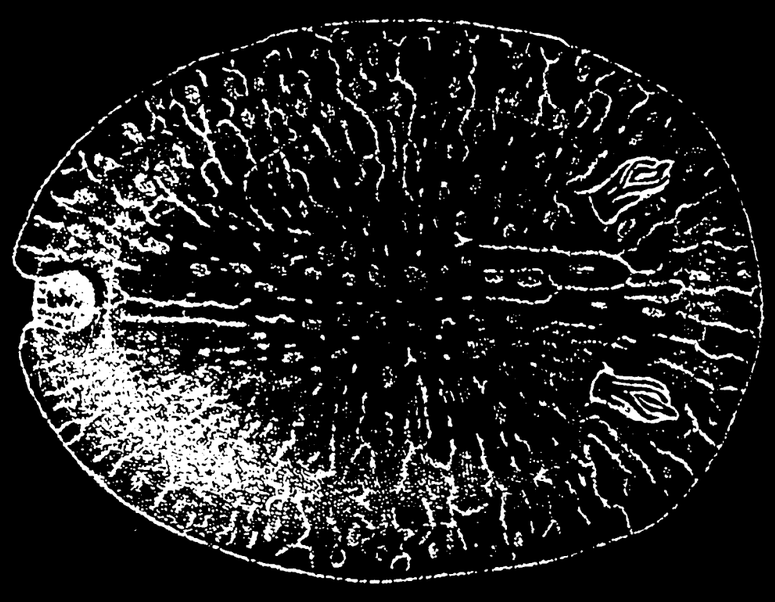
Southern California Association of Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

December, 1994 Vol. 13, No.8

NEXT MEETING:	SCBPP Non-polychaete Problem Species
GUEST SPEAKER:	none
DATE:	January 9, 1995
TIME:	9:30am - 3:30pm
LOCATION:	Cabrillo Marine Aquarium 3720 Stephen White Drive San Pedro



Quasicorambe pacifica (from MacFarland & O'Donoghue 1929)

JANUARY 9 MEETING

The January meeting will be back to the 2nd Monday of the month at the Cabrillo Marine Aquarium. It will be another non-polychaete SCBPP problem species meeting. Don't get discouraged, polychaete people, the February meeting is being planned for SCBPP problem polychaetes.

As in previous SCBPP-focus meetings, all problems are welcome. If you can contact Don Cadien prior to the meeting and indicate problem areas you wish to discuss, literature can be brought along to help.

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART, BY THE
ARCO FOUNDATION, CHEVRON USA, AND TEXACO INC.

FUTURE MEETINGS

On February 6th there will be a special SCAMIT meeting at the Santa Barbara Museum of Natural History with Dr. Eric Hochberg to resolve problems with octopus from the SCBPP trawl program. This meeting is in addition to our regular monthly meeting, which, due to the President's Day holiday may be on a Tuesday instead. This will be decided at the January meeting.

CORRECTIONS

R. Eugene Ruff's address was incorrectly given in the last newsletter. Here is the correct address.

R. Eugene Ruff
11719 E.(not S.) Meridian, Suite 401
↑ (missing from original address)
Puyallup, WA 98373
(206) 770-7007

Also, there was a mistake made in the last newsletter minutes for the November 21 meeting. In the fourth paragraph where the two shallow water species *Polydora nuchalis* and *Polydora cornuta* are being compared in the sentence, "The main difference between *P. cornuta* and *P. ligni* is the shape of the spines in the modified 5th setiger.", *P. ligni* should be *P. nuchalis*. Remember, *P. ligni* is now considered a junior synonym of *P. cornuta* due to Blake and Maciolek (1987). The secretary sincerely apologizes for this error.

CHRISTMAS PARTY

The Christmas party was a great success even though we regret many members were unable to attend. The food was truly scrumptious and the entertainment was outstanding. Larry Lovell and Ann Dalkey had some additions to their musical ensemble this year. They had help from John Shisko's daughters and family friend, along with SCAMIT friend Claire Arment. All of us non-musical SCAMIT members thank them greatly for their talent and participation.

We all must have been good this year because the evening ended with a jolly visit from Santa "John" Claus and his bag full of treasures. SCAMIT members also owe Vice-President, Don Cadien, a great big thanks for making the arrangements for such a fun party. Our thanks also go to the Cabrillo Marine Aquarium and it's staff, especially Ed Mastro, for providing us once again with a wonderful place for our Christmas festivities, and for their support throughout the year.

It has been suggested that perhaps SCAMIT should have its annual Christmas party in July or September next year when more of its members might be able to attend. Christmas being such a busy time for everyone and many people out of town. We have tried a beach party before during the summer which has been mildly successful. We hope members might have some ideas because we hate to put an end to a wonderful tradition. Please let Vice-President Don Cadien know of any thoughts or ideas you might have on this.

ELECTIONS

Nominations are now open for SCAMIT officers for the 1995-96 year. All four current officers will be running for re-election, but competition is always welcomed. Please contact Vice-President Don Cadien with your nominations. Ballots will be mailed out with the January newsletter and will be due by the March meeting.

NEW PUBLICATIONS

The collection of conference papers from the 4th International Polychaete Conference in Angers, France in 1992 is due out soon. Several papers pertinent to our area will be included.

A recent publication from Russia (Martynov 1994) resolves most, if not all, of the problems within the nudibranch family Corambidae. It is in Russian, but hopefully a translator can be found so the author's comments can be appreciated in full. The family was separated into two subfamilies; the Loyinae, with dermal spicules, and a non-deciduous notal cuticle; and the Corambinae, lacking dermal spicules, and having a deciduous notal cuticle. Changes to local taxa are as follows:

Corambe pacifica MacFarland & O'Donoghue 1929 becomes the type of the new subgenus *Gulbinia* within the new genus *Quasicorambe*, and is thus now *Quasicorambe pacifica* (MacFarland & O'Donoghue 1929).

Corambe thompsoni Millen & Nybakken 1991 becomes the type of the new genus *Psammodoris* in the subfamily Loyinae, and is thus now *Psammodoris thompsoni* (Millen & Nybakken 1991).

Doridella steinbergae (Lance 1962) becomes the type of the new subgenus *Suhinia* in the genus *Corambe*, and is thus now *Corambe steinbergae* (Lance 1962).

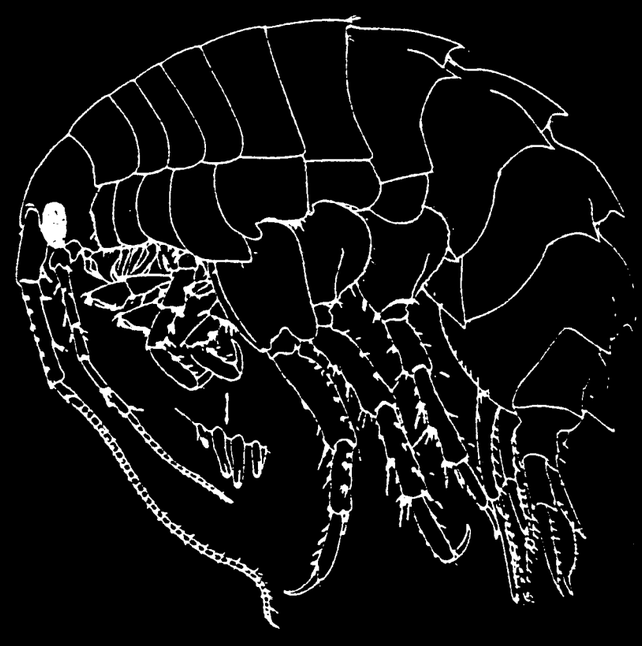
POLYCHAETE KEY

A new updated version of the non-polydorid spionidae key written by Larry Lovell and Dean Pasko for southern California species has been included in this newsletter. The new version has illustrations and members will find it very useful. This version also includes Larry Lovell's new species, *Pseudoathrospio fauchaldi.* Thanks to Larry and Dean for all their hard work.

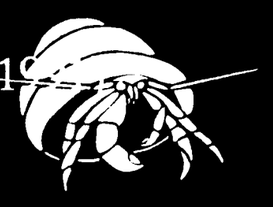
AMPHIPOD MEETING - DEC. 15TH

On Thursday the 15th SCAMIT held a special meeting on amphipods at MEC with Dr. Jim Thomas of the Smithsonian Institution. Jim was visiting in the area for personal reasons, and graciously offered to assist SCAMIT members with any problem amphipods. Because of his other commitments we started in the afternoon. Representatives of all the SCBPP participating agencies, along with Brad Myers, joined Jim in this brief meeting. We discussed several species which had been covered in previous amphipod workshops, *Paradexamine* sp. and *Photis sp. D* of SCAMIT among them. Brad Myers brought in *Paradexamine* from samples collected this fall in Richmond Harbor, San Francisco Bay, apparently the first time that the species had been taken (or reported) from San Francisco Bay. The animals appeared the same as those from Catalina Island, the San Gabriel River tidal prism, and San Diego Bay examined previously.

To recap, this animal is surely introduced (in 1988, or perhaps earlier); may be one of about eight described species, or may be as yet undescribed. Dr. Thomas will be providing access to some particularly obscure literature we have not yet been able to see, including original descriptions of several species. A related species is illustrated below.



P. frinsdorfi (from Barnard & Karaman 19



Photis sp. D of SCAMIT is apparently not very common, and is infrequently encountered during sampling programs in southern California. Jim Roney of Hyperion brought in a wonderful adult male specimen which we examined. It was taken during SCBPP sampling in Santa Monica Bay. Several other *Photis* were also examined. Ernesto Calix of MEC brought some specimens which matched *P. californica* in morphology, but had a variant coloration from those normally seen. These specimens lacked the normal antennal pigmentation of the species (longitudinal dark purplish-black lines dorsally on articles one and two of antenna one), and had blotchy light pigmentation on the anterior pereopods. Dr. Thomas concluded they could not be separated from *P. californica* as described by Barnard (1962). Specimens identified as *Photis sp* LA1 also had blotchy pigmentation on the anterior pereopods, but also on the mouthparts. These animals were not the same as those taken by MEC, being closer to *P. brevipes* or *P. parvidons* than to *P. californica*.

A general discussion of character selection in *Photis* ensued, with no definitive result other than a dissatisfaction with the current suite of characters being used. It was agreed that it would be necessary to seek other characters which were less variable than configuration of the gnathopods, coxal shape and relative size, and setation of the coxae for use in separation of species within the genus. All of these characters are related strongly to size (and/or age), and are not documented in a developmental series for any of the species in the area. The strong sexual dimorphism in nearly all *Photis* complicates the matter further, with juvenile males varying little from the female configuration, and becoming increasing dimorphic in subsequent molts.

This will be a major undertaking, and will not be completed for many years, but it needs doing. In the interim, we probably should adopt a policy of separately designating variant populations until their place in the scheme of eastern Pacific *Photis* speciation is clear.

A problem of equal perplexity was the identity of the specimens of *Garosyrrhoe* found off southern California. *Garosyrrhoe bigarra* was described from coarse sediments off San Diego (as *Syrrhoites bigarra*) by Barnard in 1962. The second eastern Pacific species in the genus (*Garosyrrhoe disjuncta*) was described from the Gulf of California (Barnard 1969). The two species are similar, but were differentiated by Barnard (1972) on the basis of the dorsal teeth on pleonites 1 and 2, and on pereonite 7.

Unfortunately, the characters are not as clear-cut and invariate as the original descriptions would indicate. To complicate matters the holotypes of the two species are different sexes; that of *G. bigarra* a male, and that of *G. disjuncta* a female. It was initially hoped that the two would be found to be a single species, but examination of both males and females from southern California collections has shown that supposedly differential characters are not segregated by sex.

Rostral shape, head carination, eye dorsal confluence, dorsal tooth pattern, and serration of the hind margin of pleonite 3 all seem to be unreliable as separatory criteria for the two species. Reexamination of the types is clearly in order to establish the accuracy and adequacy of the original descriptions. Don Cadien will reexamine the holotype of *G. bigarra* at the Natural History Museum of Los Angeles County, while Jim Thomas will do the same for the type of *G. disjuncta* at the Smithsonian.

Towards the end of the meeting we examined specimens of *Pleusymtes* from Puget Sound. It had been assumed that these were variants of *P. coquilla* described from off Oregon by Barnard (1971). The most easily seen differences were in the configuration of the pleonites. The Puget Sound material differed

from *P. coquilla*, *P. subglaber*, and all of Hirayama's Japanese *Pleusymtes* in having the second pleonal epimeron larger than the third. Dr. Thomas was of the opinion that this constituted a new species, and not just a variant of *P. coquilla*. Hopefully it will be among the new species described by Bousfield & Hendrycks in their treatment of the subfamily Pleusymtinae (in prep.).

Doug Diener (who was unfortunately not able to participate) had mentioned previously that he had taken at least three species of *Heterophoxus* during the SCBPP sampling, *H. oculatus*, *H. affinis*, and *H. ellisi*. The genus was recently reexamined by Jarrett & Bousfield, with *H. affinis* removed from the synonymy of *H. oculatus* and *H. ellisi* described as new. A series of specimens taken near the Redondo Submarine Canyon and off Palos Verdes were examined during the meeting and found to be *H. affinis* using the new key to the genus (Jarrett & Bousfield 1994, pg. 126).

It was clear that there are still plenty of amphipod problems to be addressed in southern California. One of them is that we are increasingly dealing with a world fauna in our local waters. Introductions of crustaceans (as in most other groups) have been more and more evident in the last ten years, particularly in and near major ports such as San Francisco and the Los Angeles/Long Beach Harbor complex. Jim Thomas had an interesting comment to make regarding the reason for the increase. He suggested that U.S. regulations regarding the quality of ballast water discharged into U.S. waters have been in force for long enough that most vessels have been either constructed to comply with them, or modified to do so. In consequence, there are continual introductions of organisms which in the past would have succumbed to foul or anoxic conditions in the ballast tanks. We have cleaned ourselves into a problem, perhaps one far more disruptive to the local environment than the toxic ballast waters the regulations were designed to control. We all should begin to apply the criteria for recognizing introduced species proposed by Chapman and Carlton (1991). All of us will benefit from reviewing Carlton 1985 and Chapman 1988, both of which deal with amphipod introductions to our area, and the mechanisms involved.

MINUTES FROM DECEMBER 19

Dr. Mary Wicksten of Texas A & M University was a special guest at the meeting. She brought us up to date on her current projects. She is working with Dr. Janet Haig of the Allan Hancock Foundation on a monograph of decapods from California and Oregon that will include both marine and freshwater species and extend coverage to abyssal depths. Although this project is nominally an update of Schmitt's 1921 Decapods of California, it will include many more species. It is also based on examination of specimens and not on literature records and descriptions. Because this publication includes all original illustrations it has been very time consuming to produce, but they are nearing completion. Dr. John Garth of AHF completed most of the work on the brachyuran crabs for this project prior to his death nearly a year ago.

Dr. Haig has some new publications on hermit crabs that are due out very soon. Most of her time has recently been spent untangling the problems associated with galatheid crabs. She and Dr. Keiji Baba of Japan have been working together to resolve the difficulties with the north Pacific representatives of the family.

Dr. Wicksten also reported that *Heptacarpus pictus* is no longer valid. It was found to be a synonym of *Heptacarpus sitchensis*. A full discussion of this synonymy is in press, and should be out soon.

Mary also had a cautionary note for SCAMIT members working with crustaceans originally described by W. N. Lockington. Lockington didn't feel it was necessary to provide illustrations to accompany the brief descriptions of his new species. Most of his specimens, including the types, were burnt up in the 1906 San Francisco fire. Because of this many of his species have been redescribed under different names. She recently discussed problems with Lockington's species in a paper in the Bulletin of the Southern California Academy of Sciences (Wicksten 1994).

Dr. Wicksten noted that a mid-water pandalid recorded from off Baja California had been left out of the key to the Pandalidae of California from the last newsletter. This species, *Stylopandalus richardsoni*, could range into our area during ENSO events, and will be added to the next version of the key. She also noted that shrimp of the family Nematocarcinidae had been taken on the Cascadia Abyssal Plain off Oregon. These are, however, beyond the bathymetric coverage of the key to shrimp families included in the November newsletter.

Dr. Wicksten handed out a very useful diagram of a "complete" shrimp with a list of terminology used when describing these animals. The diagram is labelled with abbreviations for these terms. This is one of the materials she prepared for her students. She kindly allowed us to include it in the newsletter.

She also clarified the difference between a movable spine and a tooth. A movable spine inserts into a socket and a tooth doesn't. A broken tooth may be moved by manipulation, and a movable spine may be tightly socketed, and not very moveable. Examination of the juncture between the carapace and the feature should allow recognition of the two structures. Also, the difference between chelae and subchelae was discussed. Chelae are shaped like pinchers and subchelae are shaped like a switchblade. To be able to see the epipods the carapace needs to be lifted up.

It was also mentioned at the meeting that many shrimp have asymmetrical limbs. In some cases the left and right members of a leg pair may be dissimmilar in number of subdivisions of the carpus, may differ in length, or may differ in terminal article shape (one chelate, the other not). These asymmetries are usually consistent, and cause little difficulty. A more troublesome variation is in the number of epipods on the walking legs. It is frequently the case that one side of an animal will have epipods on more legs than the other. This often presents a problem because both sides are generally not reported in the original descriptions. Both sides of a shrimp should be examined for epipod counts, since asymmetry is not uncommon.

Dr. Wicksten commented that hippolytids seem to have a definite affinity for certain substrates and depths. She cautioned members that there are many discontinuities in species distributions related to the combination of habitat specificity and habitat patchiness.

Mary informed us that she welcomes problem shrimp species and that she has plenty of undergraduates that would be willing to help work on them. She also desires to review large suites of specimens to better define the degree of variability within west coast shrimp populations. Please send them to her at:

Dr. Mary Wicksten
Texas A & M University
Biology Department
315 Biological Sciences Building West
College Station, Texas 77843-3258

Dr. Wicksten also mentioned that Judy Wern of the Marine Biology Dept. at Texas A & M at Galveston has been working with nemerteans in the Gulf of Mexico and may be

able to help SCAMIT members with their nemertean problems.

During the afternoon Mary Wicksten examined decapod specimens brought by several of the members. Specimens from shallow water in south Santa Monica Bay, which Carol Paquette had thought *Heptacarpus palpator* were not. They belonged to an as yet undescribed species similar to *H. palpator* which Mary had seen from the Channel Islands. Specimens Carol had designated *Heptacarpus sp. A* of MBC were referred to *H. stimpsoni* by Mary.

Jim Roney brought specimens of *Ogyrides sp. A*. Mary had previously reported the animals occurring in southern California shallow waters as a northward extention of the Pacific population of *Ogyrides alphaerostris*, a species better known from the Atlantic. After examining Jim's specimens and drawings Mary agreed with him that this was a separate and undescribed species. Jim also mentioned an undescribed *Spirontocaris* from our area, but did not bring specimens for examination. He did, however, indicate that he had found a *Spirontocaris* which bore two segmented epipods; a most remarkable feature!

The problem of how to deal with *Turbonilla sp. A* and *Turbonilla spp.* in the SCBPP program was also addressed. Distinctive species can often be recognized within sampling areas, and Kelvin Barwick of SDMWD brought one such to the meeting. It is very likely, however, that there are four or five nominate species which might apply to any one form. Such uncertainty is magnified by the combination of data from different agencies within the SCBPP database. After some discussion it was suggested that pyramidellid identifications should probably be left at the generic level because treatment by the participating agencies is unlikely to be equivalent. Each agency can, of course, differentiate *Turbonilla* and *Odostomia* species further for their internal purposes, but for the SCBPP data analysis it is very likely that the additional detail will not be used.

LITERATURE CITED

BARNARD, J. LAURENS. 1962. Benthic Marine Amphipoda of Southern California: 1. Families Aoridae, Photidae, Ischyroceridae, Corophiidae, Podoceridae. Pacific Naturalist 3(1):3-72.

---. 1969. A biological survey of Bahia de los Angeles, Gulf of California, Mexico. IV. Benthic Amphipoda (Crustacea). Transactions of the San Diego Society of Natural History 15(13): 175-228.

---. 1971. Gammaridean Amphipoda from a deep-sea transect off Oregon. Smithsonian Contributions to Zoology (61):1-86.

---. 1972. A review of the family Synopiidae (=Tironidae), mainly distributed in the deep sea (Crustacea: Amphipoda). Smithsonian Contributions to Zoology (124):1-94.

BARNARD, J. LAURENS, and Gordan S. Karaman. 1991. The Families and Genera of Marine Gammaridean Amphipoda (except Marine gammaroids)[parts 1 and 2]. Records of the Australian Museum Supplement 13:1-866.

BLAKE, JAMES A., and Nancy J. Maciolek. 1987. A Redescription of Polydora cornuta Bosc (Polychaeta: Spionidae) and Designation of a Neotype. Bulletin of the Biological Society of Washington 7:11- 15.

CARLTON, JAMES T. 1985. Transoceanic and interoceanic dispersal of coastal marine organisms: the biology of ballast water. Oceanography and Marine Biology, an Annual Review 23:313-371.

CHAPMAN, JOHN W. 1988. Invasions of the northeast Pacific by asian and Atlantic gammaridean amphipod crustaceans, including a new species of Corophium. Journal of Crustacean Biology 8(3):364-382.

CHAPMAN, JOHN W., and James T. Carlton. 1991. A test of criteria for introduced species: the global invasion by the isopod

Synidotea laevidorsalis (Miers, 1881). Journal of Crustacean Biology 11(3):386-400.

JARRETT, NORMA E., and Edward L. Bousfield. 1994. The amphipod superfamily Phoxocephaloidea on the Pacific Coast of North America. Family Phoxocephalidae. Part II. Subfamilies Pontharpiniinae, Parharpiniinae, Brolginae, Phoxocephalinae, and Harpiniinae. Systematics and distributional ecology. Amphipacifica 1(2):71-150.

MACFARLAND, FRANK MACE, and Charles Henry O'Donoghue. 1929. A new species of Corambe from the Pacific coast of North America. Proceedings of the California Academy of Sciences, Series 4 18(1):1-27.

MARTYNOV, A. V. 1994. Materials for the Revision of Nudibranchiate Molluscs of the Family Corambidae (Gastropoda, Opisthobranchia) Taxonomy .1. Zoologicheskii Zhurnal 73(10):3-15.

SCHMITT, WALDO L. 1921. The Marine Decapod Crustacea of California, with special reference to the Decapod Crustacea collected by the United States Bureau of Fisheries Steamer 'Albatross' in connection with the Biological Survey of San Francisco Bay during the years 1912-1913. University of California Publications in Zoology 23:1-470.

WICKSTEN, MARY K. 1994. On the identity of snapping shrimp described and identified by W. N. Lockington, 1878. Bulletin of the Southern California Academy of Sciences 93(3):118- 126.

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

President	Ron Velarde	(619)692-4903
Vice-President	Don Cadien	(310)830-2400 ext. 403
Secretary	Cheryl Brantley	(310)830-2400 ext. 403
Treasurer	Ann Dalkey	(310)648-5611

KEY TO THE NON-POLYDORID SPIONIDAE FROM SOUTHERN CALIFORNIA (INTERTIDAL TO 500 METERS)

by
Lawrence L. Lovell and Dean Pasko

1. Branchiae absent; setiger 1 with 1 - 2 large recurved neuropodial spines in addition to capillary setae (Fig. 1) . . (*Spiophanes*) 2

   Branchiae present; setiger 1 without recurved neuropodial spines (see Fig. 13) 7

2. Prostomium rounded anteriorly, without lateral projections; prostomium with medial orange pigment spot; median antennae absent (Fig. 2) . . . . . *Spiophanes wigleyi*

   Prostomium bell or T-shaped, with short or long lateral projections (Figs. 3-7); prostomium without pigment spot; median antennae present or absent 3

3. Prostomium T-shaped with long lateral projections 4

   Prostomium bell shaped without lateral projections 5

4. Eyes present (Fig. 3) . . . . . *Spiophanes bombyx*

   Eyes absent (Fig. 4) . . . . . *Spiophanes anoculata*

5. Median antennae absent; peristomium poorly developed (Fig. 5) . . . . . *Spiophanes missionensis*

   Median antennae present; peristomium well developed (Fig. 6) . . 6

6. Prostomium flairs laterally at distal end; neuropodial glands in setigers 10 - 13 without pigment; ventrum of setiger 8 forms dark transverse band with methyl green stain; dorsal transverse membrane without fimbriae (Fig. 6) . . . . . *Spiophanes berkeleyorum*

   Prostomium straight or with a slight constriction distally; neuropodial glands in setigers 10 - 13 darkly pigmented; setiger 8 does not form transverse band of methyl green stain; dorsal transverse membrane with fimbriae (Fig. 7). . . . . *Spiophanes fimbriata*

7. Modified segment present in anterior region (Figs. 8 & 9) . . . 8

   Modified segment absent in anterior region 9

8. Setiger 5 modified . . . . . Polydorid complex (includes *Pseudopolydora, Polydora* (Fig. 8), *Carazziella* (Fig. 9), *Boccardiella, and Boccardia*)

   Setiger 16 modified . . . . . *Morants duplex*

9. Notopodial post-setal lamellae of first 2 - 3 parapodia with 1 or more lobes; accessory branchiae present (Fig. 10). . . . . *Dispio uncinata*

Notopodial post-setal lamellae of anterior parapodia entire; accessory branchiae absent 10

10. Branchiae limited to middle and posterior setigers, except for a single pair on setiger 2 in males (Fig. 11) . . (*Pygospio*) 11

Branchiae beginning on setiger 1 or 2 and continuing for a variable number of setigers 12

11. Branchiae first present from setiger 17 - 21 (Fig.11) . . . . . *Pygospio californica*

Branchiae first present from setiger 11 - 12 (Fig.12) . . . . . *Pygospio elegans*

12. Prostomium conical, distally pointed, occassionally blunt with minute point; or conical and distally tapering (Figs. 13 & 14) . 13

Prostomium with distal lateral or frontal horns, broadly rounded, or incised on anterior margin (Figs. 19, 26, & 30) . . . 19

13. Branchiae fused to dorsal lamellae at least basally, continuing to end of body (Fig 14) . . . . . (*Scolelepis*) 14

Branchiae completely free from dorsal lamellae, present on variable number of anterior setigers, absent posteriorly (Fig. 13) . . . . . *Aonides* spp.

14. Occipital cirrus (median antenna) present (Figs. 14 & 15) 15

Occipital cirrus (median antenna) absent (Fig. 17) 17

15. Setiger 1 with notosetae 16

Setiger 1 without notosetae. . . . . *Scolelepis* sp. 1 of Point Loma

16. Hooded uncini unidentate or bidentate (Fig. 14) . . . . . *Scolelepis occidentalis*

Hooded uncini multidentate (Fig. 15) . . . . . *Scolelepis (Parascolelepis) tridentata*

17. Notosetae absent on setiger 1; hooded hooks tridentate or multidentate 18

Notosetae present on setiger 1; hooded hooks uni-, bi- or tridentate (Fig. 16) . . . . . *Scolelepis squamata*

18. Eyes arranged in straight line; hooded hooks tridentate (Fig. 17) . . . . . *Scolelepis bullibranchia*

    Eyes arranged in trapezoid; hooded hooks multidentate . . . . . *Scolelepis* sp. B of Rossi

19. Prostomium with lateral or frontal horns (variable for *Malacocerus*) 20

    Prostomium broadly rounded or incised on anterior margin, without lateral or frontal horns 21

20. Branchiae beginning on setiger 1 (Fig. 18) *Malacoceros punctata*

    Branchiae beginning on setiger 2 (Fig. 19) . *Rhynchospio glutea*

21. Branchiae present anteriorly only (Fig. 23) 22

    Branchiae present throughout most of the body (Fig. 32) 31

22. Branchiae begin on setiger 1 23

    Branchiae begin on setiger 2 24

23. One pair of apinnate branchiae, with dorsal ridge on setiger 2 (Fig. 20) . . . . . *Streblospio benedicti*

    Three pairs of pinnate branchiae, with dorsal ridge on setiger 1 (Fig. 21) . . . . . *Paraprionospio pinnata*

24. Branchiae all cirriform, 6 or more pairs (Fig. 22) . . . . . *[Prionospio (Minuspio)]* 25

    Branchiae a combination of pinnate and cirriform, 4 or 5 pairs (Figs. 25 & 26) 27

25. Prostomium with 2 pairs of large eyes, 6 - 8 pairs of branchiae (Fig. 22) . . . . *Prionospio (Minuspio) multibranchiata*

    Prostomium with 2 pairs of small eyes, 6 - 12 pairs of branchiae. .26

26. Prostomium truncate anteriorly, triangular in appearance, sometimes with 1 medial peak; posterior dorsal lamellae rounded; 6 - 8 pairs of branchiae (Fig. 23) . . . . . *Prionospio (Minuspio) cirrifera*

    Prostomium narrowly rounded anteriorly, with 5 marginal peaks; posterior dorsal lamellae triangular; 6 - 12 pairs of branchiae (most commonly ten) (Fig. 24) . . . *Prionospio (Minuspio) lighti*

27. First pair of branchiae cirriform; fourth pair pinnate with flat, plate-like pinnules (Fig. 25) . . . *Apoprionospio pygmaea*

    First pair of branchiae pinnate; pinnules digitiform (Fig. 26) . . . . . *[Prionospio (Prionospio)]* 28

28. Branchial pairs 2, 3 and 4 cirriform; interramal pouches present from setigers 2 - 4, continuing to mid-body (Fig. 26). . . . . *Prionospio ehlersi*

    Branchial pairs 2 - 3 cirriform; interramal pouches absent . . . 29

29. Four pairs of branchiae; pairs 1 and 4 pinnate (Figs. 28 & 29) . 30

    Five pairs of branchiae, pairs 1, 4, and 5 pinnate (Fig. 27) . . . . . *Prionospio heterobranchia*

30. Branchial pairs 1 and 4 pinnate, subequal, or with fourth pair longer than first; dorsal transverse membranes present from setiger 7 (Fig. 28) . . . . . *Prionospio* sp. A (*sensu* SCAMIT)

    Branchial pairs 1 and 4 pinnate; first pair two to three times longer than fourth; dorsal transverse membranes absent (Fig. 29) . . . . . *Prionospio* sp. B (*sensu* SCAMIT)

31. Branchiae begin on setiger 1 31

    Branchiae begin on setiger 2 34

32. Prostomium incised anteriorly; neurosetae of some anterior setigers with pseudoaristate setae; posterior neuropidal hooks with subdistal secondary tooth (Fig. 30) . . . . . *Pseudatherospio fauchaldi*

    Prostomium distally entire; anterior neurosetae without pseudoaristate spines; posterior neuropodial hooks with small secondary tooth distal (Fig. 32) 33

33. **(Note: 3 choices)** Branchiae on setigers 1 and 2 subequal; prostomium with dark pigment; hooded hooks bidentate (Fig. 31) . . . . . *Spio filicornis*

    Branchiae on setiger 1 longer than on setiger 2; first pair of branchiae pigmented, ciliated, and with distal swelling; prostomium without pigment; anterior dorsum pigmented; hooded hooks multi-dentate; nuchal organs form distinct zigzag pattern . . . . . *Spio* sp. A (*sensu* SCAMIT)

    Branchiae on setiger 1 shorter than on setiger 2; prostomium without pigment; peristomium with patches of pigment; hooded hooks tridentate (Fig. 32) . . . . . *Spio maculata*

34. Interramal pouches present . . . . . (*Laonice*). 35

    Interramal pouches absent . . . . . (*Microspio*). 36

35. Prostomium protrudes beyond peristomial wings; thoracic parapodial fascicles with dense, brassy colored setae (Fig. 33) . . . . . *Laonice appellofi*

    Prostomium does not protrude beyond peristomial wings; thoracic parapodial fascicles sparce, pale yellow setae (Fig. 34) . . . . . *Laonice cirrata*

36. Prostomium bilobed, without pigment spot; notosetae absent on setiger 1 (Fig. 35) . . . . . *Microspio micrccera*

    Prostomium rounded, with a pigment spot; notosetae present on setiger 1 (Fig. 36) . . . . . *Microspio pigmentata*

NON-POLYDORID SPIONIDAE (POLYCHAETA) FROM SOUTHERN CALIFORNIA (INTERTIDAL TO 500 METERS)

Aonides sp.

Apoprionospio pygmaea (Hartman, 1961)

Dispio uncinata Hartman, 1951

Laonice appellofi Soderstrom, 1920

Laonice cirrata (Sars, 1851)

Malacoceros punctata (Hartman, 1961) (formerly *Spio*)

Microspio microcera (Dorsey, 1977) (formerly *Rhynchospio*)

Microspio pigmentata (Reish, 1959)

Morants duplex Chamberlin, 1919

Paraprionospio pinnata (Ehlers, 1901)

Prionospio (Minuspio) cirrifera Wiren, 1883

Prionospio ehlersi Fauvel, 1928

Prionospio heterobranchia Moore, 1907

Prionospio (Minuspio) lighti Maciolek, 1985

Prionospio (Minuspio) multibranchiata Berkeley, 1927

Prionospio sp. A (*sensu* SCAMIT)

Prionospio sp. B (*sensu* SCAMIT)

Pseudathrospio fauchaldi Lovell (in press)

Pygospio californica Hartman, 1936

Pygospio elegans Claparede, 1863

Rhynchospio glutea (Ehlers, 1897)

Scolelepis bullibranchia Rossi, 1982

Scololepis occidentalis (Hartman, 1961)

Scololepis sp. B of Rossi

Scololepis sp. 1 of Point Loma

Scololepis squamata (O.F. Muller, 1806)

Scolelepis (Parascolelepis) tridentata (Southern, 1914)

Spio filicornis (Muller, 1776)

Spio maculata (Hartman 1961)

Spio sp. A (*sensu* SCAMIT) [formerly *Microspio* sp. A (*sensu* Lovell/Harris)]

Spiophanes anoculata Hartman, 1960

Spiophanes berkeleyorum Pettibone, 1962

Spiophanes bombyx (Claparede, 1870)

Spiophanes fimbriata Moore, 1923

Spiophanes missionensis Hartman, 1941

Spiophanes wigleyi Pettibone, 1962

Streblospio benedicti Webster, 1879

Non-polydorid spionids not included in the list or key which may occur in southern California are: *Prionospio anuncata* Fauchald, 1972; and *Spiophanes lowai* Solis-Weiss, 1983.

11/29/93

Key to the Non-Polydorid Spionidae from Southern California

by Lawrence L. Lovell and Dean Pasko

Fig. 1. Setiger 1, showing neuropodial spine of *Spiophanes*.

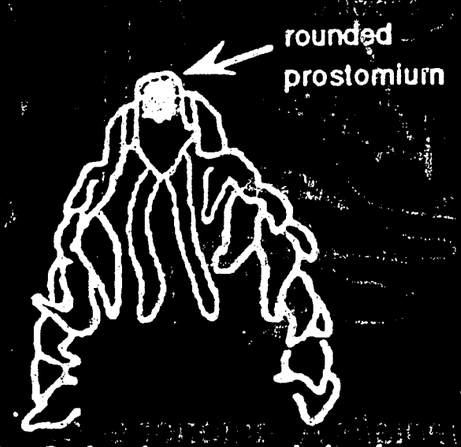


Fig. 2. *Spiophanes wigleyi*: anterior end, dorsal view.

Fig. 3. *Spiophanes bombyx*: anterior end, dorsal view.

Fig. 4. *Spiophanes anunculata*: anterior end, dorsal view.

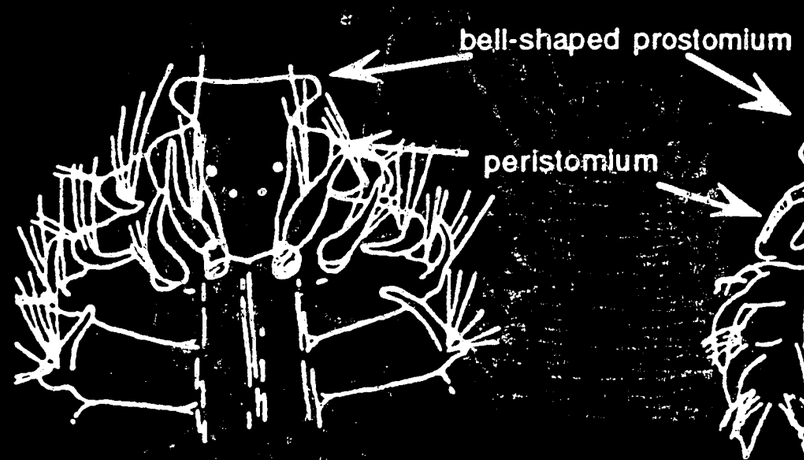


Fig. 5. *Spiophanes missionensis:* anterior end, dorsal view.

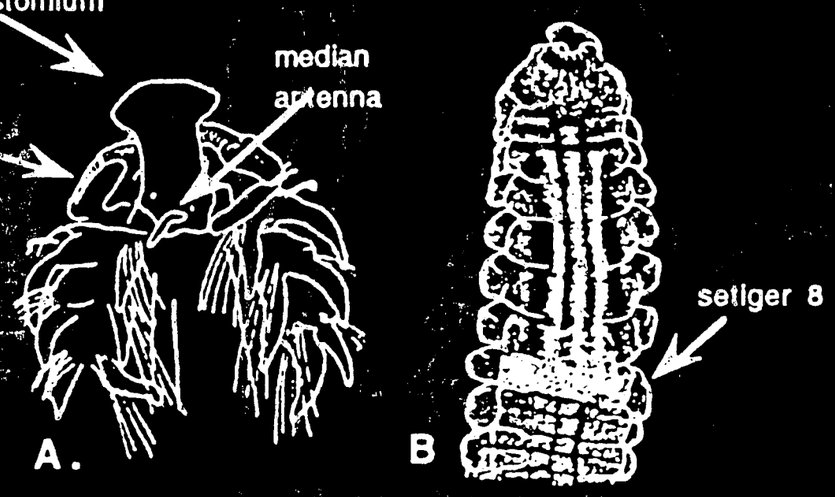


Fig. 6. *Spiophanes berkeleyorum*: A. anterior end, dorsal view; B. ventral view, showing methyl green staining pattern.

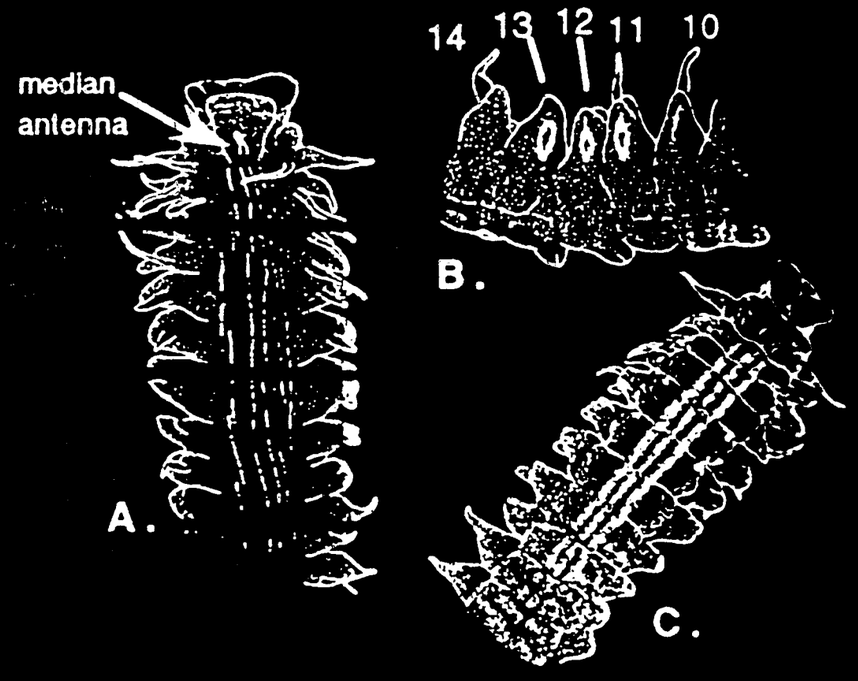
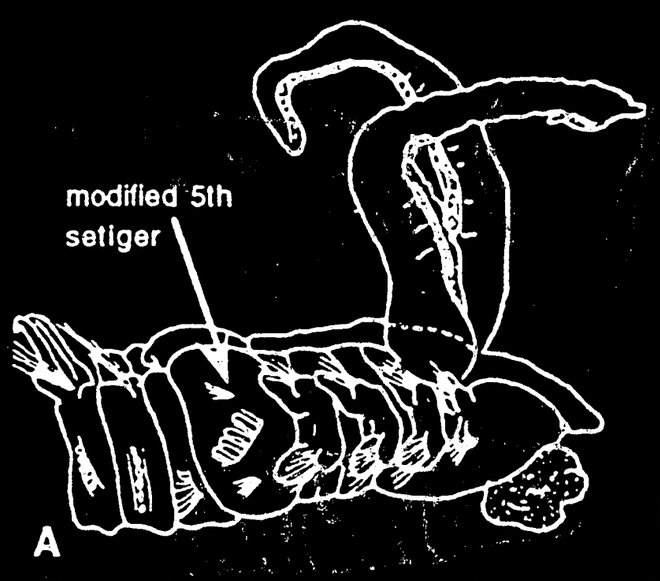


Fig. 7. *Spiophanes fimbriata*: A. anterior end, dorsal view; B. lateral view of setigers 10-14; C. ventral view, showing methyl green staining pattern.



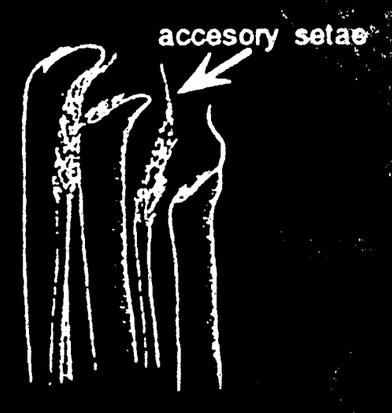


Fig. 8. *Polydora*: A. anterior end, lateral view showing modified 5th setiger; B. spines of modified 5th setiger.

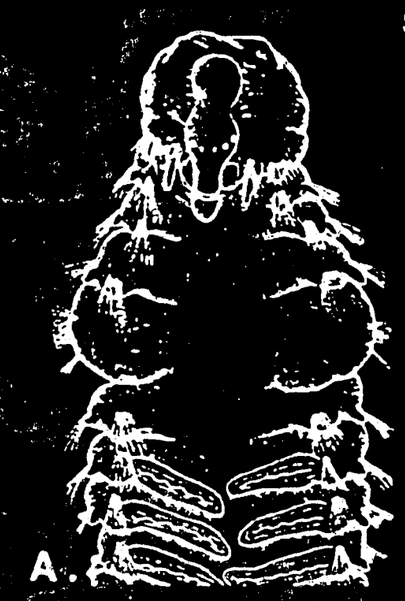


Fig.9. *Carazziella*: A, anterior end, dorsal view; B. modified 5th setiger showing double row of spines; C. brushtop spines typical of *Carazziella*.

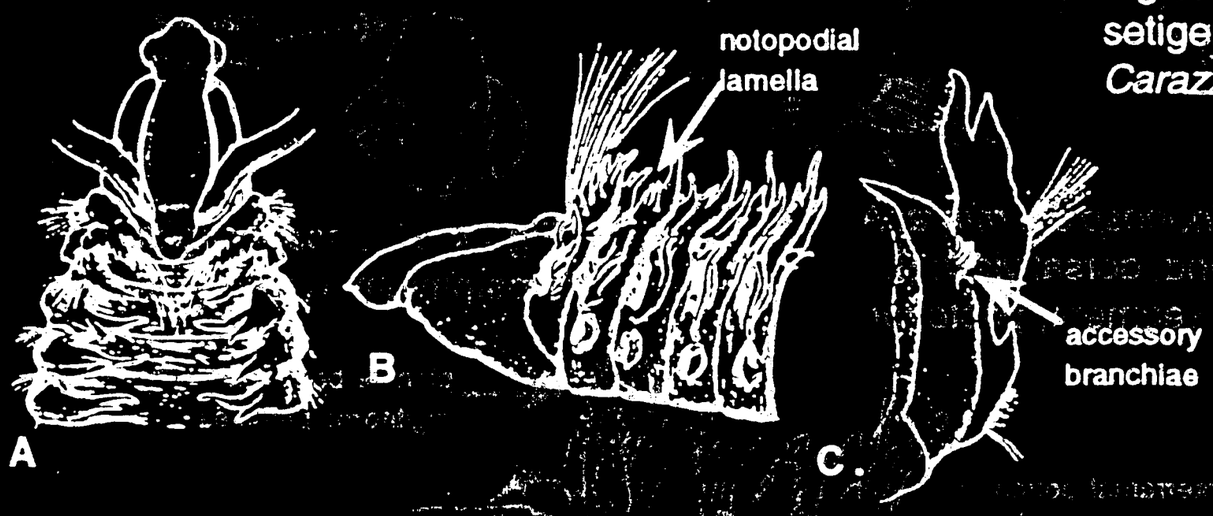


Fig. 10. *Dispio uncinata*: A. anterior end, dorsal view; B. anterior end, lateral view; C. mid-body setiger, posterior view showing accessory branchiae

Fig. 11. *Pygospio californica*: male anterior end, dorsal view.

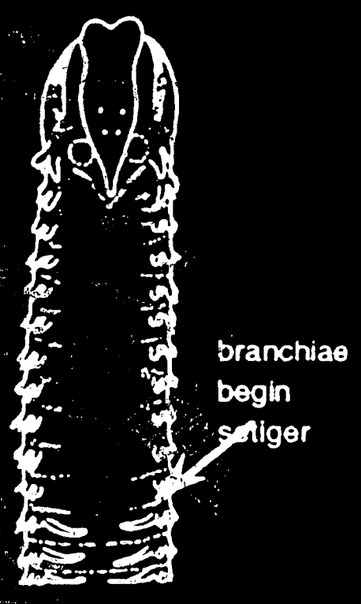


Fig. 12. *Pygospio elegans*: anterior end, dorsal view.

Key to the Non-Polydorid Spionidae from Southern California

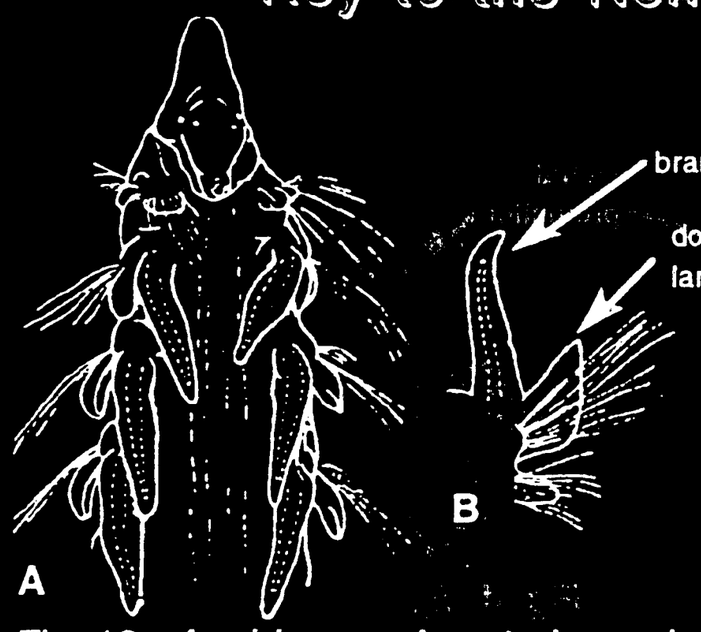


Fig. 13. *Aonides* sp.: A. anterior end, dorsal view; B. setiger 2, posterior view.

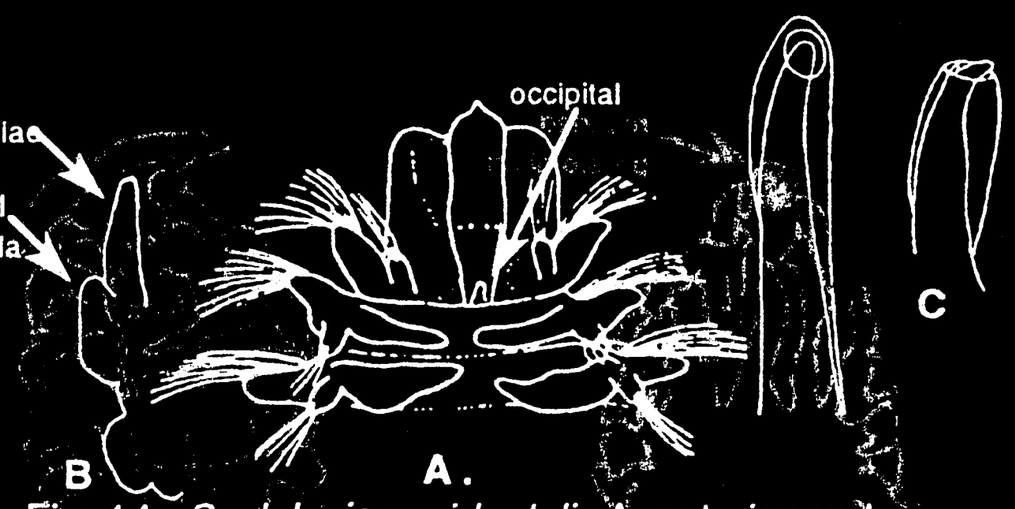


Fig. 14. *Scolelepis occidentalis* A. anterior end, dorsal view; B. diagrammatic representation of a parapod showing branchia fused to notopod; C. unidentate hooded hook; D. bidentate hooded hook.

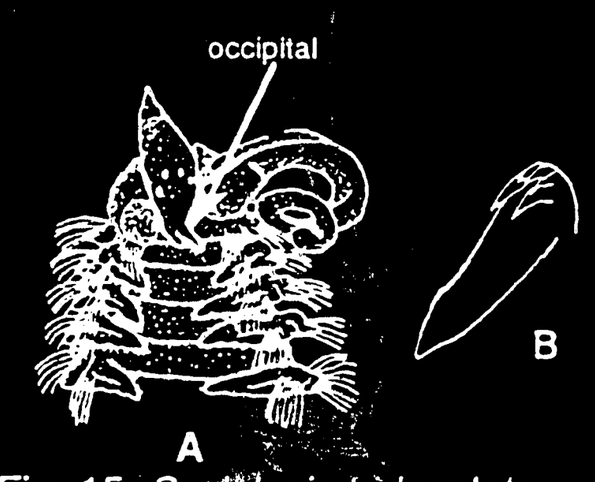


Fig. 15. *Scolelepis tridentata*: A. anterior end, dorsal view; B.head of multidentate hooded hook.

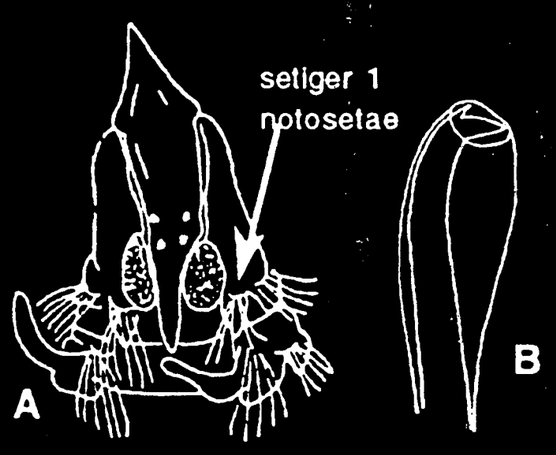


Fig. 16. *Scolelepis squamata*: A. anterior end, dorsal view; B. bidentate hooded hook.

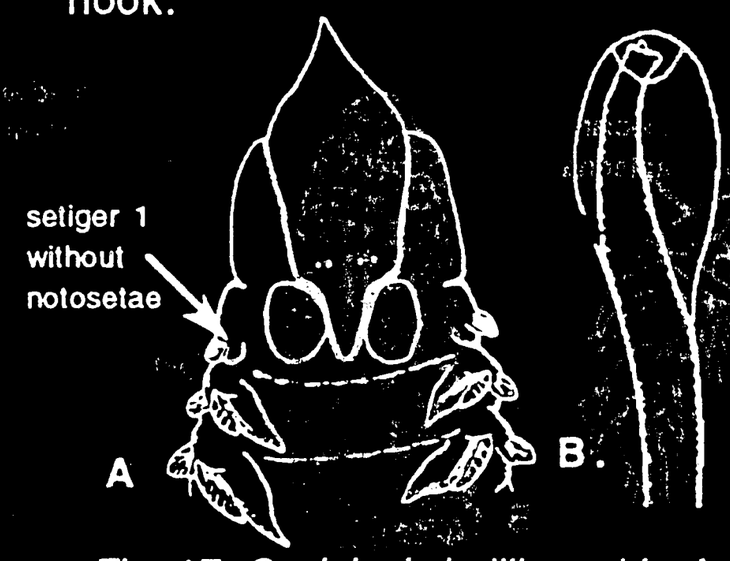


Fig. 17. *Scolelepis bullibranchia*: A. anterior end, dorsal view; B. tridentate hooded hook.

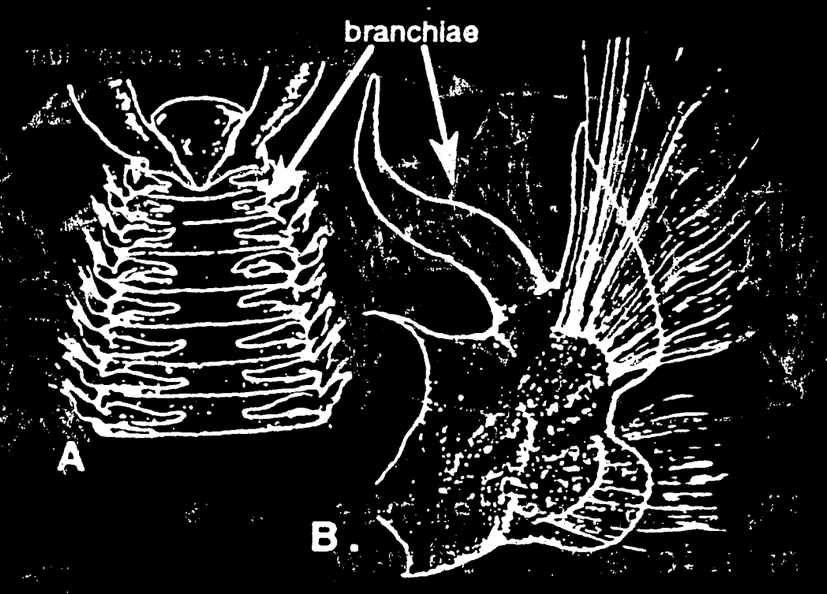


Fig. 18. *Malacoceros punctata*: A. anterior end, dorsal view; B. setiger 9, posterior view.

Fig. 19. *Rhyncospio glutea*: anterior end, dorsal view.

Fig. 20. *Streblospio benedicti*: anterior end, lateral view.

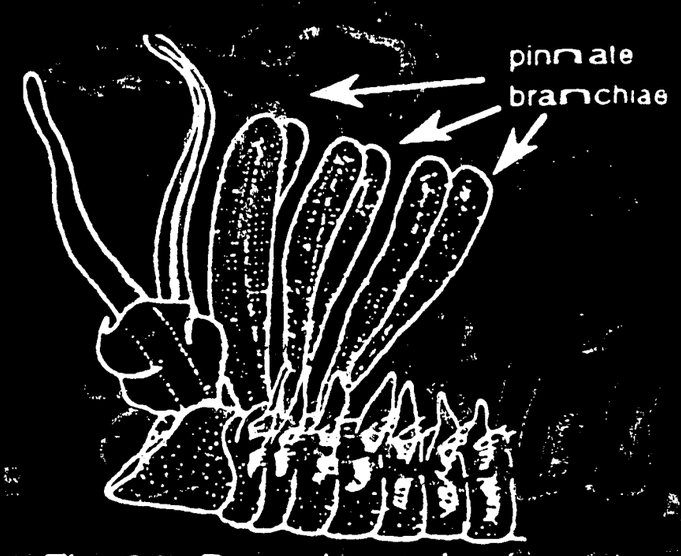


Fig. 21. *Paraprionospio pinnata* anterior end, lateral view.

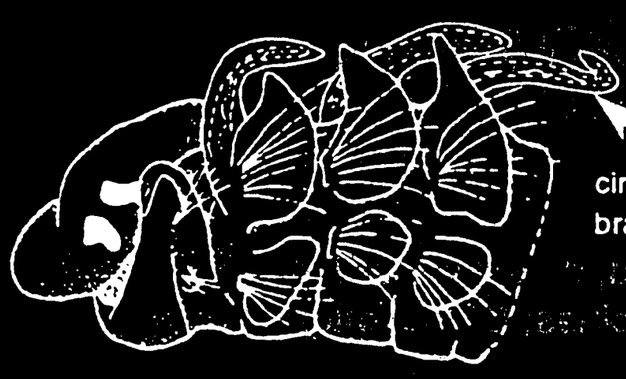


Fig. 22. *Prionospio multibranchiata*: anterior end, lateral view.

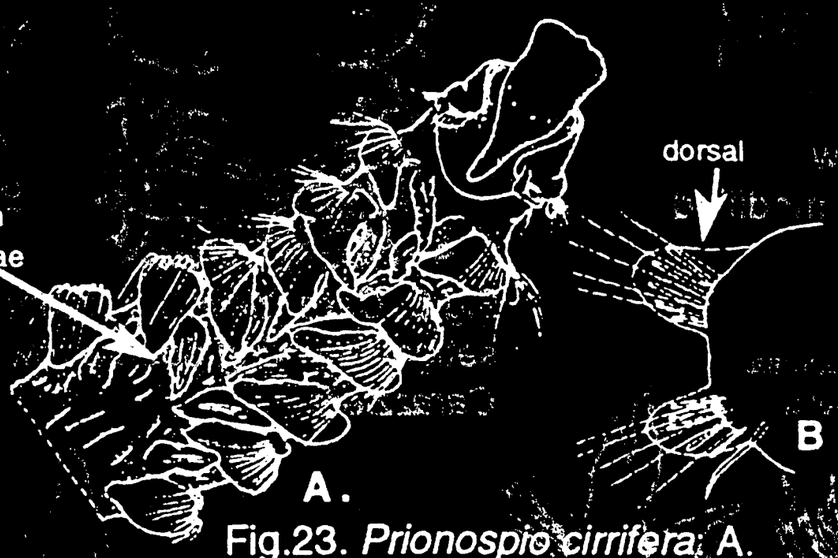


Fig.23. *Prionospio cirrifera*: A. anterior end, dorsal view; B. posterior segment, posterior view.

Fig.24. *Prionospio lighti*: prostomium, dorsal view.

Fig. 25. *Apoprionospio pygmaea*: anterior end, dorsal view.

Fig. 26. *Prionospio ehlersi*: anterior end, dorsal view.

Key to the Non-Polydorid Spionidae from Southern California

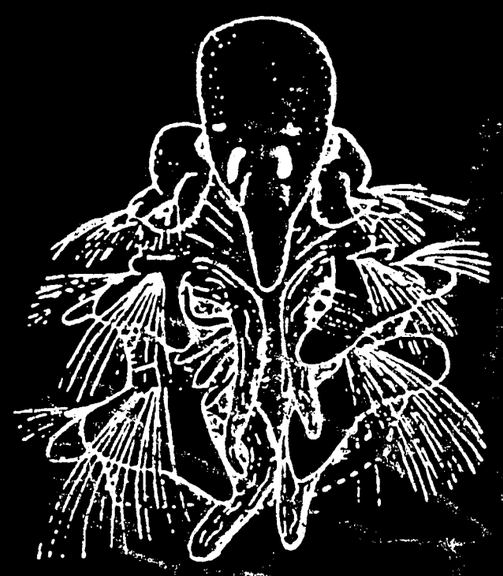


Fig. 27. *Prionospio heterobranchia*: anterior end, dorsal view.

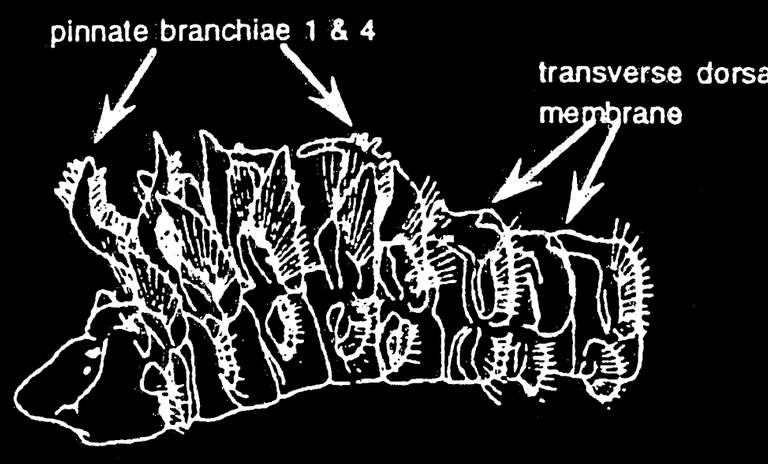


Fig. 28. *Prionospio sp. A*: anterior end, lateral view.

Fig. 29. *Prionospio sp. B*: anterior end, lateral view.

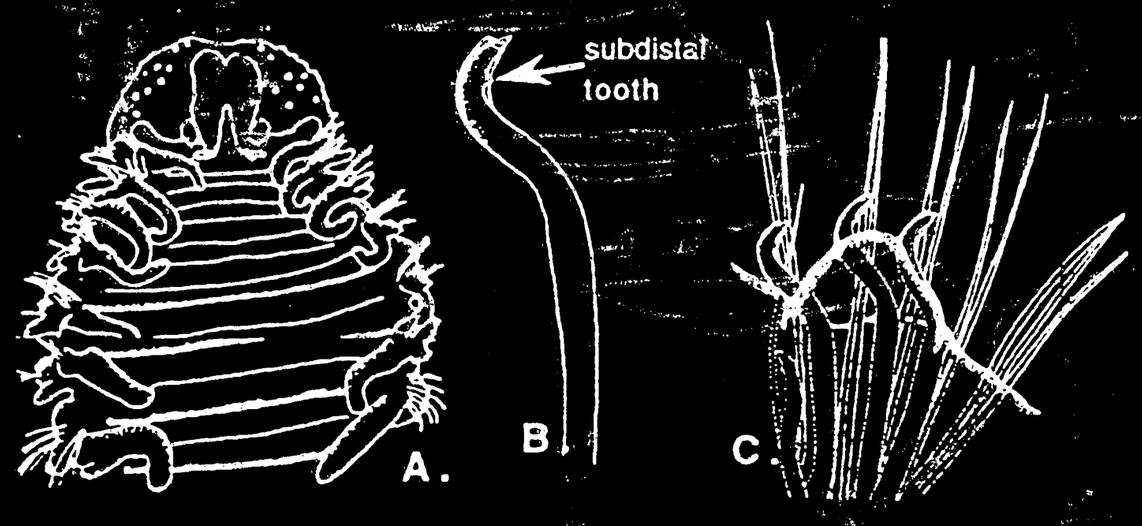


Fig. 30. *Pseudoatherospio fauchaldi*: A. anterior end, dorsal view; B. posterior neuropodial hook; C. posterior neuropodial fascicle.

Fig. 31. *Spio filicomis*: anterior end, dorsal view.

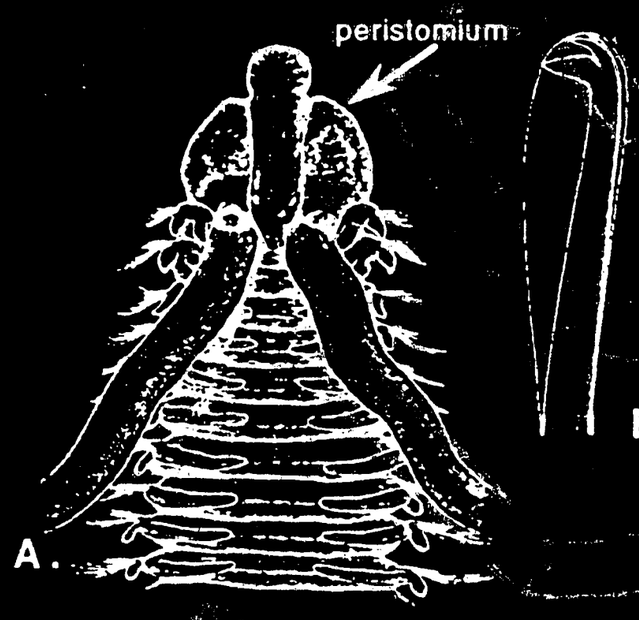


Fig. 32. *Spio maculata*: A. anterior end, dorsal view; B. tridentate hooded hook.

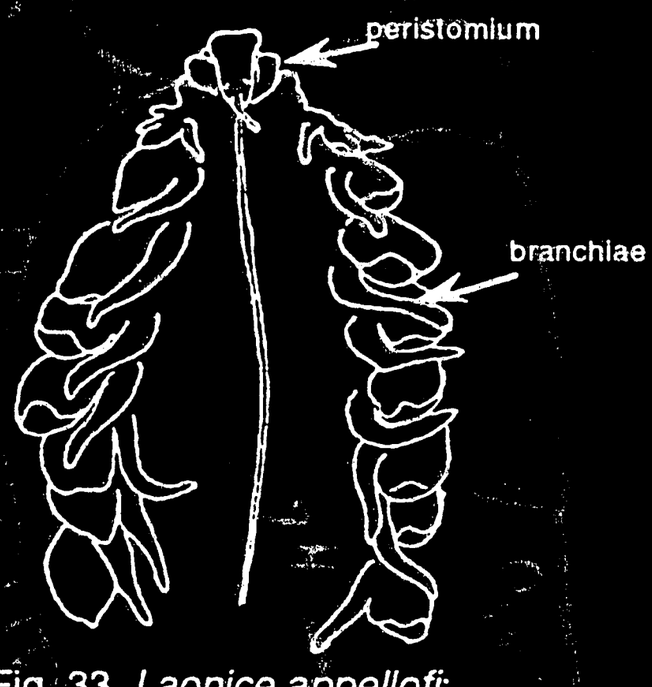


Fig. 33. *Laonice appellofi*: anterior end, dorsal view, (setae not included).

Fig. 34. *Laonice cirrata*: anterior end, dorsal view.

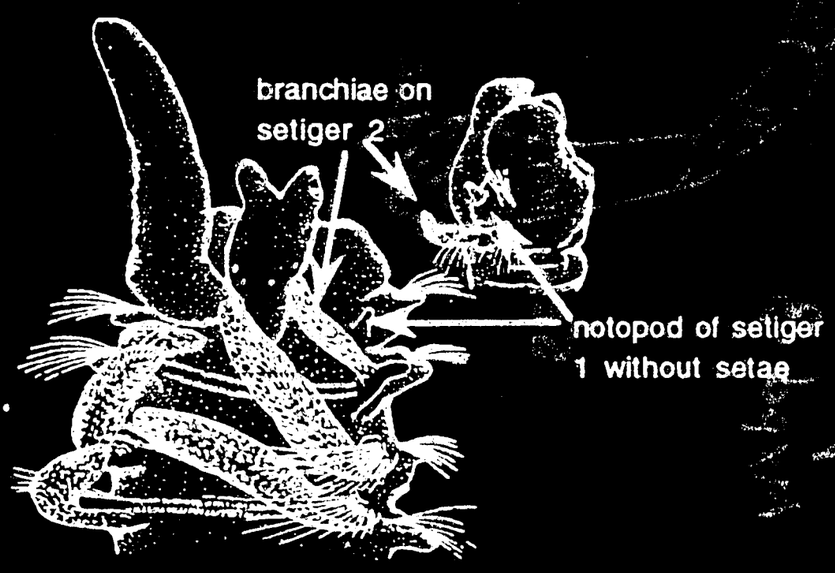
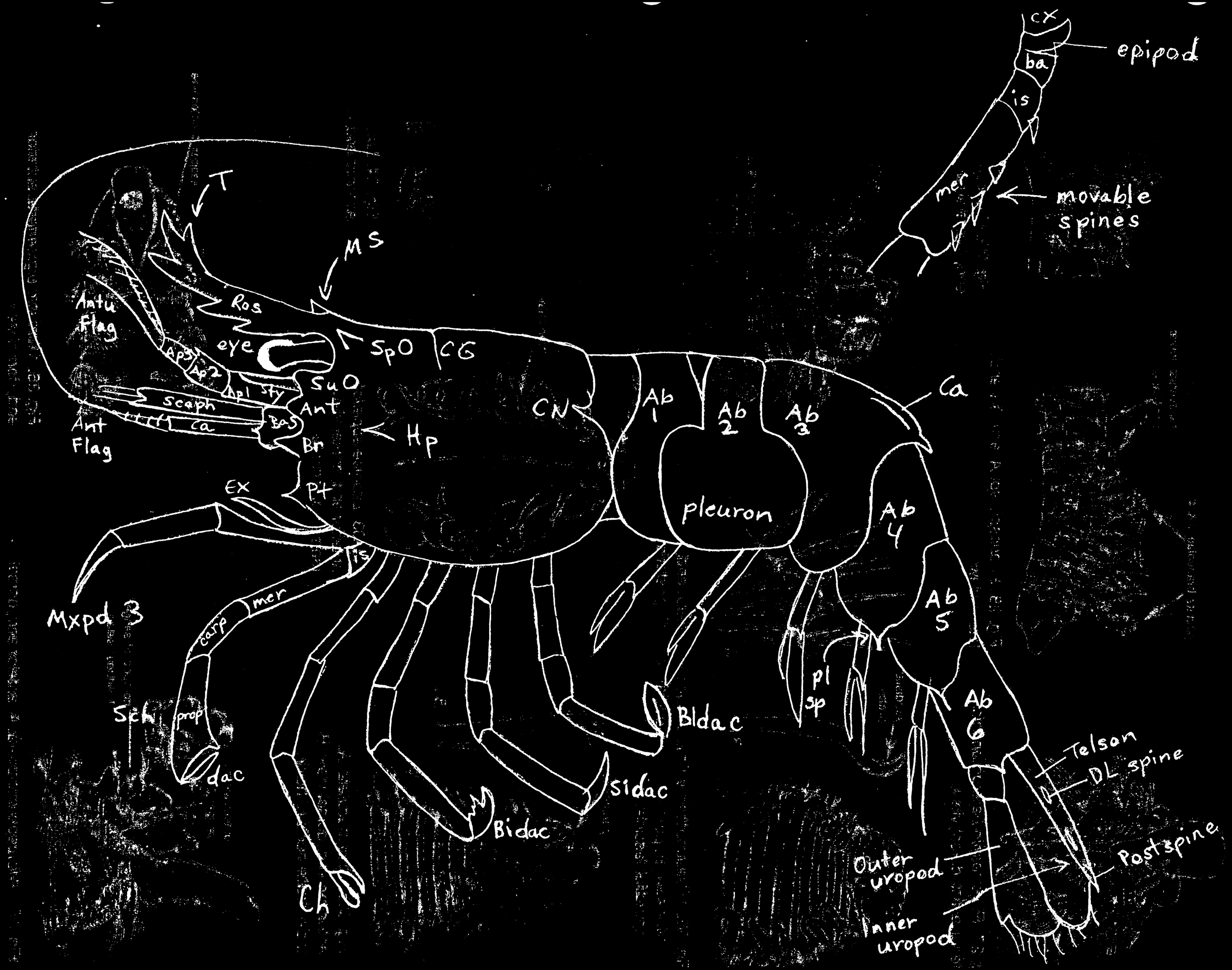
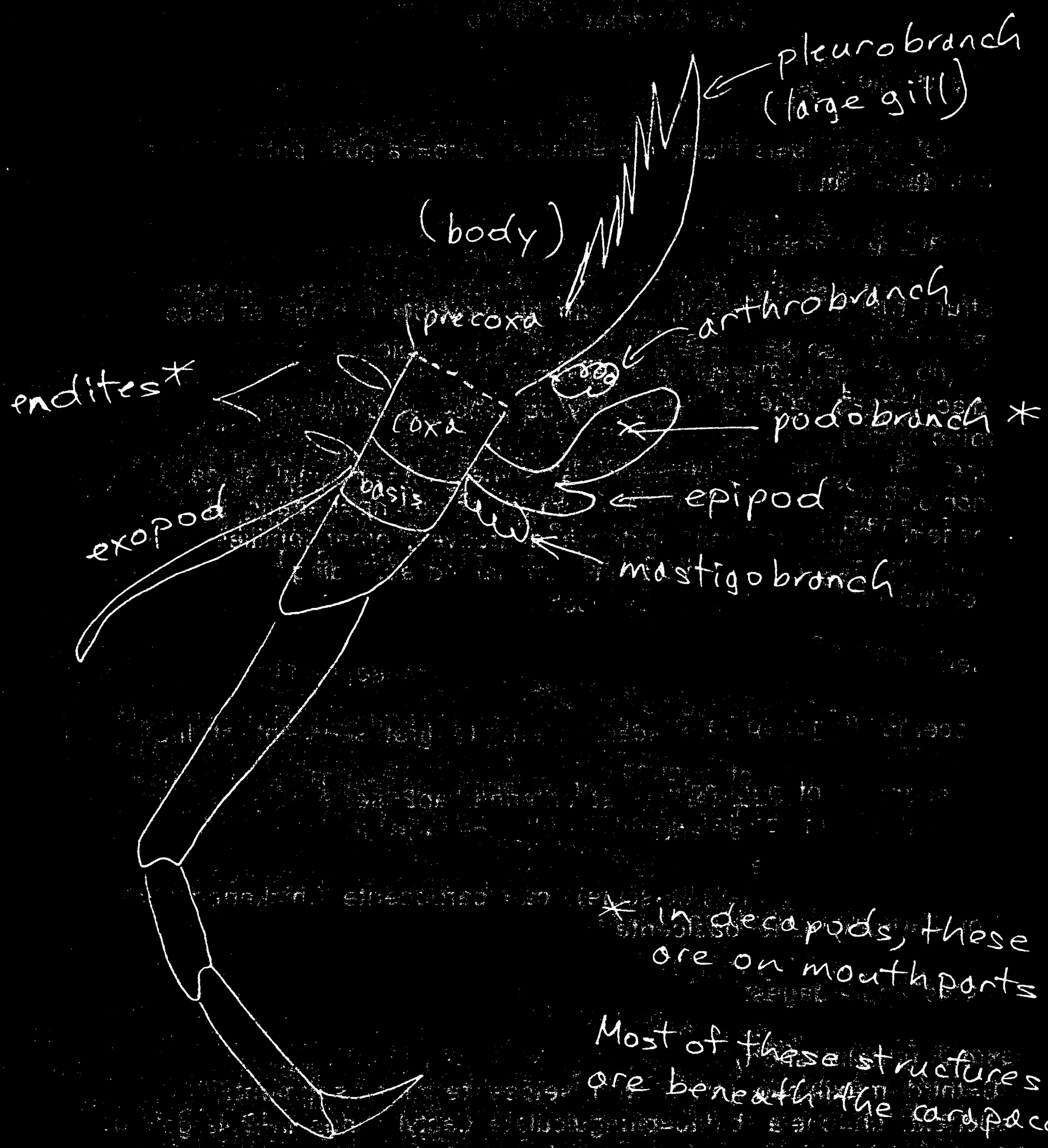


Fig. 35. *Microspio microcera*: A. anteior end, dorsal view; B. prostomium and setigers 1 and 2, lateral view.

Fig. 36. *Microspio pigmentata*: anterior end, dorsal view.


T
MS
Ros
eye
SpO
CG
Antu Flag
Ap3
Ap2
Ap1
sty
SuO
Ant
scaph
ca
Bas
Ant Flag
Br
Hp
CN
Ab 1
Ab 2
Ab 3
Ca
pleuron
Ab 4
Ab 5
Ab 6
Ex
Pt
is
mer
carp
Mxpd 3
Sch
prop
dac
Bldac
sidac
Bidac
Ch
pl sp
Telson
DL spine
Post spine
Outer uropod
Inner uropod
cx
ba
is
mer
epipod
movable spines



* in decapods, these are on mouthparts

Most of these structures are beneath the carapace

The Complete Shrimp

Segments of the legs:

cx=coxa, ba=basis, is=ischium, mer=merus, carp=carpus, prop=propodus, dac=dactyl

The carapace and rostrum:

ros=rostrum (usually attached, but can be movable if hinge at base as in Pantomus)
t =tooth (no socket), ms=movable spine.
cg=cardiac groove (note: a groove may be called a sulcus).
cn=cardiac notch
spo=superorbital spine, suo=suborbital spine, ant=antennal spine, br=branchiostegal spine, pt=pterygostomian spine, hp=hepatic spine.
Note: peneids have additional spines and grooves; other families have carinae on the carapace. The carinae are named according to the region of the carapace where they occur.

The antennae:

sty=stylocerite (long spine or scale lateral to first segment of first antenna).
apl=first segment of peduncle of 1st antenna; ap2=second, ap3=third.
antu flag= flagellum of 1st antenna; atn flag=flagellum of second antenna
scaph=scaphocerite (=antennal scale), ca= carpocerite (thickened base of flagellum), bas=basicerite

The thoracic appendages:

ex=exopod (usually short)
mxpd 3=third maxilliped (often with setose terminal segment)
sch=subchela, ch=chela, bidac=biunguiculate dactyl (ends in 2 large hooks or claws), sidac=simple dactyl, bldac=bladed (or spatulate) dactyl.

The abdomen and tail fan:

Segments are numbered from anterior to posterior.
ca=carina, pl sp =pleural spine, dl spine =dorsolateral spine, post spine=posterior spine.

Note: the outer exopod may bear additional lateral spines and/or a transverse fold.

Mary K. Wicksten, Biology Department, Texas A&M University, College Station TX 77843