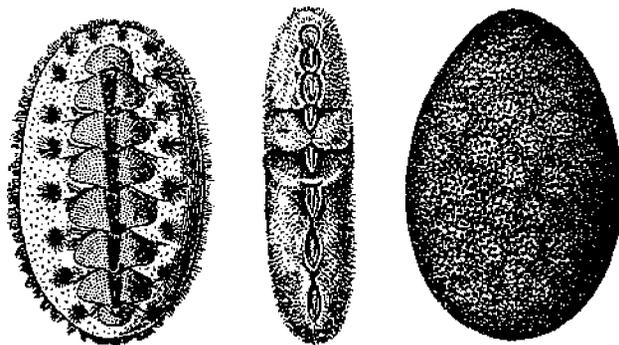


April, 1997

SCAMIT Newsletter

Vol. 15, No.12

NEXT MEETING:	Biology and Taxonomy of California Chitons
GUEST SPEAKER:	Dr. Doug Eernisse, Cal. State, Fullerton
DATE:	6 May 1997
TIME:	9:30 am - 3:30 pm
LOCATION:	Times-Mirror Room, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles



External morphology of several chiton species
(from Simroth, H. 1893-4. II. Ordnung.
Polyplacophora pp. 234-355 IN: Bronn, H. G.
Klassen und Ordnungen des Tierreichs: Band 3 -
Mollusca)

MAY 6th MEETING

Dr. Doug Eernisse of Fullerton will be guest speaker, and will discuss biology and taxonomy of local chitons. Although these animals seldom show up in our samples, they cause difficulties for exactly that reason. Dr. Eernisse will give us a preview of the new key to offshore species he will introduce in the Taxonomic Atlas. Please round up any problem specimens you have taken, and bring them along. We will be able to view specimens from the collection of the Natural History Museum to help answer any questions not resolved by the specimens at hand.

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

NEW LITERATURE

Some Pacific members of the shrimp family Axiidae are reviewed, and several new species described by Kensley (1996). One of the new species, *Eiconaxius baja*, is probably what was reported as *Axius acutifrons* by Wicksten (1982) from south of San Clemente Id., but her specimens must be reexamined before this can be verified. She did not describe the animal in her paper, and her illustration leaves the presence/absence of a median carapace carina in doubt. Other species described are from outside our area of interest.

The crangonid shrimp genus *Argis* is treated by Komai (1997), who describes a new species from the northwestern Pacific. While well represented in more boreal waters, *Argis* has but one species in southern California waters (*A. californiensis*). Komai reexamines and redescribes several of the more poorly understood members of the genus, and provides a new generic key.

Warén (1993, 1996) discusses gastropods from the North Atlantic, many in poorly known groups. Although the overlap at the species level with material from the boreal Pacific is slight, his descriptions and comments at the generic level and above provide a basis for reexamination of our fauna in these groups. The Skeneidae, which comprise a good portion of each paper, were not discussed in McLean's (1996) examination of the offshore fauna of the northeastern Pacific. The Rissoidae, also extensively treated by Warén, were only briefly covered by McLean. An added bonus is the inclusion (in the 1993 paper) of a brief update on the groups assigned to the subclass Heterobranchia. Both these papers provide a wealth of SEM photographs of both shells and radulae, often of tiny species which have not been effectively illustrated previously.

The three predominantly intertidal "gooseneck" barnacles of the genus *Pollicipes* are given a truly exhaustive treatment by Barnes (1996). Every aspect of the biology of these animals is covered.

Decades of research by the author and her late husband show clearly in this review article, which should stand for the next century (with but minor additions) as THE source for information on the group.

The evolution of reproductive biology in a series of four eastern Pacific members of the anemone genus *Epiactis* was examined by Edmands (1996). This is another in a series of papers on the biology of this group. Interestingly, two of the four species could not be distinguished on the basis of allozyme analysis, but could be neatly segregated on the basis of DNA fingerprinting. Phylogenetic analysis suggested that the four species might belong to two differing genera, and that removal of *Cnidopus* from within *Epiactis* was supported. This is, however, only a limited preliminary analysis. One which encompasses all 18 members of the genus would be preferable.

Specific points in the biology of specific animals were covered by Deheyn et al (1996) and Nishi & Nishihira (1996). The former discuss arm morphology of the ophiuroid *Amphipholis squamata* including the basis of the animal's bioluminescence. Few ophiuroids are known to luminesce, but two local species - this and *Ophiopsila californica* - have had reports of bioluminescence explored and verified. Unlike many invertebrates, the light of these brittle-stars is not a product of symbiotic luminous bacteria; nor is it incorporated in a secreted product such as luminous mucus. The light is generated intercellularly by specialized "organs" associated with the nervous tissue in the arms. Ophiuroid light production has been interpreted by some as an aposematic anti-predation display.

Organism aging is the subject of Nishi & Nishihira. They examined the polychaete *Spirobranchus giganteus*, which lives in coral heads. Analysis of coral growth, which can be reliably dated by annual growth increments, indicated that most of the worms examined had an age of 10 years or more. One particularly slow-

growing individual seemed to be about 40 yrs old. While other polychaete species of equivalent size are probably not as old, we must consider the possibility that some worm species routinely live for extended periods. The *Spirobranchus* habitat is a particularly sheltering one, offering much protection from predation, and perhaps allowing the worms to attain extraordinary ages.

Growth rates in soft bodied invertebrates respond to a large number of environmental factors, and are sufficiently variable that laboratory growth rate-based age estimates are of dubious utility in estimating age in the wild. The current paper shows that at least some species can attain a ripe old age under natural conditions.

How bivalve mollusks handle particles they ingest is reviewed by Levinton et al (1996). They examine several existing models of particle processing in bivalves, and derive a conceptual framework for bivalve particle handling which stresses the interrelationships of the different portions of the process.

Modeling of the behavior of benthic worms in response to fish foraging, and the role such trophic interactions play in recruitment processes is discussed by Lindsay et al (1996). They point out that the restriction of feeding activity by infaunal adults in response to fish grazing increases the likelihood of successful larval recruitment around the adults.

A new method for evaluating fish stomach contents was presented by Assis (1996). The rationale for and mathematical derivation of the GII (Geometric Index of Importance) are detailed. The analytic results are quite amenable to graphic presentation.

The impact of grazing by amphipods on algae, and the response of the algae, are treated by Cronin and Hay (1996). Algae, which are usually viewed as passive victims in this encounter, prove to have a powerful counter

punch. They can manufacture and deliver toxic secondary metabolites to the site of the amphipod grazing in short order, making such sites significantly less interesting to the grazers.

Chemical defense in marine organisms in general is reviewed by Hay (1996). The subject is one of considerable interest, and has produced a great deal of experimental work in the last few years. Hay provides an admirable summary which knits together the various investigative threads into a cohesive fabric of explanation. Since there is a strong link to industry through marine natural products chemistry, it is likely that explorations into this subject will not suffer from the shortage of research funding found in many other areas.

POLYCHAETE BIBLIOGRAPHY

The first edition of the Polychaete Bibliography was distributed several years ago on CD-ROM. A second edition is now available as of 7April97, but now on the WWW rather than on CD-ROM.

The authors (Linda Ward and Kristian Fauchald of the Smithsonian Institution) feel that this method of distribution will probably allow much easier and more frequent updating. They continue to caution that the bibliography is not completely proofed, and must be assumed to contain errors of pagination, dating, etc. They recommend that users cross-check citations prior to publication in the bibliography of a paper.

The present edition has been put into the Papyrus format instead of that used in the 1st edition. It can also be downloaded as ASCII delimited text for those without Papyrus. The address for the bibliography is <http://www.keil.ukans.edu/~worms/bibliog/bibliowf.html>. As there are no plans to release this edition in any other medium, worm folks not currently on the web now have a strong inducement to get a modem and start.

RESULTS OF OFFICER ELECTION

The period for submission of ballots for election of 1997-1998 SCAMIT officers expired on 31 March 1997. Results of the balloting are provided below, with the number of votes for the incumbent and for write-in candidates indicated. The total number of ballots received was 21, representing a 23% turnout for the election.

OFFICE	INCUMBENT	OTHER
President	18	3
Vice-President	21	
Secretary	20	1
Treasurer	21	

The newly elected officers will take over from the incumbents at the May meeting. The officers thank the membership for expressing approval through their votes of the way in which we have performed our duties. It should be pointed out, however, that with a less-than-majority turnout it is quite possible that the majority are very upset with the way things are going and avoided the election in protest! Let us know which it is. The only comment on job performance received with the ballots was a statement that "the info and communication is wonderful." Other comment, either laudatory or defamatory is solicited. Requests for information on open ocean medusae and gammarid amphipods were submitted as suggested meeting topics. Our thanks to all respondents for their participation, and an invitation to all non-participants to join in the process next time.

SCAS MEETINGS REMINDER

The preliminary program for the 106th annual meetings of the Southern California Academy of Sciences has been distributed. The meetings take place on May 2-3, a Friday and Saturday, as is usually the case. Pre-registration closed on the 11th of April. Registration at the meetings is \$50

for the two-day meeting for members, \$60 for non-members. Single day attendance is \$35. Scheduled symposia on Friday morning are Larval Recruitment of Fishes; Southern Deserts, Geology and Ecology; Southern California Geology; and Environmental Justice and Land Use. Friday afternoon symposia are: Southern Deserts, Archaeology, Geography, and Restoration; Coastal and Estuarine Biology; and Measurement of Ecosystem Processes.

On Saturday morning the symposia are Unwanted Aliens - Non-native Plants and Animals; Anthropology Frontiers - A Holistic Approach; Marine Invertebrate Biology; and the Plenary Session. Symposia on Fish Biology; and Terrestrial Biology will take place on Saturday afternoon. Several members are listed among the speakers. See you there!

CNIDARIAN WORKSHOP PROCEEDINGS

The two-day workshop held on 10-11 April at Dancing Coyote Ranch was attended by John Ljubenkov - who organized and led the proceedings, Dean Pasko and Megan Lillie from CSDMWWD (both days), Dr. Eric Hochberg from Santa Barbara Museum of Natural History (both days), Dave Laur from UCSB (both days), Don Cadien from CSDLAC (both days), Ron Velarde from CSDMWWD (Thursday), Tony Phillips from LACEMD (Friday), and Dr. John Rees from the Alameda Naval Air Station (Friday). Topics considered were corymorphine hydroids (including both polyp and medusa generations), and anemones (primarily athenarians). Anthozoans were discussed on Thursday, and hydrozoans on Friday.

A SCAMIT business meeting began the day during which Dr. Hochberg expressed his gratification at seeing the commentary on his chapters in Volume 14 of the Taxonomic Atlas (discussed in the last Newsletter), and requested a

copy so he could begin considering our comments. He also expressed interest in participating in the planned second meeting devoted to Volume 14, at which we would meet with several of the authors and directly address our comments and concerns. His schedule, and that of Mary Bergen, who would also like to participate, will force this second meeting into the fall.

After the business meeting the workshop itself commenced with a useful introduction to the identification of anemones by John Ljubenkov. He detailed the process, giving the sequence of observations, and the data to be gathered at each stage. He also distributed a handout (attached) which summarized the process. At the end of this he provided a printout of the 221 anemone genera in the world and a brief characterization of each taxon on the basis of tentacles, sphincter, and foot type. This information is derived from Doumenc and Foubert (1984). Tabular entries are: c=cyclic tentacles, r=radially arranged tentacles, m=mesogloal, en=endodermal sphincter, D=pedal disc, P=physa.

Slides of *Scolanthus sp A* were viewed to provide orientation for structures visible in either cross or longitudinal sections. Interpretation of the slides was assisted by the diagram John provided in the handout. We also had a practical demonstration of the methods of sectioning specimens using a very large specimen of *Halianthella sp. A* as a test organism. John said he has found that sharp fine-bladed scalpels work better than micro-scissors for these preparations, as they yield cleaner cuts.

John showed us a cross-section of the animal to illustrate the nature of the primary and secondary endocoels, and how they can be distinguished by the nature of the muscles and mesenteries which form them. We were also able to examine the mesogloal sphincters of the animal in the preparation. Recognition of sphincter structure has been a problem for many of us in the past, and this demonstration helped clarify what we

needed to see in the preparation.

After this discussion and demonstration of the procedures, we began consideration of one group of anemones, the Edwardsiidae, which form the majority of the anemones taken in soft bottom monitoring programs in the southern California Bight. Species considered were *Edwardsia californica*, *E. sp A*, *E. sp G*, and *Scolanthus sp A*. We did not discuss *E. sipunculoides* (except with reference to how other species differed from it) or *Metedwardsia sp A*.

Large specimens of all the above species were available for comparison, and all except the last two were examined by the attendees. All of the edwardsiids examined can be separated on external characters of the column, the physa, and the nemathybomes. Examination of the cnidom of the tentacles, the body wall, and nemathybomes would provide additional confirmatory evidence to support identifications based on external characters, but is only rarely necessary. Most attendees had not previously seen *Edwardsia sp A*, which both occurs in deeper water than the other species, and is rarer. Two specimens were examined, one from off Orange County at 600ft., and one from off Palos Verdes at 305m. Both specimens showed the deep longitudinal furrowing of the body and lobation of the physa which reflects the convexity of the body wall between the mesenterial insertions.

We also discussed the generic separation of the genera *Scolanthus* and *Edwardsia*. The primary difference between the two is that *Edwardsia* has histological differentiation in the physa, it differs in tissue type from the animal's column and capitulum. In *Scolanthus* such differentiation is lacking. This separation follows that introduced by Carlgren, and reiterated by Williams (1981).

Other families were not systematically examined in the same sense that the Edwardsiidae were. We examined individual species instead. Participants examined and compared specimens of

the cerianthiid *Arachnanthus sp A*, *Pentactinia californica*, *Limnactiniidae sp A* (probably a *Limnactinia*, currently the only named genus in the family), *Zaolutus actius*, *Flosmaris grandis*, *Halcompa decemtentaculata*, and *Anemonactis sp A*, and the brown tent anemone (*Anemone* #76, still of unknown affinities). We mentioned, but did not examine, *Harenactis attenuata*.

It became apparent during these examinations that what most of us had been identifying as *Zaolutus actius* John would identify as *Flosmaris grandis*. Dean Pasko began a cross-comparison of the descriptions of these two species, and found them to share many characters. The possibility was raised that the two might actually be synonyms, with *Flosmaris grandis* representing the fully mature adult form and *Zaolutus actius* described from more juvenile material. John Ljubenkov and Don Cadien will both compare the two descriptions in detail in an attempt to place species separation on a firmer basis, or confirm the synonymy of the two taxa. Should the two prove to be indistinguishable based on their original descriptions, the type material will need to be reexamined. If they are found to be the same, *Zaolutus* has priority.

The first day ended with most people heading off home, only Don Cadien, and John Rees (who arrived that evening) stayed at the Rancho. We were treated to a very fine view of comet Hale-Bopp in the dark night sky of the mountains.

The second day of the workshop was devoted to hydroids. We began with a presentation by John Rees of his research on hydroids at the Alameda Naval Air Station in San Francisco Bay. John's facilities are immediately adjacent to his study area, and this proximity has allowed not only close and frequent observation of hydroid colonies *in situ* on the docks of the Station, but rearing of the animals through their life cycle in several cases. He maintains that with the corymorphine hydroids, which formed the basis of much of his work, you can only be sure of the

relationship between the medusa and hydroid stages if you have raised one into the other. Characters overlap considerably in most of the members of many genera, and separations between genera are often seen in only one part of the life cycle. John used the hydroid genera *Sarsia* and *Polyorchis* as examples of these difficulties. He showed how subtle the differentiation of young medusae can be in these two closely related genera.

He pointed out, for instance, that the medusa illustrated by Brinckmann-Voss (1977) as immediately post-release *Polyorchis* is actually a *Sarsia* based on criteria he employs to identify these genera. He maintains that the polyp stage of *Polyorchis* remains unknown, despite determined search of probable habitat by several workers. Although it is possible that the polyp stage of this organism is both small and drab, Dr. Rees feels intuitively (as does Cadet Hand) that the hydroid stage will turn out to be something rather bizarre in structure and/or habitat.

Our focus shifted away from medusa stage to polyp stage in consideration of corymorphine hydroids of the genera *Corymorpha* and *Euphysa*. Characters of the medusa generation were also mentioned, but will not be detailed here. This discussion was again led by John Ljubenkov.

These species are some of the most conspicuous soft-bottom hydroids taken in our area. They do not require presence of hard substrate fragments in the surface sediments for attachment. They are unattached, and maintain their position by rhizoidal filaments at the base of the perisarc which extend into the sediment and which may be attached to several individual sediment grains along their length.

The two genera, which have been inadequately separated in the past, can be cleanly differentiated (at least the California representatives) by two criteria according to John Ljubenkov. First, in *Corymorpha* the small light-colored round bodies

called "growth buds" or "growth papillae" are arranged linearly in rows extending along the stalk near its base, while in *Euphysa* they form a circle or cluster around the stalk just below the line of demarcation below the hydranth were the perisarc ends. Secondly the tentacles of *Corymorpha* are always villiform, while those of *Euphysa* may be either capitate or moniliform.

We currently have two species of *Corymorpha* in our fauna, the bay species *Corymorpha palma*, and the offshore species *Corymorpha "bigelowi"*. The quotation marks were used to indicate that John Ljubenkov is convinced that the animal we know as *C. bigelowi* is a local endemic, rather than a broad ranging or introduced Indo-Pacific species (as it was considered in Sassaman & Rees 1978). He plans to redescribe and name the species based on additional material of the polyp generation which is considerably more mature than that described by Sassaman & Rees.

Distinguishing between the two species hinges on the presence of gonangia. These are of two different types. In *C. "bigelowi"* the gonangia form gonostyles on which medusa buds develop, eventually being released as free medusae. In most specimens (even small ones) these buds are clearly visible and can be recognized as developing medusae.

In *C. palma* the gonangia are cryptomedusae. These are banana shaped structures which do not develop medusa buds. They are actually sessile medusae which remain attached to the polyp. As they mature they become filled with eggs or sperm depending on the sex of the polyp. In either case the cryptomedusae look much the same externally. Eventually the reproductive products are shed into the water, where fertilization occurs and planulae develop.

So far the separation in habitat between these two species has been perfect, with no overlap. *C. palma* is found on mudflats, tidal runnels, and in very shallow muddy inner bay habitats. *C.*

"bigelowi" is found off-shore on the continental shelf, and on subtidal bottoms in the deeper outer portions of bays. The larger of the two is *C. palma*, with *C. "bigelowi"* attaining at most 1/3 the size of 75mm tall mature adult *C. palma*.

Three species of *Euphysa* are known from the northeast Pacific, *E. ruthae*, *E. sp A*, and *E. sp B*. Specimens identified in the past as *E. aurata* from our coast are actually *E. sp A*. The first of these is found only in the Puget Sound region, and is characterized by its long, narrow and non-tapering stalk. Both the provisional species have relatively short tapering stalks.

Euphysa sp A can be distinguished from *sp B* by having a single row of growth buds, while *sp B* has a band of numerous small growth buds. The two species also differ in tentacle configuration. In *sp A* the oral (distal) tentacle whorl consists of short slightly capitate tentacles, while the aboral (proximal) whorl is moniliform. In *sp B* both whorls are fully moniliform. At present *sp B* is known only from off Pt. Arguello, while *sp A* is widely distributed on the shelf of the Southern California Bight. Both species are in manuscript, and will be described in the Taxonomic Atlas volume dealing with cnidarians.

By mid-afternoon participants began to slip away to begin the long drive back to their homes. Those of us who stayed longest took a look at a number of cnidarians (along with many other types of organisms) on videotape. John Ljubenkov had shot the tape fairly recently during a submarine dive off Richardson's Rock at the northern end of the Northern Channel Islands. The tape showed a terrain of gigantic boulders, deeply undercut shelves, and great topological complexity at a depth of roughly 75m. Current action was strong as evidenced by rapid lateral movement of objects in the water column. Many tantalizing glimpses were afforded of animals we couldn't quite identify, as well as a number of standard hard-bottom community members.

WEBPAGE UPDATE

The editor met recently with our volunteer website administrator Larry Cooper (SCCWRP). We discussed how our site was set-up, modified some of the existing files (hopefully improving them in the process), and laid some plans to further automate the process of updating on a regular basis. Larry will be putting in the links to other sites we submit to him, so get candidate links submitted (e-mail is probably the easiest way). Feedback from member Jay Shrake (KLI) indicates a good degree of enthusiasm for our move into the electronic arena. He submitted a large packet of recommended URLs for us to link up to. Most comments so far have been positive; thanks. Suggestions for further improvement are more than welcome, they're required. If you have input, put it in!

PRIVACY

With SCAMIT now providing both paper and electronic versions of the Newsletter, new problems have emerged for our consideration. In the past privacy was not much of an issue, since things included in the Newsletter were going to a select (and known) group of interested parties. With the move into the electronic medium we come smack dab into conflict with the Law of Unintended Consequences. We must begin to consider, as individual members, what will happen to information submitted to the Editor for inclusion in the Newsletter. Some degree of explicitness is required to assure that things not approved for wide dissemination are not ported across to the Net with the electronic version. Anything which a member has indicated he/she does not wish placed on the Website will be removed prior to the transfer process.

The editor's consciousness of the nature and severity of the problem is improving, but he is not yet wise enough to carefully tease out the desires of each contributor, especially when the

information arrives second or third-hand. Please attempt to alert us to potentially sensitive information, or information which you just don't want made available on the WWW, so that it can be restricted to paper-only distribution. This is particularly true of information of a personal nature, such as address, telephone, or other information pertaining to an individual.

We are interested in providing this information to the membership, and also to other interested parties who may want to contact a member. We **DO NOT** want to compromise your privacy, however, so let us know of information you don't wish to have posted to the SCAMIT Website.

Campylaspis rufa TAKEN

A single specimen of the small cumacean *Campylaspis rufa* was recently taken off Pt. Loma. Previous records of the species were restricted to areas further to the north, although it had been recorded from the Southern California Bight (unpublished agency records) and was on the SCAMIT Taxonomic List Edition 2. The previous southern record was from Santa Monica Bay, so the record from 328 ft. off Pt. Loma is roughly a two degree southern range extension. The species had not been reported by Given in his thesis, and is listed as ranging only as far south as Pt. Conception by Watling and McCann (MS). The later report lists depth of occurrence as ranging from 200 to 565m., so the current record extends the distribution inshore to 101m as well.

JOB OPPORTUNITY

An inquiry was received from Gary Gillingham (KLI) trying to find someone to identify oligochaetes from the San Francisco Bay/Delta area. He thinks he will have up to 60 0.1m² samples (sieved through a 0.6mm screen) per month for a period of three years (2160 samples). You can contact him to express interest, or to

pass on the name of someone else who might wish to be involved at kinnetic@cruzio.com

AN ARTICLE ON ARTICLES

Pleijel's 1993 publication of Polychaeta Phyllodocidae (Marine Invertebrates of Scandinavia No. 8), included a SEM photograph of *Eteone* cf. *flava* that shows regular cilia patches along the frontal antennae (page 138). Until now, other illustrations and descriptions have regularly described *Eteone* frontal antennae as smooth or cylindrical.

Inspection of local Southern California *Eteone* specimens under 400X magnification shows the antennae are not merely cylindrical, but are articulated into 3-5 segments. The observed degree of articulation seems to vary between specimens. However, of the dozen or so specimens examined so far there is a clearly demarcated terminal segment and usually 3-4 more basally arranged segments. On some specimens this may appear as regularly organized intervals of constriction along the antennal walls. Other specimens have an internal membranous separation between each article. At least one specimen appeared to also have fine tufts of cilia at the point of antennal wall constriction. This articulation has been observed on both dorsal and ventral antenna, but seems more apparent in dorsal antennae. No claim of diagnostic value is made at this time. This micro-anatomical feature may become more useful after additional specimens have been carefully inspected.

- Tom Parker (CSDLAC)

SPECIMEN REQUEST

Dean Pasko (CSDMWWD) passed on a request for specimens from a researcher interested in the molecular phylogeny of the anomuran crab family Lithodidae. They currently have material of the following species: *Hapalogaster mertensii*, *Oedignathus inermis*, *Cryptolithodes sitchensis*,

Cryptolithodes typicus, *Paralithodes camtschaticus*, *Lopholithodes mandtii*, and *Phyllolithodes papillosus*. A number of other species have been taken in our area, including *Paralithodes californiensis* and *P. rathbuni*, *Lopholithodes foraminatus*, *Hapalogaster cavicauda*, *Glyptolithodes cristatipes*, *Lithodes couesi*, *Paralomis multispina* and *P. verrilli*. Samples of any of these species would probably be welcome. Material sent to her should be initially preserved in ethanol (80 % or greater).

Entire animals are not necessary, the tissue from a leg of a small animal or a portion of the leg of a larger animal would be sufficient. Please take care to identify the source organism. I am sure that full collection information would also be desired, including sex and wet weight of the individual. It might be a good idea to provide a photograph of the animal from which the tissue was taken (if one is available) as support for the field identification.

The request came from Stefanie Zaklan, Bamfield Marine Station, Bamfield, B. C., Canada VOR IBO. She can also be reached at zaklan@bms.bc.ca, or by phone at (250) 728-3301.

RESEARCH SEMINAR

The Spring 1997 Research Seminar Series at the Natural History Museum of Los Angeles County still has several seminars remaining. A list of them is attached. The Thursday 8 May pair looks particularly interesting to those with a marine bent.

TRACE OF EL NIÑO

On the second day of the Cnidarian Workshop Dean Pasko (CSDMWWD) brought a live animal taken by the agency during their trawls on the previous day. It proved to be a juvenile specimen of the target shrimp, *Sicyonia penicillatus*. The presence of this shrimp in our area seems to

indicate northward water transport from larval source areas on the outer side of the Baja California Peninsula. Although the species has been previously taken in our waters, it is an infrequent visitor to the Californian province with no known local breeding population. I had not seen one in our area since three specimens were taken in the vicinity of Los Angeles-Long Beach Harbors during the 1983-84 El Niño. Tony Phillips (CLAEMD) was in attendance and noted that a much larger mature animal had been taken in Santa Monica Bay during their 1996

sampling. These animals are markers of warm water influence. The 1996 specimen might have been the last gasp of larvae which arrived during an earlier warm water intrusion, perhaps the same one which brought large numbers of tuna crabs (*Pleuroncodes planipes*) into the waters off-shore of the Palos Verdes Peninsula in 1996. The presence of a juvenile specimen off Pt. Loma in 1997 would seem to indicate another separate warming event is about to take place or is actually underway.
-Don Cadien (CSDLAC)

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Natural History Museum of Los Angeles County

Research Seminar Series

Spring 1997

Thursday 20 March 1997. *The Origin of Rheumatoid Arthritis 6,000 Years Ago In North America.* **Bruce Rothschild, Northeast Ohio University Campus of Medicine.**

Thursday 17 April, 1997. *The Phylogenetic Placement of Snakes within Squamata as inferred from Morphological and Molecular data.* **Tod Reeder, San Diego State University**

Thursday 8 May 1997. *Eye Lens Pigmentation In Fishes: Biochemistry, Ecology, and Evolution.* **Mason Posner, U.S.C. Graduate Student in Residence, LACM.**

and

Evolution of the Sea Basses of the Genus Paralabrax.
Guillermo Herrera, U.S.C. Graduate Student in Residence, LACM.

Natural History Museum of Los Angeles County, Times Mirror Room
Seminars begin at 3:00PM, coffee and refreshments at 2:30PM
For more information contact Dr. J.D. Stewart (213) 744-3318

All welcome!

Tips on the Identification of Anemones

By John Ljubenkov

What do you need to look at to identify an anemone? If you have an anemone in front of you, what are the characters you should look at in order that you may recognize it again? Below is a list of things I look for in a 'new to my eyes' anemone which help me to visualize its exact structure. You need a dissecting and a compound microscope with slides etc., a sharp scalpel, fine forceps, and a steady hand.

1. First look at the base of the anemone to determine whether it has a strongly developed **foot** with parieto-basilar musculature. If so it is in *Thenaria*. If it has just a swollen foot with no musculature (a **physa**) then it's in *Athenaria*. This is usually obvious from external examination, but if it is not a cross section as close to the foot as possible is necessary.

2. Does it have a sphincter? If it does, then is it *Endodermal* or *Mesogloal*? For this you need to cut through the margin. Most infaunal anemones lack a sphincter or have exceedingly poorly developed ones so most anemones from monitoring programs do not have them.

3. What is the exact arrangement of the mesenteries? Find the primary (1°) and secondary (2°) pairs of mesenteries by examining on which side of the mesenteries the musculature sits. For this you need to slice as good a cross section as you can. 8-way or octamerous symmetry indicates possible 'Edwardsiid' relationships whereas 6-way or hexamerous is a more usual condition. When pedal laceration or other asexual methods of reproduction occur, then these patterns of symmetry may be obscured. I believe that this is one of the more important characters. Remember that Anthozoa are **bilaterally symmetrical** not radially symmetrical.

4. How are the cycles of tentacles arranged in relation to the cycles of mesenteries? Usually one tentacle arises from between each two mesenteries regardless of which cycle they belong to, but the two sets of cycles correspond. *Corallimorpharia* (e.g. *Corynactis*) may have more than one per endocoel, as may the *Stichodactylinae* or Carpet anemones. What are the exact type of tentacles? Capitate, viliform, bumpy, colors etc.

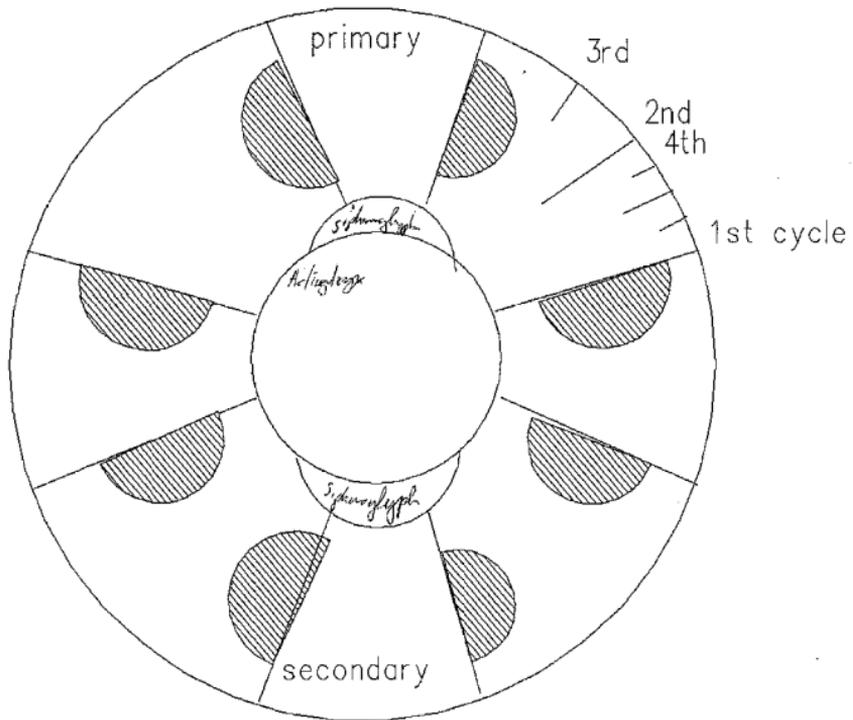
5. Mesenteries and their associated tentacles are arranged in 'cycles'. The first mesenteries to arise are usually the longest and are defined as the 1° cycle. The 1° and 2° pairs of mesenteries are at opposite sides of the actinopharynx / mouth. Color patterns also tend to reflect the internal symmetry, e.g. the bases of the tentacles associated with these pairs of mesenteries may be specially marked.

6. What is the column like in relation to other body features? What surface structures such as vesicles, warts, verrucae, cinclides etc. cover the surface?

7. In order to make a nematocyst preparation: take a small piece of flesh from the desired region. Macerate the flesh with forceps on a slide to break up the flesh. Place a drop of water on and then a cover slip. Apply pressure to the cover slip with your thumb and gently move the cover slip around to further grind up the flesh underneath. View under oil immersion at 1000x. This data is more useful at a generic level rather than a specific level in identifications.

8. Biological factors: sed. type, depth, life history and ecology.

9. Do your best to draw what you see. It is the only way to codify and eventually see the characters necessary.



026
~~Diagram~~ numerous anemone body plan

Anemone genera									
<u>Genus</u>	<u>Author</u>	<u>Date</u>	<u>Tentacle</u>	<u>Sphincte</u>	<u>Foot</u>				
<i>Acontiophorum</i>	Carlgen	1938	C		D				
<i>Acraspedanthus</i>	Carlgen	1924	C	M	D				
<i>Acthelmis</i>	Lutken	1875	C		P				
<i>Actinauge</i>	Verrill	1883	C	M	D				
<i>Actinera</i>	Blainville	1830	R	EN	D				
<i>Actinermis</i>	Verrill	1879	C		D				
<i>Actinia</i>	Browne	1756	C	EN	D				
<i>Actinogeton</i>	Carlgen	1938	C	EN	D				
<i>Actinodendron</i>	Blainville	1830	R		D				
<i>Actinodiscus</i>	Blainville	1830	R	EN	D				
<i>Actinoporus</i>	Duchaissang	1850	R	EN	D				
<i>Actinoscyphia</i>	Stephenson	1820	C	M	D				
<i>Actinostephanus</i>	Kwietniewski	1897	R		D				
<i>Actinostola</i>	Verrill	1883	C	M	D				
<i>Actinothoe</i>	Fisher	1889	C	M	D				
<i>Adamsia</i>	Forbes	1880	C	M	D				
<i>Aiptaisia</i>	Gosse	1858	C	M	D				
<i>Aiptasiogeton</i>	Schmidt	1872	C	M	D				
<i>Aiptasiomorpha</i>	Stephenson	1920	C	EN	D				
<i>Alicia</i>	Johnson	1861	C		D				
<i>Allantactis</i>	Danielssen	1890	C	M	D				
<i>Amphianthus</i>	Hertwig	1882	C	M	D				
<i>Andresia</i>	Stephenson	1921	C	EN	D				
<i>Andwakia</i>	Danielssen	1890	C	M	P				
<i>Anemonactis</i>	Andres	1880	C		P				
<i>Anemonia</i>	Risso	1826	C	EN	D				
<i>Antholoba</i>	Hertwig	1882	C	M	D				
<i>Anthopleura</i>	Du&Mi	1860	C	EN	D				
<i>Anthostella</i>	Carlgen	1938	C	EN	D				
<i>Anthothoe</i>	Carlgen	1938	C	M	D				
<i>Antiparactis</i>	Verrill	1899	C	M	D				
<i>Antosactis</i>	Danielssen	1890	C	M	D				
<i>Artemidactis</i>	Stephenson	1918	C	M	D				
<i>Aureliana</i>	Andres	1883	R	EN	D				
<i>Austroneophellia</i>	Zamponi		C	M	D				
<i>Bartholomea</i>	Duchassaing & Mi	1866	C	M	D				
<i>Bathydactylus</i>	Carlgen	1928	C	M	D				
<i>Bathypheilia</i>	Carlgen	1932	C	M	D				
<i>Bolocera</i>	Gosse	1860	C	EN	D				
<i>Boloceractis</i>	Pannikar	1937	C		D				
<i>Boloceroidea</i>	Carlgen	1899	C		D				
<i>Botoceroopsis</i>	McNurich	1904	C	EN	D				
<i>Botryon</i>	Carlgen & Hedgp	1952	C	M	D				
<i>Botryon 2</i>	Carlgen & Hedgp	1951	C	M	P				
<i>Bunodactis</i>	Verrill	1899	C	EN	D				
<i>Bunodeopsis</i>	Andres	1880	C		D				
<i>Bunodosoma</i>	Verrill	1899	C	EN	D				
<i>Cactosoma</i>	Danielssen	1890	C	M	P				
<i>Catamactinia</i>	Carlgen	1949	C		P				
<i>Catamactis</i>	Carlgen	1949	C		P				
<i>Calliactis</i>	Verrill	1869	C	M	D				

ACTIN.WDB

<u>Genus</u>	<u>Author</u>	<u>Date</u>	<u>Tentacle</u>	<u>Sphincte</u>	<u>Foot</u>
<i>Carcinactis</i>	Rieman-Zurneck	1975	C	M	D
<i>Carligenia</i>	Stephenson	1929	C		D
<i>Cataphellia</i>	Stephenson	1929	C	M	D
<i>Cereus</i>	Oken	1815	C	M	D
<i>Charisea</i>	Torrey	1902	C	EN	D
<i>Charisella</i>	Carligen	1949	C	EN	D
<i>Chondrophellia</i>	Carligen	1928	C	M	D
<i>Choriactis</i>	McMurrich	1904	C	M	D
<i>Cladactella</i>	Verrill	1928	C	EN	D
<i>Cnidanthus</i>	Carligen	1927	C	M	D
<i>Cnidopus</i>	Carligen	1934	C	EN	D
<i>Condylactis</i>	Du&Mi	1866	C		D
<i>Condylanthus</i>	Carligen	1899	C	EN	D
<i>Coralimorphus</i>	Moseley	1877	R		D
<i>Corynactis</i>	Aliman	1846	R		D
<i>Cribinopsis</i>	Siebert & Spauldi	1976	C	EN	D
<i>Cricophorus</i>	Carligen	1924	C	M	D
<i>Cryptodendron</i>	Klunzinger	1877	R	EN	D
<i>Dactylanthus</i>	Carligen	1911	C	EN	D
<i>Daontesia</i>	Carligen	1942	C	M	D
<i>Decaphellia</i>	Bourne	1918	C	M	D
<i>Diadumene</i>	Stephenson	1920	C		D
<i>Dofleinia</i>	Wasilieff	1908	C	EN	D
<i>Drillactis</i>	Verrill	1922	C		P
<i>Edwardisia</i>	Quatrefages	1842	C		P
<i>Edwardsiella</i>	Andres	1881	C		P
<i>Entacmaea</i>	Ehrenburg	1834	C	EN	D
<i>Epilactis</i>	Verrill	1869	C	EN	D
<i>Epiparactis</i>	Carligen	1921	C	M	D
<i>Epiphellia</i>	Carligen	1949	C	M	D
<i>Evactis</i>	Verrill	1869	C	EN	D
<i>Exocoelactis</i>	Carligen	1928	C	M	D
<i>Fagesia</i>	Delphy	1938	C		P
<i>Flosmaris</i>	Stephenson	1920	C	M	D
<i>Galeanthemum</i>	Carligen	1956	C	M	P
<i>Glyphoperidium</i>	Roule	1909	C	EN	D
<i>Glyphostylum</i>	Roule	1909	C		D
<i>Gonactinia</i>	Sars	1851	C		D
<i>Gyrostoma</i>	Kwietniewsky	1898	C	EN	D
<i>Hadalanthus</i>	Carligen	1956	C	M	D
<i>Halcampa</i>	Gosse	1858	C	M	P
<i>Halcampactis</i>	Farquhar	1898	C		D
<i>Halcampaster</i>	Carligen	1938	C		D
<i>Halcampella</i>	Andres	1883	C	M	P
<i>Halcampogeton</i>	Carligen	1937	C		P
<i>Halcampooides</i>	Danielssen	1890	C		P
<i>Halcurias</i>	McMurrich	1893	C		D
<i>Haliactis</i>	Carligen	1921	C		P
<i>Halianthella</i>	Kwietniewski	1896	C	M	D
<i>Haliplanella</i>	Hand	1956	C		P
<i>Haloclava</i>	Verrill	1899	C		D
<i>Harenactis</i>	Torrey	1902	C		P
<i>Heteractis</i>	Milne-Edwards	1857	C	M	D

ACTIN.WDB

<u>Genus</u>	<u>Author</u>	<u>Date</u>	<u>Tentacle</u>	<u>Sphincte</u>	<u>Foot</u>
<i>Heteranthus</i>	Klunziger	1877	C	EN	D
<i>Heterodactyla</i>	Hemprich & Ehren	1851	R	EN	D
<i>Homostichanthus</i>	Duerden	1900	R	EN	D
<i>Hormathia</i>	Gosse	1851	C	M	D
<i>Hormathianthus</i>	Carlgen	1943	C	M	D
<i>Hormosoma</i>	Stephenson	1918	C	M	D
<i>Isacfinernus</i>	Carlgen	1918	C		D
<i>Isactinia</i>	Carlgen	1900	C	EN	D
<i>Isantheopsis</i>	Carlgen	1942	C	EN	D
<i>Isanthus</i>	Carlgen	1938	C	M	D
<i>Isocradactis</i>	Carlgen	1924	C	EN	D
<i>Isoedwardsia</i>	Carlgen	1921	C		P
<i>Isometridium</i>	Carlgen	1949	C	M	D
<i>Isoparactis</i>	Stephenson	1920	C	M	D
<i>Isophellia</i>	Carlgen	1900	C	M	D
<i>Isosicyonis</i>	Carlgen	1927	C	M	D
<i>Isotealia</i>	Carlgen	1899	C	EN	D
<i>Kasodactis</i>	Danielssen	1890	C	M	D
<i>Lebrunia</i>	Du&Mi	1860	C		D
<i>Leipsiceras</i>	Stephenson	1918	C	EN	D
<i>Limnactinia</i>	Carlgen	1921	C		P
<i>Liponema</i>	Hertwig	1882	C	EN	D
<i>Lithophellia</i>	Carlgen	1938	C	M	D
<i>Macrocnema</i>	Carlgen	1928	C	EN	D
<i>Macroductyla</i>	Haddon	1898	C	EN	D
<i>Megalactis</i>	Ehrenburg	1834	R		D
<i>Mena</i>	Stephenson	1920	C	M	P
<i>Mesacmaea</i>	Andres	1883	C		P
<i>Metapeachia</i>	Carlgen	1943	C		P
<i>Metarhodactis</i>	Carlgen	1943	R	EN	D
<i>Metedwardsia</i>	Carlgen	1947	C		P
<i>Metridium</i>	Oken	1815	C	M	D
<i>Mimetridium</i>	Hand	1961	C		P
<i>Minyas</i>	Cuvier	1817	R	EN	D
<i>Myonanthus</i>	McMurrich	1893	C	EN	D
<i>Nectactis</i>	Gravier	1918	C		D
<i>Nemanthus</i>	Carlgen	1940	C	M	D
<i>Nematostella</i>	Stephenson	1935	C		P
<i>Neoparacondylacti</i>	Zamponi	1974	C	EN	D
<i>Neophelia</i>	Uchida	1939	C	M	D
<i>Nevadne</i>	Stephenson	1922	C		D
<i>Octineon</i>	Fowler	1984	C	M	D
<i>Opiodiscus</i>	Hertwig	1882	C	M	D
<i>Oractis</i>	McMurrich	1893	C	EN	P
<i>Orinia</i>	Duchassaing & Mi	1860	R	EN	D
<i>Oulactis</i>	M-Ed&Haime	1851	C	EN	D
<i>Parabunodactis</i>	Carlgen	1928	C	EN	D
<i>Paracalliactis</i>	Carlgen	1928	C	M	D
<i>Paracondylactis</i>	Carlgen	1934	C	EN	D
<i>Paractinia</i>	Andres	1884	C	M	D
<i>Paractinostola</i>	Carlgen	1928	C	M	D
<i>Paradisicosoma</i>	Carlgen	1900	R	EN	D
<i>Paraedwardsia</i>	Carlgen	1905	C		P

ACTIN.WDB

<u>Genus</u>	<u>Author</u>	<u>Date</u>	<u>Tentacle Sphincte</u>		<u>Foot</u>
<i>Parahaicampa</i>	Carlgren	1927	C	M	P
<i>Paraisometridium</i>	Zamponi	1978	C	M	D
<i>Paranemonia</i>	Carlgren	1900	C	EN	D
<i>Parantheopsis</i>	McMurrich	1904	C	EN	D
<i>Paranthus</i>	Andres	1883	C	M	D
<i>Paraphellia</i>	Haddon	1889	C	M	D
<i>Paraphelliactis</i>	Carlgren	1928	C	M	D
<i>Parasicyonis</i>	Carlgren	1921	C	M	D
<i>Parastephanauge</i>	Dufaure	1951	C	M	D
<i>Peachia</i>	Gosse	1855	C		P
<i>Pelocoetes</i>	Annandale	1915	C		P
<i>Pentactinia</i>	Carlgren	1900	C		P
<i>Phellia</i>	Gosse	1858	C	M	D
<i>Phelliactis</i>	Simon	1892	C	M	D
<i>Phelliogeton</i>	Carlgren	1927	C	M	D
<i>Phialoba</i>	Carlgren	1949	C		D
<i>Phlyctenactis</i>	Stuckey	1909	C	EN	D
<i>Phlyctenanthus</i>	Carlgren	1949	C	EN	D
<i>Phyllactis</i>	Milne-Edwards &	1851	C	EN	D
<i>Phyllodiscus</i>	Kwietniewski	1898	C	EN	D
<i>Phymactis</i>	Milne-Edwards	1857	C	EN	D
<i>Phymanthus</i>	Milne_Edwards	1857	C	EN	D
<i>Phytocoetes</i>	Annandale	1915	C		P
<i>Phytocoetopsis</i>	Panikkar	1936	C		P
<i>Protanthea</i>	Carlgren	1891	C		D
<i>Pseudactinia</i>	Carlgren	1928	C	EN	D
<i>Pseudhormathia</i>	Carlgren	1943	C	EN	D
<i>Pseudoparactis</i>	Stephenson	1920	C	M	D
<i>Ptychodactis</i>	Apellof	1893	C		D
<i>Pycnanthus</i>	McMurrich	1893	C	M	D
<i>Radianthus</i>	Kwietniewski	1898	R	EN	D
<i>Ramirezia</i>	Zamponi	1979	C		P
<i>Rhodactis</i>	Milne-Edwards &	1851	R	EN	D
<i>Ricordea</i>	Duchassaing & Mi	1860	R		D
<i>Sagartia</i>	Gosse	1855	C	M	D
<i>Sagartianthus</i>	Carlgren	1943	C	M	D
<i>Sagartiogeton</i>	Carlgren	1924	C	M	D
<i>Scolanthus</i>	Gosse	1853	C		P
<i>Scytophorus</i>	Hertwig	1882	C		P
<i>Segonsactis</i>	Reimann-Zurneck	1979	C	EN	D
<i>Sicyonis</i>	Hertwig	1882	C	M	D
<i>Sideractis</i>	Danielssen	1890	C		D
<i>Siphonactinopsis</i>	Carlgren	1921	C		P
<i>Sphincteractis</i>	Zamponi	1976	C	M	D
<i>Stephanauge</i>	Verrill	1899	C	M	D
<i>Stephensonactis</i>	Panikkar	1936	C		P
<i>Stichodactyla</i>	Brandt	1835	R	EN	D
<i>Stoichactis</i>	Carlgren	1900	R	EN	D
<i>Stomphia</i>	Gosse	1859	C	M	D
<i>Stylobates</i>	Dall	1903	C	EN	D
<i>Synactinermus</i>	Carlgren	1918	C		D
<i>Synandwakia</i>	Carlgren	1947	C	M	P
<i>Synhaicampella</i>	Carlgren	1921	C		P

<u>Genus</u>	<u>Author</u>	<u>Date</u>	<u>Tentacle Sphincte</u>		<u>Foot</u>
<i>Synhalcurias</i>	Carlgren	1914	C		D
<i>Synsicyonis</i>	Carlgren	1921	C	M	D
<i>Tealia</i>	Gosse	1858	C	EN	D
<i>Tealanthus</i>	Carlgren	1927	C	EN	D
<i>Tealidium</i>	Hertwig	1882	C	M	D
<i>Telmatactis</i>	Gravier	1918	C	M	D
<i>Thalassianthus</i>	Leuckart	1828	R	EN	P
<i>Triactis</i>	Klunzinger	1877	C		D
<i>Urticinopsis</i>	Carlgren	1927	C	EN	D
<i>Verrillactis</i>	England	1972	C	M	D
<i>Zaolutus</i>	Hand	1955	C	M	D

COUNT:

221

Compiled from D. Doumenc and A. Foubert. 1984. Microinformatique et Taxonomie des Actinies: Cle Mondial des Genres. Ann. Inst. oceanogr., Paris, 1984, Vol. 60 (1): 43-86.