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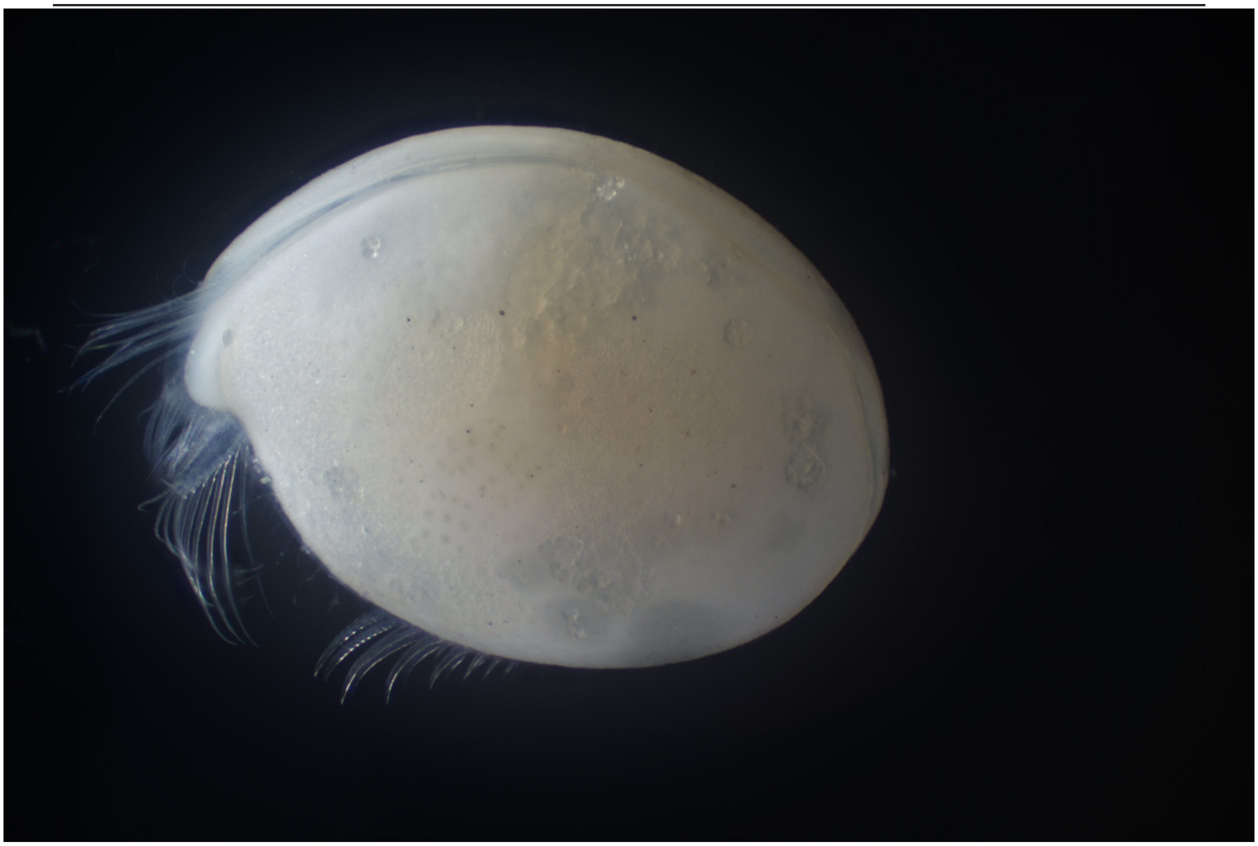

Euphilomedes carcharodonta (Smith 1952)
Photo by A. Davenport, City of San Diego

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

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13 JANUARY 2025, ARTHROPODA: OSTRACODA & PAGUROIDEA, OCSD, LEAD – D. PASKO

Attendance: JoAnne Linnenbrink, Greg Lyon (CLAEMD); Brent Haggin, Chase McDonald, Wayne Dossett (LACSD); Ben Ferraro (OCSD); Katie Beauchamp, Andy Davenport, Lauren Valentino (CSD); Dean Pasko (DCE).

UPCOMING MEETINGS

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

Brent Haggin opened the first SCAMIT meeting of 2025 with a brief discussion regarding the year's meeting schedule before turning the meeting over to Dean Pasko. Dean explained that the meeting topic originated from a series of email discussions and a general desire within the Southern California Bight (SCB) taxonomic community to review two groups that frequently present identification challenges: Ostracoda and Paguroidea (hermit crabs). While noting that he does not consider himself an expert on either group, Dean assembled a presentation based on the identification resources that he has developed and refined through years of routine laboratory work.

Before beginning the scheduled presentations, Dean addressed an ongoing issue regarding the identification of *Deflexilodes* spp (Oedicerotidae) in the Southern California Bight.

Historically, SCB specimens have routinely been identified as *Deflexilodes norvegicus* (Boeck, 1871), a species described from the North Atlantic and Arctic regions. However, Dean noted several consistent differences between local specimens and the illustrations provided by Sars (1895). Compared to SCB material, Sars' illustrations depict: a narrower and more elongate gnathopod 2 propodus, a more acute and strongly downturned rostrum, a much broader basis on pereopod 7, a non-geniculate second article of the mandibular palp, and a telson bearing only a single pair of distal spines.

Additional confusion arose after Jim Roney identified the common Southern California species as *Deflexilodes similis* Bousfield & Chevrier, 1996, based on their revision of the Oedicerotidae. Since then, uncertainty has persisted among SCB taxonomists regarding whether local specimens represent *D. similis*, *D. enigmaticus* Bousfield & Chevrier, 1996, or another taxon.

Dean and Andy Davenport recently re-examined specimens collected through agency monitoring programs and consulting projects to compare them with published descriptions of both *D. similis* and *D. enigmaticus*, both of which are listed in SCAMIT Edition 14. Their examination found that specimens from throughout the Southern California Bight are morphologically consistent across agencies, differ from *D. norvegicus* in the characters noted above, and exhibit a combination of characters shared by both *D. similis* and *D. enigmaticus*. Until the taxonomy of the group is better resolved, Dean recommended that Southern California specimens be reported as *Deflexilodes similis* complex (CMPLX).

Following this discussion, Dean began the ostracod presentation with a general overview of the Class, introducing the two subclasses, Myodocopa and Podocopa, before discussing how to distinguish the two myodocopid orders commonly encountered by SCB taxonomists.

Within the subclass Myodocopa, the primarily epibenthic Myodocopida represent the group most frequently collected in benthic monitoring programs, whereas members of the primarily planktonic Halocyprida are only infrequently encountered in benthic samples.

Focusing on the Myodocopida, Dean reviewed the principal morphological characters used in species identification, including carapace shape and ornamentation, characteristics of the caudal furca, antennae, mandibles, and additional appendages. He then discussed the principal identification resources currently available within the SCAMIT Toolbox:

Preliminary Guide to Some Ostracoda – Myodocopida from Southern California (Brad Myers, 1975). This handout, originally distributed during an early SCCWRP Inter-calibration Workshop in June 1975, remains a valuable introductory resource. It includes line drawings of carapace shapes that direct users toward the appropriate family or genus, along with keys to the Philomedidae and Cylindroleberididae, the two myodocopid families most commonly encountered at that time. Although now several decades old, the guide continues to serve as a useful starting point for family-level identification.

Tabular Guide to the Southern California Female Cylindroleberididae (2017 Revision)**.** Originally developed by Katie Beauchamp and Ron Velarde (2011) using publications by Baker (1975, 1979) and Myers (1975, 1983), this tabular key was revised by Dean in 2017. Once a specimen has been recognized as a cylindroleberid, the guide provides an effective means of distinguishing the eight reported Southern California species using diagnostic characters of the first and second antennae, mandible, and sixth and seventh limbs.

Ostracoda from Southern California of the Genus *Rutiderma* (Brad Myers, 1979). Prepared for an SCCWRP Inter-calibration Workshop, this guide illustrates both male and female carapaces of the five *Rutiderma* species commonly reported in the Southern California Bight: *Rutiderma hartmani* Poulsen 1965, *Rutiderma judayi* McKenzie 1963, *Rutiderma lomae* (Juday 1907), *Rutiderma rostratum* Juday 1907, and *Rutiderma rotundum* Poulsen 1965.

Dean has supplemented his personal copy with illustrations from Kornicker & Myers (1981) and Harrison-Nelson et al. (2011), making it an even more effective quick-reference guide.

Provisional Key to the Myodocopa Ostracoda (Jack Word, 1998). Prepared for the 1998 NAMIT workshop, Dr. Jack Word's provisional key contains a dichotomous key together with photocopies of representative species. Dean has replaced several of the original low-quality images with figures from the original descriptions or more recent publications. While the key performs well for many common SCB taxa, users should remember that it was originally developed for species occurring in Oregon, Washington, and British Columbia rather than specifically for the Southern California Bight.

The Ostracod Chapter (Cohen et al 2007) of Light's Manual, 4th Ed. Dean also reviewed several unpublished reference materials shared with him by Dr. Anne Cohen, which ultimately formed the basis of the Ostracoda chapter in the fourth edition of *Light's Manual*. These color-enhanced illustrations and tables, which Dean has further modified for his own use, provide an exceptionally useful overview of character states distinguishing ostracod subclasses, orders, families, and several genera. Dean finds these materials particularly valuable when working with unfamiliar taxa.

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Dean concluded the ostracod review with observations on the Podocopida based on specimens encountered during routine monitoring. He presented photographs of several specimens together with the provisional names assigned to them and discussed criteria for determining whether specimens should be considered countable.

Countable specimens were defined as those possessing intact valves containing viable tissue and/or developing eggs or embryos. Specimens with opaque valves lacking recognizable tissue or containing only deteriorated tissue and debris were considered not countable.

Dean also reviewed photographs of a specimen identified as *Euphilomedes longiseta* (Juday, 1907) collected from B'23 Station 12291 (509 m). If correctly identified, this specimen would represent a substantial depth extension, as Cohen et al. (2007) report the species only to approximately 90 meters.

Additional photographs were presented of a specimen believed to represent *Euphilomedes morini* Kornicker & Harrison-Nelson, 1997, collected during a consulting project near the Ormond Beach Generating Station off Ventura, California. Dean compared the caudal furca formulas of the two species:

- *E. longiseta*: 2L–1s–1L–1s–2L
- *E. morini*: 2L–1s–1L–1s–1L

He also noted that *E. longiseta* possesses a distinctly pitted carapace, whereas *E. morini* has a comparatively smooth carapace.
(Photographs available from Dean Pasko.)

Dean concluded the ostracod session by briefly discussing his draft key to the Ostracoda of the Southern California Bight. The key is based on Jack Word's 1998 NAMIT key but has been extensively modified and expanded to better reflect the Southern California fauna. Because several sections still contain potential pitfalls that could lead users to incorrect identifications, Dean is not yet prepared to distribute the key broadly but hopes to release a finalized version later in 2025.

Following a short break, Dean introduced the afternoon session on hermit crabs.

His principal identification resource is Wicksten (2012), supplemented with anatomical illustrations from McLaughlin (1974), which greatly aid interpretation of the morphological characters used throughout Wicksten's key. Dean has also assembled figures from species descriptions, SCAMIT voucher sheets, and additional literature to verify or challenge tentative identifications reached through the key.

Ben Ferraro added that he continues to use an illustrated key developed many years ago by Dean Pasko and Dr. Mas Dojiri. That project expanded Janet Haig's 1990 *Preliminary Key to the Hermit Crabs of California* by adding illustrations to accompany most couplets. Although assembled before modern image-editing software using typewritten text and cut-and-paste figures, the illustrated key remains highly effective for identifying the hermit crab species most commonly encountered in Southern California Bight monitoring samples.

Following lunch, attendees moved into the taxonomy laboratory to apply the newly discussed identification resources to a series of hermit crab specimens.

While Dean was occupied at the microscope and unable to document all identifications, Andy Davenport summarized the City of San Diego specimens examined, and Brent Haggin recorded observations from the session.

Immature specimens originally identified as *Pagurus quaylei* Hart, 1971, and *Paguristes bakeri* Holmes, 1900, were both reassigned to *Paguroidea* sp because they were female. Wicksten's (2012) key does not permit reliable identification of females beyond couplet 13. The group confirmed identifications of *Paguristes turgidus* (Stimpson, 1857) and *Pagurus hartae* (McLaughlin & Jensen, 1996) from B'18 Station 10393. Several specimens of *Pagurus spilocarpus* Haig, 1977, collected by CLAEMD, were also successfully identified.

Several participants recommended continued use of Janet Haig's (1990) illustrated *Key to the Hermit Crabs of California*, which has now been uploaded to the SCAMIT Google Drive for broader access.

A major takeaway from the session was that only male hermit crabs can be confidently identified beyond couplet 13 using Wicksten (2012). Female and immature specimens often cannot be assigned reliably to species using the available key and should be identified more conservatively.

Before concluding the meeting, Andy Davenport demonstrated an alternative method for distinguishing species of *Heterophoxus* (Family Phoxocephalidae) when pereopod 7 article 6 is absent. Using the dentition and setation patterns of the lobe on pereopod 7 article 2, Andy demonstrated reliable separation of *Heterophoxus oculatus* (Holmes, 1908), *Heterophoxus affinis* (Holmes, 1908), and *Heterophoxus ellisi* Jarrett & Bousfield, 1994. This approach provides a useful alternative for specimens lacking pereopod 7 article 6, the appendage typically used for species identification.

10 FEBRUARY 2025, SETTLING AND RECRUITMENT AT CATALINA ISLAND, GUEST SPEAKER – DR. P. EDMUNDS (CSU NORTHRIDGE)

Attendance: (Disclaimer: The Secretary is reconstructing attendance records from photographs of handwritten sign-in sheets and has done her best to interpret the handwriting. Apologies if names or affiliations are incorrect.) Peter Edmunds (CSUN); Brent Haggin, Amber Von Tungeln, Terra Petry, Christina Fuentes, Wayne Dossett, Norbert Lee (LACSD); Coulson Lantz, Andy Davenport, Lauren Valentino, Zoë Scott, Maiko Kasuya, Adam Webb (CSD); Paul Larsen, Danny Burgess (WADOE); Greg Lyon, Erin Oderlin, Jennifer Smolenski, Craig Campbell (CLAEMD); Inez Mangino (UCSB); Ben Ferraro (OCSD); Alison Fisher (SFPUC); Megan Payne (EcoAnalysts).

The meeting was held remotely via Zoom and began with a presentation by guest speaker Dr. Peter Edmunds from California State University, Northridge. Dr. Edmunds has been a professor of Invertebrate Zoology at CSU, Northridge since 1992. Following postdoctoral work at Northeastern University, he came to California in 1991 through the USC Wrigley Institute for Environmental Studies on Catalina Island. While working at Catalina, he became fascinated by the corallimorpharian *Corynactis californica* Carlgren 1936 and its differing responses to environmental conditions on opposite sides of the island. This interest led to reciprocal transplant experiments between sites and eventually laboratory studies examining the species' physiology.

Dr. Edmunds reflected on his early research career, noting that much of his initial funding came from his own MasterCard. He emphasized that having researchers in the field is often more important than having expensive equipment, and that carefully designed, low-cost studies can produce high-quality scientific data. Early in his tenure at CSU, Northridge, he secured funding to establish long-term coral reef monitoring in St. John, U.S. Virgin Islands, where photo quadrats were used to construct a time series documenting community change. These observations generated hypotheses that were subsequently tested through process-oriented experiments. This monitoring effort has now produced 39 years of ecological data. Later, funding through the Long-Term Ecological Research (LTER) program allowed him to establish a comparable study in Moorea, French Polynesia, where approximately 20 years of continuous ecological data have now been collected.

Another long-term dataset has resulted from teaching the CSU Catalina Semester. There, Dr. Edmunds has applied his philosophy of field research by keeping studies easy, simple, sustainable, and inexpensive. Students deploy low-cost terracotta settlement tiles that are later collected, examined, and identified. The preserved tiles are subsequently donated to local high schools for use in marine biology curricula. Nearly 20 years of settlement and recruitment data have now been accumulated using this approach. Results indicate that settlement of solitary invertebrates has generally increased over time, while colonial and encrusting organisms have declined in percent cover. Settlement by gastropods in the family Vermetidae was also found to increase substantially during El Niño events. These observations suggest complex relationships between functional-group abundance and temperature that may explain shifts in community structure. Dr. Edmunds noted that experimental funding is now needed to investigate these mechanisms further.

Dr. Edmunds next discussed his research in the South Pacific. During his time there, he saw the coral cover drop to near zero % in 2010. He suggested this is due to differences in protections between Moorea and St. John. Since then, the coral cover in Moorea has increased to near 60% at 10m in 2019, an improvement still not seen in the Caribbean reefs. During this time some of his results have shown that increases in settlement do not always translate to increases in % cover. Strong variation exists over time and peaks are sometimes associated with recovery, but not always.

Throughout the presentation, Dr. Edmunds emphasized the importance of long-term ecological monitoring. Short-term studies frequently fail to capture long-term ecological trends, particularly under changing environmental conditions. He stressed that the past is an unreliable predictor of the future and that long-term monitoring provides the only reliable means of connecting ecological patterns with the underlying processes responsible for change. He also commented that, along with the word “diversity,” the term “monitoring” has become somewhat unpopular in the scientific funding community. He has found greater success in grant proposals by describing these efforts as “time series analyses.”

Dr. Edmunds concluded his presentation by emphasizing ecological time series (monitoring) are critically important, and the longer the better; their true value is only realized when pattern-analysis is coupled with hypothesis driven, process-oriented investigation. Studies of settlement are critical precursors to understanding changes in community structure and how it is determined by physical environmental conditions. But, decadal scale (+) is critical, and there is a need for companion studies of post-settlement success.

After Dr. Edmunds’ presentation, Brent Haggin gave a presentation on the science of taxonomy. The presentation included a definition of taxonomy and a brief history of the science, from Shen

Nung in ancient China to Aristotle and his contemporaries. The paragraph-long species names and propagation of fanciful animals (e.g., unicorns) during the 17th century led Linnaeus to propose the binomial naming system in Species Plantarum (1753) and Systema Naturae (1758), which are still used today. The system has evolved to incorporate new knowledge gained from Darwin's Theory of Evolution, the biogeographic discoveries of J. D. Hooker, and DNA-based molecular systematics.

Standardization of the process came about with the founding of the International Code of Zoological Nomenclature in 1905, which was replaced by the current ICZN in 1961. The Code is maintained online and can be accessed at https://www.iczn.org/. Some of the problems with the current classification system were discussed, including the implied evolutionary comparability of taxonomic levels, such as between Class Crocodylia and Class Aves. Crocodiles began evolving around 250 MYA, with modern crocodilians appearing as early as 125 MYA. The earliest bird-like dinosaurs first appeared around 175 MYA, with modern birds arising around 67 MYA. Birds could arguably be treated as a subclass or infraclass within the extinct Class Dinosauria; however, due to uncertainty in the fossil record, extinct lineages are not incorporated into the current taxonomic hierarchy. Phylogenetic classification systems have been proposed to address some of these issues by using a nested hierarchy without formal ranks and naming only clades, although higher-level relationships can still be difficult to interpret.

The presentation concluded with a rundown of the rules governing binomial nomenclature and how they apply to our work as taxonomists. An example of how SCAMIT applies these rules to the Species List was presented. Brent also reviewed the elements of a modern species description, which may be useful for anyone planning a taxonomic publication, and discussed how to interpret synonymies in both the literature and the Species List. The presentation concluded with a list of taxonomic resources available to local taxonomists, including natural history museums, professional organizations, and internet resources.

10 MARCH 2025, POLYCHAETES, OCSD, LEAD – A. WEBB

Attendance: Ben Ferraro, OCSD; Tony Phillips, Kelvin Barwick, DCE; Greg Lyon, Erin Oderlin, CLAEMD; Ricardo Martinez, Veronica Rodriguez Villanueva, Adam Webb, Maiko Kasuya, CSD; Christina Fuentes, Mac Power, Norbert Lee, LACSD.

For the meeting Adam had generated three items - a presentation (SCAMIT Flabelligeridae AMW 2025.pdf), generic descriptions, and a generic key. Adam is working on a species level key but it is not yet ready for publication. Adam's presentation on the Flabelligeridae primarily covered Sergio Salazar-Vallejo's generic revisions, generic descriptions for the entire family, and focusing on those found in the NEP. The presentation and identification aids can be found on the SCAMIT website in the toolbox for the family.

Annelida > Polychaeta > Palpata> Canalipalpata> Terebellida> Cirratuliformia> Flabelligeridae> Other Useful Tools.

14 APRIL 2025, NEMERTEA, OCSD, LEAD – W. ENRIGHT

Attendance: Wendy Enright, Coulson Lantz, Zoë Scott (CSD); Chase McDonald, Brent Haggin, Karla Gutierrez Burgos (LACSD); Ben Ferraro, Cody Larsen (OCSD); Tony Phillips, Megan Lilly (DCE); Erika Keppel (Smithsonian); Erin Oderlin, Craig Campbell, Greg Lyon (CLAEMD); Paul Larsen, Danny Burgess (WADOE); Ashley Loveland (SFPUC); Robin Gartman (retired).

Wendy had prepared a brief presentation on Nemertea, which started the day. Some helpful tips were noted: Shirlastain will help reveal the often hard-to-locate mouth on *Cephalothrix*. Cody even uses Shirlastain to assist him in identifying faded *Tubulanus polymorphus* Renier, 1804. A discussion ensued regarding the "colored species" and how difficult it can be, at times, to ascertain color, much less a color pattern.

Next was the issue of backing off identifications to *Tubulanus* sp., Tubulanidae, or Palaeonemertea. Tony stated that if he can see two circular muscle layers and one longitudinal layer in cross-section, then he knows it is a tubulanid. If a clear assessment of the musculature is not possible, then he leaves the identification at Palaeonemertea (assuming cephalic slits are lacking).

A tentative consensus and protocol were reached:

- If the specimen is small, colorless, and has poor cross-sections = Palaeonemertea.
- If the specimen is small, has good cross-sections showing the musculature, and lateral nerve cord (LNC) placement is consistent throughout the body = Tubulanidae.
- If the specimen is small with an evident color pattern, but it cannot be fitted to any described species = *Tubulanus*

Lineus flavescens Coe 1904 differs from Tony's Lineidae Hyp 1 in that Hyp 1 has only one large pair of dark eyes, whereas *L. flavescens* has two pairs of large dark eyes. The first pair of eyes on *L. flavescens* is visible without clearing, but if the specimen is cleared, an additional 3–7 ocelli become apparent.

Lineidae LAH 1 needs to be uploaded to the SCAMIT provisional species site and updated to Heteronemertea sp. LAH 1 Pasko 2014 §. For more information, see the discussion in Vol. 33, No. 3.

ARTHROPOD PERSONALS

Attached is another installment in Don Cadien's "Arthopod personals" series. Slighty out of order but just as interesting and humorous is Part 4 – 'Aren't these my eggs?'

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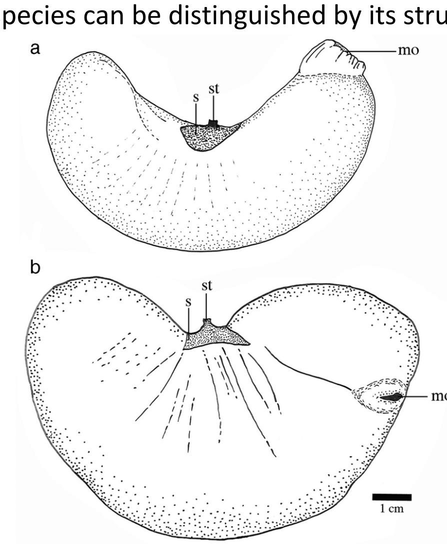
Arthropod personals – Seeking Companion?
Part 4 – 'Aren't these my eggs?' – dbcadien, WWRF, Los Angeles County Sanitation Districts 30Nov23

Like the on-line personals humans pursue, animal symbiotic pairings usually lead to unhappiness on the part of one participant. Local King Crabs, *Paralithodes californiensis* and *P. rathbuni* end up as losers when they partner up with parasitic barnacles in the genus *Briarosaccus*. Not that the crabs seek out the parasites, their involvement is involuntary. Larvae released by mature barnacles find the potential host, settle on its surface, and inject tissue through its skin. For years this parasite was known as *B. callosus* Boschma 1930, and was reputed to affect lithodid crabs worldwide. More recent investigations, utilizing molecular data, have shown that there are different species of parasitic barnacle involved (Noever et al 2016b). *B. callosus* was described from *Lithodes agassizi*i taken on the East Coast of the US.

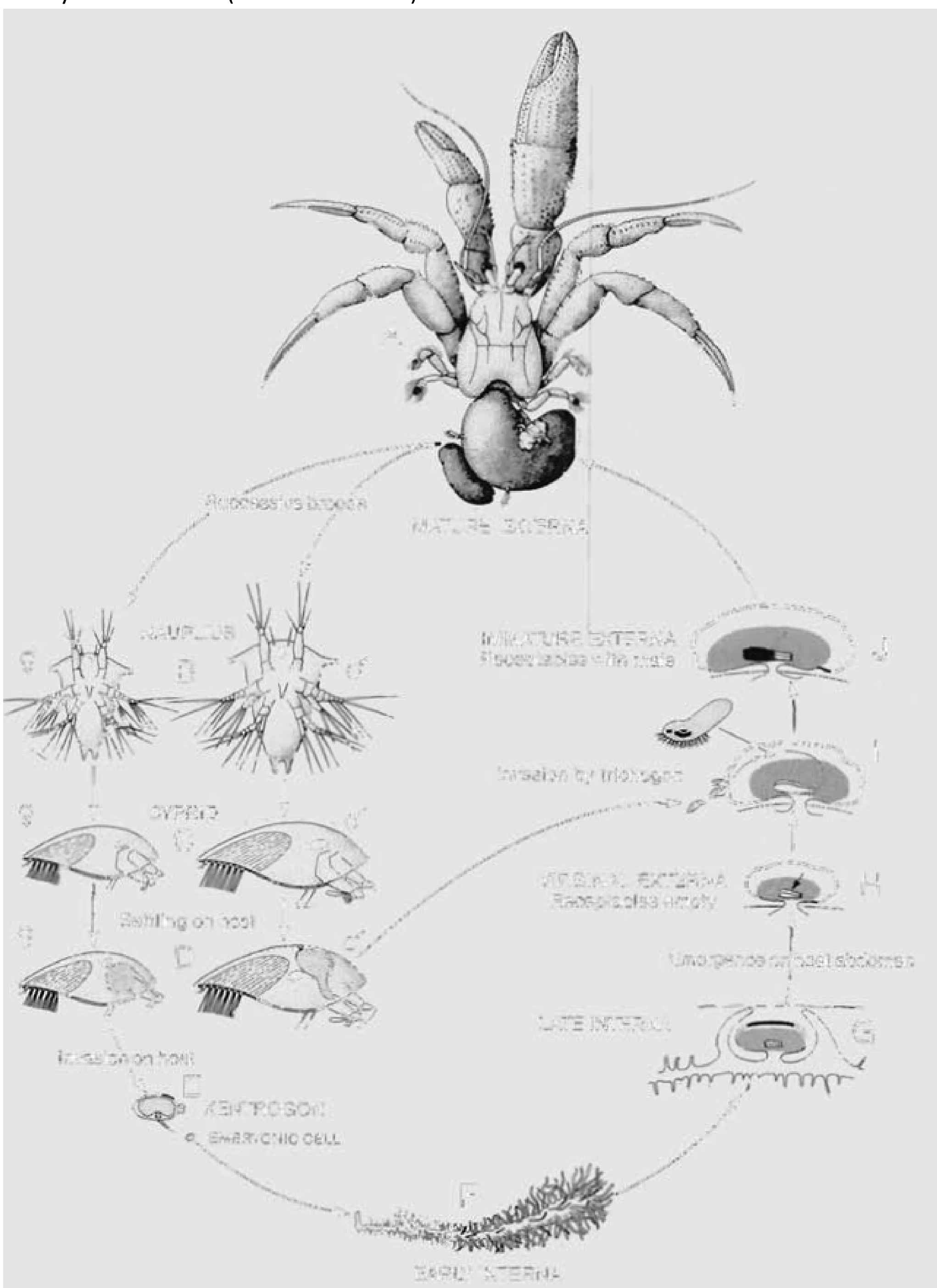
Paralithodes californiensis (Monterey Bay Aquarium)

P. rathbuni (from Wikimedia Commons)

The parasitic barnacle is not an ectoparasite, but an endoparasite with an exterior manifestation. The main body of the barnacle consists of a ramifying array of roots extending through the host tissues, all having grown from the initial tissue inoculation (see Noever et al 2016a). The exterior portion of this is the brood sac, a massive accumulation of eggs that protrudes through the soft ventrum of the crab and curls under it, covered by the flap-like abdomen itself. This is the largest such structure within the rhizocephalan parasitic barnacles (Nagler et al 2017). One would think the crab would be quite upset about this pouch hanging through its body, but no, that is not the case. *Briarosaccus*, like many other parasites, is adept at manipulation of the host via chemicals it secretes. Here, the crab is not only sterilized by the barnacle secretions (male and female crabs are both neutered), but is tricked into thinking that the brood sack represents it's own eggs. Normal brood care is extended by the host to the parasite eggs (by former males as well as former females), including grooming, protection, and irrigation with fresh seawater. Given the size of the barnacle externa, the crab must often stand on tip-toes to perform brood care. The externa itself is largely just a sack, but differs sufficiently in morphology that related species can be distinguished by its structure (Noever et al 2016b). Externae of

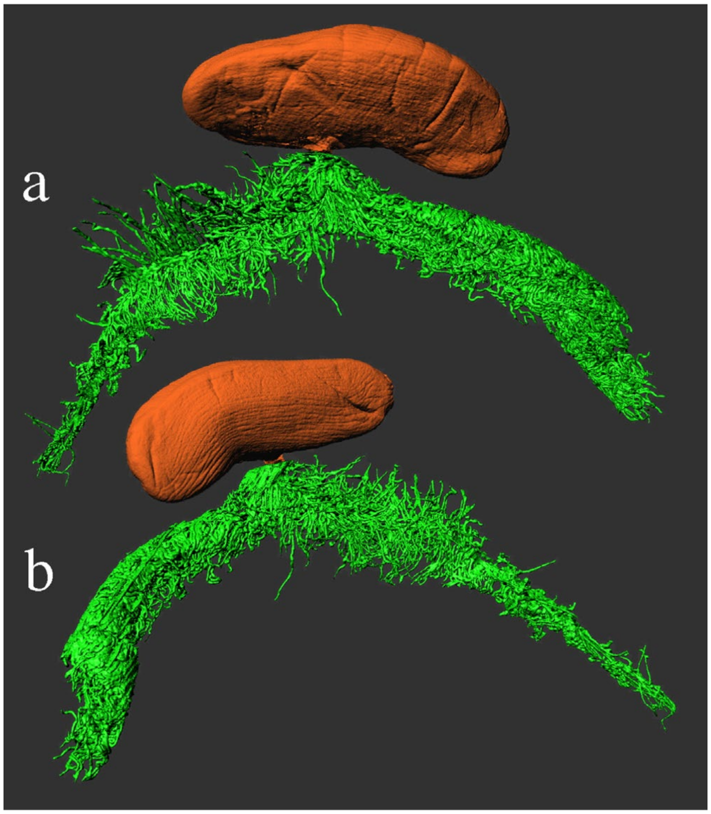


Briarosaccus, *B. regalis* (a) and *B. callosus* (b) are compared in this figure from Noever et al 2016b. In both cases **st** denotes the peduncle that protrudes through the crab abdomen, and **mo** is the aperture of the sack, through which the larvae are dispersed. *Briarosaccus regalis* was newly described as the barnacle parasite of *Paralithodes kamchaticus*, while *B. callosus* is the type of the genus, originally described from *Lithodes agassizi*. As they described two new sympatric species of parasitic barnacle from lithodids in Alaska Noever et al (2016b) found that the relationship with the host was specific and unique: each parasite being taken from only a single host species. They theorized that the pattern they observed could be generalized to lithodid/barnacle symbioses worldwide. If this is true, the two *Paralithodes* in local waters do not share a single parasite. This conclusion is at odds with statements by Høeg and Lützen (1995) that, while it was highly likely there were numerous undetected sibling species of rhizocephalans, these were not host specific. Their data was only morphological, so the latter molecularly generated information is more accurate, and host specificity, while not conclusively demonstrated, is the likely condition. This was supported experimentally by testing of cyprid attack on closely related crabs (Kuris et al. 2007).



Generalized life cycle of a kentrogonid rhizocephalan (from Høeg and Lützen 1995)

The life cycle of parasitic barnacles is a bit complex, but is laid out nicely by Høeg and Lützen (1995). The adult externa release nauplii, which metamorphose in the plankton into cyprid larvae, some male, some female. Male cyprids seek out mature externae of other barnacle parasites, and swim in through the aperture to fertilize the eggs the sack contains. Female larvae form the basis for host location and infection. Once a potential host is located (apparently via chemosensory cues) and the female cyprid settles it metamorphoses into an infectious kentrogon stage, with a hollow stylet. The host is pierced with the stylet and cells are injected into the host body which begin to coalesce and grow into the parasite internal structure.



Two individuals of *Peltogaster*, hermit crab parasites, showing the externae in brown, and the Largely filamentous structure of the endoparasite itself. (from Noever et al 2016a)

What is the mechanism through which the barnacle parasite controls the crabs sexuality, growth, molting and behavior? Above secreted chemicals were assumed, but another possibility exists. Recent investigations (Miroliubov et al 2020) suggest that specialized rhizocephalan root structures directly interact with host nervous tissue, and that this interaction is mediated by serotonin (Lianguzova et al 2023). While this may be only one of several different interaction modes, it seems well demonstrated. So chemicals, yes, needed for control: but specialized structure as well. The result, a chilling collaboration between host and parasite, with the parasite directing a zombified host to take care of its young “as if they were your own”. And yet the story does not end here.

Over two hundred years before the comedian Tom Lehrer spouted memorable doggerel on TVs “That Was The Week That Was”, Jonathan Swift was doing the same. He penned “Big fleas have little fleas upon their backs to bite them, and little fleas have lesser fleas, and so *ad infinitum*” in 1733. This serves as a near perfect exposition of the idea of hyperparasitism (van As 2019). The relationship between crab and barnacle has a third partner, the amphipod egg hyperparasite or parasite (depending on which eggs), *Myzotarsa anaxiphilius* Cadien and Martin 1999, which lives on the two King Crab species as well. When they are found on parasitized crabs, which have no brood of their own, they are apparently hyperparasites feeding on the eggs of the barnacle externa. When they occur on unparasitized crabs they are found among the crabs own brood and are apparently egg parasites of the crab. Actual consumption of eggs has not yet been observed in either case, but guts are routinely filled with material identical in appearance and consistency with the contents of arthropod eggs. The amphipods are specialized for life as ectosymbionts of larger organisms: equipped with sucker cups to keep them firmly attached to the soft and often slick surfaces they occupy. Ambulation with these has been observed in the field in glass sea-water filled vials. There is apparently no release valve for these cups, as the amphipods must twist their legs to release the suction.

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