

SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS



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Photis brevipes, mature male. Photo by D. Pasko.

This Issue

13 MARCH 2017, HETERONEMERTEA, CSD; D. PASKO, LEAD	2
18 APRIL 2017, <i>PHOTIS</i> SPP, CSD; D. PASKO, LEAD	5
BIBLIOGRAPHY	8
SCAMIT OFFICERS.....	9

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

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13 MARCH 2017, HETERONEMERTEA, CSD; D. PASKO, LEAD

Attendance: Dean Pasko, Tony Phillips, private consultants; Larry Lovell, Don Cadien, Terra Petry, Chase McDonald, LACSD; Patricia McGregor, SFPUC; Gabriel Rodriguez, Wendy Enright, Ron Velarde, Kathy Langan, Katie Beauchamp, Robin Gartman, Megan Lilly, CSD; Angelica Zavala Lopez, MTS; Dot Norris, retired; Ben Ferraro, OCSD.

Remote attendees: Matt Hill, EcoAnalysts; Dany Burgess, WADOE; Erica Keppel, Smithsonian.

UPCOMING MEETINGS

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

The business meeting started with a “round robin” of introductions. After introductions it was announced that officer elections are in progress and attendees were urged to please submit ballots by March 29th.

The taxonomic portion of the day started with Dean Pasko stating that “none of us are experts”, which is certainly true when it comes to heteronemerteans (or any of the nemerteans for that matter). The primary challenge is one of consistency. In reviewing several sets of specimens that had been sent to Dean prior to the meeting, he found inconsistencies across the board with other taxonomists as well as within his own identifications.

Dean’s presentation started with a general overview of Nemertea. He started off by reviewing the differences between the Anopla, the Class in which the mouth and proboscis pore are separate and have an unarmed proboscis, and the Enopla, where the mouth and proboscis pore are united and have an armed proboscis. Most of these differences are clearly presented in several publications (e.g., Gibson 1982) or via the Internet.

The mouth is considered to be part of the body or trunk region, while that portion of the body anterior to the mouth is the head. The proboscis of some nemerteans can be branched, though no species with that trait are present on this coast. Cross-sectioning anoplans to view muscle layer and lateral nerve chord arrangement/organization is a vital technique when practicing “functional” taxonomy of the group. The trick for making a cross-section with a blade or scalpel, is to start at an angle, then press straight down. The outer muscle layer of heteronemerteans is always longitudinal as opposed to the Palaeonemerteans, which have circular muscle as the outermost layer.

Circular muscle, upon cross-sectioning, appears shiny/shimmery but one must be careful because connective tissue shows similar characteristics. In contrast, longitudinal muscle looks spongier (or grainy) and is typically darker.

The difficulty with applying even these basic characters is that for many of them we don’t have a good handle on the level of phenotypic plasticity that can be expressed. Another difficulty is that the original descriptions are often based on large specimens and most of what we sample are likely juveniles. Recently Sunderg et al (2010) performed a comparison on morphologically distinct species of *Cerebratulus* and found a lot of intra-specific variation in color and pigment patterns that we often use for identification purposes. They noticed that color as well as patterning changes with age. Similar results were found to apply more broadly to nemertea in general (Kvist et al 2014). In addition, Herrera-Bachiller et al (2015) noted that many original descriptions are



inadequate to compare against newly recognized species. Which lead Dean to state - “Maybe we are trying too hard”....but that is a discussion for another day.

Many of the primary resources shown at the end of the PowerPoint include species keys. And although several work well (e.g., Bernhardt 1979, Coe 1940, MacEwen 1980), one must be careful to validate current name usage and synonymization. See also SCAMIT NL Vol. 3, No. 4 (July 1984) for a complete listing of useful historical nemertean literature.

After the general overview we started discussing specific species addressed in Dean’s 2nd presentation of the day.

Lineus bilineatus

Often in either Chaetopterid or *Hermundura fauveli* tubes. Distinctive coloration includes a white mid-dorsal stripe and a white area on the dorsal surface of the head, against an olive-beige body; however, use caution as this pattern can often fade with preservation. In practice, it is probable that many of us performing routine identifications call any specimen with a longitudinal, mid-dorsal stripe against a darker background (green or brown) *L. bilineatus*, irrespective of whether the stripe extends onto the head.

Lineus flavescens

Head somewhat flattened, 3-7 ocelli (eyes).

Lineidae sp HYP1

Often found in *Diopatra ornata* tubes; brown dorsum with a white border at anterior edge of the head, enabling 2 large, dark eye spots to be viewed easily.

Lineus pictifrons

Banding of white rings.

Cerebratulus:

Consistent identification of species of *Cerebratulus* has eluded many of us performing routine identifications for Southern California Bight (SCB) monitoring agencies. This group has recently been the cause of considerable consternation for Dean, as he has had an opportunity to see specimens from an increasing number of laboratories in the SCB.

- Difficult because different colors develop in different habitats.
- Often broadened in the head region compared to *Micrura* (which is more uniform in width along the entire length of the animal).
- If dealing with large, pigmented specimens it may be helpful to look at the key in Light’s manual (Roe, P. et al., 2007).
- He included in his draft key an endnote that describes some of the difficulty he has experienced with this taxon.

Maculaura and *Micrura*

These genera tend to have shallow cephalic slits and a small mouth in contrast to *Cerebratulus*, which frequently will have deep cephalic slits and a large, often open mouth.

- *Micrura wilsoni* has a dark body, head white often with pigment spots; cephalic slits narrow, smooth.



Baseodiscus

Often sampled in bays; usually found farther south; the cephalic slits are very short and shallow.

- *Baseodiscus delineatus* has a longitudinal pigment pattern, while *Baseodiscus punnetti* has dorsal pigment.
- *Baseodiscus princeps* is yellowish with irregularly spaced red/brown spotting.

Zygeupolia

Cerebral sense organ (CSO) far back from proboscis pore. Animal usually pale with a highly contracted/wrinkled head region. Caudal cirrus present if animal entire.

In Dean's Anopla key there are many footnotes and endnotes to provide additional guidance and description.

The afternoon was spent looking at specimens and discussing the confounding degree of variation in cephalic slits. They can range from something as simple as a faint line suggesting a slit; to thin, tightly appressed slits; to deep, wide, open slits. They can also vary in length; from extending just a few mm past the tip of the head, to running the length of the head to the mouth. The differences between Valenciniidae and Lineidae were discussed without much resolution and for many of the provisional Heteronemerteans, the Family placement is uncertain.

Nemertean systematicists at Universities and Museums use serial sections to look at internal features (e.g., blood vessels, intestinal diverticula), which are beyond our capabilities and scope of work. With this group of organisms we truly are “functional” taxonomists trying our best to find ways to identify these enigmatic animals. One of the primary goals is to make sure that the SCB taxonomists are consistent amongst each other with their identifications. The idea is to recognize that we may have the wrong species name, but that we are all calling an animal with a specific set of characters by the same name so the data is comparable across the region with regards to biodiversity.

Editor's note: Both Dean's Heteronemertea presentations are available on the SCAMIT website in the Taxonomic Tools Section.



18 APRIL 2017, *PHOTIS* SPP, CSD; D. PASKO, LEAD

Attendance: Ron Velarde, Katie Beauchamp, Andy Davenport (CSD); Kelvin Barwick, Danny Tang, Ben Ferraro (OCSD); Larry Lovell, Chase MacDonald, Don Cadien, Jovairia Loan (LACSD); Kathy Omura, Leslie Harris (NHMLAC); Craig Campbell, Cody Larsen (CLA-EMD); Angelica Zavala Lopez (MTS).

Remote Attendees: David Drumm, Ecoanalysts; Dany Burgess, WADOE; Tara MacDonald, Biologica Environmental Service; Phillip Hoover.

The meeting was opened by our new President, Kelvin Barwick. He started out by thanking Dean for presenting and CSD for hosting. And while thanks were being given, he wanted to recognize and thank Larry Lovell, our retiring President, for all his years of hard work and dedication to SCAMIT. It was at this point that Don Cadien spoke up and reminded everyone that while Larry was retiring from Los Angeles County Sanitation Districts, he was not retiring from being active in SCAMIT and we should all expect to see him at future meetings. Kelvin agreed and cheerfully

stated that he already had committee assignments in mind for Larry.



K. Barwick and L. Lovell, 18 April 2017

Next on the agenda was a discussion of future meetings. At this point they are scheduled through October 2017. Please see the SCAMIT website for the most current listing. There was a brief sidebar regarding the idea of another General Membership (GM) meeting in September. If we decide to pursue it, Leslie graciously offered to “give up” her September Terebellid meeting. Kelvin iterated that the SCAMIT Executive Committee should decide if another General Membership meeting is needed or desired. Larry pointed out that at last year’s GM

meeting we were able to successfully schedule future meetings a year out. Which in of itself was a big success. Since we already covered much general SCAMIT information (history, future directions, etc.) last year, there is concern that we won’t have as much to discuss this year. Larry’s response was to have it be a combination meeting with a specific taxonomic topic in the morning and then a shorter GM meeting in the afternoon. Kelvin stated that the Executive Committee will take this in to consideration at their annual meeting. Kelvin reminded everyone that Friday, April 21st (just 3 days away) was SCAMIT’s official 35th birthday. He noted that some charter members were present at today’s meeting – Ron Velarde, Leslie Harris, Don Cadien, and Larry Lovell. On that note Kelvin announced that Larry Lovell would be awarded, by unanimous consent of the Executive Committee, an Honorary Life-Time SCAMIT Membership. By way of introduction, Kelvin reminisced about how he first came to California when Larry Lovell, then the Lab manager at MEC, offered him a job as a sorter. It was at MEC where he was given the opportunity to work with the late John Ljubenkov, training in Molluscan taxonomy. It was through that opportunity that Kelvin was introduced to SCAMIT. As with the rest of the members, it has been an essential part of continued taxonomic training. Larry was given a card proclaiming his honorary life-time membership status and thanking him for his 35 years of service. A bottle of



wine was included, for good measure, and we also celebrated SCAMIT's 35th birthday a few days early with, what else, a cake and candles.

We then dove into Dean's presentation on *Photis*. He noted that this group creates great difficulty for some people, and that his previous key to the species has problems that have frustrated many; hence, here he was making his third SCAMIT presentation on the group. The key frustrated people largely due to Dean trying to make it useful for immature and juvenile specimens as well as adults. Unfortunately, that effort generated more questions and problems than it solved.

Dean then started the presentation with a review of the corophioid amphipods, and the characters used to distinguish Corophiida from Caprellida according to Myers and Lowry (2003). He also noted that several of the characters, particularly the shape of the head, the degree to which the head lobe is extended, or depth to which the antero-ventral margin of the head is recessed, varies and can be difficult to apply. Photids fall within the Order Caprellida, and Dean then went into the characters that distinguish the Caprellids (including the Dulichiidae and Podoceridae, in addition to Caprellidae) from the Photoidea (Ischyroceridae, Kamakidae, Photidae). The Caprellids are, of course, distinguished by their elongate bodies, fused cephalon and pereonite 1, and very reduced abdomen; while Dulichids and Podocerids have strongly reduced (or absent) third uropods, and very elongated urosomite 1. On the other hand, Photoids have the head distinctly separated from pereonite 1, fully developed third uropods, and varied length urosomite 1.

He then briefly reviewed his Artificial Key to the SCB Photoidea, which Dean produced in the course of training City of Los Angeles and Orange County Sanitation District staff in arthropod taxonomy. When one gets a specimen to the genus *Photis*, the key redirects the user to Dean's previously referenced Key to the *Photis* (Amphipoda: Isaeidae) from Coastal Shelf Bottoms of the Southern California Bight (Pasko, 1999); however, Dean had a simpler key to present. He cautioned that the revised and simplified key is reliable only for adult specimens, and then went on to explain this new key. [Dean is continually validating and updating the key, but it will soon be posted to the SCAMIT toolbox, and a final version will hopefully be out prior to the Bight'18 identification efforts.] This was followed by a presentation on some general guidelines for dealing with samples full of *Photis* specimens (repeated below).

Photis can be challenging and frustrating. To avoid wasting time and building up huge stores of anxiety, Dean suggests following this play-book until you get comfortable.

1. Review the *Photis* spp slides
2. Sort out the small specimens (< 2 mm is good starting point), but remember there are some pretty small species (*P. lacia*, *P. macrotica*, *P. linearmanus*, *Photis* sp A, *Photis* sp B, and *Photis* sp C are all around 3 mm)
3. Size makes a difference, especially when distinguishing among our most common species: *P. brevipes* and *P. californica*
4. Sort the specimens by color BUT do not use color as a single indicator; especially between regions
 - a. Specimens with pigment capped heads
 - b. Specimens with pigment dots at the end of Gnathopod 1 and/or 2
 - c. Specimens with pigment dots on the side of coxa 5
 - d. Specimens with pigmented antennae
 - e. Specimens with diffuse pigment throughout body



5. Sort by normal vs. large eyes
6. Sort by male (w/o brood plates) vs. female (with brood plates) – Check Cx 3
7. Males - Adult males are generally easy to distinguish by Gn2
 - a. Sort males by whether there is a tooth on dactyl of Gn 2 vs. not; then by Gn1 shape (concave palm vs. oblique palm)
 - b. Take them through simplified key
8. Females - Adult females can be distinguished by combination of Gn1 & 2
 - a. Sort by Gn2 shape (rounded vs. cornered)
 - b. Take them through simplified key
9. Certain species have very definitive characteristics
 - a. *Photis* sp A, *Photis* sp B, *Photis* sp C, *Photis brevipes*

The remainder of the presentation included photographs of specific character states (e.g., geniculate antenna 2, acutely produced vs. rounded female gnathopod 2, large vs. small eyes, etc.), as well as compiled illustrations of various species.

After a lunch break, Dean placed several dishes of mystery *Photis* at the three microscopes that Ron had kindly made available. Members were encouraged to use the revised key to identify the mystery *Photis* (consisting of males and females). He spent the remaining time visiting with SCAMIT members as they asked questions or puzzled over how to interpret various character states. Dean also spent some time revisiting a couple of provisional species he had left behind at the City of San Diego laboratory after his departure, and found that they appeared to be valid. He hopes to get time to review these provisional species in depth and come up with more definitive voucher sheets.



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

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