

# SOUTHERN CALIFORNIA ASSOCIATION OF MARINE INVERTEBRATE TAXONOMISTS

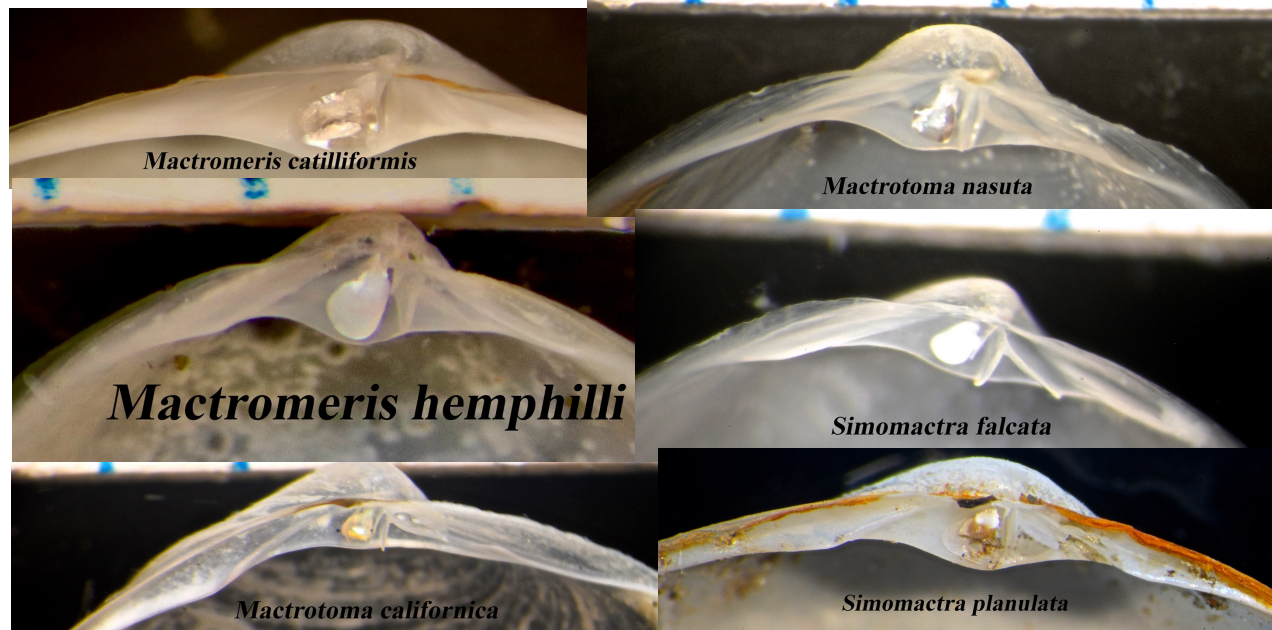


Sept–Dec 2023

SCAMIT Newsletter

Vol. 42 No. 3–4

## Mactridae



Comparison slide of Mactridae spp hinges by T. Phillips

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

Publication Date: March 2025

**11 SEPTEMBER 2023, CAPITELLIDAE, LEAD B. HAGGIN**

The minutes from this meeting were submitted as a summary of Brent's presentation on the Capitellids. For ease of formatting and to retain the work that Brent did to places images in the appropriate spots in his text, the minutes/presentation are attached at the end of the newsletter.

**16 OCTOBER 2023, CRUSTACEA, LACSD, LEAD D. PASKO**

The minutes of this meeting were compiled by Dean and were extensive and comprehensive. Therefore, similar to the September minutes, they are included as an attachment at the end of the newsletter in order to preserve Dean's formatting for the graphics and image placements.

**UPCOMING MEETINGS**

Visit the SCAMIT website at: [www.scamit.org](http://www.scamit.org) for the most current meetings announcements.

**13 NOVEMBER 2023, BIVALVIA PART V - ORDERS VENERIDA, MYIDA, ANOMALODESMATA, AND GASTROCHAENIDAE, LEAD T. PHILLIPS**

**Attendance:** Paul Valentich-Scott, Retired (SBMNH); Brent Haggin, Wayne Dosset, Amber Von Tungeln, LACSD; Kelvin Barwick, Tony Phillips, DCE; Andy Davenport, Wendy Enright, Megan Lilly, Coulson Lantz, CSD; Gregy Lyon, CLAEMD; Alison Fisher, Heather Peterson CCSF; Dany Burgess WADOE.

Below are a few notes from Tony's presentation but for the full banana go to: SCAMIT Taxonomic Toolbox/Mollusca/Conchifera/Bivalvia/Other Useful Tools

**Venerids:**

*Mactomeris catilliformis* (Conrad 1837) – found in San Diego Bay from 5-20 m in sand.

*Macoma nasuta* (Conrad 1837) – the northern range is listed as Santa Barbara, CA but Tony has seen specimens from further north. To deal with this he has added the moniker “cf” to specimens collected from Avila Beach (San Louis Obispo) and San Francisco.

*Simomactra planulata* (Conrad 1837) - Tony noted he has found it down to 95 m. Megan stated that she is concerned with the possibility of confusing it with *S. falcata* (Gould 1850) which is the species City of San Diego commonly sees offshore. Separating the species involves looking at the pallial sinus. See Coan et al 2000 for further information.

Tony showed a comparison slide of Mactridae spp hinges and Paul suggested that it be shared in a SCAMIT newsletter. So, it now graces the cover of this issue.

Tony stated that both *Cyathodonta pedroana* Dall 1915 and *Raeta undulata* (Gould 1851) have large commarginal ribs but *Raeta* is pointed at the posterior, whereas *Cyathodonta* is truncate. Paul noted that sculpture changes on *Cyathodonta* and reminded everyone that ultimately the hinges of the genera are very different.

**Myidae:**

*Mya arenaria* Linnaeus 1758– Kelvin asked if this species is invasive and Paul confirmed it is.

*Platyodon cancellatus* (Conrad 1837) – Paul stated this species is common in the Goleta slough.



*Sphenia fragilis* (H. & A. Adams 1854) - Tony has only seen *S. fragilis* and has never seen *S. luticola* (Valenciennes 1846). The difference between the two species has to do with the chondrophores. We were told to use caution with juv *Hiatella* as they can be smooth and look superficially similar to *Sphenia*. The two can be found together in rip rap samples. A quick check will reveal that *Hiatella* has an external ligament and *Sphenia* has an internal ligament. Additionally, *Hiatella*, with growth, becomes more inflated than *Sphenia*.

*Grippina californica* Dall 1912 - Kelvin noted that he has found this species at 181 m which is a depth extension from that listed in Coan et al 2000.

### **Pholadidae and Xylophagidae**

These Families contain the wood borers. They are usually shallow but can be found offshore (CSD) if wood is present. Some species bore into sandstone or clay. See Coan et al 2000 for a good graphic outlining the differences among the species.

### **Gastrochaenidae**

These are also borers but their chosen habitat is kelp holdfasts. Tony has never seen a live specimen but rather has only seen them in shell hash.

### **Cuspidariidae:**

*Cardiomya lanierli* (Strong & Hertlein 1937) – this is a southern species and Tony has only seen one which he suspects came up as larvae during an El Niño event.

### **Lyonsiidae**

*Entodesma* are smooth and have no ribbing.

*Entodesma brevifrons* (G. B. Sowerby I 1834) – found nestling in sponges and ascidians. Tony has never collected this species.

*Entodesma navicula* (A. Adams & Reeve 1850) – has some radial striae and is similar to local *Lyonsia californica* Conrad 1837 in having adherent sand grains, but it is much more inflated ventrally than *L. californica*.

*Lyonsia californica* – usually with adherent sand grains however it can be smooth as in no adherent material. Radial striae present. When Tony showed his slides of *L. californica* specimens Paul chimed in that he suspects one of the animals pictured might be a southern species pictured in his Panamic book (Coan, 2012). Megan felt that the animal Paul suspected of being a southern species is the same as that seen by CSD in San Diego Bay. The bay specimens are more truncated and flattened posteriorly than those sampled offshore.

*Mytilimeria nuttallii* Conrad 1837 – commensal and associated with ascidians. To date it has only been seen by Kelvin.

### **Periplomatidae**

*Periploma* spp – a radial fissure is present even in juveniles. We were cautioned that juvenile *Thracia* and *Periploma* look similar but *Thracia* has an external ligament.

*Periploma planiusculum* G. B. Sowerby I 1834 is smooth whereas *Periploma discus* Stearns 1890 is beaded even as small juveniles. Be careful not to confuse juv *P. planiusculum* with juv *Tellina modesta* (Carpenter 1864). But again, the presence of an external ligament in *Tellina* separates it from *Periploma*.

*Periploma rosewateri* F. R. Bernard 1989 – this is a deep water species, 600 – 1000 m, and to date has only been collected in Bight samples; it has a distinct radial fissure.



**Laternulidae**

*Exolaternula marilina* (Reeve 1860) – the animal pictured in Tony’s presentation might not be this species. A recent publication has Tony thinking the pictured animal is most likely a new species from Japan, not *marilina*. The specimen photographed was collected by ABC, at station 001 in 2013. It is the only locally recorded specimen so at this time it is being left at *E. marilina* with doubts. To date, ABC has not been able to locate the specimen.

**Thraciidae**

*Thracia challsiana* Dall 1915 – this is an intertidal species and has been found off Malibu. It is set apart from other *Thracia* species by external pustules on the valves. The pustules are similar to beading but are thicker and more pronounced.

*Thracia curta* Conrad 1837 – this species is found in shallower water; intertidal to 50 m. Tony has recorded it from 7-10 m.

Tony had a nice comparison slide showing *T. curta* and *Thracia trapezoides* Conrad 1849.

A reminder that *Thracia* spp will have an external ligament, whereas *Asthenotharus* spp have an internal ligament.

**Lyonsiellidae**

*Policordia hispida* Safonova & Barwick 2016 – this is a deeper water species and its shallowest local record is 411 m. It has also been collected by CSD (W. Enright) at Regional station 8338, 23 July 2014, 449 m. John Ljubenkov recorded a specimen from 1300 ft in 1984. Kelvin’s original voucher sheet (*Policordia* sp A) is available in the Toolbox.

**11 DECEMBER 2023 – SCAMIT ANNUAL ALL-HANDS, ZOOM**

**Attendance:** Brent Haggin, Amber Von Tungeln, Cristina Fuentes, Wayne Dossett, Mac Power, LACSD; Erin Oderlin, Cody Larsen, Jennifer Smolenski, Craig Campbell, Danielle Ayala, Greg Lyon, Nicholas Galliani, CLAEMD; Andrew Davenport, Adam Webb, Lauren Valentino, Maiko Kasuya, Ricardo Martinez, Zoë Scott, Wendy Enright, Megan Lilly, CSD; Kelvin Barwick, Tony Phillips, DCE; Ben Ferraro, Ernie Ruckman, Rob Gamber, Shelly Walthers, OCSD; Alison Fisher, SFPUC; Linnea Nicole Mooney, Angelica Zavala Lopez, MTS; Megan Payne Ecoanalysts; Michael Vendrasco, Pasadena City College; Priyanka Soni (affiliation unknown).

The meeting was opened by Brent Haggin and he started the day by reviewing the meetings that occurred during 2023. In 2024 the goal is to make meetings hybrid (in-person with a Zoom option) whenever possible. LACSD and OCSD are both willing to host any and all meetings.

Kelvin Barwick had the floor next and gave some SLRC updates:

- Ed 14 was published by the deadline of July 1 2023 and is the accepted List to use for B’23 nomenclature
- 3,217 species reported
- Reminder – the SCAMIT Species List is not an all-inclusive faunal list of the SCB; rather it is a list of those species reported by SCAMIT members. This is an important distinction to keep in mind
- Discussed some species which were pulled from the List due to lack of sufficient documentation



- The geographic and ecological range of coverage has expanded
- SCAMIT Database project – thanks to Cody they’ve found that ITIS provides a downloadable database structure. One thought is that we could take that structure and modify it to suit our needs. However, we would need dedicated personnel to make it happen and that is problematic for an all-volunteer organization.  
Cody Larsen chimed in that the level of interaction with the database is going to be fairly low so the amount of maintenance and upkeep might not be too onerous. The bulk of the work will be getting the database established. That aspect will require dedication and time and Cody is willing but simply doesn’t have the time. He suggested starting with a small prototype and testing it before building the full database. Kelvin will put this subject on the agenda for the first SLRC meeting next year
- Ed 15 – will be a slow start due to everyone being busy with B’23. The publication date is TBD, and it will probably be a 2 year turn around; hoping for July 2025 publication but that may be ambitious

Erin Oderlin was next to have the floor and gave the Treasurer’s report. She wanted to emphasize how much money we have available for grants. As for expenses, SCAMIT now has to pay a Zoom subscription and a \$25 CA state fee. We are looking in to a high yield savings account, and are hoping to transfer \$10k to one of those accounts so that we can earn a little interest on our funds. The 2022-2023 Treasury Summary is attached at the end of this newsletter.

Megan Lilly was next with her Secretary overview – She is still behind on newsletter production. She asked if anyone wanted to be a co-secretary or secretarial assistant? There was mostly crickets although Andy Davenport did volunteer to help with the production side of things. The newsletter is going to go electronic, but for now the newsletter cost in the Treasurer summary is inaccurate since there has been a delay in publishing, and therefore printing and mailing, which is where the newsletter expenses lie. SCAMIT is willing to buy an Adobe license for whoever serves as Secretary and creates and publishes the newsletter. Megan agreed to stay on as Secretary after she retires. There was some discussion about re-formatting the newsletter so it is simpler and a publication of basic minutes versus the narrative that Megan currently creates.

Leslie Harris was absent and unable to give the Vice President review, but Brent took her place and went on to fill the 2024 meeting calendar.

Next it was time to call for Officer Nominations. The current suite of Officers was nominated and all accepted.

- President – Brent Haggin
- Vice President – Leslie Harris
- Secretary – Megan Lilly
- Treasurer – Erin Oderlin
- Webmaster (not an elected position) – Cody Larsen

Brent made a special announcement – The SCAMIT Executive Committee is honoring Kelvin Barwick with a lifetime membership to SCAMIT for his many years of service as President of SCAMIT and now as the Chair of the SLRC. Thanks Kelvin!



The last agenda item for the day was an open forum round table discussion:

Should we go all digital for the newsletter? Kelvin asked how many institutional members do we have? Erin stated that there are quite a few but most of them opt out of the hard copy option. It was estimated we would have to double hard copy membership dues to cover the printing and mailing costs. Kelvin suggested that we send out the proposed change on the list server. He wants the actual constitutional changes sent out to membership for a vote. Zoë suggested creating a Google Form which holds the current language and proposed changes and a box to suggest changes to the language. Current memberships will be honored but for next year's renewals there will no longer be a paper option. Craig Campbell offered to calculate a rough estimate of what dues would be for a printed copy.

Updates to SCAMIT's personnel database – Erin inherited an Access database of SCAMIT members and there is a column for whether or not people are interested in consulting/contract work. She wants to update that column and will send a poll to membership.

There was a question about adding a digital suggestion box to the website where people can suggest meeting ideas; are people interested? Cody will research this option.

There was a suggestion of a website-hosted discussion forum. Cody would have to create a Google Groups which would allow for specific attendee access. Cody offered to look in to it.

Brent shared that The California Institute for Biodiversity has grant money available. He asked if SCAMIT would want to pursue funding to create a SCAMIT voucher collection of those species on the List? This discussion will be continued.

B'23 discussion – so far all is going well but the work has just started. Megan noted the presence of a juvenile *Enteroctopus dofleini* (Wülker 1910) in their trawls which is a new record for CSD.

Thoughts on Hybrid meetings? – there was positive feedback and the format will continue for future meeting.

Kelvin would like some feedback on the Toolbox. He will create a poll on how it's used and how often.

Brent asked that if members see names on the SCAMIT Species List that are wrong or outdated to please email Brent or Cody to have the issue corrected.

Meeting adjourned at 12:00

### **ARTHROPOD PERSONALS PART 3 BY D. CADIEN**

Attached you will find Don's next installment in his arthropod personals series.



**LITERATURE CITED**

- Coan, Eugene V., Paul Valentich Scott, & Frank R. Bernard. 2000. Bivalve Seashells of Western North America: Marine Bivalve Mollusks from Arctic Alaska to Baja California. Santa Barbara Museum of Natural History Monographs Number 2. Santa Barbara Museum of Natural History, Santa Barbara, California. 764pp.
- Coan, Eugene and Paul Valentich-Scott. 2012. Bivalve Seashells of Tropical West America. Marine Bivalve Mollusks from Baja California to Northern Perú. Santa Barbara Museum of Natural History Monographs Number 6, Studies in Biodiversity Number 4. Parts I & II. 1258 pp.



Please visit the SCAMIT Website at: [www.scamit.org](http://www.scamit.org)

### 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	<a href="mailto:bhaggin@lacsds.org">bhaggin@lacsds.org</a>
Vice-President	Leslie Harris	(213)763-3234	<a href="mailto:lharris@nhm.org">lharris@nhm.org</a>
Secretary	Megan Lilly	(619)758-2336	<a href="mailto:mlilly@sandiego.gov">mlilly@sandiego.gov</a>
Treasurer	Erin Oderlin	(310)648-5477	<a href="mailto:erin.oderlin@lacity.org">erin.oderlin@lacity.org</a>

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SCAMIT  
PO Box 50162  
Long Beach, CA 90815

# A Review of the Family Capitellidae Grube, 1862 – Diagnoses of the Family and Genera, With Notes on the Species from the Southern California Bight – A Work in Progress

## \*\*\*DISCLAIMER\*\*\*

This is a **DRAFT** version of a work in progress. All generic diagnosis listed below are based on my interpretations of the Family Capitellidae as I describe it within and emended from the most recent description in the literature as listed. Not all genera have remarks made regarding their status and recommendations to synonymize some groups are just that, a recommendation, as all descriptions are based solely on a literature review and **Type Material** has not yet been observed. That being said, I feel that the standardization of the family diagnosis, as well as the generic diagnoses, are a good starting point for future revision and better morphological grouping of the family Capitellidae. Future genetic work may show that the current taxonomic strategy within the Capitellidae does not hold.

This work only deals with the local genera that were presented during the September 2023 SCAMIT Polychaete meeting. For my thoughts on the remaining genera, please email for a more complete draft. Please send me any comments you may have as well.

## Abstract

The family Capitellidae Grube, 1862 are small, earthworm-like polychaetes found in all depths globally. Historically, capitellid taxonomy has focused on the number of thoracic segments, thoracic chaetigers, and in particular, the distribution of capillary chaetae and hooded hooks in the thorax and anterior abdomen. Inconsistent application of an achaetous segment in generic and species descriptions has led to confusion within the family and a lack of easily distinguishable characters has led to the erection of numerous monotypic genera. A review of the literature and examination of type material has resulted in the emendation of all currently accepted genera, with a focus on a consistent application of an achaetous segment in the thorax to harmonize the generic diagnosis within the family.

## Introduction

The family Capitellidae Grube, 1862 are small, earthworm-like polychaetes found in all depths globally. Some are particularly fond of organically enriched sediments and are considered pollution indicators while others have been used in studies of developmental biology (Warren, 1976a; Green, 2002). Some species inhabit tubes, but most are considered motile, deposit-feeders with different levels of feeding selectivity (Fauchald & Jumars, 1979).

Despite Eisig's (1887) monograph on capitellids, which provides substantial detail on morphology and anatomy, and Hartman's (1947) monograph, which provides details of the features of the hooded hooks, much confusion remains in the taxonomy. Capitellid taxonomy has historically focused on the number of thoracic chaetigers, and in particular, the distribution of capillary chaetae and hooded hooks within the thorax and anterior abdomen (M&BB, 2012), usually expressed as the thoracic formula. This has been complicated historically by the inclusion of an achaetous segment within the counts of thoracic segments of some, but not all, of the Capitellid genera. While problematic, the use of thoracic chaetal distribution remains the primary method for distinguishing the capitellid genera (Green, 2002).

As the family Capitellidae is defined, the peristomium is achaetous, and this achaetous peristomium is sometimes included in the counts of thoracic segments, such as in the 21 genera of *Abyssocapitella*, *Anotomastus*, *Barantolla*, *Capitellethus*, *Dasybranchethus*, *Dasybranchus*, *Decamastus*, *Dodecamastus*, *Heteromastus*, *Leiochrides*, *Mediomastus*, *Neomediomastus*, *Notodasus*, *Notomastus*, *Octocapitella*, *Parheteromastus*, *Peresiella*, *Polymastigos*, *Promastobanchus*, *Rashgua*, and *Undecimastus*. In 5 genera, such as *Amastigos*, *Baldia*, *Capitella*, *Eunotomastus*, and *Leiocapitella*, the achaetous peristomium is not included in the counts of thoracic segments and in 2 genera, such as *Mastobanchus* and *Scyphoproctus*, a true achaetous segment, one that possesses a ganglion and segmental nerves (Jones, 1961) and lateral organs (Green, 2002; Magalhães & Bailey-Brock, 2012; da Silva & Amaral, 2019), are present, as well as, the achaetous peristomium. Further complicating the matter, is the fact that the achaetous segment listed in some of the generic diagnoses is rarely explicitly defined as being the peristomium or another segment. This is true for the 13 genera of *Capitobanchus*, *Leiocapitellides*, *Leiochrus*, *Lumbricomastus*, *Neoheteromastus*, *Neonotomastus*, *Neopseudocapitella*, *Nonatus*, *Paracapitella*, *Parheteromastides*, *Pseudocapitella*, *Pseudoleiocapitella*, and *Pseudonotomastus*. Tomioka *et al.* (2018) used the width of the head relative to the first segment as one of their characters to identify an individual to the genus level. In this they defined the "head" as consisting of the prostomium and peristomium, and the first segment as the first true segment, whether chaetous or

achaetous. Ignoring the peristomium, as it is achaetous by definition, from the counts of the thoracic segments allows for a consistent diagnosis of each Capitellid genus and leads to the thoracic formulas and emended generic diagnoses given within.

According to WoRMS, there are currently 222 described species in 41 genera, 20 of which contain only a single species. This inconsistency in how the family has been interpreted, coupled with the ontogenetic changes that occur in the number of segments with capillary chaetae during development (Warren, 1976b; Blake, 2000), has likely led to the high number of genera with only a single described species (Green, 2002, M&BB, 2012). A comprehensive review of the type material, coupled with genetic analysis, would likely be needed to resolve this issue.

The Southern California Association of Marine Invertebrate Taxonomists (SCAMIT) compile *A Taxonomic Listing of Benthic Macro- and Megainvertebrates from Infaunal & Epifaunal Monitoring and Research Programs in the Southern California Bight* every few years to aid in the standardization of name usage across the Southern California Bight for the multiple marine monitoring surveys that are conducted annually throughout the region. The 14<sup>th</sup> edition of the list (SCAMIT, 2023) list 26 Capitellid species in 14 genera. Two of the species listed in SCAMIT Edition 14 are a known species complex, *Capitella capitata* Cmplx and *Heteromastus filiformis* Cmplx, and a third is reported only as *Barantolla* sp. Members of the genus *Mediomastus* are typically identified only as *Mediomastus* sp. due to their small size and limited number of distinguishable characters. A neotype for *Capitella capitata* (Fabricius, 1780) has been designated and was redescribed by Blake (2009), and its distribution restricted to the Arctic Ocean around West Greenland. This allows for the comparison of characters from local constituents of *Capitella capitata* Cmplx to designate local provisional species. As of the publication of Blake (2009), 12 to 13 biologically distinct sibling species of the *Capitella capitata* Cmplx have been identified in laboratory culture, and the previous concepts of *Capitella capitata* based on the works of Eisig (1887), Hartman (1947) and Warren (1976) refer to other species that differ significantly from the Greenland specimens (Blake, 2009).

## Systematics

### Class Polychaeta

### Subclass Sedentaria

### Infraclass Scolecida

### Family Capitellidae Grube, 1862

**Type Genus:** *Capitella* Blainville, 1828, by monotypy

**Diagnosis** (emended after Magalhães & Blake, 2020 and Blake, 2000). Capitellids range from very small (1-2 mm), threadlike forms to large, robust, earthworm-like forms exceeding 20 cm in length. The body bears a *cephalic region* with a small *conical or rounded* prostomium, *with or without a terminal palpode*, that lacks appendages and an *achaetous peristomium*, partly fused with the prostomium or forming a distinct ring. A pair of eversible nuchal organs (ciliated pits when not everted) are located near the posterior border of the peristomium. Eyes, when present on the prostomium, tend to be small, subdermal, and appear as paired single or multiple spots dorsolaterally on the posterior portion of the prostomium, and are sometimes recessed below the peristomium. Proboscis eversible, unarmed, sometimes proximally papillated and distally smooth. The thorax contains up to 20 chaetigers, *sometimes with a true achaetous segment bearing lateral organs*. *Capillary chaetae, spatulate chaetae, genital spines and hooded hooks can be found in the fascicles of the thorax, in various combinations*, and are important for generic diagnosis. A long, narrow, sometimes tattered-appearing abdominal region contain a variable number of segments that can be modified in some genera. Abdominal chaetae consist of either capillary chaetae or hooded hooks, *or may have acicular spines in pre-pygidial segments*. Branchiae, when present, are always located in the abdominal region. Nephridial openings can be found in both the thorax and abdomen. Parapodia are simple tori, but better developed in abdominal segments. The pygidium normally bears a caudal cirrus but *can be without cirrus or modified as an anal plaque*.

**Remarks.** The chaetal arrangement of the thorax is one of the most important taxonomic characters used to separate the genera. The presence of capillary chaetae or mixed fascicles in the abdomen is also an important character. The various patterns have been illustrated by Hartman (1947), Fauchald (1972) and Ewing (1984). The thoracic formula is used in this paper and are given for all the genera of Capitellids. The genital spines of the genus *Capitella* are found in the notopodia of the last 2 thoracic chaetigers. The hooded hooks typically have a fairly straight shaft with a distinct manubrium at the point where the hook emerges from the body. The main fang is bent at a nearly right angle to the shaft and is surmounted by few to many apical teeth in 1-4 rows above the main fang. The structure and dentition of the hooded hooks may be important characters for separating the genera with overlapping thoracic formulae.

### Legend to the thoracic formulas contained within

achaetous segment + (thoracic notopodia)/(thoracic neuropodia) + (abdominal notopodia)/(abdominal neuropodia)

c=capillary chaetae

h=hooded hooks

e=either capillaries or hooded hooks

m=mixed fascicle of capillaries & hooded hooks

g=genital spines

s=spatulate chaetae

p=paddlelike chaetae

(-)=achaetous segment present

0=without chaetae (used for incomplete 1<sup>st</sup> chaetigers)

### **Genus *Amastigos* Piltz, 1977**

**Type Species:** *Amastigos acutus* Piltz, 1977, by original designation

**Diagnosis** [emended after Magalhães & Blake, 2020 and Piltz, 1977] Prostomium conical, palpode absent; peristomium *achaetous*, *short*; *eyespots present*. Thorax with 8 chaetigers; *achaetous segment absent*; capillary chaetae entirely absent, hooded hooks only present in both notopodia and neuropodia of both thorax and abdomen; transition from thorax to abdomen abrupt at chaetiger 9. No visible branchiae or nephridial papillae. Lateral organs not described. Pygidium conical, with or without anal cirris.

**Thoracic formula:**  $\frac{(8h)}{(8h)}$

**Remarks** *Amastigos* is one of only two genera, *Baldia* being the other, that completely lack capillary chaetae. Both genera have hooded hooks only in both the notopodia and neuropodia of all chaetigers. The two differ only in the number of thoracic chaetigers, degree of fusion of the prostomium and peristomium, and the presence (*Amastigos*) or absence (*Baldia*) of eyespots. The presence of 9 thoracic chaetiger is within the range of reported variability for *Amastigos* so the taxonomic status of the two genera should be revisited (Magalhães & Blake, 2020) as the other characters that separate the genera are more species-specific rather than generic characters. Fresh collections for genetic analysis would be required to determine the validity of the genus *Baldia*. Three species of *Amastigos* have been described globally, with one species described from southern California.

#### ***Amastigos acutus* Piltz, 1977**

See Piltz (1977) A New Genus and Species of Polychaete (Family Capitellidae) from Southern California. *Bulletin of the Southern California Academy of Sciences* 76(1): 57-60 for a description and images of *Amastigos acutus*. See García-Garza & de León-González (2011) Review of Capitellidae (Annelida, Polychaeta) from the Eastern Tropical Pacific region, with notes on selected species. *ZooKeys* 151: 17-52 for additional comments on *A. acutus*.

### **Genus *Anotomastus* Hartman, 1947**

**Type species:** *Anotomastus gordioides* (Moore, 1909) as *Eunotomastus gordioides*, by monotypy

**Diagnosis** [emended after Magalhães and Blake, 2020 and Fauchald, 1977] *Prostomium* conical, palpode absent; *peristomium achaetous*, *clearly distinct from the prostomium*; eyespots present as multiple spots; nuchal organs present. Thorax with 17 or 18 chaetigers; *achaetous segment absent*; first chaetiger incomplete, notopodia only; chaetigers 2 thru 16-17 with capillary chaetae only; last thoracic chaetiger with capillaries in the notopodia and mixed fascicle of capillaries and hooded hooks in the neuropodia. Abdomen with many segments; abdominal chaetigers with long-handled hooded hooks only. Palmately branched branchiae in posterior abdominal segments. Lateral organs present on all thoracic chaetigers. Nephridial papillae present in the segmental furrows of some thoracic chaetigers.

**Thoracic formula:**  $\frac{(17-18c)}{(0+15-16c+1m)}$

**Remarks** *Pseudocapitella* is similar to the genus *Anotomastus* in having 17 thoracic chaetigers and the first chaetiger uniramous, differing only in the number of thoracic chaetigers with neuropodial hooded hooks (3 in *Pseudocapitella* versus 1 in *Anotomastus*).

#### ***Anotomastus gordioides* (Moore, 1909)**

See voucher sheet that was created for this species and published in SCAMIT Newsletter 41(3&4).

## Genus *Barantolla* Southern, 1921

**Type species:** *Barantolla sculpta* Southern, 1921, by original designation

**Diagnosis** [emended after Blake, 2000]. Prostomium oval to conical, with terminal palpode; eyes present or absent; *peristomium achaetous*. Thorax with 11 chaetigers; *achaetous segment absent*; chaetiger 1 with neurochaetae present or absent. Notopodia with capillary chaetae only thru chaetiger 6; chaetiger 7 with mixed fascicle of capillaries and hooded hooks or with hooded hooks only; chaetigers 8-11 with hooded hooks only. Neuropodia with capillary chaetae in *chaetigers 1 or 2 thru 6 or 8*, remaining thoracic neuropodia with hooded hooks only. Branchiae present or absent, when present with 3 or more lobes. Pygidium without appendages.

**Thoracic formula:**  $(6c+1m(h)+4h)/(0+5c+5h)$  OR  $(6c+1m(h)+4h)/(8c+3h)$

### *Barantolla americana* Hartman, 1963

See Hartman (1963) Submarine canyons of southern California. Part III. Systematics: Polychaetes. *Allan Hancock Pacific Expeditions* 27(3): 1-93 and Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel*. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae for descriptions of *Barantolla americana*.

**Remarks** Blake (2000) expanded the range of *Barantolla americana* north to Washington based on an unpublished list but also acknowledged that a different, still undescribed species of *Barantolla* is present in Puget Sound and the Northeast Pacific based on a personal communication with R. E. Ruff. *Barantolla americana* should have its range restricted to California until additional samples from northern regions can be obtained for comparison.

In the past, LACSD has reported 4 individuals as *Barantolla* sp. Upon further review, these individuals were determined to not belong to the Genus *Barantolla*. All 4 individuals were small juveniles, but all had more than 7 chaetigers with capillary notochaetae.

## Genus *Capitella* Blainville, 1828

*Branchiocapitella* Fauvel, 1932. *Fide* Magalhães & Bailey-Brock, 2012 – subjective synonym

*Capitellides* Mesnil, 1897. *Fide* Warren, 1991 – subjective synonym

*Capitomastus* Eisig, 1887. *Fide* Warren, 1991 – subjective synonym

*Isomastus* Gravier, 1911. *Fide* Hartman, 1947 – subjective synonym

*Lumbriconais* Örsted, 1842, in Grube, 1850 – subjective synonym

*Malta* Stephenson, 1908. *Fide* Hartman, 1959 – subjective synonym

*Valla* Johnston, 1865. *Fide* Hartman, 1959 – subjective synonym

**Type species:** *C. capitata* (Fabricius, 1780) as *Lumbricus capitatus*, by monotypy. Redescribed by Blake (2009).

**Diagnosis** [emended after Silva *et al.* 2017 and Silva *et al.* 2016] Prostomium conical to bluntly rounded, sometimes dorsoventrally flattened, with dorsal groove present or absent, with nuchal organs as paired slits at border between prostomium and peristomium; eyes present or absent. Peristomium forming a complete or incomplete achaetous ring. Thorax with nine chaetigers; *achaetous segment absent*; *first chaetiger complete*; with capillary chaetae in both rami of chaetigers 1-3, 1-4, 1-6, or 1-7, or capillaries and hooded hooks in various combinations in both rami; chaetigers 8 and 9 with all capillaries, mixed fascicles of capillaries and hooded hooks or hooded hooks only; arrangement is sometimes size dependent. Genital hooks present in notopodia of chaetigers 8 and 9 of males and hermaphrodites; females usually with enlarged lateral genital pores between chaetigers 7-8 or 8-9. Capillary chaetae unilimbate, hooded hooks with multiple rows of denticles above the main fang. Abdominal segments with hooded hooks in both rami, without capillaries. Branchiae present or absent. Pygidium without appendages.

**Thoracic formula:** variable based on species; *Capitella capitata* formula (♂, ♀)  $(7c+2g)/(7c+2h)$

### *Capitella capitata* (Fabricius, 1780), redescribed by Blake, 2009

*Lumbricus capitatus* Fabricius, 1780 – basionym

*Ancistria acuta* Verrill, 1874 – subjective synonym

*Capitella capitata belgica* Czerniavsky, 1881 – subjective synonym

*Capitella capitata danica* Czerniavsky, 1881 – unaccepted

*Capitella capitata hebridarum* Czerniavsky, 1881 – subjective synonym

*Capitella capitata neapolitana* Czerniavsky, 1881 – subjective synonym

*Capitella capitata suchumica* Czerniavsky, 1881 – subjective synonym

*Capitella fabricii* Blainville, 1828 – subjective synonym

*Capitella intermedia* Czerniavsky, 1881 – subjective synonym

*Capitella prototypa* Czerniavsky, 1881 – subjective synonym

*Capitella similis* Czerniavsky, 1881 – subjective synonym

*Lombricus canalium* Nardo, 1847 – subjective synonym

*Lumbriconais marina* Örsted, 1842 – subjective synonym

*Lumbricus ciliatus* Müller, 1773 – subjective synonym  
*Lumbricus littoralis* Johnston, 1827 – subjective synonym  
*Matla bengalensis* Sphenson, 1908 – subjective synonym  
*Saenuris barbata* Grube, 1860 – synonym

*Valla ciliata* (Müller, 1773) – subsequent combination of subjective synonym

See Blake (2009) Redescription of *Capitella capitata* (Fabricius) from West Greenland and designation of a neotype (Polychaeta, Capitellidae). *Zoosymposia* 2: 55-80 for the redescription and images of *Capitella capitata*.

**Thoracic Formula:** (♂<sup>(7c+2g)</sup> / ♀<sup>(7c+2g)</sup>) / (7c+2e)

**Remarks** Blake (2009) redescribed *Capitella capitata* and restricted the range to the type locality of Greenland, allowing for the comparison of local species previously identified within the *Capitella capitata* Cmplx. A review of LACSD specimens has so far yielded 1 new provisional species previously identified as *Capitella capitata* Cmplx, *Capitella* sp LA3 Haggin, 2023 §, described below. Staining variations from San Diego specimens suggest that at least 2 other provisional species are present within this complex as well.

### *Capitella capitata oculata* Hartman, 1961

See Hartman (1961) Polychaetous Annelids from California. *Allan Hancock Pacific Expeditions* 25: 1-224 for a description of *Capitella capitata oculata*.

**Thoracic Formula:** ♂<sup>(7c+2g)</sup> / (7c+2h); ♀<sup>(7c+2h)</sup> / (7c+2h)

**Remarks** When described, *Capitella capitata oculata* was found to be hosting a parasitic copepod, *Monstrilla capitellicola*. The presence of black eyes distinguishes this species from *Capitella teleta*, which has red eyes.

### *Capitella capitata tripartita* Hartman, 1961

See Hartman (1961) Polychaetous Annelids from California. *Allan Hancock Pacific Expeditions* 25: 1-224 for a description of *Capitella capitata tripartita*.

**Thoracic Formula:** ♂<sup>(3c+1c(m)+2m+1m(h)+2g)</sup> / (3c+2m+2m(h)+2h) ♀<sup>(3c+1c(m)+2m+1m(h)+2h)</sup> / (3c+2m+2m(h)+2h)

**Remarks** When described, *Capitella capitata tripartita* was found to be hosting a parasitic copepod, *Monstrilla capitellicola*.

### *Capitella ovincola* Hartman, 1947

*Capitella capitata ovincola* Hartman, 1947 – of Hartman (1959), not Hartman (1947)

See Hartman (1947) Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481 and Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Capitella ovincola*.

**Thoracic Formula:** ♂<sup>(5c+2c(m)+2g)</sup> / (4c+3c(m)+2h) ♀<sup>(5c+2c(m)+2h)</sup> / (4c+3c(m)+2h)

**Remarks** *Capitella ovincola* is known only from squid egg masses.

### *Capitella teleta* Blake, Grassle & Eckelbarger, 2009

See Blake, Grassle & Eckelbarger (2009) *Capitella teleta*, a new species designation for the opportunistic and experimental *Capitella* sp. I, with a review of the literature for confirmed records. *Zoosymposia* 2: 25-53 for a description and images of *Capitella teleta*.

**Thoracic Formula:** ♂<sup>(7c+2g)</sup> / (7c+2h); ♀<sup>(7c+2h)</sup> / (7c+2h)

**Remarks** *Capitella teleta* was originally identified and described from laboratory cultures in Woods Hole, Massachusetts. This species has since been confirmed to be present in southern California via DNA analysis. *Capitella teleta* can be distinguished locally by the presence of red eyes, rather than black eyes as in *Capitella capitata oculata*.

### *Capitella* sp LA3 Haggin, 2023 §

*Capitella capitata* Cmplx of authors SCB

See attached provisional voucher sheet

**Thoracic Formula:** ♂, ♀<sup>(4c+3h+2g)</sup> / (4c+5h); juveniles <sup>(4c+4h+1g)</sup> / (4c+5h) or <sup>(4c+5h)</sup> / (4c+5h)

## Genus *Dasybranchus* Grube, 1850

*Branchoscolex* Schmarda, 1861. *Fide* Augener, 1918 – subjective synonym

*Buchertia* Rullier, 1965. *Fide* Gallardo, 1968 – subjective synonym

*Dasymallus* Grube, 1846(1850??). *Fide* Fauchald, 1977 – junior homonym, replaced by *Dasybranchus*

**Type species:** *Dasymallus caducus* Grube, 1846, by monotypy

**Diagnosis** [emended after Magalhães & Blake, 2020 and Green, 2002] *Prostomium rounded or conical, palpode present or absent; peristomium achaetous, clearly distinct from the prostomium; eyespots present in multiple spots or absent; nuchal organs present. Thorax with 13 chaetigers; achaetous segment absent; chaetiger 1 biramous; capillary chaetae only. Abdominal chaetigers with hooded hooks only in both rami; abdominal parapodial tori without expanded lobes. Branchiae retractile or nonretractable, as simple filaments or branched tufts, arising from superior edge of neuropodia on median and posterior abdominal segments. Genital pores beginning on posterior end of thorax. Lateral organs present on thorax and abdomen. Pygidium simple, without cirri.*

**Thoracic formula:**  $(13c)/(13c)$

**Remarks** The thoracic formula and generic diagnosis of *Nonatus* matches that of the genus *Dasybranchus*. A detailed review of the type of *Nonatus longilineus* to compare the structure and dentition of the abdominal hooded hooks and fresh collections for genetic analysis would be needed to determine the validity of the genus *Nonatus*.

***Dasybranchus glabrus* Moore, 1909**

See Moore (1909) Polychaetous annelids from Monterey Bay and San Diego, California. *Proceedings of the Academy of Natural Sciences of Philadelphia* 61: 235-295 and Hartman (1947) Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481 for descriptions and images of *Dasybranchus glabrus*.

See Fauchald & Hancock (1981) Deep-water polychaetes from a transect off central Oregon. *Allan Hancock Monographs in Marine Biology* 11: 1-73 and García-Garza & de León-González (2011) Review of Capitellidae (Annelida, Polychaeta) from the Eastern Tropical Pacific region, with notes on selected species. *ZooKeys* 151: 17-52 for comments on the distribution of *D. glabrus*.

***Dasybranchus lumbricoides* Grube, 1878**

A modern description of the species can be found in Uebelacker & Johnson (1984) Taxonomic guide to the polychaetes of the northern Gulf of Mexico or López *et al.* (2005) Capitellidae from Coiba National Park, Pacific Coast of Panamá, with a new species of the genus *Amastigos*. *Cahiers de Biologie Marine* 46: 57-67 but neither description is from the type locality.

**Remarks** The main characteristics of *Dasybranchus lumbricoides* are retractile branchiae present in median and posterior segments, and the abdominal hooded hooks have a main fang surmounted by 20 teeth in 3-4 rows. This species was originally described from the Philippine Islands and now has a reported cosmopolitan distribution. The single report by CLAEMD from Ballona Lagoon should be treated as a local provisional species.

***Dasybranchus* sp SD1 Rowe, 2004 §**

This species was reported by CSD during Bight '03 regional monitoring from 100 meters. It has 13 thoracic chaetigers and the thorax is biannulated with deep furrows.

**Remarks** This species is currently on the SCAMIT hold-list pending additional documentation.

**Genus *Decamastus* Hartman, 1963**

**Type species:** *Decamastus gracilis* Hartman, 1963, by original designation

**Diagnosis** [emended after Magalhães & Blake, 2020 and Hernández-Alcántara *et al.*, 2019] *Prostomium short, conical, palpode present or absent; eyespots present or absent; peristomium achaetous, not clearly distinct from the prostomium. Thorax with 10 chaetigers; achaetous segment absent; first chaetiger complete or with notopodia only; capillary chaetae only in both rami or last 1-2 thoracic chaetigers with mixed fascicles of capillaries and hooded hooks in neuropodia. Abdomen with multidentate hooded hooks in both rami. Branchiae absent. Genital pores and lateral organs not described. Pygidium simple, without cirri.*

**Thoracic formula:**  $(10c)/(0+9c)$  or  $(10c)/(8(9)c+2(1)m)$

***Decamastus gracilis* Hartman, 1963**

See Hernández-Alcántara *et al.* (2019) A new species of *Decamastus* Hartman, 1963 (Polychaeta: Capitellidae) from the Gulf of California, with remarks on its habitat. *Marine Biodiversity* 49(3): 1123-1130 for the most recent description and images of *Decamastus gracilis*.

**Genus *Dodecamastus* Blake, 2000**

**Type species:** *Dodecamastus mariaensis* Blake, 2000, by original designation

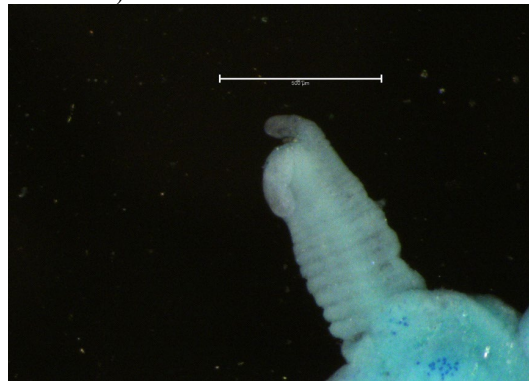
**Diagnosis** [emended after Magalhães & Blake, 2020 and Blake, 2000] Prostomium short, conical, palpode absent; eyespots absent; nuchal organs not apparent; peristomium achaetous, clearly distinct from the prostomium. Thorax with 12 chaetigers; *achaetous segment absent*; chaetiger 1 complete; chaetigers 1-10 with capillary chaetae in both rami; chaetigers 11 and 12 with hooded hooks in both rami. Abdominal chaetigers with hooded hooks only. Branchiae present, branched, superior to notopodia. Genital pores and lateral organs not described. Pygidium without appendages.

**Thoracic formula:**  $(10c+2h)/(10c+2h)$

***Dodecamastus mariaensis* Blake, 2000**

See Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for original description and images of *Dodecamastus mariaensis*.

**Remarks** Blake's original description did not include the pygidium as his specimen was incomplete. A review of LACSD vouchers yielded a complete (though regenerating) individual. Based on this individual the pygidium is known to be a terminal ring with 1 pair of fleshy to filamentous anal cirri inserted laterally (image below, photo by B. Haggin, STN B13-9210).



*Dodecamastus mariaensis* is the only species currently assigned to the genus. Locally, the species may be mistaken for *Decamastus* because the first 10 chaetigers bear only capillary chaetae. However, there are actually 12 thoracic chaetigers, the last two bearing only hooded hooks. The abdominal segments can be readily identified by the development of a long, lateral chaetal flange. The posterior, branched branchiae are also diagnostic, and not known for any species of *Decamastus*.

Locally, *Dodecamastus mariaensis* is readily distinguished from other species by the conspicuous methyl green staining pattern where the twelfth thoracic chaetiger stains an intense turquoise, unlike any other segment on the body.

**Genus *Heteromastus* Eisig, 1887**

*Ancistria* Quatrefages, 1866. *Fide* Hartman, 1947 – junior homonym, replaced by junior synonym *Heteromastus*

*Areniella* Verrill, 1874. *Fide* Hartman, 1947 – subjective synonym

**Type species:** *Capitella filiformis* Claparède, 1864, by monotypy. Redescribed by Hutchings & Rainer, 1981.

**Diagnosis** [emended after Magalhães & Blake, 2020 and Magalhães & Bailey-Brock, 2012] Prostomium short to long, conical, sometimes tapering; palpode absent; eyespots present or absent, when present, paired; nuchal organs present; *peristomium achaetous, clearly distinct from the prostomium*. Thorax with 11 chaetigers; *achaetous segment absent*; chaetiger 1 complete; chaetigers 1-5 with capillary chaetae in both rami; chaetigers 6-11 with long-handled hooded hooks. Abdominal chaetigers with short-handled hooded hooks only. Branchiae may be present or absent on posterior abdominal segments, when present, digitate or branched, notopodial. Genital pores on thorax from chaetigers 7-11. Lateral organs distinct on thorax and indistinct on abdomen. Pygidium with ventral caudal cirrus.

**Thoracic formula:**  $(5c+6h)/(5c+6h)$

***Heteromastus filiformis* (Claparède, 1864), redescribed by Hutchings & Rainer, 1982**

*Capitella filiformis* Claparède, 1864 – superseded original combination

*Ancistria capillaris* Verrill, 1874 – subjective synonym

*Ancistria minima* Quatrefages, 1866 – subjective synonym

*Areniella filiformis* Verrill, 1874 – subjective synonym  
*Capitella costana* Claparède, 1869 – subjective synonym  
*Capitella fimbriata* Van Beneden, 1857 – subjective synonym  
*Notomastus filiformis* Verrill, 1873 – subjective synonym  
*Notomastus laevis* Webster, 1886 – unaccepted

See Hutchings & Rainer (1982) Designation of a neotype of *Capitella filiformis* Claparède, 1964, type species of the genus *Heteromastus* (Polychaeta: Capitellidae). *Records of the Australian Museum* 34(4): 373-380 for their redescription and images of *Heteromastus filiformis*.

See Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspididae*. Santa Barbara Museum of Natural History and Choi & Yoon (2016) First record of *Heteromastus filiformis* (Polychaeta: Capitellidae) from Korean waters, with a taxonomic note on the genus. *Journal of Species Research* 5(3): 264-271 for descriptions of Californian and Korean records of *Heteromastus filiformis* respectively.

**Remarks** These three descriptions show that this is a species complex and not a species with cosmopolitan distribution, and local specimens should be given a provisional designation. LACSD has started using *Heteromastus* sp LA3 Haggin, 2023 § (described below) for NEP *Heteromastus filiformis* in our collections.

### ***Heteromastus filobranchus* Berkeley & Berkeley, 1932**

See Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspididae*. Santa Barbara Museum of Natural History for the most recent description of *Heteromastus filobranchus*.

**Remarks** LACSD reported 50+ *Heteromastus filobranchus* per survey prior to 2003. After 2003 reports dropped to between 2 and 10 occurrences per survey and hasn't been reported since 2016. LACSD's Joint Water Pollution Control Plant switched to a full secondary treatment process in 2003, reducing our outfalls particulate output to the low levels that we are currently discharging. This species may prefer a more impacted sediment or prefer a habitat with sediment sizes no longer found in our regular sampling area.

Southern California records of this species are doubtful and upon review may be referred to the provisional species *Heteromastus* sp LH1 Harris 20?? § (description below).

### ***Heteromastus* sp LA3 Haggin, 2023 §**

*Heteromastus filiformis* of authors SCB, not (Claparède, 1864)  
See attached provisional voucher sheet

### ***Heteromastus* sp LH1 Harris, 20?? §**

*Heteromastus* sp LH1 has filiform branchiae in the abdomen from chaetigers 55-100 with up to 8 filaments. The thorax stains uniformly with Methyl Green Stain. The anterior abdomen stains with the dorsal half of each segment dark, forming a continuous stripe down the body, the posterior margins staining with darker spots. This species was originally collected from Newport Canyon from a depth of approximately 450m.

**Remarks** *Heteromastus* sp LH1 can be differentiated from *Heteromastus filobranchus* by the later insertion of the branchiae, chaetigers 55-100 versus chaetigers 30-50 in *H. filobranchus*, and the reduced number of branchial filaments, 8 in *Heteromastus* sp LH1 compared to 16 in *H. filobranchus*.

### ***Heteromastus* sp MEC1 ??**

**Remarks** This species is currently on the SCAMIT hold-list pending documentation. No information other than a name is available.

## **Genus *Leiochrides* Augener, 1914**

*Notobranchus* Capaccioni-Azzati & El-Haddad, 2015 – new name for homonym *Pseudomastus*, a subjective synonym of *Leiochrides*  
*Pseudomastus* Capaccioni-Azzati & Martin, 1992. *Fide* Jeong *et al.*, 2017 – subjective synonym, but firstly unavailable as a homonym, replaced by *Notobranchus*

**Type species:** *Leiochrides australis* Augener, 1914, by original designation

**Diagnosis** [emended after Magalhães & Blake, 2020 and Jeong *et al.*, 2017] Prostomium rounded or conical; palpode absent; eyespots present or absent; nuchal organs present; peristomium *achaeitous*, clearly distinct from prostomium. Thorax with 12 chaetigers; *achaeitous segment absent*; chaetiger 1 complete or incomplete, chaetigers 1-10 with capillary chaetae in both rami; chaetigers 11-12 with capillary chaetae in both rami or with capillary chaetae in notopodia and hooded hooks in neuropodia. Thorax clearly demarked from abdomen. Abdominal chaetigers with

hooded hooks only. Parapodia reduced. Branchiae present or absent; when present, branched, retractile, notopodial. Genital pores in four pairs from chaetigers 7-8. Lateral organs present only in thorax. Pygidium simple, unadorned.

**Thoracic formula:**  $(12c)/(10c+2e)$  or  $(12c)/(0+9c+2e)$

**Remarks** There seems to be some confusion in Fauchald's (1977) diagnosis of the genus, possibly due to a comment made by Harmelin when comparing *Pseudoleiocapitella* to *Pseudomastus*, resulting in a reduction of thoracic chaetigers. Reviewing the original generic diagnosis, species description of *Pseudoleiocapitella fauveli* and the images provided in Harmelin (1964), it is clear that *Pseudoleiocapitella* should have 12 thoracic chaetigers. Thoracic chaetigers with notopodial capillaries and neuropodial hooded hooks is a common diagnosis of many capitellid genera, and the change in dentition between chaetigers 11-12 and the remaining chaetigers reinforce this idea. The emended generic diagnosis above is based mostly off of Harmelin's (1964) original description and corrects the incorrect diagnosis given in Fauchald (1977).

As the presence or absence of neuropodia on the first chaetiger seems to be more of a species level character, rather than a generic level, *Pseudoleiocapitella* may be synonymized with *Leiochrides*. The emended generic diagnosis shows its thoracic formula to be the same as *Leiochrides*, with the exception of the incomplete first chaetiger. A detailed examination of the abdominal hooded hooks would be needed to fully resolve this.

This interpretation of *Pseudoleiocapitella* differs from that given in Magalhães & Blake (2020).

### ***Leiochrides hemipodus* Hartman, 1960**

See Hartman (1960) Systematic account of some marine invertebrate animals from the deep basins off southern California. *Allan Hancock Pacific Expeditions* 22(2): 69-216 and Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Leiochrides hemipodus*.

### ***Leiochrides pallidior* (Chamberlin, 1918)**

*Notomastus pallidior* Chamberlin, 1918 – unaccepted

**Remarks** Blake (2000) commented that *Leiochrides pallidior* (originally described as *Notomastus pallidior*) from Pacific Grove, California was referred to the genus *Leiochrides* by Hartman, 1947 thru a process of elimination and Garcíá-Garza & de León-González (2011) commented that this is a poorly known species and all descriptions have been incomplete. This species should be considered *incertae sedis*, because it was incompletely described and not illustrated, until the type material can be re-examined.

### ***Leiochrides* sp A Harris, 1985 §**

**Description** [from SCAMIT 3(11)] The body is slender, cylindrical and moderately small. Total length may not exceed 30 mm, of which the thorax is 5.3 mm, and 28 abdominal segments measure 19 mm. None of the specimens is complete but the total number of segments may be about 50. Separation between thorax and abdomen is not marked except for a change in parapodia, where setae are abruptly replaced by uncini. The prostomium is a short, bluntly rounded lobe without eyes. The thoracic epithelium, like that of the abdomen, is smooth and glistening. The peristomium or first visible segment lacks parapodia and is somewhat longer than the next or first setigerous segment. This has notopodia, but lacks neuropodia. The next is biramous and resembles those of the following one. All have pointed setae only, emerging in lateral series. In the first few segments the parapodial ridges are at the midlength of the segment; in the last several thoracic segments, the ridges are gradually farther back.

In larger individuals the first 5 thoracic segments are somewhat set off from the next by being somewhat inflated.

Prostomium followed by an achaetous peristomium; thoracic notopodia number 12 pairs with pointed setae only; thoracic neuropodia number 11 pairs, with pointed setae.

Long-handled hooded hooks are present in abdominal segments. Branchiae are present in abdominal segments, perhaps not before the middle region. At best development, they consist of 3 to 10-12 long, filiform, non-retractile lobes in palmate arrangement, and emerge from the notopodial lobe, posterior to the uncinal ridge. An occasional filament is bifurcated along its length.

**Methyl Green Staining Pattern** Unknown

**Thoracic Formula:**  $(12c)/(0+9c+2h)$

**Remarks** *Leiochrides* is known for few species (see Hartman, 1947, p. 429) from shallow sea bottoms. *L. hemipodus* differs from others in that abdominal segments have palmately divided branchiae. It is known only from the basins of southern California and is presumed to be a deep water form. This description is very similar to *Leiochrides hemipodus* and may be synonymous.

## Genus *Mediomastus* Hartman, 1944

*Capitita* Hartman, 1947. *Fide* Fauchald, 1977 – subjective synonym

**Type species:** *Mediomastus californiensis* Hartman, 1944

**Diagnosis** [emended after Magalhães & Blake, 2020 and Green, 2002] Body small, thread-like. *Prostomium conical, palpode present; eyespots present or absent, when present, in multiple spots; peristomium achaetous*, clearly distinct from the prostomium. Proboscis papillated. Thorax with 9-11 chaetigers, usually 10; *achaetous segment absent*; chaetigers 1-4 with capillary chaetae in both rami; remaining thoracic chaetigers with long-handled hooded hooks; sometimes paddlelike chaetae may be present in thoracic chaetigers. Thorax not clearly demarcated from the abdomen. Abdominal chaetigers with short-handled hooded hooks in both rami; occasionally with capillary chaetae in notopodia of far posterior abdominal chaetigers. Branchiae absent. Genital pores in three pairs from chaetigers 7-8 or 8-9 but difficult to observe. Lateral organs present on thorax and inconspicuous in abdomen. Pygidium terminal with mid-ventral caudal cirrus.

**Thoracic formula:**  $(4c+6(5-7)h)/(4c+6(5-7)h)$

**Remarks** The generic diagnosis of *Mediomastus* Hartman, 1944 was emended by Warren et al. (1994) to expand the thoracic chaetiger range from 10 to 9-11. The thoracic formula for *Parheteromastus* Monro, 1937 now falls within the expanded thoracic range of *Mediomastus*. Genetic data will likely be needed to resolve the relationships of these two genera. If the two are found to be synonymous, I believe that *Parheteromastus* would have priority.

### *Mediomastus acutus* Hartman, 1969

See Warren et al. (1994) A revision of the genus *Mediomastus* Hartman, 1944 (Polychaeta: Capitellidae). *Records of the Australian Museum* 46(3): 227-256 or Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Mediomastus acutus*.

**Thoracic Formula:**  $(4c+3h+3p)/(4c+6h)$

### *Mediomastus ambiseta* (Hartman, 1947)

*Capitita ambiseta* Hartman, 1947 – superseded original combination

See Warren et al. (1994) A revision of the genus *Mediomastus* Hartman, 1944 (Polychaeta: Capitellidae). *Records of the Australian Museum* 46(3): 227-256 or Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Mediomastus ambiseta*.

**Thoracic Formula:**  $(4c+6h)/(4c+6h)$

### *Mediomastus californiensis* Hartman, 1944

See Warren et al. (1994) A revision of the genus *Mediomastus* Hartman, 1944 (Polychaeta: Capitellidae). *Records of the Australian Museum* 46(3): 227-256 or Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Mediomastus californiensis*.

**Thoracic Formula:**  $(4c+6h)/(4c+6h)$

### *Mediomastus* sp A SCAMIT, 2015 §

*Mediomastus* sp 6 Harris, 2001 §

**Description** [from Phillips, 2017] Body linear, not threadlike, width in anterior usually around 1 mm. Prostomium a small lobe, palpode present; peristomium achaetous, smooth, truncate. Thorax with 10 chaetigers, biannulate, achaetous segment absent; chaetigers 1-4 with capillary chaetae only, chaetigers 5-10 with hooded hooks. Abdominal chaetigers with hooded hooks. Posterior abdomen and pygidium unknown.

Chaetiger 2 with white pigment band, obvious without staining (Fig. 1)

**Methyl Green Staining Pattern** [from Phillips, 2017]. Dorsal patch on posterior prostomium and all of peristomium; chaetigers 1-2 non-staining, chaetiger 2 white pigment band obvious; posterior thoracic segments darkly stained; abdominal segments with intersegmental band (Fig. 1)

**Thoracic Formula:**  $(4c+6h)/(4c+6h)$

**Habitat & Faunal Associates** *Mediomastus* sp A is known to inhabit silty mud in shallow waters.

**Distribution** Goleta to San Diego Bay, California, USA; 1-30 m.

**Remarks** [from Phillips, 2017] Three species have been listed from the SCB (SCAMIT Edition 9) *Mediomastus acutus* Hartman 1969, *M. ambiseta* (Hartman 1947) and *M. californiensis* Hartman 1944. *Mediomastus acutus* differs from *M. sp A* in having a long, acute prostomium (see p. 385, Hartman 1969), paddle-like notosetae on setigers 8-10 and is found in shallow (1-15 m) clean, fine sands, whereas *M. sp A* is found in shallow, silty mud. *Mediomastus ambiseta* is a small, thread-like species (width 0.25 - 0.5mm) with a small, conical prostomium and longer, smooth peristomium. There is no white pigment pattern on setiger 2 for *M. ambiseta* and the methyl-green stain pattern is different from *M. sp A* (see Figure 2) with a setigers 1-7 a uniform stain and setiger 8 a solid band. There are strong intersegmental stain bands in the early abdominal setigers. *Mediomastus californiensis* is similar in appearance to *M. ambiseta* in also being a thread-like species, with similar prostomium and peristomium. The posterior setigers do not have single spines replacing the hooded hooks as in *M. ambiseta*. The stain pattern for *M. californiensis* is distinctive in having solid stain bands on setigers 4 and 10. There are weak segmental bands in the early abdominal segments. In most instances the posterior portions of specimens of *Mediomastus* are usually missing in samples analyzed from the SCB. Because of this, the SCAMIT protocol for identification of *Mediomastus* has been to label all specimens as *Mediomastus sp.* With methyl green stain patterns being clearly different for *Mediomastus sp A.*, *M. ambiseta* and *M. californiensis*, it should be possible to separate these three species in future monitoring based on stain patterns of the anterior fragments.



***Mediomastus sp 5*** Harris, 2020 §

**Remarks** This provisional species was collected in 1 meter from San Diego Bay. This species resembles *Mediomastus ambiseta* but differs in the shape and stain pattern of the posterior lobes. Due to these differences, the whole animal is needed to differentiate *M. ambiseta* and *M. sp 5*.



### Genus *Neomediomastus* Hartman, 1969

**Type species:** *Neomediomastus glabrus* (Hartman, 1960) as *Mediomastus glabrus*, by monotypy

**Diagnosis** [emended after Magalhães & Blake, 2020; Green, 2002 and Blake, 2000] *Prostomium* short, conical, palpode present or absent; eyespots present or absent; nuchal organs present; peristomium achaetous, clearly distinct from the prostomium. Thorax with 9-10 chaetigers; achaetous segment absent; chaetiger 1 complete; chaetigers 1-6 with capillary chaetae in both rami; remaining thoracic chaetigers with long-handled hooded hooks. Thorax clearly demarked from the abdomen. Small notopodial processes (“branchiae”) may be present in posterior abdominal segments. Genital pores and lateral organs not described. Pygidium unknown.

**Thoracic formula:**  $(6c+3(4)h)/(6c+3(4)h)$

#### *Neomediomastus glabrus* (Hartman, 1960)

*Mediomastus glabrus* Hartman, 1960 – superseded original combination

See Warren et al. (1994) A revision of the genus *Mediomastus* Hartman, 1944 (Polychaeta: Capitellidae). *Records of the Australian Museum* 46(3): 227-256 or Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History for descriptions and images of *Neomediomastus glabrus*.

**Remarks** *Neomediomastus glabrus* is a deep basin animal reported from 900-1749m. This organism is likely to be encountered only during Bight surveys.

### Genus *Notodasus* Fauchald, 1972

*Dodecaseta* McCammon & Stull, 1978. *Fide* García-Garza et al., 2017 – subjective synonym

**Type species:** *Notodasus magnus* Fauchald, 1972, by original designation

**Diagnosis** [emended after Magalhães & Blake, 2020 and Lin et al., 2019] *Prostomium* conical, palpode present; eyespots present or absent; peristomium achaetous, clearly distinct from the prostomium. Thorax with 11

chaetigers; *achaetous segment absent*; first chaetiger complete; thoracic chaetigers with capillary chaetae only in both rami. First 1 or 2 abdominal chaetigers with bilimbate capillary chaetae in both rami, subsequent abdominal chaetigers with hooded hooks only. Branchiae present, retractile, branched, superior to notopodia. Genital pores, when observed, in up to three pairs from chaetigers 8-9. Lateral organs present on thorax and abdomen. Pygidium with or without caudal cirrus.

**Thoracic formula:**  $^{(11c)}/_{(11c)} + ^{(12)c)/}_{(12)c(m)}$

### ***Notodasus oraria* (McCammon & Stull, 1978)**

*Dodecaseta oraria* McCammon & Stull, 1978 – superseded original combination

*Notodasus kristiani* García-Garza, Hernández-Valdez & de León-González, 2009 – subjective synonym

See García-Garza et al. (2017) Relocation of *Dodecaseta* McCammon & Stull, 1978 (Annelida, Capitellidae) in *Notodasus* Fauchald, 1972. *ZooKeys* 715: 93-101 for a description and images of *Notodasus oraria*.

## **Genus *Notomastus* Sars, 1851**

*Arenia* Quatrefages, 1866. *Fide* Hartman, 1959 - unaccepted

*Eisigella* Gravier, 1901 – subjective synonym

*Notomastus* (*Clistomastus*) Eisig, 1887 – disused currently

*Notomastus* (*Tremomastus*) Eisig, 1887. *Fide* Fauvel, 1927 – disused, synonym of *Notomastus* sensu stricto

*Paraleiocapitella* Thomassin, 1970. *Fide* Ewing, 1982 – subjective synonym

*Sandanis* Kinberg, 1867. *Fide* Hartman, 1959 – subjective synonym

**Type species:** *Notomastus latericeus* Sars, 1851, by monotypy

**Diagnosis** (emended after Magalhães & Blake, 2020 and Lin *et al.*, 2020). Prostomium conical, with or without palpode; eyespots present or absent; peristomium achaetous, clearly distinct from the prostomium. Thorax with 11 chaetigers; *achaetous segment absent*; first chaetiger complete or incomplete; chaetigers 1-10 with capillary chaetae in both rami; chaetiger 11 with capillary chaetae in both rami or with capillary notochaetae and neuropodial hooded hooks. Thorax clearly demarked from abdomen. Abdominal chaetigers with hooded hooks only. Branchiae present or absent. Genital pores present or absent. Lateral organs present on thorax and abdomen. Pygidium without cirri, but unknown for many species.

**Thoracic formula:**  $^{(11c)}/_{(10c+1c)}$  or  $^{(11c)}/_{(0+10c)}$  or  $^{(11c)}/_{(0+9c+1c)}$

**Remarks** The emended diagnosis of the genus *Capitellethus* places its thoracic formula in agreement with that of the genus *Notomastus* and similar to that of the genus *Rashgua*. *Capitellethus* differs from *Notomastus* in the dentition of the abdominal hooded hooks, with the basal row having 2 teeth in *Capitellethus* and more than 2 teeth in *Notomastus*. *Rashgua* differs from both genera in mostly lacking abdominal notochaetae. Genetic analysis will likely be needed to resolve the relationships of these three genera.

This interpretation of the genus *Capitellethus* differs slightly from that given in Magalhães & Blake (2020) as they view this genus as having a uniramous first chaetiger.

*Rashgua* is unique among the capitellids in mostly lacking abdominal notochaetae. This differentiates it from other genera with 11 thoracic chaetigers and capillary notochaetae in all thoracic chaetigers such as *Notomastus* and *Capitellethus*. See also remarks on *Capitellethus* and *Notomastus* for comments on the similarities of the three genera.

### ***Notomastus hemipodus* Hartman, 1945**

*Notomastus* (*Clistomastus*) *hemipodus* Hartman, 1945 – disused synonym

*Notomastus* (*Clistomastus*) *hemipodus* Hartman, 1947 – unaccepted

*Notomastus americanus* Day, 1973 – subjective synonym

*Notomastus* sp A SCAMIT, 2001 §

*Notomastus tenuis* of authors NEP, not Moore, 1909

See García-Garza, M. E., Harris, L. H. & de León-González, J. A. 2012. Redescription of *Notomastus hemipodus* Hartman, 1945 and *N. tenuis* Moore, 1909 (Polychaeta: Capitellidae). *Proceedings of the Biological Society of Washington* 125(1): 1-11 for a description and images of *Notomastus hemipodus*.

**Thoracic Formula:**  $^{(11c)}/_{(0+10c)}$

### ***Notomastus latericeus* Sars, 1851**

*Arenia cruenta* Quatrefages, 1866 – subjective synonym

*Arenia fragilis* Quatrefages, 1866 – subjective synonym

*Capitella rubicunda* Keferstein, 1862 – subjective synonym

*Notomastus rubicundus* (Keferstein, 1862) – subjective synonym

*Sandanis rubicundus* (Keferstein, 1862) – recombination of subjective synonym

*Notomastus* (*Tremomastus*) *benedeni* Claparède, 1864 – rank variant of subjective synonym

*Notomastus benedeni* Claparède, 1864 – subjective synonym

*Notomastus* (*Tremomastus*) *fertilis* Eisig, 1887 – subjective synonym

See Ewing (1984) Family Capitellidae Grube, 1862. Chapter 14. IN: Uebelacker, J. M. & Johnson, P. G. *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Volume II.* Minerals Management Service, Metairie, Louisiana for the most recent description of *Notomastus latericeus*.

**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>

**Remarks** This species was originally described from either New Brunswick, Canada or Norway and has since gained a cosmopolitan distribution with a depth range of intertidal to 4360m. This is likely a species complex and NEP individuals should be treated as a local provisional species. LACSD has been using *Notomastus* sp LA4 Haggin, 2023 § (described below) for local members of this species complex.

***Notomastus lineatus* Claparède, 1869**

*Notomastus (Clistomastus) lineatus* Claparède, 1869 – alternated representation with disused subgenus

*Notomastus (Clistomastus) lineatus balanoglossi* Eisig, 1887 – subjective synonym

*Notomastus sarsii* Claparède, 1864 – subjective synonym

See Ewing (1984) Family Capitellidae Grube, 1862. Chapter 14. IN: Uebelacker, J. M. & Johnson, P. G. *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Volume II.* Minerals Management Service, Metairie, Louisiana for the most recent description of *Notomastus lineatus*.

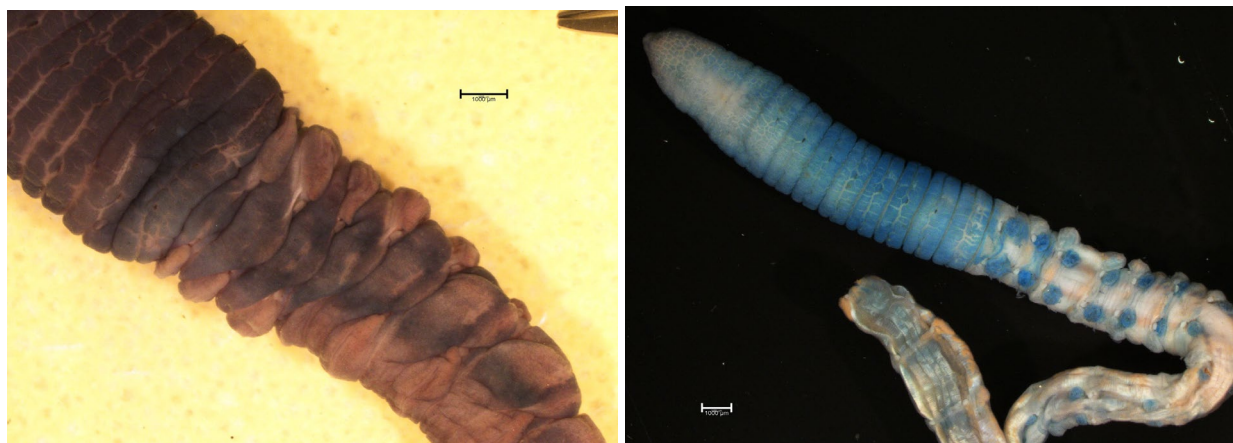
**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>

**Remarks** This species was originally described from Gulf of Naples, Italy and has since gained a cosmopolitan distribution with a depth range of subtidal to 298m. This is likely a species complex and NEP individuals should be treated as a local provisional species. LACSD has been using *Notomastus* sp LA5 Haggin, 2023 § (described below) for local members of this species complex.

***Notomastus magnus* Hartman, 1947**

See Blake (2000) Family Capitellidae Grube, 1862. pages 47-96. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 – The Annelida Part 4 – Polychaeta: Flabelligeridae to Sternaspidae.* Santa Barbara Museum of Natural History for the most recent description of *Notomastus magnus*.

**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>



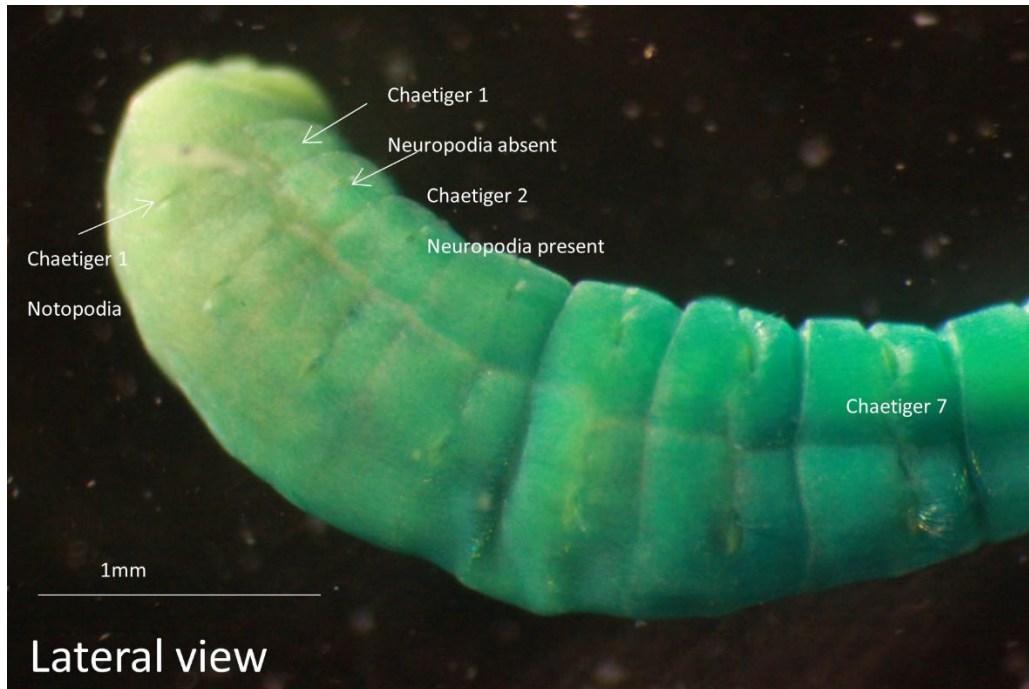
Images showing the two stain variations of *Notomastus magnus*. Left – non-reproductive, Right – reproductive. Images by B. Haggin (LACSD)

***Notomastus tenuis* Moore, 1909**

*Notomastus hemipodus* of authors NEP, not Hartman, 1945

See García-Garza, M. E., Harris, L. H. & de León-González, J. A. 2012. Redescription of *Notomastus hemipodus* Hartman, 1945 and *N. tenuis* Moore, 1909 (Polychaeta: Capitellidae). *Proceedings of the Biological Society of Washington* 125(1): 1-11 for a description and images of *Notomastus tenuis*.

**Thoracic Formula:** <sup>(11c)</sup>/<sub>(0+10c)</sub>



*Notomastus tenuis* showing anterior thoracic chaetal arrangement. Image by B. Haggin (LACSD).

***Notomastus* sp LA3** Haggin, 2023 §

**Material Examined:** LACM-AHF Poly# 12392 (DISCO ID: 17991) (320m—33.825°N 118.444°W—29AUG19) - 1 individual (incomplete fragment); LACM-AHF Poly# 12394 (DISCO ID: 17993) (320m—33.825°N 118.444°W—29AUG19) - 1 individual (in 3 pieces, complete with caudal regen)

**Description** Prostomium with palpode present, minute; eyespots not observed; peristomium achaetous. Thorax smooth, not noticeably inflated anteriorly. Thorax with 11 chaetigers; achaetous segment absent; chaetiger 1 biramous; capillary chaetae only in thoracic chaetigers. Thorax demarked from abdomen by change in chaetae. Abdominal chaetigers with hooded hooks only. Branchiae present, palmate, notopodial in nature. Abdomen pinches laterally near branchial insertion, giving the appearance of a dorsal ridge in the posterior abdomen. Anal cirri not observed and pygidial detail unknown due to caudal regeneration. Lateral organs and nephridial pores not observed.

**Methyl Green Staining Pattern** Thorax stains uniformly. Abdomen with dorso-lateral stain, becoming more dorsal only from branchial insertion. Stain concentrates along the dorsal ridge in the branchial region. Branchiae are unstained, giving the appearance of two unstained spots dorsally on posterior abdominal segments. The abdomen is unstained ventrally.

**Thoracic Formula:**  $(11c)/(11c)$

**Habitat & Faunal Associates** *Notomastus* sp LA3 is known from 2 individuals from muddy substrates.

**Distribution** *Notomastus* sp LA3 is known only from the type locality.

**Type Locality** Redondo Canyon, Santa Monica Bay, Los Angeles, California, USA; 320 m.

**Remarks** A complete provisional voucher sheet will be created in the future after I am able to get to the museum to photograph the specimens.

***Notomastus* sp LA4** Haggin, 2023 §

*Notomastus latericeus* of authors NEP, not Sars, 1851

See attached provisional voucher sheet

***Notomastus* sp LA5** Haggin, 2023 §

*Notomastus lineatus* of authors NEP, not Claparède, 1869

See attached provisional voucher sheet

**Notomastus sp E** Harris, 2021 §

**Description** [from Harris, 2021 §]. Approximately 40 specimens; longest specimen approximately 20 mm long and 1.75 mm wide for 57 chaetigers, incomplete. Prostomium not described, palpode not described; eyespots present, red; peristomium achaetous. Thorax strongly areolated, most specimens with a distinct inflation in chaetigers 1-6. Thorax with 11 chaetigers; achaetous segment absent; chaetiger 1 biramous; capillary chaetae only present in thoracic chaetigers. Thorax clearly demarked from abdomen. Abdominal chaetigers with hooded hooks only, hoods not inflated, main fang surmounted by 1 row of many small teeth. Anterior abdominal notopodia fused into a single mid-dorsal pad; by the 10<sup>th</sup> abdominal chaetiger, tori are separated with a wide gap between them. Branchiae present, as blood vessels inside abdominal superior neuropodial lobes. Lateral organs present on all chaetigers, simple inconspicuous pits in thorax between notopodia and neuropodia, changing to conspicuous ovoid structure in abdomen. Nephridia (genital pores) present in thorax only, visible as apertures in intersegmental areas between last 3 thoracic chaetigers (8/9 – 9/10 – 10/11).

**Methyl Green Staining Pattern** [from Harris, 2021 §]. Stain pattern distinctive, dark band on chaetiger 6, medium stain on chaetigers 7 thru anterior half of chaetiger 11. Thin dorsal, sometimes lateral as well, bands of dark spots on intersegmental areas of abdominal chaetigers.

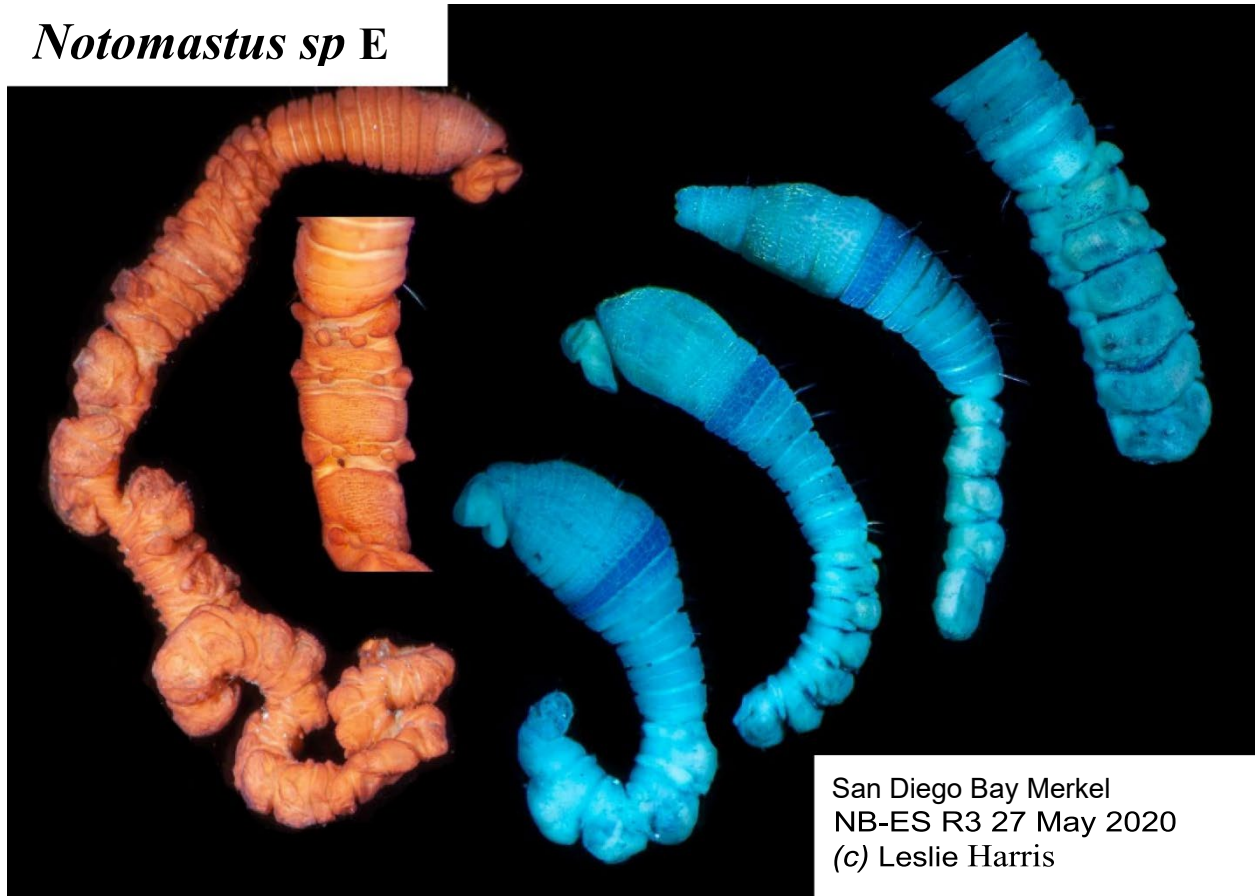
**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>

**Distribution** Currently known only from the type locality

**Type Locality** Northern San Diego Bay, California, USA; 3 m.

**Remarks** [emended from Harris, 2021 §]. *Notomastus magnus*, *N. sp LA3*, *N. sp LA4*, *N. sp LA5*, *N. sp SD2*, *N. sp SD3* and *Scyphoproctus oculatus* all have 11 thoracic chaetigers, a biramous 1<sup>st</sup> chaetiger and either look similar, *S. oculatus* can have an inflated anterior thorax, or co-occur. *Scyphoproctus oculatus* differs in having a true achaetous segment present in the thorax and a pygidium modified into an anal plaque. *Notomastus sp E* can be distinguished from *Notomastus magnus* and local provisional species *Notomastus sp LA3*, *Notomastus sp LA4*, *Notomastus sp LA5*, *Notomastus sp SD2* and *Notomastus sp SD3* by their distinctive stain patterns.

## *Notomastus sp E*



San Diego Bay Merkel  
NB-ES R3 27 May 2020  
(c) Leslie Harris

Images by L. Harris

**Notomastus sp SD2** Rowe, 1999 §

**Description** Eyes absent. Thoracic epithelium very rugose. Thorax with 11 chaetiger, chaetiger 1 biramous, all thoracic chaetae capillaries. Abdomen with short notopodial tori, neuropodial tori with rounded superior lobe, lateral in position. Abdominal hooded hooks with tightly adhering hood. Nephridial pores difficult to discern, possibly present in last 6 thoracic chaetigers. Branchiae unknown. Pygidium unknown.

**Methyl Green Staining Pattern** Thorax stains uniformly, becoming slightly darker in last few thoracic chaetigers. Abdominal chaetigers with an encircling stain band anterior to the chaetal fascicle, fading from ventrum by the 6<sup>th</sup> abdominal chaetiger, dorsally with a postchaetal stain band and a broad prechaetal patch on each abdominal segment (appears as a “U” shape opening to the posterior).

**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>

**Type Locality** southern California, USA; 84m.

**Remarks** A complete provisional voucher sheet will be created in the future after I am able to review additional specimens and take photographs.



Notomastus sp SD2 Rowe, 1999 § - Images by T. Phillips (2023), OCSN Stn. 7356

**Notomastus sp SD3** Rowe, 2004 §

**Description** Prostomium not described. Thorax with 11 chaetiger, chaetiger 1 biramous, all thoracic chaetae capillaries. Abdomen with short notopodial tori, neuropodial tori with long lobe. Abdominal hooded hooks with tightly adhering hood, few in notopodia, numerous in neuropodia. Branchiae unknown. Pygidium unknown.

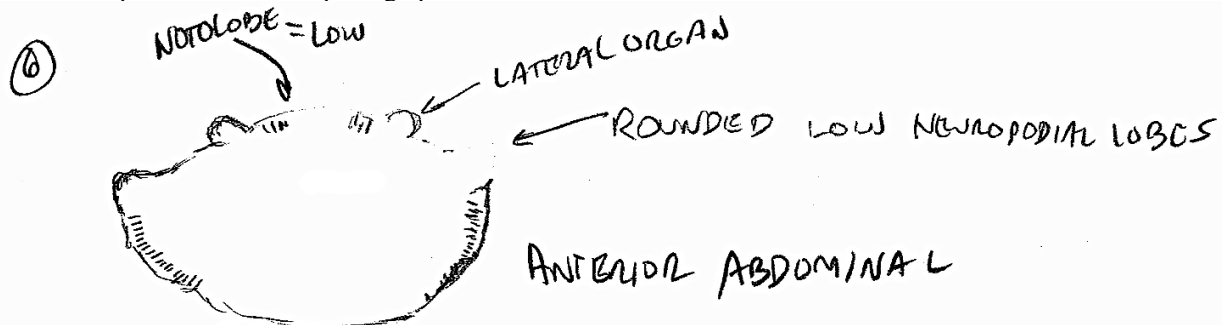
**Methyl Green Staining Pattern** Thorax stains thru anterior half of chaetiger 10, non-staining band on posterior of chaetiger 10 and anterior of chaetiger 11, staining again on the posterior half of chaetiger 11. First abdominal chaetiger with a prechaetal stain band and a small postchaetal mid-dorsal stain patch. Remaining abdominal chaetigers with a with a prechaetal “U” shaped stain, opening anteriorly, and a small postchaetal mid-dorsal stain patch (appears as a smiling cyclops). Abdomen unstained ventrally.

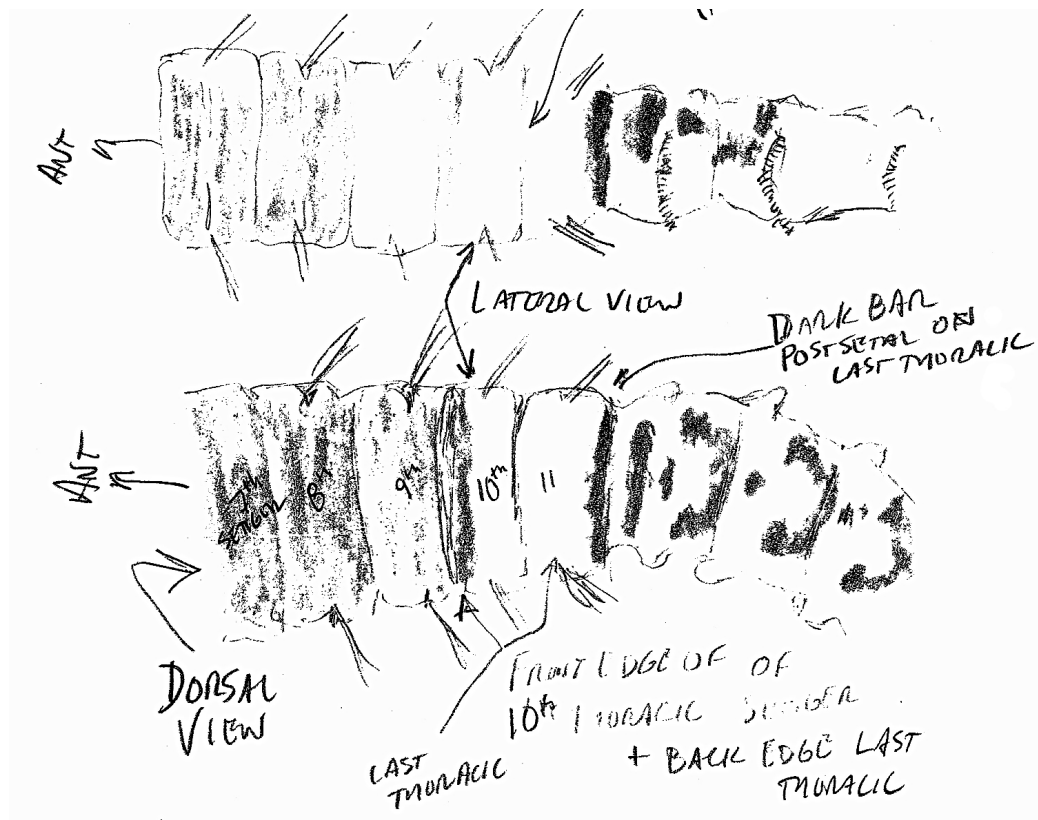
**Thoracic Formula:** <sup>(11c)</sup>/<sub>(11c)</sub>

**Habitat & Faunal Associates** small *Aphelochaeta*, *Questa*, Acrocirridae and Oligochaetes.

**Type Locality** NE end of Anacapa Island, California, USA; 75m.

**Remarks** A complete provisional voucher sheet will be created in the future after I am able to review additional specimens and take photographs.





Images scanned from SCAMIT meeting notes, 11JUN2007

**Notomastus sp SF1** Norris, 2008 §

*Notomastus* sp D Harris, 2011 §

**Description** [emended from *Notomastus* sp SF1 voucher sheet, Norris (2008) and *Notomastus* sp D voucher sheet, Harris (2011)] Specimen length to 16mm, incomplete, regenerating posterior segments. Prostomium blunt, palpode present; eyespots present, red. Thorax with 11 chaetigers; achaetous segment absent; chaetiger 1 uniramous, notochaetae only, all thoracic chaetae capillaries. Abdominal chaetigers with hooded hooks only in both rami; hooks with tightly adhering hood and main fang surmounted by secondary teeth in a few rows. Lateral organs and nephridial pores not described. Branchiae unknown. Pygidium unknown.

**Methyl Green Staining Pattern** Thorax not retaining stain anteriorly, with staining bands from chaetigers 5-9 thru 11. Abdominal chaetigers staining with a continuous, broad dorsal patch thru at least chaetiger 45. Abdomen unstained ventrally.

**Thoracic Formula:**  $(11c)/(0+10c)$

**Distribution** *Notomastus* sp SF1 has been reported from San Francisco and the LA/LB Harbor Complex near Long Beach from a depth of 4.5m. This species has also been reported from Washington.

**Type Locality** San Francisco, California, USA

**Remarks** *Notomastus* sp SF1 is similar to *Notomastus hemipodus* and *Notomastus tenuis* in having a uniramous first chaetiger. These species can be distinguished locally by their unique stain patterns.



*Notomastus* sp SF1 Norris, 2008 § - Images from Norris, 2008

## Genus *Scyphoproctus* Gravier, 1904

*Heteromastides* Augener, 1914. *Fide* Silva & Amaral, 2019

*Pulliella* Fauvel, 1929. *Fide* Magalhães & Bailey-Brock, 2012

**Type species:** *Scyphoproctus djiboutiensis* Gravier, 1904, by original designation

**Diagnosis** (emended after da Silva & Amaral, 2019). Rounded prostomium without palpode; peristomium achaetous; intersegmental groove between peristomium and achaetous segment may be complete or incomplete. *Thorax with 9-14 chaetigers*; achaetous segment with lateral organ present; *last thoracic chaetiger with capillaries in both rami or with capillary notochaetae and neuropodial hooded hooks, all other thoracic chaetigers with capillary chaetae in both rami*. Abdomen with hooded hooks throughout or with one or more pre-anal chaetigers with acicular spines in the notopodia. Pygidium expanded as a poorly or well-developed anal plaque with a pair of ventral digitiform cirri; with or without a median membrane. Anal plaque with embedded or protruding acicular spines.

**Thoracic formula:**  $(-)^{+ (9-14c)} / (8-13c+1e)$

**Remarks** *Scyphoproctus* is unique among the capitellids in being possibly the only genus to possess a true achaetous segment anterior to the first chaetiger (see also remarks on *Pseudonotomastus*). The presence of lateral organs on this segment define it as a true segment, and aids in its diagnosis when the segmental groove between the peristomium and achaetous segment is incomplete. The presence of the anal plaque with acicular spines is another character of the *Scyphoproctus* that is unique among the capitellids. See also remarks on *Mastobranchus*.

### *Scyphoproctus oculatus* Reish, 1959

See da Silva, C. F. & Amaral, A. C. Z. 2019. *Scyphoproctus* Gravier, 1904 (Annelida, Capitellidae): description of three new species and relocation of *Heteromastides* Augener, 1914 in *Scyphoproctus*. *Zootaxa* 4560(1): 95-120 for the most recent description and images of *Scyphoproctus oculatus*.

**Remarks** Locally, *Scyphoproctus oculatus* is the only capitellid species with a true achaetous segment in the thorax. Combined with the large prostomial eyespots, sometimes obscured by the peristomium, and the modified anal plaque, this species should be fairly easy to identify.

## Discussion

Also presented during the SCAMIT meeting was a discussion of the biology of the family Capitellidae and definitions of terms associated with the family Capitellidae. This can be found in the pdf version of the presentation

stored in the toolbox on the SCAMIT website. A couple of keys were also presented during the meeting. The first, *Key to the Genera of the Family Capitellidae*, covers all of the genera of the family globally. The second, *Key to the Family Capitellidae of SCAMIT Ed. 14 and Local Provisional Species*, includes all species discussed during the meeting. Both of these keys have an associated character table and all the files are available in the toolbox on the SCAMIT website. Realizing that the dichotomous key to the genera can be a little confusing by bouncing back and forth between the number of thoracic chaetigers and the number of chaetigers with capillary notochaetae, I have also created a *Tabular Key to the Genera of the Family Capitellidae*. It is included here and will be added to the toolbox as well. Any feedback on the function of the keys is welcome and please let me know if the tabular key is more useful than the dichotomous key to the genera.

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## Tabular Key to the Genera of the Family Capitellidae

Revised based on B. Haggin 2023 Capitellidae review & presentation



	# of Thoracic chaetigers											
	4	8	9	10	11	12	13	14	15	17	18	20
# of segments w/ Capillary Notochaetae	0	Amastigos	Baldia									
	2			Undecimastus								
	3				Peresiella							
	4		Capitella		Mediomastus							
	4	Abyssocapitella	Mediomastus	Mediomastus	Parheteromastus							
	5		Capitella		Heteromastus							
	5	Abyssocapitella										
	6		Capitella	Neomediomastus								
	6		Neomediomastus	Parheteromastides	Barantolla							
	7		Capitella		Barantolla							
	8	Octocapitella			Neoheteromastus							
	9		Leiocapitellides									
	9		Scyphoproctus (+)									
	10			Decamastus								
	10			Pseudonotomastus (+)								
	10			Scyphoproctus (+)		Dodecamastus						
	11				Capitellethus							
	11				Notomastus							
	11				Rashgua							
	11				Neopseudocapitella							
	11				Scyphoproctus (+)							
	12					Pseudoleiocapitella						
	12					Leiochrides						
	12					Promastobranchnus						
	12			Neonotomastus	Neopseudocapitella	Scyphoproctus (+)						
	13					Promastobranchnus						
	13					Promastobranchnus						
	13				Notodasus							
	13				Polymastigos							
	13				Neopseudocapitella							
	14					Promastobranchnus						
	14				Neopseudocapitella	Promastobranchnus						
	14					Promastobranchnus						
	15				Polymastigos							
	15				Neopseudocapitella	Promastobranchnus						
	16				Polymastigos							
	16				Neopseudocapitella	Promastobranchnus						
	17				Polymastigos							
	17				Neopseudocapitella	Promastobranchnus						
	18				Polymastigos							
	18				Neopseudocapitella	Promastobranchnus						
	19				Polymastigos							
	19				Neopseudocapitella	Promastobranchnus						
	20				Polymastigos							
	20				Neopseudocapitella	Promastobranchnus						
	20				Mastobranchnus	Promastobranchnus						Eunotomastus
	21											Lumbricomastus
	21				Polymastigos							
	21				Neopseudocapitella	Promastobranchnus						
	21				Mastobranchnus	Promastobranchnus						
	22				Polymastigos							
	22				Neopseudocapitella	Promastobranchnus						
	22				Mastobranchnus	Promastobranchnus						Paracapitella



## Voucher Sheet

B. Haggin  
June, 2024

Species: *Capitella* sp LA3 Haggin, 2023 §

P-code—P103

Synonyms: *Capitella capitata* Cmplx  
*Capitella* sp LA1

of authors SCB, in part  
Parker, 1994 §, in part

ITI-code—Group 4

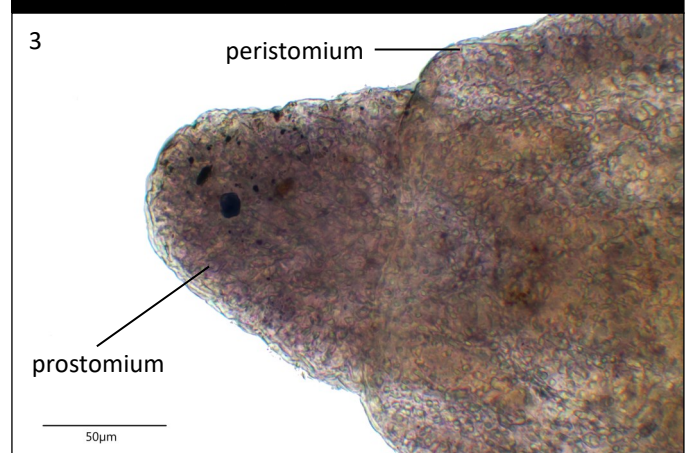
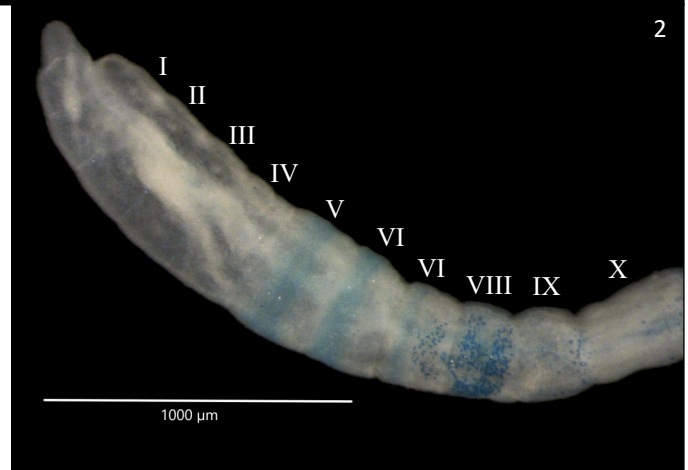
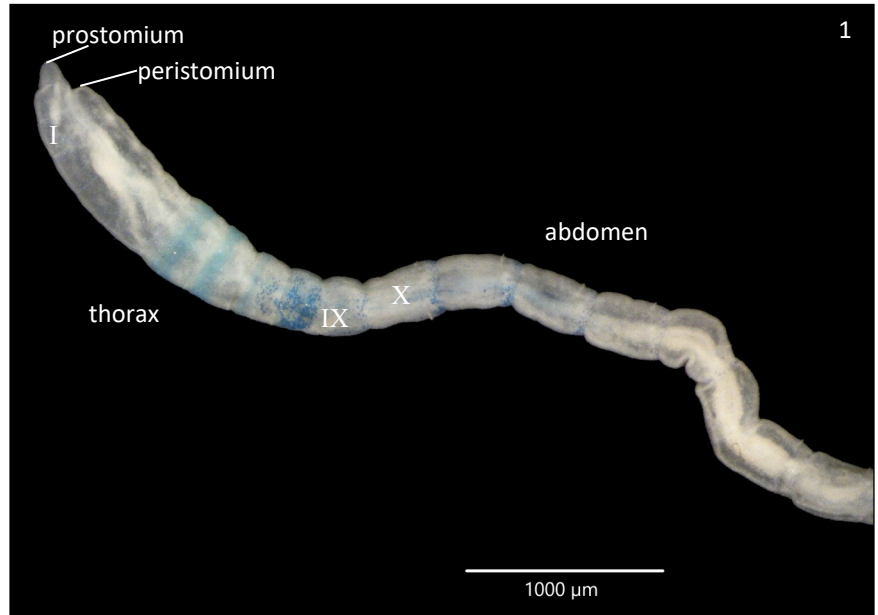
Family: Capitellidae  
Order:  
Infraclass: Scolecida  
Subclass: Sedentaria  
Class: Polychaeta  
Phylum: Annelida

### Diagnostic Characters:

- 1) Prostomium conical, rounded, slightly compressed dorsoventrally; eyes absent (images 1 - 3).
- 2) Thorax with 4 chaetigers with capillary notochaetae (images 4 & 5).
- 3) Thoracic Formula -  $\frac{(4c+3h+2g)}{(4c+5h)} \text{ ♂ } + \text{ ♀ };$   
 $\frac{(4c+4h+1g)}{(4c+5h)}$  or  $\frac{(4c+5h)}{(4c+5h)}$  Juveniles
- 4) Genital spines present in chaetigers 8 & 9. 3 pairs max in each chaetiger (images 6 & 7).
- 5) Juveniles with genital spines undeveloped. Genital spines appear to develop with age, developing first in chaetiger 9, then in chaetiger 8.
- 6) Thoracic hooded hooks with 2 small teeth surmounting main fang (image 8).
- 7) Abdominal hooded hooks with 2 rows of small teeth over main fang; 2 teeth in upper row, 2-3 teeth in lower row (image 9).
- 8) Branchiae not observed.
- 9) Pygidium a terminal ring; anal cirri absent (image 10).

### Pigmentation/MGS:

- 1) Not retaining stain, or
- 2) Slight retention on prostomium.
- 3) Light speckling on chaetigers 1-4 (image 11).
- 4) Slight stain retention in chaetigers 5 & 6 as segmental bands (images 1, 2 & 11).
- 5) Broad lateral stain patch in chaetigers 7 & 8, post chaetal only in chaetiger 7 (images 1, 2 & 11).
- 6) Chaetiger 9 and anterior abdomen with speckled postchaetal stain band.





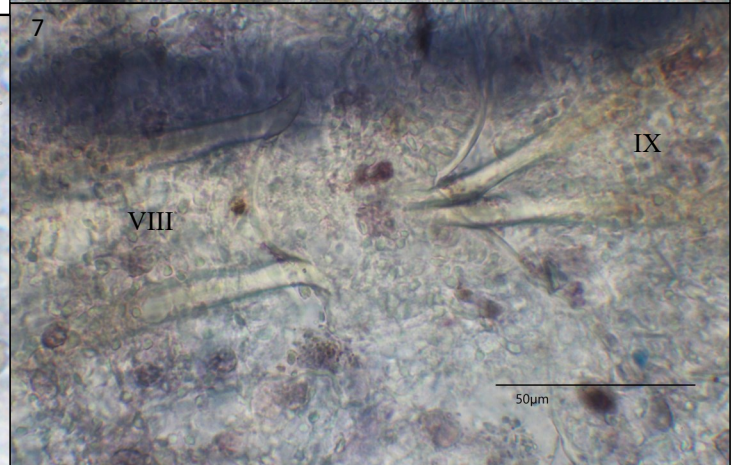
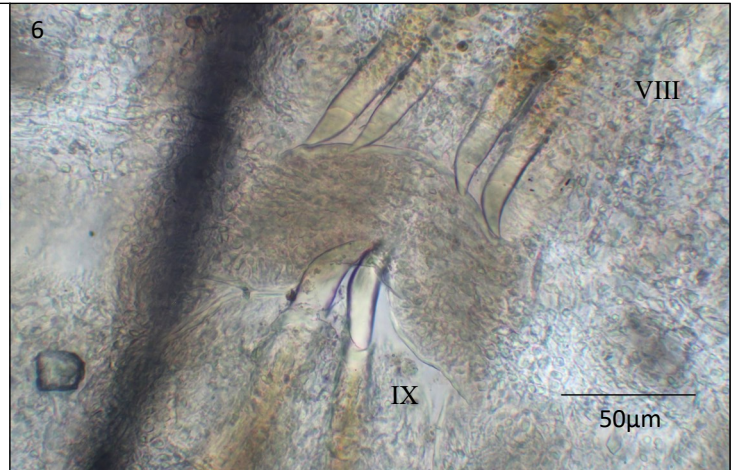
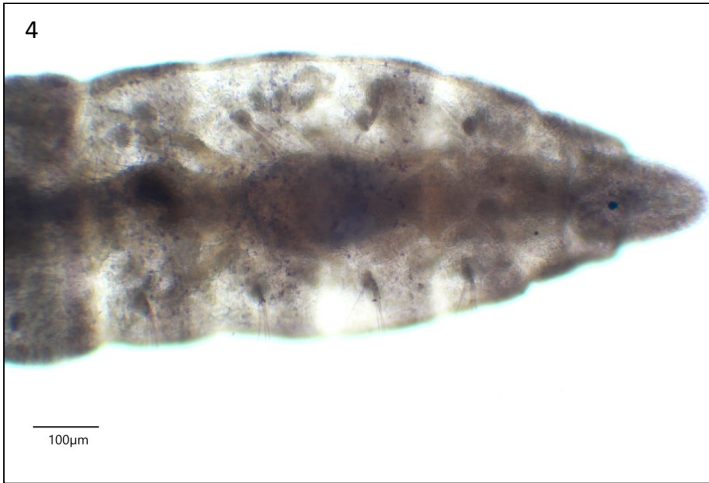
# *Capitella* sp LA3

Haggin, 2023 §

## Voucher Sheet

B. Haggin

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### Material Examined:

LACSD stations: 0715-9D (31 m—33.69963N, 118.31345W—08JUL15) - 1 individual; 0717-1B (151 m—33.74940N, 118.44653W—31JUL17) - 1 individual; 0722-1D (31 m—33.76506N, 118.43539W—12JUL22) - 6 individuals; 0722-2B (156 m—33.73228N, 118.42602W—12JUL22) - 1 individual; 0722-4B (150 m—33.71684N, 118.38760W—13JUL22) - 2 individuals; 0722-8D (31 m—33.70682N, 118.32994W—13JUL22) - 13 individuals (images 1 & 2); 0722-9B (154 m—33.68150N, 118.32222W—11JUL22) - 1 individual; 0723-1B (152m—33.74944N, 118.44666W—10JUL23) - 1 individual; 0723-3B (149m—33.72396N, 118.40733W—06JUL23) - 2 individuals; 0723-3D (33m—33.73310N, 118.40060W—11JUL23) - 1 individual; 0723-4D (30m—33.73201N, 118.38047W—10JUL23) - 2 individuals; 0723-6D (31m—33.71607N, 118.34822W—07JUL23) - 17 individuals (images 3-10); 0723-7D (30m—33.71273N., 118.34353W—07JUL23) - 9 individuals; 0723-9C (60m—33.68872N, 118.31818W—07JUL23) - 4 individuals; 0723-9D (30m—33.69961N, 118.31289W—07JUL23) - 5 individuals

SCBPP stations: PSCBE 01500 (77 m—34.40588N, 120.40885W—18AUG94) - 1 individual; PSCBE 03710 (57 m—34.33517N, 119.64275W—17AUG94) - 1 individual (image 11); PLABE 13400 (43 m—33.64092N, 118.23883W—15JUL94) - 1 individual



## *Capitella* sp LA3

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B. Haggin  
June, 2024



### Similar Species:

*Capitella capitata* (Fabricius, 1780), redescribed by Blake (2009)—This species has had its range restricted to western Greenland and is not found locally. *Capitella capitata* has 7 chaetigers with capillary notochaetae, thoracic formula: ♂  $(7c+2g)/(7c+2h)$  & ♀  $(7c+2g)/(7c+2e)$ . *Capitella* sp LA3 has only 4 chaetigers with capillary notochaetae.

*Capitella capitata oculata* Hartman, 1961—This species has black eyes present and 7 chaetigers with capillary notochaetae, thoracic formula: ♂  $(7c+2g)/(7c+2h)$  & ♀  $(7c+2h)/(7c+2h)$ . *Capitella* sp LA3 lacks eyes and has only 4 chaetigers with capillary notochaetae.

*Capitella capitata tripartita* Hartman, 1961—This species has small lateral eyespots and 6 or 7 chaetigers with capillary notochaetae, thoracic formula: ♂  $(3c+1c(m)+2m+1m(h)+2g)/(3c+2m+2m(h)+2h)$  & ♀  $(3c+1c(m)+2m+1m(h)+2h)/(3c+2m+2m(h)+2h)$ . *Capitella* sp LA3 lacks eyespots and has only 4 chaetigers with capillary notochaetae.

*Capitella ovincola* Hartman, 1947—This species has 7 chaetigers with capillary notochaetae, thoracic formula: ♂  $(5c+2c(m)+2g)/(4c+3c(m)+2h)$  & ♀  $(5c+2c(m)+2h)/(4c+3c(m)+2h)$ . *Capitella* sp LA3 has only 4 chaetigers with capillary notochaetae.

*Capitella teleta* Blake, Grassle & Eckelbarger, 2009—This species was originally described from a laboratory culture from Woods Hole, Massachusetts. *Capitella teleta* has red eyes present and 7 chaetigers with capillary notochaetae, thoracic formula: ♂  $(7c+2g)/(7c+2h)$  & ♀  $(7c+2h)/(7c+2h)$ . *Capitella* sp LA3 lacks eyes and has only 4 chaetigers with capillary notochaetae.



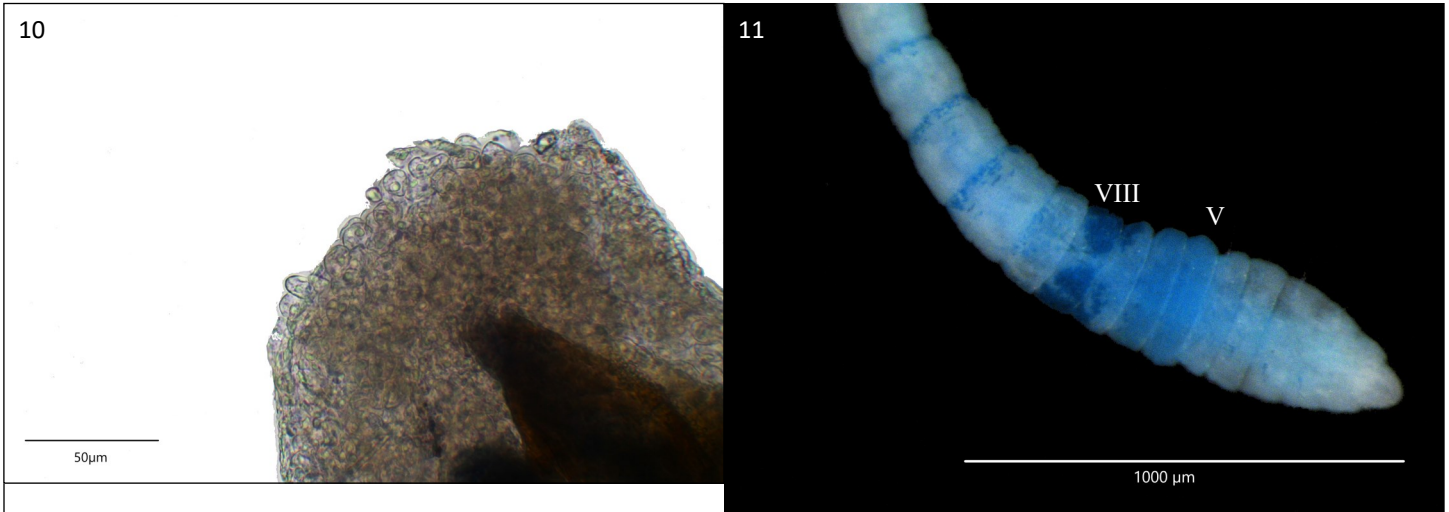
## *Capitella* sp LA3

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### Discussion:

*Capitella capitata* (Fabricius, 1780) was originally described from western Greenland and subsequently gained a cosmopolitan distribution in the literature. Blake (2009) designated a neotype and redescribed *Capitella capitata* using new material from the type locality and restricted the range of *C. capitata* to western Greenland. This redescription was very robust and allows for the separation of local specimens previously identified as *Capitella capitata* Cmplx. As of the publication of Blake (2009), 12 to 13 biologically distinct sibling species of the *Capitella capitata* Cmplx have been identified in laboratory culture, and the previous concepts of *Capitella capitata* based on the works of Eisig (1887), Hartman (1947) and Warren (1976) refer to other species that differ significantly from the Greenland specimens (Blake, 2009).

A review of LACSD collections of *Capitella capitata* Cmplx has yielded 1 new provisional species so far, *Capitella* sp LA3 Haggin, 2023 §. Images of staining variation suggests that there may be at least 2 additional cryptic species hiding within the *C. capitata* Cmplx locally. ITI- and P-code values were inherited from *Capitella capitata* Cmplx as this is how it would have been identified historically.

### Habitat:

*Capitella* sp LA3 is currently known only from the Palos Verdes Peninsula from depths of 30-156m. This range could expand farther across southern California as local reviews of *Capitella capitata* Cmplx occur. *Capitella* sp LA3 has been collected in samples with many of the common shelf species from the Palos Verdes Peninsula, but a review of LACSD specimens has yet to find it co-occurring with any other *Capitella* spp. This finding may change as local reviews of the complex continue to occur.

### References:

**Blake, J. A.** 2000. Family Capitellidae Grube, 1862. pages 47-96. IN: Blake, J. A., Hilbig, B. & Valentich-Scott, P. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 - The Annelida Part 4 - Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History.

**Blake, J. A.** 2009. Redescription of *Capitella capitata* (Fabricius) from West Greenland and designation of a neotype (Polychaeta, Capitellidae). *Zoosymposia* 2: 55-80.



## *Capitella* sp LA3

Haggin, 2023 §

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B. Haggin

June, 2024

### References cont.:

**Blake, J. A., Grassle, J. P. & Eckelbarger, K. J.** 2009. *Capitella teleta*, a new species designation for the opportunistic and experimental *Capitella* sp. I, with a review of the literature for confirmed records. *Zoosymposia* 2: 25-53.

**Eisig, H.** 1887. Monographie der Capitelliden des Golfes Von Neapel und der Angrenzenden Meeres-Abschnitte nebst Untersuchungen zur Vergleichenden Anatomie und Physiologie. *Fauna und Flora des Golfes von Neapel und der Angrenzenden Meeres-Abschnitte* 16(XXVI): 906pp.

**Hartman, O.** 1947. Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481.

**Hartman, O.** 1961. Polychaetous Annelids from California. *Allan Hancock Pacific Expeditions* 25: 1-224.

**Warren, L. M.** 1976. A review of the genus *Capitella* (Polychaeta Capitellidae). *Journal of the Zoological Society of London* 180: 195-209.

### Other Literature Consulted:

**Fauchald, K.** 1977. The polychaete worms, definitions and keys to the orders, families and genera. *Natural History Museum of Los Angeles County: Los Angeles, CA (USA), Science Series* 28: 1-188.

**Hartman, O.** 1969. *Atlas of the sedentariate polychaetous annelids from California*. 1-812. Allan Hancock Foundation, University of Southern California. Los Angeles.

**Magalhães, W. F. & Blake, J. A.** 2020. 7.6.4 Capitellidae Grube, 1862. pp. 349–403, In: Purschke, G., Bögge-mann, M. & Westheide, W. (Eds.), *Handbook of Zoology. Annelida*, 2 (Pleistoannelida, Sedentaria II), pp. 1–465.

**Pamungkas, J.** 2017. *Capitella ambonensis*: a new polychaete species (Annelida: Capitellidae) collected from a mangrove habitat on Ambon Island, Indonesia. *Zootaxa* 4227(4): 573-582.

**Silva, C. F., Seixas, V. C., Barroso, R., Di Domenico, M., Amaral, A. C. Z. & Paiva, P. C.** 2017. Demystifying the *Capitella capitata* complex (Annelida, Capitellidae) diversity by morphological and molecular data along the Brazilian coast. *PLoS ONE* 12(5): e0177760.

**Silva, C. F., Shimabukuro, M., Alfaro-Lucas, J. M., Fujiwara, Y., Sumida, P. Y. G. & Amaral, A. C. Z.** 2016. A new *Capitella* polychaete worm (Annelida: Capitellidae) living inside whale bones in the abyssal South Atlantic. *Deep-Sea Research I* 108: 23-31.

**Warren, L. M.** 1976. A Population Study of the Polychaete *Capitella capitata* at Plymouth. *Marine Biology* 38: 209-216.

### Version History:

Version 1.0—Voucher sheet created (06JUN2024)



**LOS ANGELES COUNTY  
SANITATION DISTRICTS**  
*Converting Waste Into Resources*



## Voucher Sheet

B. Haggin  
August, 2024

Species: *Heteromastus* sp LA3

Synonyms: *Heteromastus filiformis* Cmplx

*Heteromastus filiformis*

*Heteromastus filiformis*

Haggin, 2023 §

of authors SCB; in part

of authors NEP; not (Claparède, 1864)

of authors NEP; not Blake 2000

P-code—none

ITI-code—none

Family: Capitellidae

Order:

Infraclass: Scolecida

Subclass: Sedentaria

Class: Polychaeta

Phylum: Annelida

### Diagnostic Characters:

- 1) Prostomium with eyespots absent (images 1 & 3).
- 2) Thorax areolated, but not inflated thru chaetiger 4, chaetigers 5-11 smooth (images 1 & 2).
- 3) Thorax with 11 chaetigers, 5 with capillary chaetae
- 4) Thoracic formula -  $(5c+6h)/(5c+6h)$
- 5) Abdominal hooded hooks with 11-15 small teeth in 3 rows above the main fang
- 6) Branchiae present from middle abdominal segments as short, broadly-based, rounded lamellae
- 7) Pygidium unknown

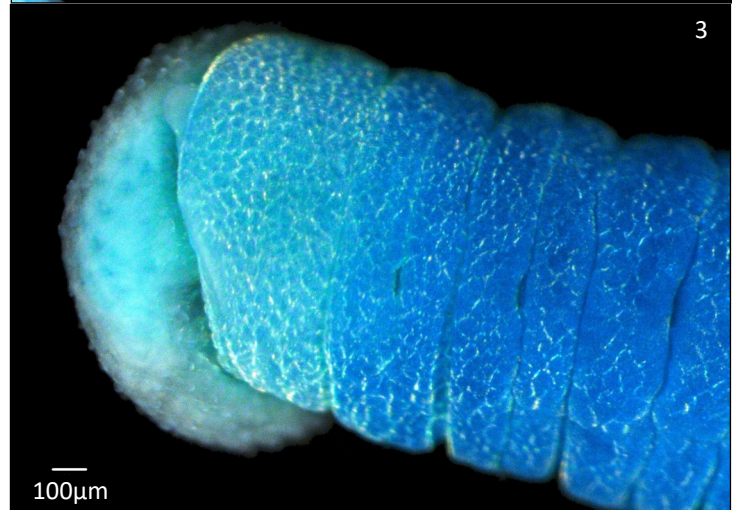
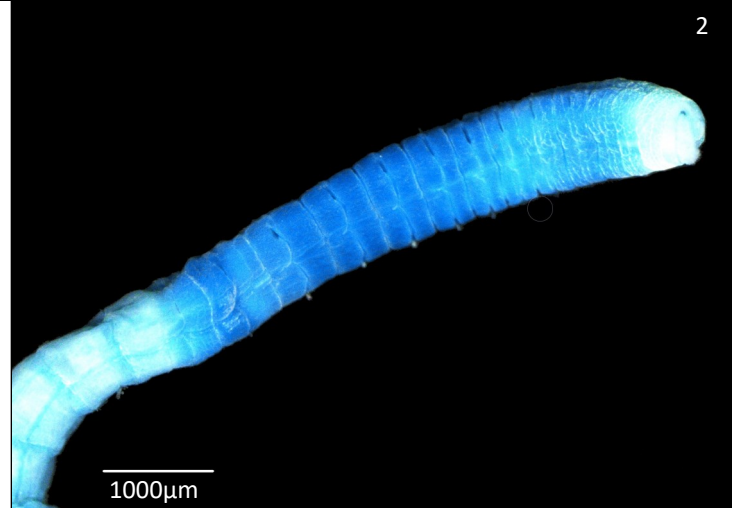
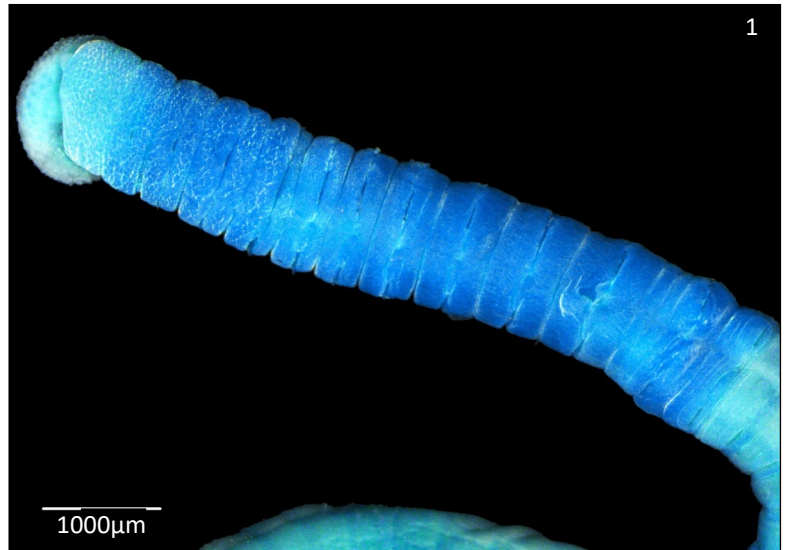
### Pigmentation/MGS:

- 1) Prostomium and peristomium unstained or retaining light stain (images 1-3).
- 2) Thoracic stain darkest on chaetigers 6-11, most intense on chaetigers 7-9, with a lighter band on the anterior of chaetiger 11 (images 2 & 4).
- 3) Abdomen with inter-segmental banding (image 4).
- 4) Ventral stripes in the abdomen described by Blake (2000) for NEP material was not observed (image 5).

### Material Examined:

LACSD stations: 0793-0A (305 m—33.81830N, 118.45420W—14JUL93) - 1 individual (images 1, 3 & 4); 0196-7A (315 m—33.69770N, 118.35320W—23JAN96) - 1 individual (images 2 & 5)

All photos by B. Haggin



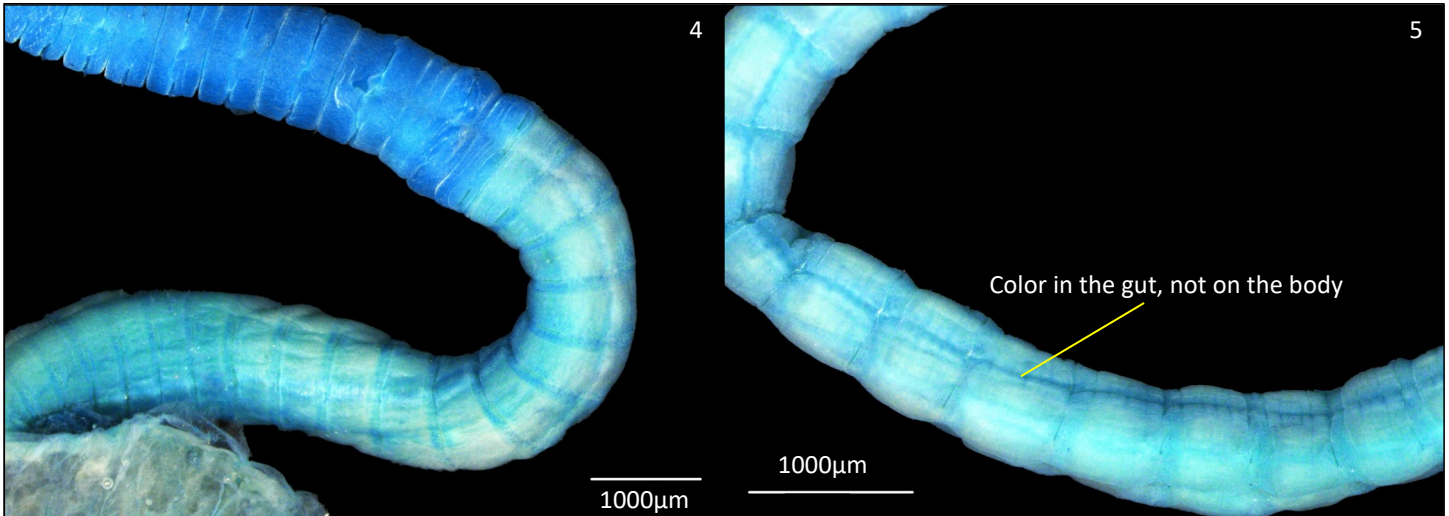


## *Heteromastus* sp LA3

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
August, 2024



### Similar Species:

*Heteromastus filiformis* Claparède, 1864 (*sensu* Hutchings & Rainer, 1982)—*Heteromastus filiformis* as re-described by Hutchings & Rainer (1982) has short, broad-based, rounded branchiae beginning around the 90<sup>th</sup> abdominal chaetiger. The MGS pattern for *H. filiformis* was not described by Hutchings and Rainer. The branchiae of *H. sp LA3* are also short, rounded lamellae but begin more anteriorly.

NEP *Heteromastus filiformis* Claparède, 1864 (*sensu* Blake, 2000)—The MGS pattern of NEP *Heteromastus filiformis* as described by Blake (2000) is similar to *H. sp LA3* in having a solidly staining thorax but differs from *H. sp LA3* in having a band of speckles on the posterior of half of the abdominal segments and in having a pair of stripes mid-ventrally. *Heteromastus sp LA3* lacks the mid-ventral stripes described by Blake and has a solid posterior stain band. The branchiae of NEP *H. filiformis* (*sensu* Blake, 2000) begin around the 80<sup>th</sup> abdominal chaetiger while the branchiae of *H. sp LA3* begin more anteriorly.

Korean *Heteromastus filiformis* Claparède, 1864 (*sensu* Choi & Yoon, 2016)—The MGS pattern of Korean *Heteromastus filiformis* as described by Choi & Yoon (2016) differs from *H. sp LA3* in having a lightly staining thorax with slight banding on chaetigers 1 and 3-11, and a pair of mid-ventral stripes on the abdomen. *Heteromastus sp LA3* has a solidly staining thorax, most intense on chaetigers 7-9, and lacks the mid-ventral stripes in the abdomen. The branchiae of Korean *H. filiformis* (*sensu* Choi & Yoon, 2016) begin around the 20<sup>th</sup> abdominal chaetiger, similar to *H. sp LA3*.

*Heteromastus filobranthus* Berkeley & Berkeley, 1932—*Heteromastus filobranthus* differs from *H. sp LA3* in having up to 16 palmately arranged filiform branchiae per bundle from chaetiger 30-50 rather than short, rounded lamellae. The anterior abdomen of *H. filobranthus* sometimes retains a mid-dorsal stripe not seen in *Heteromastus sp LA3*.

*Heteromastus sp LH1* Harris, 20XX §—*Heteromastus sp LH1* differs from *H. sp LA3* in having up to 8 palmately arranged filiform branchiae per bundle from chaetiger 55-100 rather than short, rounded lamellae. The abdomen of *H. sp LH1* retains a dark dorsal stain on each segment, forming a continuous stripe down the body.



## *Heteromastus* sp LA3

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### Discussion:

*Heteromastus filiformis* (Claparède, 1864) was originally described from Port-Vendres, France and was re-described by Hutchings & Rainer (1982) but from a locality in Egypt, 1,664 miles from the type locality. Morphological and staining differences reported from Korean material (Choi & Yoon, 2016) show that this is indeed a species complex and acknowledged that the NEP *Heteromastus filiformis* reported by Blake (2000) are likely a different species. Based on this, local specimens of *H. filiformis* matching the stain pattern described in this voucher sheet should use the new provisional name *Heteromastus* sp LA3 Haggin, 2023 §. Variations in the abdominal stain pattern from what was described by Blake (2000) suggests that there may be an additional provisional species regionally that may have been previously reported as *Heteromastus filiformis*.

A review of additional *Heteromastus filiformis* Cmplx from LACSD has yielded two more provisional species based on the stain pattern. One individual has the stain pattern as described by Blake (2000) for NEP *Heteromastus filiformis*, with midventral stripes in the abdomen. A second individual has an unstained anterior thorax and an intense stain in the posterior thorax, a stain pattern unique for NEP *Heteromastus filiformis* Cmplx. Voucher sheets for these individuals will follow at a later time.

### Habitat:

*Heteromastus* sp LA3 is currently only known from the Palos Verdes Peninsula from a depth of 305-315m and occurs in silty sediments. This range will likely expand across southern California as local reviews of *Heteromastus filiformis* occur.

### References:

- Berkeley, E. & Berkeley, C.** 1932. Some Capitellidae (Polychaeta) from the northeast Pacific with a description of a new genus. *Proceedings of the Zoological Society of London* 102(3): 669-675.
- Blake, J. A.** 2000. Family Capitellidae Grube, 1862. pages 47-96. IN: Blake, J. A., Hilbig, B. & Valentich-Scott, P. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 - The Annelida Part 4 - Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History.
- Choi, H. K. & Yoon, S. M.** 2016. First record of *Heteromastus filiformis* (Polychaeta: Capitellidae) from Korean waters, with a taxonomic note on the genus. *Journal of Species Research* 5(3): 264-271.
- Claparède, É.** 1870. Les Annélides Chétopodes du Golfe de Naples. Supplément. *Mémoires de la Société de physique et d'histoire naturelle de Genève* 20(2): 365-542.
- Hutchings, P. A. & Rainer, S.** 1982. Designation of a neotype of *Capitella filiformis* Claparède, 1964, type species of the genus *Heteromastus* (Polychaeta: Capitellidae). *Records of the Australian Museum* 34(4): 373-380.

### Other Literature Consulted:

- Fauchald, K.** 1977. The polychaete worms, definitions and keys to the orders, families and genera. *Natural History Museum of Los Angeles County: Los Angeles, CA (USA), Science Series* 28: 1-188.
- Hartman, O.** 1969. *Atlas of the sedentary polychaetous annelids from California*. 1-812. Allan Hancock Foundation, University of Southern California. Los Angeles.
- Jeong, M-K., Soh, H. Y. & Suh, H-L.** 2019. Three new species of *Heteromastus* (Annelida, Capitellidae) from Korean waters, with genetic evidence based on two gene markers. *Zookeys* 869: 1-18.



## *Heteromastus* sp LA3

Haggin, 2023 §

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August, 2024

### Other Literature Consulted cont.:

Magalhães, W. F. & Blake, J. A. 2020. 7.6.4 Capitellidae Grube, 1862. pp. 349–403, *In*: Purschke, G., Böggermann, M. & Westheide, W. (Eds.), *Handbook of Zoology. Annelida*, 2 (Pleistoannelida, Sedentaria II), pp. 1–465.

### Version History:

Version 1.0—Voucher sheet created (19AUG2024)



**LOS ANGELES COUNTY  
SANITATION DISTRICTS**  
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## Voucher Sheet

B. Haggin

June, 2024

Species: *Notomastus* sp LA3 Haggin, 2023 §

P-code—P336

Synonyms:

ITI-code—none

Family: Capitellidae

Order:

Infraclass: Scolecida

Subclass: Sedentaria

Class: Polychaeta

Phylum: Annelida

### Diagnostic Characters:

- 1) Prostomium with palpode present, minute; eyespots not observed.
- 2) Thorax smooth, not noticeably inflated anteriorly.
- 3) 1st chaetiger complete.
- 4) Thoracic formula <sup>(11c)</sup>/<sub>(11c)</sub>
- 5) Abdomen with branchiae present, palmate, notopodial in nature.
- 6) Abdomen pinches laterally near branchial insertion, giving the appearance of a dorsal ridge in posterior abdomen.
- 7) Lateral organs and nephridial pores not observed.
- 8) Anal cirri not observed and pygidial detail unknown due to caudal regeneration.

### Pigmentation/MGS:

- 1) Thorax stains uniformly.
- 2) Abdomen with dorso-lateral stain, becoming more dorsal only from branchial insertion, stain concentrates along dorsal ridge in posterior abdomen.
- 3) Branchiae unstained, giving the appearance of two unstained spots dorsally on posterior abdominal segments
- 4) Abdomen is unstained ventrally.

### Material Examined:

LACM-AHF Poly# 12392 (DISCO ID: 17991) (320m—33.825°N 118.444°W—29AUG19) - 1 individual (incomplete fragment)

LACM-AHF Poly# 12394 (DISCO ID: 17993) (320m—33.825°N 118.444°W—29AUG19) - 1 individual (in 3 pieces, complete with caudal regen)

All photos by B. Haggin



## *Notomastus* sp LA3

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024

### Similar Species:

*Notomastus* sp LA3 is most similar to other local *Notomastus* spp. with a biramous first chaetiger, *Notomastus magnus* Hartman, 1947; *Notomastus* sp E Harris, 2021 §; *Notomastus* sp LA4 Haggin, 2023 §; *Notomastus* sp LA5 Haggin, 2023 §; *Notomastus* sp SD2 Rowe, 1999 §; and *Notomastus* sp SD3 Rowe, 2004 §. Differences between the species are detailed below.

*Notomastus magnus* Hartman, 1947—*Notomastus magnus* is a large, robust species that is similar to *N. sp LA3* in lacking eyes and having palmate branchiae. *Notomastus magnus* differs in having an aerolated, rather than smooth thorax, branchiae from anterior rather than median-posterior abdominal chaetigers and has 2 staining morphologies in the abdominal chaetigers depending on its reproductive status. The first is a large, broad dorsal patch (image 1). The second is a set of paired dorsal spots (image 2). *Notomastus* sp LA3 differs from *N. magnus* by having a stain pattern with a dorsal band and unstained branchiae, giving the inverse stain pattern as a reproductive *N. magnus*.



*Notomastus* sp E Harris, 2021 §—*Notomastus* sp E differs from *Notomastus* sp LA3 in having eyes, simple rather than palmate branchiae, and in the stain pattern. *Notomastus* sp E has an intense staining band on chaetiger 6 while the rest of the animal retains a uniform stain without any distinctive patterns in the abdominal region.

*Notomastus* sp LA4 Haggin, 2023 §—*Notomastus* sp LA4 differs from *N. sp LA3* in having an aerolated rather than a smooth thorax, having eyes, having simple rather than palmate branchiae, and in the stain pattern. *Notomastus* sp LA4 has a pair of staining bands and, when reproductive, a pair of dorsal stain spots (image 3). *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen.



*Notomastus* sp SD3 Rowe, 2004 §—*Notomastus* sp SD3 differs from *N. sp LA3* in the posterior thoracic and abdominal stain pattern. The thorax of *Notomastus* sp SD3 has a dark stain band on the anterior of chaetiger 10, an unstained posterior chaetiger 10 and anterior chaetiger 11



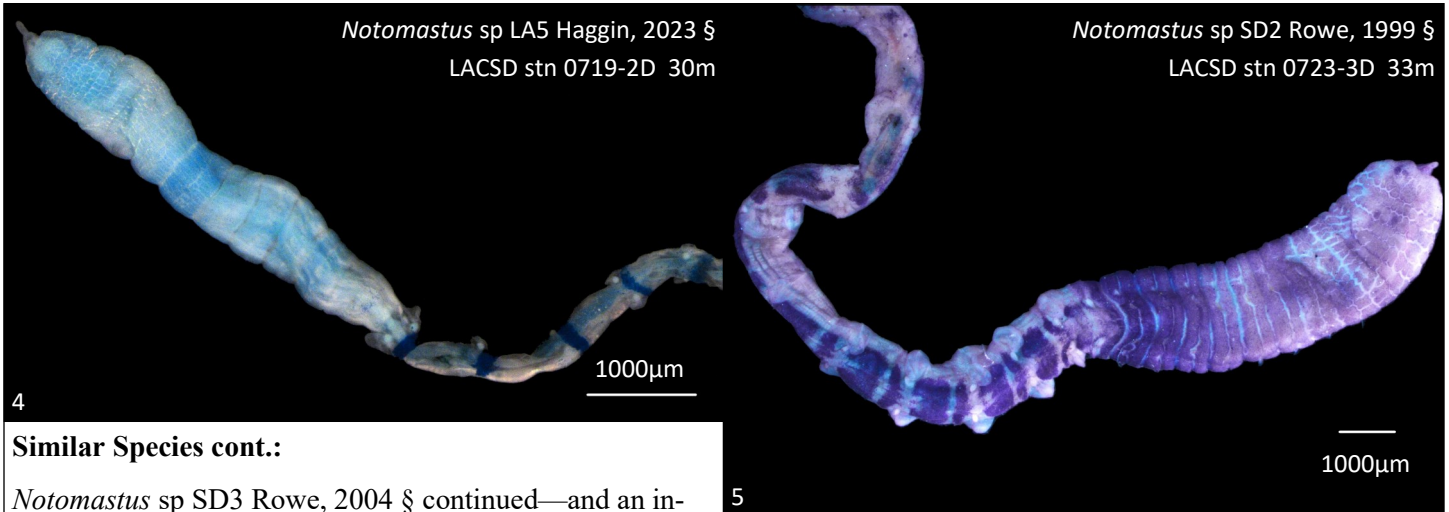
## *Notomastus* sp LA3

Haggin, 2023 §

## Voucher Sheet

B. Haggin

June, 2024



### Similar Species cont.:

*Notomastus* sp SD3 Rowe, 2004 § continued—and an intense stain band on the posterior of chaetiger 11. The abdomen has a post-chaetal mid-dorsal stain dot and a “U” shaped stain patch that opens anteriorly, giving the appearance of a smiling cyclops. *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen.

*Notomastus* sp LA5 Haggin, 2023 §—*Notomastus* sp LA5 differs from *N.* sp LA3 in having an areolated rather than a smooth thorax, having simple rather than palmate branchiae and in the abdominal stain pattern. *Notomastus* sp LA5 has a single staining band in the abdomen (image 4). *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen.

*Notomastus* sp SD2 Rowe, 1999 §—*Notomastus* sp SD2 is similar to *N.* sp LA3 in lacking eyes but differs in the abdominal stain pattern. *Notomastus* sp SD2 has a broad pre-chaetal dorsal stain patch that appears as a “U” shape that opens to the posterior (image 5). *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen.

### Discussion:

The lack of eyes and palmate branchiae make *Notomastus* sp LA3 most likely to have been mis-identified as *Notomastus magnus* prior to using methyl green staining patterns. *Notomastus magnus* was originally described from the intertidal of Tomales Bay and now has a depth range of up to 900m (Blake 2000) and has been reported south to the tip of Baja California and back north into the Gulf of California (García-Garza *et al.* 2019). Hartman (1960) tentatively referred a species from the East Cortes Basin (1415-1979m) (Hartman & Barnard 1958) to *Notomastus magnus* even though it was only known from intertidal and shallow depths. Reports such as these suggest that *Notomastus magnus* may be a local species complex and a review of older records using MGS, especially records from deeper depths, may be needed to resolve this issue.

### Habitat:

*Notomastus* sp LA3 is known only from 2 individuals. It was found in the Redondo Canyon of Santa Monica Bay at a depth of 320m in muddy substrate.



## *Notomastus* sp LA3

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024

### References:

**Blake, J. A.** 2000. Family Capitellidae Grube, 1862. pages 47-96. IN: Blake, J. A., Hilbig, B. & Valentich-Scott, P. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 - The Annelida Part 4 - Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History.

**García-Garza, M. E., de León-González, J. A. & Tovar-Hernández, M. A.** 2019. Catalogue of *Notomastus* M. Sars, 1851 (Annelida, Capitellidae) and the description of a new species from the Gulf of California. *Zootaxa* 4577 (2): 249-273.

**Harris, L. H.** 2021. *Notomastus* sp E Harris 2021 § & comparisons to NEP *N. latericeus* & NEP *N. lineatus*, *N. magnus* & *Scyphoproctus oculatus*. *SCAMIT Handout*.

**Hartman, O.** 1947. Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481.

**Hartman, O.** 1960. Systematic account of some marine invertebrate animals from the deep basins off southern California. *Allan Hancock Pacific Expeditions* 22(2): 69-216.

**Hartman, O. & Barnard, J. L.** 1958. The Benthic Fauna of the Deep Basins off Southern California. *Allan Hancock Pacific Expeditions* 22(1): 1-67.

### Other Literature Consulted:

**Ewing, R. M.** 1982. A partial revision of the genus *Notomastus* (Polychaeta: Capitellidae) with a description of a new species from the Gulf of Mexico. *Proceedings of the Biological Society of Washington* 95(2): 232-237.

**Ewing, R. M.** 1984. Family Capitellidae Grube, 1862. Chapter 14. IN: Uebelacker, J. M. & Johnson, P. G. *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Volume II*. Minerals Management Service, Metairie, Louisiana.

**Fauchald, K.** 1977. The polychaete worms, definitions and keys to the orders, families and genera. *Natural History Museum of Los Angeles County: Los Angeles, CA (USA), Science Series* 28: 1-188.

**García-Garza, M. E. & de León-González, J. A.** 2015. The genus *Notomastus* (Polychaeta: Capitellidae) in the Gulf of California, Mexico, with the description of three new species. *Proceedings of the Biological Society of Washington* 128(2): 176-189.

**Hartman, O.** 1969. *Atlas of the sedentary polychaetous annelids from California*. 1-812. Allan Hancock Foundation, University of Southern California. Los Angeles.

**Jeong, M-K., Soh, H. Y., Wi, J. H. & Suh, H-L.** 2018. A new *Notomastus* (Annelida, Capitellidae) species from Korean waters, with genetic comparison based on three gene markers. *ZooKeys* 754: 141-155.

**Magalhães, W. F. & Blake, J. A.** 2020. 7.6.4 Capitellidae Grube, 1862. pp. 349-403, In: Purschke, G., Böggermann, M. & Westheide, W. (Eds.), *Handbook of Zoology. Annelida*, 2 (Pleistoannelida, Sedentaria II), pp. 1-465.

### Version History:

Version 1.0—Voucher sheet created (18JUN2024)



**LOS ANGELES COUNTY  
SANITATION DISTRICTS**  
*Converting Waste Into Resources*



## Voucher Sheet

B. Haggin

June, 2024

Species: *Notomastus* sp LA4

Haggin, 2023 §

P-code—P336

Synonyms: *Notomastus latericeus*

of authors SCB; not M. Sars, 1851

ITI-code—none

Family: Capitellidae

Order:

Infraclass: Scolecida

Subclass: Sedentaria

Class: Polychaeta

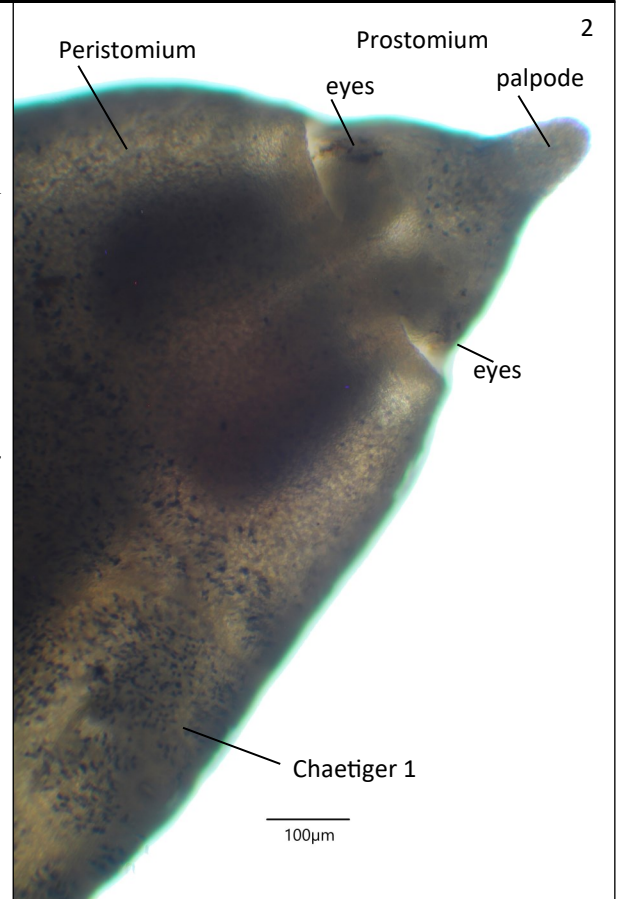
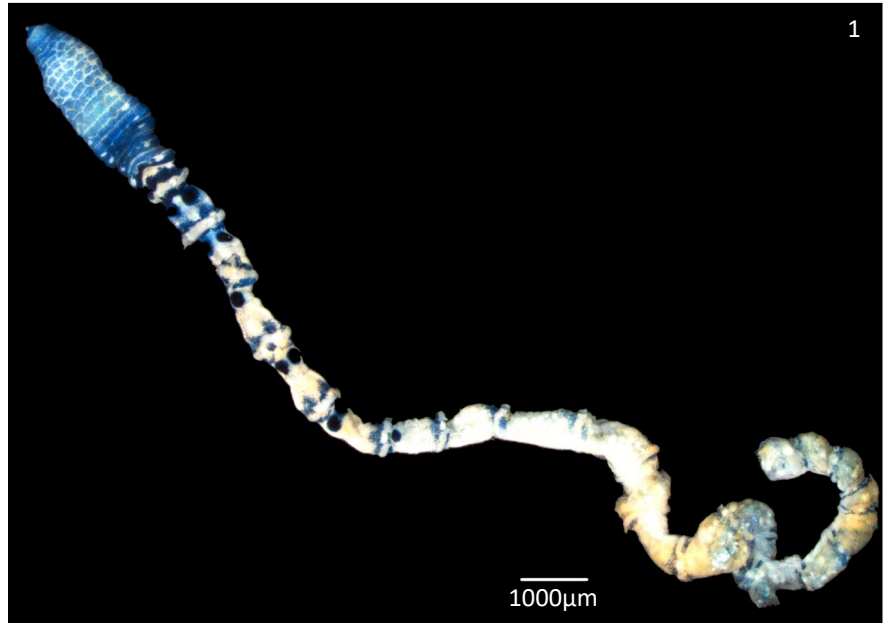
Phylum: Annelida

### Diagnostic Characters:

- 1) Prostomium small, conical; palpode present; eyes present as dorsolateral ocular patches, sometimes obscured by peristomium (images 1—5).
- 2) Chaetigers 1-5 areolated, inflated; chaetiger 6 & 7 less areolated, less inflated; chaetigers 8-11 smooth (images 3 & 4).
- 3) First chaetiger complete, thorax with capillary chaetae only (images 4 & 5).
- 4) Thoracic Formula -  $^{(11e)}/_{(11e)}$
- 5) Abdominal hooded hooks with 1-2 rows of small teeth surmounting main fang (difficult to discern even @ 1000X) (images 6 & 7).
- 6) Branchiae present in abdomen, rudimentary, as small dorsolateral swellings of notopodia and large triangular extensions of neuropodia (images 8 & 9).
- 7) Lateral organs present from chaetiger 1, between noto- and neuropodia, present throughout thorax (image 3).
- 8) Pygidium unknown.
- 9) Eggs visible thru body wall of abdomen in reproductive individuals (image 10).

### Pigmentation/MGS:

- 1) Palpode unstained.
- 2) Prostomium staining lightly; peristomium stains lightly anteriorly, darker posteriorly (images 1 & 3).
- 3) Chaetigers 1-7 staining moderately (images 1, 3 & 4).
- 4) Chaetigers 8-11 staining intensely (images 1, 3 & 4).
- 5) Abdomen with pre- & post-chaetal stain bands, most intense dorsally (images 1, 8, 9, 11, 12 & 13).
- 6) Genital pores stain as paired dorsal spots in anterior abdomen (image 11) (may be absent in juveniles or non-reproductive individuals) (image 13).



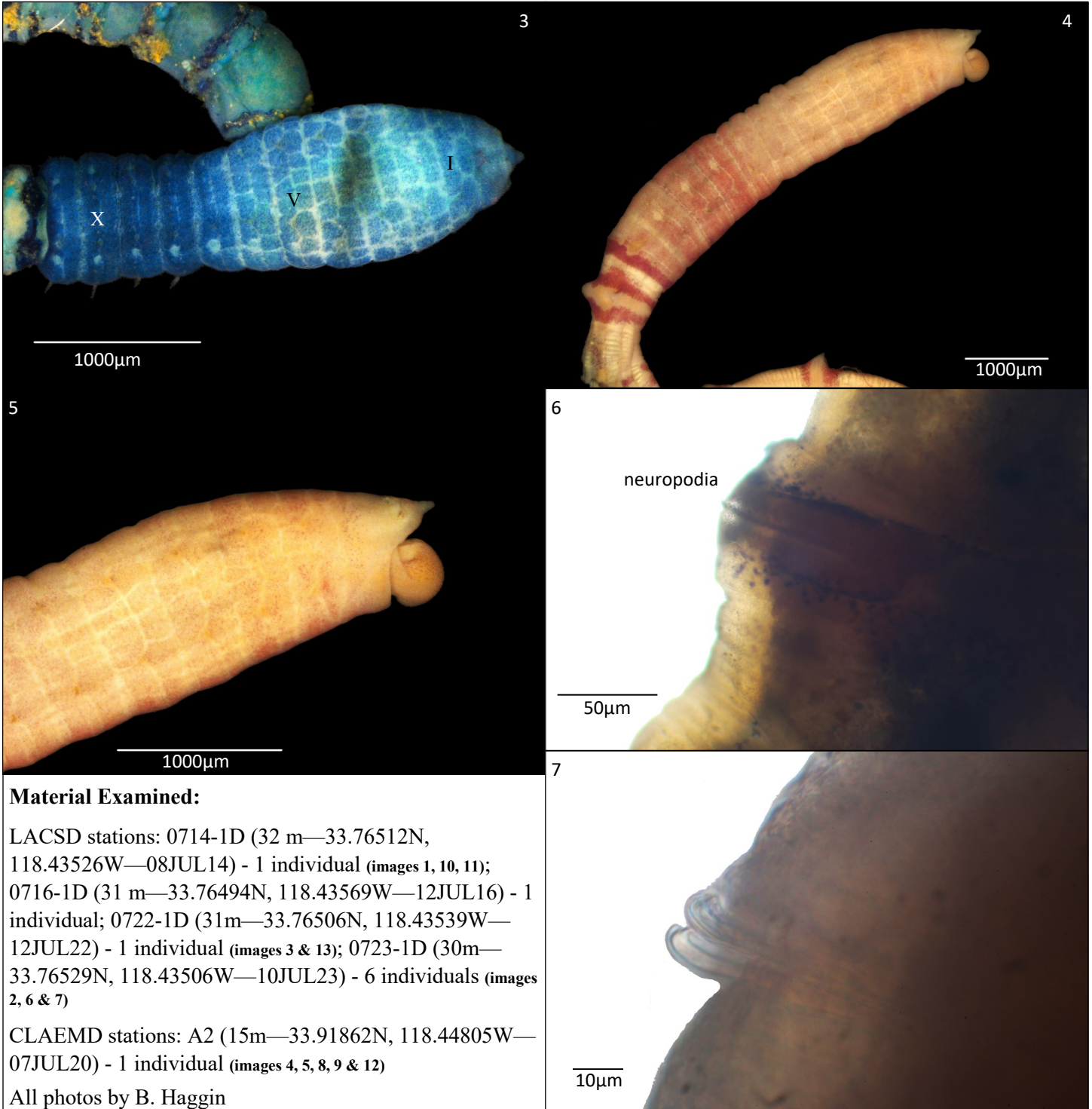


## *Notomastus* sp LA4

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024



### Material Examined:

LACSD stations: 0714-1D (32 m—33.76512N, 118.43526W—08JUL14) - 1 individual (images 1, 10, 11); 0716-1D (31 m—33.76494N, 118.43569W—12JUL16) - 1 individual; 0722-1D (31m—33.76506N, 118.43539W—12JUL22) - 1 individual (images 3 & 13); 0723-1D (30m—33.76529N, 118.43506W—10JUL23) - 6 individuals (images 2, 6 & 7)

CLAEMD stations: A2 (15m—33.91862N, 118.44805W—07JUL20) - 1 individual (images 4, 5, 8, 9 & 12)

All photos by B. Haggin

### Similar Species:

*Notomastus* sp LA4 is most similar to other local *Notomastus* spp. with a biramous first chaetiger, *Notomastus magnus* Hartman, 1947; *Notomastus* sp E Harris, 2021 §; *Notomastus* sp LA3 Haggin, 2023 §; *Notomastus* sp LA5 Haggin, 2023 §; *Notomastus* sp SD2 Rowe, 1999 §; and *Notomastus* sp SD3 Rowe, 2004 §. Differences between the species are detailed below.



## *Notomastus* sp LA4

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024



### Similar Species cont.:

*Notomastus magnus* Hartman, 1947—*Notomastus magnus* is a large, robust species that lacks eyes and has retractile, palmate branchiae from anterior abdominal chaetigers. *N. magnus* has 2 staining morphologies in the abdominal chaetigers depending on its reproductive status. The first is a large, broad dorsal patch (image 14). The second is a set of paired



## *Notomastus* sp LA4

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024

### Similar Species cont.:

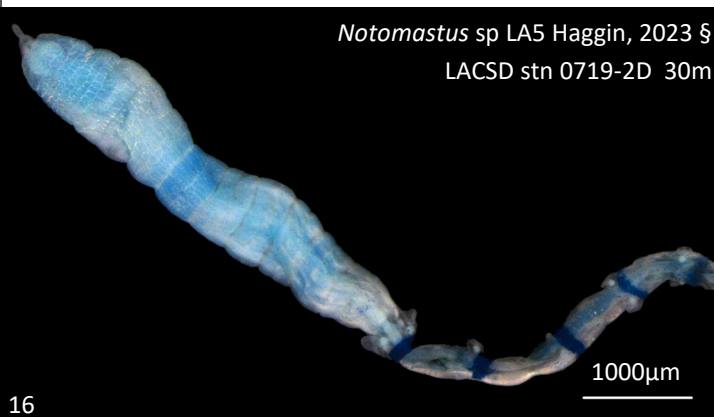
*Notomastus magnus* continued—dorsal spots (image 15). *Notomastus* sp LA4 differs from *N. magnus* by having eyes and having rudimentary branchiae as swellings of the noto- & neuropodial lobes. The stain pattern of *N. sp* LA4 also differs in having pre- & post-chaetal staining bands rather than a broad dorsal patch (image 13). When reproductive, *N. sp* LA4 also has paired dorsal stain spots, but it retains the stain bands as well (images 1 & 11).



*Notomastus* sp E Harris, 2021 §—*Notomastus* sp E is similar to *Notomastus* sp LA4 in also having eyes but differs in the stain pattern. *Notomastus* sp E has an intense staining band on chaetiger 6 while the rest of the animal retains a uniform stain without any distinctive patterns in the abdominal region.

*Notomastus* sp LA3 Haggin, 2023 §—*Notomastus* sp LA3 differs from *N. sp* LA4 in having a smooth rather than an areolated thorax, lacking eyes, having palmate rather than simple branchiae, and in the stain pattern. *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen. *Notomastus* sp LA4 has a pair of staining bands and, when reproductive, a pair of dorsal stain spots.

*Notomastus* sp LA5 Haggin, 2023 §—*Notomastus* sp LA5 differs from *N. sp* LA4 in lacking, rather than having eyes and in the abdominal stain pattern. *Notomastus* sp LA5 has a single post-chaetal stain band (image 16) rather than both pre- and post-chaetal staining bands and lacks the paired dorsal stain spots found in reproductive *Notomastus* sp LA4 (images 11 & 13).



*Notomastus* sp SD3 Rowe, 2004 §—*Notomastus* sp SD3 differs from *N. sp* LA4 in the posterior thoracic and abdominal stain pattern. The thorax of *Notomastus* sp SD3 has a dark stain band on the anterior of chaetiger 10, an unstained posterior chaetiger 10 and anterior chaetiger 11 and an intense stain band on the posterior of chaetiger 11. The abdomen has a post-chaetal mid-dorsal stain dot and a “U” shaped stain patch that opens anteriorly, giving the appearance of a smiling cyclops. *Notomastus* sp LA4 has



## *Notomastus* sp LA4

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024



### Similar Species cont.:

*Notomastus* sp SD3 Rowe, 2004 § continued—a pre- and post-chaetal stain band and paired dorsal stain spots in reproductive individuals.

*Notomastus* sp SD2 Rowe, 1999 §—*Notomastus* sp SD2 differs from *N.* sp LA4 in lacking eyes and in the abdominal stain pattern. *Notomastus* sp SD2 has a broad pre-chaetal dorsal stain patch that appears as a “U” shape that opens to the posterior (image 17). *Notomastus* sp LA4 has a pre- and post-chaetal stain band and paired dorsal stain spots in reproductive individuals.

### Discussion:

*Notomastus latericeus* M. Sars, 1851 was originally described from either Cobscook Bay, New Brunswick, Canada (WoRMS) or the Norwegian Sea, Norway (García-Garza *et al.* 2019). The species has since gained a cosmopolitan distribution with a depth range of intertidal to 4360m. The most recent re-description was by Ewing (1984) but was based on material from the Gulf of Mexico and not from either of the potential type localities. Descriptions of the staining patterns were not given by Ewing (1984).

García-Garza *et al.* (2019) does not list any records of *Notomastus latericeus* from the Pacific Ocean, the closest being from Viet Nam. They do recognize that *N. latericeus* was considered a cosmopolitan species by multiple authors but that those records need to be confirmed. Green (2002) described the staining pattern of what she called *N.* near *latericeus* from the Andaman Sea and it is clearly different that what we have locally. She also recognized the reported variation in hooded hook dentition from different localities and suggested that *Notomastus latericeus* is a species complex.

Hernández-Alcántara & Solis-Weiss reported *Notomastus latericeus* from the Gulf of California in 1993, 1998, and 1999 but a re-examination of the material by García-Garza & de León-González (2011) found them to be *Notomastus magnus*. True *Notomastus latericeus* likely does not occur locally and the provisional species *Notomastus* sp LA4 Haggin, 2023 § should be used in its place.

### Habitat:

*Notomastus* sp LA4 is known from the Santa Monica Bay and Palos Verdes at a depth of 15-32m. This range is likely to increase across southern California as local reviews of *Notomastus latericeus* occur.

### References:

Blake, J. A. 2000. Family Capitellidae Grube, 1862. pages 47-96. IN: Blake, J. A., Hilbig, B. & Valentich-Scott, P. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 - The Annelida Part 4 - Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History.



## *Notomastus* sp LA4

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024

### References cont.:

**Ewing, R. M.** 1984. Family Capitellidae Grube, 1862. Chapter 14. IN: Uebelacker, J. M. & Johnson, P. G. *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Volume II*. Minerals Management Service, Metairie, Louisiana.

**García-Garza, M. E. & de León-González, J. A.** 2011. Review of Capitellidae (Annelida, Polychaeta) from the Eastern Tropical Pacific region, with notes on selected species. *ZooKeys* 151: 17-52.

**García-Garza, M. E., de León-González, J. A. & Tovar-Hernández, M. A.** 2019. Catalogue of *Notomastus* M. Sars, 1851 (Annelida, Capitellidae) and the description of a new species from the Gulf of California. *Zootaxa* 4577 (2): 249-273.

**Green, K. D.** 2002. Capitellidae (Polychaeta) from the Andaman Sea. *Phuket Marine Biological Center Special Publication* 24: 249-343.

**Harris, L. H.** 2021. *Notomastus* sp E Harris 2021 § & comparisons to NEP *N. latericeus* & NEP *N. lineatus*, *N. magnus* & *Scyphoproctus oculatus*. *SCAMIT Handout*.

**Hartman, O.** 1947. Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481.

**Rowe, R.** 1995. *Notomastus latericeus* voucher sheet. *City of San Diego Voucher Sheet*.

### Other Literature Consulted:

**Ewing, R. M.** 1982. A partial revision of the genus *Notomastus* (Polychaeta: Capitellidae) with a description of a new species from the Gulf of Mexico. *Proceedings of the Biological Society of Washington* 95(2): 232-237.

**Fauchald, K.** 1977. The polychaete worms, definitions and keys to the orders, families and genera. *Natural History Museum of Los Angeles County: Los Angeles, CA (USA), Science Series* 28: 1-188.

**García-Garza, M. E. & de León-González, J. A.** 2015. The genus *Notomastus* (Polychaeta: Capitellidae) in the Gulf of California, Mexico, with the description of three new species. *Proceedings of the Biological Society of Washington* 128(2): 176-189.

**Hartman, O.** 1969. *Atlas of the sedentariate polychaetous annelids from California*. 1-812. Allan Hancock Foundation, University of Southern California. Los Angeles.

**Jeong, M-K., Soh, H. Y., Wi, J. H. & Suh, H-L.** 2018. A new *Notomastus* (Annelida, Capitellidae) species from Korean waters, with genetic comparison based on three gene markers. *ZooKeys* 754: 141-155.

**Magalhães, W. F. & Blake, J. A.** 2020. 7.6.4 Capitellidae Grube, 1862. pp. 349–403, In: Purschke, G., Bögge-mann, M. & Westheide, W. (Eds.), *Handbook of Zoology. Annelida*, 2 (Pleistoannelida, Sedentaria II), pp. 1–465.

### Version History:

Version 1.0—Voucher sheet created (18JUN2024)

Version 1.1—Updated references (20JUN2024)



**LOS ANGELES COUNTY  
SANITATION DISTRICTS**  
*Converting Waste Into Resources*



## Voucher Sheet

B. Haggin  
June, 2024

Species: *Notomastus* sp LA5

Haggin, 2023 §

P-code—P336

Synonyms: *Notomastus lineatus*

of authors SCB; not Claparède, 1869

ITI-code—none

Family: Capitellidae  
Order:  
Infraclass: Scolecida  
Subclass: Sedentaria  
Class: Polychaeta  
Phylum: Annelida

### Diagnostic Characters:

- 1) Prostomium small, conical; palpode present; eyes absent (images 1 & 2).
- 2) Thorax areolated thru chaetiger 8, then smoother (images 2 & 3).
- 3) Chaetiger 1 complete, thorax with capillary chaetae only.
- 4) Thoracic formula -  $^{11c}/_{11c}$
- 5) Branchiae present from anterior abdomen; simple lobes (image 4).
- 6) Abdominal neuropodia with long tori, nearly touching at midline (image 5).



- 7) Pygidium unknown.

### Pigmentation/MGS:

- 1) Palpode unstained (image 6).
- 2) Prostomium & Peristomium staining lightly (images 2 & 6).
- 3) Chaetigers 1-3 with moderate stain (images 2 & 6).
- 4) Chaetigers 4-5 staining lightly (images 2 & 6).
- 5) Chaetiger 6 staining darkly (images 2 & 6).
- 6) Chaetigers 7-11 staining moderately, with a darker band on chaetiger 10 (images 2 & 6).
- 7) Abdomen with stain band in segmental furrow only, without prechaetal band or paired dorsal stain spots (image 7).

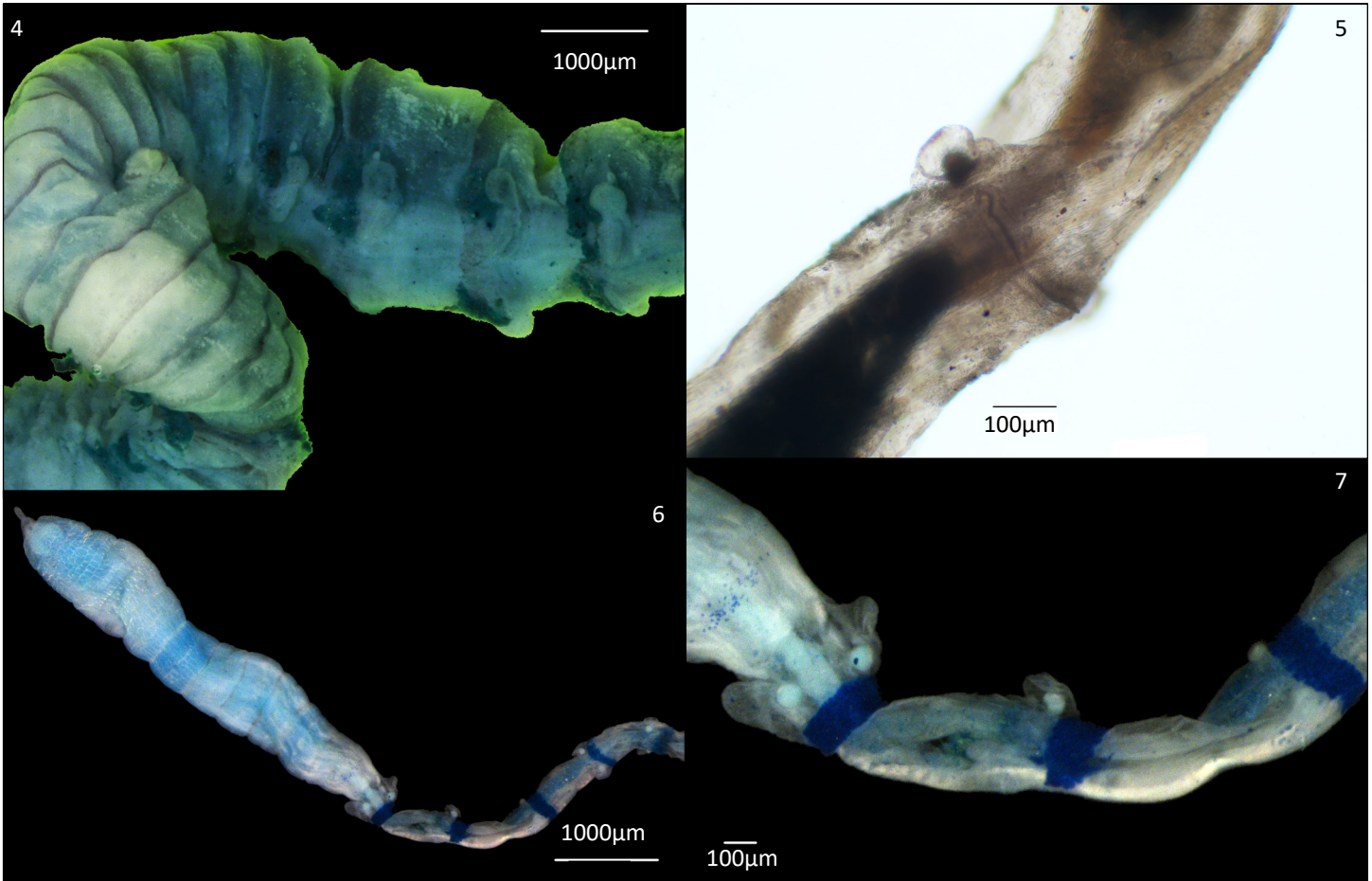


## *Notomastus* sp LA5

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024



### Material Examined:

LACSD stations: 0797-2D (31m—33.74113N, 118.42132W—09JUL97) - 1 individual (images 1 - 4); 0719-2D (30 m—33.74125N, 118.42121W—23JUL19) - 2 individuals (images 5 - 7)

All photos by B. Haggin

### Similar Species:

*Notomastus* sp LA4 is most similar to other local *Notomastus* spp. with a biramous first chaetiger, *Notomastus magnus* Hartman, 1947; *Notomastus* sp E Harris, 2021 §; *Notomastus* sp LA3 Haggin, 2023 §; *Notomastus* sp LA4 Haggin, 2023 §; *Notomastus* sp SD2 Rowe, 1999 §; and *Notomastus* sp SD3 Rowe, 2004 §. Differences between the species are detailed below.

*Notomastus* sp E Harris, 2021 §—*Notomastus* sp E differs from *Notomastus* sp LA5 in having eyes and in the stain pattern. *Notomastus* sp E has an intense staining band on chaetiger 6 while the rest of the animal retains a uniform stain without any distinctive patterns in the abdominal region. *Notomastus* sp LA5 also has a darker staining band on chaetiger 6, but also has variable staining bands on the rest of the thorax and has a distinctive post-chaetal stain band in the abdominal region (images 2, 6 & 7).



## *Notomastus* sp LA5

Haggin, 2023 §

## Voucher Sheet

B. Haggin

June, 2024

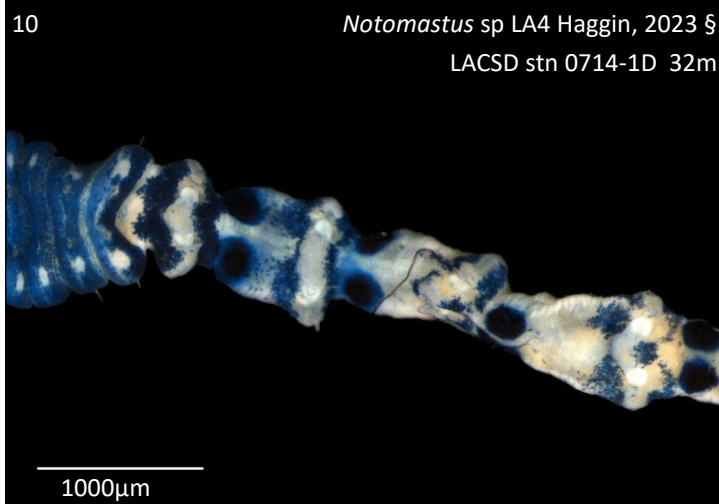


### Similar Species cont.:

*Notomastus magnus* Hartman, 1947—*Notomastus magnus* is a large, robust species that lacks eyes and has retractile, palmate branchiae from anterior abdominal chaetigers. *N. magnus* has 2 staining morphologies in the abdominal chaetigers depending on its reproductive status. The first is a large, broad dorsal patch (image 8). The second is a set of paired dorsal spots (image 9). *Notomastus* sp LA5 also lacks eyes but differs from *N. magnus* by having branchiae as simple lobes. The stain pattern of *N. sp LA5* also differs in having a single post-chaetal staining band rather than a broad dorsal patch (images 6 & 7). *Notomastus* sp LA5 lacks paired dorsal stain spots, even when reproductive.

*Notomastus* sp LA3 Haggin, 2023 §—*Notomastus* sp LA3 differs from *N. sp LA5* in having a smooth rather than an areolated thorax, having palmate rather than simple branchiae and in the abdominal stain pattern. *Notomastus* sp LA3 has a dorso-lateral abdominal stain and an unstained ventrum. The branchiae do not stain leaving a pair of unstained spots in the abdomen. *Notomastus* sp LA5 has a single staining band in the abdomen.

*Notomastus* sp LA4 Haggin, 2023 §—*Notomastus* sp LA4 differs from *N. sp LA5* in having, rather than lacking eyes and in the abdominal stain pattern. *Notomastus* sp LA4 has a both pre- and post-chaetal staining bands (image 10) rather than only a post-chaetal stain band (images 6 & 7) and reproductive *N. sp LA4* has paired dorsal stain spots (image 10) not found *Notomastus* sp LA5 regardless of reproductive state.



*Notomastus* sp SD3 Rowe, 2004 §—*Notomastus* sp SD3 differs from *N. sp LA5* in the posterior thoracic and abdominal stain pattern. The thorax of *Notomastus* sp SD3 has a dark stain band on the anterior of chaetiger 10, an unstained posterior chaetiger 10 and anterior chaetiger 11 and an intense stain band on the posterior of chaetiger 11. The abdomen has a post-chaetal mid-dorsal stain dot and a “U” shaped stain patch that opens anteriorly, giving the appearance of a smiling cyclops. *Notomastus* sp LA5 lacks the non-staining band on chaetigers 10 and 11 and the abdominal stain has only post-chaetal stain band.



## *Notomastus* sp LA5

Haggin, 2023 §

## Voucher Sheet

B. Haggin

June, 2024



11 *Notomastus* sp SD2 Rowe, 1999 §  
LACSD stn 0723-3D 33m

### Similar Species cont.:

*Notomastus* sp SD2 Rowe, 1999 §—*Notomastus* sp SD2 is similar to *N.* sp LA5 in lacking eyes but differs in the abdominal stain pattern. *Notomastus* sp SD2 has a broad pre-chaetal dorsal stain patch that appears as a “U” shape that opens to the posterior (image 11). *Notomastus* sp LA5 has a post-chaetal stain band in abdominal chaetigers.

### Discussion:

*Notomastus lineatus* Claparède, 1869 was originally described from the Gulf of Naples, Italy. It was subsequently reported from British Columbia, Canada by Berkeley & Berkeley (1932) and the from Newport Bay by Hartman (1947). *Notomastus lineatus* was redescribed by Ewing (1984) with material from the Gulf of Mexico but did not give a description of the methyl green stain pattern. García-Garza *et al.* (2019) mentions that this species is considered cosmopolitan but that the records need to be re-examined to confirm its wide distribution.

Green (2002) reported a species as *N.* near *lineatus* from the Andaman Sea and described its two staining variations. Both of these stain patterns are different than our local representative. She also commented on the variation in reported hooded hook dentition. These variations imply that *Notomastus lineatus* is a species complex. It currently has a reported cosmopolitan distribution and a depth range of subtidal to 298m.

García-Garza & de León-González (2011) re-examined material identified as *N. lineatus* by Bastida-Zavala in 1993 and found them to be *Dasybranchus parplatyceps* Kudenov, 1975. They also re-examined material from Hernández-Alcántara & Solís-Weiss in 1998 and found them to be a mix of *Notomastus magnus*; *N. polyodon* Gallardo, 1968; *N. cinctus* Fauchald, 1972; and *N. angelicae* Hernández-Alcántara & Solís-Weiss, 1998. True *Notomastus lineatus* is likely not found locally and the provisional species *Notomastus* sp LA5 Haggin, 2023 § should be used in its place.

### Habitat:

*Notomastus* sp LA5 is known from Pt. Vicente, Palos Verdes at a depth of 30-31m. This range is likely to expand across southern California as local reviews of *Notomastus lineatus* occur.

### References:

- Berkeley, E. & Berkeley, C. 1932. Some Capitellidae (Polychaeta) from the northeast Pacific with a description of a new genus. *Proceedings of the Zoological Society of London* 102(3): 669-675.
- Blake, J. A. 2000. Family Capitellidae Grube, 1862. pages 47-96. IN: Blake, J. A., Hilbig, B. & Valentich-Scott, P. *Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel. 7 - The Annelida Part 4 - Polychaeta: Flabelligeridae to Sternaspidae*. Santa Barbara Museum of Natural History.
- Claparède, É. 1870. Les Annélides Chétopodes du Golfe de Naples. Supplément. *Mémoires de la Société de physique et d'histoire naturelle de Genève* 20(2): 365-542.



## *Notomastus* sp LA5

Haggin, 2023 §

## Voucher Sheet

B. Haggin  
June, 2024

### References cont.:

**Ewing, R. M.** 1984. Family Capitellidae Grube, 1862. Chapter 14. IN: Uebelacker, J. M. & Johnson, P. G. *Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico. Volume II*. Minerals Management Service, Metairie, Louisiana.

**García-Garza, M. E. & de León-González, J. A.** 2011. Review of Capitellidae (Annelida, Polychaeta) from the Eastern Tropical Pacific region, with notes on selected species. *ZooKeys* 151: 17-52.

**García-Garza, M. E., de León-González, J. A. & Tovar-Hernández, M. A.** 2019. Catalogue of *Notomastus* M. Sars, 1851 (Annelida, Capitellidae) and the description of a new species from the Gulf of California. *Zootaxa* 4577 (2): 249-273.

**Green, K. D.** 2002. Capitellidae (Polychaeta) from the Andaman Sea. *Phuket Marine Biological Center Special Publication* 24: 249-343.

**Harris, L. H.** 2021. *Notomastus* sp E Harris 2021 § & comparisons to NEP *N. latericeus* & NEP *N. lineatus*, *N. magnus* & *Scyphoproctus oculatus*. *SCAMIT Handout*.

**Hartman, O.** 1947. Polychaetous Annelids. Part VII. Capitellidae. *Allan Hancock Pacific Expeditions* 10(4): 391-481.

**Pasko, D.** 1994. *Notomastus lineatus* voucher sheet. *SCAMIT Handout*.

### Other Literature Consulted:

**Ewing, R. M.** 1982. A partial revision of the genus *Notomastus* (Polychaeta: Capitellidae) with a description of a new species from the Gulf of Mexico. *Proceedings of the Biological Society of Washington* 95(2): 232-237.

**Fauchald, K.** 1977. The polychaete worms, definitions and keys to the orders, families and genera. *Natural History Museum of Los Angeles County: Los Angeles, CA (USA), Science Series* 28: 1-188.

**García-Garza, M. E. & de León-González, J. A.** 2015. The genus *Notomastus* (Polychaeta: Capitellidae) in the Gulf of California, Mexico, with the description of three new species. *Proceedings of the Biological Society of Washington* 128(2): 176-189.

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### Version History:

Version 1.0—Voucher sheet created (18JUN2024)



**LOS ANGELES COUNTY  
SANITATION DISTRICTS**  
*Converting Waste Into Resources*

## SCAMIT ARTHROPOD MEETING – 16 OCTOBER 2023

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(Minutes by D. Pasko)

Meeting location: LACSD

Brent opened the meeting and deftly stalled as Dean fumbled around for a version of his key to the family of amphipods – intended to be a focus of the meeting – but which had not been loaded to the meeting's Google Drive. After some embarrassing moments, Dean was able to start discussing arthropods.

The point of this meeting was to coordinate Bight'23 arthropod identifications as much as possible, with respect to data recording, identification resources, the introduction of a suite of SCB specific keys that Dean has been working to finalize. The meeting went forward somewhat clumsily as Dean struggled to synchronize his jumpy mouse with the computer screen being shared with the audience.

Dean initially pointed people to the existing tools in the SCAMIT website, specifically the various reviews that Don Cadien has posted to the site. Though buried in the toolbox hierarchy Don has posted reviews of cumaceans by family, tanaids, in addition to the gammarid amphipods organized by superfamily as listed in SCAMIT Ed 13. Unfortunately, that organization changed drastically with Edition 14.

Most significantly, Dean had updated his key to the family of amphipods reported by SCAMIT, which broadens John Chapman's 2007 key from Light's Manual and incorporates information and keys from Don Cadien's compilation of Northeastern Pacific (NEP) amphipod reviews mentioned above. In concert with this effort, he has been updating other amphipod family keys, specifically those that typically generate identification issues (e.g., Photidae, Ischyroceridae, Aoridae, Phoxocephalidae, etc.). [Host's note: several small errors have been discovered in the posted keys. These will be corrected and reposted soon.]

Dean then gave a brief overview of the family key, dated 29 September 2023, encouraging users to do two things: (1) take note of and read the referenced Endnotes, several of which include valuable information on limits to the identification of a particular taxon or other restrictions; and (2) send him questions about, or comments on, the key.

This effort was followed by a few examples of his family keys. In particular, he pointed to updates to oft perplexing photids and aorids. Dean had recently updated his *Photis* key, which is now incorporated into the Key to the SCB Photidae, as well as his *Aoroides* table, now included in the Key to the SCB Aoridae. The latter benefited from an effort by Don Cadien to reduce the reliance on color, the mandibular palp, and cusps on the teeth of the maxilliped inner plate, which are so heavily relied upon by Dean's table. The new key seems to work well.

There was some discussion of *Photis* characteristics used in the key as well as other useful characters not included in the key (e.g., setation of antennae and gnathopods, eye shape and size, etc.). For example, when faced with a large number of specimens containing multiple species, one can key in on a specific adult character (e.g., antennal length, antennal setation, pigment, epimeron 3 shape) and track that character to smaller and smaller specimens allowing for the identify many juvenile or immature specimens with confidence. Work one's way down from the larger adult specimens to smaller and smaller ones is a technique that can hopefully reduce the frequency of "*Photis* sp" records. Don agreed and commented that *Photis* have a plethora of characters that can be used to distinguish one species from another, especially within the limits of a sample.

We discussed the three size groupings of *Photis* (large, medium and small) that Don has also observed. Dean has presented this information previously (e.g., SCAMIT NL, Vol 35 No 6). Size is very important in distinguishing *P. californica* and *P. brevipes*, the later maturing at ~2.5mm larger than *P. californica*. For example, the two species are distinguished by the presence of a dactylar tooth in the male gnathopod 2 dactyl in *P. brevipes*; absent in *P. californica*. The dactylar tooth begins forming in juvenile male *P. brevipes* at about 3.5mm specimen. The dactylar tooth is absent

in male *P. californica*. So, even though adult *P. brevipes* reach 8<sup>+</sup>mm, even juvenile specimens can be distinguished from *P. californica* in the same sample by the presence of the swelling dactyl in 4mm specimens.

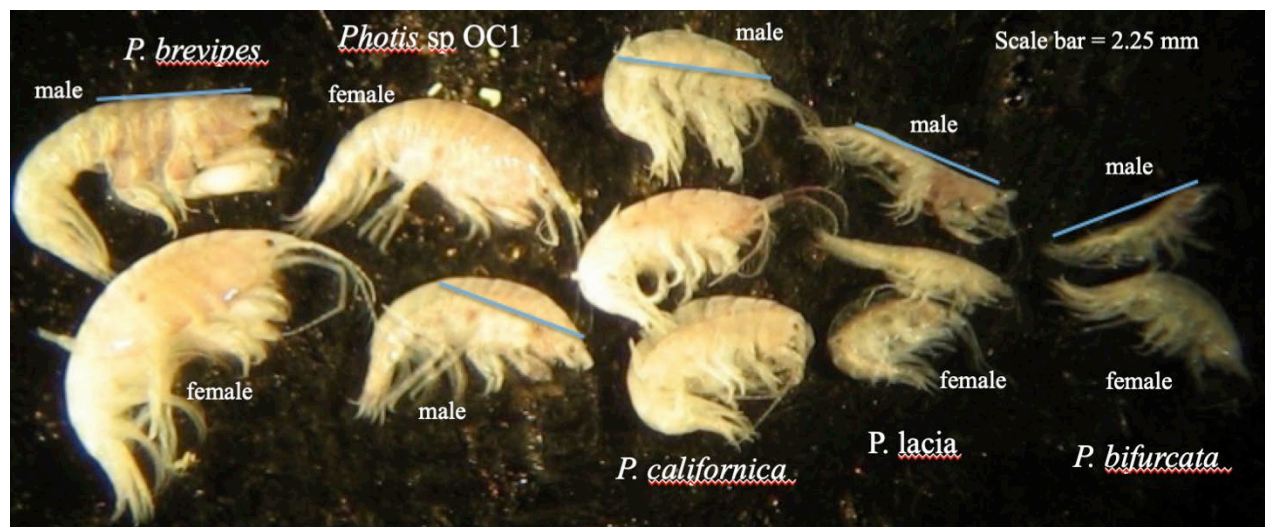


Table of reported sizes for *Photis* spp

Species	Male	Female
<i>P. bifurcata</i>	to 4.0 mm (Holotype 2.75 mm <sup>+</sup> )	to 3.5 mm
<i>P. brevipes</i>	to 8.0 mm <sup>+</sup>	to 6.0 mm
<i>P. californica</i>	4.5 mm <sup>+</sup>	
<i>P. chiconola</i>	Holotype 5.0 mm <sup>+</sup>	to 4.5 mm <sup>+</sup>
<i>P. conchicola</i>	to 5.5 mm	to 3.2 mm <sup>+</sup>
<i>P. lacia</i>	to 3.0 mm	to 3.3 mm
<i>P. lineramanus</i>	3.4 mm	
<i>P. macinerneyi</i>	to 4.3 mm	to 4.0 mm
<i>P. macrotica</i>	to 3.3 mm*	
<i>P. parvidons</i>	to 5.0 mm	to 6.0 mm
<i>P. viuda</i>	Holotype 5.0 mm <sup>+</sup>	
<i>Photis</i> sp A	<3.0 mm	2.8 mm
<i>Photis</i> sp B	2.5 mm	2.5 mm
<i>Photis</i> sp C	3.0 mm	3.5 mm
<i>Photis</i> sp E		3.25 mm
<i>Photis</i> sp OC1		4.0 mm
*Size range from Conlan 1983		<sup>+</sup> Barnard 1962

The updated key to the Aoridae was also reviewed and discussed since it introduces some additional characters less reliant on mouthpart characteristics. In particular, the key relies on characters of the uropod 1 peduncle and setation of gnathopods 1 and 2 that can be quite reliable.

To avoid the boredom of going through key after key, Dean presented a list of the keys that will be added to the SCAMIT Webpage. These included keys cover the Amphilochidae, Aoridae, Bateidae, Caprellidae, Dexaminidae/Atylidae, Dulichiidae, Liljeborgidae, Lysianassoidea, Pardaliscidae,

Photidae, Phoxocephalidae, Podoceridae, Pontogenidae, Synopiidae, and Uniciolidae. He also encouraged arthropod taxonomists to utilize Don's Northeastern Pacific (NEP) arthropod reviews for tanaid, cumacea, and amphipods (organized by Superfamily). If you haven't delved into them, these reviews are brimming with useful information including lists of species reported from the NEP, discussions of identification resources, keys generated by Don, generic diagnoses, detailed commentary of species with perplexing histories, and relevant taxonomic literature available at the time.

Don reminded everyone to take advantage of the recently published review to the SCB isopods by members Tim Stebbins and Regina Wetzer, and pointed to the endnotes which include a lot of valuable commentary to accompany the keys bringing light to potential problem areas of the keys and confusing taxa.

Dean closed with a discussion of the updated Phoxocephalidae key which he also populated with endnotes. Some time was spent discussing one footnote dealing with *Rhepoxynius lucubrans* and *R. menziesi*. He mentioned his review of type material of *R. lucubrans* at the Natural History Museum of Los Angeles County and found that the specimen did not have "lateral armaments" on urosomite 1 as discussed in Barnard and Barnard 1982 (page 20). Referencing personal experience with shallow water samples and *Rhepoxynius* with very short epistome that are consistently missing the "lateral armaments," Dean believes that the discussion included in Barnard and Barnard 1982 may have to be switched with respect to the presence/absence of ventro-lateral setae (or spines) on urosomite 1. The male type specimen (listed as a female) did not have "lateral armaments" on urosomite 1 while the other characters (e.g., the broader rostrum and much smaller epistomal cusp) did agree with Barnard and Barnard's discussion. Dean closed with a reminder to take note of endnotes to keys added by authors because they usually have them there for a reason.

Dean also noted that he's working on a revised key to the tanaids that merges Don's key to the NEP tanaids (Cadien 1914) with the Dojiri and Sieg key in the MMS Atlas (Dojiri and Sieg 1997) to accommodate all the SCAMIT recognized taxa in one key. While the key isn't quite ready for distribution, it is close. Interested parties can contact Dean individually for draft versions.

We then moved on to the discussion of ostracods. Don noted that a fair number of new ostracod voucher sheets have been deposited to the Toolbox, many of which had been started by Lisa Haney. These include mostly members of the *Philomedes* group: *Philomedes dentatus* Poulsen 1962, *Philomedes* sp A SCAMIT 1988 §, *Philomedes* sp LA1 Haney 2004 §, *Philomedes* sp SD1 Pasko 2014 §. Dean has also been working on a Key to the SCB ostracods, which has been a work in progress for a while. Andy brought up the idea of adding some sort of alert to material newly deposited to the SCAMIT toolbox. Brent noted that there is a "Latest Website Updates" in the upper right corner of the SCAMIT website to point people to new changes to the website and toolbox.

Dean took this moment to remind everyone about the issues encountered in Bight'18 regarding countable vs. non-countable- podocopid ostracod specimens. Countable specimens – those alive at the time of collection – should be distinguished from non-countable specimens – those specimens that were dead at the time of collection. The former typically have a clear, glistening carapace, with tissue present, eggs with developing embryos, etc., while the latter often have a dull, opaque carapace, exoskeleton of limbs present with little muscle or other tissue and are often filled with debris. Dean shared a slide showing these character differences, something he has shared previously via email to the SCAMIT listserver.

After a brief break, Mary gave her presentation on SCB brachyuran crabs. Mary provided some wonderful slides accompanied by very interesting discussions that cannot be replicated here. [The reader is encouraged to watch and listen to the presentation, starting at about the 1 hr, 4 min. mark in the recording and continuing for just over 30 minutes, through 1 hr 38 min.] She referenced her 2012 monograph (Wicksten 2012) as one of the most recently published comprehensive key to the

group along with Doug Jensen's guide to the Pacific coast decapods (Jensen 2014), noting that both were difficult to obtain because of their limited distribution. She also recommended the new Light's Manual (Kuris et al. 2007), despite issues with the included illustrations and bias towards central California.

Using *Micropanope latimanus* Stimpson 1871 as an example, Mary discussed the Xanthoid crabs (formally Xanthiidae) and the difficulty of identification, in part due to the difficulty in the original descriptions, type specimen lost to the fire in Chicago, history of confusing synonymies, some with vague original location designations (e.g., from "San Diego" or "Los Angeles area"). She currently considers *M. latimanus* to be a synonym of *Lophopanopeus frontalis* (Rathbun 1893). Many former xanthoid crabs are now listed under Panopeidae. She referenced Menzies (1948) as a good resource for many members of the group.

*Macroregonia macrochira* Sakai 1978 is a deepwater majoid crab that may be present in Southern California but Mary has not seen it yet. However, *Eurypanopeus hyperconvexus* Garth 1969 *is* present in Southern California, and was the last true crab to be described from Southern California. The identification can be made by the downward angle of the chelae fixed finger, the prominently pointed lateral carapace teeth, and long thin dactyls of the walking legs.

*Parapinnixa affinis* Holmes 1900, is common to bays and lives in terebellid tubes. It can be identified by the large first walking legs and broad, elongate carapace. It is currently on the IUCN endangered species list. It is likely listed in shallow waters, less than 3m, but Brent commented that he has seen something similar in his shelf-depth samples heavy with terebellids.

Mary then went on to discuss several subtidal crabs: *Deilocerus planus*, *Erileptus spinosus*, and *Pugettia venetiae*. *D. planus*, now in the family Cyclodipiidae, has modified hind limbs to carry things on top of the carapace. Don commented that this taxon is common around the coastal generating intakes, around the gravely substrates. *E. spinosus* is a tiny spider crab with fairly long eyestalks, and very long legs, similar to podochelids. It lives in similar habitat to *Deilocerus*, deep, shelly, gravely areas. *P. venetiae* was discussed next; it is sporadically reported from 18-120m. It does not have the hooked carapace setae typical of other spider crabs. *Chorilia*, a larger species, is also found in similar habitat and the two may be related.

Mary then explained ways to differentiate the very similar *Pugettia dalli* and *P. venetiae*, both of which are pictured in Garth (1958). *Pugettia dalli* has a pear-shaped carapace, long rostral forks, while the rostral spines of *P. venetiae* are more convergent and short, and the carapace more rounded. *Chorilia* spp look very similar to *P. venetiae* and may represent two species of *Chorilia*, although that hasn't been resolved. She discussed three papers reviewing this issue: Garth (1958) who noted the similarities between the two genera, Hultgren and Stochowitz (2008) who separated the two into different families, and Hendrickx (2015) who reviewed *Chorilia turgida* off the coast of Mexico.

She then went on to species that are now residents of southern California, starting with the now ubiquitous *Carcinus minus*, the introduced green crab. Another is the white-fingered mud crab, *Rhithropanopeus harrisi*, found in Oakland, but included in some sporadic reports from southern California, one from San Diego Bay sent to Mary by Dean. In Texas, it has been found in estuaries and inland lakes.

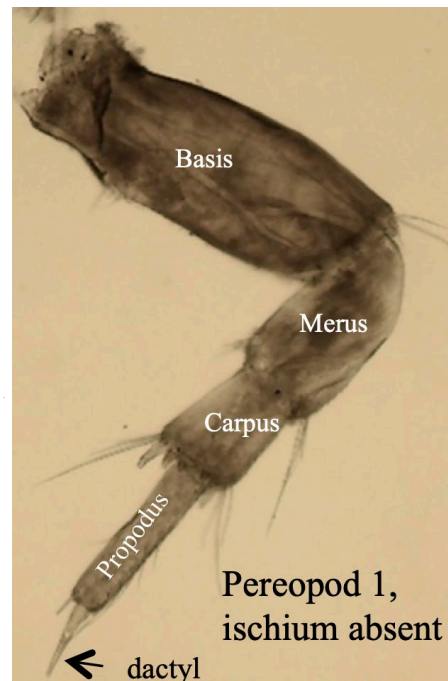
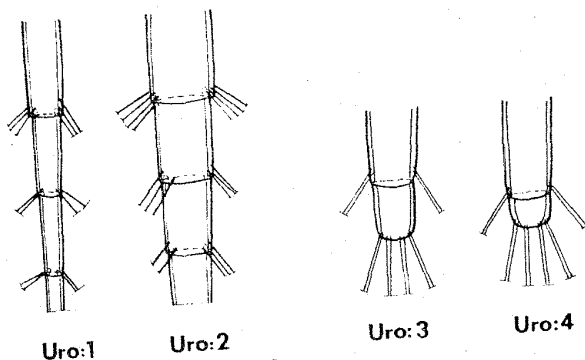
Mary then discussed some other less common species, including *Stenoryhnus debilis*, the arrow crab; the swimming crabs *Callinectes arcuatus*, *C. bellicosus*, *C. sapidus*; *Gonopanope areolata*, recently found in Santa Monica and San Diego by Dean Pasko who sent the specimens to her for confirmation; and *Telmessus cheiragonus* found in Monterey Bay, but there are no intertidal records.

Mary then offered her services to look at any crabs. She has lots of upper division and graduate students who need projects and is happy to put them to work. After which some lively banter

ensued between Mary and the present members regarding methods of crab identification, and various species of crabs and whether their reported occurrences in southern California are real or dubious.

A discussion of podocopid copepods somehow led to Don's discussion of parasitic and commensal copepods. Prior to the screening of wash water for field sampling, we used to get a large number of calinoid copepods in our samples. While those numbers have gone down, Don recommended we make the effort to look for the commensal and parasitic copepods found among worms, clams, and decapods. Brent mentioned that, among the worms, many of these copepods are found in the back half of the worm tubes, so if you're only exposing the head end of a worm you may be missing "the opportunity" to find these copepods. Don encouraged folks to look for them among benthic and commensal copepods in their Bight samples.

Dean shared one more file, a revised key to the Tanaididae modified from Cadien (2014) dealing with *Sinelobus*, *Anatanais*, and *Zeuxo*. One character that has generated confusion is the first couplet of the Tanaid keys dealing with the length of the uropodal segments used to separate *Synaptotanis* from other tanaids. Dean explained his point of view using Figure 1 from Sieg and Winn (1981) as a reference point. His interpretation of the key is that *Synaptotanis* has each article of the uropod twice (or more) as long as broad (see Uro:1) relative to other taxa in which one or more distal uropodal articles (see Uro:2) will be significantly shorter than 2 times the width ( $\leq 1.5$ ). He also discussed the absence of an ischium on pereopod 1 in Tanaididae, a sometimes difficult-to-observe character used to separate Tanaididae from other families of tanaids.



**From Sieg & Winn (1981), Figure 1:** Uropods and antenna 1 of different members of Tanaididae.

**Uro:1** = uropod long and slender, articles more than twice as long as broad; **Uro:2** = uropod short, articles twice as long as broad; **Uro:3** = uropod with terminal article normal; **Uro:4** = uropod with terminal article greatly reduced; Pereopod 1 of *Zeuxo normani* (Tanaidae), photo by D. Pasko.

Finally, before breaking for lunch and the review of specimens, Dean lead a discussion of data reporting consistency for Bight'23. He cautioned everyone to take note of the significant changes in orthography of SCAMIT species and record and report their taxa according to SCAMIT. We also reviewed the usage of the Exclude code, as well as how to deal with epibionts (e.g., barnacles on

mollusk shells). We noted that there is likely a fair degree of inconsistency among laboratories relative to the counting of epibionts, and that the Bight Benthic Manual suggested excluding them from infaunal counts. Greg noted that epibionts are often dropped during the Regional Synoptic Data Review process because of this inconsistency. In the end, everyone acknowledged that inconsistency between laboratories would likely continue, unfortunately.

Don then asked all attendees to consider adopting the usage of subgenera when recording Cumacea, specifically *Leucon* spp. Subgenera are useful in distinguishing species of *Leucon* and can be very helpful for classifying the many provisional species that exist in SCAMIT. Dean then reminded everyone about Don's reviews of the 2006 NEP Cumacea, posted to the SCAMIT Toolbox. These reviews include keys that are very useful because they include a number of provisional species and can help provide information and characters to enlighten one to other potential taxa that he/she may not have otherwise considered.

The meeting then adjourned for lunch followed by a review of specimens. In addition to a few *Aoroides* spp for which we don't have records, the following City of San Diego Bight'23 specimens were reviewed and confirmed: *Pseudotaniais californiensis*, B23-12315, 524m; *Microjassa* sp, B23-12315, 524m; *Eurocope californiensis*, B'23 12319, 848m; *Belonectes* sp A, B'23 12319, 848m. The specimen of *Microjassa* was unusual in that coxa 1 was smaller than coxa 2, and uropod 3 had five large denticles on the outer ramus, which seemed quite unusual at the time. [In hindsight, however, this specimen may quite possibly represent *Ischyrocerus anguipes* Krøyer 1838, which has been reported as deep as 326m. Another quite distinctive *Ischyrocerus*, *I. malacus* JL Barnard 1964, was described from 1593m.]

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## Arthropod Personals -Seeking companion?

### Part 3 – “The shrimp that mistook its parasite for a hat” -dbcadien, WWRF, Los Angeles County Sanitation Districts 28Nov23

Arthropods often form symbiotic associations with other arthropods (Boxshall et al 2005). For the most part these involve ectoparasitism of a macroarthropod host by either a copepod or an isopod, or with less frequency with a decapod, a barnacle, or an amphipod. In the case considered here it is an ectoparasitic isopod and its host shrimp. Although another shrimp/isopod symbiont pair was known, based on the isopod *Holophryxus alaskensis*, isopods of the genus *Zonophryxus* were unreported in SCB waters prior to the strong “El Niño” event of 1998. Trawls by CSDLAC in southern Santa Monica Bay in late summer of 1998 yielded a number of pandalid species not previously taken there. These included *Pantomus affinis*, *Plesionika trispinus*, *Plesionika beebei*, and *Plesionika carinirostris*. Their presence in the area stemmed from northward El Niño current flow, as the normal ranges of all four were further to the south (Montagne and Cadien 2001). Along with these relatively large shrimp came an associate, a dajid isopod of the genus *Zonophryxus*. Dajids are known as ‘shrimp riders’ and mature specimens are evident atop the carapace of pelagic decapods. More specialized dajids are found on mysids and euphausiids. No *Zonophryxus* were reported from the SCB, and as the nearest type localities of described species were several thousand kilometers to the north or south of the catch location: we assumed these isopods to be undescribed, and labeled them *Zonophryxus* sp A. Two hosts were sampled from the several southern shrimp populations: *Pandalus affinis* and *Plesionika trispinus*. A total of 30 female isopods (accompanied in several cases by males hidden under the female): 25 from *Pantomus*, and 5 from *Plesionika*. The two hosts are not the same size; the *Plesionika* being about twice the size of the *Pantomus* or more.



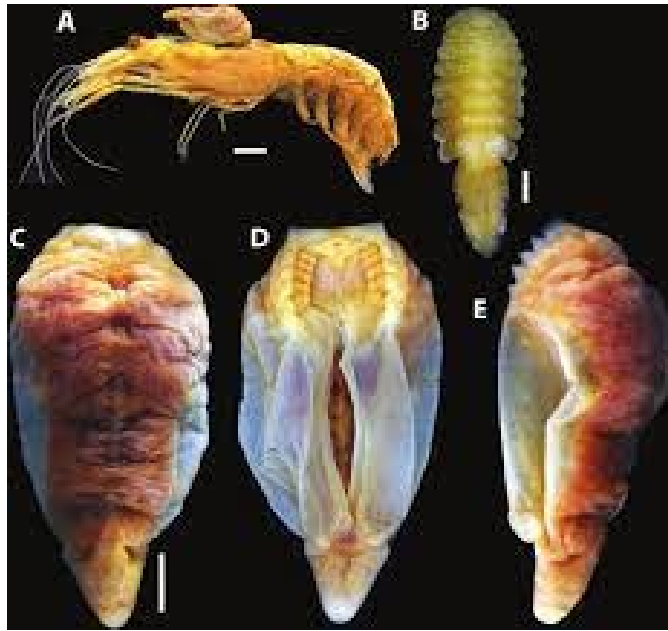
While the female shown seems to merely perch on the carapace of the shrimp, it is affixed with the claws of the legs, which penetrate the carapace and give the parasite a secure hold on its host. Although not well shown in the photo, the actual shape of the female is like that of a WW2 Nazi helmet: low, broad, with a slightly upturned edge, but bearing a series of serrations on its antero-ventral margin. The isopods orient head-backwards on the host, positioning the mouthparts just above the host heart. The isopods are true parasites (Boyko and Williams 2021), feeding on host fluids taken up by the piercing mouthparts. The resemblance of the female to a soldier's helmet led to the above title (with apologies to neurologist Dr. Oliver Sacks, whose book ‘The Man Who Mistook his Wife for a Hat’ was its inspiration). The

tenacity of the parasite; it's resistance to abandoning the host, can be seen in the specimens we collected. Most of these were still affixed to the host, having survived the trawling, retrieval, and sorting process without losing their hold.



The isopod here is in a more typical posture, more tightly adherent to the host

Even after preservation a number of the collected host/parasite pairs were still connected. This material, including hosts, was sent to Dr. Chris Boyko (Hofstra University) for examination. He is determining if they are undescribed, or represent a new occurrence of a known form far from its normal haunts. The genus is relatively small, made up of only seven species, including a new one from Peru described by Boyko and Williams in 2021. In their review of the genus they indicated that none of the currently known females were ovigerous. Fortunately, several of the females taken in Santa Monica Bay still had eggs. These were very tiny, present in the tens of thousands in gravid females, and easily lost during handling. Although I did not witness it, it is likely that these were newly laid eggs, and had not developed to the epicaridium larval stage. As an intermediate developmental stage of dajids is passed in copepods, dajids have compound life histories, with different life stages passed in association with different hosts. In this case the definitive (final) host is a decapod, while the intermediate host is a copepod. Dajids typically have one or two epicaridium larvae which infect the intermediate copepod host, and a subsequent cryptoniscid larva which infects the primary host.



*Holophryxus alaskensis* and host (from Boyko and Williams 2021a)

There is another dajid encountered in the SCB. It can be easily distinguished from *Zonophryxus* by the long tail, elevated off the carapace, that points forward over the shrimps head like a finger (see figure above). Although also parasitizing pelagic shrimps, *Holophryxus alaskensis* is currently known only from the pasiphaeid *Pasiphaea pacifica* (Butler 1980), and does not occur on the pandalids which host *Zonophryxus*.

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## SCAMIT Treasury Summary 2022-2023

Below is the treasurer's report for 2022-2023. In 2018 we raised dues for the first time since the start of SCAMIT in 1982 from \$15 to \$20 for electronic memberships, \$30 to \$35 for hardcopy memberships, and \$60 to \$65 for institutional memberships. We have over 150 members across the US and worldwide. SCAMIT awarded two publication grants this past year: 1) Paul Valentich-Scott for publishing *A fossil species found living off southern California, with notes on the genus Cymatinoa (Mollusca: Bivalvia: Galeommatoidea)* and 2) Tim Stebbins and Regina Wetzer for publishing *Review and guide to the isopods (Crustacea, Isopoda) of littoral and sublittoral marine habitats in the Southern California Bight*. As stipulated in our grant policy, we have **\$7,446.34** or 25% of our operating budget of \$29,785.36 available for publication grants this year. Please help get the word out that these funds are available. The taxonomic database support tools on our website were maintained by our webmaster.

### Account Balances (as of 5/31/2023)

Checking	\$ 29,785.36
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### Income

2022-2023 Membership dues	\$ 2,563.99
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### Expenses

Newsletters (printing/postage)	\$ 125.41
Zoom Subscription	\$ 182.88
2022-2023 PO Box Renewal	\$ 230.00
CA Attorney General Registry of Charitable Trusts Fee	\$ 25.00
Paul Valentich-Scott Publication Grant	\$ 780.00
<u>Tim Stebbins &amp; Regina Wetzer Publication Grant</u>	<u>\$ 2,800.00</u>

<b>Total</b>	<b>\$ 4,143.29</b>
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