SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

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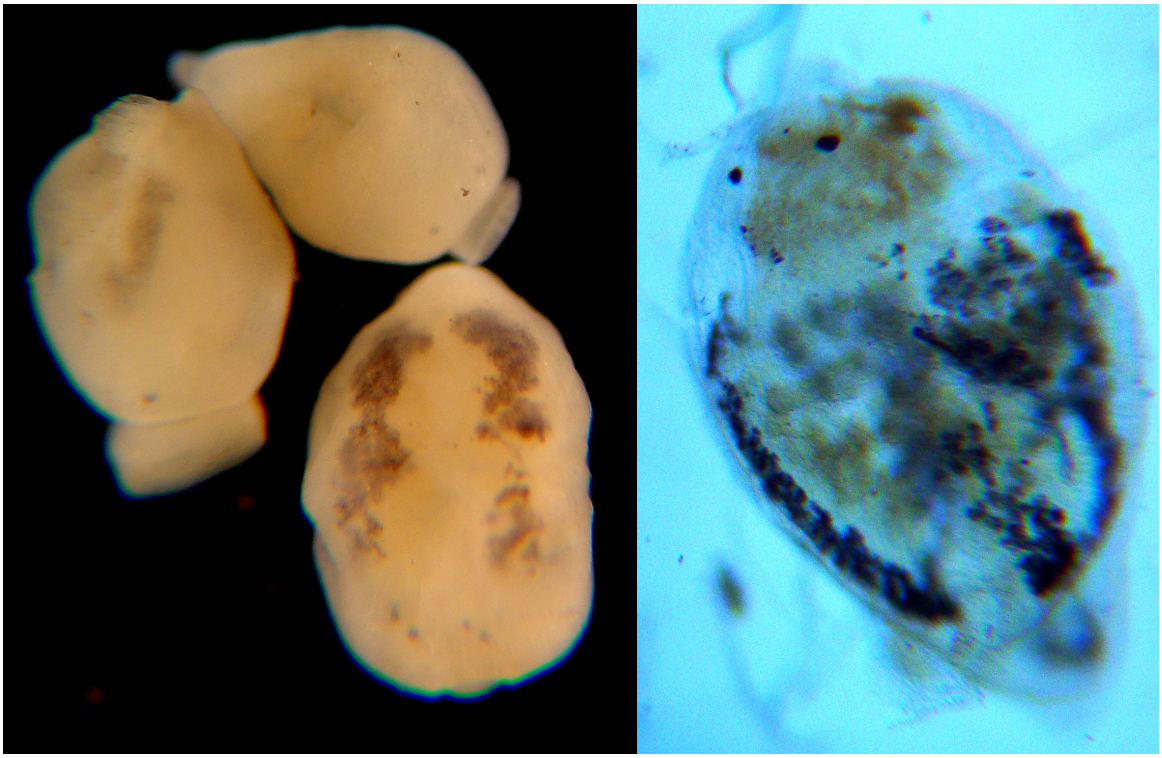

Unidentified Turbellaria from Marina del Rey in 1m of water (B'03 station 4213), July 2003.
The animal on the right has been cleared with methyl salicylate.
Photos by M. Lilly, CSD.

This Issue

Publication Date: 28 July 2016

14 JANUARY 2013, POLYCLADIDA, OCSD

President Larry Lovell opened the meeting with introductions and announcing upcoming meetings. Literature review meetings have been suggested for February, March, April, May, and June in preparation for the upcoming Bight '13 project.

Other announcements: SCAS 2013 will be May 3-4 at CSULB. SCAMIT will be hosting a symposium with member talks on taxonomy, ecology, QA/QC, and intercalibration. To date there are eight talks scheduled.

UPCOMING MEETINGS

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

Larry reminded us again that 2013 Officer Elections are looming. He repeated that Laura Terriquez had been nominated for Treasurer along with the current suite of officers being nominated to serve another term.

Don Cadien briefly took the floor to remind the Species Review Committee that they are "on notice" and the July 1st deadline for the next edition of the Species List is fast approaching.

Kelvin Barwick then announced that OCSD will be seeking an RFP for Crustacea taxonomy training.

With the business complete it was time for Tony Phillips to take the floor and lead the meeting on Polycladida. Tony started by thanking Kelvin and OCSD for hosting the meeting, and he thanked Dean for help with formatting species pages.

Tony touched on his preferred literature when dealing with flatworms. Following is a listing:

- Newman 2003, Marine Flatworms: The World of the Polyclads; this book has good family descriptions and pictures
- Hyman 1953, The Polyclad Flatworms of the Pacific Coast of North America
- Hyman 1955, The Polyclad Flatworms of the Pacific Coast of North America: Additions and Corrections
- Hyman 1959, Some Turbellaria from the Coast of California
- Heath and McGregor 1912, New Polyclads from Monterey Bay
- Faubel, 1983 and 1984, two publications dealing with the Cotylea and Acotylea
- Prudhoe, 1985, a Monograph on Polyclad Turbellaria
- Freeman, 1930 and 1933, Polyclads of Pt. Furmin and the San Juan Region
- Boone 1929, Polyclads of the California coast

One of the guides used by Tony is John Holleman's key (Key to the Polyclads of the Pacific Coast of North and Central America (https://flatwormsrock.wordpress.com/). Tony noted that it is important to be able to ascertain pharynx type in order to proceed with the most generalized ID.

He distributed handouts of his presentation and files, as well as his latest key - Polycladida of the Southern California Bight; see the Tools section of the SCAMIT website. The species names used in Tony's key are based on WoRMS (http://www.marinespecies.org/). For each species that he addresses, he also lists depth and geographic distribution when possible.

Publication Date: 28 July 2016

He also discussed preservation effects, and touched on the differences in techniques employed by research/academia-based experts vs local morphological-based taxonomists.

Tony mentioned that in researching for this presentation he saw several new and additional specimens at MBC that Carol Paquette had in her collection.

He started by discussing the two Suborders of Polycladida - the Cotyleans which have ventral suckers and head tentacles, although there are some species without head tentacles. Additionally they have a ruffled pharynx anteriorly, or a tubular pharynx.
In contrast, the Acotyleans have a ruffled pharynx mid-body to posterior, except in the Superfamily of Enantiidea, which have a tubular pharynx and spines on the dorsum.

After his overview he lead a species by species review of the two major groups and it is summarized below.

Acotylea

Enantiidae sp A - cuticular spines present along margin and dorsum of body, tubular pharynx, tentacles absent. This is the first record of the family from the west coast of North America. It has only been found on the legs of the offshore oil platforms Edith (Huntington Beach) and Grace (Ventura). Specimens have been sent to John Holleman for description.

Koinostylochus burchami - large animal; note the gap between the cerebral and tentacular eyes which are deep within the tissue; has elongate, rounded nuchal tentacles; eyes not present within nuchal tentacles; tentacular eyes form dense ring around base of nuchal tentacles; cerebral eyes between nuchal tentacles in two rows with distinct gap in center; differs from *Paraplanocera* in its large, robust size.

Paraplanocera oligoglena - very thin species; has elongate, rounded nuchal tentacles; eyes not present within nuchal tentacles; tentacular eyes in loose groupings around base of nuchal tentacles, with eyes spreading out from bases; cerebral eys between nuchal tentacles in two elongate rows, no gap in middle.

Latoplana levis – large, thick species; has a large fan of frontal eyes; marginal eyes encircle body, thickest anteriorly; inter-tidal, sub-tidal, and rocky substrate.

Latocestidae sp A - single row of minute eyes along one-quarter to one-half of the anterior margin; frontal eyes present in four elongate lines that form a “W” pattern.

Diplehnia caeca (see synonomies) – eyes few to absent; if present, are in two loose cerebral clusters composed of 10-25 very small eyes.

Stylochus atentaculatus - anomalous species which grows up to 60 mm; nuchal tentacles in specimens to 13 mm, but they are lost afterwards; marginal eyes are densely packed anteriorly, thinning posteriorly; cerebral eyes in broad, poorly separated groups; dorsum buff to light brown, with dark brown spots; not usually collected in Van-Veen grab samples.

Stylochus exiguus - some specimens are without spots on the dorsum, although most do have a maculated pigment pattern; tentacular eyes present within tentacles; note 2 pairs of paired eyes (4 pairs, 8 total) anterior to the cerebral tentacles; these are of particular use when viewing specimens without spots; also of note are the marginal eyes that encircle the entire body.

Publication Date: 28 July 2016

Stylochus franciscanus - note more cerebral eye pairs than *S. exiguus* and marginal eyes only about 1/3 to 1/2 way along the body (just to or slightly beyond cerebral tentacles); tentacular eyes within tentacles; this species is much thicker than *Stylochus exiguus.*

Stylochus insolitus - easy to ID by color pattern; brown spots and longitudinal bars in mid and posterior sections and transverse bar across anterior region (tentacles).

Stylochus tripartitus - thin species, note thin line of cerebral eyes between tentacles; tentacular eyes within tentacles.

Cryptocelis occidentalis - common in the infaunal community; note cerebral eyes in two, unstructured longitudinal rows between tentacles, reaching anterior and posterior to tentacles.

Hylocelis californica - very thick animal; see voucher sheet for difference between *Interplana* and *Hylocelis*, the latter having more eyes.

Interplana sandiegensis – nuchal tentacles nipple-like; tentacular eyes loosely scattered and extending only posteriorly from base of nuchal tentacles; cerebral eyes start sparsely at base of tentacles, extending forward into a broad group; shallow bays/harbors but also shallow off-shore.

Hoploplana californica - can be heavily pigmented (red to purple); dorsum with dense papillae, occasionally with surface papillae absent (removed via sieving); tentacular eyes in ring at base of tentacles, not within tentacles; cerebral eyes medial and anterior to tentacles.

Hoploplana sp A – only specimens seen are ivory white and with dense, elongate dorsal papillae; tentacular eyes in ring at base of tentacles, not within tentacles; cerebral eyes in linear row between tentacles.

Parviplana hymani - no nuchal tentacles; can be without pigment and/or spotting or will have reddish-brown body coloration with some spotting; cerebral and tentacular eye clusters few in number, tentacular eyes larger (previously referred to as *P. californica* by SCAMIT).

Leptoplanidae sp A – two cerebral rows of three eyes (3 pairs). **NOTE -** voucher sheet shows set of spots posterior to eyes, not actual eyes, but debris artifact.

Notocomplana acticola - common in the ISS (Introduced Species Survey); reddish-brown dorsum, except where cerebral and tentacular eyes are located; this area (eye location) is opaque, appears like headlights; tends to be a thick species.

Notocomplana rupicola - Van Veen grab species; four distinct, separate cerebral and tentacular eye clusters; deeper water (>100 meters).

Pleioplana inquieta – body beige to light tan, with distinctive brown spots covering the dorsum; more prevalent in bays and harbors but rarely present offshore.

Armatoplana reishi - not elongated; cerebral eyes starting anterior to tentacles and extending posteriorly between tentacles; picture shows ruffled pharynx and ovaries.

Emprosthopharynx gracilis (was as *Stylochoplana*) - "cuneate" form (anteriorly broad, posteriorly narrowed); pharynx ruffled; tentacular sets of eyes widely separated.

Phaenoplana longipenis – tentacular and cerebral eye clusters form a continuous band, tentacular eyes much larger; body elongate, thin, opaque to light brown.

Publication Date: 28 July 2016

Stylochoplana chloranota - (used to be called *Leptoplana*) tentacular eyes in large, dense clusters; cerebral eye clusters start posterior and inside of tentacular eye clusters, extending almost half-way to anterior margin; thick species, tan to brownish dorsum.

Stylochoplana sp A - deepest sampled was 25m near oil rigs off Huntington Beach; very thick; see picture showing unpigmented "spot" in head area continuing as white line running posteriorly.

Stylochoplana sp B – body wafer thin, can see eye pattern without clearing.

Cotylea

Characters:

- frontal tentacles present or absent
- ventral sucker
- diagnostic pigmentation patterns
- if ruffled pharynx present, will be in anterior third of body (rather than posterior half as found in Acotyleans)
- if tubular pharynx present, will be in anterior third of body
- frontal = marginal = nuchal tentacles (all reference the same structure)

Pseudoceros montereyensis - ruffled pharynx anteriorly; dark brown frontal tentacles (Eurylepteids similar but with reddish-orange frontal tentacles); cerebral eye cluster in anterior 1/3 of body; marginal eyes along anterior margin to either side of median line; body white with blackish-brown mid-dorsal stripe; outer margin white, with thin black line inside of white margin; small blackish-brown spots scattered across dorsum.

Pseudoceros mexicanus – ruffled pharynx anteriorly; cerebral eye cluster in anterior 1/3 of body; marginal eyes along anterior margin and along anterior of frontal tentacles; very thin, lacy margins; dorsum colored brown with white spots.

Acerotisa californica - tubular pharynx anteriorly; without frontal tentacles; hard to see very small ventral sucker; white body is typical, but can be pigmented; one pair large cerebral eyes accompanied by 1-4 small eyes; widely separated groups (2-3 pairs) of marginal eyes at mid-point of anterior margin.

Acerotisa langi (= sp 43 of Ljubenkov) - tubular pharynx anteriorly; two large bands (20-25) of "outer cerebral" eyes and pair of inner cerebrals; no tentacular or marginal eyes.

Eurylepta aurantiaca - tentacular eyes within frontal tentacles; tubular pharynx; body beige to orange brown, covered in small orange to brown spots, with darker midline and tentacles.

Eurylepta leoparda – body crème to white, tentacles are orange-red, spotting is reddish brown and large (relative to *P. montereyensis*).

Euryleptodes insularis - frontal tentacles rounded (not pointed) or tapering; distinctive pigment pattern of large dark spots on beige to light brown dorsum; cerebral eye mass of numerous eyes and tentacular eyes, which extend outward to anterior margin between the tentacles.

Praestheceraeus bellostriatus - diagnostic color pattern of stripes and dark frontal tentacles.

Publication Date: 28 July 2016

Stylostomum lentum - small, short frontal tentacles (more knob-like) with tentacular eyes; large tubular pharynx in anterior third of body; cluster of cerebral eyes; color beige to bright red.

Enchiridium punctatum - beige with tiny black spots; no frontal tentacles; anterior tubular pharynx; marginal eyes multiple layers anteriorly, thinning to one layer posteriorly; marginal eyes visible ventrally rather than from dorsal aspect.

Prosthiostomum latocelis - frontal eyes extending broadly posteriorly and laterally to cerebral eye region but anterior to pharynx.

Prosthiostomum multicelis – found more often from scrapings, etc.; marginal eyes more tightly bound (than *P. latocelis*) to anterior margin, extending only to 1/3 of body; cerebral eyes present; tubular pharynx.

Turbellaria sp A (= sp 27 of Ljubenkov) - note size of cerebral eyes relative to *A. langi*.

Turbellaria sp B - bays and estuaries towards fresh water; 1 pair of large eyes with 2-3 pairs of smaller cerebral eyes; fairly thick animal, frequently w/ curled margins.

Turbellaria sp C (= Leptoplanidae sp SD2 Lilly-Pasko); elongate, thin species, up to 15 mm long, with two pairs of round eyes situated anteriorly, the first slightly larger than the second.

GENERAL COMMENT - eyes develop differentially with age, so smaller specimens have fewer (or absent) cerebral eyes. It is important to distinguish between two types of anterior eyes: cerebral and frontal. Frontal eyes reach the anterior margin of the head and are typically anterior to tentacles; whereas cerebral eyes are more clumped and can extend posteriorly in a loosely structured group. Tony also noted that eye patterns may be (likely are) inconsistent between species within a Family because Family-Generic distinctions are made by internal morphology, not external (generally).

11 FEBRUARY 2013, POLYCHAETES, NHMLAC

Attendance: Ron Velarde, Peter Vroom, Kathy Langan, Veronica Rodriguez-Villanueva, Ricardo Martinez, Matthew Nelson, CSD; Kelvin Barwick, Rob Gamber, OCSD; Leslie Harris, NHMLAC; Tony Phillips, consultant; Chip Barrett, EcoAnalysts; Larry Lovell, Cheryl Brantley, Bill Furlong, LACSD; Dot Norris, CCSF/PUC; Greg Lyon, CLAEMD.

Larry Lovell opened the meeting with introductions. Next was a discussion of upcoming meetings. Literature review, and shallow and deep water species review, prior to Bight ’13 were suggested topics. The following dates, subjects, and locations have been scheduled: March 11, Echinoderms at CSD, Megan Lilly meeting lead; April 15, Misc Phyla at Dancing Coyote Ranch, John Ljubenkov meeting lead; May 13, Mollusks at OCSD, Kelvin Barwick meeting lead; June 10 Arthropoda at CSD, Dean Pasko meeting lead; Polychaete meeting in June TBD.

The polychaete meeting was a Bight ’13 preparation led by Leslie Harris and others. The taxonomy portion of the meeting started with a review of papers distributed electronically by Leslie. There were many newly published papers she had gathered for sharing and discussion. Leslie next led a discussion of her provisional species recently reported in the SCB.

Mediomastus sp 6 Harris – staining difference, larger species. Leslie only sees them as larger individuals. There is a staining patch on the head. It is reported from South SD Bay and Hyperion SMB samples. Copies of her drawings were distributed.

Publication Date: 28 July 2016

Mediomastus sp 5 Harris –has banding in abdomen. Copies of her drawings were distributed.

Notomastus sp D Harris – reported from Hyperion LAREST LB Harbor station, Washington State, Channel Islands, and Marina Del Rey. Staining pattern is unique, with eyespots, uniform width. Copies of her drawings were distributed.

Next Dot Norris shared some provisional species from the SF Bay region:

Sigambra sp SF1 (Bay) and *S.* sp SF2 (offshore) – there was some discussion and voucher sheets were handed out. Issues with the true identity of our commonly reported *Sigambra tentaculata* were discussed. *Sigambra setosa* was mentioned as a possible correct name, but some are not convinced that is correct and are leaning towards erecting a provisional species. A lack of specimens with the proboscis fully everted revealing a recently defined character in the genus hinders resolution of this problem.

Amaeana sp A from SF Bay has a striped thorax, 10 thoracic notosetae segments. Methyl Green stained dark lower lip.

Larry led a discussion on the different *Onuphis* spp reported in the SCB. There are problems and reluctance by many present to identify immature or juvenile individuals to species. A key character - on which anterior setiger the branchiae begin, is ontogenetically influenced. In particular the discussion centered around ongoing issues between *O. iridescens,* with branchiae beginning on setiger 1, and *O.* sp A, with branchiae beginning on setiger 1 in adults but setigers 2-5 on immature specimens. And, further complicating matters is *O. geophiliformis* with branchiae beginning on setiger 5 (setiger 3-6 (Hilbig, 1995)). The presence of brown dorsal banding is inconsistent both in the literature and members' reports. Both *O. iridescens* and *O*. sp A are commonly reported, but *O. geophiliformis* is rarer and generally collected in deeper waters, likely Bight habitat. Several ideas on how to standardize the way juveniles should be handled were discussed but no consensus was reached.

Next we had a *Dipolydora* discussion. Methyl Green staining differences between *D. socialis* and *D. bidentata* have been noted by Bill Furlong at LACSD. An unstained third species was questioned as possibly being *D. cardalia* or *D. neocardalia*. Vasily has ID'ed CSD material as *D. neocardalia* and has other Spionid names for older Bight sample material provided by CSD that are not reported in Ed 7.

Larry next led a discussion of *Arcteobia* cf *anticostiensis* stating there are two forms with different types of stout notosetae. To further illustrate the notochaetal cusping in *Arcteobia* Larry showed everyone his new provisional species *Arcteobia* sp LA1. It possesses *Harmothoe*-like notochaetal cusping , is without prostomial peaks, and the ventrum is without pigment; while *Arcteobia* cf *anticostiensis* has *Malmgreniella*-like notochaetal cusping, has peristomial peaks, and has ventral pigment. Both possess capillary notochaetae, are commensal in the tubes of *Streblosoma crassibranchia*, and can co-occur in samples.

Publication Date: 28 July 2016

25 MARCH 2013, ECHINODERMS, CSD

Attendance: Megan Lilly, Robin Gartman, CSD; Fred Stern, Don Cadien, Larry Lovell, Cheryl Brantley, LACSD; Laura Terriquez, Michael Vendrasco, OCSD; Greg Lyon, Craig Campbell, CLAEMD; Tony Phillips, consultant; Dean Pasko, consultant.

Larry opened the meeting with introductions and then went right in to announcing upcoming meetings. The next meeting will be Monday April 15 at SCCWRP, and will be a Species List Review Committee meeting. The SCAMIT symposium at SCAS 2013 (May 3-4 CSULB) has been scheduled. So far 7 talks are lined up and the symposium is Friday afternoon from 1:20 – 5:00. Larry reminded everyone that the 2013 Officer Elections ballots are due to Leslie March 29. The next Crustacean Society Meeting will be July 7-11 in San Jose, Costa Rica. Larry also announced that the SCAMIT Picnic will be held at Doheny State Beach in late July. Volunteers are needed to help with the set-up and clean-up.

The question of Bight'13 specialty taxa was raised. What taxa are in need of special assignment or study? With John Ljubenkov's untimely departure there may be a need to have Cnidaria repeated as a specialty group; otherwise, everyone will be on their own to figure out these difficult taxa.

With that it was time to start the echinoderm portion of the meeting. Don Cadien started the meeting by providing a short review of certain echinoderm literature. Don will make the list of new echinoderm literature available, although he warned that most of it does NOT relate to west coast taxonomy. Some articles relate to west coast echinoderm ecology, particularly of the threat to the local asteroid *Pisaster* resulting from warm water intrusion. Some papers out of Alaska include species reviews and systematic rearrangement; but none of these impact us. One paper discussed the fact that *Leptasterias* is no longer *L. hexactus*, based on microstructural differences, but the taxon needs to be reviewed and renamed. This topic will be researched by Dr. Doug Eernisee.

Holothurian-related literature also included nothing related to west coast taxonomy, but included an interesting article on Antarctic tanaids that burrow into the dermis of holothurians as parasites/ parasitoids.

There was also an interesting paper discussing oceanic acidification impacts on larval echinoderms. Larval echinoderms, it turns out, have to utilize additional resources (energy) to overcome the sparse availability of calcium necessary to create their skeleton. This is putting stress on their survival.

Echinoderm phylogeny was somewhat upset by the deep sea X*yloplax*, a pedomorphic echinoderm that was previously unrecognized as a member of this phyla.

Don finished up his literature overview and Megan Lilly then began a review of some problematic holothuroids. She started out with some basic limitations to holothuroid identification. First, specimens need to be at least 1 cm in total length in order for ossicle development to be determinate. The ossicles of smaller specimens may not be fully developed, which could result in a mis-identification. Some deep sea taxa may be exempt from this rule because several of those taxa have a limited maximum size. Second, when performing ossicle mounts, you need to mount tissue from both the tube feet and the body wall. Even the "common" *Pentamera* needs to be dissected because there are a minimum of five to six possible species represented in the

Southern California Bight (SCB). Third, one needs to place high value on the **predominant** style of ossicles, although not to the exclusivity of the other forms present. The two best references include Philip Lambert's Sea Cumber book *Sea Cucumbers of British Columbia, Southeast Alaska and Puget Sound* (1997) and his 1998 paper describing *P. rigida* and *P. pediparva* from the west coast of North America which elucidates problems with the MMS Atlas illustrations.

Megan then began discussing various issues concerning the identification of holothuroids based upon her experience from the City of San Diego (CSD) sampling program, as well as past Regional Bight programs. She had prepared a talk showing examples of the species discussed below.

Pentamera populifera has supporting tables with medium spires (i.e., not short!) and multiple teeth, along with cross bars near their top. Specimens from our area are typically white with a caudus (tail). The body is typically plump in middle with numerous tube feet giving the animal the appearance of having a "mohawk."

P. rigida (=*Pentamera* sp A "probably undescribed species" in Lambert 1997) has a more generally streamlined body form, with a long caudus, and a relatively short, indistinct mohawk of tube feet. The more rigid body, relative to *P. populifera,* is due to the more dense ossicles. The body wall tables are irregular, round or star-shaped and there can be some lozenge-shaped plates present as well (but the predominant type will be irregular tables) with supporting tables that have small/short spires with multiple teeth. *P. rigida* is found in CSD's South Bay Ocean Outfall samples among fine sands.

P. lissoplaca has little to no tail, beige pigment (not white), and some speckling, with long tube feet all over, giving the animal a "furry" appearance. The body is soft, not strong or rigid with ossicles. It is typically found among coarse sand, but has also been found in fine sand. Lozenge-shaped plates (i.e., without spire) predominate, and irregular body wall tables are also present. The supporting tables are not too distinctive, and have fewer teeth than in *P. populifera*, although the spire is of good size.

P. pseudopopulifera, the dark almost chocolate-colored holothurian, whose color intensifies with age was also discussed. Megan had not prepared a slide on *P. pseudopopulifera* as she was focusing only on those species she thought might give taxonomists some difficulty; however, she warned that small juveniles will only be lightly pigmented. It has a predominance of round to irregular body wall tables and the supporting tables have tall spires with large, symmetrical teeth.

Pentamera pseudocalcigera was discussed next. The tube feet of *P. pseudocalcigera* are different from other *Pentamera* species in being conical rather than cylindrical. In addition the body wall ossicles are distinctive irregular or triangular plates, and the supporting tables have large complex spires that cause the tube feet to have a "hairy" appearance as these spires actually stick out through the skin. The body tapers towards the posterior and is stiff as a result of the density and style of the ossicles.

Megan then discussed *Pentamera* sp C of Haney, a deep water species from 300m, and its similarities and differences from *P. pseudocalcigera*. *P.* sp C has similar body wall plates, but differences in the supporting tables as well as over-all gestalt distinguish the two taxa. Although there was some discussion on the validity of *P.* sp C, it was decided that for the time being it should still be considered a distinct species and identified as such during Bight'13. The voucher sheet for *P.* sp C is available on the SCAMIT website in the Tools Section.

Publication Date: 28 July 2016

Caudina arenicola is a sand encrusted, plump species that is "peanut-worm" shaped with a small tail. The species has very delicate ossicles and tables that almost appear to be "disintegrating" according to notes from several small (1 cm or so) specimens. The tables have large holes in the plate portion of the ossicle. Don Cadien mentioned that specimens from LACSD are typically larger and not covered by fine sand. Since CSD only sees small, juvenile specimens (usually 1 cm or less) the identification of CSD specimens is tentative.

Phyllophoridae sp A Lilly. See the SCAMIT voucher sheet in the Tools section of the SCAMIT website. The apparently undescribed species has a complete lack of ossicles in the tube feet, and delicate tables in the body wall. The body is white with widely distributed delicate tube feet that show no distinctive pattern. It is found in 30–45m depth among relict red sands and coarse sediments.

Megan then moved on to discuss members of *Parastichopus* (Stichopodidae). Based on Bight'08 results there seems to be wide-ranging variability in both *P. californicus* and *P.* sp A. Megan showed a series of field photos from Bight'08 that showed a range of morphologies for both species. She worries there might be undescribed species of *Parastichopus* in the So Cal Bight. As a result, Megan proposed putting together a set of photos of "acceptable" *P. californicus* and "acceptable" *P.*sp A, which people can take in to the field for the upcoming Bight'13 project. Specimens that do not fit within these pre-ordained ranges of variability should be recorded as "*Parastichopus* sp." These specimens should be photographed live (including size scale within photo) and clipped for body and tube feet tissue.

The problem with ossicle mounts of *Parastichopus* specimens is that they rely on micro-measurements of ossicles to determine species identifications. See Lambert (1986) which describes one new species of *Parastichopus* and includes a review of common taxa. Lambert uses ossicle sizes to distinguish taxa. This genus would be a good candidate for DNA work.

For Bight'13, Megan volunteered to create one field sheet per agency prior to the July trawl surveys.

We then moved on to ophiuroids and their associated SCB taxa. Megan strongly urged everyone to dry specimens of *Amphiodia urtica*, *A. digitata*, *A. psara*, and *Amphiodia* sp A and use side-lighting (to create contrast/depth of field) to view the scale patterns and hyaline forks of the disc, oral papillae, dorsal arm plates, etc.

Amphiodia psara is pigmented on both the disc and the arm plates, which can be helpful but not relied upon since other taxa are also pigmented. *A. psara* has blunt, round-tipped arm spines vs. the tapered, sharp-tipped arm spines of *A. urtica* and *A. digitata*. The dorsal arm plates are rectangular with corners touching. The primary plates are evident as a rosette.

Amphiodia digitata has large scales on the dorsal disc cap, and there is a **single** row of hyaline forks that runs along the dorso-lateral edge of the cap. Ophiuroid specimens with multiple, crowded rows of hyaline "spines" can occur but they should not be called *A. digitata*. Each hyaline "fork" can have two or more spires. The dorsal arm plates are rectangular and adjacent plates touch along their front-to-rear edges. You need all three characters present (large dorsal disc cap scales, single row of hyaline forks, and rectangular dorsal arm plates) to call a specimen *A. digitata*; if you don't have all three characters, an ID of *Amphiodia* sp is suggested. *A. digitata* is typically found in coarse sediments.

Publication Date: 28 July 2016

Amphiodia urtica has small, numerous scales on the disc cap and can have some hyaline forks or spines that are limited in location to the area around the genital slits. The dorsal arm plates are rhomboid-shaped, so that corners of the plates are separated/not touching, thereby showing underlying arm tissue. Examples of possible hybridization (between *A. urtica* and *A. digitata*, or...?) are referred to *A. urtica* in the CSD Lab when there is question as to the proper identification.

Amphioplus strongyloplax is found in deeper water in the SCB, but in shallow depths in northern waters. *A. strongyloplax* do not have hyaline cross-bars (T-shaped) on the tips of the proximal to medial arm spines, distinguishing it from *Amphioplus* sp A which does have them. Large radial shields also distinguish it from *Amphioplus* sp A. Megan made a special note for *Amphioplus* specimens from deep water (>200m): disc diameters need to be $\geq$ 3 mm before a specific identification should be attempted, as the hyaline cross-bars of *Amphioplus* sp A aren't always developed on small juveniles.

Amphiura arcystata is usually clearly distinguished from most taxa, but could be confused with juvenile *Amphioplus.* Consequently, if the buccal scales remain appressed to the jaw, then back-off to Amphiuridae. The oral papillae pattern of *A. arcystata* consists of a single pair of infradental papillae and the buccal scales that are well separated from the jaw (at angle to jaw). In contrast, *Amphioplus* will develop one or two additional pairs of oral papillae (two or three total) distal to the buccal scale if the specimen is developed to where the buccal scale is separated from jaw.

We paused the species review here to discuss the general limitations on the use of color patterns because specimens from San Diego (and other areas) do not always show the same depth and richness of color as specimens from some of the northern communities (e.g., Santa Monica Bay, Goleta, etc).

Amphipholis pugetana vs. *A. squamata* – In *A. pugetana* the median arm spines are like large paddles (thickened and distally flattened, flaring at the tip) and longer than the dorsal and ventral spines which is in contrast to the relatively narrow, evenly tapered and subequal arm spines of *A. squamata.* Again, as with most ophiuroids, growth stage is a factor in the development of these distinctive character states.

Ophiopsila californica has pigment on the disc as well as pigmented arm plates. It has round, blunt arm spines, and extremely long tentacle scales which are so large that they can be mistaken for tube feet or ventral arm spines. As adults *O. californica* has oral teeth (not papillae), but as juveniles, it appears to have an oral papillae pattern similar to *Amphiura arcystata* or an *Amphioplus*. Closer inspection reveals this not to be the case, but caution must be used with juveniles. Based on feedback from other agencies (Don Cadien, LACSD) the species is typically associated with hard bottom, or rubble having been dislodged from reef material and therefore is rarely seen, at least in CSD samples.

Several species of *Ophiura* are possible: *O. luetkenii*, *O. leptoctenia*, and *O. sarsi.* The MMS Atlas Volume 14 (1996) distinguishes *O. luetkenii* and *O. leptoctenia*; however, it omits *O. sarsi*. *O. sarsi* is separated from the other two by the nature of the spines in the arm comb. Megan feels that we probably do not see *O. sarsi* this far south as it is mostly recorded from the Bering Sea and Japan, but she suggested taxonomists use caution when looking at *Ophiura* from unusual locales and depths (see Clark 1911, D'Yakonov 1954, and Lambert 2007 for further discussion of *Ophiura*). [**M. Lilly update July 2016: 1 specimen of *O. sarsi* was recorded from B'13 sampling**].

We briefly touched on separating *Dougaloplus* from *Amphioplus* sp A. Both have hyaline cross-bars on the tips of the arm spines and so cannot be confidently identified without the disc cap intact. If an animal is regenerating or missing the disc cap, one should back-off to the family Amphiuridae because the primary differences between the genera/species are restricted to characteristics of the disc.

The presentation portion of the meeting concluded with a general discussion of size limitations. However, along the way, the group discussed the need (or desire) to ask all agencies to supply a copy of their identification conventions for consolidation and comparison.

Megan suggested the following guidelines for limiting specific identification by size:

Ophiuroids should have a disc diameter greater than 2 mm.

Astropecten greater than 5 mm arm-to-arm can be identified to species; but those between 3–5 mm should be left at genus (*Astropecten*); and those less than 3 mm should be left at class (Asteroidea).

Brisaster specimens should have a test length >30 mm before they can be confidently identified to species.

Dendraster species are typically depth dependent. Specimens from samples >30 m depth should be *D. terminalis*; while those from <30 m depth should be *D. excentricus*. Samples coming from 30m depth could become an issue and may require a size limitation. [**M. Lilly update July 2016: specimens of *D. terminalis* have been collected in 20m of water, but were sampled outside of "high energy" zones**].

We then adjourned to review specimens of interest.

Juvenile *Ophiura* – This was an odd specimen for review of size limitations, but was determined to be *Ophiura luetkenii.*

We reviewed a specimen of *Pentamera rigida* from Hyperion, which was confirmed by tissue dissection. The specimen came from Los Angeles Harbor at 14m depth.

We also reviewed specimens of *Amphiodia* from LACSD. The lot included good specimens of *A. digitata* and *A. urtica,* and others thought to be *A. digitata.* But after some review and discussion of the hyaline forks, the latter specimens were determined to be *A. urtica.*

Amphiodia sp A LACSD was also examined. This species has long arms that typically do not fall from the body, but remain intact. In EtOH the arms disentangle easily. There is some pigment on the dorsal arm plates, but use color with caution. *A.* sp A are typically found in shallow and coarse sandy sediments. A distributed voucher sheet does exist, but is not included in the SCAMIT toolbox.

Several specimens of *Ophiopsila californica* were reviewed. Dorsal arm plates are "balloon-shaped" and the tentacle scales are nearly as long as arm spines.

15 APRIL 2013, SCAMIT SPECIES LIST REVIEW COMMITTEE AND TWO PRESENTATIONS: LESLIE HARRIS – HITCHHIKING ALIENS, AND ERIC STEIN - MOLECULAR METHODS FOR INVASIVE SPECIES MONITORING, SCCWRP

Attendance: Ron Velarde, Megan Lilly, Wendy Enright, Katie Beauchamp, Kathy Langan, CSD; Leslie Harris, NHMLAC; Kelvin Barwick, Danny Tang, OCSD; Victoria Gray, Endemic Environmental Services; Larry Lovell, Don Cadien, Cheryl Brantley, LACSD; Tony Phillips, consultant; David Gillett, SCCWRP.

The business portion of the meeting was opened by Larry Lovell. Introductions were conducted and upcoming meetings were covered. There was a sad discussion concerning the passing of John Ljubenkov and what it will mean to our local cnidarian taxonomy. All agreed it will mean a huge loss. Tony Phillips proposed a meeting for cnidarian taxonomists consisting of people bringing all their respective literature and trying to standardize our approach to this often difficult group. Leslie suggested there should be a scanner present at the meeting so that any literature that needs to be duplicated and distributed can be dealt with in the present moment. Don Cadien also suggested that we compare our notebooks against what is already posted in the Tools section of the SCAMIT website. Kelvin offered to host the meeting at OCSD.

Larry announced that he would be gathering John's notes, files, and specimen collections which will then be accessioned at the NHMLAC.

John's upcoming memorial services were discussed. There will be two, one on May 18th at Dancing Coyote Ranch which will be a small event for family and close friends only; a second event will be held at the Cabrillo Marine Aquarium in June and this will be a larger celebration. It will be held in the evening after 5 p.m. and will consist of a potluck dinner and a slide show of John's life (running in the auditorium). This will be open to the SCAMIT "crowd" who knew John.

There are no notes from either of the presentations that day, but both were informative and entertaining and appreciated by all present.

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