently thought to be 18 families and 320 species but this is an underestimate given there are numerous undescribed species. Aplacophorans are traditionally considered ancestral, but as is often the case, that idea is not uniformly held. They have their greatest diversity at 1000 m or deeper.

Amelie Scheltema and Luitfried von Salvini-Plawen are the two dominant workers in the field. Prof. Scheltema believes in the use of hard parts (spicules, radula) to distinguish taxa, whereas Prof. Salvini-Plawen uses anatomical/histological character states. Prof. Scheltema believes they are derived mollusks, whereas Prof. Salvini-Plawen suggests they are ancestral.

Aplacophorans have the following in common with the "typical" mollusc: Radula, mantle cavity, aragonite spicules, but no shell. But are they monophyletic? Most recent evidence suggests yes. Using genetic data, Kocot *et al.* (2011) found that the Aculifera were monophyletic (Chaetodermompha, Neomeniomorpha) and were sister taxa to the Monoplacophora. Sherholz *et al.* (2013) looked at internal anatomy of monoplacophorans and neomeniomorphs and determined that these two groups share developmental traits further supporting the concept of Aculifera. Once they develop to adulthood, the shared traits are lost. Additionally for the first time Todt and Kocot (in manuscript) have found brooding Neomeniomorpha.

Pam then reviewed some of her post-doc work on *Spiomenia*, which has capitate spicules and a radula with denticles lateral to the radular buttress. Pam's work as a post-doc investigated whether Simrothiellidae was monophyletic but that Cavibelonia was not. Dimitry Ivanov shared with Pam how to quickly distinguish four genera of prochaetodermatids. He provided four drawings that demonstrated different patterns of the surface spicules and how they are aligned along the body axis: *Spathoderma* have spicules that spiral outward from antero-ventro center; *Prochaetoderma* have linearly arranged spicules lying longitudinally along the body axis; *Claviderma* have obliquely arranged spicules angled from ventrum-to-dorsum towards the posterior; and *Chevroderma* spicules are arranged in a diagonal chevron type pattern from anterior to posterior.

Having been updated on recent research on aplacophorans, we moved on to discuss the practical aspects of sectioning them. Sectioning is important for new species descriptions and provides useful insights as noted above regarding phylogeny**.** Prior to such invasive analysis, however, information on the external features should be gathered, particularly the morphology and arrangements of the aragonitic spicules that cover the body. These should be carefully scraped off from several areas of the body including the margins of the pedal groove and the mid dorsal area. If there are different types of spicules in different areas all should be gathered and documented. Use of polarized light birefringence patterns can help describe these spicules by providing information of their thickness and three-dimensional forms. Once the spicules have been documented, the spicules and tissues need to be removed to allow for radular dissection. Bleaching the specimens helps rid them of spicules; but maintains the radula. Preparing aplacophorans for sectioning requires multiple steps. Pam showed histological slides of *Spiomenia* from her post-doctoral work and discussed methods for preparing and drawing aplacophorans, and reconstructing internal structure of whole organisms from the histological sections. We also reviewed some of the permanent slides of these specimens, during which Pam demonstrated the capitate spicules of *Spiomenia*. Spicules usually vary in different regions of the body, and many Solenogastres have special modified spicules, which tend to be located on the postero-dorsal portion of the body.

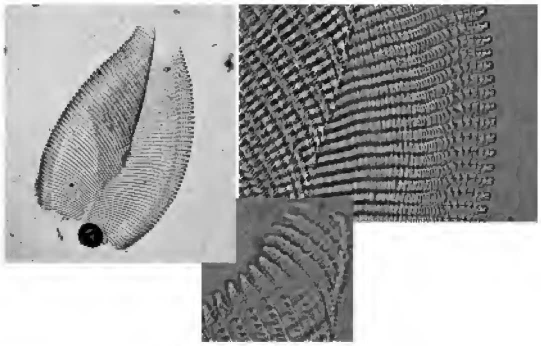
We also saw examples of the copulatory apparatus, including spicules with hooked ends and bifurcate tips. The morphology of the hook and general shape is diagnostic for different genera. These types of copulatory spicules are present only in the Solenogastres.

We next looked at slides of radula structure. There was some discussion of the functioning of the radula and how it works without large musculature attachments. Pam has seen specimens with cnidarian nematocysts as well as sponge spicules in the gut.

We discussed the difficulty of aplacophoran identifications, during which Pam congratulated Kelvin and Don on their key, noting that she uses it all the time. However, there is still some ambiguity regarding *Chaetoderma pacificum* vs. *C. marinelli* vs. *Chaetoderma* sp A, which should be resolved with the discovery of additional specimens. With the various presentations complete, we jumped into the examination of specimens for FID. Wendy had pulled CSD specimens for review by Pam. Two specimens came from 676 m, station 9095 near Encinitas/Carlsbad area, along the lower slope. The first specimen had a large fat oral shield or "lips". We performed a spicule preparation. There was some discussion of the preferred media for spicule preparations – H2O (Pam) vs. EtOH (Kelvin) – but both preferred to get them from the same area of the body by routine. The sample included two species, one denuded specimen originally thought to *C. pacificum* based on general gestalt and the other was something different. Kelvin removed the few remaining spicules from the denuded specimen and mounted them for view via Nomarski polarization. These were long with a narrow base, almost parallel sided, but there were not enough of them to identify the specimen. They then dissected spicules from the second specimen, which had spicules over the entire body. After careful review by Pam, Kelvin, Wendy, Tony, and Ron this specimen was determined to be *Chaetoderma* sp A SCAMIT 2005. As it turns out, Station 9095 was just north of Station 4100 from which *Chaetoderma* sp A had been originally collected. This was only the second specimen of this species found to date.

The second set of specimens came from off the South Bay Ocean Outfall (CSD), Station 9009, 648 m. Of the three specimens, two were determined to be *Falcidens hartmanae*, while the other was *Chaetoderma hancocki.*

Kruppomenia sp radula (ID Pam Neubert). Specimen courtesy of Don Cadien:
Cascadia slope station EBS - 64 950m 05 July 1975
photo credit: Kelvin Barwick



Larry took this opportunity to segue into SCAMIT's Taxonomic Database Tool (DBT). Kelvin and Don's key to the chaeteodermatidae is an excellent example of how the DBT could be used. Each species is linked to the color images of the specimens and their spicules. The beta version of the DBT allows you to click on a species, and pull up information on depth range, phylogeny, distribution map, and, most importantly, images. We're all looking forward to seeing how this tool develops.

Don then introduced a specimen from the Oregon slope that Pam thought might be interesting. It was a member of the Neomeniomorpha, which is as far as Don was able to go with it: Neomeniomorpha sp CS14, a.k.a. the plump C-shaped neomeniomorph. Pam dissected spicules from the dorsal ridge, some of which turned out to be hollow, elongate, and spatulate (thinning and distally curved). There was discussion about whether hollow spicules were specific to *Philodoskepia*. Kelvin, under guidance of Pam's direction, then dissected out the radula, which was hooked. Kelvin cleaned and mounted it revealing a bilateral radula with rows of broad-based, closely packed denticulate bars. This made Pam speculate that it was in the family Simrothiellidae, quite likely *Kruppomenia* sp, representing the first west coast record. Kelvin and Wendy then brought back some beautiful images of the radula.

Don brought out another specimen from the same station. This specimen was full of grouped spicules. It generated a lot of curiosity, but alas as the meeting was reaching the end of a long day, interest dwindled. However, before packing up for the day, Pam and Don identified this second neomeniod from off Oregon as a possible *Tegulaherpia* sp, which would also be a new geographic record for this genus.

Publication Date: 5 February 2014

BIGHT'13 TRAWL FIDs, ARTHROPODA, 18 NOV 2013, LACSD

Attendees: Larry Lovell, Chase McDonald, Cheryl Brantley, Don Cadien (LACSD); Kelvin Barwick, Danny Tang, Ken Sakamoto (OCSD); Wendy Enright, Megan Lilly, Matt Nelson, Maiko Kasuya, Ron Velarde (CSD); Kelly Tait (AMEC); Mark LeBlanc (NHMLAC); Wayne Dossett (MBC); Emmanuel Riccet, Greg Lyon (CLAEMD); Jim Mann (ABC); Tony Phillips, Dean Pasko (DCE); Emile Fesler (BioNeyda).

Business:

This was the first SCAMIT sponsored Bight Trawl identification meeting. There was some discussion about the upcoming meetings, their meeting dates and locations. Please see the SCAMIT website or read the General Membership emails for the latest developments. After some discussion, the group decided to hold the January 2014 meeting to discuss Echinoderms at the City of San Diego laboratory.

Specimen review:

Don began by asking what had been brought for further identification (FID).

- **CLAEMD** - Shrimp confirmations; along with *Paguristes bakeri*, and *Pachycheles pubescens*
- **MBC** - One peneid shrimp
- **AMEC** - Several anomurans, shrimp, and brachyurans
- **OCSD** - Several samples of shrimp for verification
- **CSD** - Squat lobster (*Munidopsis aspera*) to show and tell, and, if time allows, incidentally collected sergestid shrimps and mysids,
- **ABC** labs - A number of shrimp, brachyurans, and pycnogonids

Ron asked if anyone pulled *Neocrangon recima*/*zacae* from their trawls for fixation in 95% EtOH for genetic analysis. Ethanol fixed specimens of both species were collected by CLAMED, CSD, LACSD, and OCSD. Eric Pilgram of the EPA Cincinnati lab will be performing the genetic analysis to resolve these co-occurring species.

We decided to take specimens in order of pycnogonids, brachyurans, anomurans, finishing with the more numerous shrimp. Larry suggested that we also discuss relevant literature that laboratories should consider using in the field or in the laboratory to complete these identifications in the future.

Although the workshop was successful in finalizing the identifications of all of the specimens brought to the meetings, not every identification was documented in detail. For the most part, the Secretary took notes of specimens being identified by D. Cadien while other taxonomists worked at other microscopes available at other locations in the laboratory. During the latter part of the day, R. Velarde confirmed shrimp specimens from other laboratories to insure that all specimens were completed before day's end.

Pycnogonida

ABC brought a few specimens of *Nymphon pixillae* for identification. No other species of pycnogonids were examined.

Anomura:

CLAEMD brought a beautiful specimen of *Paguristes bakeri* that had burrowed deeply into a shell overgrown by the sponge *Suberites*. Greg had an excellent cross-section photo of the specimen within the sponge (see cover photo). We discussed the application of a mechanism for deciding whether the chelae are "very broad" or not. Dean had measured many specimens (large and small) when working for the City of San Diego, and found that the width of chelae – measured at the widest portion of propodus behind the dactyl – in *P. bakeri* is ≥75% of the length; where as it is ≤66% in *P. turgidus*. In addition, Tony noted that the corneal spines of *P. bakeri* are much less pronounced and less pointed than those in *P. turgidus*. The primary references for this group is Janet Haig's key updated by SCAMIT (J. Haig: A preliminary key to the hermit crabs of California. AHF, Revised 14 February 1990) or Wicksten (2012).

ABC Labs brought another, smaller, *P. bakeri* housed in a *Megasurcula* shell. This specimen was collected from the Santa Barbara Channel, and was verified by D. Cadien.

CLAEMD also brought in a specimen of *Munnidopsis aspera*, from 466 m that was confirmed. The primary reference for this group is Cadien (1997: California Galatheids, D. Cadien, CSDLAC, 10 December 1997) or Wicksten (2102). *M. aspera* differs from *M. depressus* in absence of a strongly upturned rostrum or ventro-lateral spines, and the presence of setose chelae. *Munnidopsis* are easy to quickly separate from other galatheids by their "white" eyes. *M. aspera* is an addition to the SCAMIT species list. It is not often collected due to preference for hard bottom substrates; whereas *M. depressa* is thought to be associated with multi-armed seastars. Ron then passed around their specimen of *Munnida tenella* (see photo in SCAMIT NL, Vol. 32, No. 1).

We then reviewed a CLAEMD specimen of *Pachycheles pubescens*, which was confirmed using Wicksten's key (2012). The specimen initially keyed to *P. holosericus*, but is distinguished by the presence of 7 telson plates vs. 5 in *P. holosericus*.

Brachyura

We made a valiant effort to work our way through the Brachyurans before lunch. AMEC brought a number of vials for review, most of which were immature Majoids (left in Majoidea). Nearly all of these were very small (carapace diameter < 1cm), and although many looked like juvenile *Pyromaia*, they were determined to be not reportable because they did not meet the criterion of having a diameter of ≥1 cm. Only one or two specimens were considered countable by this criterion, and then confidently identified as *P. tuberculata*. The primary identification aid for this group remains Debbie Zmarzly's Understanding Majid Crabs (we all need a little understanding) an internal publication of the City of San Diego Lab that has been widely circulated among SCAMIT member agencies, along with Wicksten (2012) and Garth (1958).

Kelly also had several specimens labeled as *Lophopanopeus*. Unfortunately, many of these specimens were also <1 cm and considered too small to identify. However, one station contained several specimens that exceeded the 1 cm mark, and also retained their chelae. All keyed to *L. frontalis* with the absence of several key characteristics: a large proximal tooth on the dactyl, bilobed carpus of ambulatory legs, and granulate chelae. Don reviewed several other specimens from other stations and all were confirmed as *L. frontalis* based on one or more of the above characters.

ABC brought a small, densely decorated *Loxorhynchus* that was determined to be *L. grandis* by the presence of the two vertically stacked hepatic spines, relative to one in *L. crispatus*. Wicksten (2012) confirms the use of this character over the spread or deflexed nature of the rostrum or use of the crab's carapace decorations. Several other Majoidea samples brought for review contained mixed batches of *P. tuberculata* and *Podochela lobifrons.* A different sample contained a specimen decorated with an anemone (*Urticina* sp A, recognized by the uneven rows of verrucae on the column) with a nearly 1 cm broad disc, and a large barnacle (*Paraconcavus pacificus*). Although this specimen was relatively large, it could not be easily identified because the barnacle had completely overgrown the carapace along the posterior margin and obscured the key characters; however, after some debate, the specimen was identified as *P. lobifrons*.

P. tuberculata was then confirmed from another station.

The OCSD representatives brought a kelp crab collected from 78 m off northern San Diego County. There was some debate over the identity of the specimen as it did not readily key using Wicksten (2012). No one was sure if the difficulty was the result of the specimen (roughly 5 mm in carapace width) being an immature representative of a large taxon, or a poor specimen of something smaller. The key in Wicksten and descriptions in Garth (1958) kept leading us in the direction of *Pugetia*, but the specimen just didn't fit any description or image correctly. Eventually, recognizing that it was a male, we pulled the gonopods and, comparing these to the figures in Garth, Dean concluded that the specimen might represent an immature *Chorilia longipes* (Plate P, Figure 4). However, the specimen did not show the extended rostral horns. There was some debate that the gonopod also resembled that of *P. producta* (Plate L, Figure 2), but again the carapace did not resemble the images or description. Alternatively, there was some resemblance to the gonopod represented of *P. richi* in (Plate L, Figure 3), which everyone was initially leaning towards based on the Wicksten's key. In the end, the specimen and gonopods were return to the OCSD staff with some confidence that it belonged to the family Epialtidae, but unsure of the specific identification, with a blessing to decide for themselves given all the information that had been discussed and debated.

Shrimps

Wayne (MBC) brought a specimen of *Sicyonia* from Station 8355 in the Harbor area that had been collected with many *S. penicillata*, but the specimen just "looked different." The key literature for this group is Perez-Farfante (1985). The specimen was fairly small, relative to the co-occurring adults, and had a broken rostrum. The defining characters of the spination of the rostrum, carapace, and abdomen were not developed to the point of allowing for a confident identification. It had some characteristics of *S. penicillata*, but could not be verified, although better judgment suggested that it was probably the same as the other specimens from the same trawl.

ABC brought several samples containing large numbers of crangonids. These were predominantly mixed lots of *N. zacae/resima*, and one *Neocrangon alaskensis* from Station 9424 (63 m).

AMEC brought a *Heptacarpus palpator* confirmed by R. Velarde, from Mission Bay, Station 8152, about 12 m, while a *Metacrangon spinosissima* from station 9431 was confirmed. Station 9419 from 191 m contained a mixed bag of *N. resima*, *N. zacae*, and *Heptacarpus tenuissimus*.

CLAEMD received confirmations from R. Velarde of *H. stimpsoni* (Stn 8318, in LA Harbor); *Lysmata californica* (Stn 9319, SMB), *Spirontocaris holmesi* (Stn 9287, SMB), *S. prionota* (Stn 8322, LA Harbor).

CNIDARIA, 9 DECEMBER 2013, TONY PHILLIPS, OCSD

Attendees: Carol Paquette (MBC); Terra Petry, Larry Lovell (LACSD); Erica Jarvis, Rob Gamber, Ken Sakamoto, Laura Terriquez, Kelvin Barwick (OCSD); Greg Lyon (CLA-EMD); Megan Lilly, Nick Haring, Wendy Enright (CSD); Beth Horvath (SBMNH); Tony Phillips, Dean Pasko (DCE)

Business:

The Jan 7th meeting will be follow-up from the December 16th B'13 Trawl meeting covering all things not arthropod or echinoderm.

The January 29th meeting will cover trawl Echinoderms at CSD.

Larry put out a general request for 2014 meetings. Most will likely be Bight'13-related. Megan suggested a meeting dealing with small sipunculids in grab samples and how to distinguish them (e.g., *Siphonosoma ingens* vs. *Sipunculus nudus*); although the single topic may not be enough for full meeting. Tony mentioned that he is getting *Thysanocardia* from Puget Sound that look different externally.

This prompted additional discussion of potential Bight'13 meetings in a workshop format to take some burden off the host. For example, one or more individuals could host the workshop where Bight'13 taxonomists could bring their troubling specimens for further ID, resolution, confirmation, or just to inform others (e.g., provisional taxa demonstrations), without the host(s) being burdened with creating large presentations.

Larry also reminded everyone to vial specialty taxonomy taxa (oligochaetes, cirratulids, *Photis* spp) into separate vials and within jars by taxa. This effort will facilitate the identification of these taxa should the funding come through in succeeding years.

Don Cadien will be divesting himself of a large portion of his literature collection. He intends to donate it to SCAMIT members and SCAMIT so that it could be sold to raise money for SCAMIT.

Tony then began the presentation titled: Infaunal Anthozoa of the SCB, Big John's Legacy. Tony explained how he came about getting these samples when helping clean out John's storage and collection. During the clean-out and organizational effort, Tony found many of John's personal voucher specimens, including a number of provisional taxa that had not been clearly documented. He added other donated specimens from Carol, Don, Dean, and his own collection to compile this presentation. Tony also paid tribute to John's work and the reliance we all had on John such that many of us let this very difficult group go without giving it a lot of effort. [We all owe Tony a big favor for spending many hours and hours photographing and documenting as well as possible John's legacy in this presentation. It was a Herculean effort!]

In going through John's material and notebooks, and in his efforts to give himself a better understanding of the subject, Tony found the following material of great value: The MMS Atlas, Volume 3 has a lot of value including an excellent glossary and great species descriptions; Light's manual has an excellent key, but poor glossary; the British Anthozoa (Manuel 1981) is a great resource for general family and generic descriptions and illustrations; and John's notebook that provided a great history of the evolution of his thinking on these taxa. He discussed the difficulty of the soft internal characters used by Cnidarian specialists to identify specimens that has been a stumbling block for us all (e.g., siphonoglyph; actinopharynx; primary, secondary, tertiary mesenteries; acontia; etc.). Tony did not try to deal with the scleractinia but suggested Bythel (1986) "Guide to the Living Corals", and Cairns (1994) "Scleractinia of the Temperate North Pacific". Carlgren (1949), the survey of the actiniara includes keys to all taxa but uses internal characters that are often difficult to interpret or apply. Definitions of the various families and genera can be found in Carlgren's publication. Tony explained that he was not trying to provide a workshop of "how to id the anthozoans" but wanted to provide us an opportunity to get on the same page by providing images of material collected from the SCB. The presentation of images followed the organization of SCAMIT Ed. 8, and using John's identifications and names as he applied them; however, this was not intended to be an exhaustive review of all the taxa listed in SCAMIT Ed 8, only a review of John's collection. Some of those IDs were changed according to collective discussions that took place during the meeting. An updated presentation will be made available at the December 16 Trawl Review meeting. Tony also said that this is a "living" presentation: As other species listed in Ed 8 or new species are identified from Bight'13 samples, he will photograph them and add them to this presentation.

Tony started with describing the list of taxa he would be covering. [Secretary's clarification: in the polyp phase of cnidarians, the proximal end is the basal end where the physa or pedal disc is located, and the distal end is the mouth-tentacle end.]

Heterogorgia tortuosa – Beth Horvath looked at these in 2012 and initially believed them to be something else (probably *Leptogorgia*). Tony followed Beth's lead and went to literature and found support for Beth's claim that our *Heterogorgia* is probably not so. The species referred to as *H. tortuosa* by members of SCAMIT actually has a calix with "flaps" that fold over the polyps, which are characteristic of *Leptogorgia*. Real *H. tortuosa* have polyps placed irregularly over the rachis, and are bright yellow. However, Beth clarified that the sclerite form of this species was more true to *Eugorgia*. Beth will be describing this species as a *Eugorgia* sp nov (not *Leptogorgia*). For now, SCAMIT members should continue to use *Heterogorgia tortuosa* to reference this white gorgonian with alternating polyps arranged opposite each other, and with slits that fold over the polyps because Bight'13 identifications are to be based on the SCAMIT Edition 8 listing.

Tony then showed *Thesea* sp B with polyps placed randomly around stalk, colored gray to yellow-white and calyx with 8 lobes surrounding opening of polyp. *Eugorgia*, *Filigorgia* and *Thesea* all have eight lobes. The ensuing discussion of *Thesea* sp A (stalk is white) vs *Thesea* sp B, concluded that no one really sees a *Thesea* sp A; however Beth later mentioned that she has some specimens that she got from John. Her recollection was that they were the same. *Thesea* typically has "football" sclerites, but some specimens/colonies will develop without them. Beth plans to revisit some of these specimens from John to help resolve this question. [At the trawl FID meeting on December 16th a specimen of *Thesea* thought to be sp A was shown by San Diego. The specimen was white like *Thesea* sp A, but differences in general morphology (width of stalk, placement of polyps and difference in sclerite size) had Beth come to the conclusion that this could be another species. At this time it will be called *Thesea* sp SD1. Pictures have been taken by Tony of the individual and will be added to the presentation.]

We then looked at juvenile Renillidae, *Renilla koellikeri*. Juveniles, taken from shallow waters in fine sediments, look very different from the adults with 4 mm specimens having a single main polyp.

Stachyptilum superbum was next, another juvenile, but this time from deep water. This juvenile

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specimen had a single calyx with large spines that surrounded a solitary polyp, and had spicules along the axis.

Tony then moved into the members of the Virgulariidae. *Acanthoptilum* has sclerites at the base of each extended leaf. The MMS Atlas includes descriptions of two species, *A. album* Nutting 1909 and *A. gracile* (Gabb 1863), and makes mention of a third, *A. annulatum* Nutting 1909. One species, *Acanthoptilum* sp Type 1, is probably *A. annulatum*. It has reddish sclerites below the extended leaf. Another species, *Acanthoptilum* sp Type 2, appears to have white sclerites below the leaves. However, the distinctive SCB shelf species with the reddish peduncle will continue to be referred to as *Acanthoptilum* sp per SCAMIT Edition 8 protocol.

Stylatula elongata is another common taxon collected in our trawl and benthic samples. *S. elongata* has many sclerites below the tightly grouped polyps of each leaf. Megan has observed specimens in the field with pigment at the base of the polyps, even though the species is described as being white. The pigment is generally uniform on the polyps, like that on *Virgularia californica*, but fades with time in EtOH. We also discussed juvenile *S. elongata*, which will have tightly packed leaves vs. *Stylatula* sp A, which has the polyps widely separated and fewer supporting spicules per leaf. We then clarified that counts of *S. elongata* are handled a little differently than other sea pens. We typically include a count of one (1) even when the peduncle is not present because *S. elongata* have a very elongate rachis with the peduncle oft well below the penetration depth of the van veen grab, and the rachis is often broken to fit the specimen within the sample vial. This method of counting is not followed with the other sea pens.

Stylatula elongata with pigment

Virgularia agassizii, V. californica, and *V.* sp B do not have sclerites below the leaves. *V. agassizii* has just a few polyps (three to five) and with very little color.

V. californica has six to eight polyps per leave, although 17–18 are reported in the literature. The polyps have dark pigmented cores and the siphonozooids are also darkly pigmented. Tony noted that the polyp color can fade with time, but the siphonozooids maintained their color.

Virgularia sp B has 5–7 polps per leaf and siphonzooids that are <u>not</u> darkly pigmented. Instead *Virgularia* sp B has a brownish ground color at the base of each polyp which extends down to the rachis. The actual tips of the polyps are white. The specimens came from OCSD samples, in 50–60 meter water.

Tony also showed some beautiful pictures of *Pennatula phosphorea*, a deep-water animal from depths >400 m. It has sweeping reddish polyp leaves with long sclerites that all bend to one side, with a rachis base that is white, and which contains groups of small sclerites within. Tony noted that the MMS Atlas is a very good reference for these deep-water taxa.

We finished the sea pens with a few pictures of *Ptilosarcus gurneyi*, the brightly colored orange-red pen with a thick peduncle and large rachis.

We next dove into the Ceriantharia, a difficult group for most of us. Cerianthids are true tube-dwelling anemones that are exclusively infaunal. They are defined as having simple tentacles in two cycles: longer marginal and shorter oral tentacles, and unpaired complete mesenteries. They are quite distinctive in having a long, tapering, smooth column that ends in a typically narrowed end. Tony noted a difference in color between the different cerianthids in John's collection, particularly *Arachnanthus* and *Pachycerianthus*. *Pachycerianthus* is distinguished by having a chocolate brown column, whereas *Arachnanthus* are typically a lighter shade of brown and some specimens from the Channel Islands were white. *Arachnanthus* have mesenteries that reach toward the end of the body and end in acontoids. *Arachnanthus* sp A is defined as a brown cerianthid with a single pair of mesenteries running the length of the body, each ending with a single acontoid. However, during a review of Molodtsova 2003, Tony learned that *Arachnanthus* can vary from having zero to two acontoids. In *Arachnanthus* sp A the acontoids are typically cream colored, but those from the Chanel Island specimens were bright white. Another specimen from the Channel Islands had a brown column but two acontoids per mesentery.

Tony found a couple of vials labeled as *Ceriantharia* sp C, which John had defined as a cerianthid with mesenteries that stop about 1/2 to 2/3 the way down the base. However, Dean raised the point that John had told him that he had stopped recognizing *Ceriantharia* sp C because he considered it an invalid taxon. After some discussion, the group decided that we should keep a lookout for specimens representing this mesentery arrangement, but would report it as *Ceriantharia*.

Pachycerianthus, in addition to being chocolate brown, are very large by comparison. The largest Pachycerianthids can be 50+ cm, and live in meters-long tubes. Carol mentioned that she has seen specimens that are large enough to fill a quart jar. In reviewing the specimens, Tony noted that *Pachycerianthus* has labial palps and a ribbed actinopharynx, which were absent in *Arachnanthus*, and mesenteries that are much more thickened in the middle of the column.

We then discussed how to deal with specimens that are tangled such that they cannot be reliably dissected or that have broken bases. These should all be referred to the Order Ceriantharia. In addition, some are clean but do not have acontoids or other distinguishing characters. These too are referred to Ceriantharia. Tony and others recommended that when collecting benthic grabs, it is good practice to separate the cerianthid tubes from the remainder of the sample by placing them in a whirl pack or separate container because they can create such a mess when dismantling them to collect the anemone.

After a lunch break, we moved into Part II of Big John's Legacy: The actiniarians, corallomorphs and provisional/unidentified species. Tony noted that the actiniarians are the most commonly encountered anthozoans in our samples and that for the purposes of identification, cross-sections seem to be more valuable than longitudinal sections.

We began with the Edwardsiidae. Edwardsids are elongate, infaunal anthozoans, whose body is divided into several distinct regions: capitulum, scapus with periderm, scapulus without periderm, and an aboral end that may be differentiated into a physa. They have eight primary mesenteries – enumerate the primary mesenteries only, i.e., those attached to body wall and pharynx. The presence or absence of nemathybomes – ectodermal invaginations of the mesogela containing nematocyst batteries – is of generic value.

Drillactis sp (=*Nematostella vectensis*) is a small edwardsid with brownish coloration to the column and very thin tentacles. There were no descriptions of the species from preserved material. They differ from *Edwardsia* and *Scolanthus* by the presence of fine tentacles, tapered distal end, and absence of nemathybomes. This species has only been found in estuaries between 1 and 5 meters.

As Tony looked through vials of *Edwardsia* and *Scolanthus* he found vouchered specimens that did not match the descriptions. This group has represented a conundrum for many years among those of us performing cnidarian identifications in the SCB. Tony spent quite some time trying to make sense of the publication (Daley and Ljubenkov 2008) relative to the specimens at hand, but ran into some difficulties.

Edwardsia californica – Tony mentioned the disconnect between the description of *E. californica* relative to the key, particularly couplet 4B, which suggests that the nemathybomes are inconspicuous. However, Tony noted that the nemathybomes are very prominent and quite easily seen in straight rows raised above the epidermis. He also noted that the physa is very thin and the body has a soft, flimsy structure. Do not use presence of debris on the physa as a distinctive character as this was seen on several different species.

Megan showed an image of a San Diego specimen that may be a new species of *Edwardsia*. They are hoping to collect more specimens.

E. handi – Daley and Ljubenkov (2008) note that *E. handi* replaces *E. californica* north of Point Conception. *E. handi* has large protrusive nemathybomes in low density between mesenteries, with basotrichs of two different sizes.

E. juliae – a compact animal with small nemathybomes that do not protrude notably above the epidermis. There are two forms pictured: a smooth form and one that is tightly packed and wrinkled. They are typically collected from 10 – 15 m in outer harbor areas, but can be found on the shallow shelf to 45 meters. Tony noted that many of the specimens he has seen have an ivory white physa.

E. olguini – The basal end of *E. olguini* is expanded, making them look like *Scolanthus,* but the nemathybomes appear smaller and more depressed than those of *Scolanthus*.

E. profunda – This deep water species is distinguished by the rosette-shaped physa. It also has tiny nemathybomes that occur in a single row proximally and spread out as you move away from the base.

Scolanthus scamiti – This bay species is reddish brown and has small nemathybomes in irregular rows that occur in higher concentrations proximally than distally.

S. triangulus – This nearshore edwardsid has large nemathybomes arranged in irregular rows. The large nemathybomes have large basotrichs that lay one on another and appear like stacked bananas.

The Halcampoididae are also elongate, vermiform anthozoans, without a sphincter, and with a physa-shaped, rarely flattened, proximal end. *Pentactinia californica* is our local representative. It has tenaculi with adherent sand grains along the column, white tentacles without internal pigment, and five pair of perfect mesenteries. Juveniles generally do not have the full complement of mesenteries. For example Tony reviewed one 4 mm specimen with eight mesenteries.

The Limnactiniidae are a vermiform anemone that do not have any tentacles, nor a sphincter. There are eight to 10 perfect mesenteries and the oral disc has a very thickened ectoderm. John had recognized one species, Limnactiniidae sp A, and Tony provided some excellent images. It has no tentacles, but typically retains some coloration in oral region where tentacles might be placed if present, and a long actinopharynx.

Among the Haloclavidae, we discussed *Anemonactis* sp A, *Harenactis attenuata*, and *Peachia quinquecapitata.* There are supposed to be 20 tentacles in *Anemonactis*, but Tony never found one with that many. The tentacles often have pigment within, and have capitate tips, which can be wider than the remainder of tentacle, while the wrinkled column has rows of papillae externally, and a large basal pore. Juvenile *Anemonactis* have fewer tentacles, but the tentacles are still capitate.

Harenactis attenuata has a physa-like aboral end that is often flattened. It has 24 tentacles, a smooth column with cinclides (pores). The specimen reviewed was collected from 30 m on D transect off LACSD.

Peachia quinquecapitata has 12 tentacles that are nipple-like to digitiform, six pairs of primary mesenteries that are continuous along the entire column. A longitudinal section is valuable to verify that the mesenteries run the full length of the animal.

The Halcampidae are not too different from the Haloclavidae. John had a specimen of *Cactosoma arenaria*, which had 24 tentacles, and the columns of a couple of specimens were covered in adherent material. These also had six pairs of mesenteries.

Halcampa decemtentaculata has 10 tentacles and five pairs of perfect mesenteries. Generally, *H. decemtentaculata* is white, with a clear physa, and tentacles without pigment, although CSD staff mentioned that they get specimens with pigment, both associated with the tentacles and occasionally with a pigmented column.

Halianthella sp A has six pairs of mesenteries, groups of 12 tentacles with pigment, and a physa. The column is almost always found with encrusting material, typically of uniform sized sand grains. In contrast, *Pentactinia* has more heterogeneous sand grains adhering to the column. *Halianthella* sp B was not covered here, but is included in John's presentation of Anthozoa from Bight 2003.

Among the members of Actiniidae, Tony showed a small, 2.5 mm specimen that had been labeled as *Anthopleura* sp; however, the group felt that there was not enough evidence to identify the specimen at the generic-level.

Tony then showed a few pictures of specimens labeled as *Epiactis prolifera*. These had a distinct pedal disc, many tentacles, and a wrinkled to smooth column. Tony noted that the mid-portion of the tentacles was larger than either the base or tip, which may be something worth watching for.

Urticina sp A is a relatively large specimen with large veruccae on the distal end of the column, beneath the tentacles. The veruccae occur in tight longitudinal rows. Tony mentioned that *U. macpeaki* was described from the Pacific Northwest by Hauswaldt & Pearson (1999), but the authors made no reference to MacPeak's *Urticina* sp A.

Zaolutus actius (Isanthidae) is another common elongate anemone with a slightly papillated column, elongate tentacles, and a pedal disc. We had a lot of discussion about whether all of the specimens John referred to *Zaolutus* were representative of a single taxon. Some specimens were very similar to other lots listed as *Diadumene*. We found there to be a discrepancy in several pictures, which Tony noted for correction.

Flosmaris grandis (Isopheliidae) has a large pedal disc, with many tentacles (from 80 – 100) and occurs in shallow water. The specimens that Tony photographed were quite large.

Sagartia catalinensis (Sagartiidae) often occurs on hard substrates (rock, shell, etc.) and forms to the shape of the substrate.

Bunodeopsis sp A (Bolocerodidae) is a small species with long tentacles for its small size. A large specimen is only 2–3 mm tall. These tentacles are not retractile, and are often shed upon collection. *Bunodeopsis* are hard to cross-section because they reproduce asexually and you get mixed counts of mesenteries.

We looked at a few pictures of *Metridium* sp (Metridiidae) which have up to 100 tentacles, a pedal disc, generally ribbed column, and an outer lip that is always ribbed (vs. *Epiactis* or *Urticina*, each of which has smooth lips). *Metridium* also have numerous primary mesenteries.

Corynactis californica (Corallimorphidae) is another small species found attached to rocks and debris, but is distinguished by the clearly capitate tentacles.

We then reviewed several pictures of John's provisional taxa that could not be neatly placed into any of the existing anthozoan families. *Actiniaria* sp 10 (as recorded in Bight'03) is the same, we think, as *Acontifera* sp A (recorded from Bight'08). This is a small species reported from off the Channel Islands, that has adherent shell hash, or not, but is often attached to shell hash. There is very little else to go on.

Anthozoa #49, commonly referred to as "The Brown tent anemone," is a distinctive creature sometimes overlooked because of how it tightly compresses against the substrate to which it attaches (shell or other material). It has six pairs of mesenteries, with muscles positioned towards middle.

Zoanthidea sp A is a small, elongate species from Bigth'03 that is completely encrusted with sand grains and shells. It has tentacles that appear cupped.

Zoanthidea sp B, also from Bight'03, is similar in basic appearance to Zoanthidae sp A except that the specimens are connected. It also has cupped tentacles, and is likely the same species: We couldn't distinguish any differences between the two species!

At the very end Tony showed pictures of specimens that none of us could identify, but were good for all of us to see. Species (?) 1 had been taken from 45 m at a couple of sites in Santa Monica Bay in 2010 and 2011. It had a brown mottled column with distinctive mesenteries. Species (?) 2 is another small, 5 mm specimen collected in Bight'08 from shallow waters. It is a clean, de-nuded species with eight clear mesenteries visible through the body wall, and clear in cross-section. Species (?) 3 is another Bight'08 species collected at 42 m, and distinguished by a dense mesoglea in cross section and a large number of mesenteries. There were specimens labeled as Species (?) 4 but looked like juvenile *Halcampa decemtentaculata.*

Tony showed a few slides comparing Species ?1 and ?5 which seemed to represent two different species. Although very similar in overall appearance, the number of mesenteries differed.

Finally, Tony showed specimens that one should only list as “Actiniaria.” These are specimens without any clear qualities or which are exploded leaving one without anything to go on other than the fact that you have a countable specimen.

B’13 TRAWL FIDs, 16 DECEMBER 2013, OCSD

Attendees: Mark LeBlanc (NHMLAC); Greg Lyon (CLAEMD); Megan Lilly, Matt Nelson, Maiko Kasuya, Wendy Enright (CSD); Beth Horvath (SBMNH), Kelly Tait (AMEC); Jim Mann (ABC); Tony Phillips (DCE); Ken Sakamoto, Laura Terriquez (OCSD); Larry Lovell, Cheryl Brantley, Don Cadien (LACSD).

Business:

Larry called the meeting to order with a round robin of introductions and reminded us that Part 2 of the Mollusca & Miscellaneous Phyla review will occur at LACSD Tuesday, January 7th. The final Trawl FID meeting will be Wednesday January 29 at CSD to address Echinodermata.

There seem to be some continuing issues with emails to/from the Bight’13 taxon listserver either not coming in or going out. If you’re having problems, please check with your local IT staff for potential issues.

Tony clarified a couple of corrections to his Cnidarian (Anthozoan) presentation from last week and re-distributed his corrected power points (e.g., *Heterogorgia tortuosa* will be transferred to *Eugorgia* sp 1, *Edwardsia handi* is actually *E. californica*, etc.). However, these changes will be proposed for Edition 9 and name usage for Bight’13 identifications will follow Edition 8 of the SCAMIT Species List.

Larry turned the meeting over to Don and the meeting broke up into Mollusca, Cnidaria, and other groups with Beth Horvath on hand to help ID the gorgonians right away.

ID resolutions:

Mollusca – We confirmed specimens of *Tegula eiseni*, *Caesia fossatus*, *Argopecten ventricosus*, *Norrisia norrisi*, *Megastraea undosa* for Kelly and then identified *Janolus barbarensis*. During the process we realized that the picture of *J. barbarensis* in David Behrens’ nudibranch book (Behrens 1991) is “awful” and not representative of the actual animal. A picture of a live specimen brought in by Kelly looked like a *Limacina crockerelli* upon initial inspection. The key character is the indigo blue band beneath the tips of the cerata, which can be either white or more commonly golden.

Platydoris macfarlandi, *Flabellina,* and *Polygireulima rutila* were idenfied for the CLA-EMD staff. There were no specimens of the *Flabellina,* photos only, so we were unable to identify the specimen any further.

Confirmed *Calliostoma keenae* for CSD and identified specimens of *Antiplanes thalea* and *Borsonella merriami,* a new record of live occurrence in the SCB.

Confirmed *Octopus rubescens* for ABC and identified *Calinaticina oldroydii*, *Cancellaria crawfordiana*, *Calliostoma tricolor*, *Antiplanes catalinae*, *Rossia pacifica*, *Acanthodoris brunnea,* and *Tritonia tetraquetra*. A *Simnia* sp was put off for the January meeting when Ron Velarde could attend.

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Confirmed *Lamellaria diegoensis* for OCSD. The specimen was without the dermis, and the shell looked quite a bit like *Sinum scopulosum*.

The CSD lab also had a specimen of *Opisthoteuthis* for confirmation. Don Cadien reminded us that *Opisthoteuthis californica* has a larger web and is more disc-shaped/flatter than *Opisthoteuthis* sp A. Megan will still perform a dissection of SD's specimen to do a gill lamellae count to confirm her identification.

Cnidaria – Don also reminded us that *Thesea* sp A Ljubenkov 1986 is bright white, very thick, with scattered polyps (i.e., a 5 cm section will have about 8–10 polyps). Wendy brought a white *Thesea* that was not sp B, and which will become *Thesea* sp SD1. A voucher sheet is in preparation. *Thesea* sp SD1 is white and otherwise very similar to *Thesea* sp B; however, Beth confirmed that the sclerites are different: smaller and without the "footballs" common in *Thesea* sp B.

Beth looked at many gorgonians for us, including *Muricea californica* (CLA-EMD), *Thesea* sp SD1 (CSD), *Eugorgia* sp 1, which Beth will be describing in her upcoming manuscript, *Thesea* sp B, *Adelogorgia phyllosclera*, and *Eugorgia rubens* (OCSD).

Other Cnidarian identifications/confirmations included *Virgularia agassizii*, *Tubularia* sp A, *Aglaophenia* and *Plumularia* (CLA-EMD), *Stephanauge* sp, *Stylatula elongata* (CSD), *Parazoanthus*, *V. agassizii* (OCSD) and *Acanthoptilum* sp (ABC).

Other Miscellaneous Phyla –We then dove into the few remaining specimens of various sorts.

Echiura – *Nellobia eusoma* was confirmed for OCSD.

Ectoprocta – Membranoporidae, *Scrupocellaria diegensis*, Crissiidae were reviewed for CLA-EMD.

Annelida – *Aphrodita longipalpa*, notable for the absence of eyes, longer palps, and presence of a cirriform median antennae, *A. negligens*,and *Chloeia pinnata* were confirmed for ABC Labs. A few specimens of "trawl caught", but true infaunal annelids were examined and identified for AMEC.

Sponges will be addressed at a separate meeting since most (all?) specimens brought for FID by AMEC were from SD Bay. Megan will set up a separate meeting to review those.

The meeting successfully handled all the trawl FID material that was brought to the meeting. Thus the Jan 7 meeting will not be necessary and was cancelled.

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The SCAMIT newsletter is published every two months and is distributed freely to members in good standing. Membership is $15 for an electronic copy of the newsletter, available via the web site at www.scamit.org, and $30 to receive a printed copy via USPS. Institutional membership, which includes a mailed printed copy, is $60. All correspondences can be sent to the Secretary at the email address above or to:

SCAMIT
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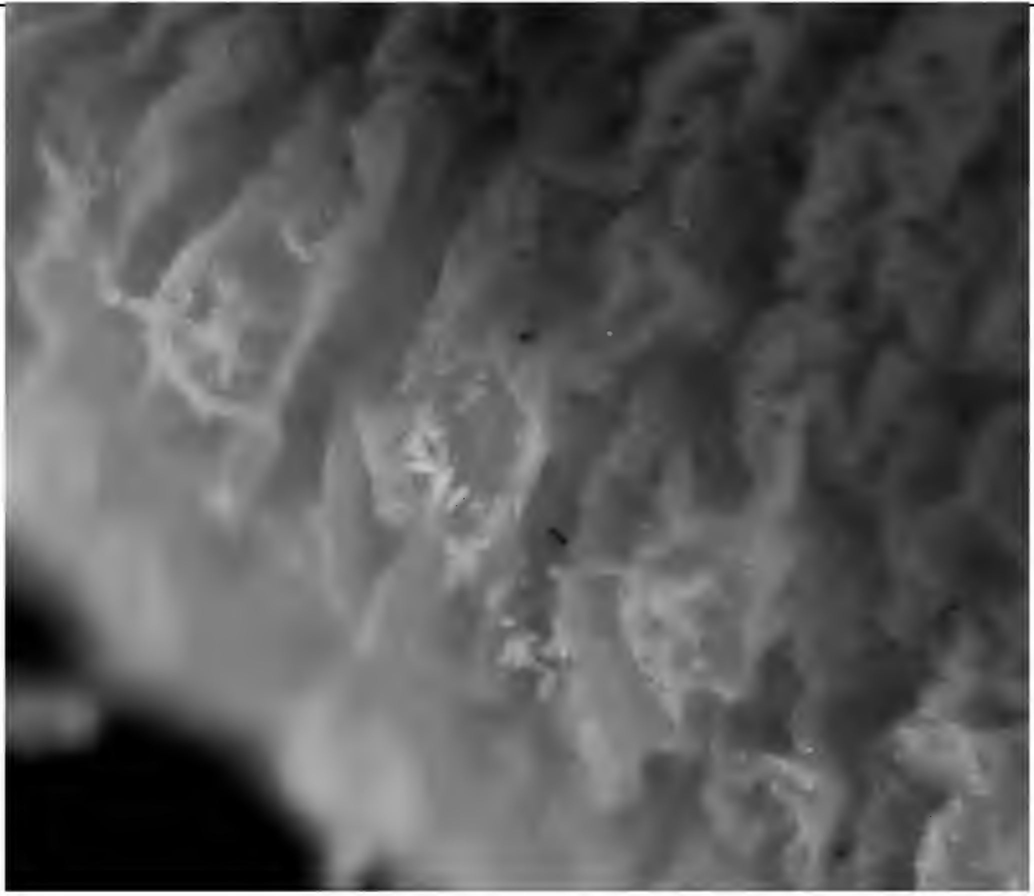
TAXONOMISTS

January/February, 2014 SCAMIT Newsletter Vol. 32, No. 5



Scolanthus triangularis nemathybomes at 600x. Photo by Dean Pasko

Publication Date: May 2015

BIGHT'13 TRAWL ECHINODERM FID, 29 JANUARY 2014, CSD

Attendees: Greg Lyon (CLAEMD); Ron Velarde, Megan Lilly, Matt Nelson, Kathy Langan, Wendy Enright (CSD); Kelly Tait (AMEC); Jim Mann (ABC); Seth Jones (MTS); Tony Phillips (DCE); Kelvin Barwick, Ernest Ruckman, Laura Terriquez (OCSD); Larry Lovell, Cheryl Brantley, Chase McDonald, Fred Stern, Don Cadien (LACSD).

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.

Business

Larry called the meeting to order by announcing that many of the 2014 meetings will likely focus on Bight taxonomic issues. The Monday February 24 meeting will be at CSD and will cover Bight'13 infauna miscellaneous phyla and Megan may include a short segment on sipunculids, specifically how to deal with small specimens.

Larry also called for more meeting topics for 2014.

We discussed the recent posts to the SCAMIT General list server emails dealing with *Nuculana minuta* (Mollusca: Bivalvia: Nuculanidae), an invalid taxon. There was also some discussion about the panopeid decapods, *Lophopanopeus bellus* and *L. diegensis,* now synonomized under *L. bellus*.

We then moved on to how to address juvenile specimens of *Cyclocardia crebricostata* (Mollusca: Bivalvia: Carditidae). The discussion came about because we had *C. crebricostata* on the list based on a John Ljubenkov identification from some regional material. Paul Scott (Santa Barbara Museum of Natural History) found this very unlikely and asked SCAMIT to review the ID if possible. We did, and the specimens proved to be something other than *C. crebricostata,* which eliminated the need for a considerable southern range extension. Paul was happy, and the SCAMIT List got simpler. Unfortunately, the five species within *Cyclocardia* remain difficult to distinguish, especially as juveniles. The recommendation is to leave juveniles at the generic level.

Tony announced that he had updated the Cnidaria presentation parts I and II, which will be posted to the SCAMIT website.

ID resolutions

Kelly announced that AMEC has partially worked up the SD Bay sponges, but the effort is ongoing.

Megan reviewed ophiuroid specimens for Kelly (AMEC) and confirmed many identifications.

There was some confusion and discussion as to the desired processing procedures for measuring *Brisaster* for the meeting. The idea was that individuals were to have arrived with some efforts to measure and identify their specimens prior to the meeting.

Brisaster measurements were reviewed for LACSD and CLAEMD. OCSD had already measured their specimens. Aquatic BioAssay Consulting (ABC Labs) and AMEC were fortunate enough to have none since their Bight'13 trawl stations were too shallow for the echinoid fauna.

ABC Labs and Vantuna Research Group (VRG) brought specimens of *Aphrodita* for review (a polychaeta – just for clarification!). ABC labs collected *A. castanea* and VRG specimens were identified as *A. negligans* and *A. japonica.*

Megan and Wendy assisted everyone with Asteroid identifications in the afternoon.

Bight'13 Miscellaneous Phyla, 24 February 2014, CSD

Attendees: Greg Lyon, Craig Campbell (CLAEMD); Ron Velarde, Megan Lilly, Wendy Enright, Nick Haring, Robin Gartman (CSD); Seth Jones (MTS); Tony Phillips (DCE); Ken Sakamoto, Laura Terriquez (OCSD); Larry Lovell, Don Cadien (LACSD); Chip Barrett (EcoAnalysts); Dean Pasko (DCE-presenter).

Business

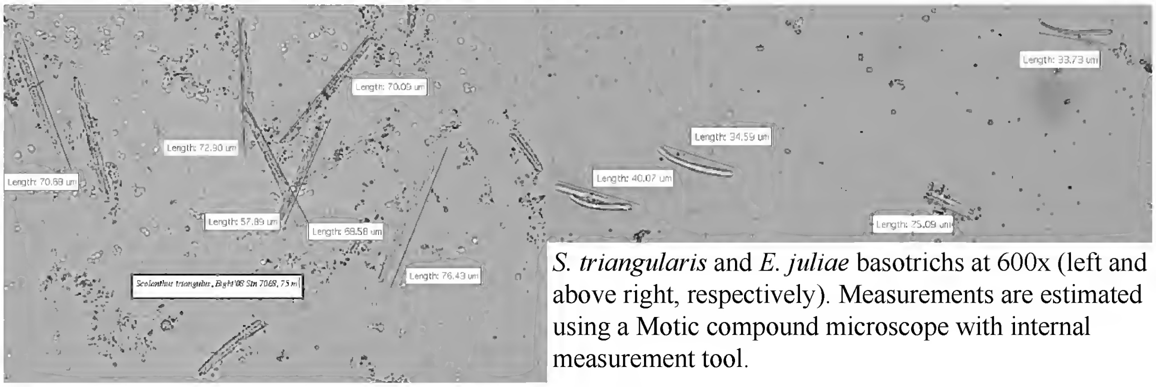
Larry called the meeting to order by announcing that there were no new meetings scheduled for 2014. Larry offered to host a SCAMIT Taxonomic Toolbox Workshop and Tony offered to help host a discussion workshop on *Chaetozone* (Annelid: Cirratulidae). Dean then suggested that he could try to manage an arthropod workshop, particularly if Don and Ron were willing to assist with FIDs. The two meetings were tentatively scheduled for April and March respectively. See the SCAMIT webpage and General Discussion ListServer for additional information.

Workshop

Larry then turned the meeting over to Dean who began by announcing that this was indeed intended to be a workshop since none of us were really "expert" in any of the various taxa that make up the Miscellaneous Phyla category. And with the recent passing of John Ljubenkov ("Big John"), we have an even smaller pool of people with broad ranging experience or expertise. Although several of us have tried hard to grasp these difficult groups over the years, they remain a challenge for all of us.

Dean then opened with a few slides and a short discussion of the Edwardsiidae, specifically *Scolanthus triangulus* and *Edwardsia olguini*. Dean had a couple of slides showing the difference in nemathybome basotrich size between *S. triangulus* and *E. juliae*. The difference in size is very clear (see comparison photo). He offered up the idea that the basotrichs can be used, in some cases, to separate species or individuals when there is a difference between specimens. However, he pointed out that he had had difficulty differentiating *S. triangulus* from *E. olguini* because the absence of a physa in *S. triangulus,* versus its presence in a very reduced form in *E. olguini,* was nearly impossible to differentiate. He wondered if the basotrichs could be used to distinguish between them, and though he had tried there did not seem to be a notable difference. On the other hand, he couldn't know for sure if this difficulty was the result of not having truly distinct species to examine or not. Additional work will be required going forward.

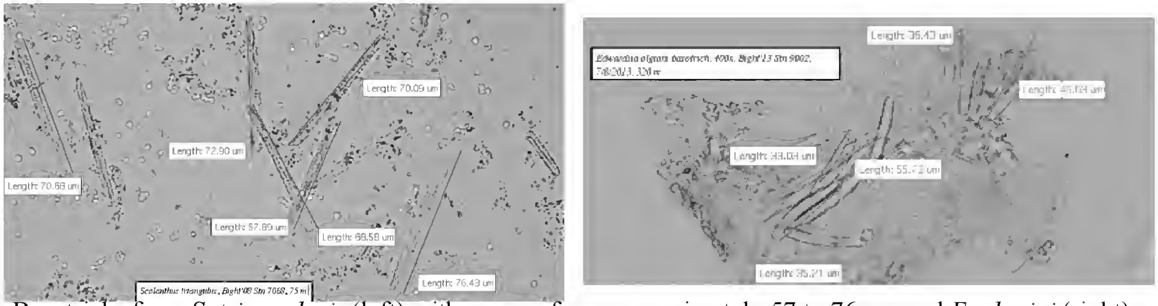
Dean then explained that he had found the nemathybome basotrichs less difficult to isolate and examine than he had thought. John had always sliced off a portion of the epidermis of his specimens, laid that piece on a slide, diced it up with a blade, smashed it under a coverslip, and examined the result for basotrichs. While trying to repeat the process, Dean discovered that the nemathybome tissue seems to dissolve readily in glycerin! So it became much easier to simply pinch off a nemathybome or two, place them into a drop of 50% glycerol on a slide, place a coverslip over it, and, using a dissecting scope, smash the material with the base or tips of his



S. triangularis and *E. juliae* basotrichs at 600x (left and above right, respectively). Measurements are estimated using a Motic compound microscope with internal measurement tool.

forceps. Doing the manipulation under a compound scope is not impossible, but more difficult because of the restricted working distance. In just a few seconds the tissue falls apart leaving the basotrichs mostly intact and ready for viewing. The slide can then be moved to the compound scope once the tissue is dissociated for examination of basotrichs. Hopefully sharing the simplicity of this process will facilitate a broader examine basotrichs for comparison by everyone.

Later on, after lunch and during the workshop portion, we were able to take specimens identified as *E. olguini* by Megan and *S. triangulus* by Big John and compare them. We noted differences in the external appearance that, although apparently clear in these two specimens, remain potentially difficult to apply. *S. triangulus* has nemathybomes that are sunken into the wrinkled mesoglea/ epidermis of the animal, while the nemathybomes of *E. olguini* tend to be more bulbous and protruding (blister-like) out of a smoother epidermis. When we mounted the basotrichs however, we were able to distinguish the *E. olguini* basotrichs (approximately 25 micrometer units at 400x) were about one-half the size of those from the *S. triangulus* specimen (about 80 micrometer units at 400x). ***See the comparison figure***.



Basotrichs from *S. triangularis* (left) with a range from approximately 57 to 76 um and *E. olguini* (right) at ≤40 um. Magnification is 600x. Measurements are estimated using a Motic compound microscope with internal measurement tool.

Dean then gave a short presentation on the corymorphines (Cnidaria: Hydrozoa: Corymorphidae). Big John had been working with this group for a while and helped prepare the MMS Atlas Volume 3 Cnidaria section on Hydrozoa. He created a key to the southern California corymorphines in about 2004, which Dean later revised to incorporate Corymorphidae sp SD1. During the presentation we were able to add distribution information to the key, and clarify and correct the usage of certain terms. The revised key is included in this NL. This key was distributed via the Bight'13 taxon list server and should be used for all Bight'13 identifications.

We then moved on to a presentation of Nemertea that had been modified from Megan Lilly's 2006 presentation: "Palaeonemertea of the SCB." The presentation began with a short description/ discussion of the differences between Heteronemertea and Palaeonemertea, and Carinomidae and Tubulanidae within the latter. Dean emphasized the need to perform cross-sections to confirm musculature and/or clear the specimens as necessary, particularly for the Enopla, which were not discussed. Throughout the presentation we made additions and clarifications to the pictured and referenced taxa. Nick Haring shared his preferred blade for making nemertean cross-sections: Feather Hi-stainless double edged razor blades. You can get packs of 10 for about $5 from Amazon. All of these additions to the presentation and more were incorporated into a final presentation that will be posted to the SCAMIT website and distributed via the Bight'13 Listserver for use during Bight'13 sample processing.

After lunch we dove into a review of specimens. Dean started by showing a few slides of a large polyclad flatworm that he could not identify cleanly. The specimen was about 20 mm long, had eyes within the tentacles, and a small group of eyes between the tentacles and extending anteriorly. No marginal eyes were present. There was some discussion of potential taxa, and Tony suggested that the specimen was a stylochoplanid and perhaps *Emprosthopharynx gracilis*. Though the number of cerebral eyes was small by comparison, the shape of the general body structure was suggestive of *E. gracilis*. [**Editor's note**: Dean was able to confirm the ID.]

We had a more lengthy discussion of Heteronemertea sp SD2, Heteronemertea sp HYP1, and what Laura, Dean, and Ken had called Anopla sp OC1. Laura and Megan had already considered Heteronemertea sp SD2 and Anopla sp OC1 and determined them to be the same. Some question remained in Dean's mind because he had not yet seen a specimen of Anopla sp OC1 with a caudal cirrus. Unfortunately, there is little to distinguish the two taxa since both have the same distinctive C-shaped cerebral sense organ (CSO), accompanied by a group of cells lining the CSO invagination with a unique sheen or glistening characteristic to them that make the CSO stand out. And both have the same musculature that includes a narrowed band of outer longitudinal muscle. The only character that could be used to distinguish them was the presence/absence of the caudal cirrus; but that remained an elusive character since only one damaged complete specimen of "Anopla sp OC1" had been collected. On the other hand, there was also a fair amount of debate about whether Heteronemertea sp SD2 and Heteronemertea sp HYP1 are the same. After quite a lively discussion, we decided to attempt to separate them based on differences of the musculature. Heteronemertea sp SD2 musculature includes a very narrow outer longitudinal muscle band that is not much wider than the middle circular muscle band, if at all. Heteronemertea sp HYP1, on the other hand, has a quite large, noticeable outer longitudinal muscle band that is about 1.5 to 2 times as thick as the inner circular muscle band. Heteronemertea sp HYP1 also has a different presentation than Heteronemertea sp SD2. The former does not have the characteristic "puckered" mouth opening, nor the glistening C-shaped CSO – it is typically round in form. In addition the head seems to preserve with a ventral furrow.

We also discussed Dean's specimens listed as Heteronemertea: Lineidae, which only added to the confusion discussed above between Heteronemertea sp SD2 – Heteronemertea sp HYP1. Megan and a few others thought they might represent *Zygeupolia rubens* because of the tapered head, wrinkled anterior region, and caudal cirrus. However, Dean's specimens have a distinct, though shallow, cephalic slit and a less strongly tapered head. These specimens also do not have a strong cerebral sense organ, like that found in *Z. rubens.* Dean mentioned that, in his experience, finding the CSO on *Z. rubens* is often difficult due to the contracted/wrinkled nature of the head; it is not an obvious character of the species. In the end, Dean renamed the species as Lineidae sp LAH1 in recognition that the specimen was collected from Bight'13 samples collected from Los Angeles Harbor/Port of Long Beach area.

A specimen of Tubulanidae sp C that Dean had brought was also confirmed.

Finally, Megan confirmed an echiurid specimen from 363 m off the Santa Barbara Channel. Dean had identified it as *Listriolobus hexamyotus* at first, but then changed his mind to *Arhynchite californicus* because he could not distinguish the muscle bands. However, upon additional dissection and review, Megan was able to confirm the long nephrostomal lips of *L. hexamyotus*.

Please visit the SCAMIT Website at: www.scamit.org

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If you need any other information concerning SCAMIT please feel free to contact any of the officers at their e-mail addresses:

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A Key To Corymorphine Polyps

Modified from J.Ljubenkov (2004) by D.Pasko 26Feb2015

1. Both tentacle whorls filiform (smooth) to serially bulbous, tips bulbous; papillae at base of hydrocaulus .... *Corymorpha* **2**

— Aboral and/or oral tentacles moniliform (beaded)..**3**

2. [Note: 3 choices] Gonangia are cryptomedusae (elongate, fusiform bodies); hydrotheca transparent ... . *Corymorpha palma*

— Gonangia are quadrate eumedusoids with one tentacle longer; hydrotheca transparent .... *Corymorpha bigelowi*

— Hydranth equal to or larger than hydrocaulus; hydrotheca not transparent, rugose ... *Corymorpha* sp A

3. Oral tentacles moniliform, tapering distally, 10 in number; aboral tentacles filiform, up to 12 in number; papillae above oral tentacles at base of hypostome; San Diego Bay................Corymorphidae sp SD1

— Oral tentacles filiform or moniliform and capitate; aboral tentacles moniliform; papillae below oral tentacles at top of hydrocaulus.. *Euphysa* **4**

4. More than 10 oral tentacles; oral and aboral tentacles long, moniliform, capitate; hydrocaulus short and relatively thick, not tapering; hydranth tapering distally; gonosome formed by quadrate eumedusoids with 4 equal tentacles; from Point Arguello..*Euphysa* sp B

— Less than 10 oral tentacles; hydrocaulus long, thin for entire length or tapering; gonosome of medusoids or buds without 4 equal tentacles..**5**

5. Oral tentacles typically 4 in number, short and capitate; aboral tentacles about 10 in single whorl; hydrocaulus tapering; hypostome short and blunt; quadrate hydromedusa with 1 longer tentacle......... ....*Euphysa* sp A

— Oral tentacles 3-7, short and capitate; aboral tentacles 4-12 in two alternating whorls; hydrocaulus thin with uniform diameter; hypostome elongate, ovoid; buds polyps that often contain one aboral tentacle of parent.. *Euphysa ruthae*

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A Key To Corymorphine Polyps

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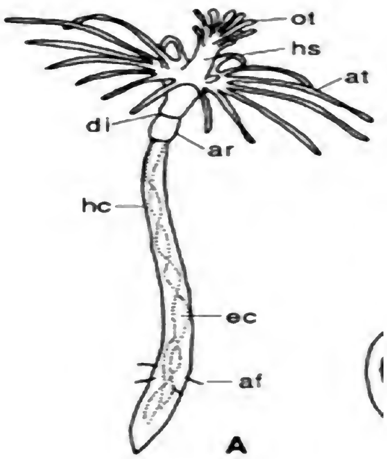
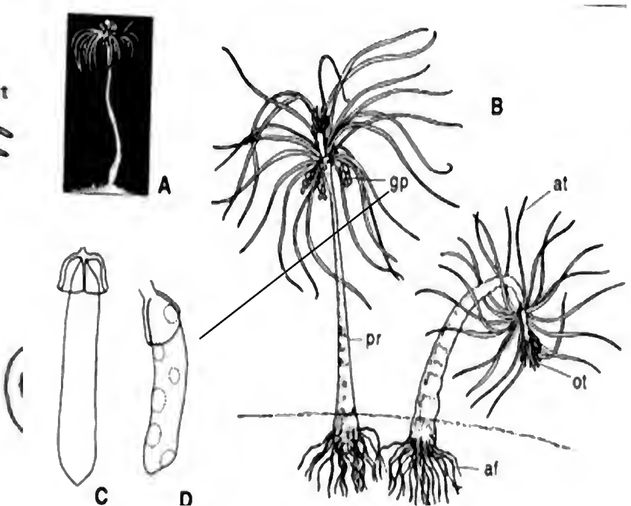
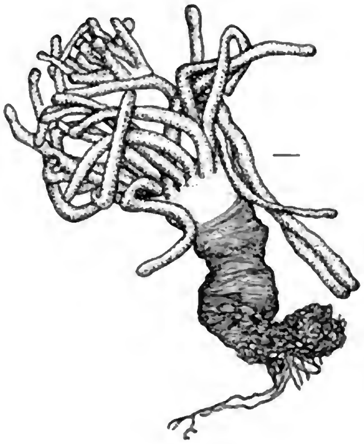


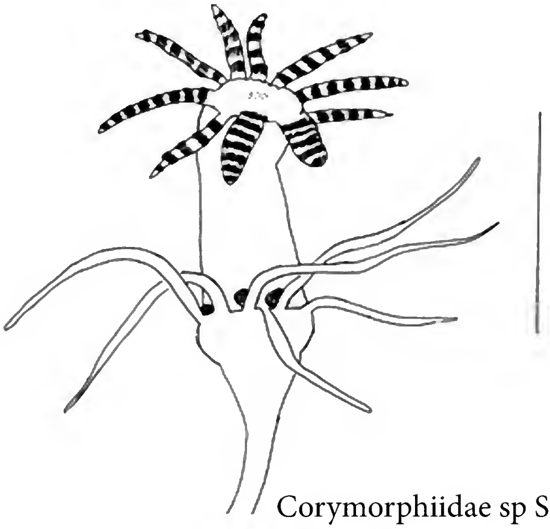
Corymorpha bigelowi



Corymorpha palma



Corymorpha sp A

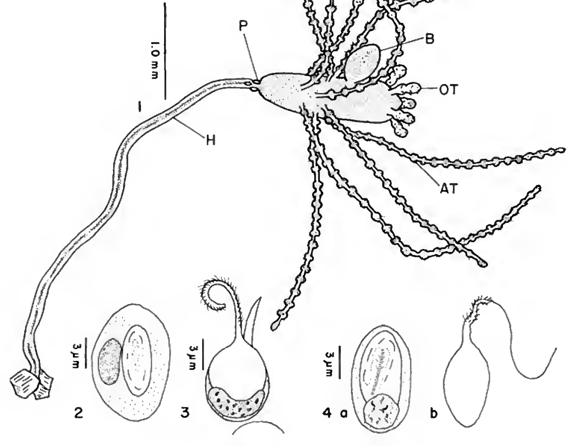


Corymorphiidae sp SD1

Euphysa sp A

Euphysa sp B

Euphysa ruthae



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March/April, 2014 SCAMIT Newsletter Vol. 32 No. 6

1.5 mm male *Rutiderma lomae*; OCSD Station 4; 4Jan2011; 56m. Photo by Dean Pasko

This Issue

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

Publication Date: 2 November 2015

17 MARCH 2014, BIGHT'13 ARTHROPOD PREPARATION, SCCWRP

Attendees: Andrew Davenport, Katie Beauchamp, Ron Velarde, Tim Stebbins (CSD); Chase McDonald, Don Cadien, Larry Lovell (LACSD); Greg Lyon, Craig Campbell (CLA-EMD); Tony Phillips, Dean Pasko (DCE); Ken Sakomoto, Danny Tang, Erica Jarvis (OCSD); David Drumm (EcoAnalysts).

Business Meeting: Larry opened the meeting noting that this meeting and many of the upcoming meetings will likely focus on Bight'13 taxonomic issues, and that we need more suggestions for specific topics to discuss. The next meeting will include a presentation by Larry about the Taxonomic Database Tool, including a demonstration of the features and tools available, along with a review of the cirratulid genus *Chaetozone* by Tony.

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.

Larry apologized for getting a late start on the SCAMIT elections, but promised to have the ballots out soon, with a due date of March 31 back to Leslie Harris. All of the current officers were willing to run again, and Larry opened the floor for additional nominations. Hearing none, he closed the nomination process and turned the meeting over to Dean.

Bight'13 Arthropod Preview

Dean started his review of potentially problematic or interesting arthropods with a look at a common taxon, *Heterophoxus ellisi* (Phoxocephalidae). He noticed a different form in bays and harbors that he has called *Heterophoxus cf ellisi*. The offshore form of *H. ellisi* has singly inserted setae on the posterior margin of pereopod 6, article 6, and multiple sets of a single spine paired with single plumose seta on the posterior margin of article 5, along with a strong (long), slender hooked tooth on epimeron 3. In contrast, the bay/shallow water *H. cf ellisi* has singly inserted setae on the posterior margins of both articles 5 and 6 of pereopod 6, and a very small, acute tooth on epimeron 3. The latter is not prolonged into a hook. A comparative slide helped demonstrate the differences.

He then moved on to discuss an interesting ostracod encountered in samples from OCSD's monitoring program (Station 4, 56m; Station 86, 57m). He had referred these specimens to Sarsiellidae sp OC1 and noted that they had a finely serrated rostrum, two longitudinally running elevated carapace ridges that are distinctly elevated at their posterior termination, and a 4-clawed furca. [*Secretary's note*: Danny Tang of OCSD has subsequently identified these specimens as the male of *Rutiderma lomae*. See cover photo. Oops!]

Dean then began a discussion of *Hippomedon* (Lysanassidae), particularly *Hippomedon* sp A. and *H. columbianus.* Dean was concerned that *H. columbianus* was being missed and wanted to make sure that we were all on the same page as to the distinguishing character employed in Jarrett and Bousfield's key (Jarrett and Bousfield 1982) subsequently modified by Doug Diener to accommodate *Hippomedon* sp A (Diener 1990): the length of the gnathopod 2 palm relative to the dactyl. In *H. columbianus* the gnathopod 2 palm is longer than the dactyl by nearly the entire length of the dactyl, whereas in *Hippomedon* sp A the dactyl, when closed, fully covers the palm reaching just shy of the posterior-distal (defining) corner of the palm. Dean showed a couple of pictures depicting this difference quite clearly.

Americhelidium was next on the list. Dean had been having some doubt about the distinction between *Americhelidium* sp SD4 and *A. rectipalmum.* To resolve the issue for himself, he revisited the distinguishing characters as well as his 2005 key. He reviewed his key and presented pictures of the distinguishing characters for each species in a set of slides, particularly the provisional species *Americhelidium* sp SD1 and sp SD4 (see voucher sheets at www.SCAMIT.org). *Americhelidium* sp SD1 is easily recognized by the relatively sparse setation of the propodus and the elongate setae emanating from the distal end of the gnathopod 2 propodus and running dorsally (anteriorly) for the length of the dactyl. *Americhelidium* sp SD4 can be distinguished from *A. rectipalmum* by the absence of a postero-distal lobe on the basis of pereopod 7, the sparse postero-marginal setae on pereopod 7, and the single, short seta located along the proximal quarter of the gnathopod 2 dactyl. In contrast, *A. rectipalmum* has a distinct lobe on pereopod 7 basis, of which the posterior margin has numerous long setae, and two or more pleonites with pairs of relatively long setae mid-dorsally along their posterior margin. Dean also confirmed with everyone that *A. shoemakeri* is now being recognized as a complex by SCB SCAMIT members. Several members (Dean, Don Cadien, Ron Velarde, among others) have noted a lot of variability in the shape and setation of the gnathopods as well as uropodal setation and spination, and none have been able to distinguish these apparently variable morphs with consistency.

With some trepidation we ventured into caprellids. This group, particularly the bay species, has confounded Dean. Dean's presentation included images of *Caprella californica*, *C. mutica*, *C. scaura, C. simia*, and *Caprella* sp WS1. All but *C. mutica* have a distinct head spine. Dean suggested that everyone pay attention to the position and size of the head spine, position of the gnathopod 2 on pereonite II, and presence/absence, length and density of swimming setae on antenna 2. He had also noted differences in the size and shape of the gills. After lunch we examined specimens of *C. simia* and *Caprella* sp WS1, and determined them to be synonymous. [*Secretary's note*: In a subsequent meeting on 13 April 2015, we encountered great difficulty distinguishing *C. californica* and *C. scauroides*. Readers are referred to the April 2015 meeting minutes for a discussion of Bight'13 caprellid amphipods.]

Another perplexing group, at least for Dean, has been the tanaids, particularly the *Zeuxo* complex. To get the discussion started, however, we dealt with something simpler, distinguishing *Araphura* sp SD1 from the closely related *A. brevaria.* Both have the fused uropodal exopod (pseudo-biramus) but *Araphura* sp SD1, a deep-water species, has a granulate ridge on the ventro-mesial margin of the fixed finger of the chela and the pseudo-exopodite is shorter than in *A. brevaria. A. brevaria* does have a ridge on the inner margin of the chela, but the ridge is smooth and sharp, without granulations. In addition, the pseudo-exopod is more robust, elongate, and distinctly curved inward, whereas the short pseudo-exopod of *Araphura* sp SD1 is nearly straight.

Dean then showed images of *Zeuxo coralensis*, a species that he has been encountering in shallow water samples from San Diego Bay, near the Reynolds Desalination Facility. *Z. coralensis* is easily distinguished from the other possible *Zeuxo* in SCB in having fewer articles of the uropod, consistently four including the peduncle, relative to 5-6 for the other taxa. It also has weakly produced coxae of pereonite 1, and one seta on the inner margin of the pleopodal endopod.

He suggested that we attach "complex" to records of *Zeuxo normani* because of the variability he has found in the uropodal articles such that *Z. normani* and *Z. pseudonormani* cannot be distinguished. For the Bight'13 process, Dean recommended the use of *Z. normani* Cmplx. We also had images of *Zeuxo maledivensis* identified by Tony and collected from Los Angeles Harbor Station B, Settling Plate by Dr. Reish. These specimens had a 5-articulate uropod and a pleon without dorsal setae, and one seta on the inner border of the pleopodal endopod. Tony also provided Dean with a specimen of *Anatanais* ? *pseudonormani* from Avalon (42m). *Anatanais* differs from *Zeuxo* in having antenna 1, article 1 only twice as long as article 2 instead of 2.5 times as long (as in *Zeuxo*). In addition, the specimen had 6-articulate uropod and five setae along the inner border of the pleopodal endopod. [*Secretary's note*: Larsen et al. (2014) subsequently synonymized *Z. normani* and *Z. pseudonormani* thus eliminating the need to use *Z. normani* Cmplx.]

We moved forward with a couple of slides of a new brachyuran Dean encountered in a sample from Mission Bay (Bight'13 Station 8157, 3.3m). It was a small specimen that Dean originally keyed to be *Eurypanopeus hyperconvexus* in Wicksten (2012), but then considered it to be *Rhithropanopeus harrisii.* We examined the small crab and after some time and discussion, the group leaned towards *Gonopanope areoloata* as the proper identification. Following the meeting, however, Dean had a few email exchanges with Dr. Wicksten and Dr. Terrence Boyle, a student of Mary's who had studied *Rhithropanopeus* in the U.S. for his doctoral dissertation. After a series of exchanges, Dean settled on *Gonopanope nitida* (Rathbun 1898) based on the dark coloration of the fixed finger and dactyl of the chelae, but which does not extend onto the palm, as it does in *G. areoloata*.

After this excitement, we discussed the validity of records of *Heterophoxus conlanae* in the SCB. Dean had some doubt about the reliability and consistency of the 3-setal group on pereopod 6, noting the great amount of asymmetrical setal pairing in *Heterophoxus*. However, Ron Velarde brought out a specimen collected from an offshore sample (Station B-11, 90m) that was quite convincingly adorned with 3-setal sets along the posterior margin of pereopod 6. In the end, we decided to continue recognizing *H. conlanae* and distinguishing it from *H. ellisi* and *H. oculatus* based on the setal patterns, and hoped that someone would make an effort to find at least one additional character to distinguish them.

The City of Los Angeles staff brought out a vouchered specimen of *Americhelidium shoemakeri* for confirmation. Unfortunately, the specimen was in poor condition. Dean tentatively identified it as *Americhelidium* sp SD1, but the specimen's condition prevented confirmation.

Lastly, we reviewed a specimen of *Listrella* sp from a 202m Bight station. It was not taken any further.

17 APRIL 2014, TAXONOMIC TOOLBOX & CIRRATULIDAE (POLYCHAETA), SCCWRP

Attendees: David Vilas (MBC); Leslie Harris (NHMLAC); Chip Barrett (EcoAnalysts); Ananda Ranasinghe (PC); Cheryl Brantley, Bill Furlong, Larry Lovell (LACSD); Greg Lyon, Craig Campbell (CLA-EMD); Ricardo Martinez-Lara, Veronica Rodriquez, Ron Velarde, Maiko Kasuya, Kathy Langan (CSD); Erica Mason, Kelvin Barwick, Rob Gamber, Laura Terriquez, Ken Sakamoto, Matthew Garchow, Danny Tang (OCSD); Russell Carvallo (OCCR); Tony Phillips, Dean Pasko (DCE); Dot Norris (SFPUC).

Business Meeting: Larry announced that the next several meetings would focus on consistent taxonomy for the Bight'13 Regional Monitoring and coordination of taxonomic identification. There was also a round of questions about the Bight'13 voucher specimens and the request by the NHMLAC staff that taxonomists try to pull good condition specimens for the museum where practical. Poor specimens pulled because they were the first specimen(s) encountered should be replaced with good quality specimens for the museum. Museum staff also asked that we make an effort to use our best hand writing for recording species names and data. The museum can accept slides (e.g., parapodia, setae, mouthparts, etc.), if properly labeled. It was preferable, however, to put dissected parts into properly labeled micro-vials; it is often difficult to track permanent slides back to the originating specimen, even when properly labeled.

The upcoming meetings will include Polychaetes (May 12) at the NHMLAC; a Cnidaria Meeting (June 9) at OCSD; and a Micro-Crustacea meeting (June 23) at CSD.

Taxonomic Database Tool

History of the database tool started with Dave Montagne in 2004. He called together a group of SCAMIT taxonomists to discuss the concept of a database tool for taxonomy. In 2005 we determined that the flow would include the SCAMIT Species List as the backbone. In 2006, the expanded version came into concept, which was based on a large, complicated “pie in the sky” approach. Dr. Todd Haney, then a recent UCLA graduate, led an effort to secure some sort of grant funding; unfortunately, that effort didn’t pan out. What followed was a period of dormancy due to the shear complexity of the project. With Bight’08 and a need to develop SCAMIT Ed 5, Rick Rowe re-invigorated the idea of putting the species list into a database. BATMAN, the Benthic Assessment and Taxonomic Management group, grew out of that effort. From 2008–10, OCSD granted $15K to push the process along, help retrieve database species images in Morphbank and link those to the Database Tool in the hopes of creating dynamic identification pages. Unfortunately, that effort came to an abrupt stall in 2011 when Katja Seltmann became too busy to further consult with SCAMIT, and substitute efforts failed. BATMAN continued to meet and Cheryl Brantley took the lead from a discussion at one of the meetings. She met with Steve Weisberg (SCCWRP) to get things moving forward again. Ananda, Cheryl, Shelly Walther, Wendy Enright, and the recently hired Data Group Manager at SCCWRP, Steve Steinberg, kept the database effort moving forward. SCAMIT applied some of the OCSD funds to hire an intern to mine the various agencies for missing taxonomic documents (voucher sheets, keys, etc.), which have been added to the toolbox. Although hugely helpful at consolidating the wealth of information from the different agencies, the effort has produced a number of duplicate documents, some with old, outdated names. Progress has been made however and Larry showed a chart showing the items from the “Pie in Sky” document that have been implemented: species maps, depth, latitude, distribution, synonymy, voucher sheets, Morphbank image links, definitive diagnosis, links to WoRMS, IBIS, EOL, SCAMIT NL content, character tables, keys, and BOLD and Genbank links.

Future efforts will focus on the following items:

- Update species names from Edition 8 to 9 [Ed 10 at the time of publication of this NL]
- Building a name update tool for future editions of the list
- Link assessment tools (BRI, P-code, SQO, etc.) to the species list
- Seek a solution to long-term image storage
- Seek additional funding ($5 – 20K), perhaps teaming with SCCWRP, State of CA, or CTAG to complete the basic structure of the database including a Species List update tool.
- Hire an intern to clean-up the duplicate pages in the tool box, remove erroneous pages, and update filenames, etc.

Members can help by suggesting corrections to tool box files, search their individual labs and their own computers for images of species and taxonomic characters, provide suggestions for member-funded activities, and encourage their laboratories to submit their monitoring data to SCCWRP for inclusion in the mapping and distributional tools.

Larry noted that Morphbank is having funding issues and although the images are available on mirrored websites, we're not sure how long this will last. We need to decide whether to host the images ourselves or look for another image server.

Why did we feel it was necessary to build the database tool? SCAMIT thought it was important to monitoring assessment, especially for maintaining data consistency through time. SCAMIT believes it is important to provide a comprehensive information source (e.g., P-codes), to have a long-lasting taxonomic legacy, a training tool for future taxonomists, and to standardize the use of specific codes (P-codes, BRI, AMBI) for assessment.

There was open discussion of how individual laboratories could help support funding mechanisms, and how SCAMIT can get funded to complete this project. Staff was encouraged to understand how the data are used/analyzed and how the codes are applied to their identifications so that they can talk to their laboratory managers and request support for SCAMIT's effort to increase their own efficiencies.

Russell Carvalho asked if SCAMIT had considered hosting it on a GIS database. Shelly Moore said it can be done, but there hasn't been any thought on it. Right now the plan is to use the SCAMIT server.

Larry then distributed the Toolbox User Guide 1.0 DRAFT, and we went through a demonstration of the existing tools. The toolbox works best on FireFox, Google Chrome, and Safari, and is a little clunky on Explorer. It also works best on high screen resolution. It is currently based on SCAMIT Ed 7 names. Here are some highlights.

- The edition of the species listing (SCAMIT Ed 7) is displayed in the synonyms box when browsing species names
- Species display information page includes phylogeny and synonyms, and links to toolbox documents and external links (Morphbank, ITIS, uBio, NCBI Entrez, WoRMS, EOL, GenBank, BOLD)
- The Photo links directly to Morphbank
- Mapping Tab is populated by Regional Bight sample data (up to B'03), WEMAP surveys, and some POTW data. More data is needed. The tool displays the data underlying each occurrence (depth of sample, origin of sample, etc.)
- Outside links have been maximized. For example, when you click on the link to ITIS, ITIS automatically understands that you want that specific taxon so that you do not have to re-search within the site

Larry performed demonstrations using *Euphilomedes carcharodonta*, *Nuculana* sp A, and other taxa. Leslie asked if the underlying data would be available for download via Excel or database? These data will not be made available through the SCAMIT site, but can be accessed through CDEN (California Environmental Data Exchange Network) or at the SCCWRP website for Bight data. The *Nuculana* sp A demonstration showed the need to get more monitoring data into the database as the toolbox showed scanty records for a species that is very common in CSD and OCSD.

Leslie Harris noted that the records are not representative of "true" distribution but only public records from SCB and specific monitoring programs (E-map, etc.). Others agreed that this limitation should be posted prominently, so that there is no misunderstanding about the intended use for these data (i.e., limited to our own efforts here in the SCB). Cheryl suggested that perhaps an abbreviated table listing species and depth range, rather than a detailed listing of station and abundances would be appropriate. Shelly agreed that this was possible. Kelvin and Leslie suggested that the addition of a comment tool and "report error" page (e.g., dead link, distributional error) might also be helpful. Kelvin then asked if there would be an opportunity to download an electronic form of the species list (Access or Excel)? At present this is available on request, but not as an automatic download.

Someone asked, "If all money were available to complete the process, would it simplify the process of [SCAMIT Species] list maintenance?" The answer was "yes!" Ideally, the intention is for a name change to cascade through the SCAMIT Website from the Species List as well as the voucher sheets, etc. A few select individuals would control the Toolbox and Species List with "Super User" access. This lead to a discussion of succession management relative to the flexibility of the website and database going forward (20 years into the future); and the necessary activities of the members to support the effort overall. How to maintain the effort and progress should the current leaders retire is always a concern.

Somehow this lead to the discussion, with a little admonition, that the synonymy listing of SCAMIT Species List is not exhaustive and is only intended to update commonly used literature in the SCB and historical SCAMIT usage. The users of the list need to understand this, but that information is contained in the introductory material to the List, and it is up to the user to read this material for a clear understanding of the included taxa.

Some also suggested that we limit the sites to which the toolbox links. SCAMIT linkage to a site provides some legitimacy to a site (e.g., WoRMS or ITIS), and therefore links should be applied cautiously and each should receive approval at some level before a link is established. Dot suggested that there should be an effort to involve northern Ca.

We concluded with a short list of Action Items: **(1)** find funding and support funding via your agencies or suggest funding; **(2)** look for errors and report the errors to Larry (cc'd to Shelly Moore); **(3)** identify errors in names and links to the toolbox; and **(4)** look into Crowd Funding.

After a brief lunch we celebrated Cheryl Brantley and her many years of service to SCAMIT. Larry showed several pictures of Cheryl from her first days at LACSD, thanking her for her nearly 20 years of SCAMIT service as Secretary and then Treasurer; as well as her years of service at the Districts. Larry then gave Cheryl several gifts from SCAMIT in her appreciation for her many years as friend, taxonomist, and educator representing the Districts.

We then moved on to discuss Cirratulidae (Polychaeta). Veronica Rodriguez-Villanueva introduced the topic. Veronica began with a reference to her list of characters of importance:

- Where neuroacicular setae start (although growth related): first 3rd of body, middle, or last third
- Number of acicular spines at the partial cinctures (first, second, third portion)
- Acicular setal arrangement (w/ or w/o gap) between dorsal and ventral portions of body
- Shape of prostomium (with or without crest) and peristomium

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- First pair of branchiae in relation to insertion of dorsal tentacle on the body
- Shape of pygidium cup-like, dome-like, fan-shaped

She generated some discussion with a brief description of *Chaetozone* sp 1 Morph 1 vs. Morph 2 vs. Morph 3, all pulled from the *Chaetozone setosa* complex of taxa. All have a dorsal crest, but position of branchiae differs relative to crest. Right now they are all called *Chaetozone* sp 1 because of the placement of the neuroacicular setae in the first 1/3 of the body. Head shape is similar to *C. hedgpethi*. Morph 3 also has a dorsal crest but differs in the position of the first tentacle. All have the same methyl green stain. None have eyes. The differences in dorsal crest morphology may be due to relaxation. Dot asked if the first position of the acicular setae was size dependent? Veronica has a table showing that the individuals differ in exact setiger placement of aciculae, however, they still occur in the same body region (i.e., same third of the body).

In response to this discussion, Tony read from an email exchange he had had with Rick Rowe. Rick had mentioned that the head shape is variable, as is staining, when not done with some consistency. Rick recommended hours of soaking in stain rather than just minutes! Tony leaves them in for a minimum of 2 hours and sometimes overnight before reading the staining patterns.

Tony then began to introduce his 72-slide presentation, recognizing Veronica's efforts to wrestle with this difficult group and pull together characteristics of Cirratulidae taxa. Tony introduced the topic with a short discussion of the wide variation of staining for species of *Chaetozone*, where the same species may demonstrate two or three separate staining patterns. Other characters, such as cincture types in some of the setae, are also variable. In short, the difficulty of the group is that so many of the characters show themselves to be variable, thus creating confusion.

Tony modeled his presentation on the MMS Atlas key by Jim Blake (1996). The presentation was quite exhaustive and included beautiful color photographs of all species represented in Blake (1996), as well as three SCAMIT provisionals: *Chaetozone* sp SD3 of Rick Rowe 1997; *Chaetozone* sp B from Channel Is; and *Chaetozone* sp C from Santa Monica Bay (SMB). His presentation, listing the species according to the major couplets of Blake's key (e.g., those taxa with paired dorsal tentacles first present from setiger 4–7, and species with neuropodial spines present from setiger 1), is summarized below. He also mentioned that the Atlas key has one mistake: *C. commonalis* was placed in the section of the key with neuropodial spines starting at 65+ setigers, when it should be in the section of the key where neuropodial spines begin at setigers 20–40.

Tony cautioned everyone that the Channel Island samples from previous Bight projects have been a *Chaetozone* nightmare! With spines starting between Blake's two groupings, variable spination, and placement of tentacular cirri, speciation has been difficult. High abundances are also a problem in processing.

Leslie commented that Blake no longer considers *C. setosa* to be found on west coast. Consequently, we can call our *C. setosa* whatever we want.

Tony noted that he would not be discussing *C. spinosa* and *C. gracilis,* which are both deep-water 1000+ m depth.

The following notes are from Part 1 of Tony's Cirratulidae presentation: *Chaetozone*, the bi-tentaculate cirratulid. This group includes the following SCB taxa: *C. acuta, C. armata, C. bansei, C. columbiana, C. corona, C. commonalis, C. hartmanae, C. hedgpethi, C. lunula, C. senticosa, C. setosa* Cmplx, *Chaetozone* sp A (= sp SD3 of Rowe 1997), *Chaetozone* sp B SCAMIT 2014 (Santa Barbara Channel), *Chaetozone* sp C SCAMIT 2014 from Santa Monica Bay (SMB) and 150m.

Paired dorsal tentacles found from setigers 4-7 (All other species with paired dorsal tentacles have them first present from the peristomium or from setiger 1)

- *Chaetozone bansei* has been collected at LACSD Station 0 and in Carpenteria. It has a very distinctive stain where ridge pattern and posterior prolongation of dorsal ridge show a dark staining elongate, triangular extension from prostomium. The dorsal tentacles start on setigers 3–5. The specimen pictured in Tony's presentation came from San Luis Obispo.

Species with neuropodial spines from setiger 1.

- *C. armata* is typically collected from 45–100m. It has single spines in neuro- and notopodia, a pointed prostomium that may be with and without slight posteriorly directed dorsal ridge. There are typically two annulations on peristomium. The position of branchiae relative to tentacle is consistent, but has some variability of staining pattern. Tony found one specimen with dark stain on the posterior portion of peristomium.
- *C. corona* ranges from Gulf of California to Goleta, and from 15 to 120m. It has a grub-like, iridescent body, with eyes, and spaghetti-like branchiae.

Species with neuropodial acicular spines starting between setigers 60–100+.

- *C. senticosa* was found once in Bight'08 by Tony, but that specimen could not be located, and Tony's deep-water specimens have now been referred to *Chaetozone* sp C SCAMIT 2014. *C. senticosa* comes from shallow water bays and harbors (5–10m). The type material is described as having setiger 1 larger/wider than following setigers and as having partial cinctures on thoracic segments, but Tony has had difficulty seeing these characters. It's a large species, reaching greater than 20mm in length. The dorsal tentacle starts anterior to first setiger. Tony had some pictures of paratypes from the Los Angeles Natural History Museum, which were supplied by Leslie Harris. In general, the spines start on setigers 65–80, and the cinctures are weak with 5–6 spines/cincture, and there is no distinctive staining. Tony has observed that *C. senticosa* has a pear-shaped prostomium, narrowing in the post-peristomium region,with the thoracic setigers becoming quite narrow.
- *C. hedgpethi* is a large animal without eyes that occurs from San Diego to Goleta, north of Pt. Conception, and the Channel Islands. The dorsal tentacle and first branchiae are anterior to setiger 1, and there is a pear-shaped, inflated crest posteriorly on posterior margin of the peristomium. *C. hedgpethi* has partial cinctures housing 13–15 spines, and a very distinctive staining pattern, with no stain between neuro- and notopodia. Tony also showed a picture of a specimen from Goleta that had a different staining pattern: It was missing the white band on the posterior portion of the peristomium.
- *C. columbiana* is the most common species, occurring from San Diego to Goleta, found at depths between 15 to 45m. It should have three faint, indistinct annulations on peristomium that are not very strongly grooved. It always has a depression at the posterior margin of prostomium; although this character is also present in other species. The dorsal tentacle is anterior to first setiger, and there are no distinct deep cinctures. Each of the partial cinctures have 11–14 spines. The rounded pygidium flips upward and matches the illustrations in Blake (1996) very well. The staining pattern is distinctive with head/peristomium very different from setigers.

- *Chaetozone* sp A (=*Chaetozone* sp SD3 Rowe 1997 and *Chaetozone* sp 1 Lovell and Phillips 1998) is found from San Diego to Goleta, 45–100m, in coarser sands. It has a small section of inflated setigers between 12–25 and flattening at the pygidium. The species has distinct spines on posterior of body, and a very distinctive methyl green banding at the inflated section and on the head, with no color anterior to the band in the inflated region and nothing posterior to it, except for pro- and peristomium. The eyes are evident. The cinctures are very visible with 13–16 spines, and the neuropodial spines start on setigers 40–65. Tony calls such specimens a "tweener" since the spines start between Blake's two major groupings. A voucher sheet is available in the SCAMIT toolbox.
- *Chaetozone* sp C is another "tweener" that was originally thought to be *C. senticosa* based on where spines start (setigers 59–75) with 11–12 spines. It differs from *C. senticosa* because the first two setigers are equal in width, with succeeding setigers becoming wider moving posteriorly, rather than uniform in width. In addition, *Chaetozone.* sp C is found at 150+ m, while *C. senticosa* is found in bays and harbors, 5–10m. There is a large tentacle anterior to the first setiger that is twice as large as the branchiae (which start on first setiger). The species has a distinctly triangular head, and there is a clear gap between the dorsal and ventral group of setae, which may be related to how contracted or inflated the specimen was at the time of fixation. *Chaetozone* sp C has a dark staining pro- and peristomium, with narrow bands of non-staining ventrally. The represented specimen came from Station E8, SMB, 152m.

Species with acicula starting on setigers 20–40

- *C. commonalis* has been found off Palos Verdes, but not yet in SMB nor in OCSD samples. This is a small species, 5–7 mm. It has a short prostomium/peristomium with a triangular prostomium. The peristomium has three clear annulations. The tentacle and first branchiae are just anterior of setiger 1 and more centrally placed, away from parapodia. Neuropodial spines start at setigers 40–48, and there are weak cinctures in the posterior setigers. There is no distinctive staining pattern. A key character is the distinct shape of the neuropodial spines; the tips bend back along the shaft, attaching to the spine (see Blake 1996).
- *C. hartmanae* is common in coarse-grained sediments from 45–150m, from San Diego to Goleta. This species also has an inflated region anteriorly; neuropodia that often have an orange tinge, and falcate spines with slight serrations. The staining pattern is distinctive with lateral staining that begins posterior to the inflated region and does not extend on to the dorsum. This is a very characteristic species with the golden spines and specific staining color pattern. One of the few species that is so distinctive that it can be readily identified with little confusion to others.
- *C. acuta* is another small species, ranging between 8–10 mm that occurs from 30–125m in SMB and Goleta. It has two weak annulations on the laterally rounded/bulbous peristomium, and a fairly large separation between tentacle and first branchiae. Spines start at 18–40; but Tony has seen them only as far back as 30. Partial cinctures are present with 7–9 spines. The staining pattern includes a pale band on the posterior of the prostomium, a dark stain between parapodia, and weak staining ventrally.
- *C. lunula* is yet another small species, reaching only 8 mm. Tony examined the paratypes from Santa Cruz, and his own specimens from SMB (113m). *C. lunula* has a distinctive dorsal groove in the thorax, a pointed prostomium, with semi-cinctures in the posterior portion of body, but does not have a staining pattern. There was some discussion of whether the bifid setae in posterior region illustrated by Blake (1996) are a character worth watching for. For example, Veronica argued for the fact that they were seeing this animal in San Diego, based on the presence of the bifid setae; however, Ron was of the opinion that it was a juvenile specimen. On the other hand, the pictured specimen represented a 5 mm holotype, which was gravid. Tony's specimens did not show any staining pattern.

- *Chaetozone* sp B was originally called *Chaetozone* sp MEC1 from Bight'98, Channel Island sample. Tony has seen it in 45m samples from the Santa Barbara Channel. The first branchiae are anterior to first setiger and there are massive, golden, thick, pointed spines in posterior region. Neurospines start at 37–40; and notospines from setiger 60. Pygidium is a little different from others and is flattened dorso-ventrally, but slightly produced laterally. Staining shows banding posteriorly on the dorsum and ventrum of each segment, and between the parapodia from about mid-body to posterior.

Tony recommended that everyone look at the chart that Veronica put together, which was modified from Rowe.

The presentations from today's meeting will be distributed via Dropbox. [Secretary's note: Whether or not these presentations make it to the SCAMIT website will be left with the originating taxonomist; however, please feel free to contact any individual directly for information regarding these taxa or their presentations.]

Tony's presentation brought about a question concerning the uniformity of stain formulations. Ron knows of two different green stains, methyl green, and ethyl green (listed as "methyl green"), and suggested that we perform a study of the differences between them. Leslie has researched this a little when helping another group establishing their lab, and found that different companies may use different formulations. She suggests that everyone bring material and their bottles of stain to the May 12 meeting at the museum.

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