SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

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Sheet by W. Enright CSD

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14 MARCH 2022, AMPELISCIDAE & PHOXOCEPHALIDAE, LEADS A. DAVENPORT & D. PASKO, ZOOM

Attendance: Brent Haggin, Don Cadien, Jojo Loan, Chase McDonald, LACSD; Ben Ferraro, OCSD; Andrew Davenport, Katie Beauchamp, Lauren Valentino, CSD; Dean Pasko, DCE; Heather Peterson, Jessica Donald, CCSF; Angelica Zavala Lopez, MTS; Dany Burgess, WADOE; Siena Audra McKim, UCSB – Tom Turner Lab; Ashley Smith, Carol Paquette, MBC.

UPCOMING MEETINGS

Visit the SCAMIT website at: www.scamit.org for the most current meetings announcements.

Andrew Davenport began the taxonomy portion by presenting images, key characters, and distributional data for the members of the family Ampeliscidae found in the CSD monitoring region. All distribution data presented was CSD data from 1991-2019 and was not intended to represent distribution across the entire Southern California Bight (SCB). Designations of "rare", "very rare", or "extremely rare", or reports of co-occurrence, only reflected the species presence relative to CSD and might not be indicative of other sampling locations.

It was noted during the discussion that keys created for the Amphipoda are typically made relative to the female morphology, but males usually fit into the key. Differences for males are typically evident in the key. Note that in the following list of character states "A" = article and "P" = pereopod, such that A5P7 = article 5 (carpus) of pereopod 7.

AMPELISCIDAE:

Ampelisca indentata J. L. Barnard 1954

- Reported from 30-190m (most common from 50-100m)
- Can co-occur with *Ampelisca pugetica*
- Uropod 1 rami to midpoint of uropod 2
- Dorsal carina of urosomite 1 saddle-shaped (not on males)
- A5P7 with notch on anterior margin
- A6P7 short and thick
- Minute tooth on epimeron 3

Ampelisca pugetica Stimpson 1864

- Reported from 10-465m (most common from 30-120m)
- Can co-occur with *A. indentata*
- Uropod 1 rami reaching to or just beyond uropod 2 peduncle
- Dorsal carina of urosomite 1 saddle-shaped
- A5P7 with notch on anterior margin
- A6P7 long and slender
- Prominent tooth on epimeron 3

Ampelisca pacifica Holmes 1908

- Reported from 30-430m (most common from 60-120m)
- Distal tips of uropod 3 broadly rounded

Ampelisca hancocki J. L. Barnard 1954

- Reported from 30-887m (most common from 60-120m; 1 record from 887m during B'08)
- Uropod 2 lacking subapical spine on outer ramus
- Should be noted that the white patch on uropod 1 peduncle can be confused for other species, and therefore not diagnostic
- Hook on epimeron 3, with nearly straight posterior margin
- Dactyl of P7 short and thick

Ampelisca cristata cristata Holmes 1908

- Reported from 10-140m (most common 60-120m)
- Can co-occur with *Ampelisca cristata microdentata*
- Dorsal carina of urosomite 1 tall, rounded and laminar
- Dorsal ridge of pleonite 3 cleft
- Epimeron 2 postero-distal corner square (sub-adults) or with small tooth (adults)

Ampelisca cristata microdentata J. L. Barnard 1954

- Reported from 9-138m (most common 20-40m)
- Can co-occur with *Ampelisca cristata cristata*
- Dorsal carina of urosomite 1 tall, rounded & laminar
- Dorsal ridge of pleonite 3 with a single low ridge
- Epimeron 2 postero-distal corner rounded, tooth absent

Ampelisca brevisimulata J. L. Barnard 1954

- Reported from 10-250m (most common from 20-120m)
- Can co-occur with *Ampelisca* cf. *brevisimulata*
- Paired setae on pereonites 2 and 3
- A2P7 setae transitions dorsally to inserted spines
- Epimeron 2 with acute tooth on postero-distal corner

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Ampelisca cf brevisimulata SCAMIT 1995 §

- Reported from 10-320m (most common from 20-120m)
- Can co-occur with *A. brevisimulata*
- A2P7 setae does not transition to spines
- Epimeron 2 rounded, without tooth on corner
- Epimeron 3 with large, convex process above tooth

Ampelisca careyi Dickinson 1982

- Reported from 20-327m (most common from 30-60m)
- If deeper than 150m, double check against *Ampelisca unsocalae*
- Head produced anteriorly into dome-shaped process above antenna 1
- Lower front margin not parallel to upper margin
- A5P7 with 1-3 setae
- Epimeron 3 with slight sinuous process above the tooth

Ampelisca unsocalae J. L. Barnard 1960

- Reported from 100-800m; only from Regional Bight surveys; *rare*
- If shallower than 200m, double check against *A. careyi*
- Head not produced into dome-shaped process
- Lower front margin of head nearly straight
- A5P7 with 1-3 setae
- Epimeron 3 with slightly sinuous process above tooth

Ampelisca brachycladus Roney 1990

- Reported from 10-185m (most common from 10-40m)
- Uropod 1 outer ramus ~2X length of inner ramus
- Epimeron 3 without hook

Ampelisca milleri J. L. Barnard 1954

- Reported from 30-130m; only from Regional Bight surveys; *rare*
- No lobe on A4P7
- A4P7 shorter than A3P7
- Epimeron 3 with minute, blunt tooth postero-distally in adults

Ampelisca lobata Holmes 1908

- Reported from 20-120m; only from Regional Bight surveys; *extremely rare*
- Antenna 1 long, reaching end of peduncle of antenna 2
- A4P7 without antero-distal notch
- Posterior lobe of A4P7short, extending less than ½ way down A5P7
- Female uropod 3 inner ramus strongly serrate
- Epimeron 3 without hook

Ampelisca agassizi (Judd 1896)

- Reported from 10-270m (most common from 20-130m)
- Can co-occur with *Ampelisca romigi*
- Posterior lobe of A2P7 broadly rounded
- A6P7 with anterior & posterior margins parallel
- Female inner ramus of uropod 3 not uncinate and distally hooked
- White patch on peduncle of uropod 1

Ampelisca romigi J. L. Barnard 1954

- Reported from 20-220m (mostly found at 80-120m);**uncommon**
- Can co-occur with *A. agassizi*
- Posterior lobe of A2P7 ventrally produced
- A6P7 posterior margin convex
- Female inner ramus of uropod 3 uncinate and distally hooked
- White patch on peduncle of uropod 1

Andrew also has a pictorial key to the *Ampelisca* of the CSD monitoring region. Dean is preparing an updated key to the *Ampelisca* for the entire SCB area.

Don commented on the importance of checking the dactyls of Pereopod 7 to examine the variability between (and within?) species. This would be a good future project to compare all the reported SCAMIT *Ampelisca* spp P7 dactyls.

Andrew then presented images, key characters, and distributional data for the members of the family Phoxocephalidae found in the CSD monitoring region. All distribution data presented was from 1991-2019 CSD data, and does not represent distribution across the entire SCB. Designations of “rare”, “very rare”, or “extremely rare”, or reports of co-occurrence, only reflect the species presence relative to CSD and may not be indicative of other sampling locations.

Andrew began by discussing 2 species that are not Phoxocephalids but contained within the Superfamily Haustorioidea and are visually similar at first glance.

Family Platyischnopidae:

Tiburonella viscana (J. L. Barnard 1964)

- Reported from 10-30m
- Rostrum long, cylindrical, with ventral, backwardly directed distal process
- Antenna 2 peduncular articles elongate

Family Urothoidae:

Urothoe elegans Cmplx

- Reported from 60-190m
- Head truncate, rostrum strongly reduced or absent
- Lower anterior portion of head extends forward; looks like a cheek
- Antenna 1 peduncular articles elongate

Family Phoxocephalidae: Subfamily Metharpiniinae:

Foxiphalus golfensis J. L. Barnard & C. M. Barnard 1982

- Reported from 20-160m (most common from 30-60m)
- Rostrum tapers evenly, not constricted
- A2P7 setose
- Epimeron 3 posterior end pointy or blunt, not hooked

Foxiphalus obtusidens (Alderman 1936)

- Reported from 10-190m (most common from 20-60m)
- Rostrum tapers evenly, not constricted
- A2P7 asetose
- Epimeron 3 posterior end pointy or blunt, not hooked and setose
- Gnathopod 2 normal size
- A6G2 only slightly longer than A5G2
- Uropod 1 with flexible subapical nail & displaced peduncular spine
- Setal bundles posterior to middle of telson not obscured by urosomal plate

Foxiphalus similis (J. L. Barnard 1960)

- Reported from 20-160m (most common from 60-120m)
- Rostrum tapers evenly, not constricted
- Epistome long and broad
- Epimeron 3 posterior end pointy or blunt, not hooked

Majoxiphalus major (J. L. Barnard 1960); mentioned but no collection data reported

Metharpinia coronadoi J. L. Barnard 1980

- Reported from 10-60m (mostly common at 30m) **uncommon**
- Rostrum linguiform, constricted/indented
- Epistome blunt
- Uropods 1 & 2 rami tips bearing small, subapical spines dorsally
- Epimeron 3 postero-ventral corner rounded, without hook
- A2P7 with many teeth

Metharpinia jonesi (J. L. Barnard 1963)

- Reported from 10-30m; **uncommon**
- Rostrum linguiform, constricted/indented
- Epistome blunt
- Uropods 1 & 2 rami tips bearing subapical spines dorsally
- Epimeron 3 postero-ventral corner produced into a hook
- A2P7 with many teeth

Rhepoxynius abronius (J. L. Barnard 1960)

- Reported from 10-60m; (most common from 20-30m) **uncommon**
- Rostrum linguiform, constricted/indented
- Epistome acute, longer than basal width
- A2P7 with more than 4 teeth
- Uropod 1 rami spinose
- Epimeron 2 with at least 1 vertically set facial setae out of sequence
- Epimeron 3 postero-ventral corner pointy with a small hook

Rhepoxynius bicuspidatus (J. L. Barnard 1960)

- Reported from 20-250m (most common from 60-110m)
- Rostrum linguiform, constricted/indented
- Epistome small, acute
- Uropods 1 & 2 rami tips not bearing subapical spines
- A2P7 with 2 large spines
- Epimeron 3 postero-ventral corner rounded, without hook

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Rhepoxynius daboius (J. L. Barnard 1960)

- Reported from 20-250m; (most common from 20-40m) **rare**
- Rostrum linguiform, constricted/indented
- Epistome acutely produced, short
- Uropod 1 without displaced peduncle spine and rami bare
- A2P7 with 3-5 similar sized, small teeth
- A6G1 not elongate, square, smaller than A5G1

Rhepoxynius fatigans (J. L. Barnard 1960)

- Reported from 20-60m; (most common from 20-30m) **uncommon**
- Rostrum linguiform, constricted/indented
- Eyes pixelated
- Epistome acutely produced, short
- Uropod 1 without displaced peduncle spine and rami each with a single spine
- A2P7 with 4 dissimilar teeth and beveled ventral margin
- A6G1 narrow, elongate, rectangular subequal to A5G1

Rhepoxynius heterocuspidatus (J. L. Barnard 1960)

- Recorded from 10-100m (most common from 20-50m)
- Rostrum linguiform, constricted/indented, BROAD
- Epistome small, acute
- Uropods 1 & 2 rami tips not bearing subapical spines
- Spines of uropods 1 & 2 robust, jewel-like
- A2P7 with 4-5 dissimilarly sized teeth

Rhepoxynius stenodes (J. L. Barnard 1960)

- Recorded from 20-120m (most common from 20-40m)
- Rostrum linguiform, constricted/indented, SLENDER
- Epistome blunt
- Uropods 1 & 2 rami tips not bearing small subapical spines
- Spines of uropods 1 & 2 elongate
- A2P7 with 7 or fewer medium/small teeth

Rhepoxynius sp A SCAMIT 1987 §

- Reported from 5-50m; found in Regional Bight surveys; **very rare**
- Rostrum linguiform, constricted/indented
- Epistome acute, longer than basal width
- A2P7 with 2 large spines/teeth

Dany Burgess mentioned that *Rhepoxynius* sp A resembles what they identify as *Rhepoxynius barnardi* Jarrett & Bousfield 1994. It was determined that the *R. barnardi* and *Rhepoxynius* sp A differ by the presence of an acute epistomal cusp on *Rhepoxynius* sp A that is absent on *R. barnardi*. In addition, the pereiopod 7, basis (article 2) upper 'spur' of hind margin is smaller than lower 'spur' on *R. barnardi* (see Jarrett & Bousfield, 1994), whereas the upper 'spur' on P7 basis is larger than the lower 'spur' in *Rhepoxynius* sp A (see SCAMIT toolbox for the *Rhepoxynius* sp A voucher sheet).

Rhepoxynius variatus (J. L. Barnard 1960)

- Reported from 10-180m (most common from 20-40m)
- Rostrum linguiform, constricted/indented
- Epistome acute, longer than basal width
- Uropod 1 rami lacking spines
- A2P7 with 3 medium-large teeth
- Epimeron 3 postero-ventral corner rounded

Dean mentioned some of his work on Washington samples and discussed the differences between *Rhepoxynius variatus* (reported locally) and *R. boreovariatus* Jarrett & Bousfield 1994 (reported from Washington). *R. boreovariatus* has spines present on the rami of uropods 1 and 2, while *R. variatus* **lacks** spines on the rami of uropods 1 and 2.

Rhepoxynius lucubrans (J. L. Barnard 1960)

- Reported from 10-120m (most common from 20-80m); **uncommon**
- Rostrum linguiform, constricted/indented
- Epistome acutely produced, short
- Uropod 1 with displaced peduncular spine
- A2P7 with 4-5 similarly sized teeth
- Lateral facial spines present on urosomite 1

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Rhepoxynius menziesi J. L. Barnard & C. M. Barnard 1982

- Reported from 10-180m (most common from 20-120m)
- Rostrum linguiform, constricted/indented
- Epistome acute, longer than basal width
- A2P7 with more than 2 teeth
- Uropod 1 with displaced peduncular spine between rami

Dean spoke about his review of the character states of *Rhepoxynius lucubrans*, *R. menziesi*, and *Rhepoxynius* sp D Barnard & Barnard 1982 (which has not been reported by SCAMIT). The key characters he reviewed are in the table below.

Species	Epistome	Mn Molar	Lacinia Mobilis	Urosomite 1
Rhepoxynius menziesi	Long & sharp	Bulbous, R. molar w/ 6 short spines + 1 short spine disjunct	Simple, sharp, broad, like raker	Naked above base
Rhepoxynius lucubrans	Small to medium	Wide plaques, each molar w/ 6 primarily long to medium spines + 1 short, thick spine, strongly disjunct	Simple, sharp, small, like raker	w/4 widely spread, short setae on lateral face
Rhepoxynius sp D	Long & sharp	Bulbous humps, R. molar w/ 6 short spines + 1 short spine strongly disjunct	Deeply bifid, distal bunch little shorter than proximal; narrow proximal branch simple, pointed	w/ 8 large lateral setae in long row on face

As a result of his review, Dean found that many of the specimens show a mix of characters. This led him to believe that the species are likely hybridizing, and they should be referred to as a species complex. This topic will be brought up at the Species List Review Committee meeting to determine the extent of the complex and what will be included within the complex. This could result in a single species complex (*Rhepoxynius lucubrans-menziesi* Cmplx) or as two species complexes (*Rhepoxynius lucubrans* Cmplx and *Rhepoxynius menziesi* Cmplx). Barnard and Barnard (1982) noted that *Rhepoxynius* sp D may be a "gerontic menziesi", i.e., a terminal developmental stage of *R. menziesi*, but goes on to provide a detailed description of the provisional species. The examined specimens were reported from Newport Bay and off Corona del Mar (0-27m). However, the species has not been reported by SCAMIT, but that may be because we have not been looking for it.

Subfamily Brolginae:

Eyakia robusta (Holmes 1908)

- Reported from 50-150m (most common from 80-100m)
- Tends to be crunchy
- A2P7 without setae
- Epimeron 3 with blunt hook that extends anteriorly as a setose lateral flange

Mandibulophoxus gilesi J. L. Barnard 1957

- Reported from 10-20m; **rare**
- Rostrum tapers evenly, not constricted, fingernail-like, distal end not downturned
- Eyes absent
- Base of P5 broadened, with distinct posterior lobe
- A2P7 with 2 small, distal serrations, ventral margin asetose, not extending beyond A3

Paraphoxus sp 1 Jarrett & Bousfield 1994

- Reported from 80-668m; found in Regional Bight surveys; **rare**
- Rostrum tapers evenly, not constricted, fingernail-like
- Eyes present
- Antenna 2, article 1 not ensiform
- Palps of maxilla 1 biarticulate
- Base of P5 broadened, posteriorly expanded, with or without distinct posterior lobe
- Epimeron 3 without oblique rows of robust facial setae
- Epimeron 3 with few or no posterior marginal setae

Subfamily Phoxocephalinae:

Cephalophoxoides homilis (J. L. Barnard 1960)

- Reported from 10-200m; uncommon
- Epistome short or blunt
- Uropod 2 without flexible subapical nail and displaced peduncular spine
- A2P7 asetose
- A6G1about equal to A6G2
- A6G2 much larger than A5G2
- Epimeron 2 ventral margin with 5-6 setae
- Epimeron 3 posterior bottom end blunt, not hooked
- Posterior edge nearly straight with 2 short setae

Leptophoxus falcatus icelus J. L. Barnard 1966

- Reported from 300-600m; found in Regional Bight surveys; **rare**
- Rostrum tapers evenly, not constricted, fingernail-like, distal end distinctly downturned
- Eyes absent
- Base of P5 broadened, with distinct posterior lobe
- A2P7 with 2 small distal serrations; ventral margin asetose not extending beyond A3

Metaphoxus frequens J. L. Barnard 1960

- Reported from 10-200m (most common from 80-120m)
- Epistome short or blunt
- A2P7 asetose
- A6G1 shorter than A6G2
- A6G2 much larger than A5G2
- Epimeron 2 ventral margin with 2 setae
- Epimeron 3 posterior bottom end blunt, not hooked
- Posterior edge nearly convex, asetose
- Uropod 2 without subapical nail and displaced peduncular spine
- Coxae 1 & 2 setae inserted across 1/4 to 1/3 of ventral margin

Subfamily Harpiniinae:

Harpiniopsis emeryi J. L. Barnard 1960

- Reported from 300-900m; found in Regional Bight surveys; **very rare**
- Rostrum tapers evenly, not constricted, fingernail-like
- Eyes absent
- Head lacking acute process at lower corner
- Epistome acutely produced
- Base of P5 narrow, not posteriorly expanded, without lobe
- Antenna 2, article 1 not or weakly ensiform
- A2P7 lobed and not flattened antero-distally, asetose
- Epimeron 3 with prolonged hook

Harpiniopsis epistomata J. L. Barnard 1960

- Reported from 400-900m; found in Regional Bight surveys; **rare**
- Rostrum tapers evenly, not constricted, fingernail-like
- Eyes absent
- Epistome strongly produced
- A2P5 narrow, not posteriorly expanded, without lobe
- Antenna 2, article 1 not or weakly ensiform
- A2P7 lobed and not flattened antero-distally, asetose

Harpiniopsis fulgens J. L. Barnard 1960

- Reported from 148-948m; found in Regional Bight surveys; **very rare**
- Rostrum tapers evenly, not constricted, fingernail-like
- Eyes absent
- Head with acute process
- Epistome acutely produced
- A2P5 narrow, not posteriorly expanded, without lobe
- Antenna 2, article 1 not or weakly ensiform
- A2P7 lobed and not flattened antero-distally, asetose
- A2P7 with small teeth along posterior margin
- Epimeron 3 with acute tooth

Harpiniopsis galera J. L. Barnard 1960

- Reported from 98-300m; **very rare**

Harpiniopsis naiadis J. L. Barnard 1960

- Reported from 195-263m; **very rare**

Harpiniopsis profundis J. L. Barnard 1960

- Reported from 887-1023m; found in Regional Bight surveys; **very rare**
- Rostrum tapers evenly, not constricted, fingernail-like
- Eyes absent
- Head with acute process at lower corners
- A2P5 narrow, not posteriorly expanded, without lobe
- Antenna 2, article 1 not or weakly ensiform
- A2P7 base lobed and not flattened antero-distally; asetose base with large posterior spikes or teeth
- Epimeron 3 with acute tooth

Heterophoxus affinis (Holmes 1908)

- Reported from 90-850m; **very rare**
- Rostrum tapers evenly
- Eyes present
- Antenna 2, article 1 strongly ensiform
- A6P6 without setae on posterior margin
- A2P7 with bifurcated teeth; setae present
- Epimeron 3 with pointed hook

Heterophoxus ellisi Jarrett & Bousfield 1994

- Reported from 90-850m; **rare**
- Rostrum tapers evenly
- Eyes present
- A6P6 with setae on posterior margin
- A2P7 with unidentate teeth; setae present

Heterophoxus oculatus (Holmes 1908)

- Reported from 20-230m (most common from 40-110m)
- Eyes present (deeper populations without eyes per D. Cadien)
- A6P6 with paired setae on posterior margin, occurring singly or in groups of 2 or 3
- A2P7 with setae
- Epimeron 3 with pointed hook

Per the discussion, *Heterophoxus oculatus* seems to have its range restricted to California. The morphologically similar *H. conlanae* Jarrett & Bousfield 1994 has been reported from California, and is on the Species List (SCAMIT 2021), but its true range is in question and may be limited to the north, either from northern California or from areas even farther north. *H. conlanae* is reported frequently from Washington, where they do not report *H. oculatus*. Genetic analysis will be needed to resolve this range question, therefore please collect these two species in 95% ethanol if the opportunity arises.

Andrew also has a pictorial key to the Phoxocephalidae of the CSD monitoring region. Dean is finalizing an updated key to the Phoxocephalidae for the entire SCB area.

Don commmented that many male Amphipods, and *Ampelisca* in particular, can have some extreme characters in their post-reproductive molts that may confuse the identification process.

Andrew discussed a strange *Pachynus* sp (Family Pakynidae) and detailed the differences between *Pachynus barnardi* Hurley, 1963, and *P. chelatum* Bulyčeva, 1955. *P. barnardi* has eyes and a convex gnathopod. *P. chelatum* lacks eyes and has a flat gnathopod. His current specimen agrees well with *P. chelatum*. This would be a new record for the area, as well as a large range extension. **UPDATE**: In June 2022 Andrew and Dean dissected the mouth parts of the specimen and it was determined to be *P. barnardi.*

Next Andrew discussed a currently unidentified *Chromopleustes* (Family Pleustidae: Subfamily Parapleustinae). This species was found as a parasite on a crab's leg that was caught in a 30m trawl off San Diego. This new species differs from the previously reported *Chromopleustes oculatus* (Holmes 1908) in several characters.

Siena told attendees about her research project in Tom Turner's lab at UC, Santa Barbara. She is investigating the biodiversity of sponge symbionts by collecting amphipods and pericarids from sponges. Do some species have more symbionts? Are the symbionts facultative or obligate? If anyone has interesting Peracarid-Sponge observations or knowledge, she would love to hear from you! She can be reached at: smckim@umail.ucsb.edu.

Andrew then led a discussion reviewing 2 of the provisional species currently residing on the Provisional Species Website:

Protolafystius sp B Tang,2020 § - Order Amphipoda, Family Lafystiidae:
This parasite was found on the body of a California Scorpionfish (*Scorpaena guttata* Girard 1854) and is different than the parasites typically found on the head and face of the fish. The provisional species sheet was deemed to be complete and will move forward in the process of receiving a SCAMIT provisional designation.

Photis sp HYP2 Campbell 2020 § - Order Amphipoda, Family Photidae:
This *Photis* was found in 124m off Santa Rosa Island during Bight '18. The provisional species sheet was deemed complete and will move forward in the process of receiving a SCAMIT provisional designation.

*Note - these vouchers sheets can be pulled from the provisional species website.

A brief group discussion about digital photography was held. Ben left links for microscope mounts that can be used with the camera on your cell phone. Andrew mentioned that most digital cameras have a ¾″ image sensor size. He recommended splurging for the digital cameras that have a 1″ image sensor size. Brent recommended using Helicon Focus (https://www.heliconsoft.com), an inexpensive photo stacking software for creating 3-D images from a series of 2-D photos. After the photos are stacked, they can be manipulated in your favorite photo imaging software without having to pay the Adobe prices for Photoshop.

With that the day wrapped up. Andy and Dean let attendees know that if they have further inquiries about any of the information, species, or materials mentioned they can contact them at: Andrew - adavenport@sandiego.gov, or Dean - deanpasko@yahoo.com.

4 APRIL 2022 SLRC PROVISIONAL SPECIES, ZOOM

Attendees: Wendy Enright, Megan Lilly, Zoë Scott, Ricardo Lara, Veronica Rodriguez, CSD; Brent Haggin, Don Cadien, LACSD; Kelvin Barwick, OCSD; Greg Lyon, Erin Oderlin, CLAEMD; Tony Phillips, DCE.

Kelvin opened the meeting by addressing the question - Will Ed 14 be ready by 2023? Don feels we could make it but Kelvin has doubts. Tony and Brent feel that by the deadline, whatever is done is done, and we publish what we have. Creating the Species List is an open-ended process with changes occurring with each edition. The biggest phylogenetic challenge will be nesting Echiurans and Sipunculans where they are supposed to be, within the Annelids. We have already moved the Echiurans but their final resting place within the polychaetes is still unsure. The

Sipunculans still need to be addressed. It was decided to move towards the goal of July 2023 for Ed 14. Megan talked about getting as many of her ID sheets as she can to the provisional species site in order to share them prior to Bight'23.

Next Kelvin wanted to discuss roles and responsibilities, and asked if he should continue as committee Chair? A resounding yes filled the meeting. Larry is stepping down as an editor, we will need a replacement. As for individual taxa leads – if people don't want to continue or want a change, Kelvin asked that they try to find a replacement.

The ongoing provisional species review was the next topic up for discussion. Kelvin revealed the results thus far. Most of the volunteer reviewers have returned their results. Out of the 352 provisional species listed on Ed 13 (SCAMIT, 2021) all but 80 had been reviewed. Kelvin put the question to the committee of what to do with the results once completed. This led to a discussion about species being covered/addressed in presentations but not subsequently having voucher sheets created. Additionally, some species have been uploaded to the provisional species site but not necessarily shared elsewhere. Kelvin will try to collate and assimilate this information. He asked what should we do for those species that are missing any form of documentation? Don responded that this process allows us to look at things that are undocumented and if there are no strong advocates for retention, move them to an inactive hold file. Wendy noted that we "move them to purgatory". Ricardo suggested the creation of a "recommend or not recommend" column to say whether an animal should be moved to purgatory. Veronica stated that she and Ricardo have moved images or drawings that they found while searching through their polychaete documents, to the provisional species site.

Erin noted that while she has been trained on some of these animals, she has never actually seen them in a sample, and doesn't feel comfortable recommending yes or no with regards to retention on the List. Kelvin encouraged her to reach out to her phyla committee for assistance.

For the next edition of the List, if someone wants a provisional species added they will submit it for consideration to the SLRC committee. The primary editors will have to approve the addition and will ask to see available information for the suggested species. Brent shared the SCAMIT provisional voucher sheet guidelines currently out for review. The guidelines will need to be met prior to inclusion on future editions of the Species List. The circulation criteria for species inclusion have changed since the development of the provisional species site. We will remove newsletter publication as a requirement but noted that all approved species should eventually be published and distributed in the newsletter. Don touted how important it is that we track these provisional species; SCAMIT is the only organization that tries to deal with nonstandard nomenclature so how we do it is important.
UPDATE: The guidelines were officially adopted on June 20, 2022 and can be found at SCAMIT.org on the Toolbox page.

Brent brought up the idea of including the BRI or ITI on the provisional sheet. This led to an extensive discussion about p-codes and who has access/knowledge of their creation. The compromise would be to have the editing committee be part of that process. Ben stated that this will help limit drift and align our regionality. Wendy liked the idea of having a place for it but doesn't feel it necessarily would have to be filled in initially. After it is applied it could be added at a later date. At this point Don and Kelvin warned that the p-code process is easy to misunderstand/abuse, so it would be imperative to have these properly vetted. This led to an action item for Brent to add a place for p-codes in the draft of new provisional species voucher sheet guidelines.

We discussed the database project and an action item for Kelvin developed – he will draft a document (similar to an RFP) and circulate it to the SLRC for feedback.

Don requested that Kelvin send out a set of deadlines leading up to the target publication date. He suggested that old milestones can be used for reference.

11 APRIL 2022, BIVALVIA PART III, TONY PHILLIPS, ZOOM

Attendance: Brent Haggin, Don Cadien, Chase McDonald, Jojo Loan, Terra Petry, LACSD; Kelvin Barwick, OCSD; Wendy Enright, Megan Lilly, Lauren Valentino, CSD; Heather Peterson, Ashley Loveland, Jessica Donald SFPUC; Tony Phillips, DCE; Carol Paquette, MBC; Angelica Zavala Lopez, MTS; Matt Hill, EcoAnalysts; Paul Valentich-Scott, Santa Barbara Museum of Natural History (Retired).

Brent opened the meeting with a few business announcements and afterward we moved right into Tony's presentation - "***Bivalvia of the SCB adult-subadult-juvenile (Part III)***" Tony thanked everyone who allowed him access to, or sent him, voucher specimens. He also promoted Paul's Bivalvia 101 presentation as being very useful and valuable (found in the SCAMIT Toolbox). Paul noted that he has retired but is still willing to help people with bivalve questions.

Following are notes on only a small fraction of Tony's (as usual) excellent and exhaustive presentation (it is available in the SCAMIT Toolbox).

We started with an outlier, *Eucrassatella fluctuata.* The only specimen ever seen by SCAMIT was identified by CSD from B'08, stn 2527, 9 Sept 2008, 42m, near Catalina Island.

Carditidae:

Subfamily Scalaricarditinae:

Cyclocardia bailyi (J.Q. Burch 1944) – the only species Tony feels comfortable with. It has distinctive scalloping across the radial ribs even down to juv sizes. It occurs from 25-275m.

Cyclocardia ventricosa (Gould 1850) - listed as occurring from Alaska to Baja California in 20 - 450m. The ribs extend to the edge vs in *Cyclocardia barbarensis* (Stearns 1890) where the ribs terminate prior to the edge of shell.

Cyclocardia gouldii (Dall 1903) - can't be separated from *C. ventricosa* at small sizes. Paul warned that in deep water the two species can co-occur.

Tony did note that he assumed small specimens (2-3mm) in a sample were same as the adults. However, if a sample contained nothing but small juveniles, they were left at genus.

Use caution as the radial rib count can be variable even though it is listed in species descriptions. Paul chimed in to say there is a real problem with *C. ventricosa* vs *C. gouldii* and that more molecular work is needed to sort it out. Megan chimed in – as functional taxonomists we need a decision before B'23. Kelvin suggested a species complex. Tony will make an effort to get to the Santa Barbara Museum and work with Paul to examine specimens. It was suggested for now the complex would be *Coanicardita ventricosa* Cmplx. Wendy noted that in Vol 37(1) we created a minimum 5mm size limit to identify beyond Family level. She asked if we needed to revisit this convention. It was decided that the size convention should be replaced with *C. ventricosa* Cmplx. However, *C. bailyi* is excluded from this convention since it is felt it can be IDed down to a small size. When in doubt, reference Tony's presentation (the presentation on SCAMIT.org includes these changes).

Tony suggested *Crassicardia crassidens* (Broderip & G. B. Sowerby I 1829) be removed from the SCAMIT List since he has never seen it and found no materials or records during his preparation for this presentation. Tony asked the various agencies to check their historical data for any records of this species. Wendy checked previous editions of the List to see when it was added. It was not in Ed 1 but turned up in Ed 4 (2001). There was some thought it might have been a B'98 record? It is not present in CSD data but waiting to hear from other agencies. Kelvin noted that Coan
(1977) published a paper in the Veliger entitled, *Carditidae of the NE Pacific*, which should be reviewed for further information.

Tony went on to other members of the carditids but stated they are much easier to deal with.

Subfamily Carditamerinae:

Glans carpenteri (Lamy 1922) – found in coarse sediments, usually shallow but described as to 100m; he identified quite a few specimens from Bolsa Chica which is fine sand so there is a bit of a discrepancy.

Subfamily Thecaliinae:

Milneria kelseyi Dall 1916 – there are two species possible and their range is intertidal, riprap so most of us won't see them in agency monitoring samples. The other species *Milneria minima* (Dall 1871) has not been reported by SCAMIT (2021). Paul chimed in with a warning – the image of *M. minima* in the Western North America bivalve book (Coan et al. 2000; pg 306) is in fact *M. kelseyi*.

Lucinidae:

Epilucina californica (Conrad 1837) – shallow water species; Crescent City to Baja California; intertidal to 80m; there is a helpful table in Coan et al 2000.

Parvilucina tenuisculpta (Carpenter 1864) – Being a common species a good size series, juvenile to adult, was presented along with comparison to other morphologically similar Lucinids. *Parvilucina approximata* (Dall 1901) was incorrectly reported from the SCB by Coan et al. (2000).

Don gave an interesting life history note on Lucinids – they can be very inflated if living in anoxic conditions and doing a lot of sulfur oxidizing. Their gills expand to accommodate additional symbiotic bacteria.

Thyasiridae:

Adontorhina cyclia Berry 1947 – Tony has only seen *A. cyclia*, but there are two other species listed in SCAMIT (2021): *Adontorhina lynnae* Valentich Scott 2000 and *Adontorhina sphaericosa* Scott 1986.

Axinodon redondoensis (T. Burch 1941) - Tony recommends using bleach for opening the valves as they are delicate. Attempts to remove any ferruginious material will break the valves. *Axinodon* has a central tubercle in the left valve which is absent in *Adontorhina*.

Mendicula ferruginosa (Forbes 1844) - A deep water species which looks similar to *Axinodon* externally but *Mendicula* lacks a central tubercle in the hinge. Should also should be opened with bleach due to its delicate nature. *weird note about *Mendicula* – as you go deeper, the cardinal teeth disappear.

Thyasira flexuosa (Montagu 1803) – Paul stated that he is working with someone in Japan who feels there might be another valid species. However, that paper won't be out any time soon. Additionally, there is a researcher working on *Thyasira* in the Atlantic who feels we don't have *T. flexuosa* at all. The story will unfold in the future but for now, just stick with *T. flexuosa*

Thyasyridae sp LA1 Cadien 1999 § – collected during B'98. Paul has never seen anything like it and thought it might be a *Mendicula*. The specimen is lost in the bowels of the NHMLAC.

Lasaeidae:

Lasaea adansoni (Gmelin 1791) – found predominantly in rip rap samples. Paul said it seems to be a cosmopolitan species; it is an Atlantic species name. Don noted that it is found in the byssal threads of *Mytlius* which could explain its cosmopolitan distribution.

Kurtiella spp

- Lateral teeth are very distinctive between *Kurtiella coani* (Scott 1998) and *Kurtiella tumida* (Carpenter 1864).
- *Kurtiella grippi* (Dall 1912) - Paul wants wet specimens with full collection data.
- *Kurtiella pedroana* (Dall 1899) – in clean sediments; will never see with ferruginous coating; often seen on the mole crab, *Blepharipoda* and also found on hermit crabs.
- *K. tumida* – opaque and occasionally with ferruginous coating.
- *Kurtiella compressa* (Dall 1913) – The specimen pictured in Coan et al. (2000) are not of this species. Local records for this species have been referred to *Kurtiella* sp D (SCAMIT 1988§) (SCAMIT, 2021). Images of the true *K. compressa* can be found in Coan & Valenitch-Scott's (2012; pg 510) Tropical West America Bivlaves book.
- *Kurtiella* sp LA1 (Power 2004 §) – should probably go on the Hold list; it could be *K.* sp D, but there is no descriptive data at this point.
- *Kurtiella* sp E SCAMIT 1988 § - The original voucher sheet, by Paul, was published in Vol 7(2) of the SCAMIT newsletter, but he now feels it is a synonym of *K. pedroana*. This will be added to the proposals for the next edition of the species list.

There was a discussion about separating small Lasaeids and about the reliability of juvenile IDs. There is some doubt about consistency of effort but overall people feel comfortable.

Pristes oblongus Carpenter 1864 – intertidal; distinctive serrated cardinals; at first glance externally can look like a *Kurtiella* but the hinge is very different; *Kurtiella* doesn't have cardinals.

Rhamphidonta retifera (Dall 1899) – seen in Palos Verdes samples; Megan chimed in that it has been sampled in CSD monitoring, and Wendy confirmed that CSD has recorded 3 specimens from shallow stations since 2005. It can be confused with juv *Kellia suborbicularis* (Montagu

1803) but they are fatter and the hinge is different. Don also noted that in *K. suborbicularis* the anterior and posterior margins are parallel whereas in *R. retifera* the anterior and posterior margins are asymmetrical.

Galeommatidae:

Cymatioa electilis (Berry 1963) - distinctive feature is the crenulation of the ventral margin. However, the crenulations are not evident below 4mm and even then it is a difficult character to see as they are just starting to develop. Due to this feature, it was decided that taxonomists should not try to differentiate *Rhamphipdonta* from *Cymatioa* at ≤ 4mm.

Cardiidae:

Clinocardium nuttallii (Conrad 1837) – in juveniles the umbones are central vs posterior in adults; shell pigmentation present or absent.

Americardia biangulata (Broderip & G. B. Sowerby I 1829) - recorded off Catalina Island, California. Tony was unable to find any other locality records for this species.

Laevicardium substriatum (Conrad 1837) – A good size series was presented along with detailed images of the hinge. Paul feels that the other reported species from the SCB, *Laevicardium elatum* (G.B. Sowerby, in Broderip and G.B. Sowerby I 1933) is most likely extinct in the SCB but still extant further south. There is a possibility to see it in the San Diego region. Tony noted that he only ever sees *L. substriatum*. Through his web cam, Kelvin showed a single large empty valve of a dead *L. elatum* from SD Bay and noted it could have been dead for a long time. The two species can be separated by presence or absence of internal shell pigment. *L. substriatum* has pigment and *L. elatum* does not.

We ended the day with Round Table comments/questions:

Heather Petersen talked about the possibility of *Trachycardia* in San Francisco Bay. While far north, with shipping traffic it's possible. It was asked if the radial rib counts are reliable in juveniles? Tony said probably not but a growth series would need to be examined to know for sure.

Don wanted to discuss ferruginous deposits – on small Lasaeids and others, those deposits are a result of a relationship with a symbiotic bacteria that lives on the periostracum of these animals. He feels it would be an interesting study to find out if it is mutualistic. Do clams benefit from having a ferruginous coating? Could it help prevent predation? The bacteria benefit from the respiratory pumping of the bivalve. Tony noted that he has not seen ferruginous coating on *Cymatioa electilis* not even on the umbones. It was pondered if the genesis of ferruginous coating on other phyla, such as sipuncula and anthozoa, could be the result of a different mechanism. We were unable to solve that mystery.

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SCAMIT OFFICERS

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

President	Brent Haggin	(562)908-4288 x 5672	bhaggin@lacsd.org
Vice-President	Leslie Harris	(213)763-3234	lharris@nhm.org
Secretary	Megan Lilly	(619)758-2336	mlilly@sandiego.gov
Treasurer	Erin Oderlin	(310)648-5477	erin.oderlin@lacity.org

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SCAMIT
PO Box 50162
Long Beach, CA 90815