

August, 1996

SCAMIT Newsletter

Vol. 15, No.4

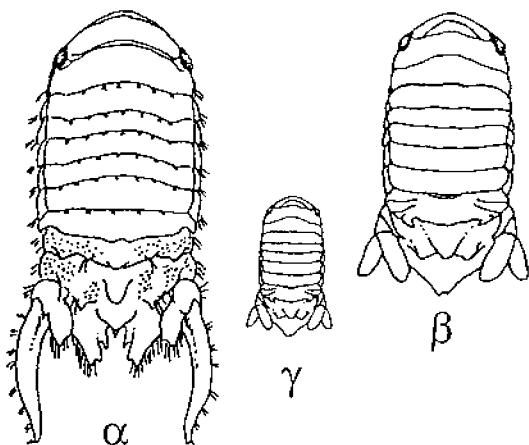
NEXT MEETING: Review of MMS Taxonomic Atlas Volume 6

GUEST SPEAKER: Larry Lovell - discussion leader

DATE: 16 September 1996

TIME: 9:30 AM to 3:30 PM

LOCATION: SCCWRP
7171 Fenwick, Westminster



α , β , and γ male morphs (all to scale) of *Paracerceis sculpta* (from Shuster 1992)

SEPTEMBER 16 MEETING

Our September meeting will be devoted to discussion of the latest polychaete volume of the MMS Taxonomic Atlas series - Volume 6. As the Paraonidae, Spionidae, and Cirratulidae are all included in this volume, with major revisions, there will be plenty to discuss. Please do as thorough a review of the volume as you can prior to the meeting so that everyone is prepared to express - and defend - their own viewpoints. Supportive literature is also useful, so bring what you feel is necessary. Larry will lead an initial overview covering the entire volume. Specific trouble points will be revisited in more detail later in the meeting.

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ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.

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

Serolis TO *Heteroserolis*

Tim Stebbins (CSDMWWD) recently came across a change in the generic assignment of one our local isopods, *Serolis carinata*. As he relates it "While examining some isopods for CICESE from Bahia Todos Santos, I came across one lot of what we call *Serolis carinata*, although the specimens were tentatively identified as *Heteroserolis carinata*. The Smithsonian's World List of Isopods also placed "*S. carinata*" and the other eastern Pacific species, "*S. tropica*," in *Heteroserolis*. Rick Brusca wasn't up to date on serolids, although he said Gary Poore (Australian Museum) and Wolfgang Wägele (Univ. Bielefeld, Germany) have been working on the family. He also said that the Smithsonian's list is generally correct and he would trust it. Gary Poore wasn't 100% sure either, but he referred me to some work by both Wägele and Angelika Brandt (Univ. of Kiel, Germany).

I reviewed these papers, although quickly, and it appears that our southern California serolid should be called *Heteroserolis carinata*. Basically, Brandt (1991) accepted *Heteroserolis* as a valid genus and placed "*carinata*" and other species within it. Wägele (1994) discusses many of the characters defining the serolid genera."

Many thanks to Tim for his update. It will be reflected in Ed. 3 of the SCAMIT Taxonomic Listing. The Smithsonian World Isopod List is at <http://nmnhwww.si.edu/gopher-menus/Isopods.html> on the World Wide Web.

ISOPOD INHABITANTS

During the most recent CSDLAC trawl series we found *Pagurus spilocarpus* common at our shallowest stations (23-30m). Nearly all were in shells of moon snails. These shells bore *Crepidula perforans* within their apertures, and many *Balanus pacificus* on their upper sides. Most of these barnacles were dead, and their tests

housed other organisms seeking structure and shelter on the sandy bottom. As with other pagurids (Jenson & Bender 1973, Stachowitz 1977), their adopted homes become an entire biocenosis of species normally associated with hard bottoms.

Besides the usual worms and fouling amphipods, some of these hermit crabs provided homes for mate guarding sphaeromatid isopods. Breeding sites and mate guarding are well described for *Paracerceis sculpta* (Schuster 1992), and we ascribed our field observations to this species. Collected individuals proved to be *Discerceis granulosa* (Richardson 1899) instead.

We have seldom taken the species previously (4 in 1976, 1 in 1993, and 1 in 1996), and suspect that it is not common. Two females in the CSDLAC collections previously identified as other sphaeromatids were found to belong to this species when reexamined.

Two barnacles on one crab shell contained isopods. In both cases the males had positioned themselves at the aperture of the barnacle test with their heavily calcified and ornamented pleotelsons and uropods blocking the aperture. They were noticed in the field because one of the males was backing out of the aperture. It was a close fit between the rear of the isopod and the test aperture.

Inside this particular barnacle test were a pair of females, one in the unmoulted S1 stage, and one in the half-moulted S2 stage (Shuster 1991). The second inhabited barnacle test was found in the laboratory after preservation. The isopods had probably not left their shelter because the collections were first frozen, and later preserved in formalin. Following fixation and washing, the barnacles were examined, and the additional pair of *Discerceis* as well as a single female not associated with a male were found. As in the first case, the male was situated with his back to the

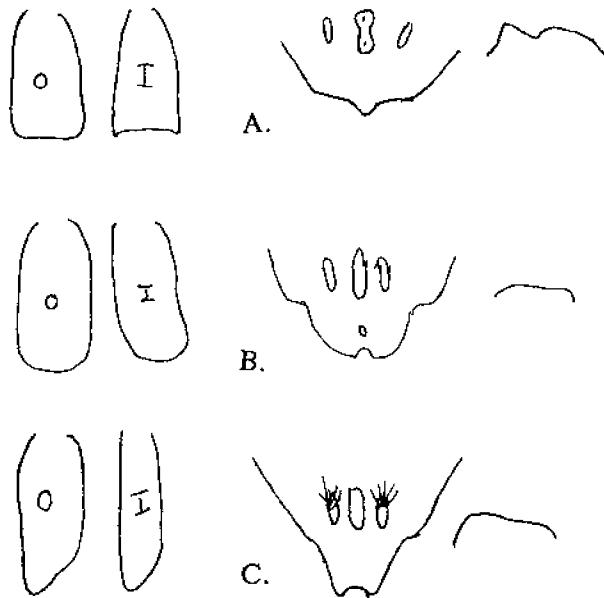
aperture and his head down. The female was below him and pressed against the side of the barnacle test at its base. She was in the S1 stage (Shuster 1991), with full ovaries, but prior to the reproductive moult. It is likely that in this species, as in *Paracerceis sculpta*, the male guards the female(s) on his breeding ground until they undergo the reproductive moult, and the eggs can be laid and fertilized.

It is possible that there is male polymorphism in this species, but the present male specimens were very similar, offering no evidence of the complex male breeding strategies of the three *P. sculpta* male morphs (see front cover).

The female was not described by Richardson, and has remained undescribed. It has a pleotelson like *Paracerceis*, but the medial sinus is not visible dorsally in *Discerceis*. The pleotelson ends, when viewed dorsally, in a blunt point. Ventrally this is excavated to form the sinus so evident in the dorsal aspect of *P. cordata* and *P. sculpta* females. The median tubercle on the pleotelson is actually two fused tubercles, and is saddle-shaped in profile, unlike the more evenly rounded median tubercle of *Paracerceis* females. These may be oblong, and about the same height for their entire length, or may slope to a high point at or near the posterior end.

The uropods of the female differ from those of *P. cordata* or *P. sculpta*, being bluntly truncated, with the posterior margin nearly transverse. In *P. cordata* the uropods are also nearly transverse, but are rounded, not truncate. In some female *D. granulosa* the outer ramus is more rounded, resembling that of *P. cordata*, while the inner ramus is truncate. In *P. sculpta* both rami are posteriolaterally pointed. Females of *P. gilliana* are not described. As their name would suggest *D. granulosa* females have the pleotelson and uropods granulose. The males have this condition exaggerated, with large individuals covered with tuberculations posteriorly. The pleotelson surface

of *P. sculpta* females is somewhat scaly, but is not granulose.



Uropodal rami and pleotelsons of female A.) *D. granulosa*, B.) *P. cordata*, and C.) *P. sculpta*

It is not possible at this time to prepare a key to the females of this family based on the literature. Too many species have only one sex described.

-Don Cadien (CSDLAC)

NEW LITERATURE

One new book, and another not so new, will be of interest to many members. New is the just released Coral Reef Animals of the Indo-Pacific (Gosliner et. al. 1996). This authoritative field guide has over 1150 color underwater photographs of a wide variety of tropical reef invertebrates. The standards of underwater color photography have been steadily raised over the last decade or so, and the present crop are absolutely marvelous. Continued interest in and accessibility of coral reefs to recreational and

scientific diving has also increased the available ecological and distributional information. As all of the authors are also invertebrate taxonomists, the taxonomic treatment is more detailed and accurate than that in many earlier reef guides. It covers only a part of the diversity of macro-invertebrates inhabiting the reefs of the Indo-Pacific region. Depth of coverage within any group is sacrificed for broad coverage of all groups.

The book is available from Sea Challengers for \$45 + 4.25 shipping + 7 1/4 % tax. Orders can be placed by Phone @ (408)373-6306 or FAX @ (408) 373-4566, or by mail @ 4 Somerset Rise, Monterey, CA 93940. It will also be distributed in some museum and aquarium bookstores, and in some aquarium shops.

The older book is Deep-Sea Biology, a natural history of organisms at the deep-sea floor (Gage and Tyler 1991). It incorporates much of the information from recent investigations of the deep-sea, especially from vent, and other newly explored habitats. It summarizes physical, chemical, taxonomic, and ecological information on the ocean depths in a very readable text augmented by abundant illustration. Additional detail can be accessed through the large bibliography. The book is about \$45, and can be obtained through booksellers or directly from Cambridge University Press @ 40 West 20th St., New York, NY 10011-4211.

MINUTES OF AUGUST 12 MEETING

The first half of the meeting was spent reviewing Northeast Pacific syllids that were examined by Leslie Harris for the NAMIT polychaete meeting this past May. This was a continuation from last months meeting. Included with this newsletter are Leslie's handouts of selected characters of *Sphaerosyllis*, *Exogone*, and *Brania* that may be used to differentiate between species. We have

also included Leslie's figures of the provisional species that are listed in the tables. While most of these animals came from shallow, subtidal areas of gravel and shell debris, (unlike our common soft bottom communities) some of the species included in these tables also occur off So. Calif.

Pionosyllis NAMIT sp.1- This animal has digitate or club-shaped ventral cirri, which is very different from the foliaceous ventral cirri of our local *Pionosyllis uraga*. Also, contrast the teeth of the compound setae with that of *P. uraga* and notice the difference in the two subdistal primary and secondary teeth.

Brania sp. 1 - This animal's most distinctive feature are the flaps of skin that cover the four large lensed eyes. The genus *Brania* differs from *Sphaerosyllis* by having 2 pairs of tentacular cirri, both ventral and dorsal, whereas *Sphaerosyllis* has only one pair. *Brania* is also not covered with papillae. *Brania* sp. 1 has ventral tentacular cirri that are small and pressed close to the prostomium.

Leslie informed members that the first half of her table of characters for *Sphaerosyllis* lists those that are not very helpful with species level distinctions. Characters such as parapodial papillae, the papillae on parapodial bases, internal reproductive products, and the attachment of gametes are all characters that have not been used before, but seem to be species specific. Members need to be careful when checking the papillae on the parapodia to make sure they know the correct orientation of the parapodia. Often the papillae are not well developed.

Leslie also described at the meeting 5 provisional species of Northeast Pacific *Sphaerosyllis*. *Sphaerosyllis* sp. 1 and 2 are distinguished from others by the presence of flaps over the eyes. Body papillae are very small on S. sp. 1. In S. sp. 2 they start out small anteriorly and become digitate by setiger 10. S. sp. 2 also has much

longer compound falcigers. *Sphaerosyllis* sp. 3 looks like a piece of white polyethylene thread where the body is very smooth with thick setae that have very short setose blades. Setation is lost posteriorly on the animal. *Sphaerosyllis* sp. 4 is similar to *S. californiensis*. It is a large and robust animal like *S. sp.* 3. The bases of the dorsal cirri are filled with golden colored granules. Posteriorly along the body the granules decrease in number, but elongate in shape. Some of these elongated granules or "capsules" are themselves filled with granules. *Sphaerosyllis* sp. 5 is not too distinct, but some of the setae look as if they may have a hood. Please refer to the illustrated handouts.

The afternoon was spent discussing sphaerodorids. Ron Velarde (CSDMWW) has been examining sphaerodoridae polychaetes lately because the City of San Diego's monitoring program has turned up several of these in recent years. Ron has produced a key to the Sphaerodoridae of So. Calif. that is included in this newsletter.

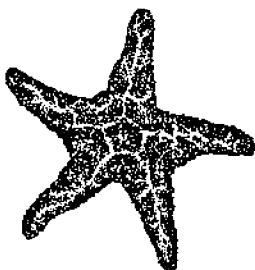
Three main characters are used to separate sphaerodorids; macrotubercles, microtubercles, and setal shape. Four types of macrotubercles are found on either the dorsum or ventrum of the worm. They are stalked, sessile without terminal papilla, sessile with terminal papilla, and sessile with short terminal papilla. The small distal terminal papillae on sessile macrotubercles are referred to as microtubercles. There are 2 types of microtubercles, one with and one without a basal collar surrounding the terminal papilla. The terminal papilla is often difficult to see. Ron has found that alcian blue staining better defines the papillae (remember, alcian blue is a permanent stain). Sphaerodoridae setae consist of 3 types; simple, compound, and recurved hooks.

Ron made a few comments at the meeting regarding the different species of sphaerodorids from So. Calif. *Clavodorum clavatum* and

Ephesiella mammifera are found in deep water off Mexico. *Sphaerephesia longisetis*, *Sphaerephesia similisetis*, *Sphaerodoropsis sphaerulifer*, and *Sphaerodorum papillifer* are all found off our coast. Ron has looked at the type specimen of *Sphaerodoropsis biserialis* and animals that have been identified as *S. biserialis* have generally turned out to be *Sphaerephesia similisetis*. Ron has yet to see any *S. biserialis* or *S. minuta* locally.

Couplet 9 of Ron's key, which refers to the median antennal length and the presence or absence of eyes, helps to separate the closely related species *Clavodorum clavatum* and *Sphaerodordium* sp. A. Fauchald (1972) included local specimens of *Sphaerodordium* sp. A as paratype material in his description of *C. clavatum*. Ron believes that the arrangement of the rows of tubercles on the dorsum might be species specific. The arrangement seems distinctly different between the two species and it has been consistent among the few specimens that Ron has examined to date. While *Clavodorum clavatum* has some rows of macrotubercles that are grouped close together, *Sphaerodordium* sp. A has rows that are evenly spaced.

There seems to be an illustration out of place in volume 4 of the MMS Atlas for the chapter on sphaerodorids. On page 236 *Sphaerodoropsis sphaerulifer* is described as having entirely compound setae, only the figures 8.3 E-F are of simple setae. It is believed that these figures were misplaced.



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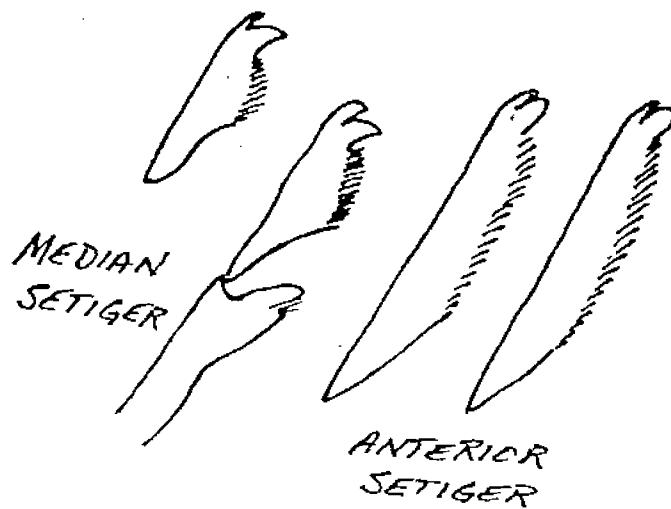
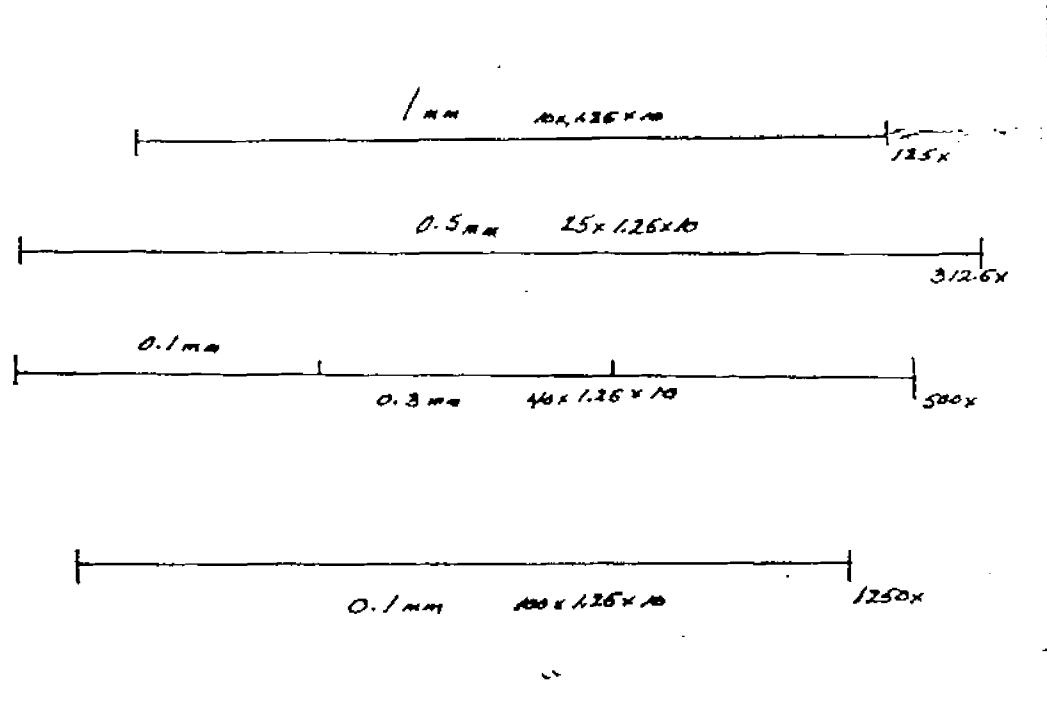
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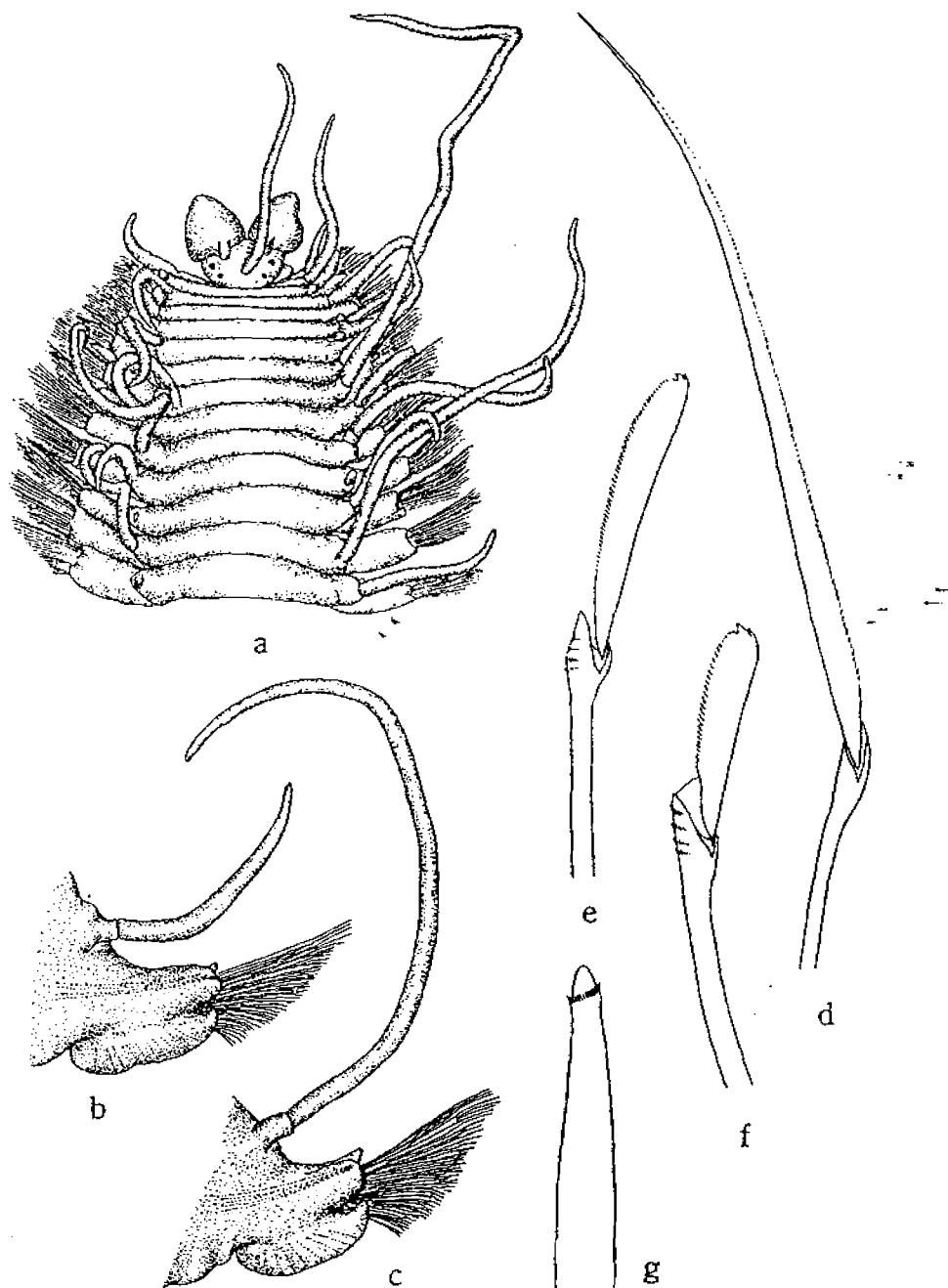
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Single back issues are also available at cost.

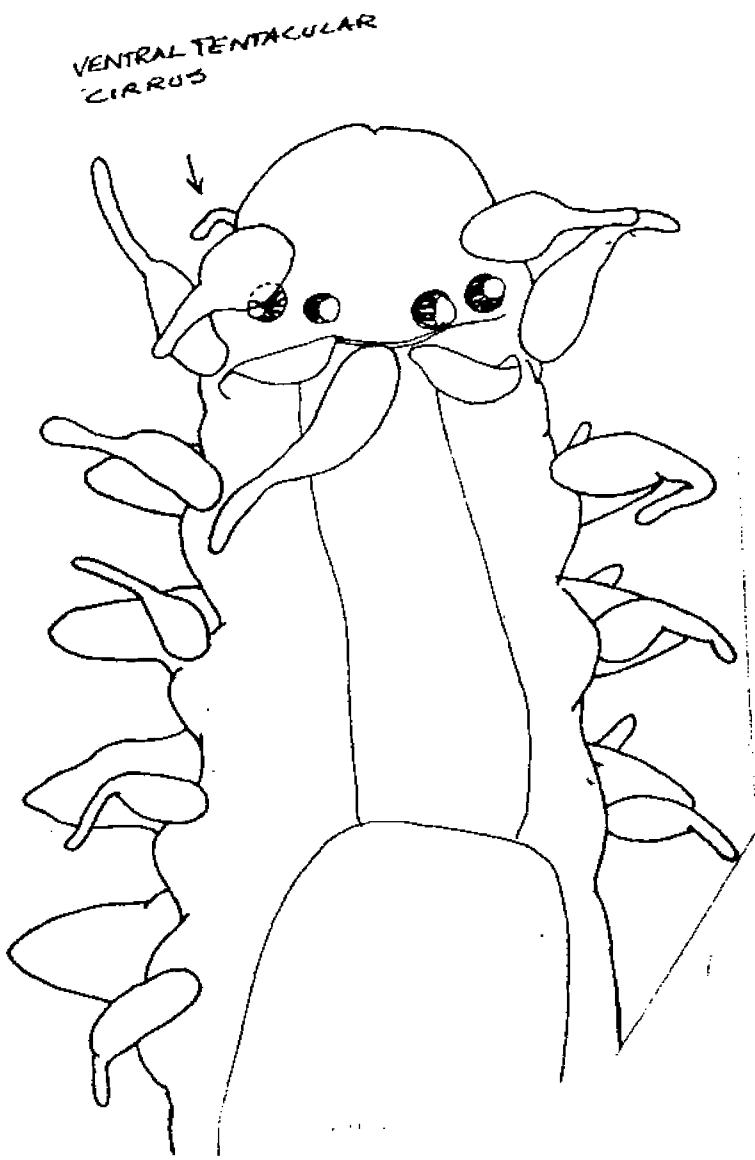


PIONOSYLLIS NAMIT I
BCPM 973-194-51N



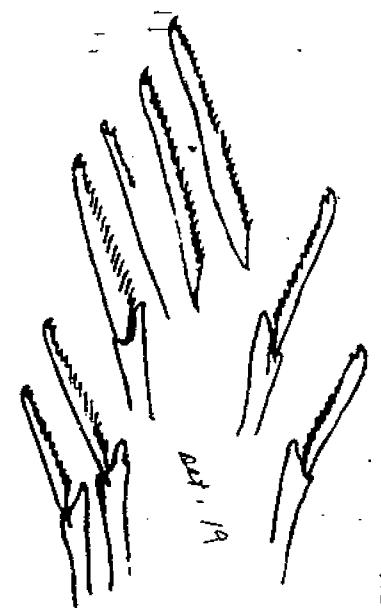
Text-fig. 37. *Pionosyllis uraga* n. sp. a, anterior end, in dorsal view, $\times 35$; b, 10th parapodium, in posterior view, $\times 55$; c, 11th parapodium, in same view, $\times 55$; d, superior compound seta with long appendage (=spiniger) from 5th parapodium, $\times 950$; e, f, compound setae with bladelike appendages from same parapodium, $\times 950$; g, aciculum, $\times 950$.

Xeroxed from Imajima 1966

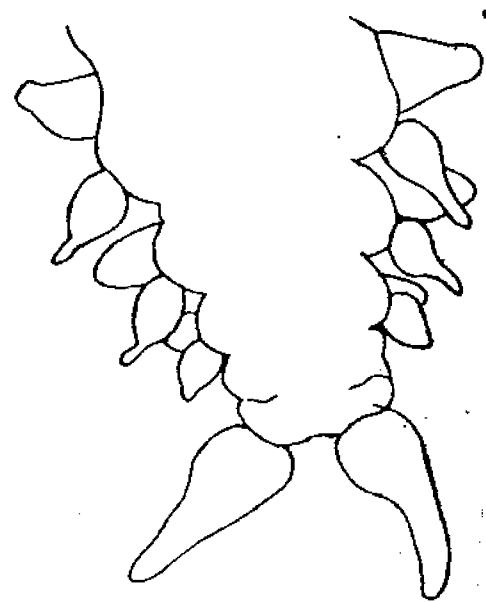
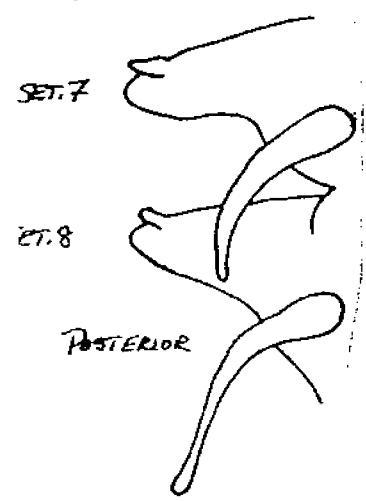


BRANIA SP. 1

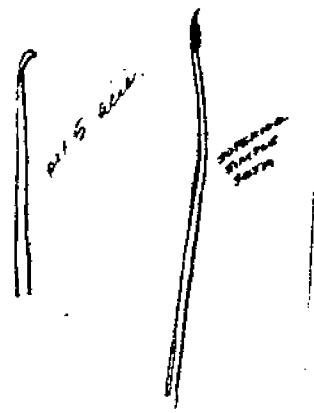
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ANTERIOR

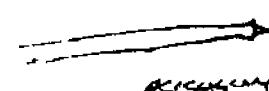
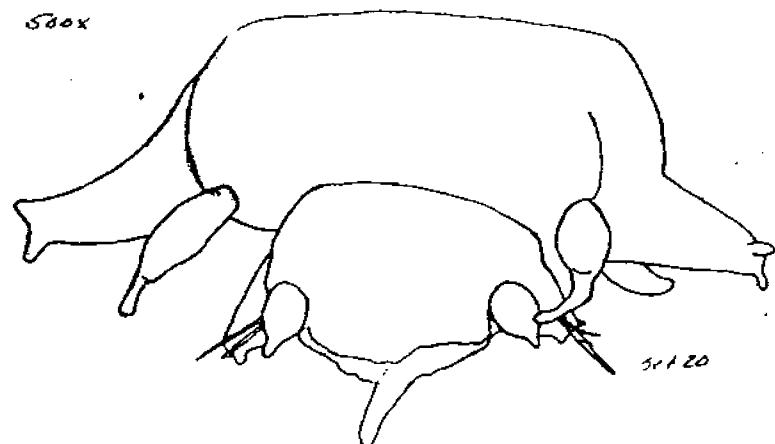
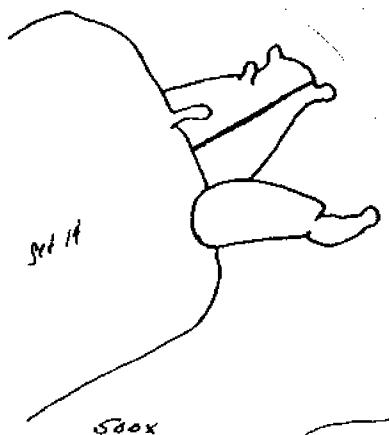


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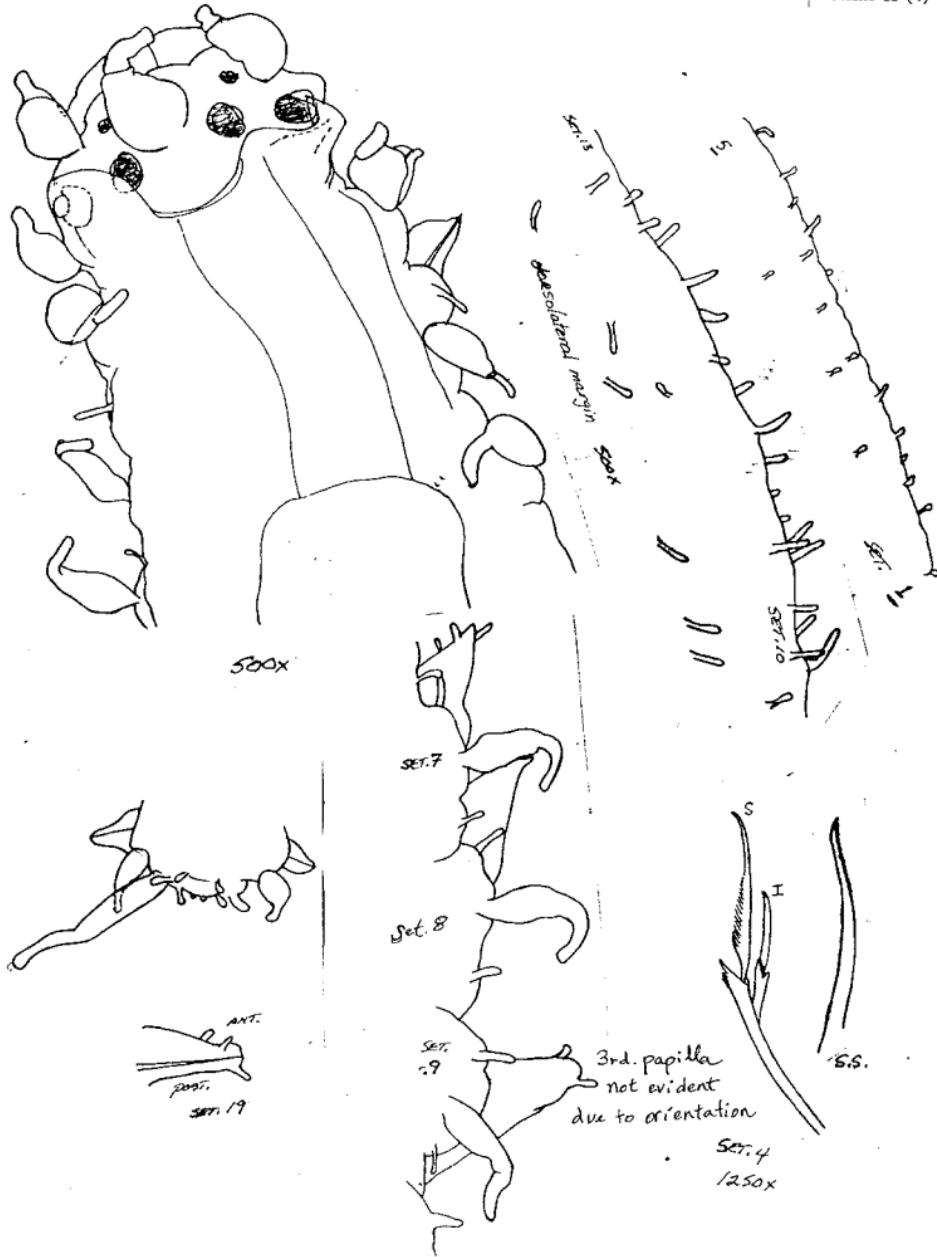


Sphaerosyllis
sp. 1
WSDOE VIAL K

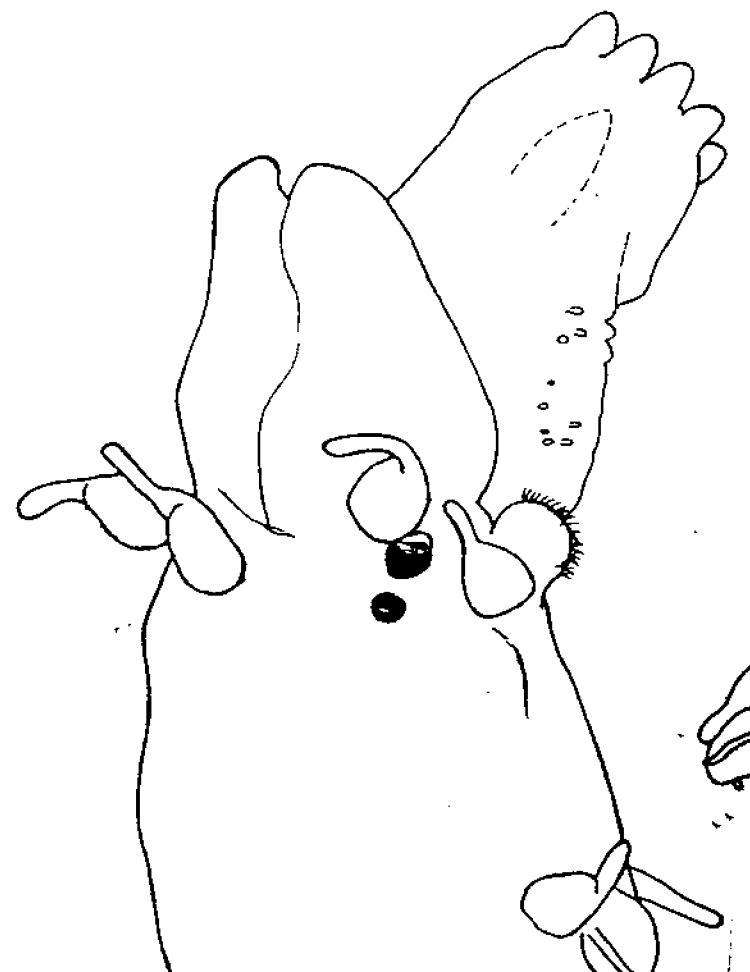


SIMPLE
SETAE

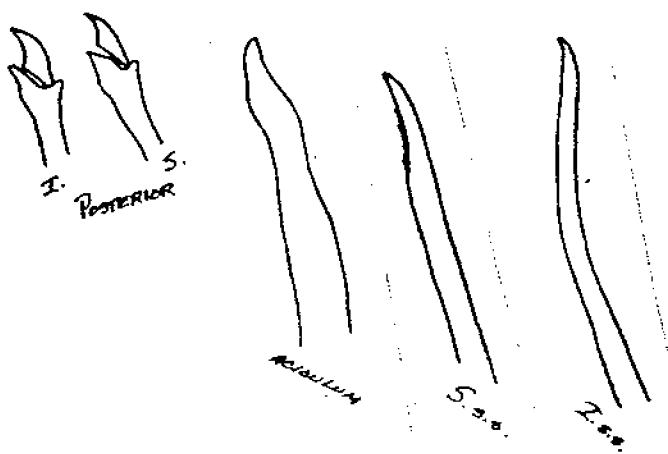
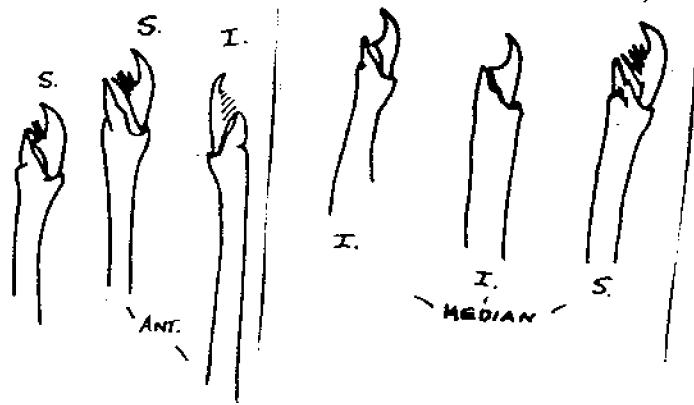
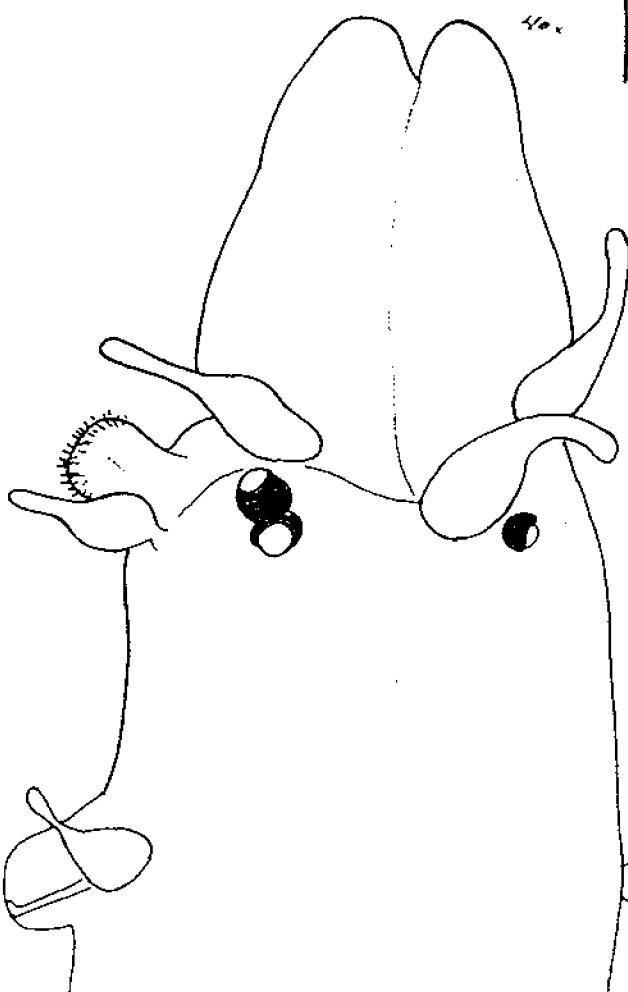
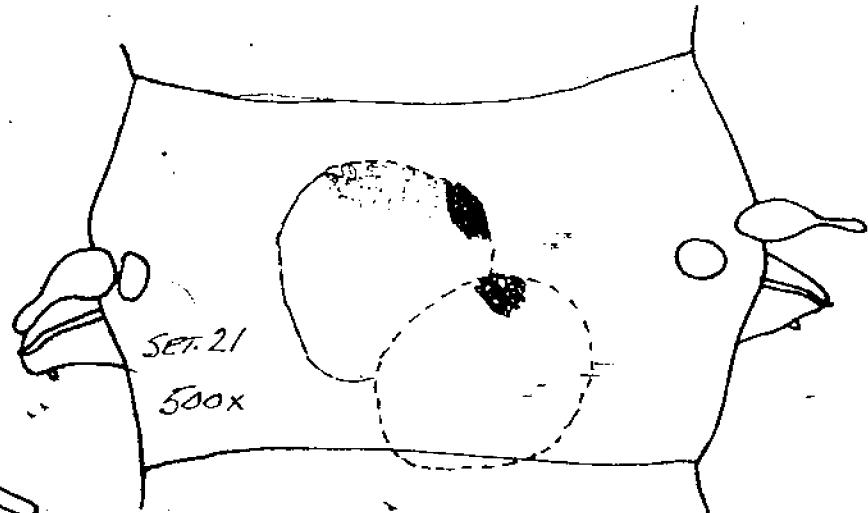
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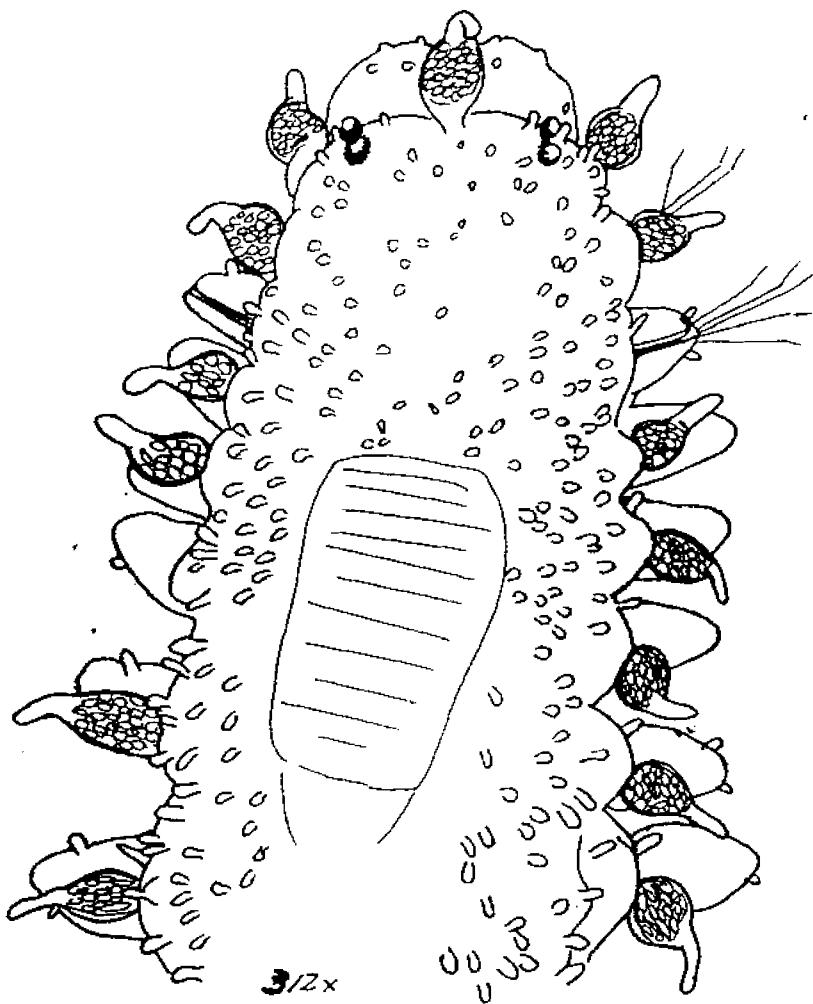


SPHAEROSYLLIS SP. 3
BCPM 975-100-6

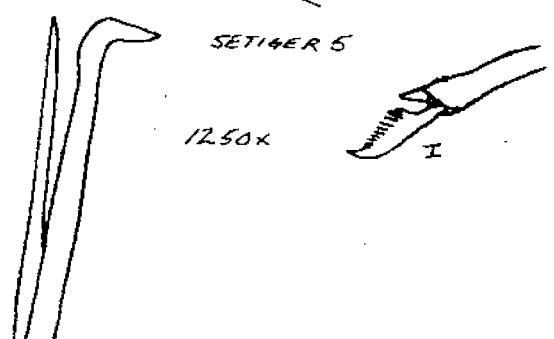
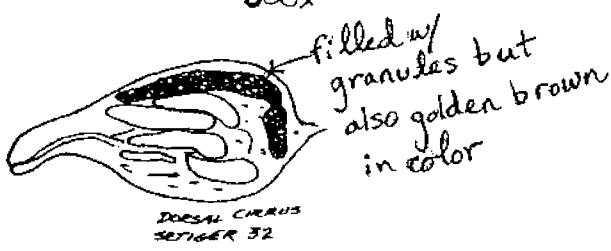
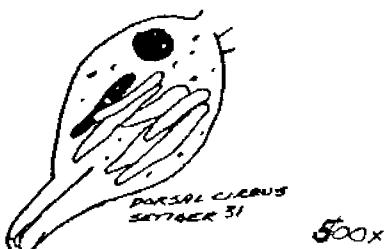
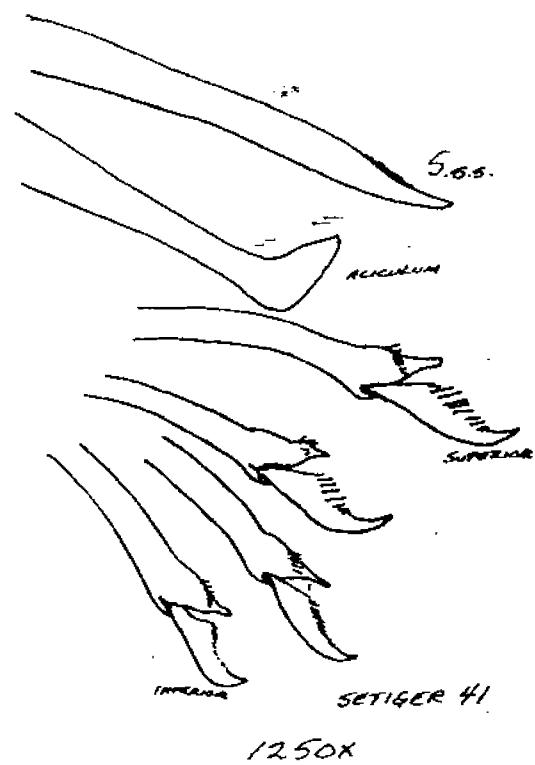


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SPHAEROSYLLIS
SP. 4
BCPM 974-569-10

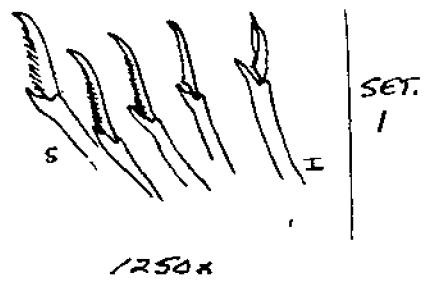
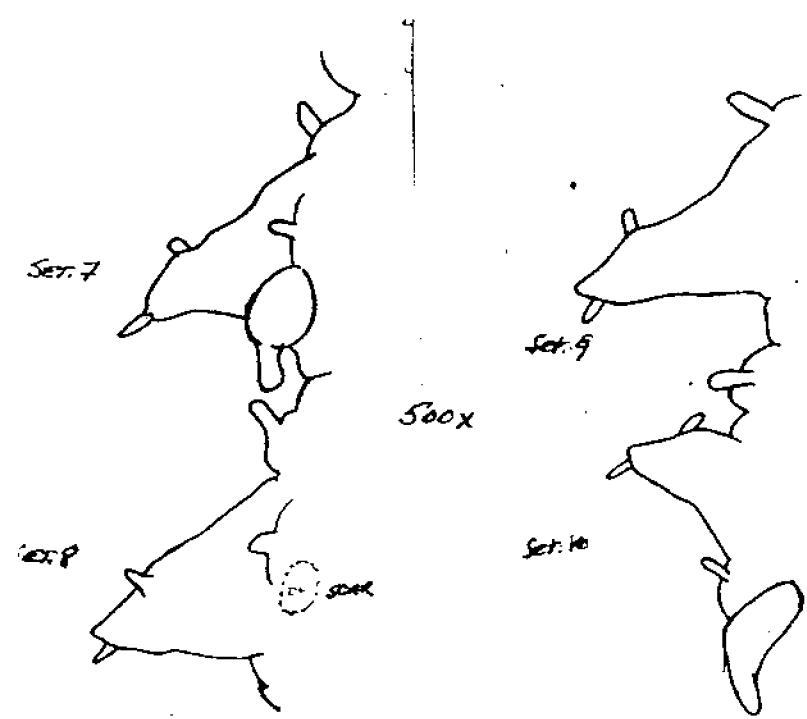




SPHAERO SYLLIS

SP. 5

RBCM 973-100-5



ACICULAR

POSTERIOR
SUPERIOR
SIMPLE SETA

SELECTED CHARACTERS OF BRANIA FROM THE NORTHEAST PACIFIC
Leslie Harris, LACM-AHF, 213) 744-3234, lhharris@bcf.usc.edu

CHARACTER	BREVIPHARYNGEA Banse 1972	CALIFORNIENSIS Kudenov & Harris 1995	NAMIT sp. 1 L. Harris
source	Banse 1972	Kudenov & Harris 1995	examination of specimen
eyes	4 large, 2 small; median pair w/ lenses	4 large, lensed; 2 small eyespots	4 large, lensed
dorsal cirri on setiger 2	yes	yes	yes
change in dorsal cirri	elongate bottle-shape throughout	elongate bottle-shape throughout	mostly elongate bottle-shape, posteriormost more bulbous
flaps over eyes	no	no	yes
median antenna placement	slightly before posterior pair of eyes	before posterior pair of eyes	posterior to eyes
parapodial glands	not mentioned	no	no
dorsal papillae	not mentioned	no	no
papillae on parapodial bases	not mentioned	no	no
parapodial papillae	"anterior lip"	no	1 subdistally on anterior face
pharynx	in 2.5 segments	in 4 segments	setigers 1-3
proventriculus	3.5 - 4.5 setigers long	setigers 4.5-6.5	setigers 4-5
muscle rings	20-25 rows	19 rows	about 12 rows
length/width provent.			
dorsal simple seta	present from set. 1 (4); bidentate & serrated	present from setiger 1, bidentate & serrated	present from setiger 1, dentate, lightly serrated
ventral simple seta	last 10 setigers	present	present last 2-3 setigers
compound setae, anterior	all bidentate & serrated, superior 2x length of short inferior	7; bidentate, serrated, superior 2x inferior	8 (7-9); bidentate, serrated, superior 2x length of inferior
compound setae, posterior	as above	7; bidentate, serrated, superior decreases in length towards end of body	7-8; bidentate, serrated, superior longer than in anterior; superior 2x length of inferior
aciculum	1, with small, asymmetrical knob at end	1, distally blunt, beak-shaped	1, thin, distally bent
swimming setae			
internal reproductive products	setigers 7 to 15		setigers 9-20
external attachment		setigers 12-15	

Brania heterocirra Rioja 1941 has been reported from San Juan Island, Washington (Westheide 1974)

SELECTED CHARACTERS OF NORTHEAST PACIFIC SPHAEROSYLLIS

Leslie H. Harris, LACM-AHF, 213) 744-3234, lhharris@bcf.usc.edu

CHARACTER	BILINEATA	CALIFORNIENSIS	<i>dominant species</i> for soft bottoms	HYSTRIX	PIRIFERA
	Kudenov & Harris 1995	Hartman 1986		Claparedes 1863	Claparedes 1868
source	examination of types		examination of types	San Martin 1982	San Martin 1982
eyes	4 large lensed eyes, 2 eyespots	4 large lensed eyes	4 large lensed eyes	4 large lensed eyes	4 large lensed eyes
dorsal cirri on setiger 2	yes	no	no	no	no
change in dorsal cirri	gradual change from flask-shaped to cliriform	gradual change from flask-shaped to cliriform	no	no	no
flaps over eyes	no	no	no	no	no
parapodial glands	no	yes, may begin at setiger 1 noticeable after setiger 7-8	always begin in setiger 4	no	no
dorsal papillae	arranged in 2 rows, alternating long and short	2 types: small & rounded, long & filiform	sparse, small	dense, small & rounded	
papillae on parapodial bases (0, 1, 2)	yes	2 pairs per segment, long	no	no	
parapodial papillae (0, 1, 2, or 3)	1 on anterior face & 1 distally on posterior face	3 distal papillae	no	no	
pharynx	usually in 3-4 setigers	In 3-4 setigers	In 3 setigers	In 4 setigers	
proventriculus	In 3-4 setigers	usually in 2 setigers	In 2 setigers	In 2.5-3 setigers	
muscle rings	20-23 rows	13-14 rows	12-18 rows	14 rows	
length/width provent.			0.80 - 1.17	1.33 - 1.6	
dorsal simple seta	present from setiger 1	present from setiger 1	posterior to proventriculus	posterior to proventriculus	
ventral simple seta	present, last 2-8 setigers	present, in variable # of setigers	present	present	
compound setae, anterior	6-7; superlormost finely serrated, all short	6: superior coarsely serrated, 2-3x length of finely serrated or smooth inferior	all blades finely serrated, superior 3x length of inferior	all blades moderately serrated, superior 3x length of inferior	
compound setae, posterior	5; superlormost finely serrated, all short	4-3: superior finely serrated or smooth, subequal to smooth inferior, superior wider than inferior	superior finely serrated, 2x smooth inferior	all smooth, hooked, subequal	
acicula	1, slender, subdistally enlarged, bent	1 thick, sharply bent distally plus 1 extra, thin, straight in anterior setigers	1 thick, sharply bent distally	1 thick, sharply bent distally plus 1 extra, thin, straight, in anterior setigers	
swimming setae					
internal reproductive products	sperm in setigers 8-26	setigers 10 to 22 or near end of body			
attachment of gametes	dorsal, setigers 11-17	ventral			
distribution	Southern California	Mexico to British Columbia (LHH)	?cosmopolitan (no verified specimens from Pacific North American coast, LHH)	?cosmopolitan (no verified specimens Pacific North American coast, LHH)	

NOTE: I have not seen any specimens of *S. hystrix* or *S. pirifera* from the Pacific coast of North America and not do believe that they occur here.

SELECTED CHARACTERS OF NORTHEAST PACIFIC SPAEROSYLLIS
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CHARACTER	PUMILA Westheide 1974	RANUNCULUS Kudovor & Harris 1995	NAMIT sp. 1 L. Harris	NAMIT sp. 2 L. Harris
source	Westheide 1974	examination of types	examination of specimens	examination of specimen
eyes	4 large, 2 small, all lensed	4 large, 2 small, all lensed	4 large lensed eyes	4 large, 2 small, all lensed
dorsal cirri on setiger 2	yes	yes	no	no
change in dorsal cirri		usually changes from mammiform to digitiform about setiger 8-10		no, flask-shaped throughout
flaps over eyes	no	no	yes	yes
parapodial glands	no	no		no (?) - hard to tell, dorsum encrusted with silt
dorsal papillae	no	2 longitudinal rows, very hard to see & micropapillae	sparse, small	small & rounded in anterior, long & filiform in rest of body
papillae on parapodial bases	appears smooth in illustration	no	1	2 pairs, 1 each at anterior & posterior margin of segment
parapodial papillae	1 dorsal, 1 posterior	no	1 distal on anterior, 1 distal on posterior, 1 subdistal on anterior	1 on anterior face, 1 subdistal on posterior, 1 distal on posterior
pharynx	up to setiger 4	In 3 setigers	everted	to setiger 4
proventriculus	In setigers 4-6	In 3.5-4 setigers	In setigers 1-5	In 2 to 4 setigers
muscle rings	12 large, 5 small rows	19-22 rows	13 large rows, 3 small	16 large, 3 small rows
length/width provent.				
dorsal simple seta	present from setiger 1	present from setiger 1	begin setiger 6	begin setiger 6
ventral simple seta	posteriormost	present, last 5 or less setigers	present, last 6 setigers	present, last 5 setigers
anterior compound setae	5 short-bladed setigers, strongly serrated	7-8; superimposed moderately serrated, inferior smooth; inferior 2/3x length of superior	6 (5-8); superior moderately serrated & 2x length of smooth inferior	6-8; serrated superior 2x length of smooth inferior
posterior compound setae	as above	3-5; usually smooth, slightly shorter than those in anterior	5; superior moderately serrated & 1.5x length smooth inferior	4-5; serrated superior slightly less than 2x length of smooth inferior
acicula	1, trifid, resembling a trident with short side prongs	1, distally pointed, slightly bent	1, with "shell" subdistal to pointed tip, straight	1, slightly bent at tip
swimming setae		from setiger 8 to end of body		
internal reproductive products		from setiger 8	eggs in setiger 7 to end of body	setiger 5-8 to near end of body
attachment of gametes	dorsal, setigers 8/7 to 13/14	dorsal, from setiger 8		
distribution	Galapagos; Red Sea; Point Barrow, Alaska (Westheide 1974)	Southern California & Puget Sound (LHH)	EVS 8401, st. 103R, rep. 5, July 1994	Strait of Juan de Fuca; Victoria, British Columbia

SELECTED CHARACTERS OF NORTHEAST PACIFIC SPHAEROSYLLIS

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CHARACTER	NAMIT sp. 3 L. Harris	NAMIT sp. 4 L. Harris	NAMIT sp. 6 L. Harris
source	examination of specimens **	examination of specimen	examination of specimen
eyes	4 large lensed eyes	4 large, lensed	4 large, 2 small, all lensed
dorsal cirr on setiger 2	no	no	yes
change in dorsal cirr		slight elongation towards posterior; unusual elongate interior capsules	elongation towards posterior
raps over eyes	no	no	no
parapodial glands	no	present, from anterior setiger	present, from anterior setiger
dorsal papillae	appears smooth; micropapillae present	densely papillate, anterior papillae only slightly smaller than posterior	sparingly papillate, no pattern
papillae on parapodial bases	no	1 larger one on anterior, 1 smaller one on posterior	1 larger one on anterior, 1 smaller one on posterior, 1 next to dorsal cirrus
parapodial papillae	1, subdistal on posterior face	1 subdistally on anterior face, 1 distally on posterior face	1 subdistally on anterior face, 1 distally on posterior face
pharynx		In setigers 1-3	In setigers 1-3
proventriculus	In 2 setigers	In setigers 4-6	In setigers 4-6
muscle rings	13 rows	9 large, 4 small	16 large, 4 small
length/width provent.			
dorsal simple seta	present on setiger 1	present from setiger 5/8	present from setiger 1
ventral simple seta	present	present, last 2-3 setigers	?
compound setae, anterior	5-4; short, with 4 coarse spines on superior, inferior smooth, subequal	5-7; all serrated, range from coarse to moderate (SUP to INF); superior 2x length of inferior	4-5; all serrated, range from moderate to fine (SUP to INF); Inferior 3/4x length of superior
compound setae, posterior	3-2; all short, subequal, smooth	5-3; all serrated, range from coarse (SUP) to extremely fine (INF); superior about 1.5x length of inferior	4-3; all serrated, range from moderate to fine (SUP to INF); subequal length superior & inferior
acicula	1 thick, gently bent at tip	1 thick, sharply bent at tip, In all setigers; 1 thin, straight, In anterior setigers only	1 thin, straight with slight bend at tip; 1 thin, straight
swimming setae			
internal reproductive products	2 egg masses In each of setiger 15, 17-27		
attachment of gametes			
distribution	Arbutus Island, British Columbia	Klaquack Channel, Rivers Inlet	Arbutus Island, British Columbia

SELECTED CHARACTERS OF NORTHEAST PACIFIC EXOGONE

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CHARACTER	ACUTIPALPA Kudenov & Harris 1995	BREVISETA Kudenov & Harris 1995	DWISULA Kudenov & Harris 1995	LOUREI Berkeley & Berkeley 1938
source	Kudenov & Harris 1995	Kudenov & Harris 1995	Kudenov & Harris 1995	Kudenov & Harris 1995
eyes	4 large, lensed; 2 small	4, large, lensed (frequently divided); 2, small eyespots	4, large, lensed	2 pairs, anterior pair lensed
antennae	originate together, between large eyes; median at least as long as palps, and 4x (up to 10x) length of laterals	originate together between posterior eyes; median twice as long as prostomium & 2-5x length of laterals	originate separately, median posterior to laterals; median 2x prostomium length, and 1.5-2x length of laterals	all 3 arise together, anterior to eyes; median as long as prostomium & 2-3x length of laterals
palps	long and pointed	long and pointed	broad, rounded	long, usually distally blunt
dorsal cirri on setiger 2	no	no	no	yes
flaps over eyes	no	no	no	no
pharynx	In setigers 1-4	through setigers 6 (8)	usually through setigers 2-3	usually in 3 segments
proventriculus	in setigers 5-7	setigers 7-8 or 8-9	in 2.5 segments, usually setigers 3-5.5	usually in 4-5 segments (range: from 2 to 7 segments long)
muscle rings	20-23 rows	20-23 rows	14-16 rows	usually 18-24 (range: 16 to 30)
length/width provent.				
dorsal simple seta	present from setiger 1, distally pointed, unidentate, becoming bidentate in posterior	present from setiger 1, slightly bifid at first then becoming strongly bifid in posterior	present from setiger 1, with abruptly tapered tips & transverse rows of spines	present from setiger 1, slender, unidentate, distally bent
ventral simple seta	posteriormost segments, distally pointed	from median body, distally bifid	from midbody, bifid, with subdistal serrations	median & posterior setigers; distally bidentate & curved
aciculum	1, tip curved	1, distally bent tip	1 (2), distally enlarged blunt heads	1 (2) distally enlarged blunt heads
compound setae	12-15 in anterior, 6-8 in median, 4-6 in posterior; blades with reduced subdistal tooth, heavily serrated; superior blades 3x length of inferior blades, size of blades gradually decreasing	all short falcigers, strongly serrated, distally bifid; superior slightly less than 2x length of inferior	1) in setigers 1-3, falcigers with deeply bifid blades, smooth, subequal; 7-10 per fascicle 2) setiger 4 on: 1-2 superimmost, narrow-bladed spinifers 3) setiger 4 on: 3-2 falcigers with short, comblike, bidentate blades with large primary tooth	1) 1-2 long, superior, spinifers; shafts in set. 2 (sometimes 1) enlarged 2) 2-5 short, distally bidentate falcigers; primary tooth terminal, smaller than secondary tooth
swimming setae		found in setigers 11-27 (1 specimen)	present from setigers 8-9	begin setigers 13-15
internal reproductive products		present from setigers 9-10 to near end of body	present from setigers 8-9	usually in setigers 10-14, can occur in setigers 8-28
attachment of gametes			present from setigers 8-9	
distribution	Southern California	Southern California	Southern California & NE Pacific	Pacific Mexico to British Columbia; ? Pacific rim; ?tropical Atlantic

Exogone naidinoides Westheide has been reported from Japan, Point Barrow, Alaska (Westheide 1974), and Mexico (LHH).

Exogone occidentalis Westheide has been reported from Japan (Westheide 1974), southern California and Mexico (LHH).

Exogone longicornis Westheide has been reported from Orcas Island, Washington (Westheide 1974).

SELECTED CHARACTERS OF NORTHEAST PACIFIC EXOGONE

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CHARACTER	MOLESTA
	Banse 1972
source	Kudneov & Harris 1995
eyes	4, large
antennae	originate together between anterior eyes; median as long as palps, & 7-10x length of laterals
palps	long, distally pointed
dorsal cirri on setiger 2	no
flaps over eyes	no
pharynx	usually through setigers 3-4
proventriculus	in 4-4.5 segments
muscle rings	20 rows
length/width provent.	
dorsal simple seta	present from setiger 1, distally pointed
ventral simple seta	far posterior, usually unidentate, sometimes bidentate
aciculum	1, distally blunt, knob-tipped
compound setae	12 in anterior, 6 in median, 4 in posterior; anterior superior blades 3-4x length of middle & inferior blades, abrupt difference between two size-groups; anterior blades unidentate or subbidentate, becoming more bidentate posteriorly; all serrated
swimming setae	present from setiger 11
internal reproductive products	present from setiger 11
attachment of gametes	
distribution	California & NE Pacific

KEY TO THE SPHAERODORIDAE OF SOUTHERN CALIFORNIA

Ronald G. Velarde

City of San Diego, Marine Biology Laboratory
12 August 1996

List of Species

Clavodorum clavatum Fauchald, 1972
Ephesiella brevicapitis (Moore, 1909)
Ephesiella mammifera Fauchald, 1974
Sphaerephesia longisetis Fauchald, 1972
Sphaerephesia similisetis Fauchald, 1972
Sphaerodoridium sp A
Sphaerodoropsis biserialis (Berkeley and Berkeley, 1944)
Sphaerodoropsis minuta (Webster and Benedict, 1887) *
Sphaerodoropsis sexantennella Kudenov, 1993
Sphaerodoropsis sphaerulifer (Moore, 1909)
Sphaerodorum papillifer Moore, 1909

1. Body long, vermiform; dorsum with 2 rows of sessile macrotubercles with long terminal papillae; first setiger with recurved hooks..... 2
1. Body short, grub-like; dorsum with more than 2 rows of macrotubercles; first setiger without recurved hooks..... 4
2. All setae simple, with small lateral boss..... Sphaerodorum papillifer
2. All setae compound (except recurved hooks) Ephesiella 3
3. Microtubercles partially fused to macrotubercles; dorsum and ventrum densely papillated..... Ephesiella mammifera
3. Microtubercles separated from macrotubercles on dorsum; dorsum with only few papillae..... Ephesiella brevicapitis
4. Dorsum with 4 rows of sessile macrotubercles..... 5
4. Dorsum with more than 4 rows of macrotubercles..... 7
5. Macrotubercles with short terminal papillae; anterior face of each parapodium with more than six papillae.. Sphaerephesia 6
5. Macrotubercles without terminal papillae; anterior face of each parapodium with only single papilla Sphaerodoropsis biserialis
6. Compound setae from setigers posterior to setiger 3 very long, more than twice as long as parapodia; microtubercles present between the parapodia..... Sphaerephesia longisetis
6. All compound setae short, no longer than parapodia; microtubercles absent..... Sphaerephesia similisetis
7. Dorsum with 6-8 rows of macrotubercles..... 8
7. Dorsum with 10-12 rows of macrotubercles..... 10

8. Dorsum with 6 rows of stalked macrotubercles..... 9
8. Dorsum with 7-8 rows of sessile macrotubercles; lateral antennae short, truncate..... Sphaerodoropsis sphaerulifer
9. Median antenna long, as long as, or longer than, the lateral antennae; eyes absent..... Clavodorum clavatum
9. Median antenna short, shorter than the lateral antennae; eyes present..... Sphaerodoridium sp A
10. Dorsum with 10-12 rows of macrotubercles, forming a transverse row on each segment; two short, rounded postsetal lobes present..... Sphaerodoropsis minuta
10. Dorsum with 10-11 rows of macrotubercles, forming a zig-zag pattern on adjacent segments; postsetal lobes absent..... Sphaerodoropsis sexantennella

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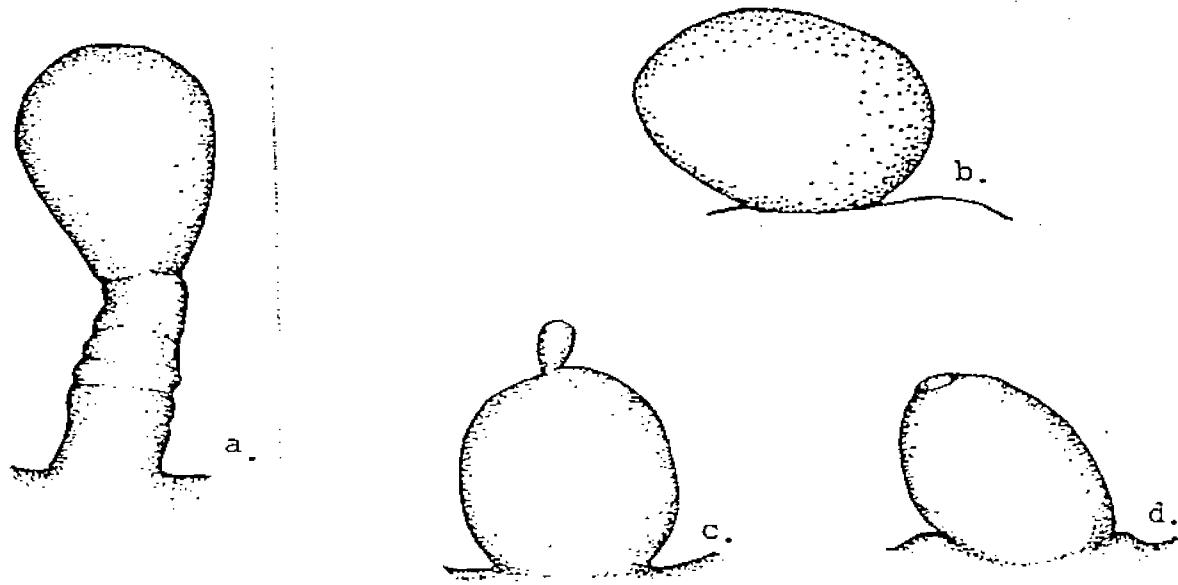


Figure 1. Macrotubercles. a. stalked
b. sessile without terminal papilla
c. sessile with long terminal papilla
d. sessile with short terminal papilla



Figure 2. Microtubercles.

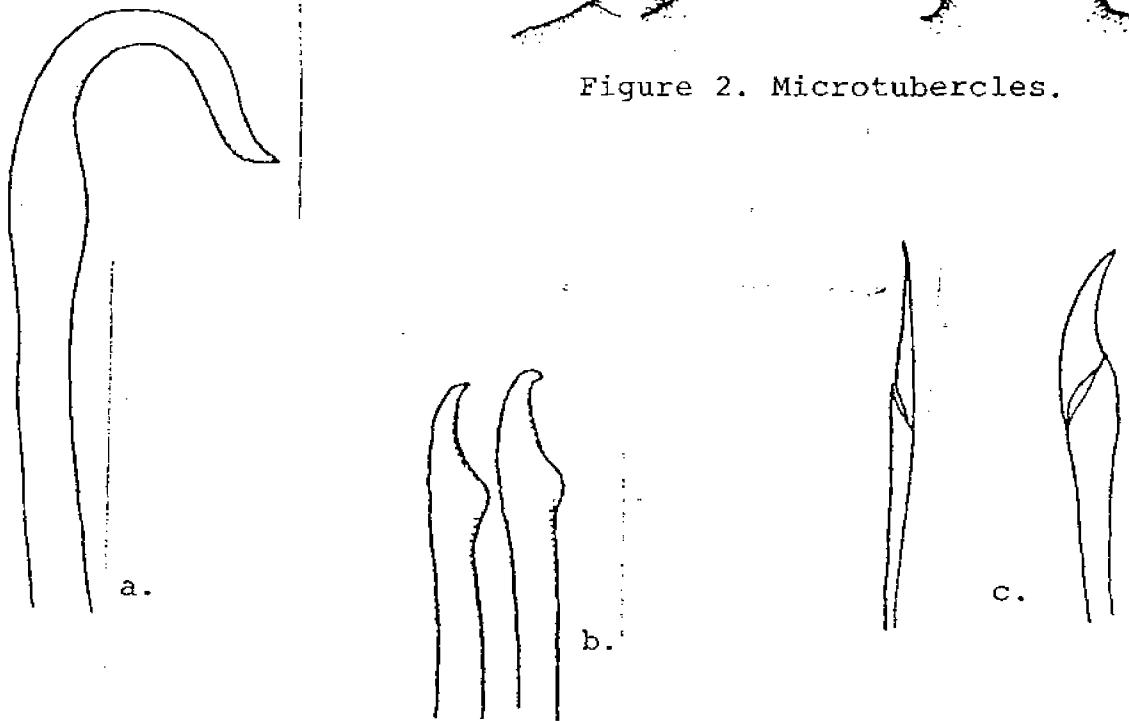


Figure 3. Setae.
a. recurved hook
b. simple
c. compound