Southern California Association of Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

November, 1991 | Vol. 10, No. 7

NEXT MEETING: Sponges

GUEST SPEAKER: Karen Green
Private Consultant

DATE: December 9, 1991
Note this is the second Monday of the month.

LOCATION: Cabrillo Marine Museum
San Pedro, California

MINUTES FROM MEETING ON NOVEMBER 18:

Ron Velarde announced the addition of a new symposia to the Water Environment Federation's annual conference in New Orleans, Louisiana on September 20-24, 1992. It will be entitled "Surface Water Quality and Ecology." A copy of the announcement and a abstract submittal form have been included in the newsletter.

Sea Pen Meeting: Dr. Hochberg of the Santa Barbara Museum of Natural History lead the meeting on sea pens. He reviewed the terminology used for their morphology and gave brief descriptions of some of the species encountered off the coast of southern California. The following is a synopsis of what was discussed during the meeting.

The typical sea pen is divided into two distinct regions. The subsurface **peduncle** with a **terminal bulb** (a swelling used to anchor the animal in the sediment) and the portion above the surface of the sediment called the **rachis**. The latter part includes all the

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

reproductive and feeding structures.

A number of different types of zooids are found on the rachis. The primary zooid is called the **ozooid.** It is the zooid from which the entire animal is derived. It is a single, non-feeding polyp located on the distal tip of the animal.

The feeding polyps, **autozooids,** can originate from the rachis directly or emerge from fleshy limbs called **leaves** (pinna). Their arrangement and number is diagnostic. The autozooids are composed of feeding tentacles or **anthocodium.** The base is called the **calyx.** which can contain spicules.

Two other zooids are involved in maintaining turgor. The **siphonozooids** and **mesozooids** are both non-feeding and non-reproductive. Siphonozooids have well developed siphonoglyphs and usually lack tentacles. They function in maintaining water pressure. The larger mesozooids have poorly developed siphonoglyphs and function in the release of water pressure. They are typically arranged in rows on the rachis between leaves.

In stalked forms of the animal it is arranged so that the autozooids are lateral, whether attached directly to the rachis or on leaves. Dorsal and ventral are considered to be the barren sides. In flattened forms such as Renilla spp. the dorsal surface is considered to be the surface that is facing up and contains the autozooids.

An internal stiffening rod called the **axis** can be present. The cross-section of which can be taxonomically significant (e. g. round or square).

Spicules are typically smooth in appearance and can take a variety of shapes. There location within the animal is considered more diagnostic than their individual shape. All color in sea pens is derived from the color of the underlying spicules.

Dr. Hochberg has prepared a checklist of known west coast species of Pennatulacea. Bold type refers to species commonly encountered in Southern California. It has been include in the newsletter.

In his discussion, Dr. Hochberg gave a brief description of a select number of species.

Family Umbellulidae

Umbellula huxleyi - 4-7 terminal polyps; 10-20 cm. high.

U. lindahli - 10-11 terminal polyps; 60 cm. high.

Family Pennatulidae

Penatuala spp. - Small dark red leaves; triangular; 3-10 polyps per leaf; calyx with 8 teeth.

Ptilosarcus gurneyi - 50+ polyps; rachis fleshy; calyx with 2 teeth on the calyx; small siphonoglyphs.

P. undulatus - 50+ polyps; rachis fleshy; 1 tooth on the calyx; large siphonoglyphs.

Family Virgulariidae

Subfamily Virgulariinae

Acanthiptilum spp. - See Table 1.

Stylatula elongata - There are two different morphs. They are both characterized by having a separate calyx.

Morph 1 - 20-24 polyps per leaf; 10-15 leaves per inch.
Morph 2 - 40 polyps per leaf; 8 leaves per inch.

S. gracilis - Calyx fused at base; 13-18 polyps per leaf; 30 leaves per inch.

Virgualria bromleyi - 3-5 polyps per leaf.

V. galapensis - 25-35 polyps per leaf.

Subfamily Balticininae

Halipteris californica - 100 rows of leaves; 2-5 polyps per leaf; 2 teeth on calyx; with spicules.

Balticina willemoesi - 200+ rows of leaves; 8-15 polyps per leaf; no teeth on calyx; no spicules.

FUTURE MEETINGS:

The January meeting is on the **sixth**. Ron Velarde will be leading the meeting on Mysids. It will be held at the San Diego Museum of Natural History. As in the past it will be in the basement education room. Bring or send your problem specimens to:

Ron Velarde
4918 North Harbor Dr. #101
San Diego, CA 92106.

Note this is the **first** monday of the month.

The February 10, meeting will be on ophiuroids lead by Dr. Gordon Hendler of the Los Angeles Museum of Natural History. It will be at the museum in the Times Mirror Room. As always send or bring any problem ophiuroids to Dr. Hendler.

92-93 Schedule: Larry Lovell is looking for input for possible speakers and subjects for the next year. He would appreciate any input you might have. You can write him at:

Larry Lovell
1036 Buena Vista
Vista, CA 92083

CHRISTMAS PARTY DECEMBER 7:

Don't forget the Christmas party at the Cabrillo Marine Museum. It will be from 6 to 9 pm on December 7. Mark you calendars and bring the kids.

SCAMIT OFFICERS:

If you need any other information concerning SCAMIT please feel free to contact any of the officers.

President	Ron Velarde	(619)226-0164
Vice-President	Larry Lovell	(619)945-1608
Secretary	Kelvin Barwick	(619)226-8175
Treasurer	Ann Martin	(213)648-5317

Table 1. Table of some taxonomic characters for selected species of the genus *Acanthoptilum*.

character	*album*	*annulatum*	*gracile*	*scalpellifolium*
pairs of leaves	≈75	≈170	?	?
Number of polyps per leaf	4-5	5-6	7-9 or >	7-9
siphonozooids	3/single rows	3-8/single or double rows	6-12	8 (white)
spicule color	none	pink	none	purple/pink
ratio of stalk/rachis	1/2	1/1	1/4	1/3

ORDER PENNATULACEA

Colonial octocorals unbranched, not firmly attached, consisting of a primary polyp (oozooid) that elongates to produce a barren, proximal stalk which anchors colony in soft substrate, and a polypiferous distal rachis from which secondary polyps arize, either directly or from ridgelike or broadly expanded polyp leaves. Gastric cavity of primary polyp divided into 2 primary and 2 secondary longitudinal canals by fleshy partitions at cent of which a more or less calcified horny axis usually is produced. Secondary polyps invariably of at least 2 kinds. Spicules smooth, 3-flanged rods or needles, rarely tuberculated; or small scales or plates. Axes of pennatulids formed of irregular, prismatic columns of calcareous material radiating outwrd from axis core, which seems to contain a higher proportion of organic matter.

SUBORDER SESSILIFLORAE

Sea pens with polyps standing separately and arising directly from rachis without being united near their bases by ridgelike or leaflike structures.

1. ANTHOPTILIDAE - Bilateral sea pens with polyps in transverse or somewhat diagonal rows on 2 sides of rachis. Sclerites absent except for minute oval bodies in interior of stalk. Axis round or quadrangular with rounded angles.

2. Chunellidae

3. Echinoptilidae

4. FUNICULINIDAE - Colonies elongated, slender; autozooids rather small, arranged laterally and ventrally on rachis, producing distinct calyces with 8 marginal teeth; siphonozooids infrequent. Spicules are prismatic needles. Axis quadrangular.

5. KOPHOBELEMNONIDAE - Sea pens with polyps bilaterally oriented on rachis but with some tendency toward radial symmetry; colonies clavate with axis.

6. PROTOPTILIDAE - Bilateral sea pens with autozoids longitudinally arranged in orne or more lateral rows. Spicules 3-flanged. Axis stout, rounded.

7. RENILLIDAE - Sea pens with slender stalk and oval or reniform foliate rachis bearing polyps on upper surface only. Axis absent. Spicules 3-flanged rods with may be more or less platelike.

8. SCLEROPTILIDAE - Rachis elongate, bearing autozooids closely arranged in indistinct whorls; dorsal track free of autozooids; siphonozooids scattered between autozooids.

9. STACHYPTILIDAE - Bilateral colonies with autozooids arranged laterally in transverse rows but not in longitudinal rows. Autozooids and siphonozooids with well developed, scalelike calyces. Spicules 3-flanged needles.

10. UMBELLULIDAE - Rachis is slender, elongate, bearing at its apex an umbelliform tuft of large autozooids; siphonzooids situated among autozooids and in groups or rows on barren parts of rachis. Spicules 3-flanged needles in polyp walls, rachis and stalk rind, and small oval bodies in deep layers of stalk. Axis round or quadrangular.

11. VERETILLIDAE - Stout, commonly clavate colonies without trace of bilaterality; polyps fully retractile, no calyces. Spicules of various types, none 3-flanged.

SUBORDER SUBSELLIFLORAE

Polyps united by their bases, situated in rows on lateral swellings or foliate polyp leaves.

1. PENNATULIDAE - Bilateral sea pens with well developed polyp leaves bearing one or more marginal rows of autozooids. which have calyces with marginal teeth formed by spicules; siphonozooids on rachis, not on leaves. Spicules minute oval bodies, plates, rods and prismatic needles.

2. Pteroeididae

3. VIRGULARIIDAE - Bilateral, with slender rachis; autozooids situated in transverse rows and united together by their bases, rachis beneath them raised into lateral swellings or small leaves. Spicules prismatic needles, small biscuit-shaped plates or entirely absent. Axis stout.

(from Bayer, 1956)

CHECKLIST OF WEST COAST SEA PENS

ORDER PENNATULACEA

Suborder Sessiliflorae

Family Anthoptilidae

Anthoptilum grandiflorum (Verrill, 1879)
[In Nutting = A. murrayi Kolliker, 1880]

Family Funiculinidae

Funiculina parkeri Kukenthal, 1913
[In Nutting = F. armata Verrill, 1879]

Family Kophobelemnonidae

Kophobelemnon affine Studer, 1894

K. biflorum Pasternak, 1960

K. hispidum Nutting, 1912

Family Protoptilidae

Distichoptilum gracile Verrill, 1882
[In Nutting = D. verrillii Studer, 1894]

Helicoptilum rigidum Nutting, 1912

Family Renillidae

Renilla amethystina Verrill, 1864

R. inermis Pfeffer, 1886

R. kollikeri Pfeffer, 1886

R. k. var. tigrina Deichmann, 1941

R. mulleri Kolliker, 1872

Family Stachyptilidae

Stachyptilum quadridentatum Nutting, 1909

S. superbum Studer, 1894

Family Scleroptilidae

Scleroptilum grandiflorum Kolliker, 1880

Scleroptilum sp.

Family Umbellulidae

Umbellula geniculata studer, 1894

U. huxleyi Kolliker, 1880

U. lindahli Kolliker, 1880

[In Nutting = U. loma Nutting, 1909]

[In Nutting = U. magniflora Kolliker, 1880]

Family Veretillidae

Cavernulina darwini Hickson, 1921
[= Veretillum binghami Deichmann, 1936

Suborder Subselliflorae

Family Pennatulidae

Pennatula distorta var. pacifica Studer, 1894

P. kollikeri Studer, 1894

P. phosphorea var. californica Kukenthal, 1913
[In Nutting = P. aculeata Danielsson, 1858]

Ptilosarcus gurneyi (Gray, 1860)
[= Leioptilus quadrangularis (Moroff, 1902)]
[= Pennatula tenua Gabb, 1862]

P. undulatus (Verrill, 1865)
[= Lioptilum Verrillii Pfeffer, 1886]
[In Kukenthal = L. sinuosum Kolliker, 1872]

Family Virgulariidae
Subfamily Virgulariinae

Acanthoptilum album Nutting, 1909

A. annulatum Nutting, 1909

A. gracile (Gabb, 1864)
[= Virgularia gracilis Gabb, 1864 - March]

A. scalpellifolium Moroff, 1902

Stylatula columbiana Verrill, 1922

S. elongata (Gabb, 1862)
[= S. elongata Verrill, 1864]
[= S. Ringei Pfeffer, 1886]

S. gracilis Verrill, 1864 [January]

Virgularia bromleyi Kolliker, 1880
[= V. californica Pfeffer, 1886]
[= V. reinwardti Herklots, 1858]
[= Halisceptrum cystiferum Nutting, 1909]

V. galapagensis Hickson, 1930

V. agassizii Studer, 1894
[= Cladiscus]

Subfamily Balticininae

Halipteris californica (Moroff, 1902)
[= Balticina, Pavonaria]
[= H. contorta Nutting, 1909]
[= B. pacifica Nutting, 1909]

B. willemoesi Kolliker, 1870
[In Nutting = Balticina finmarchia (Sars, 1856)]
[In Nutting = B. septentrionalis (Gray, 1872)]
[= Pavonaria (Verrillia) blakei Stearns, 1873]
[= P. dofleini (Moroff, 1902)]

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CALL FOR ABSTRACTS

The Water Environment Federation (WEF) Program Committee has approved a new symposium entitled "Surface Water Quality and Ecology" for the 1992 Annual Conference in New Orleans, Louisiana, September 20-24, 1992. The chairman of the Symposium is Harvey Olem of Olem Associates.

Individuals are encouraged to submit abstracts to address this important and expanding focus of the Federation. Papers covering the following topics are especially encouraged:

* Urban & Agricultural Nonpoint Sources
* Stormwater Managment
* Nutrient Problems and Eutrophication
* River and Lake Management
* Water Quality Monitoring
* Water Quality Modeling
* Waste Disposal Effects on Estuaries and Coastal Areas
* Toxicity Testing
* Water Quality Impacts of Air Emissions
* Assessment of Sediments
* Ecological Risk Assessment
* Evaluation of Cumulative Impacts
* Regional Planning
* Criteria and Standards for Water Quality
* Freshwater & Marine Water Quality and Ecosystem Issues
    - -Biomonitoring
    - -Effects Assessment
    - -Management Strategies

The deadline for submission of abstracts is **January 15, 1992.** Authors will be notified of tentative selection of abstracts by May 1; final acceptance of papers is contingent on submission of a full manuscript of the selected abstract by July 15, 1992.

Submit abstracts to :

Water Environment Federation
Attn: Conference Program
601 Wythe Street
Alexandria, VA 22314-1994

For additional information and submittal forms, call Maureen Novotne, WEF Technical Services, at (703)684-2400 x7450 or Rhoda Miller, WEF Research Journal, at (703)684-2400 x7530.

WPCF Control No.______

Water Pollution Control Federation

65th Annual Conference

New Orleans, Louisiana • September 20-24, 1992

Abstract Submittal Form

Title of paper:______________________________

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Speaker:______________________________

Coauthors:______________________________

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Will this paper be presented elsewhere before September 1, 1992? ☐ Yes ☐ No

If so, where?______________________________

Paper submitted for session topic G. SURFACE WATER QUALITY AND ECOLOGY SYMPOSIUM

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EDITORIAL

How Much is a Worm Worth?

The word "worm" elicits a negative response from most people. Worms are usually considered as creepy, crawly, slimy, and dirty creatures that should be avoided or stepped on. However, there are good worms, such as the common earthworm; pretty ones, such as the colorful Christmas tree worm of the tropical seas; and bad ones, such as tapeworms and blood-sucking leeches.

In fact, there are many different types of worms in the animal kingdom—round worms, flatworms, and segmented worms, as well as insect larvae (caterpillars) and others. The most important for our purposes are the segmented worms that live in the soil and in the sediments of fresh and marine waters.

It has been over 110 years since Charles Darwin called attention to the importance of earthworms to the terrestrial environment in his classic work, "The formation of vegetable mould through the action of worms." He emphasized that the mixing of the soil with organic matter and the mucus secretions from the digestive tract of the earthworm plays an important role in humus formation. In addition, the extensive burrowing habits of worms improve soil drainage and aeration.

Earlier in this century, Kolkwitz and Marsson in Germany developed the saprobic system of zones of organically polluted rivers. Similar studies were conducted by Forbes and Richardson on the Illinois River. These pioneers of the biological effects of aquatic pollution used the presence and absence of different species of plants and animals to indicate different degrees of pollution caused by the discharge of domestic wastewater into rivers.

From these studies evolved the concept of biological indicators of pollution. The presence of a particular species or group of species, especially bottom-dwelling ones, indicates the biological condition of the site. Gauafin and Tarzwell, among others who published in this *Journal*, refined the indicator concept for fresh water in the post-World-War-II period.

Worms play an important role in the indicator organism concept. The oligochaete, *Tubifex tubifex*, or sludge worm, along with a few associated species, flourishes immediately downstream from a domestic sewer discharge. So does the polychaete *Capitella capitata*, near an oceanic domestic sewer discharge. As with earthworms, these indicators of organic pollution burrow into the enriched sediment, ingest the material, mix it with their mucus secretions, and defecate onto the surface of the sediment.

Presumably the chemical nature of the sediments is changed as the material passes through the gut, but the nature of these changes has not been investigated. The burrowing activity by thousands of these worms per square meter allows the penetration of dissolved oxygen beneath the surface layer of sediments, facilitating the oxidative process in an otherwise dissolved-oxygen-poor environment. These worms have short life histories, which perpetuates the population in the environment.

Because of the harsh nature of the organically enriched sediments, these opportunistic worms are able to flourish in the absence of competing species. Whenever the characteristics of the discharge change, such as by improved waste treatment, these pollution-indicator species gradually disappear and are replaced by a more diverse assemblage of benthic species belonging to many different animal phyla.

The concept of indicator organisms, which was established nearly one hundred years ago, is just as valid today as it was then. A knowledge of what species are present at a particular site forms the basis of today's biological monitoring of streams, rivers, lakes, estuaries, and oceans. The ability to identify these organisms, a field not looked upon with favor in these days of molecular biology, is imperative. Steps must be taken to ensure a continual supply of personnel who are able to distinguish between, say, a worm and a clam.

The question posed at the outset remains: How much is a worm worth? To a fisherman a worm costs a few cents; to a supplier of worms for toxicity testing, a few cents to over a dollar; to a tropical aquarist, a Christmas tree worm costs $5.00 and up; but to the environment, the worm is priceless!

Donald J. Reish
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