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MARINE
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TAXONOMISTS**



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SCAMIT Newsletter

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Unknown anemone, intertidal, Bird Rock, La Jolla, CA
Photo by B.J.Stacey, taken from iNaturalist

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

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21-22 MARCH 2018, ASCIDIAN WORKSHOP, GRETCHEN LAMBERT
Day 1, March 21, 2018

Attendance: Kelvin Barwick, OCSO; Megan Lilly, CSD; Don Cadien, Chase McDonald, Terra Petry, Jovairia Loan, LACSD; Cecilia Hernández, SFSU; Lisa Gilbane, Dept. of Interior/BOEM – Marine; Doug Eernisse, CSU Fullerton; Linsey Sala, USCD/SIO; Greg Lyon, Jennifer Smolenski, Erin Oderlin, CLAEMD; Dean Pasko, DCE.

<p>UPCOMING MEETINGS</p> <p>Visit the SCAMIT website at: www.scamit.org for the latest upcoming meetings announcements.</p>
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Business began with Kelvin announcing upcoming meetings:

April 16th at CSD will cover phoxocephalids lead by Dean Pasko. At this point there was a side-bar by Dean – he has revised his key and will review it at the meeting. He knows there are some odd species “floating around”, and asked that they please be brought to the meeting. Dean stressed that people need to bring specimens or it will be a short day. May 7th at OCSO will be mollusk problems lead by Kelvin Barwick. Kelvin doesn’t have enough material for a full day so he is asking people to bring problems/ideas/specimens/photos, etc. He also mentioned that we need to standardize our approach to the aplousobranchs. Don Cadien offered to mine the “on hold list” for mollusks that have been provisionally erected but not finalized. Kelvin offered to send the “hold list mollusks” to the SCAMIT List Server for perusal prior to the meeting. 11th June at NHMLAC will be Orbinids with Brent Haggin (LACSD) and Ashley Loveland from SFPUC. There will be no meeting in July due to most of the agencies being out on the water for B’18. August 20th will be at NHMLAC and cover “Terebellids part II” with Leslie as the meeting lead. September 10th will be at OCSO and address holothuroids/echinoderm problems with Megan as meeting lead. October 15th (location TBD) will be Spionids and Polydorinae with Leslie and Tony as meeting leads. November 5th (TBD) will be nemerteans with Tony and Megan [Editor’s note: This meeting has since been changed to a review of B’18 FID trawl invertebrates; location OCSO]. December 3rd will see our annual General Membership meeting at SCCWRP.

The SCAMIT Species List Review Committee (SLRC) met recently and they are still aiming for a July 1st publication date for Ed. 12. The SLRC is exploring possibilities for the SCAMIT database tool and will be looking for someone to help draw up the proposal. They need a rough estimate of cost in order to budget accordingly. With regards to the Species List, Don chimed in and noted that Ed. 12 is a return to a semi-annual list, and that new editions do not necessarily have to be compiled every year.

It was stressed that new volunteers for the SLRC are always needed. The List is divided by phyla and people assigned to those phyla are asked to keep track of pertinent systematics-type changes.

Leslie then had the floor and wanted to bring to our attention a new animal found in the intertidal off San Diego – the Torrey Pines and Bird Rock areas. It is an unknown anemone (see cover photo) discovered by iNaturalist (<https://www.inaturalist.org/>) volunteers. Specimens were sent to Meg Daly (Ohio State University) who stated that it reminded her of an indo-west pacific species. It could be an *Anthopleura* but specimens will be needed for a definitive identification. A request was put forth that if anyone sees one of these animals while out tide-pooling, to clip some tentacles and place them in 95% EtOH and then fix the animal in formalin. Specimens can be sent to the NHMLAC and after preliminary work will be shipped to Meg Daly. Leslie suspects it is



an introduced species by way of San Diego harbor/shipping. Is it going to spread north? South? Deeper? She will be showing images and discussing it at the MARINE meeting (<https://www.marine.gov/>).

Doug Eernisse (CSUF) had the floor next and told us he has been finding eulimids on *Ophionereis*. He thinks they may be a *Stilaplex* which is from Baja. It is an orange eulimid which has been found implanted in the arms of brittle stars. Doug has a student who is going to work on it and he requested that if anyone has specimens or sees it, to please collect and donate to Doug.

Leslie then told us that she has a visitor, Sergio Salazar-Vallejo, and it just so happens his wife is a Eulimid specialist. She would love to see specimens, however, she works in Mexico so specimens may not be sent “home” with her.

Don Cadien then asked if anyone had an update on an unknown anthozoan from Baja. Leslie hasn’t heard anything about it and no one else present had any information to offer. Don feels we are suddenly having strange anthozoans showing up in greater numbers. We will alert the MARINE people to this unknown Baja species as well.

Dean Pentcheff took the floor to talk about DISCO (Diversity Initiative for the Southern California Ocean) and to extend a welcome on behalf of the marine biodiversity center at NHMLAC. One of DISCO’s goals is to enable environmental DNA surveys. They are working with people at UCLA on making eDNA technology easier and not just a post-doc cottage industry. The problem with eDNA info is that it is not up on GenBank databases etc., and very few marine invertebrates have been sequenced.

He then discussed iNat (iNaturalist) which is a collaborative project of the California Academy of Sciences and the National Geographic Society. The iNat project has been helpful in picking up on species observations in nature. Historically volunteer-based observations have been criticized, as often no specimens were collected. However, recently the idea is gaining traction because there is a paucity of good species list for intertidal areas; between modern technology and some hands on training, citizen scientists can be an asset in creating new, more robust species lists. The San Francisco Bay area has had good success in this endeavor. DISCO is going to use those efforts as a template for work in Point Fermin. They are hoping to get fairly intensive surveying done over the next several years. To that end they have scheduled a couple of intertidal trips and would love to have volunteers join in April and June. Dean distributed hand-outs, but there will also be sign ups at the DISCO website (<https://research.nhm.org/disco/>). The Cabrillo Marine Aquarium will also be involved in the intertidal surveys and participating in the iNaturalist project with someone from the California Academy of Sciences providing training. Dean also briefly told us about “City Naturalist”; Los Angeles is competing against 60 other cities for the greatest number of species volunteers can find.

Erin Oderlin suggested to Dean that he talk to Dr Alan Miller and Dr. Suzanne Lawrence-Miller as they’ve been documenting San Pedro’s rocky intertidal for decades.

Don Cadien posed a question – as specimens are sequenced are the results being posted on-line? Dean answered yes, they are being posted as quickly as possible. He is negotiating with BoLD and GenBank to push data to them. BoLD has very strict quality controls in place (pictures, locations, vouchers). GenBank has less strict rules, but more data/info available. For this reason DISCO is trying to get sequences in to both databases.



With most of the business portion of the meeting over, the floor went back to Kelvin who called for a round of introductions. During introductions Leslie invited people to tag along on an upcoming June survey of harbors and have the opportunity to learn ascidians from Gretchen Lambert.

Leslie began the taxonomy portion of the meeting by introducing Gretchen and telling of her life's work with ascidians. Gretchen explained that the workshop was broken in to two days, with the 1st day being an Ascidiacea 101 overview. She then opened with her talk - "*Introduction to Ascidians*". She concentrated on Southern California species with her focus being on harbors and a few offshore species. She started by recommending Monniot et al (1991), for good figures exemplifying stigmata and branchial sac patterns.

She feels that the Subphylum Tunicata is more appropriate than Urochordata but for this meeting she will limit herself to the Class Ascidiacea. All are sessile and most have swimming tadpole larvae for the dispersal phase. In the social ascidians (type of colonial) – individual zooids are connected by stolons, vs “true” colonial species which share a common tunic. All ascidians are hermaphrodites and in colonial species the 1st individual is formed by sexual reproduction but the rest of the colony is formed by budding. Something to keep in mind when collecting for DNA purposes – try to find more than one colony, because all the individuals in a colony are the same genetically.

Some characters used for taxonomic purposes include: External – type of tunic (rough, smooth, thick, thin, etc.); number of siphonal lobes (molgulids = 6 internal and 4 external vs. others with 6 & 6, or 4 & 4; and phlebobranchs have >4). Internal characters – branchial folds present or absent and number of folds per side (molgulids = 4 per side, all others 6); oral (branchial) tentacles simple or branched; stigmata straight or spiral; gonads single or multiple and on one or both sides.

A little about physiology – the endostyle makes hormones, compounds that start digestive processes, and mucous which is integral to feeding for all ascidians. The branchial sac is the filtering/feeding structure. Stigmata within the branchial sac are lined with cilia which create a water current. The stigmata do not filter food but rather move the mucous sheet from the endostyle around the sac and to the dorsal side. Plankton and other trapped particles are stuck to the mucous and particles of 1 micron or less can be caught. Ascidians are very successful in polluted areas because of their ability to feed on bacteria, macromolecules, and fungal cells. In general, ascidians tolerate and can utilize some pollution, consequently allowing them to do well in harbors. They can even filter/trap heavy metals and attempts are being made to culture *Styela* for use in clearing polluted waters.

Gretchen then moved on to discussing “local” species.

Colonial:

Symplegma reptans, non-native species introduced from Japan; often yellow or pink in life with individual zooids imbedded in a common tunic; can often see stigmata (10 – 11 rows), through the translucent body.

Polyandrocarpa zorritensis, introduced species with black and white stripes on siphons; form large colonies and very common in the Southern California Bight.

Botryllids are colonial stolidobranchs. They have vascular ampullae surrounding their colonies which are specific to Botryllids. The ampullae are defensive and will fight with non-genetically



similar counterparts. Botryllid tadpoles are ovulated in to the tunic and enclosed in placenta (has vascular attachments) and nourished; they get very large.

Botrylloides diegensis, despite its name, is not native. It has yellow and white coloration around the oral siphons.

B. violaceous is all one solid color, i.e., there are no rings of color around the oral siphons.

B. leachii is a European species and has been seen locally.

B. giganteus is not native and it is unknown from where it originated. The Lamberts first found it in 1997 at the south end of San Diego bay and it is now abundant in both San Diego and Mission Bays. It is a warm temperate species and is distinctive in having approximately 16 rows of zooids (vs 10-12 in other species) and a very thick tunic. A 2011 survey in SD Bay found huge colonies.

Solitary:

Ciona was first recorded in San Diego in the 1900s. It is the only genus with wide white muscle bands.

C. robusta (= *Ciona intestinalis* of authors NEP), has a red-tipped vas deferens and is a Japanese invasive.

C. savignyi has a white-tipped vas deferens and has white or orange pigment spots on body wall; it too is native to Japan and was first discovered in Southern California in the 1970's.

Microcosmus - in order to identify species within the genus, the branchial siphonal spines have to be examined. The tunic lines the inside of siphons so in order to find the spines it is necessary to peel off the internal lining of the branchial siphon, place the tissue on a slide with sea water or ethanol, and use a compound scope to examine the spines. Every species has a unique structure to their siphonal spines.

Styelids all have ridges/folds on an elongated stomach, this includes both solitary and colonial species. In the compound species there will be 4 longitudinal vessels on each side of the branchial sac, vs in solitary species there will be 4 branchial folds on each side.

Styela plicata is not native but it is found all over the world in temperate waters; it's white, lumpy, and often curved.

S. clava is native to Japan and Korea and is a terrible "pest". It has a lumpy flat body and the siphons are positioned on the distal end. It does especially well in areas of aquaculture because the water is enriched and full of bacteria and it is particularly fond of mussel aquaculture farms.

S. montereyensis is native and widespread on the pacific west coast. It has a long, thin, stalk, a furrowed tunic, and the siphons aim away from each other at 90 degrees.

Ascidia zara which is an introduced species seems to only be found on floats versus its native counterpart, *A. ceratodes*, which can exist subtidally.

Molgulidae – Oral siphon with 6 lobes, atrial with 4; a renal sac is present on the right side, this character is not present in any other family.

Molgula verrucifera is tiny and sand covered and found in the outer coast. Gretchen wanted to know if we are seeing this species. It has 6 branchial folds on each side.

M. ficus - non-transparent tunic; 7 branchial folds on each side.

M. manhattensis - non-native, tunic thin and transparent; 6 branchial folds on each side.

Pyuridae - To separate *Pyura* from *Halocynthia* you need to use the gonads and the siphons.

Pyura has one gonad on each side, which is long and sinusoidal; the oviduct is in the middle with ovitestes attached (Gretchen recommended examining Abbott's drawing in Light's manual) and has long siphons.



Halocynthia has several gonads on each side and short siphons.

H. igaboja – tunic covered in large spines; found subtidal, not on floats.

H. aurantium – large, with very small spines on tunic giving a rough appearance

We broke for lunch and after Gretchen started the afternoon with colonial ascidians – how to separate between colonial stolidobranchs vs colonial phlebobranchs and aplousobranchs. The taxonomy is based on individual zooids; if you take the body out of the tunic, how many body parts do you have? All stolidobranchs and phlebobranchs have one body part vs aplousobranchs which can have 2 or 3 body parts (see drawings in Light's Manual). And with that Gretchen's talk was complete and we spent the afternoon looking at live specimens.

Gretchen covered dissection techniques: Use a single-edged razor blade to slice through the tunic, then use scissors to cut upwards on the ventral side; remove the body and then cut it open, starting at the attachment points at the siphons (because lining of tunic starts from the siphon). Remember, after opening the specimen per diagram (Light's Manual) the Right and Left sides are reversed (right side is on left, vice versa).

We learned how to do a proper dissection of a compound ascidian, something which many members greatly appreciated as this is a difficult task at best.

Day 2, March 22, 2018

During the second day of the work shop Gretchen continued to cover, and expanded upon, the ecology, physiology, and reproduction of ascidians. She also spent some time looking at attendees' problematic ascidian specimens. Specimens of *Molgula* sp SD 1 (Lilly 1999) were examined and some were determined to be *Eugyra arenosa californica* and others were *Eugyra glutinans*. The difference in the two species has to do with the gonads; *E. glutinans* has 2 gonads and *E. arenosa californica* has 1.

Gretchen recommended the following resources for Ascidian taxonomy: Tabular keys to the Worldwide Ascidian Families from Monniot et al (1991). However it is so comprehensive that it is difficult to use. California ascidians are keyed in Light's Manual (2007) but Gretchen warned us that even this limited key is difficult to use.

That ended a 2 day workshop and SCAMIT members were extremely grateful to have Gretchen share her extensive knowledge.

16 APRIL 2018, PHOXOCEPHALIDS, CSD, DEAN PASKO

Attendance: Ron Velarde, Tim Stebbins, Katie Beauchamp, Andrew Davenport, CSD; Dean Pasko, Tony Phillips, DCE; Don Cadien, Terra Petry, Chase McDonald, LACSD; Ben Ferraro, Kelvin Barwick, Danny Tang, OCSD; Heather Peterson, SFPUC; Craig Campbell, JoAnne Linnenbrink, Cody Larsen, CLAEMD.

The meeting opened with Kelvin reminding everyone that May is membership month for SCAMIT. The fees and payment options have changed and are as follows:

Electronic member - \$20 (PayPal = \$20.74)

Hard copy member - \$35 (PayPal = \$36.07)

Institutional member - \$65 (PayPal = \$66.73)



Next it was time for a Bight'18 Update; there will be a B'18 Intercalibration Cruise April 18, 2018, hosted by LACSD on their boat *The Ocean Sentinel*. There is a B'18 benthic infauna technical group meeting on May 16, 2018 at SCCWRP.

Kelvin then opened the floor to questions or comments. Danny Tang reminded everyone that the SCAS meeting is May 4th. Dean Pasko then had the floor and asked what is SCAMIT doing to prepare for Bight'18? Kelvin stated that SCAMIT will probably move to double meetings starting in 2019. These meetings will often be FID sessions for various phyla groups. Don Cadien asked if anyone would like to have a meeting to explore unknown groups including Conacea (specifically the Turrids). Ron Velarde wanted to know if there had been any further word on Bight'18 taxonomic specialization? He suggested that it should be considered and brought up to the benthic group subcommittee May 16th. Taxonomists should think about what groups would need specialization. Kelvin also suggested if specialization is used, veteran taxonomists should team up with novice taxonomists as a training opportunity.

With that it was time for the Phoxocephalid Presentation by Dean Pasko. Preamble – Dancing Coyote Environmental is currently trying to make new keys and update current material to prepare for Bight'18. However, don't depend on keys alone, use vouchers and visual aids when possible to confirm characters.

Dean's presentation is available on the SCAMIT website in the Taxonomic Tools section. After his presentation, Dean and Ron set up microscopes with numbered specimens and attendees formed groups and identified the specimens using Dean's new key.

UNLISTED NUMBER

Don Cadien, LACSD – 16 March 2018

While the LACSD crew was out trawling at the end of February, they made an unusual catch at one of our 305 meter stations. Along with the usual assortment of fish and urchins (*Mesocentrotus fragilis*) there was a strange mushy blob in the tank as the catch was processed. This proved to be a juvenile of the midwater octopod *Haliphron atlanticus*, the seven-armed octopus – largest octopod in the world. Some squid are much larger, but only the Pacific Giant Octopus, *Enteroctopus dofleini*, comes close to equaling the 4m length of the largest members of this species. The one in the tank was only about 2 ft. long, so was quite juvenile. It was also a female, lacking the specialized hectocotylized arm of the male. In all members of the superfamily Argonautoidea, to which the species belongs, the male hectocotylus tip is detachable, forming a synapomorphy of the group. *Haliphron* is a monotypic genus, and the only member of the family Alloposidae. It was formerly known as *Alloposus mollis* on our coast, but was one of several species synonymized with the earlier *Haliphron atlanticus* of Steenstrup 1861.

The flesh of the animal is gelatinous, and at least one of the crew put part of their hand clean through it while trying to raise the animal from the tank for closer examination. Even so the specimen was in quite good condition for such a delicate beast in a net-full of spiny echinoderms. Photographs were taken at sea, and an arm tip was excised and preserved in 100% ethanol for later molecular work. Two views are provided on the next page, one, a ventral view of the sucker arrangement, and the other, a lateral view of the mantle complex and webbed arms.





Haliphron atlanticus ventral view. Note initial series of single suckers (first 10) followed by pairs.



Haliphron atlanticus juvenile female from T4-305m off Palos Verdes Peninsula (photos Chase McDonald)



The animal appears to have a cosmopolitan distribution (although Lima et al 2017, suggests based on molecular data, that two different species occur in the north Atlantic), but is rarely encountered in the Northeast Pacific. Prior to our specimen, only three others were known from Southern California; a good sized individual reported by Young (1972), and two much smaller specimens reported by Alvariño & Hunter 1981 (Verrill’s material was all Atlantic). These last two specimens were quite small, and came from relatively shallow waters (7m and 70m). Young’s specimen came from the Catalina Basin, but from an unspecified depth. It had a mantle length of 115mm and was of similar size to our specimen. All individuals caught to date in the region have been female. Recently additional individuals were observed live via ROV, but not captured. This was in the Monterey Submarine Canyon (Hoving & Haddock 2017) where one individual was seen at 390m and another at 520m depths.

Not many specimens for an entire biogeographic province. Despite this the species is not rare. Dietary studies of cetaceans and sharks have demonstrated accumulations of the beaks of this species in guts of both top predators, and they are assumed to form a significant link between gelatinous zooplankton and such large consumers. They are just infrequently caught by non-predators.

While they have not proven very common yet in our area, POTW biologists should be prepared to recognize the species if they take it. Of prime utility in such recognition is the uniserial nature of the proximal suckers. This is also shared by *Japetella*, but in that genus the distal suckers are not paired. There is some variation in where the pairing starts. Literature records suggest it begins at roughly the edge of the web, but in our specimen it began about 2/3 of the distance from the mouth to the web margin. Such variations were used in the past as suggested characters of other species in the Alloposidae, now all synonymized with *Haliphron*. The animal is a light violet color, with pigmentation becoming more intense towards the tips of the arms. There are 8 arms by the way, despite the common name of the animal. That derives from the male, whose hectocotylus is so much smaller than the other arms it appears to only have seven. If one is taken it should be photographed and recorded at a minimum, a tissue snip collected and preserved in 100% ethanol for molecular work, and if feasible, collected. Containers can be an issue because this is potentially a very large organism. Don’t look for the name on the SCAMIT Species List, however. As a holopelagic critter it does not meet the criteria for inclusion there. Such encounters are well worth noting and sharing in the research community, but this lovely animal will remain an unlisted number.

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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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