SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

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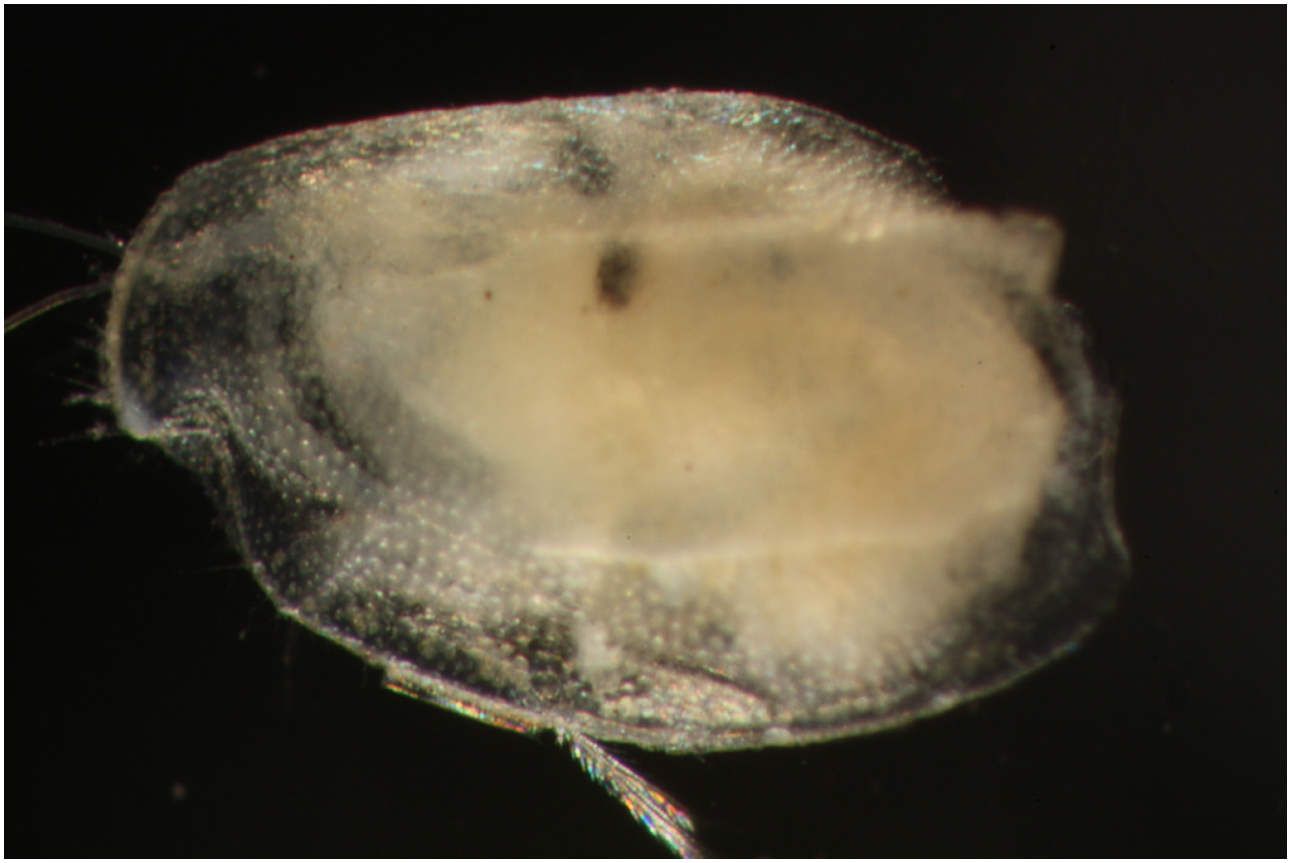

1.5 mm male *Rutiderma lomae*; OCSD Station 4; 4Jan2011; 56m. Photo by Dean Pasko

This Issue

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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).

UPCOMING MEETINGS

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

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.

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 (pseudobiramus) 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

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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

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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.

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- *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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