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CANADIAN PACIFIC FAUNA

9. ANNELIDA

9b (2). POLYCHAETA SEDENTARIA,

BY

EDITH BERKELEY AND CYRIL BERKELEY

WITH FIGURES

Printed by
THE UNIVERSITY OF TORONTO PRESS
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POLYCHAETA SEDENTARIA

INTRODUCTION

The Polychaeta Sdentaria differ from the Errantia (described in Part 1) chiefly in the following particulars. The body is often divided into two or more distinct regions. The head is frequently obscure or profoundly modified. The peristomium is usually apodous and achaetous. The parapodia are never prominent and generally inconspicuous though their lobes may be prolonged into amellae or cirrus-like processes. The parapodia are nearly always biramous, but the rami are frequently marked by little more than setigerous areas. The ventral rami are often in the form of tori or pinnules armed with crotchets or with uncini. The proboscis is never armed. The Sdentaria are usually tubicolous.

The warning given in Part 1 about using size, markings and coloration as characteristics for the determination of species applies equally, or even more strongly, in the case of the Sdentaria.

The keys given below are designed to apply only to the families, genera and species dealt with. Many of the illustrations are taken from Fauvel's volume in the "Faune de France", Vol. 16, "Polychètes Sédentaires". Others are taken from various papers to which reference is made in the text. Again we wish to acknowledge our indebtedness to the authors of the publications concerned. Finally, we wish to pay tribute to the memory of Mr. E. F. Ricketts, formerly of Pacific Grove, California, to whose enthusiasm for shore collecting many of our records are due.

SELECTED LITERATURE

- (1) ANDREWS, E. A. Report upon the Annelida Polychaeta of Beaufort, North Carolina. Proc. U.S. Nat. Mus., vol. 14, pp. 277-302, 1891.
- (2) ARWIDSSON, I. Studien über die skandinavischen and arktischen Maldaniden. Inaug. Dis., Uppsala, 1906.
- (3) ARWIDSSON, I. Systematic notes on some maldanids. Kungl. Svenska Vetenskapsakad. Handlingar, vol. 63, pp. 1-46, 1922.
- (4) ASHWORTH, J. H. The annelids of the Family Arenicolidae of North and South America, including an account of *Arenicola glacialis* Murdoch. Proc. U.S. Nat. Mus., vol. 39, pp. 1-32, 1910.
- (5) ASHWORTH, J. H. Catalogue of the Chaetopoda in the British Museum. A. Polychaeta, Pt. 1. Arenicolidae, 1912.
- (6) BERKELEY, E. A new genus of Chaetopteridae from the N. E. Pacific: with some remarks on allied Genera. Proc. Zool. Soc. London, 1927, pp. 441-445.
- (7) BERKELEY, E. Polychaetous annelids from the Nanaimo district. Pt. 3, Leodicidae to Spionidae. Contr. Canad. Biol. (n.s.) vol. 3, pp. 407-422, 1927.

- (8) BERKELEY, E. Polychaetous annelids from the Nanaimo district. Pt. 4. Chaetopteridae to Maldanidae. Contr. Canad. Biol. (n.s.) vol. 4, pp. 305-317, 1929.
- (9) BERKELEY, E. Polychaetous annelids from the Nanaimo district. Pt. 5. Ammocharidae to Myzostomidae. Contr. Canad. Biol. (n.s.) vol. 6, pp. 65-77, 1930.
- (10) BERKELEY, E. AND C. On a collection of littoral Polychaeta from the west coast of Vancouver Island. Contr. Canad. Biol. and Fisheries, vol. 7, pp. 309-318, 1932.
- (11) BERKELEY, E. AND C. Notes on Polychaeta from the coast of western Canada. Pt. 1. Spionidae. Ann. and Mag. Nat. Hist., Ser. 10, vol. 18, pp. 468-477, 1936.
- (12) BERKELEY, E. AND C. On a collection of Polychaeta from southern California. Bull. S. Calif. Acad. Sci., vol. 40, pp. 16-60, 1941.
- (13) BERKELEY, C. Occurrence of *Ctenodrilus* in the Pacific. "Nature", vol. 149, p. 248, 1942.
- (14) BERKELEY, E. AND C. North Pacific Polychaeta, chiefly from the west coast of Vancouver Island, Alaska, and Bering Sea. Can. J. Res., vol. 20, pp. 183-208, 1942.
- (15) BERKELEY, E. AND C. Biological and oceanographical conditions in Hudson Bay. J. Fish. Res. Board of Canada, vol. 6, pp. 129-143, 1943.
- (16) BERKELEY, E. Morphological characters of *Myriochele heeri* Malmgren. "Nature", vol. 164, p. 239, 1949.
- (17) BERKELEY, E. AND C. Notes on Polychaeta from the coast of western Canada. Pt. 4, Polychaeta Sedentaria. Ann. and Mag. Nat. Hist., ser. 12, vol. 3, pp. 50-69, 1950.
- (18) BUSH, K. Tubicolous annelids of the tribes Sabellides and Serpulides from the Pacific Ocean. Harriman Alaska Exped., vol. 12, pp. 169-355, 1904.
- (19) CAULLERY, M., AND F. MESNIL. Études sur la morphologie comparée et la phylogénie des espèces chez les Spirorbes. Bull. Sci. France et Belgique, vol. 30, pp. 185-233, 1897.
- (20) CHAMBERLIN, R. V. New polychaetous annelids from Laguna Beach, California. Pomona College J. of Entomology and Zoology, vol. 11, pp. 1-23, 1919.
- (21) EHLERS, E. Polychaeten. Hamburger magalhaenische Sammelreise, pp. 1-148, 1897.
- (22) EHLERS, E. Die Polychaeten des magellanischen und chilenischen Strandes. Ein faunistischer Versuch. Festschrift Kgl. Ges. Wiss. Göttingen, pp. 1-232, 1901.
- (23) EISIG, H. Monographie der Capitelliden des Golfes von Neapel, pp. 1-906, 1887.
- (24) FAUVEL, P. Polychètes sédentaires. Faune de France, No. 16, pp. 1-494, 1927.
- (25) FAUVEL, P. Annelida polychaeta of the Indian Museum, Calcutta. Mem. Indian Museum, vol. 12, pp. 1-262, 1932.
- (26) HARTMAN, O. Descriptions of new species and new generic records of polychaetous annelids from California of the Families Glyceridae, Eunicidae, Stauronereidae, and Opheliidae. Univ. of California Publ. in Zoology, vol. 43, pp. 93-112, 1938.
- (27) HARTMAN, O. Annotated list of the types of polychaetous annelids in the Museum of Comparative Zoology. Bull. Mus. Comp. Zool. Harvard, vol. 85, pp. 1-29, 1938.

- (28) HARTMAN, O. *Boccardia proboscidea*, a new species of spionid worm from California. J. Washington Acad. of Sci., vol. 30, no. 9, pp. 382-387, 1940.
- (29) HARTMAN, O. Polychaetous annelids, Pt. 4. Allan Hancock Pacific Expeditions, vol. 7, pp. 325-345, 1941.
- (30) HARTMAN, O. Some Contributions to the biology and life history of Spionidae from California, Pt. 3. Allan Hancock Pacific Expeditions, vol. 7, no. 4, pp. 288-323, 1941.
- (31) HARTMAN, O. A review of the types of polychaetous annelids at the Peabody Museum of Natural History, Yale University. Bull. Bingham Oceanographic Collection, vol. 8, pp. 1-98, 1942.
- (32) HARTMAN, O. The identity of some marine annelid worms in the U. S. National Museum. Proc. U. S. Nat. Mus., vol. 92, pp. 101-140, 1942.
- (33) HARTMAN, O. Polychaetous annelids, Pt. 6. Allan Hancock Pacific Expeditions, vol. 10, nos. 2 and 3, pp. 239-389, 1944.
- (34) HARTMAN, O. Polychaetous annelids, Pt. 7. Allan Hancock Pacific Expeditions, vol. 10, pp. 391-481, 1947.
- (35) HARTMAN, O. The polychaetous annelids of Alaska. Pacific Science, vol. 2, pp. 1-58, 1948.
- (36) JOHANSSON, K. E. Beiträge zur Kenntnis der Polychaeten-Familien Hermellidae, Sabellidae und Serpulidae. Zool. Bidr. Uppsala, vol. 11, pp. 1-184, 1927.
- (37) JOHNSON, H. P. The Polychaeta of the Puget Sound region. Proc. Boston Soc. Nat. Hist., vol. 29, pp. 381-437, 1901.
- (38) MCINTOSH, W. C. Report of the Scientific Results of the Exploring Voyage of H.M.S. "Challenger", vol. 12, pp. 1-154, 1885.
- (39) MCINTOSH, W. C. A monograph of the British Annelids, vol. 3, Pt. 1, pp. 1-368, 1915.
- (40) MCCONNAUGHEY, B. H., AND D. L. FOX. The anatomy and biology of the marine polychaete *Thoracophelia mucronata* (Treadwell), Opheliidae. Univ. of California Pubs. in Zoology, vol. 47, pp. 319-340, 1949.
- (41) MALMGREN, A. J. Nordiska Hafs-Annulater. Ofv. Kgl. Svenska Vetenskapsakad. Forhandl., no. 5, pp. 355-410, 1865.
- (42) MARENZELLER, E. Südjapanische Anneliden, Pt. 2. Denkschr. Kais. Akad. Wiss. Wien, vol. 49, pp. 197-224, 1884.
- (43) MESNIL, F. Études de morphologie externe chez les Annélides. 1. Les Spionidiens des côtes de la Manche. Bull. Sci. de la France et de la Belgique, vol. 29, pp. 110-287, 1896.
- (44) MONRO, C. C. A. Polychaete worms. Discovery Reports, vol. 2, pp. 1-222, 1930.
- (45) MONRO, C. C. A. The Polychaeta Sedentaria collected by Dr. C. Crossland at Colon, in the Panama region and the Galapagos Islands during the Expedition of the S. Y. "St. George". Proc. Zool. Soc. London, Pt. 4, pp. 1039-1092, 1933.
- (46) MOORE, J. P. Polychaeta from the coastal slope of Japan and from Kamchatka and Bering Sea. Proc. Acad. Nat. Sci. Philadelphia, vol. 55, pp. 401-490, 1903.
- (47) MOORE, J. P. New Polychaeta from California. Proc. Acad. Nat. Sci. Philadelphia, vol. 56, pp. 484-502, 1904.
- (48) MOORE, J. P. AND BUSH, K. J. Sabellidae and Serpulidae from Japan, with an appendix on Spirorbis by K. J. BUSH. Proc. Acad. Nat. Sci. Philadelphia, vol. 56, pp. 157-179, 1904.

- (49) MOORE, J. P. Five new species of *Pseudopotamilla* from the Pacific Coast of North America. Proc. Acad. Nat. Sci. Philadelphia, vol. 57, pp. 555-569, 1905.
- (50) MOORE, J. P. New species of Ampharetidae and Terebellidae from the North Pacific. Proc. Acad. Nat. Sci. Philadelphia, vol. 57, pp. 846-860, 1905.
- (51) MOORE, J. P. Descriptions of two new Polychaeta from Alaska. Proc. Acad. Nat. Sci. Philadelphia, vol. 58, pp. 352-355, 1906.
- (52) MOORE, J. P. Additional new species of Polychaeta from the North Pacific. Proc. Acad. Nat. Sci. Philadelphia, vol. 58, pp. 217-260, 1906.
- (53) MOORE, J. P. Some polychaetous annelids of the north Pacific Coast of North America. Proc. Acad. Nat. Sci. Philadelphia, vol. 60, pp. 321-364, 1908.
- (54) MOORE, J. P. Polychaetous annelids from Monterey Bay and San Diego. Proc. Acad. Nat. Sci. Philadelphia, vol. 61, pp. 235-294, 1909.
- (55) MOORE, J. P. The polychaetous annelids dredged in 1908 by Mr. Owen Bryant off the coasts of Labrador, Newfoundland, and Nova Scotia. Proc. U.S. Nat. Mus., vol. 37, pp. 133-146, 1910.
- (56) MOORE, J. P. The polychaetous annelids dredged by the U.S.S. "Albatross" off the coast of southern California in 1904. Pt. 4, Spionidae to Sabellariidae. Proc. Acad. Nat. Sci. Philadelphia, vol. 75, pp. 179-259, 1923.
- (57) O'DONOGHUE, C. H. A note on the polychaetous annelid *Eudistylia gigantea* Bush. Contr. Canad. Biol. (n.s.), vol. 1, pp. 443-456, 1924.
- (58) OKUDA, S. Polychaetous annelids from Toyama Bay and its adjacent waters. 1. Polychaeta Sedentaria. Bull. Biogeograph. Soc. Japan, vol. 6, pp. 147-157, 1936.
- (59) OKUDA, S. Some ariciid worms from Japan. Annotationes Zoologicae Japonenses, vol. 16, pp. 99-105, 1937.
- (60) OKUDA, S. Spioniiform polychaetes from Japan. J. Fac. Sci. Hokkaido Imp. Univ., Ser. 6, vol. 5, pp. 217-254, 1937.
- (61) OKUDA, S. The Sabellariidae of Japan. J. Fac. Sci. Hokkaido Imp. Univ., vol. 6, pp. 235-253, 1938.
- (62) PIXELL, H. Polychaeta from the Pacific coast of North America. Pt. 1. Serpulidae. Proc. Zool. Soc. London, 1912, pp. 784-805.
- (63) POTTS, F. A. Polychaeta from the N. E. Pacific: The Chaetopteridae. With an account of the phenomenon of asexual reproduction in *Phyllochaetopterus* and the description of two new species of Chaetopteridae from the Atlantic. Proc. Zool. Soc. London, 1914, pp. 955-994.
- (64) SÖDERSTRÖM, A. Studien über die Polychaetenfamilie Spionidae. Inaug. Diss. Uppsala, pp. 1-286, 1920.
- (65) SOUTHERN, R. Clare Island Survey. Pt. 47, Archiannelida and Polychaeta. Proc. R. Irish Acad., vol. 31, pp. 1-160, 1914.
- (66) TREADWELL, A. L. Polychaetous annelids of the Pacific coast in the collections of the Zoological Museum of the University of California. Univ. of California Pubs. in Zoology, vol. 13, pp. 175-234, 1914.
- (67) TREADWELL, A. L. Polychaetous annelids collected at Friday Harbour, State of Washington, in February and March 1920. Carnegie Inst. of Washington, Pub. 312, pp. 171-181, 1922.
- (68) VERRILL, A. E. Explorations of Casco Bay by the U. S. Fish Commission in 1873. Proc. Am. Ass. Adv. Sci., 1874.

KEY TO FAMILIES

- 1 (16) Body not divided into distinct regions (except in Magelonidae).
 2 (9) A pair of grooved tentacular cirri or a group of grooved tentacular filaments.
 3 (8) Tentacular cirri on peristomium, no tentacular filaments.
 4 (5) Tentacular cirri retractile, cephalic cage usually present.
 FLABELLIGERIDAE (Chloraemidae) (p. 6)
 5 (4) Tentacular cirri not retractile, no cephalic cage.
 6 (7) Tentacular cirri with suckers. Large flat prostomium.
 MAGELONIDAE (p. 11)
 7 (6) Tentacular cirri without suckers. Extended parapodial lobes and branchiae usually present.
 SPIONIDAE (p. 13)
 8 (3) Tentacular cirri, or group of tentacular filaments, posterior to peristomium.
 CIRRATULIDAE (p. 31)
 9 (2) With neither grooved tentacular cirri nor tentacular filaments.
 10 (11) A single median tentacle or no tentacles.
 PARAONIDAE (p. 38)
 11 (10) No median tentacle, with or without laterals.
 12 (15) With crotchets.
 13 (14) Crotchets very small and in many rows.
 AMMOCHARIDAE (Oweniidae) (p. 40)
 14 (13) Crotchets not very small, in single (rarely double) rows.
 MALDANIDAE (p. 43)
 15 (12) Without crotchets.
 SCALIBREGMIDAE (p. 57)
 16 (1) Body divided into distinct regions (except in some Opheliidae).
 17 (36) No terminal branchial plume.
 18 (33) Without an operculum.
 19 (20) Branchiae in two large anal tufts. A large caudal shield.
 STERNASPIDAE (p. 59)
 20 (19) No anal tufts of branchiae nor anal shield.
 21 (26) Branchiae absent or on not more than three segments.
 22 (23) One or two pairs of tentacular cirri, no tentacular filaments.
 CHAETOPTERIDAE (p. 60)
 23 (22) No tentacular cirri, many tentacular filaments.
 24 (25) Tentacular filaments short, retractile.
 AMPHARETIDAE (p. 64)
 25 (14) Tentacular filaments long, non-retractile.
 TEREBELLIDAE (p. 73)
 26 (21) Branchiae on many segments.
 27 (30) Without uncinigerous tori.
 28 (29) All setae capillaries. No parapodial lobes.
 OPHELIIDAE (p. 89)
 29 (28) Setae capillaries and crotchets. Parapodia and branchiae conspicuous.
 ARICIIDAE (p. 94)
 30 (27) With uncinigerous tori.
 31 (32) Prostomium blunt. Body usually stout and opaque.
 ARENICOLIDAE (p. 98)
 32 (31) Prostomium conical. Body smooth, translucent.
 CAPITELLIDAE (p. 100)
 33 (18) Large specialized setae (paleae) forming an operculum.
 34 (35) Operculum a single row of paleae. Posterior region small and modified. Tube light, carried by the animal.
 PECTINARIIDAE (Amphictenidae) (p. 104)
 35 (34) Operculum of more than a single row of paleae. Posterior region conspicuous, achaetous, apodous. Tube massive, fixed to substrate.
 SABELLARIIDAE (p. 107)
 36 (17) With a terminal branchial plume.
 37 (38) No operculum. No thoracic membrane. Tube mucoid or membranous.
 SABELLIDAE (p. 109)
 38 (37) Usually an operculum. Usually a thoracic membrane. Tube calcareous.
 SERPULIDAE (p. 124)

NOTE. The numbers placed after the specific names in the text refer to the numbered articles in the list of literature. The number given in heavy type refers to the article containing the fullest description of the species.

FLABELLIGERIDAE (Chloraemidae)

Body more or less cylindrical or sub-fusiform, covered with papillae. Prostomium and peristomium forming jointly a retractile buccal funnel into which the pair of heavy tentacular cirri and the branchiae which it bears can be withdrawn. Eyes present. Notosetae capillary, annulate, simple. Neurosetae various.

KEY TO GENERA

- | | |
|--|----------------------------|
| 1 (2) Neurosetae compound or pseudo-compound. | FLABELLIGERA (p. 6) |
| 2 (1) Neurosetae simple. | |
| 3 (4) A pair of prominent ventral nephridial papillae. | BRADA (p. 7) |
| 4 (3) No such ventral papillae. | STYLARIOIDES (p. 8) |

Genus **FLABELLIGERA** Sars

Body soft, narrowed at extremities, covered with stalked papillae, usually with a mucous sheath. Tentacular cirri short, heavy and grooved. Branchiae few or numerous. Setae of first setiger projecting forward forming a cage en-

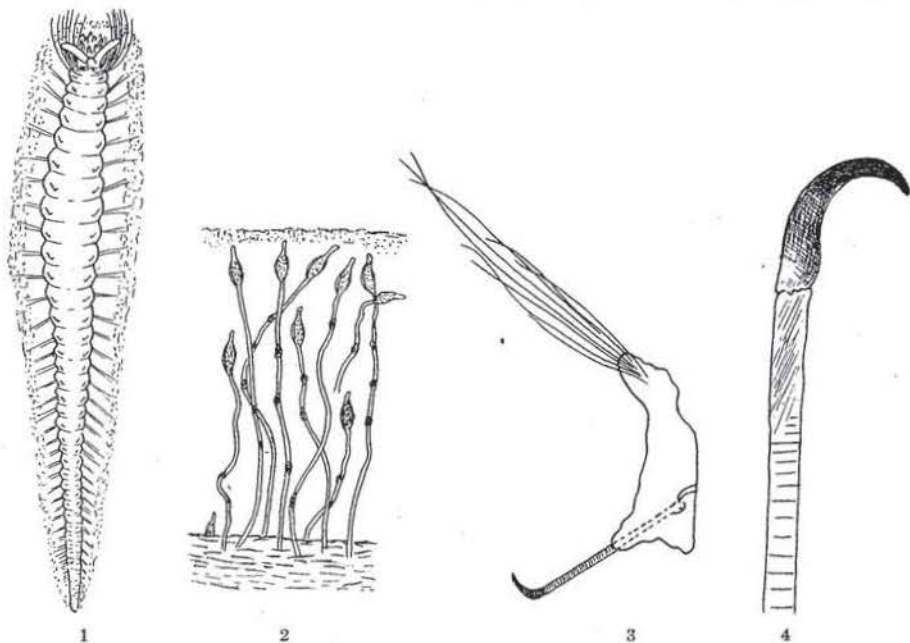


Fig. 1. *F. infundibularis* Johnson, ventral view.
 Fig. 2. *F. infundibularis* Johnson, surface papillae.
 Fig. 3. *F. infundibularis* Johnson, parapodium (after Johnson).
 Fig. 4. *F. infundibularis* Johnson, hook from neuropodium.

closing the tentacular cirri and branchiae. From second setiger notopodium with fine annulate capillaries and neuropodium with heavy compound or pseudo-compound hooks.

F. infundibularis (Johnson). 37. (Figs. 1 to 4.)

Up to 7.5 cms. long, 15 mm. wide, 70 segments. Body long, posterior third narrowed to a very small extremity; enclosed in a clear, thick, mucous sheath open only at the extremities. The body surface covered with very long, thin, thread-like papillae with clavate tips projecting to the limits of the mucous sheath. Buccal funnel bearing a pair of heavy, deeply grooved tentacular cirri and a large number of ciliated filiform branchiae. First setiger (into which the buccal funnel with all its appendages can be withdrawn) almost completely encircled by long, fine, annulate capillaries, projecting forward and enclosing the cephalic region. Subsequent setigers with closely packed bundles of similar capillaries in the notopodia and only one or two long, heavy, compound or pseudo-compound dark hooks in the neuropodia. Coloration in life greenish, branchiae green; a uniform reddish brown as preserved.

Nanaimo region, littoral, at lowest tide-mark. Alaska to California.

Genus **BRADA** Stimpson

Body more or less fusiform and short, few segments. Body covered with sessile papillae especially concentrated around the bundles of neurosetae. Branchiae cirriform, in two groups. No marked cephalic cage. Notosetae annulate capillaries, often poorly developed. Neurosetae similar, but heavier and with shorter annulations. A pair of conspicuous nephridial papillae on the fourth or fifth setiger.

B. villosa (Rathke). 24. (Fig. 5.)

Up to 40 mm. long, 5 mm. wide and 35 segments. Only much smaller examples are known from the Canadian Pacific region. Usually covered with

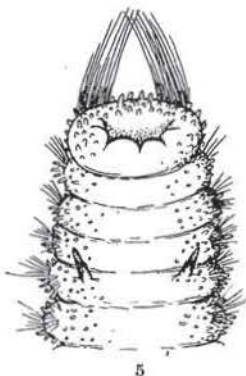


Fig. 5. *B. villosa* (Rathke), anterior region, ventral view (after McIntosh).

adherent sand. Papillae cylindrical with clavate ends, thicker and longer on dorsal than on ventral surface, especially long and arranged in rosettes around the neurosetae. A pair of conspicuous nephridial papillae on the ventral surface of the fifth setiger. Buccal funnel short, usually retracted into the first setiger which then forms a low rounded collar. Two bundles, each of thirty or more, fine branchiae. Tentacular cirri canaliculate, wide and short. Setae of first setiger little developed, directed forward, few in number, light in colour, annulations long. Notosetae of subsequent setigers shorter, but otherwise similar. From the second setiger neurosetae heavier than notosetae, curved, annulations shorter, and, when unworn, with long fragile tips. Coloration greyish brown.

Nanaimo region, dredged in about 250 fathoms. Oregon. Japan. Atlantic. Mediterranean. Arctic.

B. pilosa (Moore).

This species was taken by the SS. "Albatross" in the Gulf of Georgia in 1903 and recorded from that locality in 1908 (39, p. 357). It has not been taken since. It appears to differ from *B. villosa* in little but the density of the papillae and is probably a synonym of it.

Genus **STYLARIOIDES** Delle Chiaje

Body elongate, more or less cylindrical, often swollen anteriorly and tapered posteriorly, covered with papillae, often coated with sand. Setae of first few setigers longer than subsequent ones and directed forward, usually forming a cephalic cage. Notosetae all annulate capillaries. Neurosetae various.

KEY TO SPECIES

- | | |
|---|------------------|
| 1 (4) Ventral setae unidentate throughout. | |
| 2 (3) Anterior notosetae long and conspicuous; papillae long. | papillata |
| 3 (2) Anterior notosetae short and inconspicuous; papillae short. | plumosa |
| 4 (1) Ventral setae bidentate except in first few setigers. | |
| 5 (6) Body densely coated with sand, stout neurosetae in median region. | arenosa |
| 6 (5) Body lightly covered with silt, all setae long and slender. | negligens |

S. papillata (Johnson). 37. (Fig. 6.)

Up to 88 mm. long, 4 mm. wide, 89 segments. Body swollen anteriorly, attenuated posteriorly, the stiffly projecting setae and papillae giving it an angular and bristly appearance. Papillae sessile, long, cylindrical, and of various sizes, often swollen at the ends and often thickly coated with sand at the base. In specimens from a sandy habitat the whole body surface is usually coated with fine sand. Eight rather short cylindrical branchiae, pointed at the tips. Tentacular cirri slightly heavier with blunt ends, grooved and crenulate. Two pairs of eyes, the anterior pair more or less fused with the posterior pair. Setae of the first three setigers three or four times as long as the body-width, flexible, annulate and

pointing forward forming a very conspicuous cephalic cage. Remaining setigers with similar, but very much shorter, setae in the notopodium and three to six long hooks with striated shafts ending in thin, broad, clear unidentate blades in the neuropodium. The hooks are arranged in a group and are mutually and individually slightly twisted; they are accompanied by fine spines. Coloration greyish brown.

Nanaimo region, dredged in about 25 fathoms. Port Simpson. Queen Charlotte Islands. Alaska. California. Taboga Island.

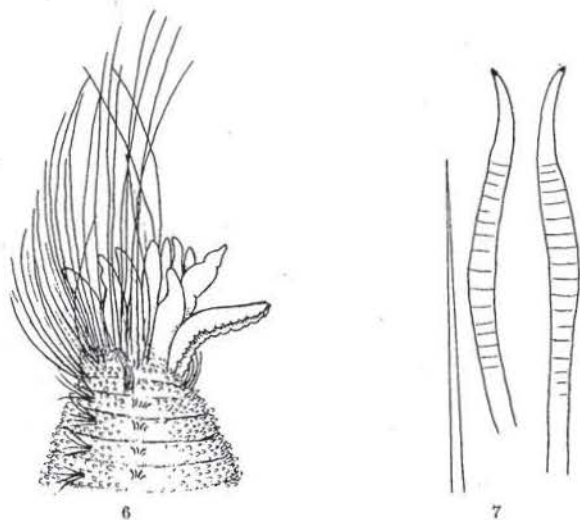


Fig. 6. *S. papillata* (Johnson), anterior region, lateral view (after Johnson).
 Fig. 7. *S. plumosa* (O. F. Müller), neurosetae (after Fauvel).

***S. plumosa* (O. F. Müller). 24. (Fig. 7.)**

Up to 80 mm. long, 6 mm. wide, 90 segments. Body of same shape as *S. papillata*, but, owing to less conspicuous setae and papillae, appearing much smoother and rounder. Papillae all short, subequal and regularly distributed, but those on the dorsal side slightly longer than those on the ventral side. Body surface and papillae coated with sand or mud. Branchiae and tentacular cirri as in *S. papillata*. Setae of first three setigers similar to, and arranged in the same way as, those of *S. papillata*, but much shorter and finer so that the cephalic cage is less conspicuous. Subsequent notosetae similar but shorter. Neurosetae dark, sigmoid hooks with striated shafts arranged in a straight row of three to five, not twisted and accompanied by fine spines. Coloration greyish brown.

Nanaimo region and Queen Charlotte Islands, littoral. Alaska. California. Japan. Atlantic. Arctic.

S. arenosa (Webster). 14, 39. (Figs. 8 and 9.)

Up to 50 mm. long, 5 mm. wide. Body only slightly enlarged anteriorly and densely covered with sand, making it more or less rigid. Papillae long, but only the tips extruding from the sandy covering. Especially long papillae in groups arranged in two longitudinal lines dorsally and around the notosetae. These groups are cemented together and encrusted with sand to form pillar-like prominences sloping forward, so that there appear to be three deep longitudinal furrows anteriorly. Branchiae numerous. All setae of first three setigers long striated capillaries pointing forward to form a definite cephalic cage. Notosetae of subsequent setigers, in approximately the first half of the body, similar but shorter (about a quarter the body-width), becoming much longer more posteriorly. Neurosetae from fourth setiger stout bifid hooks with striated stems and clear tips which are jointed only in more anterior setigers. Coloration determined by incrusting sand.

West coast Vancouver Island, dredged in about 20 fathoms. Virginia Channel Islands.

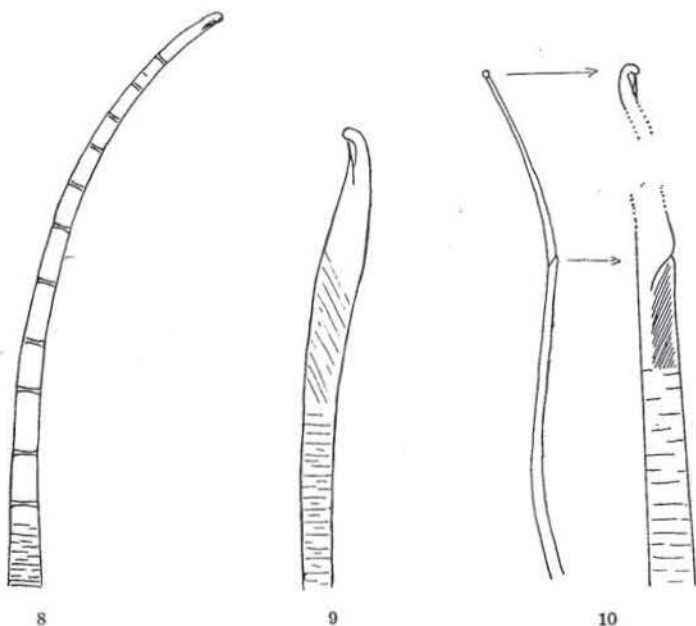


Fig. 8. *S. arenosa* (Webster), anterior hooked neuroseta.

Fig. 9. *S. arenosa* (Webster), posterior hooked neuroseta.

Fig. 10. *S. negligens* Berkeley, hooked neuroseta.

S. negligens Berkeley. 17. (Fig. 10.)

The only example known not quite complete posteriorly. It measures 15 mm. long for 30 setigers and is about 3 mm. wide at the widest point. The

body only moderately inflated anteriorly and only lightly coated with fine silt. It is covered with long, slender, uniformly distributed papillae, longer on the dorsal than on the ventral surface. Neither branchiae nor tentacular cirri have been observed. Setae of first three setigers all long, fine capillaries with close striations, pointing forward to form a fairly dense cephalic cage. Notosetae of subsequent setigers similar, slightly shorter, but considerably longer than the body-width. They are carried over the dorsum, those on opposite sides of the body tangling with one another, producing a characteristically untidy appearance. From the fourth setiger the neurosetae very slender and about as long as the body-width. The stems are finely striated and have long, clear unjointed tips terminating in small bidentate hooks. Coloration greyish brown.

Mitlenatch Island, Gulf of Georgia. Dredged in about 100 fathoms.

MAGELONIDAE

Body long and narrow, divided into two distinct regions. Prostomium flattened. Two long tentacular cirri bearing very numerous sucker-like papillae. No branchiae. Setae, capillaries and hooded crotchets.

Genus **MAGELONA** F. Müller

Two body-regions separated by a modified ninth setiger. Prostomium thin and plate-like in front; extending over and merging with the peristomium posteriorly. No eyes. Lobes of one or both parapodial rami more or less extended into lamelliform or cirriform processes. Either dorsal or ventral cirri, or both, sometimes present. Setae simple or bladed capillaries in anterior region, hooded crotchets in posterior region. Those of the ninth setiger variable. Two anal cirri.

KEY TO SPECIES

- | | |
|---|-----------------|
| 1 (2) Prostomium with antero-lateral projections (horns); all setae of ninth setiger acutely pointed. | japonica |
| 2 (1) Prostomium without antero-lateral horns; some setae of ninth setiger obliquely truncate subterminally and bluntly pointed terminally. | pitelkai |

M. japonica Okuda. 17, 60. (Figs. 11 to 14.)

Up to at least 50 mm. long, 1.5 mm. wide. Prostomium large, thin and oval, with distinct, though short, antero-lateral horns and four longitudinal ridges. Peristomium with two lateral lobes and bearing the very long papillated tentacular cirri. The anterior body-region consisting of eight setigers, all with dorsal and ventral lamellae only moderately extended into subequal cirriform processes. The ninth setiger shorter than those immediately preceding it and with wide triangular lamellae. The beginning of the posterior region at the tenth setiger marked by the lamellae becoming abruptly longer, foliaceous and lanceolate. They remain well developed and sub-equal until near the end of the body. Minute dorsal and ventral cirri on posterior setigers. Setae in anterior region

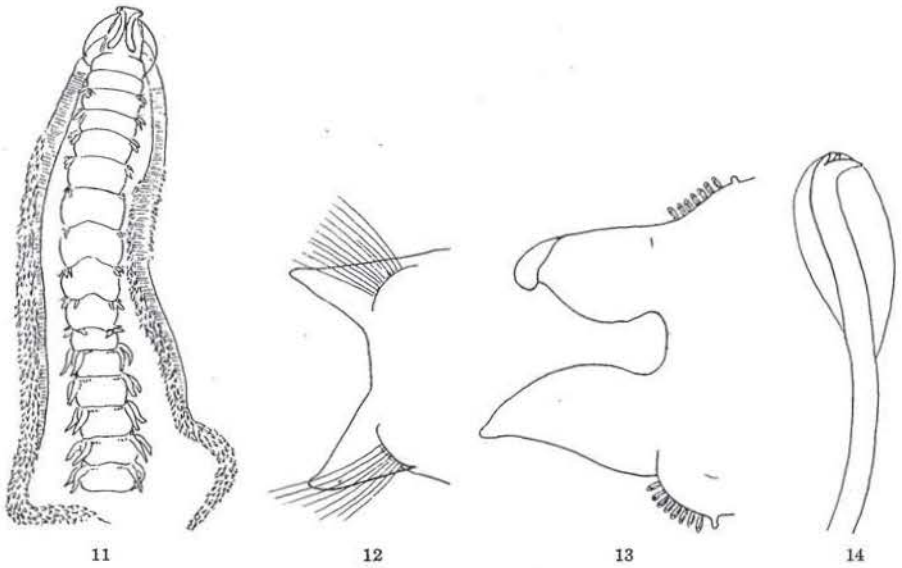


Fig. 11. *M. japonica* Okuda, anterior region (after Okuda, modified).

Fig. 12. *M. japonica* Okuda, ninth parapodium (after Okuda).

Fig. 13. *M. japonica* Okuda, twelfth parapodium (after Okuda).

Fig. 14. *M. japonica* Okuda, crotchet.

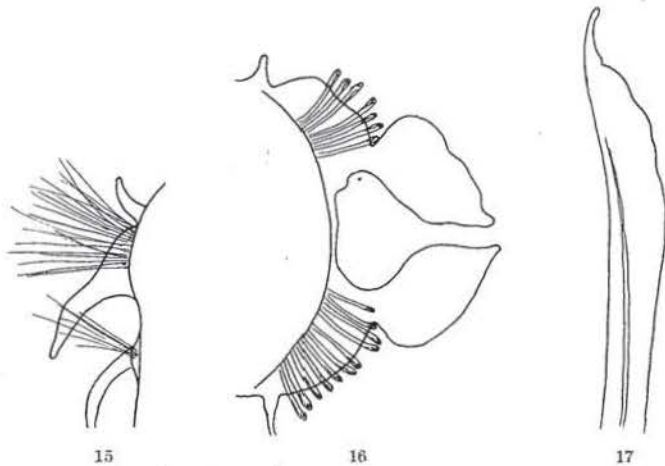


Fig. 15. *M. pitelkai* Hartman, fifth parapodium (after Hartman).

Fig. 16. *M. pitelkai* Hartman, tenth parapodium (after Hartman).

Fig. 17. *M. pitelkai* Hartman, flattened seta of ninth setiger (after Hartman).

and ninth setiger slender bladed capillaries. Hooded crotchets in posterior region tridentate. Little colour remaining in preserved specimens. Tube fragile, sandy. East coast Vancouver Island, littoral. Japan.

M. pitelkai Hartman. 33. (Figs. 15 to 17.)

Up to more than 40 mm. long, 1 mm. wide. Prostomium irregularly oval, rounded anteriorly, with four longitudinal ridges mid-dorsally. Setigers of anterior region with dorsal lamellae extended into cirriform processes, ventral lamellae short and rounded; dorsal and ventral cirri both present. Ninth setiger markedly shorter than eighth. Tenth setiger with well developed foliaceous dorsal and ventral lamellae and both dorsal and ventral cirri. This condition continues to near the end of the body. Setae in anterior region slender bladed capillaries. The more dorsal of the ninth setiger in both rami similar to these, the remainder shorter, flattened, and truncated obliquely at the widest point, the oblique edge terminating in a blunt tip. The setae of the ninth setiger form a dense fascicle partially encircling the body. Hooded crotchets in posterior region tridentate. No coloration as preserved. Not tubicolous.

Departure Bay, east coast Vancouver Island, littoral. California.

SPIONIDAE

Body not divided into distinct regions. Prostomium sometimes expanded antero-laterally into horn-like projections. Eyes often present. The peristomium extended forward at the sides of the prostomium and bearing two long canaliculate tentacular cirri. Parapodial lobes may be extended into lamelliform or cirriform processes. Branchiae usually present. Setae simple capillaries and hooded crotchets.

KEY TO GENERA

- | | |
|---|---------------------------|
| 1 (2) Fifth setiger specially modified. | POLYDORA (p. 13) |
| 2 (1) Fifth setiger not specially modified. | |
| 3 (4) Branchiae absent. | SPIOPHANES (p. 22) |
| 4 (3) Branchiae present. | |
| 5 (6) Branchiae beginning on the first setiger. | SPIO (p. 25) |
| 6 (5) Branchiae beginning on the second setiger. | |
| 7 (8) Without dorsal crotchets. | LAONICE (p. 26) |
| 8 (7) With dorsal crotchets. | |
| 9 (10) Branchiae almost the whole length of body. | NERINE (p. 27) |
| 10 (9) Branchiae not beyond the first half of the body. | PRIONOSPIO (p. 27) |

Genus **POLYDORA** Bosc.

Prostomium rounded or more or less bifurcate anteriorly, usually prolonged posteriorly into a ridge which is bounded on either side by sensory grooves. Sometimes this ridge not apparent beyond the first one or more setigers, the sensory grooves alone extending farther posteriorly, forming jointly a dorsal sense

organ. Branchiae present, but always absent from the fifth setiger. Fifth setiger enlarged and modified with specialized heavy bristles. Both rami usually with capillaries in the anterior region (they are absent in the notopodium of the first or fifth setiger, or both, in certain species). Thereafter, these capillaries persist in the notopodia, but some or all are replaced in the neuropodia by hooded, bifid crotchets from the seventh or eighth setiger to near the end (except in *P. commensalis*, in which they start farther back).

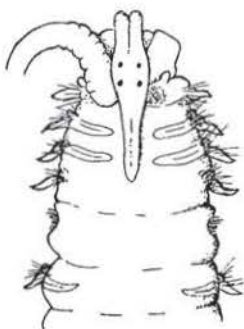
KEY TO SPECIES

| | | |
|----|--|---------------------|
| 1 | (9) Branchiae beginning on second setiger. (S-G <i>Boccardia</i> .) | |
| 2 | (3) Heavy dorsal hooks on posterior parapodia. | uncata |
| 3 | (2) No heavy dorsal hooks on posterior parapodia. | |
| 4 | (5,6) Notosetae on first setiger very long, extending forward beyond prostomium. | columbiana |
| 5 | (4,6) No notosetae on first setiger. | polybranchia |
| 6 | (4,5) Notosetae on first setiger not very long. | |
| 7 | (8) Prostomium rounded anteriorly. Lobes of first setiger inconspicuous. | proboscidea |
| 8 | (7) Prostomium bifurcate anteriorly. Lobes of first setiger conspicuous. | natix |
| 9 | (1) Branchiae beginning posterior to the fifth setiger. | |
| 10 | (11,14) Branchiae beginning on the sixth setiger. | commensalis |
| 11 | (10,14) Branchiae beginning on the seventh setiger. | |
| 12 | (13) A tentacle on the posterior extension of prostomium. | ligni |
| 13 | (12) No tentacle on posterior extension of prostomium. | ciliata |
| 14 | (10,11) Branchiae beginning on the eighth setiger. | |
| 15 | (16) Dorsal lamella of first setiger inconspicuous. | caeca |
| 16 | (15) Dorsal lamella of first setiger well developed. | |
| 17 | (18) Packets of fine needles in posterior notopodia. | cardalia |
| 18 | (17) No packets of fine needles in posterior notopodia. | |
| 19 | (20) Dorsal sense-organ reaching to twelfth setiger. Body long (up to 100 mm.). | magna |
| 20 | (19) Dorsal sense-organ reaching to fifth setiger. Body short (up to 10 mm.). | socialis |

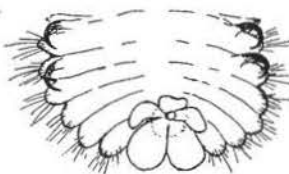
P. (*Boccardia*) *uncata* Berkeley. 7, 60. (Figs. 18 to 21.)

Up to 30 mm. long, 1 mm. wide. Prostomium bifurcate, the posterior ridge prolonged to the anterior border of the fourth setiger. Usually four eyes. Peristomium broad, forming spreading lobes either side of the prostomium. Branchiae begin on the second setiger and are present on all setigers until the beginning of the posterior region, except the fourth and fifth. They are flattened strap-like processes with membranous borders, becoming gradually longer posterior to the sixth setiger until they reach a maximum length of about half the body-width at about the fourteenth, thereafter gradually declining in size. The notopodium of the first setiger carries no setae and consists of a small lobe bent sharply forward. Thereafter, except in the specialized fifth setiger, the notopodia have setae and well developed lamellae. The fifth setiger has both dorsal and ventral bundles

of short, fine capillaries and between these a row of about eight heavy simple spines with slightly hooked, rather blunt tips accompanied by as many fine bristles with spear-head tips. Characteristic heavy notopodial hooks occur, together with the usual capillaries, in all but the last few segments of the posterior region. The pygidium bears two rounded ventral lobes and two or three smaller dorsal ones. Coloration reddish yellow in life, red-brown as preserved.

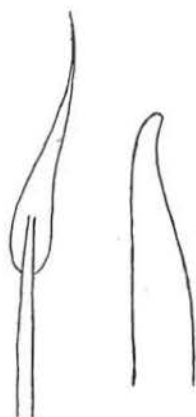


18



19

Fig. 18. *P. uncata* Berkeley, anterior region (one tentacular cirrus removed).
 Fig. 19. *P. uncata* Berkeley, posterior region.



20



21

Fig. 20. *P. uncata* Berkeley, fine seta and spine of fifth setiger.
 Fig. 21. *P. uncata* Berkeley, heavy hook from posterior region.

East and west coasts Vancouver Island, littoral, in sandy tubes; both free and associated with the calcareous tubes of the cirratulid *Dodecaceria pacifica* (Fewkes). California. Japan.

P. (*Boccardia*) *columbiana* Berkeley. 7. (Figs. 22 and 23.)

Up to 15 mm. long and 1 mm. wide. Prostomium rounded anteriorly, the posterior ridge extending to the anterior border of the fourth setiger. Four to six eyes. The peristomium forms a narrow rounded ridge on either side of the prostomium. Branchiae begin on the second setiger and (excepting the fifth) extend to near the end of the body. The notopodium of the first setiger is well developed and carries a large bunch of long fine capillaries extending straight forward beyond the anterior border of the prostomium. The fifth setiger has no dorsal capillaries; it has two to five heavy, blunt hooks and three to five heavy spines which have the ends expanded and abruptly cut across leaving one edge to continue in the form of a coarse brush; ventral capillaries are present. The pygidium a small lobed cup. Coloration red-brown as preserved.

East coast Vancouver Island, littoral, usually in minute galleries in shaly rock.

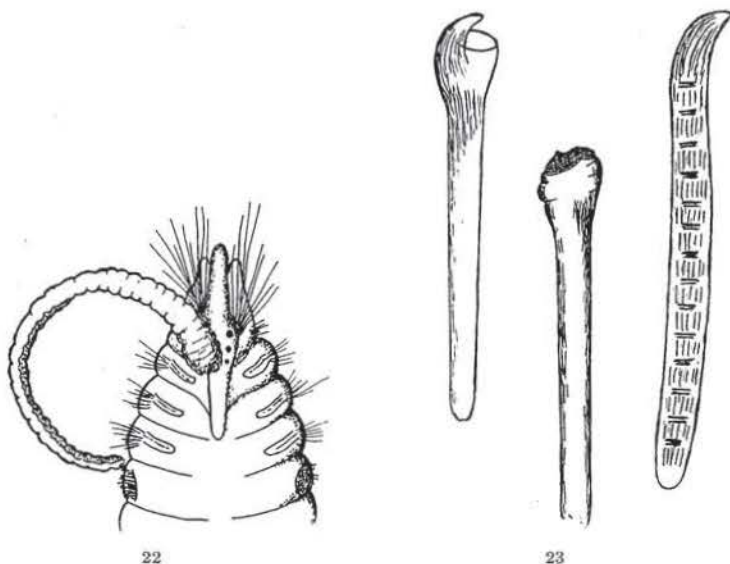


Fig. 22. *P. columbiana* Berkeley, anterior region (one tentacular cirrus removed).

Fig. 23. *P. columbiana* Berkeley, hook and spines (worn and unworn) of fifth setiger.

P. (*Boccardia*) *polybranchia* Haswell. 17, 24, 64. (Figs. 24 and 25.)

Up to 25 mm. long, 2 mm. wide, 80 setigers. Prostomium more or less notched, the posterior ridge prolonged to the anterior border of the fourth setiger. Eyes absent or present in variable number. Branchiae begin on the second setiger and (except the fifth) are present on all setigers to near the anal end; they are long, straight and fused to the dorsal parapodial lamellae, partially in the anterior region, almost entirely towards the anal end. No dorsal setae on the first setiger and its lamellae little developed. The fifth setiger with no dorsal

capillaries; it has a row of heavy specialized bristles consisting of hooks hollowed on the concave side at the bend and wide-ended spines truncated terminally and bearing on one edge a bush of densely ranked fibres; ventral capillaries are present. Pygidium a very small thickened ring, sometimes with a dorsal incision. Coloration green or yellow-red with dark extremities, the colour disappearing on preservation.

East coast Vancouver Island, littoral, at lowest tide-mark. Japan. Australia. Atlantic. Mediterranean.

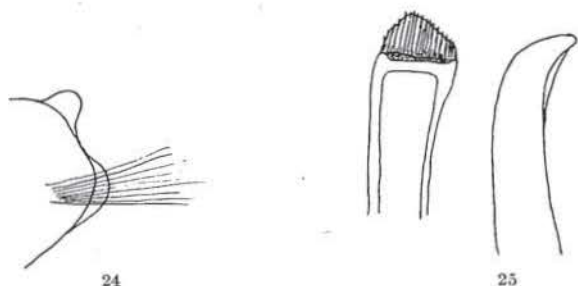


Fig. 24. *P. polybranchia* Haswell, first parapodium.

Fig. 25. *P. polybranchia* Haswell, brush-ended spine and hook of fifth setiger.

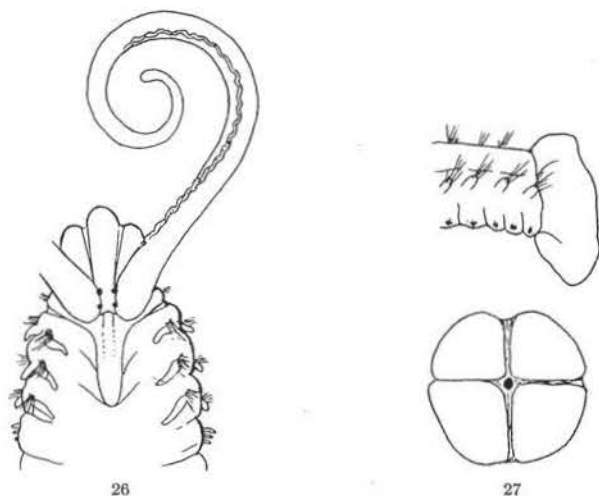


Fig. 26. *P. proboscidea* Hartman, anterior region (one tentacular cirrus removed) (after Hartman).

Fig. 27. *P. proboscidea* Hartman, posterior region, lateral view of anal end and end view of disc (after Hartman).

***P. (Boccardia) proboscidea* Hartman. 17, 28. (Figs. 26 and 27.)**

Up to 35 mm. long, 1.5 mm. wide, 150 setigers. Prostomium rounded anteriorly. Short fine capillaries in both rami of first setiger. Parapodial lamellae

inconspicuous throughout. Pygidium a large quadrilobate disc. In other respects resembling *P. polybranchia* except in that there are fewer specialized setae in the fifth setiger.

West coast Vancouver Island, littoral. Oregon. California.

***P. (Boccardia) natrix* Söderström. 11, 64. (Fig. 28.)**

Up to 70 mm. long, 4 mm. wide, and more than 100 segments. The posterior prostomial ridge extends to the anterior border of the third setiger. Both lamellae of first setiger well developed; short, fine capillaries in both rami. The pygidium a ring of small lobes. Remaining characters as in *P. polybranchia*.

East and west coasts Vancouver Island, littoral.

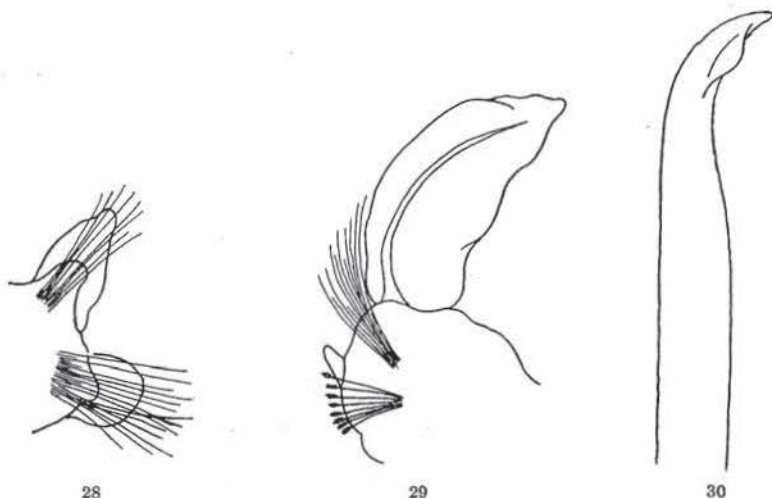


Fig. 28. *P. natrix* Söderström, first parapodium (after Söderström).

Fig. 29. *P. commensalis* Andrews, posterior parapodium.

Fig. 30. *P. commensalis* Andrews, hook of fifth setiger (after Andrews).

***P. commensalis* Andrews. 1, 7, 11. (Figs. 29 and 30.)**

Up to 30 mm. long, 2.5 mm. wide. Prostomium slightly emarginate in front, the posterior ridge extending no farther than the anterior border of the first setiger. Four eyes, not always detectable. Tentacular cirri shorter and thicker than is usual in the genus. Both prostomium and peristomium often retracted into the first setiger in preserved material. Branchiae begin on the sixth setiger and extend to the end of the body. They are broadly foliaceous with wide membranous margins. In the median region of the body the branchiae on opposite sides meet in the mid-dorsal line and almost cover the dorsum. The dorsal and ventral lamellae of the first four setigers are well developed; both rami have large bundles of exceedingly fine capillaries. The fifth setiger lacks dorsal capillaries; it has six or seven stout hooks, much like those of *P. poly-*

branchia but with lateral wings, accompanied by about as many very fine setae with subterminal expansions; there is a small bunch of ventral capillaries. Hooded crotchets begin at the fourteenth setiger with about five, the number increasing in more posterior setigers until a maximum of about ten is reached and capillaries are almost entirely displaced towards the anal end. No true pygidium. The anus dorsal surrounded by a variable number of small, unequal papillae. Coloration golden yellow with bright red branchiae.

East coast Vancouver Island, littoral. Common as a commensal with the hermit-crab *Pagurus granosimanus* in old shells of *Thais lamellosa*. Oregon. California. Mexico.

***P. ligni* Webster.** 11, 29. (Figs. 31 to 33.)

Recorded up to 35 mm. long, but, as found in Canadian Pacific waters, usually not more than 15 mm. Prostomium distinctly bifid, the posterior ridge extending to the fourth setiger and bearing a well defined tentacle. Four eyes. Branchiae begin on seventh setiger. First setiger with no dorsal setae; its lamellae well developed. Fifth setiger with no dorsal or ventral capillaries; some ten or eleven heavy hooks, each, when unworn, with a secondary tooth, accompanied by slender forked bristles with the prongs of the fork brush-like. Pygidium a large rounded disc with a rim which is often raised. Coloration, as preserved, yellowish. Fine sandy tubes.

East coast Vancouver Island, littoral. Oregon. California. Mexico. North Atlantic.

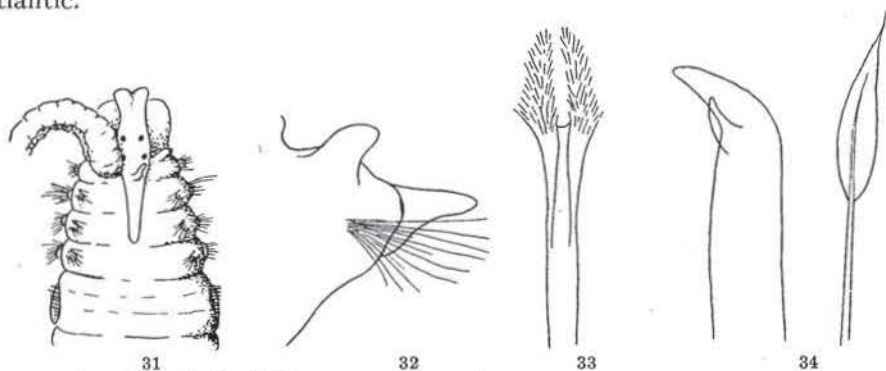


Fig. 31. *P. ligni* Webster, anterior region.

Fig. 32. *P. ligni* Webster, first parapodium.

Fig. 33. *P. ligni* Webster, forked bristle of fifth setiger (after Söderström).

Fig. 34. *P. ciliata* (Johnston), hook and fine bristle of fifth setiger (after Fauvel).

***P. ciliata* (Johnston).** 11, 24, 64. (Fig. 34.)

Recorded up to 30 mm. long, but known up to only half that length from the Canadian Pacific coast. Prostomium with shallow notch, the posterior ridge extending to the middle of the second setiger. One or two pairs of eyes, sometimes indistinguishable. Branchiae begin on the seventh setiger and extend to near

the end of the body. First setiger with lamellae feebly developed, no dorsal setae. Fifth setiger with both dorsal and ventral capillaries and up to seven heavy hooks each with a secondary tooth (both main and secondary hooks may be worn to mere knobs) accompanied by a row of fine companion bristles with lanceolate tips. Pygidium cup-shaped with a broad ventral rim which almost disappears dorsally. Coloration yellowish brown or yellow, with the tentacular cirri, the anterior region, and the pygidium markedly darkened.

East coast Vancouver Island, littoral; in the walls of old shells of *Thais lamellosa*. A common shell- and rock-drilling species. Cosmopolitan.

***P. ciliata* (Johnston) var. *spongicola* Berkeley. 17. (Fig. 35.)**

This variety only differs from the main species in the form of the specialized hooks of the fifth setiger. These have a thick collar encircling them subterminally. Both the collar and the hook may be so worn down as to leave no more than terminal knobs.

East coast Vancouver Island, littoral and dredged in about 30 fathoms. In fine sandy tubes in sponges encrusting rocks and shells of *Pecten hindsi*.

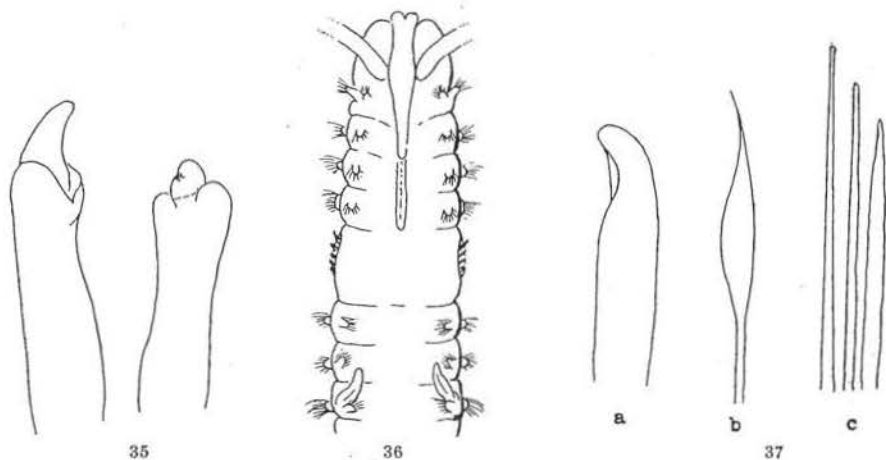


Fig. 35. *P. ciliata* var. *spongicola* Berkeley, hooks of fifth setiger (worn and unworn).

Fig. 36. *P. caeca* (Oersted), anterior region.

Fig. 37. *P. caeca* (Oersted), (a and b) hook and companion seta of fifth setiger, (c) posterior dorsal spines (all after Fauvel).

***P. caeca* (Oersted). 11, 24, 64. (Figs. 36 and 37.)**

Up to 40 mm. long, 1.5 mm. wide, 130 setigers. Prostomium sharply bifurcate, prolonged posteriorly to the anterior border of the third setiger, thereafter extended into the dorsal sense organ which continues to at least the fifth setiger and may reach the eighth. Four eyes, not always detectable. Branchiae begin on the eighth setiger and extend over two-thirds of the body length. First setiger

with small lamellae; notopodial setae present. Fifth setiger with dorsal and ventral capillaries, the specialized setae heavy blunt hooks hollowed near the tip and with no secondary tooth; a row of fine companion setae with lanceolate tips. Starting from about the forty-fifth some dorsal capillaries are replaced by three or four straight spines in each setiger. Pygidium a rather flat funnel notched dorsally and, sometimes, ventrally and laterally. Coloration yellowish.

West coast Vancouver Island, dredged in about 70 fathoms. In the walls of tubes of the maldanid *Nicomache lumbricalis*. Cosmopolitan.

***P. cardalia* Berkeley. 7. (Figs. 38 and 39.)**

Up to at least 150 mm. long and 2 mm. wide, about 400 segments. Prostomium deeply notched anteriorly and extending posteriorly over the peristomium and into the dorsal sense organ which continues to, or crosses, the fifth setiger. Four eyes. Branchiae begin on the eighth setiger and continue to near the end of the body. First setiger with a bunch of dorsal capillaries, both lamellae well developed. Fifth setiger with both dorsal and ventral capillaries; the specialized setae straight spines, rather finer than in most species of the genus, slightly hollowed near the tip, accompanied by a row of small companion bristles with lanceolate tips. Posterior notopodia with packets of fine parallel needles in addition to the usual capillaries. The pygidium cup-like, may be divided into two,

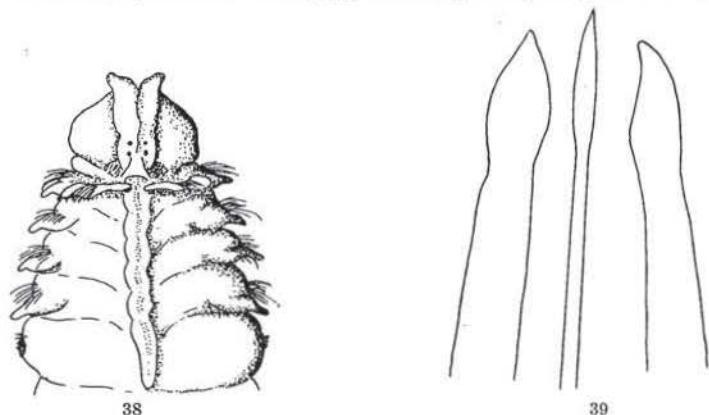


Fig. 38. *P. cardalia* Berkeley, anterior region (tentacular cirri removed).

Fig. 39. *P. cardalia* Berkeley, spines and bristle of fifth setiger.

three or four lobes. Tube sandy with a tough membranous mouth. Coloration, as preserved, cream to pale brown, covered with flecks of black.

East coast Vancouver Island, littoral and dredged in about 30 fathoms.

***P. magna* Berkeley. 11.**

Up to at least 100 mm. long, 1.5 mm. wide. Superficially like *P. caeca*. Prostomium deeply notched anteriorly, prolonged posteriorly to the third setiger,

thereafter extended into the dorsal sense organ which continues back as far as the twelfth setiger. No eyes detectable in mature individuals. Branchiae begin on the eighth setiger and extend to near the end of the body. First setiger with lamellae well developed, notopodial setae present. Fifth setiger with setae as in *P. caeca*. Posterior parapodia with no specialized setae. Pygidium funnel-shaped, two or four lobes. Tubes sandy, rather frail. Coloration yellowish.

East coast Vancouver Island, littoral and dredged.

P. socialis (Schmarda) subsp. **plena** Berkeley. 11, 43 (stem species).

Up to 10 mm. long, 1 mm. wide. Prostomium distinctly bifid. Dorsal sense organ extending to fifth setiger. Four well defined eyes. Branchiae begin on the eighth setiger and extend to near the end of the body. First setiger with well developed dorsal lamellae and notopodial setae. Fifth setiger with setae as in *P. cardalia* (fig. 39). Posterior parapodia with no specialized setae. Pygidium with a large ventral lobe, which may be subdivided, and two small dorsal ones. Coloration golden yellow with black spots dorsally and black lines on the dorsum, between the parapodia, and around the rim of the pygidium. Tubes frail, sandy; occurring in large colonies in clean sand-beds, the tubes frequently branched and united basally.

East coast Vancouver Island, littoral. Alaska.

Genus **SPIOPHANES** Grube

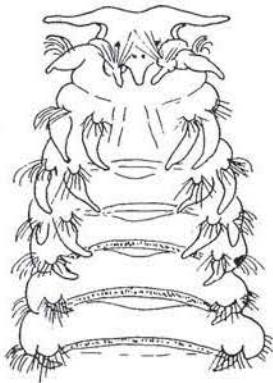
Prostomium subtriangular, its anterior margin rounded or extended anterolaterally into two horn-like projections; terminating posteriorly in a short ridge with, or without, an occipital tentacle. Four eyes or none. Dorsal sensory grooves present. Branchiae absent. Lamellae of both rami of anterior parapodia well developed; those of more posterior parapodia variable. Parapodial threadglands between the fifth and fifteenth setigers. Interparapodial genital pockets sometimes present thereafter. Ciliated membranous ridges across the dorsum more or less developed. Capillary setae in anterior setigers with one or two heavy, ventral, hook-shaped setae in the first. Neuropodial crotchets in all but the most anterior setigers, with or without hoods.

KEY TO SPECIES

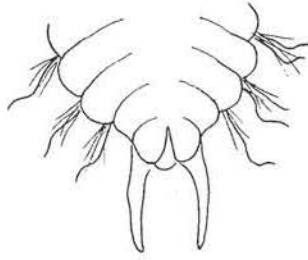
- | | |
|---|----------------|
| 1 (2) Prostomium extended antero-laterally into horn-like projections (fig. 40). No occipital tentacle | bombyx |
| 2 (1) Prostomium not thus extended. An occipital tentacle. | cirrata |

S. bombyx (Claparède). 24, 43, 64. (Figs. 40 to 43.)

Body flattened anteriorly, rounded posteriorly. Up to 60 mm. long, 1.5 mm. wide, and about 180 setigers. Prostomium an inverted isocetes triangle with the anterior angles produced laterally into horn-like projections, the apex extended posteriorly into a short ridge. A pair of small black eyes near the posterior end of the prostomium and a second, more anterior, pair farther apart, usually de-

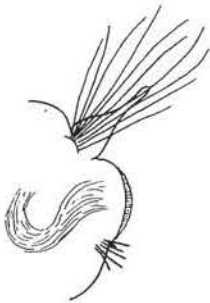


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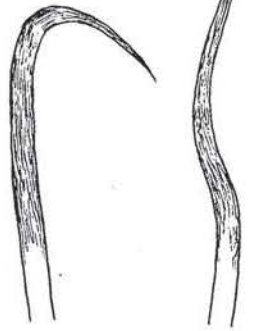


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Fig. 40. *S. bombyx* (Claparède), anterior region (tentacular cirri removed).
 Fig. 41. *S. bombyx* (Claparède), anal end.



42



a

b

Fig. 42. *S. bombyx* (Claparède), parapodium (to show thread-gland).

Fig. 43. *S. bombyx* (Claparède), neurosetae, (a) from first setiger, (b) from posterior setiger (after Fauvel).

tectable. Dorsal sensory grooves extending from the first to the third or fourth setiger. Dorsal lamella of first setiger small, but long; ventral lamella larger. Following three setigers with both lamellae well developed, the notopodium carried over the dorsum and the neuropodium dorso-laterally. Rami of next ten setigers little divided and considerably distended, only the dorsal lamella remaining distinct. Thread glands occur in these setigers, the fine threads (not always easily seen) lying parallel in a more or less S-shaped bundle. From the fifteenth setiger the rami again separated, the dorsal lamellae becoming gradually longer, straighter, and more cirriform towards the posterior region, finally becoming filiform. The ventral lamellae remain undeveloped. Transverse ciliated ridges

start at about the fifth setiger and are well marked after the fifteenth. One to three characteristic heavy hook-shaped setae in neuropodium of first setiger. Heavy setae of varying shape occur ventrally from the tenth setiger and both these and bidentate hooded crotchets from the fifteenth to near the end of the body. The pygidium a ring with a dorsal cleft, bearing ventrally two simple cirri. Tubes sandy and rigid. Coloration yellow as preserved.

East coast Vancouver Island, littoral, rare. Japan. Cosmopolitan.

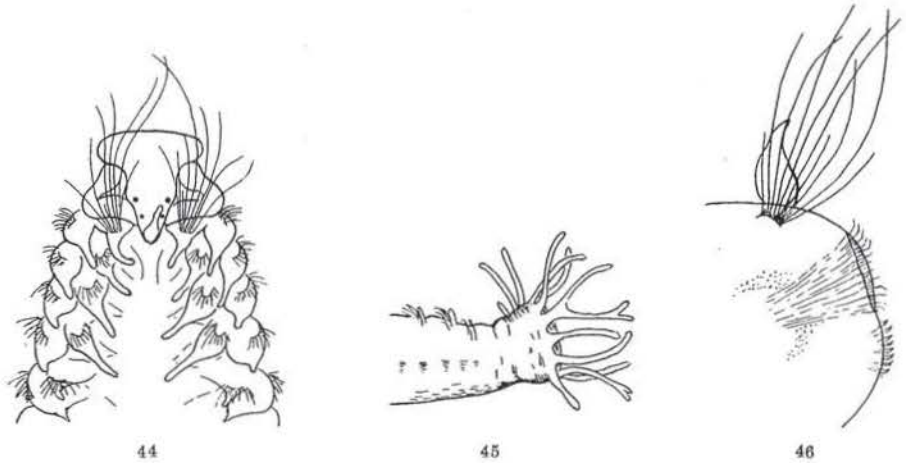


Fig. 44. *S. cirrata* Sars, anterior region (tentacular cirri removed).

Fig. 45. *S. cirrata* Sars, anal end.

Fig. 46. *S. cirrata* Sars, parapodium (to show thread-gland).

***S. cirrata* Sars. 43, 64 (as *S. kröyeri*). (Figs. 44 to 46.)**

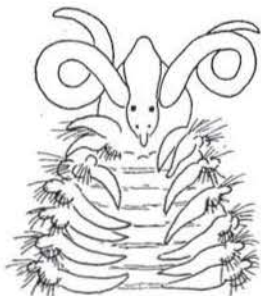
Body flattened anteriorly. Up to 35 mm. long, 2 mm. wide, 100 segments. Prostomium as in *S. bombyx* except that the anterior angles are merely rounded instead of being extended; the posterior angle bearing a well defined occipital tentacle. Four small eyes near the posterior extremity of the prostomium. Dorsal sensory grooves extending from the first to about the fourteenth setiger. Anterior parapodial lamellae generally as in *S. bombyx* except that, in the first setigers, the dorsal lamellae are larger, more digitiform and are carried more vertically. Parapodia containing thread-glands resemble and extend over the same body range as in *S. bombyx*, but the threads are straight and are arranged fan-wise. The lamellae of posterior setigers and both the distribution and the forms of the setae also resemble those of *S. bombyx* except that the ventral crotchets are tridentate and are not hooded. Ciliated transverse ridges start at about the nineteenth setiger. They are low at first, but become well marked more posteriorly. The pygidium a cup with a fringe of six to twelve, or more, delicate cirri, any one, or more, of which may be dichotomously branched. Tubes fine

and sandy or muddy, fitting the occupant closely. Coloration orange, becoming pale on preservation.

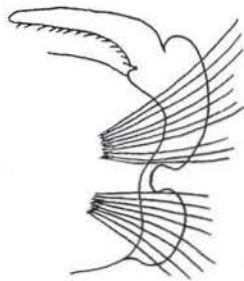
East coast Vancouver Island, littoral and dredged; fairly common. North Atlantic.

Genus **SPIO** Fabricius

Prostomium elongate with no lateral projections anteriorly, pointed posteriorly. Four eyes. Branchiae from first setiger to the end of the body. Parapodial lamellae well developed in both rami. Two rows of setae in each ramus. Hooded crotchets ventrally in median and posterior setigers.



47



48

Fig. 47. *S. filicornis* (O. F. Müller), anterior region (after Fauvel).

Fig. 48. *S. filicornis* (O. F. Müller), anterior parapodium (after Fauvel).

S. filicornis (O. F. Müller) var. ***pacifica*** Berkeley. 7 (as *S. Martinensis*), 11, 24 (stem species). (Figs. 47 and 48.)

Up to 30 mm. long, 2 mm. wide, 90 segments. Prostomium rounded anteriorly. Tentacular cirri short and thick. Branchiae of first setiger well developed. Lamellae of anterior setigers rounded, the notopodial fused with the base of the branchiae, those of more posterior setigers smaller, flatter and the notopodial lamella not fused with the branchia. Hooded bidentate crotchets (tridentate in juveniles) begin in neuropodium of tenth to fifteenth setiger. Some heavy recurved acicular bristles in the inferior portion of posterior neuropodia. Pygidium consisting of four almost equal thick subulate cirri surrounding the anus. Coloration ranging from greenish yellow anteriorly to orange posteriorly, each segment marked with a silver-white spot mid-dorsally. Dark lines and patches throughout. Tube may be either short and muddy or longer, flexible, and coated with fine shell or sand.

East coast Vancouver Island, littoral, common.

Genus **LAONICE** Malmgren

Prostomium broad and rounded anteriorly, produced and narrowed posteriorly, bearing an occipital tentacle. Two eyes. The posterior extremity of the prostomium joining the dorsal sense-organ which extends back a considerable distance. Branchiae begin on the second setiger and are present only in the anterior region. Anterior dorsal lamellae produced and well developed, not fused with branchiae; posteriorly becoming increasingly smaller. Interpodal pouches present. Hooded crotchets in posterior neuropodia.

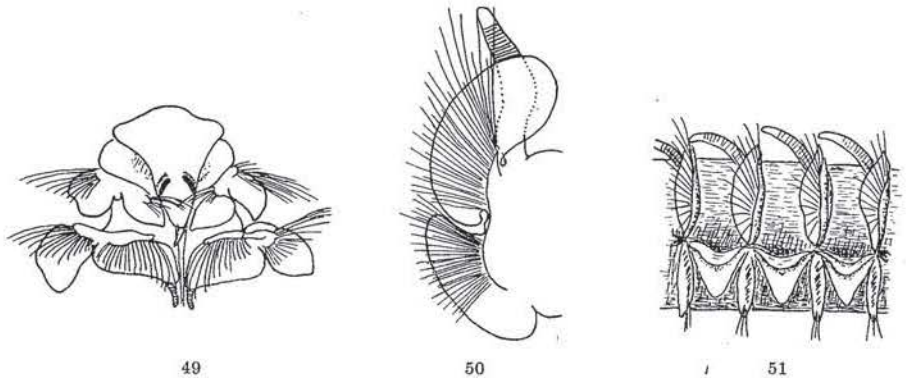


Fig. 49. *L. cirrata* (Sars), head (tentacular cirri removed) (after Moore).

Fig. 50. *L. cirrata* (Sars), fourteenth parapodium (after Moore).

Fig. 51. *L. cirrata* (Sars), lateral view of median segments (to show interpodal pouches)

L. cirrata (Sars). 7 (as *Spionides japonicus*), 24, 64. (Figs. 49 to 51.)

Body elongate, rounded. Up to 120 mm. long, 5 mm. wide, 160 setigers. Prostomium as described for genus. Eyes usually large and crescentic, but often inconspicuous in very large specimens. Occipital tentacle well developed, just behind the eyes. Dorsal sense-organ reaching to at least the twenty-eighth setiger. Tentacular cirri heavy, very easily lost. Branchiae begin at second setiger and extend for twenty-eight to fifty-two setigers. They are long, cirriform and are carried over the dorsum well separated from the parapodial lamellae. Lamellae of first setiger small. Dorsal lamellae in branchial region large, pointed, and auriculate, thereafter smaller. Interpodal pouches begin from the seventh (in small specimens) to the thirtieth setiger and extend to near the end of the body. Hooded neuropodial crotchets begin at, or near, the last branchial segment. Pygidium consisting of eight to twelve short cirri surrounding the anus. Coloration yellow to brown.

East and west coasts Vancouver Island, dredged in 25 to 70 fathoms. Queen Charlotte Islands. Alaska. Oregon. California. Japan. N. Atlantic. Mediterranean. Arctic.

Genus **NERINE** Johnston

Prostomium acute or rounded anteriorly, ending posteriorly in a free point. Eyes present. Branchiae begin on second setiger and extend nearly to the end of the body. Dorsal parapodial lamella attached to the branchia for all or part of its length in anterior segments. Ventral lamella deep and notched in posterior segments. Capillaries only in both rami in anterior segments. Some hooded crotchets in both rami in posterior segments.

KEY TO SPECIES

- 1 (2) Crotchets bidentate.
2 (1) Crotchets unidentate.

cirratulus
foliosa

N. cirratulus (Delle Chiaje). 10, 24.

Up to 80 mm. long, 3 mm. wide, 150 to 200 setigers. Prostomium prolonged and rounded anteriorly, reaching posteriorly to the second or third setiger, where it terminates in a sharp, free point. Four eyes. Tentacular cirri long and slender. Branchiae begin on second setiger and extend to within seven or eight of the posterior end. Dorsal parapodial lamellae well developed, bordering the branchiae for a part of their length in the anterior region, increasingly less so towards the posterior end. Ventral parapodial lamellae entire in anterior region, increasingly deeply notched more posteriorly and, finally, forming two distinct lobes. Capillaries lightly bladed. Hooded bidentate crotchets in the ventral ramus from about the fortieth setiger; in the dorsal ramus from about the sixtieth.

Known from Canadian Pacific coast only by a single example taken littorally at Long Bay, west coast Vancouver Island. Oregon. California. Atlantic. Mediterranean.

N. foliosa (Audouin and Milne-Edwards). 24, 64 (as *Scolecolepis*).

Up to 160 mm. long, 9 mm. wide, 200 to 250 setigers. Prostomium blunt and obscurely trilobed anteriorly, carrying a short tentacle on its posterior end. Four inconspicuous eyes. Tentacular cirri heavy. Branchiae begin on second setiger and are well developed to the fiftieth or sixtieth setiger, in which region they are bordered for their whole length by the dorsal lamella. Thereafter transition to complete freedom of the branchiae is rapid and they remain long and filiform until about the last third of the body length where they finally disappear. Ventral lamellae much as in *N. cirratulus*. Unidentate hooded crotchets in both rami from about the sixtieth setiger.

Known from the Canadian Pacific coast by only a single example, incomplete posteriorly, found on shore at Beaver Cove, McCauley Island. N. Atlantic. Mediterranean.

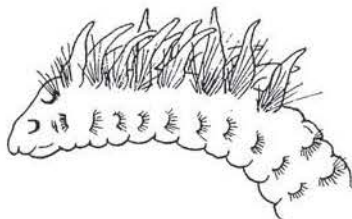
Genus **PRIONOSPIO** Malmgren

Prostomium rounded anteriorly, narrowed and extended posteriorly. No occipital tentacle. Eyes present or absent. Short dorsal sense organs on first

one or two segments. Branchiae begin on second setiger and are present on only a small number of anterior segments, often pinnate. Dorsal parapodial lamellae well developed in branchial region. Interpodal pouches sometimes present. Hooded pluridentate crotchets in all except most anterior neuropodia and also in posterior notopodia. Pygidium with an unpaired cirrus and, usually, a pair of shorter lateral ones.

KEY TO SPECIES

- | | |
|--|------------------|
| 1 (2) Six to thirteen pairs of branchiae, all simple. | <i>cirrifera</i> |
| 2 (1) Less than six pairs of branchiae, some pinnate. | |
| 3 (4) Four pairs of branchiae, two pairs pinnate. | <i>malmgreni</i> |
| 4 (3) Three pairs of branchiae (rarely four), all pinnate. | <i>pinnata</i> |



52



53

Fig. 52. *P. cirrifera* Wiren, anterior region (tentacular cirri removed).

Fig. 53. *P. cirrifera* Wiren, dorsal hooded crotchet (after Söderström).

***P. cirrifera* Wiren.** 7 (as *P. multibranchiata*), 24. (Figs. 52 and 53.)

Recorded up to 30 mm. long, 1.5 mm. wide and 87 setigers, but known Canadian Pacific specimens average only about 10 mm. long and 0.5 mm. wide. Prostomium rounded anteriorly and extended posteriorly into a crest which reaches the second or third setiger. Four large crescentic eyes, often small or wanting in older specimens. Branchiae begin on the second setiger and extend for six to thirteen setigers. They are simple subulate processes, the first pair about two-thirds the length of the remainder, which slightly exceed the body-width. Dorsal lamellae of the first setiger small rounded discs partially fused to the peristomium, those of the second setiger somewhat larger. The next four or five setigers have large, pointed foliaceous dorsal lamellae which are carried vertically. Thereafter they become more rounded, shorter and increasingly

inconspicuous. Ventral lamellae smaller and more or less pointed in the first four or five setigers, thereafter short and rounded. From the tenth or eleventh setiger until about the twenty-fourth the dorsal lamellae on either side are joined by a low transverse ridge. In mature specimens interpodal pouches occur from the fifth to the seventh setiger and extend over some twenty setigers. Capillary setae in the notopodium throughout, short at first, becoming longer through the median region, accompanied by a few pluridentate hooded crotchets after about the fortieth setiger. In the neuropodium hooded crotchets, similar to those of the notopodium, and a heavy acicular bristle (which, jointly, soon displace the capillaries) after the fifteenth setiger. Coloration yellowish.

East coast Vancouver Island, littoral. Atlantic. Indian Ocean. Arctic.

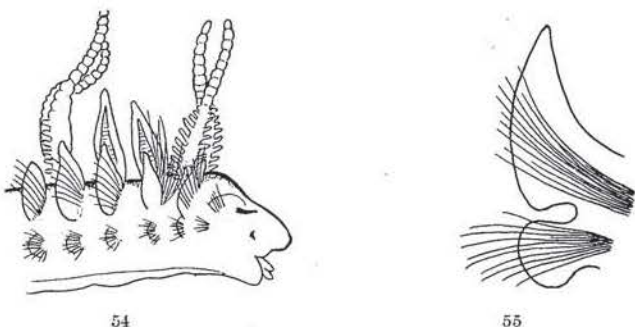


Fig. 54. *P. malmgreni* Claparède, anterior region (after McIntosh).
 Fig. 55. *P. malmgreni* Claparède, sixth parapodium (after McIntosh).

***P. malmgreni* Claparède.** 7, 24, 64 (as *P. fallax*). (Figs. 54 and 55.)

Up to 25 mm. long, 0.8 mm. wide and 63 segments. Prostomium as in *P. cirrifera* but posterior crest shorter. Four eyes (often lacking in large individuals), the anterior pair small and round, the posterior pair long and oblique. Branchiae begin on second setiger and extend for four setigers; the first and fourth pair long and pinnate, the other two pairs shorter, broader, and not pinnate. Dorsal lamellae of first setiger much as in *P. cirrifera*, those of subsequent setigers triangular, largest at the fourth setiger, thereafter diminishing and much reduced after the eighth or ninth setiger. Ventral lamellae of second and third setigers well developed and pointed, thereafter oval and rounded. Dorsal lamellae of sixth setiger joined by a low transverse ridge; this becomes elevated and quite marked on the seventh setiger and is present on subsequent setigers in varying degree. Notopodial and neuropodial hooded crotchets resembling, and their

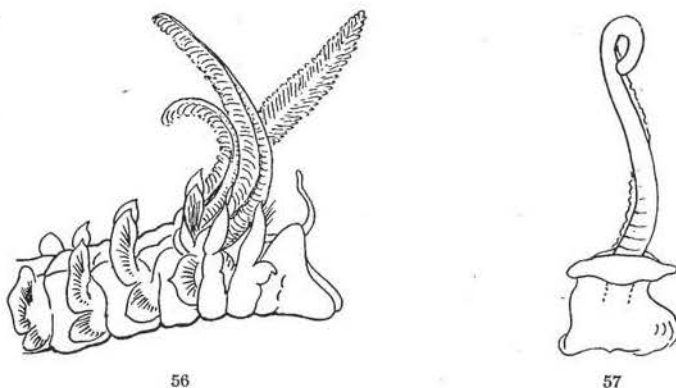


Fig. 56. *P. pinnata* Ehlers, anterior region (tentacular cirri removed).
 Fig. 57. *P. pinnata* Ehlers, tentacular cirrus.

incidence similar to, those of *P. cirrifera*. No interpodal pouches. Coloration yellowish.

East coast Vancouver Island, littoral and dredged in depths ranging to 250 fathoms. Alaska. Atlantic. Mediterranean.

***P. pinnata* Ehlers. 7 (as *P. tribranchiata*), 25. (Figs. 56 and 57.)**

Body slightly depressed anteriorly. Up to 80 mm. long and 3 mm. wide. Prostomium elongate, rounded anteriorly, spindle-shaped, ending at first pair of branchiae. Six, four, or only two eyes, where six are present the median pair the largest. The peristomium and first setiger distinct ventrally, but fused dorsally and laterally to form two upstanding flaps which enclose the prostomium, nothing remaining of the first pair of parapodia except a lateral depression on each flap. Tentacular cirri on the peristomium within the flaps on either side of the widest part of the prostomium, long and heavy and with wide basal membranes. Three or four pairs of branchiae (only specimens with three pairs known from Canadian Pacific waters), all pinnate, the first pair on a ridge which crosses the second setiger (which appears to be the first). Lamellae of second, third, and fourth setigers well developed and lanceolate in both rami, those of the second being only slightly smaller than those of the third and fourth; the notopodial elongate and curved dorsally, the neuropodial not so long and pointing laterally. At the fifth setiger the lamellae diminish in size and from the ninth the ventral lamella remains quite inconspicuous. No interpodal pouches. Crotchets in posterior notopodia and in neuropodia from about the ninth or tenth setiger. Tubes thick-walled, muddy. No colour remains in preserved specimens.

East coast Vancouver Island, dredged in moderate depths. Oregon. California. Japan. S. Pacific. Indian Ocean.

CIRRATULIDAE

Body thick, rounded dorsally and more or less flattened ventrally, usually attenuated at the extremities. Numerous short segments. Prostomium small, but distinct; with or without eyes. A pair of heavy tentacular cirri on a segment posterior to the peristomium or groups of grooved tentacular filaments on one or more of such segments. Branchiae (filamentous), on a variable number of segments. Parapodial lobes very little developed. Setae simple capillaries and, usually, acicular crotchets. Pygidium more or less lobed, no anal cirri.

(The genus *Ctenodrilus* is aberrant and possesses few of the foregoing characters. It is included here on the basis of characters which it has in common with larval stages of certain *Cirratulidae*.)

KEY TO GENERA

- | | |
|---|-----------------------------|
| 1 (10) With branchiae. (S-F. Cirratulinae.) | |
| 2 (3) With more or less numerous grooved tentacular filaments; no heavy tentacular cirri. | CIRRATULUS (p. 31) |
| 3 (2) No grooved tentacular filaments; a pair of heavy tentacular cirri. | |
| 4 (5) Three to eleven pairs of branchiae. | DODECACERIA (p. 33) |
| 5 (4) Many pairs of branchiae. | |
| 6 (7) Setae all capillaries. | THARYX (p. 34) |
| 7 (6) Crotchets in some segments. | |
| 8 (9) Crotchets almost completely surrounding posterior segments. | CHAETOZONE (p. 35) |
| 9 (8) Crotchets not thus. | CAULLERIELLA (p. 36) |
| 10 (1) Without branchiae. (S-F. Ctenodrilinae.) | CTENODRILUS (p. 37) |

Genus **CIRRATULUS** Lamarck

Prostomium conical. First three segments achaetous. Branchiae beginning on one of the anterior segments and continuing over most of the length of the body. Tentacular filaments as heavy as (or a little heavier than) the branchiae appearing on the same segment. Setae either capillary throughout or with both capillaries and acicular crotchets in some parapodia.

KEY TO SPECIES

- | | |
|--|--------------------|
| 1 (2) Acicular crotchets starting on the tenth to the twelfth setiger; two to eight tentacular filaments in each group. | cirratulus |
| 2 (1) Acicular crotchets starting between the twentieth and thirtieth setiger; eight to twenty tentacular filaments in each group. | spectabilis |

C. cirratulus (O. F. Müller). 17, 24. (Figs. 58 and 59.)

Up to 120 mm. long, 3 mm. wide, and 130 segments, but the only specimens yet known from the Canadian Pacific region not more than 40 mm. long. Prostomium a blunt cone with a broad base. A row of four to eight small black eyes

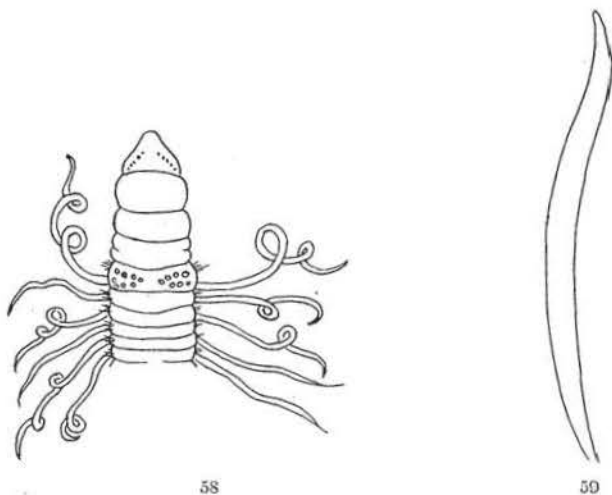


Fig. 58. *C. cirratus* (O. F. Müller), anterior region (after Fauvel).
 Fig. 59. *C. cirratus* (O. F. Müller), acicular crotchet.

placed obliquely on either side of the mid-dorsal line (the rows sometimes meeting anteriorly). Branchiae starting on the first setiger. The distance between the insertion of the filament and the notopodium is less than that between the rami in the anterior region, equal, or slightly exceeding it, in the median region, and considerably exceeding it posteriorly. Grooved tentacular filaments, a little heavier than the branchiae, on the anterior border of the first setiger, usually arranged in two groups, each of two to eight. Capillary setae, finely serrated on one edge, throughout in both rami. First ventral acicular crotchets on the tenth to the twelfth setiger; first dorsal ones more posterior by a very variable number of setigers. Anus small, sub-dorsal. Coloration yellow-orange to brownish, branchiae and tentacular filaments red. Sometimes luminescent.

Galiano Island, east coast Vancouver Island, on piles at low tide-mark amongst barnacles. Cosmopolitan.

***C. spectabilis* (Kinberg). 17, 37 (as *C. cingulatus* and *C. robustus*).**

Up to 115 mm. long, 5 mm. wide, and 115 segments. Prostomium a blunt, depressed cone with a row of five or six eye-spots placed obliquely on either side of the mid-dorsal line or a row of ten to twelve transversely. Dorsal surface of first three segments often wrinkled and their boundaries obscure, subsequent segments often triannulate. Branchiae starting on the first setiger. They originate quite near the notopodia in the anterior region, but rise to a more dorsal position in the median region, where there may be considerable irregularity of position among individual filaments. In the posterior region there is usually a

tendency for the position to fall again, but this is not always the case. Grooved tentacular filaments as in *C. cirratus* except that they tend to be longer and the number of filaments in each group is very variable (eight to twenty). Setae also much as in *C. cirratus* except that the acicular crotchets in both rami start more posteriorly. Anus dorsal to terminal. Coloration buff to red-brown, sometimes with black areas.

Common between tide-marks; east and west coasts Vancouver Island and elsewhere in Canadian Pacific region. Queen Charlotte Islands. California. Mexico.

Genus **DODECACERIA** Oersted

Body thick, often flattened and widened posteriorly. Prostomium bluntly conical, usually without eyes. First metastomial segment with a pair of heavy tentacular cirri. Branchiae start on the same segment and are present on the first three to eleven setigers; the first pairs long, the posterior pairs decreasing in length. Capillary setae in both rami in most setigers. Crotchets with spoon-shaped ends in both rami in all but the most anterior and the most posterior setigers.

KEY TO SPECIES

- | | |
|---|------------------|
| 1 (2) Tentacular cirri often shorter than the first pair of branchiae; six to eleven pairs of branchiae. | pacifica |
| 2 (1) Tentacular cirri as long as, or longer than, first pair of branchiae; three to five pairs of branchiae. | concharum |

D. pacifica (Fewkes) 10, 54.

Up to 40 mm. long, 1 mm. wide, 130 segments. Prostomium and peristomium more or less fused dorsally, but distinguishable ventrally, forming jointly a subconical head. First pair of branchiae and the tentacular cirri on the dorsal side of the first metastomial segment. The branchiae are smooth when extended, the first few pairs at least five or six times the length of the head, the remainder considerably shorter. The tentacular cirri are thick, grooved, and crenulate, often less than half the length of the first pair of branchiae. Capillary setae very finely serrated on one edge. Ventral crotchets with spoon-shaped ends first present on the ninth to the twelfth setiger, similar crotchets in dorsal ramus a few segments farther back. Every degree of replacement of capillaries by crotchets in setigers of median region. Posteriorly the crotchets are gradually, and finally entirely, displaced by capillaries. Coloration dark brown to black, sometimes patchy. Calcareous tubes in dense, tangled, colonial masses, often of considerable size.

East and west coasts Vancouver Island, littoral. California.

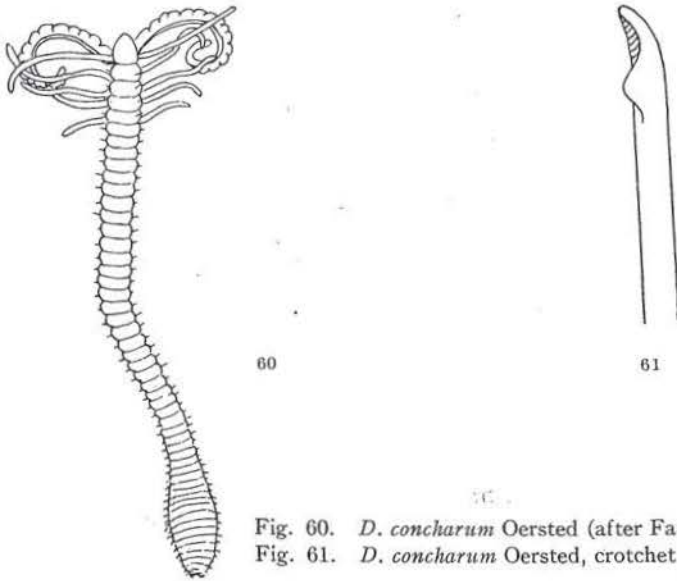


Fig. 60. *D. concharum* Oersted (after Fauvel).

Fig. 61. *D. concharum* Oersted, crotchet (after Fauvel).

D. concharum Oersted. 24. (Figs. 60 and 61.)

Closely resembling *D. pacifica* except as differentiated in key to species. Usually fewer (forty to eighty) segments. Occurring in galleries drilled in old shells.

Ladysmith harbour, east coast Vancouver Island, in oyster shells. N. Atlantic. Mediterranean.

Genus **THARYX** Webster and Benedict

Body long, numerous segments. Prostomium conical. Peristomium and one or two following segments achaetous, their boundaries often indistinct. Heavy tentacular cirri and first pair of branchiae on first setiger, the branchiae extending more or less posteriorly according to species. Setae all capillaries throughout.

T. multifilis Moore. 54. (Fig. 62.)

Up to 58 mm. long, 2 mm. wide, 240 segments. Prostomium short, eyes indistinct or absent. Peristomium and two following segments forming a large, swollen achaetous region with transverse furrows. Anteriorly some sixty setigers very short and crowded, more posteriorly the setigers longer and wider. Tentacular cirri nearly a third of the body-length, narrow at the base, but becoming gradually thicker toward the distal end; grooved and crenulate the entire length. Branchiae arising in contact with the notopodia, very long and thin in the anterior region forming a tangled mass, shorter more posteriorly. They extend

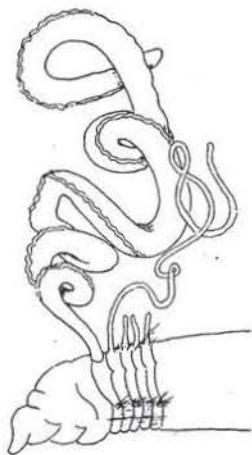
nearly to the end of the body, but are frequently absent or damaged in the median region. Setae all simple, smooth, slender capillaries in the anterior region, all alike except that the notopodials are much longer than the neuropodials. Farther back the neuropodials are not only the shorter, but also broader and flattened. Coloration brown to almost black.

East and west coasts Vancouver Island, dredged in 30 to 60 fathoms. California.

T. multifilis Moore var. **parvus** Berkeley. 8.

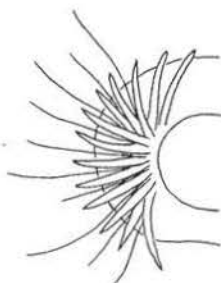
Differs from the stem species only in that it is consistently not more than a quarter the size.

East coast Vancouver Island, littoral.



62

Fig. 62. *T. multifilis* Moore, anterior region (after Moore).



63

Fig. 63. *C. setosa* Malmgren, posterior parapodium (after Fauvel).

Genus **CHAETOZONE** Malmgren

As *Tharyx* except for the presence of crotchets which almost completely surround posterior segments.

C. setosa Malmgren. 24. (Fig. 63.)

Up to 25 mm. long, 2 mm. wide, 90 segments. Prostomium acute, no eyes. Peristomium and two following segments often biannulate. Tentacular cirri very long, grooved, crenulate. Branchiae extending about half the length of the body, relatively short at posterior end of the range. Capillaries throughout in both rami, the dorsal very long and very fine, the ventral shorter and broader.

Crotchets in posterior region only; they are present in both rami, are unidentate, and are arranged in linear series which almost meet dorsally and ventrally. Coloration grey to brown.

West coast Vancouver Island, dredged in about 30 fathoms. North Atlantic. Arctic. Mediterranean.

Genus **CAULLERIELLA** Chamberlin

As *Tharyx* except that bidentate or unidentate crotchets occur in some, or all, neuropodia and, usually, in some notopodia.

KEY TO SPECIES

- 1 (2) Crotchets all bidentate.
2 (1) Crotchets all unidentate.

alata
gracilis

C. alata (Southern). 17, 24 (as *Heterocirrus*), **65** (as *Chaetozone*). (Fig. 64.)

Up to 25 mm. long, 1 mm. wide. Prostomium acutely conical, a pair of dark eyes deeply embedded. Peristomium and two following segments obscurely separated. Tentacular cirri very long, grooved and heavy. Capillary setae of two kinds in all notopodia, the one long, fine and cylindrical, the other flattened. One or two very fine capillaries sometimes present in neuropodia. Three to seven recurved and bladed bidentate crotchets in all neuropodia, the blades very thin and visible only under optimum conditions. Similar crotchets in notopodia after the twentieth setiger. Coloration greyish brown.

Nanaimo region, littoral. Ireland. California.

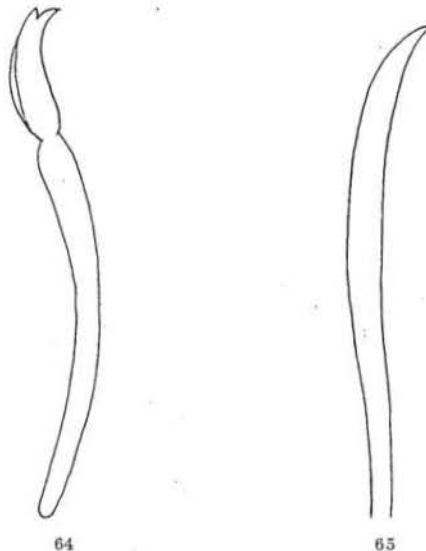


Fig. 64. *C. alata* (Southern), crotchet (after Southern).
Fig. 65. *C. gracilis* (Moore), crotchet (after Moore).

C. gracilis (Moore). 17, 56 (as *Tharyx*). (Fig. 65.)

Up to 30 mm. long, 1 mm. wide. Prostomium elongate, two eyes sometimes visible. Peristomium and two following segments forming jointly a raised area partially hiding the prostomium from above. Tentacular cirri very long and grooved, but slender. Branchiae on all setigers except the last few. Notopodial capillaries long and slender; the neuropodial shorter, broader, and with one edge finely serrated. A single unidentate crotchet appears in the neuropodium of the eighth or ninth setiger, two or three farther back. Similar crotchets in the notopodium after about the twenty-fifth setiger. Coloration light brown as preserved.

Skidegate narrows, Queen Charlotte Islands. California.

Genus **CTENODRILUS** Claparède

Body small, short and wide, not more than fifteen segments. Prostomium large, ciliated on ventral surface. Nuchal organs present. Neither tentacular cirri, tentacular filaments nor branchiae. Setae all simple, with or without pectinate extremities, on all segments.

Ct. serratus (O. Schmidt). 13, 24, 33. (Figs. 66 and 67.)

Up to 9 mm. long, 1 mm. wide, 12 to 15 segments. Prostomium a blunt cone rounded anteriorly with no eyes, but a pair of lateral ciliated nuchal organs. Ventral ciliation of prostomium extended to first setiger. Setae with pectinate terminal enlargements, the teeth large and triangular. Body more or less transparent with greenish coloration, the skin with heavy dark spots.

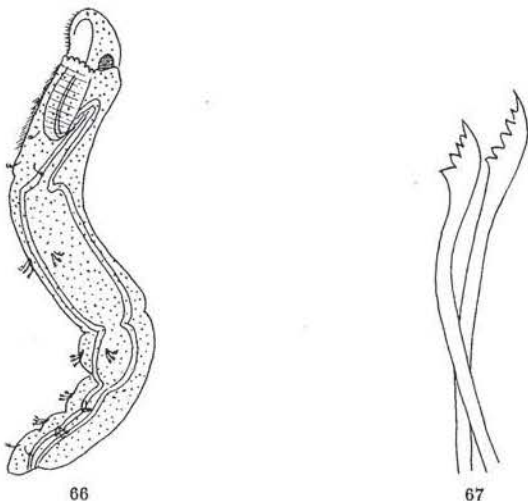


Fig. 66. *Ct. serratus* (O. Schmidt) (after Fauvel).

Fig. 67. *Ct. serratus* (O. Schmidt), setae.

Taken in tow-net in an artificially constructed lagoon at Ladysmith, Vancouver Island. Probably swept off eel-grass or other submerged vegetation. California. English Channel. Mediterranean.

PARAONIDAE

Body long, many segments. Protopodium sometimes terminated anteriorly by a sensory papilla, with or without a single tentacle and with or without eyes. Peristomium often indistinctly divided from protopodium, with nuchal organs. Branchiae simple, starting on the fourth to the seventh setiger and extending over a variable number of anterior setigers. Dorsal cirri may be present, but no ventral cirri. Notopodium and neuropodium low lobes, either or both of which may be extended into a long cirrus-like process. Capillary setae in both rami throughout. Occasionally some crotchets posteriorly. Three anal cirri.

Genus **ARICIDEA** Webster

Protopodium with a well developed dorsal tentacle. Branchiae beginning on the fourth (rarely the fifth) setiger and present on only a few anterior setigers. No true cirri, but either or both parapodial lobes may be extended into cirrus-like processes.

KEY TO SPECIES

- | | |
|---|---------------------|
| 1 (2) Neuropodial lobes elongate in branchial region. | longicornuta |
| 2 (1) Neuropodial lobes not elongate in branchial region. | jeffreysii |

A. longicornuta Berkeley. 17. (Figs. 68 and 69.)

Largest specimen known 25 mm. long and about 1.5 mm. wide, incomplete posteriorly. Protopodium a small flattened triangle bearing a slender tentacle extending back to the sixth setiger. Peristomium is swollen laterally and has on either side of the median line a curved elevation bounding the nuchal organ of that side. No eyes. Branchiae begin on the fourth setiger. There are twenty-three to twenty-seven pairs; the more posterior have very long, filiform tips. The notopodial lobes are elongate throughout and become increasingly long and slender towards the posterior end. From the fourth to about the nineteenth setiger the elongation is bifid, becoming single again more posteriorly. A similar prolongation of the neuropodium occurs from the first setiger to the end of the branchial region. Setae all capillaries in both rami as far posteriorly as the most complete specimen available extends. Anteriorly the majority of them are short and bladed, but an increasing number of fine capillaries displace them in more posterior setigers until, posterior to the branchial region, all are long and fine. Coloration cream with brown mottlings in the anterior region.

East coast Vancouver Island, dredged in 75 to 230 fathoms.

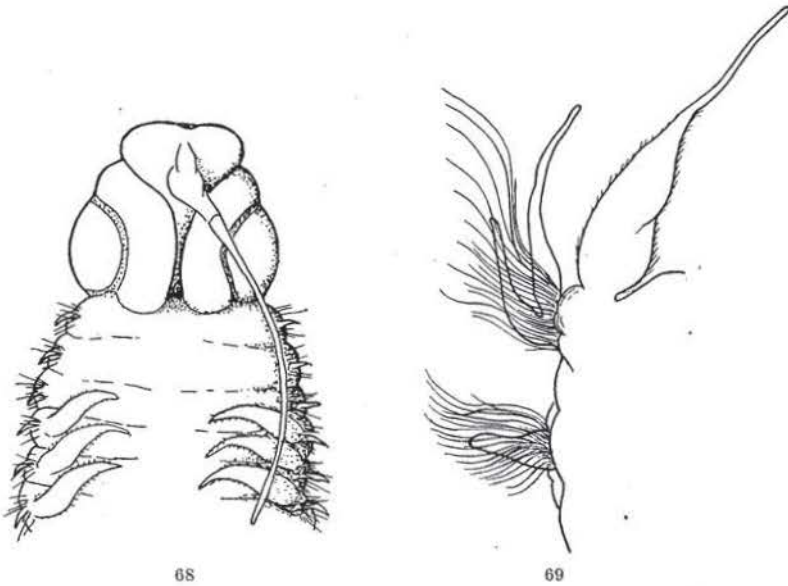


Fig. 68. *A. longicornuta* Berkeley, anterior region.

Fig. 69. *A. longicornuta* Berkeley, parapodium from branchial region.

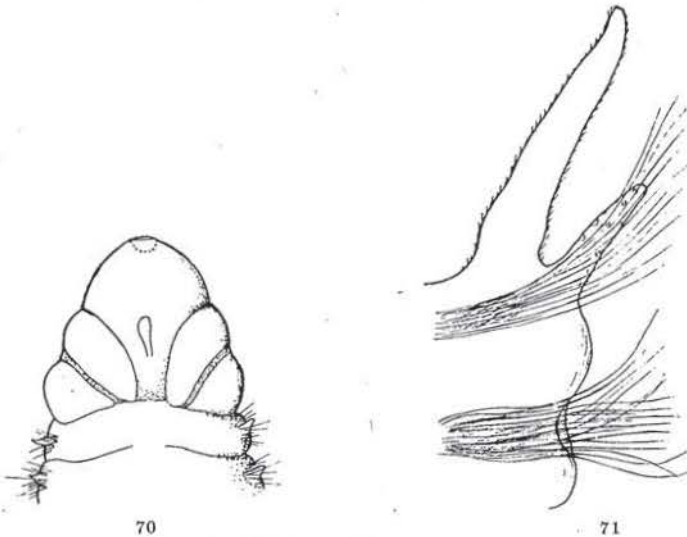


Fig. 70. *A. jeffreysii* (McIntosh), head.

Fig. 71. *A. jeffreysii* (McIntosh), parapodium from branchial region.

***A. jeffreysii* (McIntosh). 17, 24. (Figs. 70 to 73.)**

Up to 20 mm. long, 1 mm. wide and 120 setigers. The pyriform prostomium, bearing a small, clavate tentacle, projects posteriorly over the peristomium,

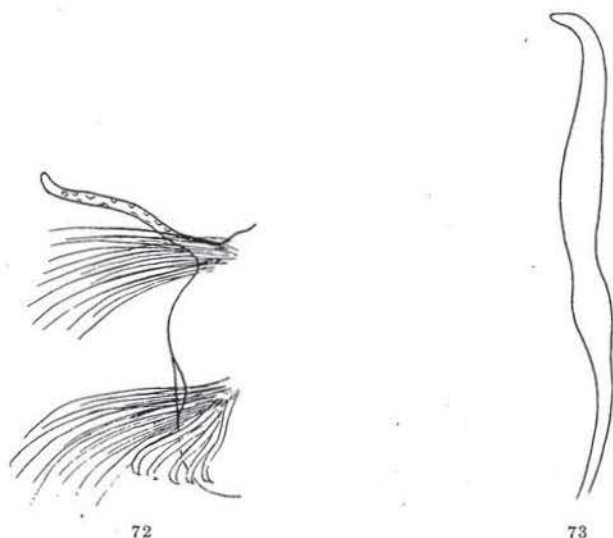


Fig. 72. *A. jeffreysii* (McIntosh), parapodium from posterior region.
 Fig. 73. *A. jeffreysii* (McIntosh), crotchet.

which is inflated laterally and carries two large nuchal organs. Three first setigers with elongate lobes and straight, fine capillaries in the notopodia, similar capillaries and some broader bent ones in the neuropodia. Branchiae beginning at the fourth setiger, long, straight and ciliated, carried high on the dorsum and extending for eight to fourteen setigers, most frequently thirteen. The notopodial lobes become long in the branchial and thread-like in the posterior region. The neuropodial lobes are not elongate. Beginning about the middle of the branchial region the capillaries in both rami are all long and straight, increasing in length towards the posterior end. Beginning at the thirteenth to the eighteenth setiger and extending to the posterior end there are one to six crotchets, with or without hoods, in the neuropodia. Pygidium variable, more or less rounded with a small median cirrus and two longer laterals. Coloration yellow to brown.

East coast Vancouver Island, dredged in 20 to 230 fathoms. Howe sound dredged in 120 fathoms. Atlantic. Mediterranean.

AMMOCHARIDAE (Oweniidae)

Body cylindrical, few segments, not divided into distinct regions; the anterior segments very short, succeeded by a few long ones, the remainder again short. Prostomium and peristomium fused, the head thus formed terminating in a lobe which may be smooth or extended into several wide membranes terminating in branched processes. Notosetae capillaries, neurosetae very small and very numerous crotchets.

KEY TO GENERA

1 (2) Head rounded and without appendages.

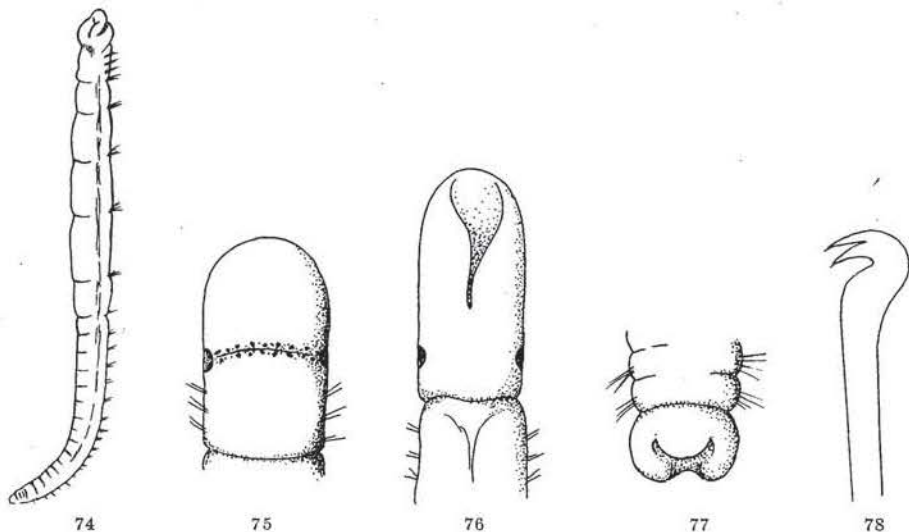
MYRIOCHELE (p. 41)

2 (1) Head extended into several branched lobular processes.

AMMOCHARES (p. 42)

Genus **MYRIOCHELE** Malmgren

Body slender. Head without appendages, with or without eyes. Three first setigers with capillaries only. Capillaries with delicately spiny tips. Crotchets bidentate, in many dense rows.

Fig. 74. *M. heeri* Malmgren (after Fauvel).Fig. 75. *M. heeri* Malmgren, head partially extended, dorsal view.Fig. 76. *M. heeri* Malmgren, head fully extended, ventral view.Fig. 77. *M. heeri* Malmgren, anal end, dorsal view.Fig. 78. *M. heeri* Malmgren, crotchet (after McIntosh).***M. heeri*** Malmgren. 14, 16, 24. (Figs. 74 to 78.)

Up to 30 mm. long, 1.5 mm. wide. Canadian Pacific specimens usually narrower. Body only slightly attenuated posteriorly. About twenty-seven setigers. The head lobe in contraction forming a low roll; in extension becoming a cylindrical funnel-like projection open on the ventral side. In the latter condition, viewed dorsally, it is simply rounded, usually (in Canadian Pacific specimens) with a pair of eyes strictly lateral and with a line of pigment spots connecting them. Seen ventrally it is deeply notched, the notch extending posteriorly as far as the line joining the eyes. Mouth central. Anterior three setigers very short, all with nothing but lateral bundles of capillaries with delicately spiny tips, the subsequent five setigers long, followed by increasingly shorter ones posteriorly.

All except the first three setigers have, in addition to spiny-ended capillaries, a very large number of very small crotchets with two superimposed teeth and short stems, these almost completely encircling the ventral side of the body. The pygidium, when expanded, terminates in a low, wide dorsal lobe and two longer ventral lobes partially joined, but it is generally contracted into a thickened, incomplete ring. Tube smooth, membranous, flexible, coated with fine sand, fitting the animal tightly and open at both ends.

East coast Vancouver Island in 15 to 50 fathoms. West coast Vancouver Island in about 40 fathoms. Oregon. N. Atlantic. Arctic. Antarctic. Often at great depths.

Genus **AMMOCHARES** Grube

Body slender. Head extended anteriorly into wide membranous lobes with lacinated borders. Otherwise as *Myriochele*.

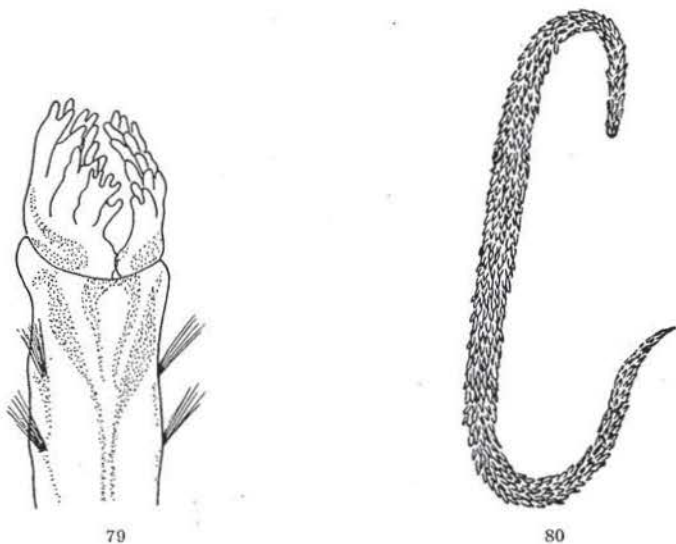


Fig. 79. *A. fusiformis* (Delle Chiaje), anterior region (after Okuda).

Fig. 80. *A. fusiformis* (Delle Chiaje), tube.

A. fusiformis (Delle Chiaje). 9, 24. (Figs. 79 and 80.)

Up to 100 mm. long, 3 mm. wide, but Canadian Pacific specimens usually smaller than this. Head extended into a crown consisting of six or eight membranous lobes terminating in branched processes. Eighteen to twenty-eight setigers. Body-shape, relative lengths of setigers, form and distribution of capillaries and uncini much as in *Myriochele heeri*, the only notable difference being that the capillaries of the third setiger are smaller and fewer than in the first two and are

placed dorsally. Pygidium lobed. Tube membranous, covered with coarse sand grains or shell particles attached at an edge and overlapping, giving it a shaggy appearance; open at both ends.

East coast Vancouver Island, littoral. West coast Vancouver Island dredged in about 35 fathoms. Alaska. Washington. Oregon. California. Japan. Cosmopolitan.

MALDANIDAE

Body cylindrical, truncated at the extremities; not divided into regions. Usually only a few segments. Anterior extremity consisting of a "head" made up of a very small prostomium partially fused with the peristomium. This head may be simply an ovoid area, flattened or arched, or may bear a plate with up-standing, entire or crenulate rim. A median ridge extends posteriorly from the prostomium and, on either side of this ridge, are nuchal grooves. The prostomium may bear minute eye-spots ventrally, but has no appendages. Biramous notopodia situated anteriorly on the first few setigers, medially on a single setiger (usually the eighth), and posteriorly thereafter. Notopodia with capillaries only, neuropodia with crotchets or with acicular setae, the crotchets with short, bent shafts and usually a bunch of filaments below the main fang. Cirri and branchiae absent. Usually one or more non-setigerous pre-anal segments. Pygidium often conspicuous and characteristic, very varied in shape. Tubes usually membranous, more or less resistant, covered with silt, sand, mud, or gravel, occasionally of hard sandy structure.

KEY TO GENERA

- | | |
|---|----------------------------|
| 1 (16) Head bearing a plate with a rim. | |
| 2 (3) A triangular glandular area on the ventral surface of the eighth setiger. | LEIOCHONE (p. 44) |
| 3 (2) No such glandular area on the eighth setiger. | |
| 4 (7) Pygidium terminating in a plate, anus dorsal. | |
| 5 (6) Cephalic ridge long and convex. | MALDANE (p. 45) |
| 6 (5) Cephalic ridge short and low. | ASYCHIS (p. 46) |
| 7 (4) Pygidium with a ring of cirri, anus central. | |
| 8 (13) With acicular setae replacing crotchets in the first three setigers. | |
| 9 (10) Pygidial cirri short, equal, and none strictly ventral. | ISOCIRRUS (p. 47) |
| 10 (9) Pygidial cirri unequal or subequal and one strictly ventral. | |
| 11 (12) Anal cone originating at base of pygidial funnel. | EUCLYMENE (p. 48) |
| 12 (11) Anal cone originating at base of pygidial cirri. | PRAXILLELLA (p. 49) |
| 13 (8) Without acicular setae replacing crotchets in the first three setigers. | |
| 14 (15) No crotchets in the first setiger. | MALDANELLA (p. 50) |
| 15 (14) Crotchets in all setigers. | AXIOTHELLA (p. 51) |
| 16 (1) Head with a flattened area or simply rounded. | |
| 17 (18) With double rows of crotchets in anterior setigers. | RHODINE (p. 52) |
| 18 (17) No double rows of crotchets. | |

19 (20) Pygidium with a funnel with a ring of cirri.

NICOMACHE (p. 53)

20 (19) Pygidium otherwise.

21 (22) Pygidium with an asymmetric scoop, anus terminal.

PETALOPROCTUS (p. 55)

22 (21) Pygidium truncated, anus dorsal.

NOTOPROCTUS (p. 56)

Genus **LEIOCHONE** Grube

Cephalic plate small or well developed. Nuchal grooves short. Anterior segments with glandular rings and a marked triangular glandular area on the ventral side of the eighth setiger. Neuropodia of some anterior segments with nothing but a few acicular setae, subsequently crotchets of the usual type. Two kinds of capillary setae. Pygidium with a circular rim with or without cirri and a central anal cone.

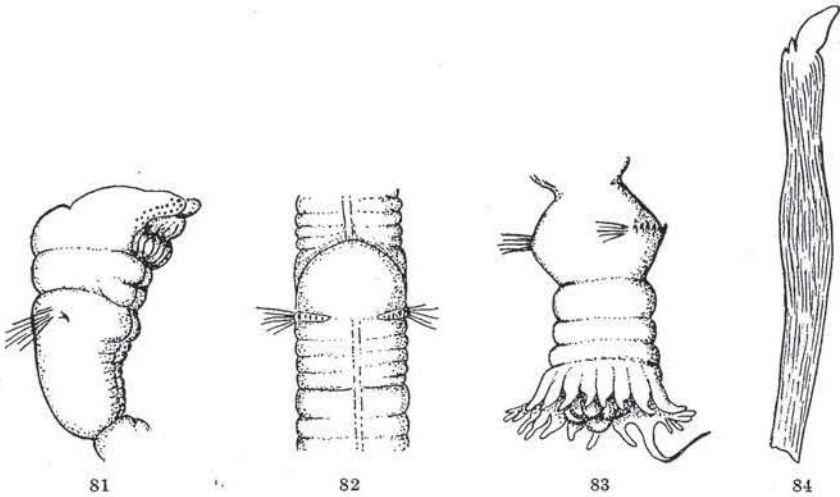


Fig. 81. *L. columbiana* Berkeley, head.

Fig. 82. *L. columbiana* Berkeley, eighth setiger, ventral side.

Fig. 83. *L. columbiana* Berkeley, anal end.

Fig. 84. *L. columbiana* Berkeley, acicular seta from second setiger.

L. columbiana Berkeley. 8. (Figs. 81 to 84.)

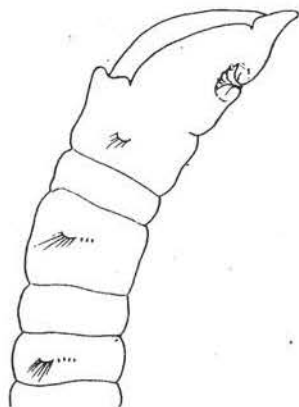
Up to 70 mm. long, 3 mm. wide. Cephalic plate well developed with a broad rim slightly notched posteriorly and laterally. Eye-spots in patches from beneath the prostomium to the corners of the mouth. Nineteen setigers and two or three non-setigerous pre-anals. First seven setigers about equal in length, the eighth shorter, with the triangular glandular ventral area characteristic of the genus well developed and extending to the anterior margin of the segment. A few setigers posterior to the eighth relatively longer than those anterior to it. Pygidium saucer-shaped with a fringe of eighteen to twenty cirri, all of which are short and (excepting a single, long, strictly ventral one) of equal length. The anal cone projects only slightly. Three anterior setigers with bladed capillaries

in the notopodia and only one or two (rarely more than two) heavy acicular setae in the neuropodia. More posteriorly some of the capillaries like those in anterior notopodia, but with feathered edges, others much finer with bent finely hairy tips. Crotchets posterior to the third setiger of the ordinary type. Coloration red, more or less retained on preservation. Tubes heavily coated with sand, sponge-spicules, or other material; usually attached to shells, stones, or siliceous sponges.

East coast Vancouver Island in from 10 to 75 fathoms.

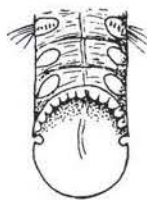
Genus **MALDANE** Grube

Cephalic plate well defined, long-oval, with a rim divided into three lobes by deep lateral notches; median ridge long and convex. Nuchal grooves rather short, straight or slightly curved. Pygidium terminating in a plate with lateral incisions; anus dorsal. Capillaries of three sorts. No neurosetae on first setiger, crotchets from second.



85

Fig. 85. *M. glebifex* Grube, anterior region.



86

Fig. 86. *M. glebifex* Grube, anal end.

M. glebifex Grube. 24. (Figs. 85 and 86.)

Up to 65 mm. long, 2 mm. wide. Head very oblique and median ridge slightly convex. Cephalic rim not crenulated. Prostomium flattened and rounded, no eye-spots. Nineteen setigers and two non-setigerous pre-anals. Capillaries either geniculate with a short blade on the convex surface, almost straight with narrow blades on both edges, or straight and barbed. Pygidium with a slightly oblique plate with laterally notched rim, the superior edge entire, the inferior with a row of blunt teeth. Tube of fine mud. Coloration red with darker bands on anterior region.

East coast Vancouver Island, dredged in 25 to 250 fathoms. West coast Vancouver Island in about 45 fathoms. Friday Harbour, Washington. Atlantic. Mediterranean.

Genus **ASYCHIS** Kinberg

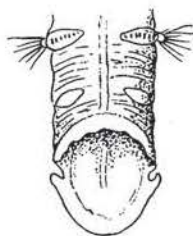
Cephalic plate well defined, oval or rounded, rim distinct and usually divided into three lobes by deep lateral notches; median ridge low and broad. Nuchal grooves recurved. Pygidium terminating in an oval plate with a rim with lateral incisions; anus dorsal. Anterior segments short, the first setiger without neurosetae and usually with a collar on the anterior border. Capillaries of three sorts.

KEY TO SPECIES

- 1 (2) Lateral lobes of cephalic plate smooth or almost so. **similis**
 2 (1) Lateral lobes of cephalic plate with five or six large rounded teeth. **disparidentata**



87



88

Fig. 87. *A. similis* (Moore), anterior region.Fig. 88. *A. similis* (Moore), anal end.**A. similis** (Moore). 52 (as *Maldane*). (Figs. 87 and 88.)

Up to 55 mm. long, 2.5 mm. wide. Cephalic rim with the posterior lobe erect and with a number of fine teeth, lateral lobes smooth or almost so. Prostomium wide anteriorly. Nineteen setigers and a single non-setigerous pre-anal. The first setiger with a well defined collar. Notosetae very similar to those of *Maldane glebifex*. Pygidium with a plate almost making a right angle with the long axis of the body, the dorsal lobe simple and flaring, the ventral more or less erect and slightly undulating. Tube membranous, coated with very fine silt.

West coast Vancouver Island, dredged in about 70 fathoms. Alaska. California?

A. disparidentata (Moore). 25, 47 (as *Maldane*). (Figs. 89 and 90.)

Up to at least 150 mm. long and 6 mm. wide. Cephalic plate oval, the rim divided by lateral notches into a posterior lobe with about fifteen low, broad, truncate teeth and the lateral lobes, more elevated and each with five or six larger rounded teeth. Prostomium very broad, low and inconspicuous. Nineteen

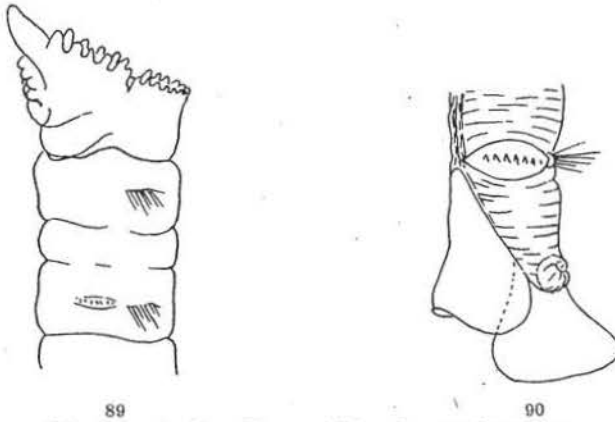


Fig. 89. *A. disparidentata* (Moore), anterior region.
 Fig. 90. *A. disparidentata* (Moore), anal end.

setigers and a single non-setigerous pre-anal. The rim surrounding the oval plate of the pygidium greatly extended and cut into two lobes, the ventral one forming a pocket over the plate and the dorsal flaring beyond the anus. Setae similar to those of *A. similis*.

West coast Vancouver Island, littoral. California. S. India, dredged at considerable depth.

Genus **ISOCIRRUS** Arwidsson

Cephalic plate ovoid or circular, the rim with or without lateral notches. Nuchal organs moderately short. Acicular setae on three first setigers. Capillaries of two kinds. Pygidial funnel very shallow. No anal cone.

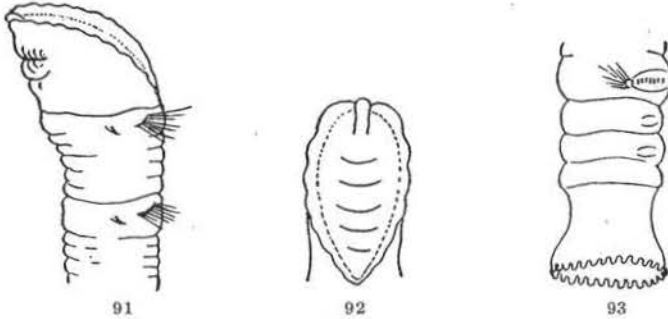


Fig. 91. *I. longiceps* (Moore), anterior region.
 Fig. 92. *I. longiceps* (Moore), cephalic plate.
 Fig. 93. *I. longiceps* (Moore), anal end.

I. longiceps (Moore). 17, 56 (as *Pseudoclymene*). (Figs. 91 to 93.)

About 100 mm. long, 3.5 mm. wide. Cephalic plate elongate-oval, tapering to a narrow end, sloping back almost to the first setiger. Prostomium very small.

Median ridge very low. Cephalic rim low and thick, without lateral notches, but with very slight crenulations corresponding to four or five cross furrows on the plate below the nuchal grooves. The latter about one-quarter the length of the cephalic plate and almost straight. A distinct thin membranous collar on the fourth setiger extending over a large portion of the third. Two non-setigerous pre-anal segments. Capillaries with wide or narrow blades, or barbed. Pygidium constricted and with a ring-like welt at the base and about thirty short, blunt cirri, no one of which is strictly ventral.

East coast Vancouver Island, dredged in 10 to 15 fathoms. California.

Genus **EUCLYMENE** Verrill

Cephalic plate oblique with well defined rim, either entire or partially denticulate. Nuchal grooves usually long and almost straight. Ventral acicular setae on first three setigers. Capillaries of two kinds. Pygidial funnel terminating in a ring of equal or unequal cirri, the anus at the summit of a central cone originating at the base of the funnel.

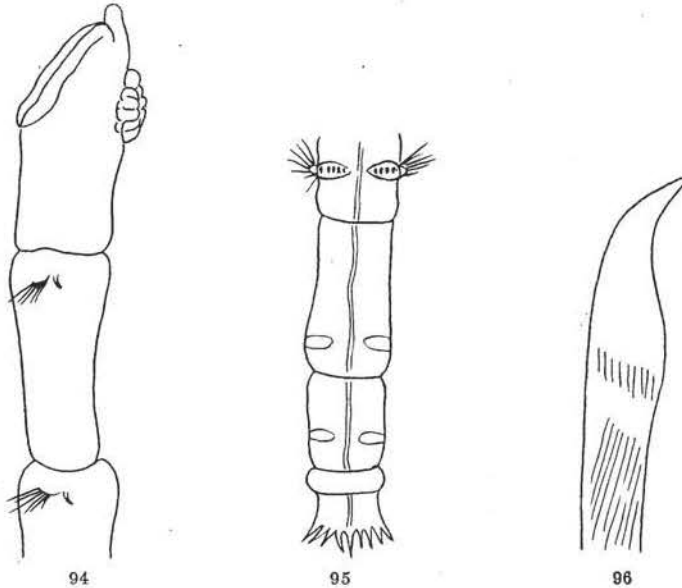


Fig. 94. *E. zonalis* (Verrill), anterior region.

Fig. 95. *E. zonalis* (Verrill), posterior region, extended.

Fig. 96. *E. zonalis* (Verrill), acicular seta from second setiger.

E. zonalis (Verrill). 17, 68. (Figs. 94 to 96.)

Up to 60 mm. long, 1 mm. wide. Head very oblique; well developed cephalic rim with posterior and lateral notches, the latter very slight. Nuchal grooves long. Twenty-two setigers and two pre-anal non-setigerous segments, or twenty-one setigers and three non-setigerous pre-anals. The setae are some-

times obscure in the last one or two setigers. One or two acicular setae in the neuropodium of each of the first three setigers. A tendency to a collarette on the fourth setiger. Capillaries with narrow blades or finely hirsute. The pygidium preceded by a wadded ring on the posterior edge of the last pre-anal segment, a blunt funnel bordered by about eighteen subequal cirri surrounding the anal cone. Coloration light orange-yellow with bands and spots of red; colourless as preserved.

West coast Vancouver Island, littoral.

Genus **PRAXILLELLA** Verrill

As *Euclymene* except that the pygidium has no true funnel, the anal cone starting at the base of the cirri and usually projecting beyond them.

KEY TO SPECIES

1 (2) Prostomium obtuse.

2 (1) Prostomium prolonged anteriorly.

affinis var. **pacifica**
gracilis

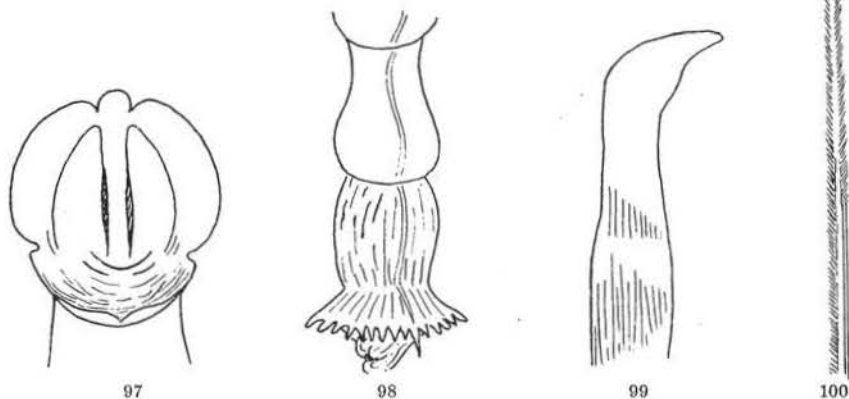


Fig. 97. *P. affinis* var. *pacifica* Berkeley, cephalic plate.

Fig. 98. *P. affinis* var. *pacifica* Berkeley, anal end.

Fig. 99. *P. affinis* var. *pacifica* Berkeley, acicular seta from second setiger.

Fig. 100. *P. affinis* var. *pacifica* Berkeley, tip of capillary from eleventh setiger.

P. affinis (Sars) var. ***pacifica*** Berkeley. 2 (stem species), 8. (Figs. 97 to 100.)

Up to 135 mm. long, 4 mm. wide. Cephalic plate oval, oblique, with a well developed membranous rim notched posteriorly and laterally. Median ridge and

nuchal grooves long. Prostomium obtuse, usually with ventral eye-spots. Eighteen setigerous segments and two to four non-setigerous pre-anals. The pygidium is constricted immediately anterior to the cirri and has a ring of up to twenty-eight subequal cirri and a long mid-ventral one. The anal cone projects well beyond these. Notosetae bladed capillaries and pinnate filiform ones, the latter especially numerous in the tenth and eleventh setigers. Ventral crotchets on first three setigers replaced by two or three heavy acicular setae with fangs bent almost at right angles to the shafts and no crown of small teeth. Remaining setigers with the usual type of crotchets. In preserved material only colour remaining, reddish areas on the third to the seventh setigers. Tubes membranous coated with fine mud. *Lepidametria longicirrata* Berkeley occurs as a commensal.

East coast Vancouver Island, dredged in 10 to 25 fathoms. West coast Vancouver Island in about 45 fathoms.



101

Fig. 101. *P. gracilis* (Sars), cephalic plate.



102

Fig. 102. *P. gracilis* (Sars), posterior region.

***P. gracilis* (Sars). 2, 24. (Figs. 101 and 102.)**

Up to 80 mm. long, 3 mm. wide. A more slender form, but generally resembling *P. affinis* var. *pacifica*. It differs from it mainly in that the prostomium is extended into a finger-like projection and has no eye-spots and there is no constriction above the cirri of the pygidium.

Not yet known from Canadian waters, but recorded from Friday Harbour, Washington, immediately adjacent thereto. Its occurrence may therefore be anticipated. California. North Atlantic. Mediterranean. Arctic.

Genus **MALDANELLA** McIntosh

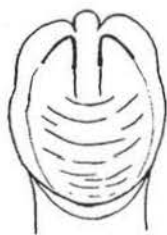
Cephalic plate oblique, well defined rim, entire or slightly crenulate. Nuchal

grooves short. No acicular setae. No neurosetae on first setiger. Pygidium with a funnel terminating in a ring of short, equal cirri, no one of them strictly ventral. Capillaries all bladed or smooth.

M. robusta Moore. 52. (Figs. 103 and 104.)

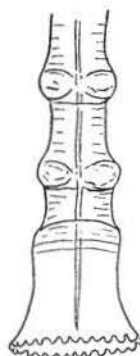
Up to 195 mm. long, 7.5 mm. wide; 19 setigerous segments and 2 non-setigerous pre-anals. Cephalic plate oval. The rim thin, wide, flaring anteriorly and erect posteriorly, entire, but folded laterally in such a way as to simulate notches. Prostomium short and broadly rounded. Cephalic ridge broad and low. Nuchal grooves short and bent anteriorly. Pygidial funnel campanulate, terminating in twenty-five to forty short, equal, bluntly rounded cirri. No anal cone. Capillaries all bladed, the lengths of the setae and the width of the blades varying with the body-region, none pinnate. Crotchets of the usual type, numerous in all setigers except the first. As preserved almost colour less. Tube thick, sandy.

East coast Vancouver Island, dredged in 20 to 90 fathoms. Alaska. Queen Charlotte Islands.



103

Fig. 103. *M. robusta* Moore, cephalic plate.



104

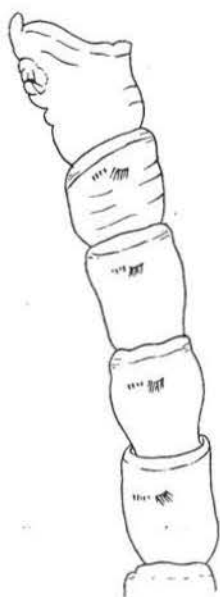
Fig. 104. *M. robusta* Moore, anal end.

Genus **AXIOTHELLA** Verrill

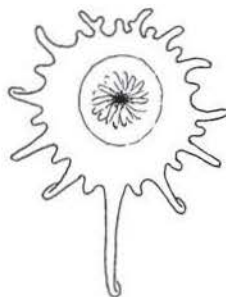
Cephalic plate oblique with a well defined rim. Nuchal grooves long. No acicular setae. Capillaries of two sorts. Crotchets on first setiger. Pygidium with well developed funnel with cirri of various lengths, a strictly ventral one longer than the rest.

A. rubrocincta (Johnson). 3, 37 (as *Clymenella*). (Figs. 105 and 106.)

Up to 200 mm. long, 6 mm. wide. Cephalic plate oval, the rim well developed, smooth and flaring anteriorly, shallow and deeply notched posteriorly and with



105



106

- Fig. 105. *A. rubrocincta* (Johnson), anterior region (after Arwidsson, modified).
 Fig. 106. *M. rubrocincta* (Johnson), pygidium, end view (after Johnson).

indications of lateral notches dividing off the posterior third, which may be slightly crenulate. Prostomium bluntly conical with a few scattered eye-spots sometimes present beneath it. Nuchal grooves extending over about two-thirds the length of the cephalic plate. Eighteen setigerous segments and two achaetous pre-anals. A certain amount of telescoping, simulating a collar, sometimes present at the anterior margin of the fourth setiger. Pygidium with a swollen ring, the funnel with twenty to thirty cirri tending to be alternately long and short, the anal cone low. Capillaries bladed or finely pinnate. Coloration striking, with bands of red through the anterior region. Tube thick, sandy.

East and west coasts Vancouver Island, littoral. Washington. Oregon. California.

Genus **RHODINE** Malmgren

No cephalic plate. Nuchal grooves curved or sharply bent. A distinct median ridge. The first few setigers long, the second and third with forwardly directed collars. Posterior setigers with backwardly directed collars. Crotchets small, numerous and without filaments, arranged in double rows in a number of anterior setigers. Pygidium small, anus central on an insignificant terminal cone.

R. bitorquata Moore. 17, 56. (Figs. 107 and 108.)

Known from anterior portions only. Head with a somewhat flattened area,

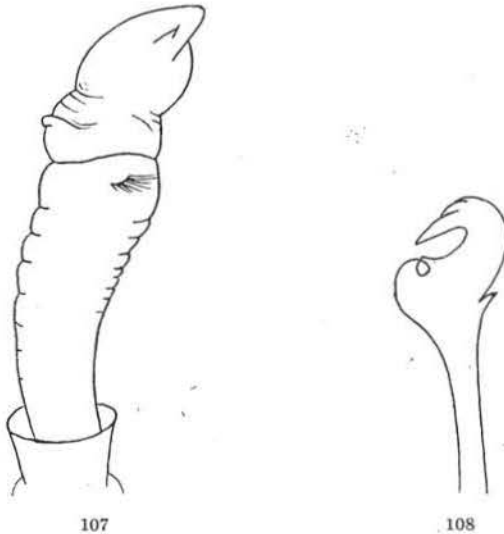


Fig. 107. *R. bitorquata* Moore, anterior end.
 Fig. 108. *R. bitorquata* Moore, crotchet.

rounded in front and with a well marked median ridge. Nuchal grooves deep, bent to a rather sharp angle anteriorly forming two unequal limbs, the inner and longer one running parallel to the median ridge. The first setiger long and slender, the second about half to three-quarters its length and wider, the anterior fifth consisting of a slightly oblique collar covering the posterior end of the first setiger. The third setiger, slightly shorter and wider than the second, has a similar, but rather shallower, collar. The next four or five setigers short and without collars, the subsequent seven or eight somewhat longer and also without collars. The first four setigers bear only capillaries; these numerous, slender and bilimbate. The remaining anterior setigers with similar capillaries in the notopodia and with double, interlocking rows of many small crotchets in the neuropodia.

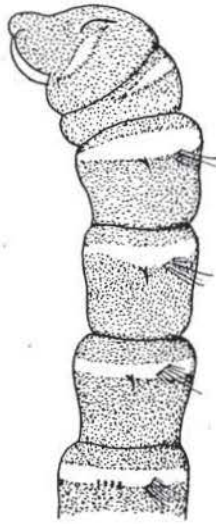
East coast Vancouver Island, dredged in 75 fathoms. Friday Harbour, Washington, in 25 fathoms. Monterey Bay, California, in 75 to 766 fathoms.

Genus **NICOMACHE** Malmgren

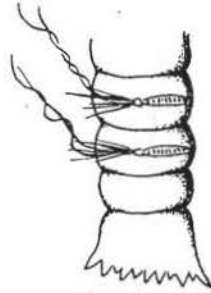
No cephalic plate. Nuchal grooves curved. Acicular setae in some anterior setigers. Capillaries of two or three sorts. Pygidium with a more or less oblique funnel terminating in cirri.

KEY TO SPECIES

- | | | |
|-------|--|--------------------|
| 1 (2) | One non-setigerous pre-anal segment. Head and anterior segments heavily pigmented, with conspicuous white markings. | personata |
| 2 (1) | Two non-setigerous pre-anal segments. Head and anterior segments lightly pigmented and with no conspicuous white markings. | lumbricalis |



109

Fig. 109. *N. personata* Johnson, anterior region.

110

Fig. 110. *N. personata* Johnson, anal end.

***N. personata* Johnson. 8, 35, 37. (Figs. 109 and 110.)**

Up to 60 mm. long, 2 mm. wide. Head irregularly rounded with a hood-like projection overhanging the mouth. The anterior ends of the nuchal grooves curved outwardly, often obscured by cephalic pigmentation. Twenty-two setigerous segments and one non-setigerous pre-anal. Single heavy acicular setae in neuropodia of first three setigers, in the fourth, one to three somewhat bent and blunter. In the fifth to the seventh the neurosetae are transitional in type between acicular setae and normal crotchets and they increase in number. Capillaries long, slender and bilimbate or smaller and obscurely pinnate. In addition long, filamentous setae, extending a long way from the body, are usually present from the fourth setiger to the end of the body. Pygidial funnel slightly oblique, with from nineteen to twenty-six cirri, sometimes fairly uniform and equally spaced, but usually irregular both as to length and distribution. Coloration white with chocolate-brown banding and mottling on the head and first four or five segments, but in some specimens little or no colour remains on preservation. Tubes with thick walls constructed of coarse sand.

East and west coasts Vancouver Island. Queen Charlotte Islands. Washington. All littoral. Alaska, dredged in depths to 30 fathoms.

***N. lumbricalis* (Fabricius). 2, 24, 52 (as *N. carinata*). (Figs. 111 and 112.)**

Up to 160 mm. long, 5 mm. wide, but not usually so large in Canadian Pacific specimens. Head rather short and thick, rounded and with a well defined median ridge. Nuchal grooves S-shaped, the curves more or less flattened according to fixation. Twenty-two setigers and two non-setigerous pre-anals.

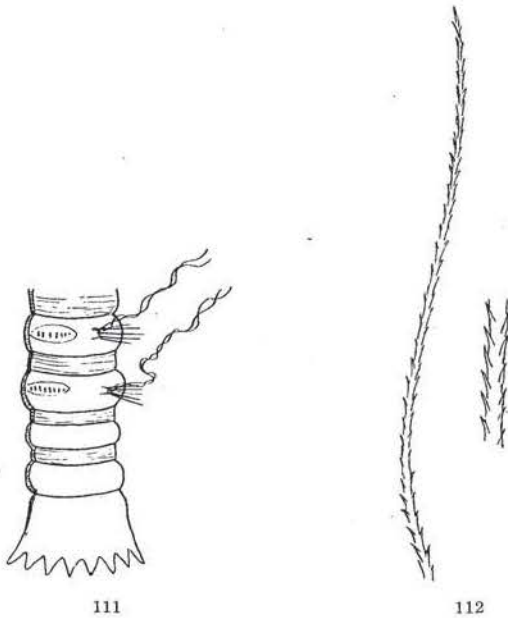


Fig. 111. *N. lumbricalis* (Fabricius), anal end.

Fig. 112. *N. lumbricalis* (Fabricius), tip and section of fine pinnate capillary.

First three setigers with one or two straight acicular setae in neuropodia. Normal crotchets in those of succeeding setigers. Capillaries long, slender and bilimbate, or short and unbladed; in addition some very long, slender, and very finely pinnate. Pygidial funnel slightly oblique with from fifteen to twenty-five equal cirri. Coloration in anterior segments a uniform reddish brown with marked iridescence. Tubes with very heavy sandy walls, smoothly lined, usually in more or less complex coils. The polynoid *Enipo cirrata* Treadwell occurs as a commensal in the tubes of this species and the spionid *Polydora caeca* (Oersted) is often present in galleries in the tube walls.

West coast Vancouver Island. Gulf of Georgia. Washington. California. Alaska. All dredged in very various depths up to 1400 fathoms. N. Atlantic. Arctic.

Genus **PETALOPROCTUS** Quatrefages

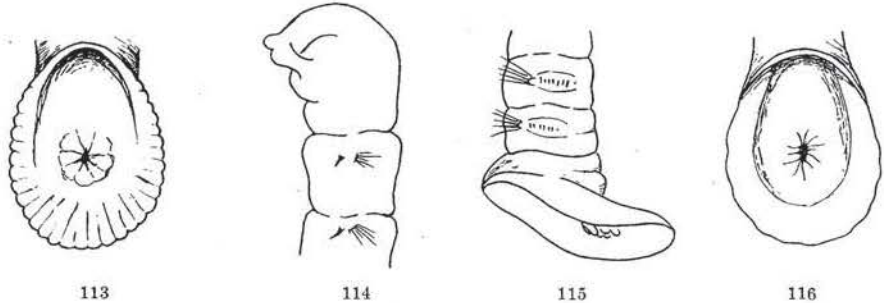
No cephalic plate. Nuchal grooves short. Acicular setae in some anterior setigers. Capillaries of three kinds. Pygidial funnel represented by an asymmetric rim, reduced almost to the point of disappearance on the dorsal side, extended into a wide, flaring lobe on the ventral side, with or without cirri.

P. tenuis (Théel). 2. (Fig. 113.)

Up to about 25 mm. long, less than 1 mm. wide. Head broadly rounded, turned ventrally. High convex median ridge. Nuchal grooves bent. Twenty

setigers and one non-setigerous pre-anal. Acicular neurosetae straight in first three setigers, bent and with a few small apical teeth in the next two, and normal crotchets thereafter. Capillaries very similar to those of *Nicomache lumbricalis*. Pygidial scoop surrounding the anus, but very narrow on the dorsal side, wide on the ventral side, the edge with clear, regular, short teeth in some specimens, almost smooth or only slightly crenulate in others.

West coast Vancouver Island, dredged in about 100 fathoms. N. Atlantic. Arctic.



113

114

115

116

Fig. 113. *P. tenuis* (Théel), pygidium (after Arwidsson).

Fig. 114. *P. tenuis* var. *borealis* Arwidsson, anterior region.

Fig. 115. *P. tenuis* var. *borealis* Arwidsson, anal end, lateral view.

Fig. 116. *P. tenuis* var. *borealis* Arwidsson, pygidium, end view.

***P. tenuis* var. *borealis* Arwidsson. 2. (Figs. 114 to 116.)**

As the stem species except in having 21 setigers and a smooth edge to the pygidial scoop.

East coast Vancouver Island, dredged in 10 to 25 fathoms. Alaska. N. Atlantic. Arctic.

Genus **NOTOPROCTUS** Arwidsson

No cephalic plate, but head somewhat flattened dorsally and anteriorly. No median ridge. Nuchal grooves arched, more or less transversely placed. Capillaries of one kind. Pygidium terminating in a transverse or oblique plate. Anus dorsal.

***N. pacificus* (Moore). 3, 52 (as *Lumbriclymene*). (Figs. 117 and 118.)**

Up to about 100 mm. long and 2 mm. wide. Head flattened dorsally and rounded anteriorly. Nuchal grooves shallow arches, their outer limbs slightly the longer. Nineteen setigers and one to three non-setigerous pre-anals. The nineteenth setiger generally lacks crotchets and often the capillaries on one side, the divisions between the pre-anals are often obscure. One or two acicular setae in the first four setigers, thereafter normal crotchets, but these always few in

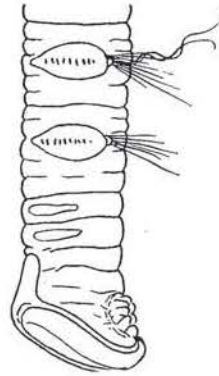
number. Capillaries all bladed with fine tips which lengthen in posterior segments. Pygidial plate more or less oblique, oval, and with a slight fold at its edge. Coloration conspicuously white on reddish brown. A variable white patch on the anterior region of the head, a narrow band posterior to this, and white bands across the dorsum between the bundles of setae of the first six setigers. Tubes with thin, hard, brittle walls composed chiefly of sand and sponge spicules.

East and west coasts Vancouver Island, dredged in 15 to 60 fathoms. Alaska. Gulf of Aden.



117

Fig. 117. *N. pacificus* (Moore), anterior region.



118

Fig. 118. *N. pacificus* (Moore), posterior region.

SCALIBREGMIDAE

Body usually swollen anteriorly, passing somewhat abruptly into a slender posterior region, occasionally short and fusiform or vermiform. The skin usually tessellated, especially anteriorly. Prostomium small, with or without anterolateral projections, with or without eyes and with nuchal organs. Proboscis soft, smooth, more or less globular. Branchiae present or absent, when present confined to the first five or six setigers. Parapodia biramous, the rami distinct and similar to one another, with or without cirri. Setae fine capillaries and forks; in addition there may be stout simple setae in one to three of the most anterior setigers. Pygidium with or without cirri.

KEY TO GENERA

- 1 (2) With dorsal and ventral cirri. Branchiae present.
2 (1) No cirri. Branchiae absent.

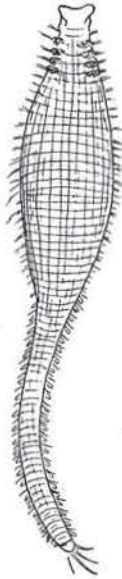
SCALIBREGMA (p. 57)

ONCOSCOLEX (p. 58)

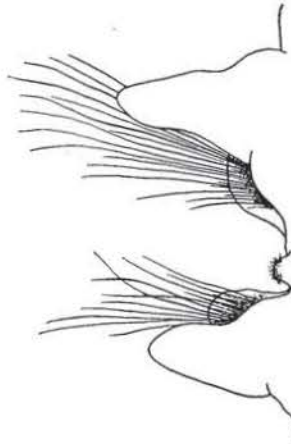
Genus **SCALIBREGMA** Rathke

Anterior region of body swollen, narrowed to the small prostomium and tapered into the posterior region which is more or less uniform in diameter.

Prostomium T-shaped, sometimes with eyes. Segments, except the first few, divided into four rings. Branchiae present on anterior segments. Parapodia prominent, flattened and with dorsal and ventral cirri on all but the first few. No heavy acicular setae in anterior setigers. Anal cirri present.



119



120



121

Fig. 119. *S. inflatum* Rathke (after Fauvel).
 Fig. 120. *S. inflatum* Rathke, parapodium.
 Fig. 121. *S. inflatum* Rathke, forked seta.

***S. inflatum* Rathke. 24. (Figs. 119 to 121.)**

Up to 60 mm. long and 10 mm. wide. About fifty to sixty segments, the skin markedly tessellated. Prostomium with two anterior widely divergent processes. Two nuchal slits. The first setigers triannulate, the remainder quadriannulate. Arborescent branchiae on the second to the fifth setiger. Parapodial rami similar to one another, anteriorly conical, posteriorly flattened and prominent. Digitate dorsal and ventral cirri beginning on the sixteenth to the eighteenth setiger. A small, round ciliated organ between the two rami. Setae fine capillaries and delicate forks, spiny between the prongs. Four or five filiform anal cirri. Coloration bright yellow and red.

East coast Vancouver Island, dredged in 15 to 75 fathoms. Alaska. California. Japan. Atlantic. Arctic.

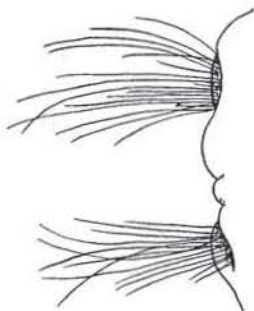
Genus **ONCOSCOLEX** Schmarda

Body as in *Scalibregma* or more vermiform. Prostomium T-shaped, with eyes. Segments with one to four annulations. No branchiae. Parapodia projecting little; no cirri. No heavy acicular setae in anterior setigers.

O. pacificus (Moore). 9, 12, 54 (as *Schleroechilus*). (Fig. 122.)

Body usually not so inflated as in *Scalibregma*. Up to 35 mm. long, 5 mm. wide, sixty to seventy segments. The skin tessellated, particularly antero-dorsally. Prostomium T-shaped with two pairs of short rows of eye-specks, the rows either parallel or meeting at an acute angle. The segments are at first bi- and then tri-annulate; in the median region there may be four annulations and posteriorly again fewer. Parapodia, though projecting little, large in area, particularly in the anterior region. No branchiae nor cirri. Setae fine capillaries and forks. Four to six blunt anal cirri.

"False Narrows Reef", Nanaimo region. California. Mexico.



122

Fig. 122. *O. pacificus* (Moore), parapodium.

STERNASPIDAE

Body very short, form aberrant, divided into three regions, the anterior with the segmental divisions complete rings and with rows of spines on some segments, the median with the segmental divisions absent on a portion of the ventral side and with no setae visible externally, the posterior with the segments crowded and a pair of horny plates (caudal shield) on the ventral side.

Genus **STERNASPIS** Otto

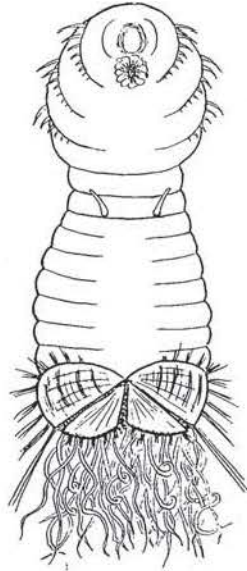
Body swollen at both ends, the anterior region retractile. Prostomium small and without appendages. Mouth subterminal. Segments few, uniramous or achaetous. Anus terminal with two bundles of filamentous branchiae just above it on the dorsal side. Two sexual appendages.

S. fossor Stimpson. 9, 55. (Fig. 123.)

Length to 30 mm., width to 10 mm. About twenty-eight segments, the posterior half of them much modified, crowded, and not easily differentiated. Cuticle densely pilose. The anterior region of seven segments, the second, third,

and fourth with spines in semicircular rows on each side diminishing in size from the dorsal to the ventral surface, and the seventh bearing two long sexual papillae. The median region also of seven segments, well defined except on a narrow mid-ventral strip and with a bundle of small capillary setae on each side entirely embedded in the body-wall. The posterior region bearing the caudal shield consisting of two plates, each with ten bundles of setae laterally (one very small) and five bundles posteriorly; in each case a mixture of slender capillaries and finely hirsute setae. Branchiae in dense bundles, often tightly coiled. Coloration greyish white with the caudal shield orange to brown as preserved.

East coast Vancouver Island, dredged in 12 to 60 fathoms. West coast Vancouver Island in 60 to 90 fathoms. Alaska. California. Atlantic. Arctic.



123

Fig. 123. *S. fossor* Stimpson.

CHAETOPTERIDAE

Body soft, divided into three dissimilar regions (except in *Ranzania*, which is not known in Canadian Pacific fauna). Prostomium small, often indistinct. Sometimes two eyes. Mouth terminal. Peristomium extended into a collar and carrying a pair of long tentacular cirri and, sometimes, a second, much smaller, pair. Anterior region with a few uniramous segments, median region with biramous segments much modified, posterior region with biramous segments differing from the preceding ones and all alike. Notopodial setae all capillary or lanceolate. Heavy modified setae in fourth setiger. Pectiniform uncini in neuropodia of median and posterior regions.

KEY TO GENERA

- | | |
|--|----------------------------------|
| 1 (2) Notopodia of median region unilobed. | MESOSCHAETOPTERUS (p. 61) |
| 2 (1) Notopodia of median region bilobed. | |
| 3 (4) One pair of tentacular cirri. | TELEPSAVUS (p. 63) |
| 4 (3) Two pairs of tentacular cirri. | PHYLLOCHAETOPTERUS |

Genus **MESOSCHAETOPTERUS** Potts (Berkeley *char. emend.*) 17

Anterior region flattened dorsally, rounded ventrally, consisting of nine to fourteen short setigers with notopodia only. Median region longer, less flattened dorsally and consisting of two, three, or many setigers, one or more very long; these have the notopodial lobes elongated and more or less conical, the neuropodia with single or double uncinigerous lobes. Posterior region the longest and with many setigers which are shorter than in the median region, sharply divided from one another, and, usually swollen with genital products, giving the region a more or less beaded appearance. Prostomium a rounded knob more or less visible from the dorsal side through a gap in the peristomial collar which, otherwise, completely surrounds it. Eyes obscure or absent. A single pair of long tentacular cirri. A mid-dorsal ciliated groove runs the whole length of the body and is enlarged to form a fleshy organ on one or more of the median setigers.

M. taylori Potts. 63. (Figs. 124 to 126.)

Up to at least 300 mm. long, 10 mm. wide at the widest point. Prostomium small, rounded, almost entirely surrounded by an extension of the peristomium which forms a prominent collar. Tentacular cirri long and grooved. Anterior region with nine to eleven setigers with conical notopodia, the fourth differing from the rest in having the notopodia shorter and thicker and most of the setae heavier. Median region about three times as long as the anterior, consisting of three long setigers with dorsal surface in transverse glandular ridges and bounded on each side by a continuous, upturned, undulating fold. Notopodia of this region irregularly conical, carried well up on the dorsal surface, and supported internally by two or three stout capillary setae. Enlargements of the mid-dorsal ciliated groove to form accessory feeding organs present on the second and third median setigers. Posterior region as described for the genus, much longer than the anterior and median regions combined, the notopodia of each setiger swollen and more or less fused across the dorsum so that only short tips are carried dorsally. The neuropodia consist of two uncinigerous tori, of which the ventral is the longer, excepting the neuropodia of the first median setiger which have single tori. Notosetae throughout are more or less lanceolate except in the fourth setiger where they are mostly broad, heavy, and flattened, with truncated ends and a deep brown colour. Uncini flat, multidentate plates. Coloration generally creamy white to yellow with chocolate pigment on peristomial collar and tentacular cirri; the posterior region showing the green lining of the intestine, and pink ova in females, through the integument. Tubes tough, parchmenty and flexible, heavily coated with sand.

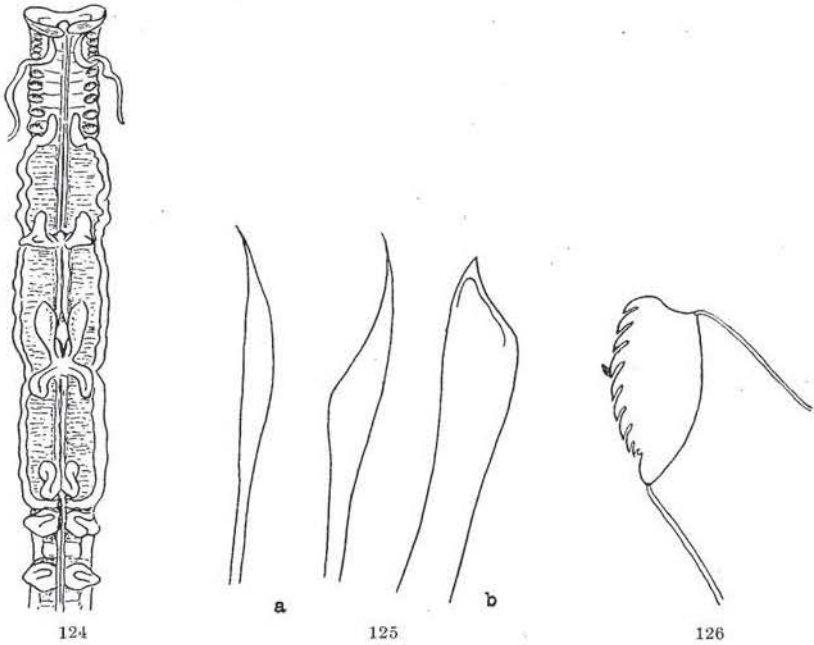


Fig. 124. *M. taylori* Potts (after Potts).

Fig. 125. *M. taylori* Potts (a) notosetae (b) heavy seta from fourth setiger (after Potts).

Fig. 126. *M. taylori* Potts, uncinus (after Potts).

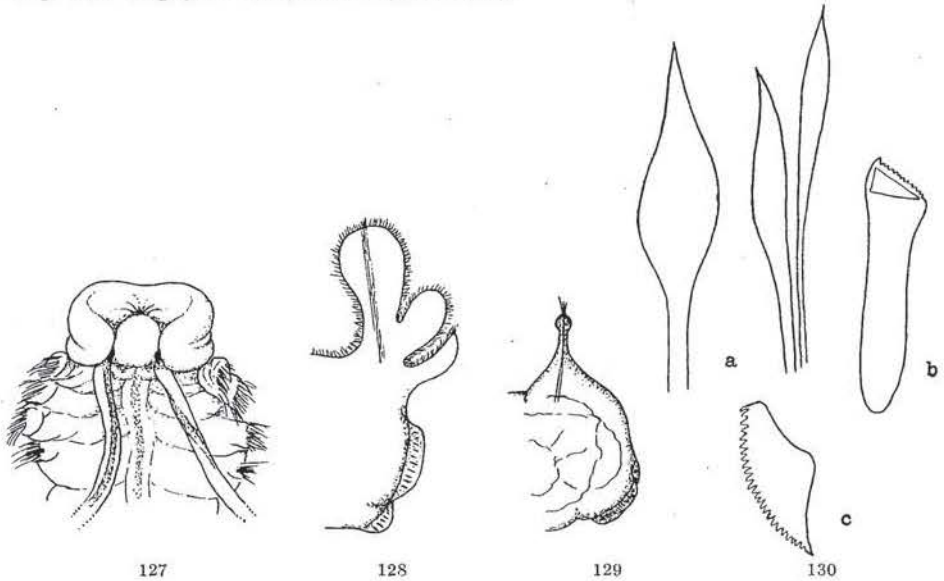


Fig. 127. *T. costarum* Claparède, anterior region.

Fig. 128. *T. costarum* Claparède, parapodium from median region.

Fig. 129. *T. costarum* Claparède, parapodium from posterior region.

Fig. 130. *T. costarum* Claparède, (a) three types of anterior notosetae (after Potts) (b) specialised seta from fourth setiger (after Potts) (c) uncinus (after Monro).

Common on Canadian Pacific coast in sand-beds, at, or near, lowest tide mark.

Genus **TELEPSAVUS** Claparède (Monro *char. emend.*)

Body very long and slender. Anterior region flattened dorsally, short and with few segments, all uniramous. Median region several times as long and with many segments, all biramous. Posterior region the longest and with most numerous segments. Prostomium a well defined knob-like process clearly visible from the dorsum, bearing two eyes. Peristomium as described for the family, with only one pair of tentacular cirri. A ciliated mid-dorsal groove the whole length of the body.

T. costarum Claparède. 6 (as *Leptochaetopterus*), 45. (Figs. 127 to 130.)

Up to at least 630 mm. long and 3 mm. wide, but dredged forms much smaller. Prostomium almost spherical, with two large black eyes partially hidden by the bases of the tentacular cirri and the ends of the peristomial collar. Anterior region of nine setigers, the seventh, eighth and ninth much longer than the rest. Median region of from thirty to ninety, or more, setigers with glandular dorsal surface especially marked on the first six, on which the surface is raised in ridges. Notopodia of this region divided into two flattened ciliated lobes carried dorsally and supported by capillary setae; there are accessory lobes laterally. Posterior region with very variable, and often very large, number of segments. Posterior notopodia consist of single elongated processes with expanded ends, carried dorsally, with two or three delicate capillary setae. Neuropodia in median region with two uncinigerous tori; in posterior region with only one. Notosetae lanceolate or cultriform throughout, a single very heavy dark spine, with an inflated tip worn to a triangular end, replacing some of them in the fourth setiger. Uncini triangular plates very finely serrated. Coloration fawn, with brown markings on the peristomial collar and the ventral side of the first six setigers; the seventh and eighth with a conspicuous white ventral shield. The green gut seen through the body wall posterior to the ninth setiger gives the body a greenish tinge, most marked in the posterior region. In ripe females the latter region is mottled with patches of orange from the contained ova. Tubes transparent, regularly annulated and flexible.

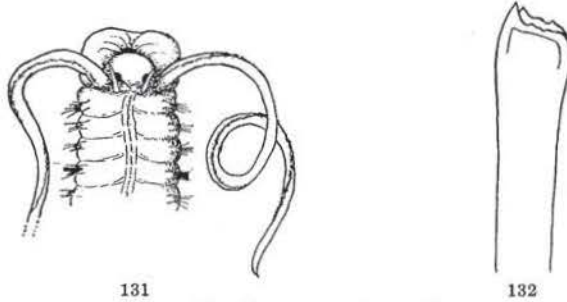
Common in Canadian Pacific region in sand-beds, at, or near, lowest tide mark; often associated with *Mesochaetopterus taylori*. West coast Vancouver Island, dredged in 20 to 50 fathoms. Japan. S. Pacific. Atlantic. Mediterranean. Indian Ocean.

Genus **PHYLLOCHAETOPTERUS** Grube

In general aspect similar to *Telepsavus*. Differing mainly in the presence of a second pair of tentacular cirri.

P. prolifica Potts. 14, 63. (Figs. 131 and 132.)

Up to 60 mm. long and 0.8 mm. wide in asexual forms; sexual forms longer.

Fig. 131. *P. prolifica* Potts, anterior region.Fig. 132. *P. prolifica* Potts, specialised seta from fourth setiger.

Anterior region with nine to twelve setigers, median with four to twelve, and posterior with up to about thirty in asexual forms, up to forty or more in sexual ones. There is great variation in the numbers of segments in the three regions and in their relative lengths owing to the usual method of reproduction by autotomy and regeneration. Prostomium, peristomium, parapodial lobes, notopodia (except the specialized ones of the fourth setiger) and uncini, much as in *Telepsavus costarum*, except that there is a second pair of short tentacular cirri on the peristomium just posterior to the large pair. The single specialized heavy seta in each notopodium of the fourth setiger ends in a blunt, elliptical, cusped crown. Coloration also similar to that of *Telepsavus costarum*, except that the white ventral shield is longer, extending from the sixth to the twelfth setiger. Tubes long, thin and branched, the more recently developed portion of the tube irregularly annulate and more or less transparent, the remainder smooth and opaque. Reproduction usually asexual by autotomy and regeneration, but sexually mature individuals sometimes occur in the tubes.

Widespread in Canadian Pacific region in depths varying from 10 to 250 fathoms; frequently occurring in large colonies. California.

AMPHARETIDAE

Body tapered, widest anteriorly, few segments (except in *Melinna*), divided into two regions; the anterior (thoracic) with capillaries in the notopodia, the neuropodia represented by uncinigerous pinnules which start on the seventh segment (except in *Melinna*, which has, in addition, some segments anterior to this with neuropodial capillaries); the posterior (abdominal) with uncinigerous pinnules only. Prostomium produced forward into a hood-like process (cephalic hood). Peristomium surrounding the prostomium laterally and extended forward ventrally to form a lower lip. Between the cephalic hood and the peristomial lip a bunch of smooth or pinnate retractile tentacular filaments. Second segment usually achaetous. Third segment with more or less prominent paleae in some genera. Two or four pairs of branchiae, the first pair usually on the third segment. Capillaries smooth and bladed, uncini pectiniform. Pygidium with or without cirri. Tubicolous.

KEY TO GENERA

- | | | |
|-----------|--------------------------------|---------------------------------|
| 1 (6) | With paleae. | |
| 2 (3,4,5) | Fourteen thoracic setigers. | AMPHARETE (p. 65) |
| 3 (2,4,5) | Fifteen thoracic setigers. | ANOBOTHRUS (p. 66) |
| 4 (2,3,5) | Sixteen thoracic setigers. | LYSIPPE (p. 67) |
| 5 (2,3,4) | Seventeen thoracic setigers. | AMPHICTEIS (p. 68) |
| 6 (1) | Without paleae. | |
| 7 (8) | With post-branchial spines. | MELINNA (p. 69) |
| 8 (7) | Without post-branchial spines. | |
| 9 (10) | Branchiae of two kinds. | SCHISTOCOMUS (p. 70) |
| 10 (9) | Branchiae of one kind. | |
| 11 (12) | Tentacular filaments pinnate. | PSEUDOSABELLIDES (p. 71) |
| 12 (11) | Tentacular filaments smooth. | |
| 13 (14) | Fourteen thoracic setigers. | AMAGE (p. 72) |
| 14 (13) | Seventeen thoracic setigers. | AMPHISAMYTHA (p. 73) |

Genus **AMPHARETE** Malmgren

Cephalic hood more or less trilobed. Tentacular filaments pinnate. Paleae well developed. Four pairs of subulate branchiae posterior to the paleae. Fourteen thoracic setigers. Fourth segment much reduced and achaetous, sometimes discernible only on the ventral surface. Uncinigerous pinnules start at the third setiger (seventh segment), often with a cirrus on the pinnules in the abdominal region. Pygidium with two or more anal cirri.

KEY TO SPECIES

- | | | |
|-------|---|----------------|
| 1 (2) | Branchiae in two rows; 13 abdominal segments. | arctica |
| 2 (1) | Branchiae in a single row; 17 abdominal segments. | goësi |

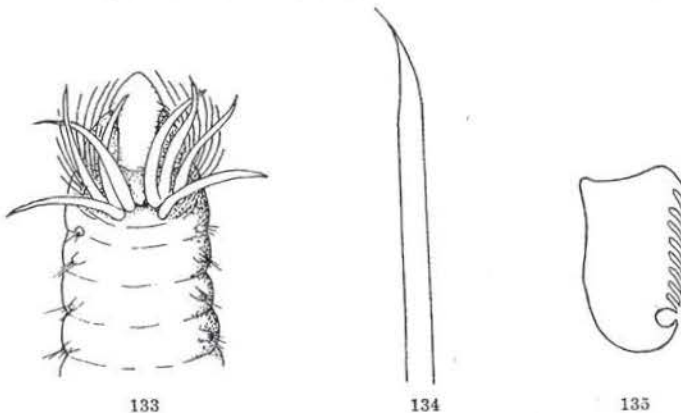


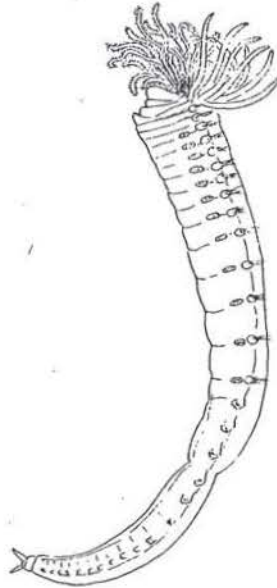
Fig. 133. *A. arctica* Malmgren, anterior region.
 Fig. 134. *A. arctica* Malmgren, palea.
 Fig. 135. *A. arctica* Malmgren, uncinus.

A. arctica Malmgren. 41, 58. (Figs. 133 to 135.)

Up to 45 mm. long, 7 mm. wide at widest point; 27 setigers of which 14 are thoracic. Cephalic hood produced, trilobed, the median lobe pointed. Branchiae

about as long as the greatest body-width, three pairs in a row in advance of the fourth pair. Nine to sixteen pairs of paleae, tapered subterminally and with long mucronate tips. Uncinigerous pinnules with small, blunt cirri in the abdominal region. Uncini with six to eight large teeth. Pygidium with two short anal cirri.

East and west coasts Vancouver Island, dredged in moderate depths. Alaska. California. Japan. N. Atlantic. Arctic.



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Fig. 136. *A. goësi* Malmgren.

A. goësi Malmgren. 41. (Fig. 136.)

Up to 50 mm. long, 7 mm. wide; 31 setigers of which 14 are thoracic. Cephalic hood more or less trilobed, the median lobe low and round. Branchiae a little longer and more slender than in *A. arctica*, all eight in a single transverse row. About seventeen pairs of paleae, tapered subterminally and with short, mucronate tips. Uncini and pygidium much as in *A. arctica*.

West coast Vancouver Island, dredged in about 20 fathoms. Atlantic. Arctic.

Genus **ANOBOTHRUS** Levinsen

Cephalic hood trilobed. Tentacular filaments smooth. Paleae present. Four pairs of filiform branchiae. Fifteen thoracic setigers. Notopodium of fourth segment much reduced, with only a few capillaries. Uncinigerous pinnules starting at fourth setiger (seventh segment), often with a rudimentary cirrus in the abdominal region. Special notosetae, with slender, finely spinous tips, in one of the last thoracic setigers. Uncini much as in *Ampharete*. No anal cirri.

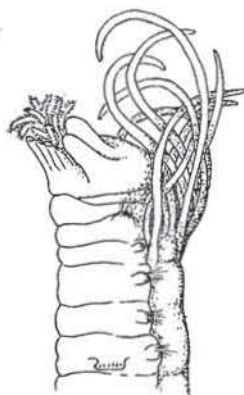
A. gracilis Levinsen. 24. (Fig. 137.)

Up to 47 mm. long; 28 setigers of which 15 are thoracic. Cephalic hood trilobed, with two simple eyes. Tentacular filaments smooth. Twelve to fourteen pairs of paleae with long, attenuated tips. Four pairs of filiform branchiae arranged as in *Ampharete arctica*, the anterior pairs three to five times the body width, much longer than the posterior pair. Notopodium of the fourth segment reduced to a small rounded knob with minute setae. Notosetae of eleventh setiger with finely spinous tips. Thoracic uncini with two rows of teeth, six in each row; abdominal with three rows, each with fifteen teeth. Pygidium with very small papillae.

Known from Friday Harbour, Washington, just outside Canadian waters. Its occurrence here is therefore to be anticipated. Oregon. California. N. Atlantic. Arctic.



137



138

Fig. 137. *A. gracilis* Levinsen, specialised seta from eleventh setiger.
Fig. 138. *L. labiata* Malmgren, anterior region, lateral view.

Genus LYSIPPE Malmgren

Cephalic hood trilobed, the rounded median lobe well developed and bounded by deep grooves. Tentacular filaments pinnate. Four pairs of subulate branchiae posterior to the paleae. Sixteen thoracic setigers. Fourth segment well developed and setigerous. Uncinigerous pinnules start on the fourth setiger.

L. labiata Malmgren. 41. (Fig. 138.)

Up to 22 mm. long, 1.5 mm. wide; 29 or 30 setigers, of which 16 are thoracic. The peristomium considerably produced forming a prominent corrugated ventral lip. Paleae fine and delicate. Branchiae slender, nearly twice as long as the greatest body-width, in two close groups joined by a membrane across the dorsum. Uncini with six teeth. Two very short anal cirri.

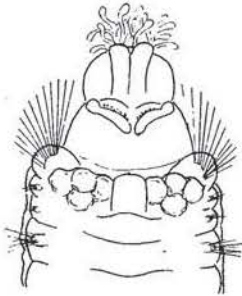
Burrard Inlet, dredged in 68 fathoms. Alaska. Atlantic. Arctic.

Genus **AMPHICTEIS** Grube

Cephalic hood trilobed, the median lobe with two, more or less divergent, glandular ridges simulating two median lobes. Numerous eyes. Nuchal organs distinct. Tentacular filaments smooth. Four pairs of branchiae. Seventeen thoracic setigers. Fourth segment well developed and setigerous. Notopodia with a ventral cirrus in the thorax which persists as a small protuberance in the abdominal region. Uncinigerous pinnules starting on the fourth setiger, frequently with a dorsal cirrus in the abdominal region.

KEY TO SPECIES

- | | |
|--|-------------------------|
| 1 (2) Branchiae flattened, some foliaceous. Paleae almost straight and tapered to long acute tips. | scaphobranchiata |
| 2 (1) Branchiae subulate. Paleae slightly curved and contracted into long, slender mucrons. | mucronata |



139



140



141

Fig. 139. *A. scaphobranchiata* Moore, anterior region.

Fig. 140. *A. scaphobranchiata* Moore, specialized branchia (after Moore).

Fig. 141. *A. scaphobranchiata* Moore, palea (after Moore).

A. scaphobranchiata Moore. 52. (Figs. 139 to 141.)

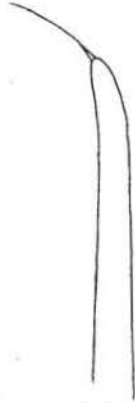
Up to 54 mm. long; 32 setigers, of which 17 are thoracic. Median lobe of cephalic hood with the glandular ridges parallel for most of their length, slightly diverging anteriorly. Branchiae at least twice as long as the greatest body-width, all stout and flattened, especially one pair which broaden into plates subterminally and then narrow into relatively slender hook-like ends. Fourteen to seventeen well developed paleae on each side, almost straight and tapering

regularly and rather rapidly to very long, slender, acute tips. Dorsal cirri on abdominal pinnules short. Uncini with six teeth. Pygidium with stiff, short anal cirri.

East, west, and north coasts Vancouver Island, dredged in 20 to 145 fathoms. Washington. California.

A. mucronata Moore. 56. (Fig. 142.)

Up to 50 mm. long; 32 setigers of which 17 are thoracic. Median lobe of cephalic hood with the glandular ridges divergent throughout their length. Branchiae long, heavy, subulate, easily detached. Eight to eleven paleae on each side reaching as far as, or beyond, the prostomium. They are somewhat flattened and the tips are slightly curved and, when unworn, abruptly contracted into long and very slender mucrons.



142

Fig. 142. *A. mucronata* Moore, unworn palea.

Uncini with six teeth. Pygidium with two anal cirri, two or three times as long as the width of the pygidium.

East coast Vancouver Island in 20 to 30 fathoms. West coast Vancouver Island in 65 to 90 fathoms. Washington. Queen Charlotte Islands. California.

Genus **MELINNA** Malmgren

Body with more than fifty segments, the abdominal region long and narrow. Eighteen thoracic setigers, the three or four most anterior with ventral capillaries, dorsal capillaries starting on the third, uncinigerous pinnules starting on the fifth. Cephalic hood more or less trilobed. Tentacular filaments smooth. Branchiae filiform, in close groups, united for a portion of their length. A pair of heavy dorsal hooks posterior to the branchiae. Segments two to five coalesced in the mid-dorsal area and raised laterally to form a ridge. At the sixth segment (fourth setiger) a membrane crossing the dorsum.

M. cristata (Sars). 24, 41. (Figs. 143 to 145.)

Up to 50 mm. long, 3 mm. wide; some 70 setigers, of which 18 are thoracic. Cephalic hood feebly trilobed, border entire, no glandular ridges. Peristomium not projecting much, largely covered by second segment which forms an anterior ventral collar. Tentacular filaments few, smooth, and almost as long and heavy as the branchiae. Two groups of filiform branchiae, those of each group united by a membrane varying in height. Segments two to five coalesced in the mid-dorsal area and raised laterally to form ridges which run forward on either side to join the ends of the collar which is formed by the second segment. At the sixth segment the posterior ends of these lateral ridges are joined by a transverse membrane with crenulate anterior edge, which has

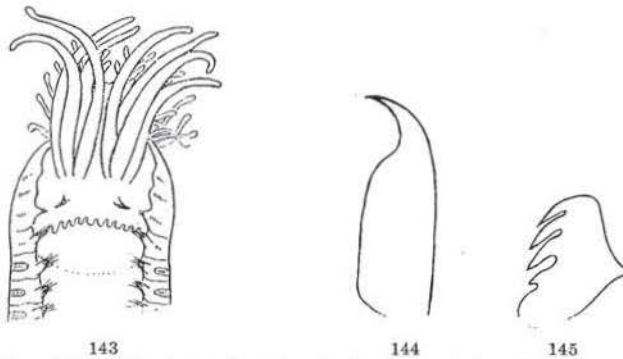


Fig. 143. *M. cristata* (Sars), anterior region (after Fauvel, modified).
 Fig. 144. *M. cristata* (Sars), heavy dorsal hook (after Fauvel).
 Fig. 145. *M. cristata* (Sars), uncinus (after Malmgren).

ten to twenty fine teeth and forms a pocket. Ventral setae of the first four thoracic setigers (third to sixth segments) fine, lanceolate capillaries. Dorsal capillaries of fifth and sixth segments very small and fine, those of the fifth almost hidden by the lateral ridge. Heavy hooks dorsally on the fourth segment. Uncinigerous pinnules start on the fifth setiger (seventh segment). No dorsal cirri on the pinnules. No anal cirri. Uncini with four teeth. Tubes thick, frail, and muddy.

East coast Vancouver Island, dredged in 20 to 30 fathoms. West coast Vancouver Island, dredged in about 70 fathoms. Prince Rupert, in 25 fathoms. Alaska. Oregon. California. N. Atlantic. Arctic. Antarctic.

Genus **SCHISTOCOMUS** Chamberlin (Berkeley *char. amend.*) 12

Cephalic hood bilobed, without ridges or eyes. A large number of long, smooth tentacular filaments. Four pairs of branchiae of two kinds. Fifteen thoracic setigers. Uncinigerous pinnules starting on the fourth setiger.

S. hiltoni Chamberlin. 12, 20, 25. (Fig. 146.)

Up to 80 mm. long, 10 mm. wide; about 50 setigers of which 15 are thoracic.

Anterior region swollen and appearing truncate when the tentacular filaments are retracted, but having the normal appearance of the Ampharetidae when they are extended. Cephalic hood and tentacular filaments as described for the genus. Nuchal organs well defined. Branchiae of two kinds, subulate and pinnate. The most anterior pair pinnate on one side only, situated medially on the first presetal segment, and joined at their bases. A subulate pair on the first setiger and a bipinnate pair on each of the two subsequent setigers. Uncini with six teeth. Pygidium terminating in a fringe of short cirri. Coloration yellowish, the dorsum in the thoracic region strikingly striped transversely brown and white. Tube membranous, thickened by adherent miscellaneous fragments.

East coast Vancouver Island, dredged in 20 fathoms. Oregon. California. Madras, India.

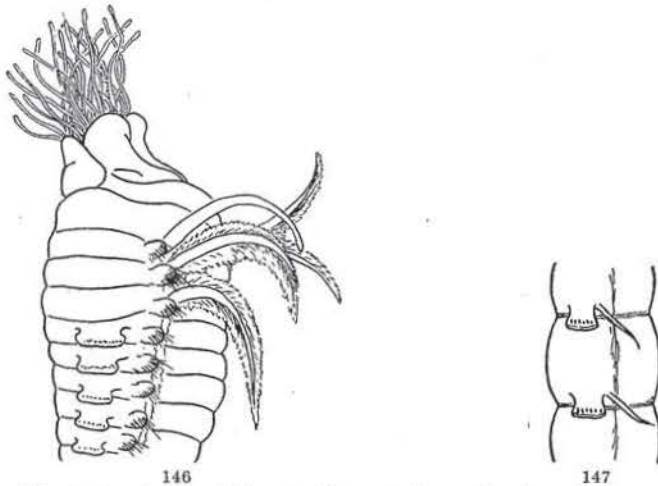


Fig. 146. *S. hilloni* Chamberlin, anterior region, lateral view.
Fig. 147. *P. lineata* Berkeley, abdominal segments, lateral view.

Genus **PSEUDOSABELLIDES** Berkeley

Cephalic hood trilobed. Tentacular filaments pinnate. Four pairs of subulate branchiae. Fourteen thoracic setigers. Uncinigerous pinnules starting on third setiger.

KEY TO SPECIES

- | | |
|---|-------------------|
| 1 (2) Form very slender; abdominal pinnules with long, slender cirri. | lineata |
| 2 (1) Form not very slender; abdominal pinnules with inconspicuous cirri. | littoralis |

P. lineata Berkeley. 15. (Fig. 147.)

Up to 15 mm. long, 0.6 mm. wide; up to 34 setigers (usually not more than 30), of which 14 are thoracic. Cephalic hood indistinctly trilobed. Branchiae very slender, in two rows, three pairs in a continuous line in advance of the fourth pair, which are more or less medially placed. Uncinigerous pinnules in

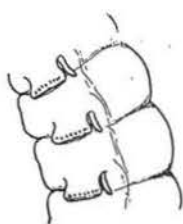
abdominal region with long, slender cirri. Uncini with two rows of major teeth, each of three or four, so arranged that six or eight are seen in full profile. Tube very fine, muddy, fitting the animal closely.

East coast Vancouver Island, dredged in 25 fathoms. Alaska. Hudson Bay.

P. littoralis Berkeley. 15. (Fig. 148.)

Average length about 25 mm., width 3 mm. Differs from *P. lineata* in the characters indicated in the key and the following:—The cephalic hood distinctly trilobed. Usually two eyes. The branchiae heavier and subulate, those of the posterior pair situated more laterally. The tubes frail and coated with sand and shell particles.

East coast Vancouver Island, littoral. Hudson Bay.



148



149

Fig. 148. *P. littoralis* Berkeley, abdominal segments, lateral view.

Fig. 149. *A. anops* (Johnson), abdominal segments, lateral view.

Genus **AMAGE** Malmgren

Cephalic hood trilobed. Tentacular filaments smooth. Four pairs of branchiae. Fourteen thoracic setigers. Notopodium of first setiger often reduced. Uncinigerous pinnules beginning on the fourth setiger, with or without a dorsal cirriform prolongation in the abdominal region. Conspicuous papillae in place of notopodia in the abdominal region.

A. anops (Johnson). 8, 37 (as *Sabellides*). (Fig. 149.)

Up to 40 mm. long, 5 mm. wide; 26 to 29 setigers, of which 14 are thoracic. Cephalic hood trilobed, the median lobe with two glandular ridges. Branchiae subulate, originating on three or four segments, not joined across the dorsum, but united into two lateral groups, about twice as long as the body-width. Dorsal abdominal papillae distally inflated. Uncinigerous pinnules with inconspicuous dorsal cirri. Uncini with five or six major teeth. Occuring in masses of fine mud tubes.

East coast Vancouver Island, dredged in 15 to 30 fathoms. West coast Vancouver Island in 30 to 40 fathoms. Alaska. Oregon. California.

Genus **AMPHISAMYTHA** Hesse

As *Amage* except that there are seventeen thoracic setigers and no papillae in place of notopodia in the abdominal region.

A. bioculata (Moore). 25, 52 (as *Samytha*).

An imperfectly known species. Longest specimen recorded, incomplete posteriorly, measured 30 mm. Seventeen thoracic setigers and thirteen or fourteen abdominal. Cephalic hood trilobed, the margin entire, the median lobe without glandular ridges. Branchiae originating on three or four segments, all partially united across the dorsum, much crowded and appearing as a single series. No cirriform prolongation of uncinigerous pinnules. Uncini with four or five major teeth. Tube membranous, thickened at anterior end.

Recorded from Gulf of Georgia in 31 to 90 fathoms, but unknown to the authors from the Canadian Pacific region. California. Bay of Bengal, India.

TEREBELLIDAE

Body with numerous segments; two distinct regions, the anterior (thoracic) more or less distended in front and tapered into the posterior (abdominal) which is usually longer and continues to taper, often to a very slender end. The thoracic region with bundles of dorsal capillaries, generally uncinigerous ventral tori and often, ventral plates; the abdominal usually with uncinigerous pinnules. Prostomium partially or wholly fused with the peristomium to form a cephalic lobe, varied in shape, often with eyes. Numerous filiform, non-retractile tentacular filaments, some or all grooved. Branchiae usually arborescent, occasionally filiform, cirriform or pectinate, rarely absent. Conspicuous nephridial papillae sometimes present. Capillaries often bladed and with smooth or ciliated tips. Abdominal pinnules with uncini in one or two rows. Uncini of various types. Pygidium without cirri. Tubicolous.

KEY TO GENERA

- | | | |
|------------|--|-------------------------------|
| 1 (2) | Peristomium produced into a large extensible papillated proboscis. | ARTACAMA (p. 74) |
| 2 (1) | Peristomium not thus produced. | |
| 3 (6) | Thoracic and abdominal uncini each of a different kind. | |
| 4 (5) | A single branchia. | TEREBELLIDES (p. 75) |
| 5 (4) | Three pairs of branchiae. | TRICHOBRANCHUS (p. 76) |
| 6 (3) | Thoracic and abdominal uncini of one kind (excepting those of a few anterior setigers in <i>Pista</i>). | |
| 7 (8) | Without branchiae. | POLYCIRRUS (p. 77) |
| 8 (7) | With one to three pairs of branchiae. | |
| 9 (10) | Uncini of anterior setigers with posterior prolongation. | PISTA (p. 78) |
| 10 (9) | Uncini of anterior setigers with no prolongation. | |
| 11 (12,15) | Capillaries beginning on second segment. | STREBLOSOMA (p. 81) |
| 12 (11,15) | Capillaries beginning on third segment. | |

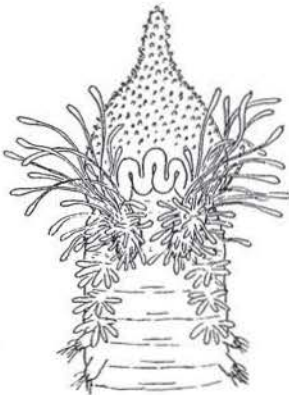
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| 13 (14) | Branchiae filiform. | THELEPUS (p. 82) |
| 14 (13) | Branchiae branched. | NEOLEPREA (p. 84) |
| 15 (11,12) | Capillaries beginning on fourth segment. | |
| 16 (21) | Notosetae with tips appearing ciliated at low magnification. | |
| 17 (20) | Branchiae with well developed stems and subdivided branches. | |
| 18 (19) | Capillaries on many (more than 25) segments. | TEREBELLA (p. 84) |
| 19 (18) | Capillaries on few (less than 25) segments. | NEOAMPHITRITE (p. 85) |
| 20 (17) | Stems of branchiae reduced, the branches simple filaments. | |
| 21 (16) | Notosetae with tips appearing smooth at low magnification. | AMPHITRITE (p. 86) |
| 22 (23,24) | One pair of branchiae. | SCIONELLA (p. 86) |
| 23 (22,24) | Two pairs of branchiae. | NICOLEA (p. 87) |
| 24 (22,23) | Three pairs of branchiae. | EUPOLYMNIA (p. 88) |

Genus **ARTACAMA** Malmgren

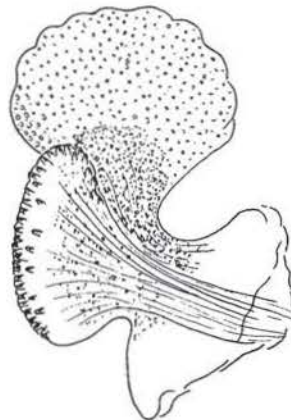
Prostomium indistinctly separated from peristomium. No eyes. Peristomium produced antero-ventrally into a prominent, papillated, retractile proboscis. Three anterior segments achaetous. Seventeen thoracic setigers, starting on the fourth segment. Uncinigerous tori starting on the fifth segment, the uncini in single rows on the second to the seventh setiger, partially double on the eighth, and entirely double on the remaining thoracic setigers. Abdominal segments numerous, with uncinigerous pinnules. Uncini with narrow bases and a number of small teeth surmounting the main fang.

A. conifera Moore. 50. (Figs. 150 and 151.)

Up to 68 mm. long; about 80 setigers, of which 17 are thoracic. The



150



151

Fig. 150. *A. conifera* Moore, anterior region.

Fig. 151. *A. conifera* Moore, abdominal pinnule.

prostomium partially fused with the peristomium and extended forward into a trilobed cephalic hood. The peristomium carrying dorsally two thick, reflexed pads which bear the tentacular filaments and extending ventrally into the prominent proboscis. The tentacular filaments unequal in length and thickened at the tips. A pair of branchiae, on the second, third and fourth segments respectively, each branchia consisting of a tuft of filaments. Capillaries slightly curved and winged. Abdominal pinnules with a prominent membranous wing arising from the dorsal border.

East coast Vancouver Island, dredged in 25 to 170 fathoms. West coast Vancouver Island. Friday Harbour, Washington. Oregon. California. Mexico.

Genus **TEREBELLIDES** Sars

Cephalic lobe large, folded, bearing numerous tentacular filaments of one kind. No eyes. A single branchia with four pectinate branches. No ventral plates. Number of thoracic setigers somewhat variable, usually eighteen. Capillaries beginning on the third or fourth segment; uncini on the seventh or eighth. Uncini of two sorts, thoracic with long manubria, abdominal avicular.

T. stroemi Sars. 24. (Figs. 152 and 153.)

Up to 60 mm. long, 8 mm. wide; 50 or 60 setigers, of which 16 to 18 are thoracic. Anterior edge of cephalic lobe rounded and undulate, bearing numerous short, grooved tentacular filaments with enlarged ends. A prominent, concave, semi-circular plate beneath the mouth. The single branchia with a heavy trunk originating mainly on the second segment, partially on the third, and divided into four pectinate branches; these are frequently interlocked giving the branchia the appearance of a more or less solid mass. The third to the

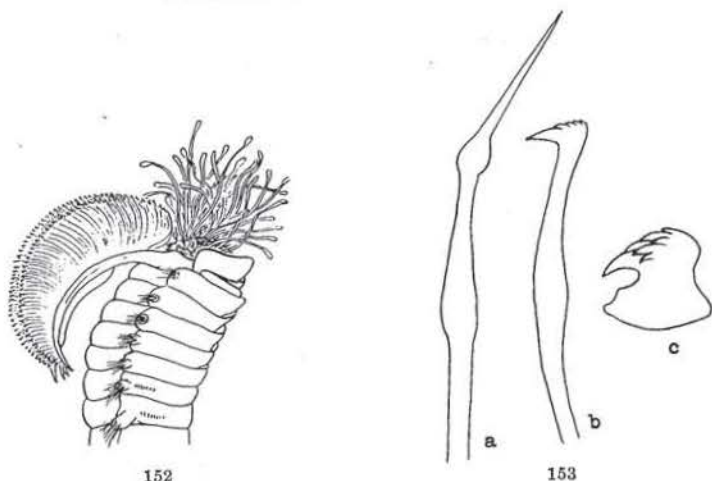


Fig. 152. *T. stroemi* Sars, anterior region.

Fig. 153. *T. stroemi* Sars (a) uncinus of sixth thoracic setiger, (b) uncinus of thoracic setiger posterior to sixth (c) abdominal uncinus.

sixth segments have the anterior borders on the ventral side extended and projecting forward. Bladed capillaries begin at the third segment. The uncini of the first row (on the seventh or eighth segment) long, bent, acicular spines, those of the remaining thoracic setigers somewhat shorter and with a large fang surmounted by a number of small teeth. Abdominal uncini avicular with two semi-circular rows of small teeth surmounting the main fang. Tube sandy or muddy.

East coast Vancouver Island in 20 to 30 fathoms. West coast Vancouver Island in 45 to 90 fathoms. Princess Louise Inlet in 20 fathoms. Cosmopolitan.

Genus **TRICHOBRANCHUS** Malmgren

Cephalic lobe bearing numerous tentacular filaments of two kinds, one finely filiform, the other thick and distinctly grooved. Eyes and nuchal organs present. Branchiae filiform. No ventral plates. About fifteen thoracic setigers. Capillaries and uncini both beginning on the sixth segment. Uncini in single rows, of two sorts, crotchets with long manubria in the thorax, avicular in the abdomen.

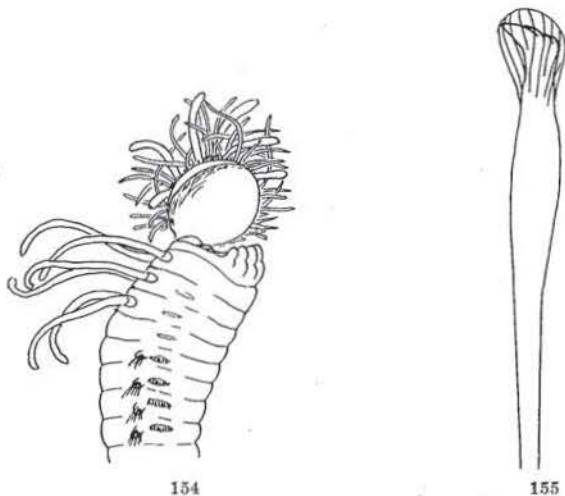


Fig. 154. *T. glacialis* Malmgren, anterior region, lateral view.
Fig. 155. *T. glacialis* Malmgren, thoracic uncinus.

***T. glacialis* Malmgren. 17, 24.** (Figs. 154 and 155.)

Up to 30 mm. long, 3 mm. wide; 60 to 70 setigers, of which 15 are thoracic. Cephalic lobe short, undulate, with numerous tentacular filaments, some thick and grooved, others filiform, which obscure it. Small eyes sometimes discernible. A vertical rounded flap on either side of the cephalic lobe. Six long filiform branchiae, a pair on each of the second, third and fourth segments. No capillaries or uncini on the first five segments, but rudimentary tori present. Capillaries beginning on the sixth segment with straight, or slightly curved, stems, narrow blades and smooth tips. Thoracic uncini crotchets with hoods, each with a long manubrium terminating in a heavy fang surmounted by three or four small teeth.

Abdominal uncini small, avicular, with narrow base and a row of denticles surrounding the main fang. Prominent triangular uncinigerous pinnules in the abdominal region. Tube sandy or muddy.

East coast Vancouver Island in about 25 fathoms. Cosmopolitan.

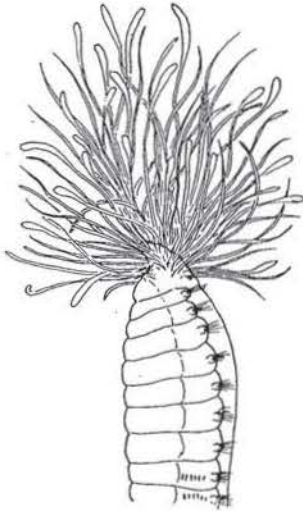
Genus **POLYCIRRUS** Grube

Body very fragile, easily breaking up. Cephalic lobe large and folded, bearing a large number of tentacular filaments. No eyes or branchiae. Thoracic setigers starting on the second or third segment, their number variable. Incidence of uncini variable, few or none in the thorax. Capillaries smooth or spinous, uncini avicular and arranged in single rows. Ventral plates present. Nephridial papillae on some segments.

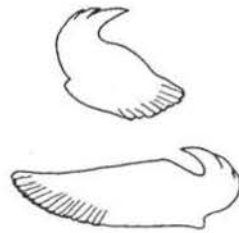
KEY TO SPECIES

- 1 (2) Thirty to sixty thoracic setigers beginning on the second segment.
2 (1) Eleven to fifteen thoracic setigers beginning on the third segment.

caliendrum
kergeuelensis



156



157

Fig. 156. *P. caliendrum* Claparède, anterior region, lateral view.

Fig. 157. *P. caliendrum* Claparède, abdominal uncini.

P. caliendrum Claparède. 24. (Figs. 156 and 157.)

Up to 100 mm. long, 4 mm. wide; 70 to 90 segments of which 30 to 75 have dorsal capillaries. Cephalic lobe forming an anterior folded collarette bearing very long and numerous tentacular filaments. These of two kinds, one broad and dilated terminally, the other filiform. Eight to eleven pairs of ventral plates. Six pairs of nephridial papillae on the first six setigers. Capillaries long and simple, or shorter and with narrow blades, commencing on the second segment.

Uncini usually beginning on the ninth setiger, rarely on one anterior to this, more frequently posterior to it (sometimes as far as the twelfth setiger) and extending to the end of the body. Uncini with two large teeth and, sometimes a crown of smaller ones. Anus surrounded by small lobes. Phosphorescent. Tubes mucous, frail.

East coast Vancouver Island in 10 fathoms. West coast Vancouver Island, littoral. Friday Harbour, Washington. Atlantic. Mediterranean.

P. kerguelensis (McIntosh). 14, 38 (as *Ereutho*).

Up to 30 mm. long, 3 mm. wide; up to 58 setigers, of which 11 to 15 are thoracic. Frilled cephalic lobe with both grooved and smooth tentacular filaments. Ventral plates well developed. Three pairs of nephridial papillae on fourth, fifth and sixth setigers. Capillaries with rather broad serrated blades beginning on the third segment. Usually no uncini in thorax, but occasionally present in the last two or three thoracic setigers. Uncini with two large teeth above the main fang.

West coast Vancouver Island, dredged in about 30 fathoms. Antarctic.

Genus **PISTA** Malmgren

Cephalic lobe produced into an elevated superior lip bearing long and numerous tentacular filaments on dorsal side. Thoracic region almost always with seventeen setigers, starting on the fourth segment. Eyes often present. One to three pairs of branchiae with well developed main trunks, often lateral lobes on anterior segments. Ventral plates well developed. Uncini starting on the fifth segment (second setiger). Capillaries with narrow blades and smooth tips. Uncini of first two or three t \ddot{u} ri with long posterior prolongations which rapidly diminish on subsequent segments, avicular thereafter; in double rows on a certain number of segments and on pinnules in the abdominal region. Often large anal papillae.

KEY TO SPECIES

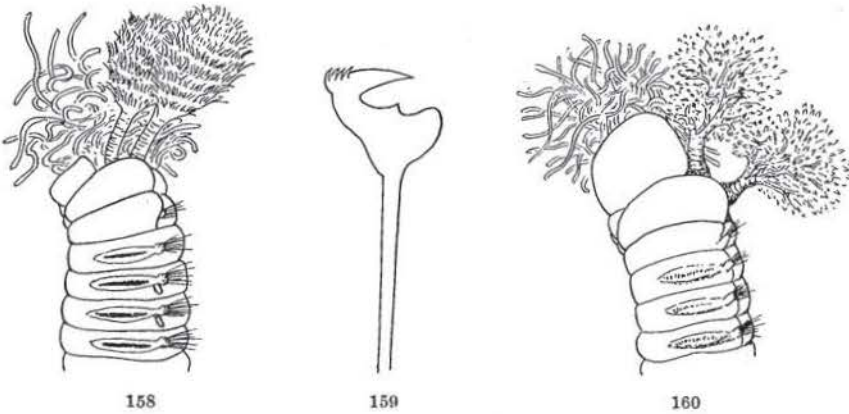
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|---|------------------|
| 1 (6) Two pairs of branchiae (sometimes only one pair in <i>cristata</i>). | |
| 2 (3) Branchiae club-shaped. | cristata |
| 3 (2) Branchiae arborescent. | |
| 4 (5) Prominent lateral lobes on peristomium. | fasciata |
| 5 (4) No lateral lobes on peristomium. | fratrella |
| 6 (1) Three pairs of branchiae. | |
| 7 (10) Branchiae dichotomously branched. | |
| 8 (9) No lateral wings on fourth segment. | elongata |
| 9 (8) Prominent lateral wings on fourth segment. | pacifica |
| 10 (7) Branchiae long and trailing with bunches of short twigs arranged spirally. | moorei |

P. cristata (Müller). 24. (Figs. 158 and 159.)

Up to 90 mm. long, 6 mm. wide; up to 180 segments. Peristomium forming a straight inferior lip notched medially. No eyes. Lateral lobes on the second, third, and fourth segments, those of the third and fourth large and subequal.

Usually a pair of branchiae on the second and third segments respectively (sometimes with only one pair, situated on the second segment); they have long cylindrical trunks and carry terminally a large number of short branches arranged in a compressed spiral forming a club-shaped mass. Size of branchiae variable. Nephridial papillae on the sixth and seventh segments, uncini in single rows on the six most anterior uncinigerous segments, in interlocking double rows on the remaining thoracic segments, with a row of five or six teeth and a crest of several rows of denticles above the main fang; those of the first few segments with long, narrow posterior prolongations. Tube with heavy mud walls.

East coast Vancouver Island in 15 fathoms. West coast Vancouver Island in about 60 fathoms. Jervis Inlet in 20 fathoms. Alaska. California. Cosmopolitan.



158

159

160

Fig. 158. *P. cristata* (Müller), anterior region.

Fig. 159. *P. cristata* (Müller), anterior thoracic uncinus (after Fauvel).

Fig. 160. *P. fasciata* (Grube), anterior region.

***P. fasciata* (Grube). 42, 53. (Fig. 160.)**

Up to more than 160 mm. long, and 6 mm. wide; some 130 segments. Peristomium produced into two large wing-like lobes, one on either side of the cephalic lobe. No lateral lobes on second segment, they are well developed on the third and low on the fourth. A prominent ridge connecting the notopodia across the dorsum of the fourth segment. A pair of branchiae, on the second and third segments respectively, with heavy trunks terminating in many branches which are repeatedly (up to eight times) asymmetrically branched and are not spirally arranged. Nephridial papillae on sixth and seventh segments. Arrangement and character of uncini much as in *P. cristata* except that there are at most only four large teeth above the main fang. Tubes as in *P. cristata*.

East coast Vancouver Island in 12 to 25 fathoms. West coast Vancouver Island in 65 to 85 fathoms. Alaska. Japan.

P. fratrella Chamberlin. 20.

Up to a little more than 36 mm. long, 2.8 mm. wide. Lateral lobes absent on peristomium, prominent on third segment, and with lower ones parallel to these on the fourth. Tentacular filaments spotted. A pair of arborescent branchiae on second and third segments respectively, the trunks variable in development. Uncini much as in *P. elongata* (fig. 162). Tubes of fine sand and shell particles, or sponge spicules, on a membranous base.

Known from Canadian Pacific region only from a single small specimen taken off Cape Cook, west coast Vancouver Island, in a deep net haul. California.

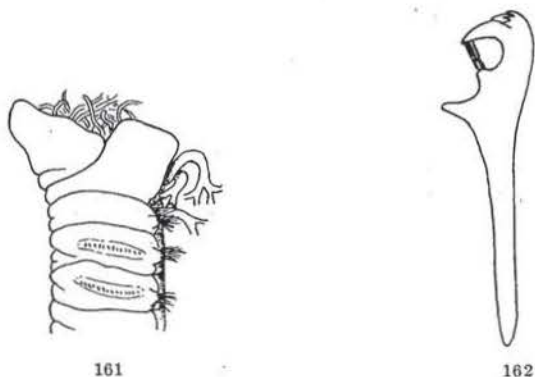


Fig. 161. *P. elongata* Moore, anterior region, lateral view (ends of branchiae and of tentacular filaments removed).

Fig. 162. *P. elongata* Moore, uncinus from first torus.

P. elongata Moore. 8, 54. (Figs. 161 and 162.)

Up to more than 210 mm. long and 6 mm. wide across the thorax; up to 240 segments. Form rather slender. Peristomium extended ventrally into a scoop-like fold rounded laterally. No lobes on the second or fourth segments, but large on the third and dorso-lateral in position. A pair of arborescent, dichotomously branched branchiae on the second, third, and fourth segments respectively, varying in appearance according to degree of contraction. Nephridial papillae on the sixth to the tenth segments (sometimes to the fifteenth). Uncini on the first six thoracic and all abdominal tori in single rows, on the eleventh to the twentieth in double interlocking rows, with three rows of teeth of diminishing size above the main fang. The uncini of the first two tori with wide tapering posterior prolongation and apical teeth often difficult to make out. Tube chitinous, covered with coarse particles of shell, sand, etc. and ending in two thick pads composed of chitinous strands covered with fine shell.

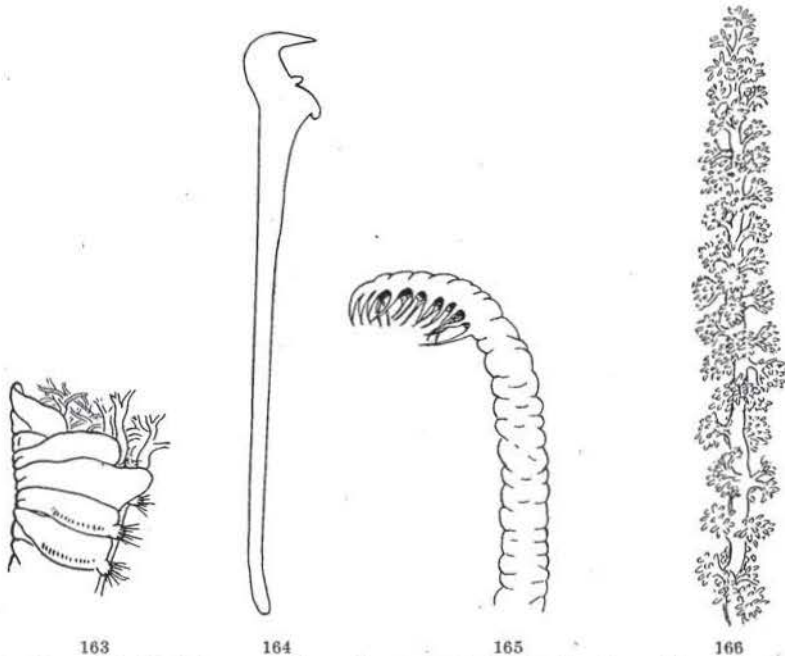
East coast Vancouver Island, littoral at lowest tide-mark and dredged in 25 fathoms. Oregon. California. Panama. Japan.

P. pacifica Berkeley. 14, 33. (Figs. 163 to 165.)

Up to 300 mm. long and 8 mm. wide across thorax. Much as *P. elongata*

Moore except in the presence of a pair of large tongue-shaped lobes on the fourth segment and the form of the long-stemmed thoracic uncinus. Tubes heavily coated with mud and sand, terminating in a hood, bent, and ornamented round the mouth with long pendent processes. The polynoid *Halosydna brevisetosa* Kinberg may occur as a commensal.

West coast Vancouver Island, littoral. Oregon. California.



- Fig. 163. *P. pacifica* Berkeley, anterior region, lateral view (ends of branchiae and of tentacular filaments removed).
 Fig. 164. *P. pacifica* Berkeley, uncinus from first torus.
 Fig. 165. *P. pacifica* Berkeley, end of tube.
 Fig. 166. *P. moorei* Berkeley, branchia.

***P. moorei* Berkeley.** 14, 56 (as *P. sp?*). (Fig. 166.)

Up to 140 mm. long and 5 mm. wide. Peristomium with large lateral lobes. A median ventral fold on the second segment only. The lateral lobes on the third segment varying considerably in different specimens, always large and extending from the ventral side to above the dorsum and each with a tongue-like extension which may rise only a little above the dorsum or may extend forward beyond the cephalic lobe. Lobes of the fourth segment small and subtriangular. Three pairs of long trailing branchiae with whorls of branchlets throughout their length. Uncini very like those of *P. elongata*. Tubes with heavy mud walls.

West coast Vancouver Island, dredged in about 18 fathoms. California.

Genus *Streblosoma* Sars

Cephalic lobe short, with few grooved tentacular filaments and, often, eye-

spots. Capillaries starting on the second segment and extending over a large number of segments. Two or three pairs of branchiae, each consisting of a row of simple filaments. Ventral plates present. Uncini starting at the fifth segment (fourth setiger).

S. bairdi (Malmgren). 24, 41 (as *Grymaea*).

Up to 80 mm. long; 30 to 40 setigers most of which bear capillaries. Posterior region very attenuated and fragile. Cephalic lobe rounded, often with numerous eye-spots. Tentacular filaments few, thick and grooved. Peristomium forming a swollen lip. About ten well marked ventral plates. A pair of branchiae on the second, third and fourth segments respectively, each consisting of a row of simple filaments. Notopodia starting on the second segment, large flattened tubercles with smooth capillaries. Neuropodia starting on the fifth segment with uncini, at first in typical tori which change into projecting rectangular pinnules in the posterior region. Uncini avicular, in single rows, with two or three large teeth and several small apical ones above the rostrum. Tubes fragile, encrusted with fine sand or mud and frequently whorled.

Not known from Canadian waters, but recorded from Friday Harbour, Washington, immediately adjacent thereto. Its occurrence is therefore to be anticipated. California. N. Atlantic. Arctic.

Genus **THELEPUS** Leuckart

Cephalic lobe not enlarged, often with eyes. Branchiae each represented by a transverse band of simple filaments, two or three pairs. No lateral lobes on anterior segments. Ventral plates usually indistinct. Capillaries on a large number of segments beginning on the third, with narrow blades and smooth tips. Uncini beginning on the fifth segment (third setiger), of characteristic shape (fig. 167), with a long fang more or less parallel to the base and a crest of small teeth.

KEY TO SPECIES

- | | |
|--|----------------|
| 1 (2) Two pairs of branchiae. | hamatus |
| 2 (1) Three pairs of branchiae. | |
| 3 (4) Uncini in single rows throughout. | setosus |
| 4 (3) Uncini in flattened rings in all but the first and last few uncinigerous segments. | crispus |

T. hamatus Moore. 50. (Fig. 167.)

A small, delicate species, usually incomplete as preserved. Largest complete specimen over 50 mm. long, 2.5 mm. wide, 85 segments. Tentacular filaments few, thick and deeply grooved. Below these a row of conspicuous black eyes. A pair of branchiae on second and third segments respectively, each consisting of a few filaments, usually a smaller number in the posterior pair. Capillaries extending from the third segment to the end of the body. Uncini as in fig. 167, with two or three large teeth above the main fang and above these a variable number of small denticles. Coloration orange. Tubes membranous, covered with sand and sponge spicules.

East coast Vancouver Island, dredged in 15 to 60 fathoms. West coast Vancouver Island in 70 fathoms. Alaska. California.



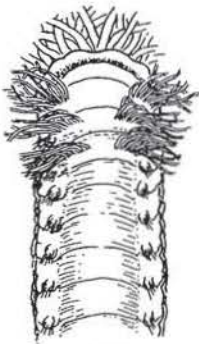
167

Fig. 167. *T. hamatus* Moore, uncus.

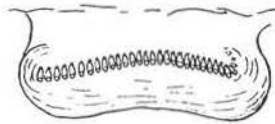
T. setosus (Quatrefages). 24. (Figs. 168 and 169.)

Up to more than 200 mm. long, 10 mm. wide and 120 or more segments. Anterior region distended, with about twenty, more or less distinct ventral plates, posterior region long and narrow. Tentacular filaments long and numerous. Many small eye-spots, particularly in young forms. A pair of branchiæ, on the second, third and fourth segments respectively, each consisting of numerous filaments which are frequently coiled spirally. Capillaries extending from the third segment for about half, or almost the whole, of the body length. Uncini beginning on the fifth segment, similar to those of *T. hamatus*; they are on projecting rectangular pinnules except in the extreme anterior region. Coloration yellowish brown in life, no colour remains on preservation but the skin acquires a rough, warty appearance. Tubes with thin membranous walls coated with sand and gravel. The polynoids *Polyeunoa tuta* (Grube) and *Halosydna brevisetosa* Kinberg may occur as commensals.

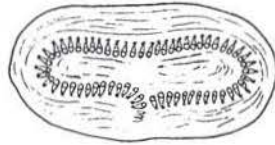
East coast Vancouver Island, littoral and dredged in 10 fathoms. California. China. Japan. Cosmopolitan.



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169



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Fig. 168. *T. setosus* (Quatrefages), anterior region (ends of branchiæ and of tentacular filaments removed).

Fig. 169. *T. setosus* (Quatrefages), abdominal uncinigerous pinnule.

Fig. 170. *T. crispus* Johnson, abdominal uncinigerous torus.

T. crispus Johnson. 14, 37. (Fig. 170.)

Similar to *T. setosus* in size and general aspect. Differs as indicated in key

and also in the following particulars. The thoracic ventral plates are almost indistinguishable. The uncinigerous tori are not in the form of pinnules but are low and rounded. Tubes and commensals as in *T. setosus*.

West coast Vancouver Island, littoral. Queen Charlotte Islands, littoral. Alaska. Oregon. California. India.

Genus **NEOLEPREA** Hesse

Branchiae branched. Lateral lobes absent. Capillaries on a large number of segments beginning on the third, with narrow blades and ciliated tips. Uncini beginning on the fifth segment, small, avicular, in double rows on a certain number of segments.

N. spiralis (Johnson). 37 (as *Amphitrite*). (Fig. 171.)

Form greatly elongated, anterior region arched dorsally, posterior region slender. Up to 160 mm. long, 8 mm. wide; about 170 segments. No eyes. A pair of arborescent branchiae somewhat dichotomously branched, on the second and third segments respectively. Capillaries beginning on the third segment and extending to about the thirty-sixth. Uncini beginning on the fifth segment, in single rows from the fifth to the tenth segment, in double rows from the eleventh to the thirty-fourth, and in single rows thereafter, small, avicular, with five rows of small teeth above the main fang. Coloration pale cream, white tentacular filaments, red branchiae. Tubes muddy, attached to rocks.

East and west coasts Vancouver Island. Queen Charlotte Islands, littoral. Washington. Alaska. California.

Genus **TEREBELLA** Linné

Capillaries, beginning on the fourth segment, on a very large number of segments or to the end of the body, ciliated at the tips and, sometimes, of two kinds. Two or three pairs of branched branchiae. No lateral lobes. Ventral plates present. Uncini usually beginning on the fifth segment, in biserial opposite rows on a large number of segments.

T. ehrenbergi Grube. 14, 42 (as *Leprea*). (Figs. 172 and 173.)

Up to 27 mm. long, 3.5 mm. wide. Numerous eye-spots, sometimes difficult to make out in preserved material. A pair of branchiae, on the second, third and fourth segments, respectively. About thirteen ventral plates. Nephridial papillae long on the third, and the sixth to the eighth segments, short on the ninth to the twelfth. Capillaries begin on the fourth segment and are absent only from thirty or forty of the most posterior, those of all but the most anterior segments twisted. Uncini in single rows from the fifth to the tenth segment and in the last twenty-five or so, the remainder in double rows facing inwards, with two or three large teeth above the main fang and two or three rows of small denticles. Tubes thin-walled, muddy.

East and west coasts Vancouver Island, littoral. Japan. India.

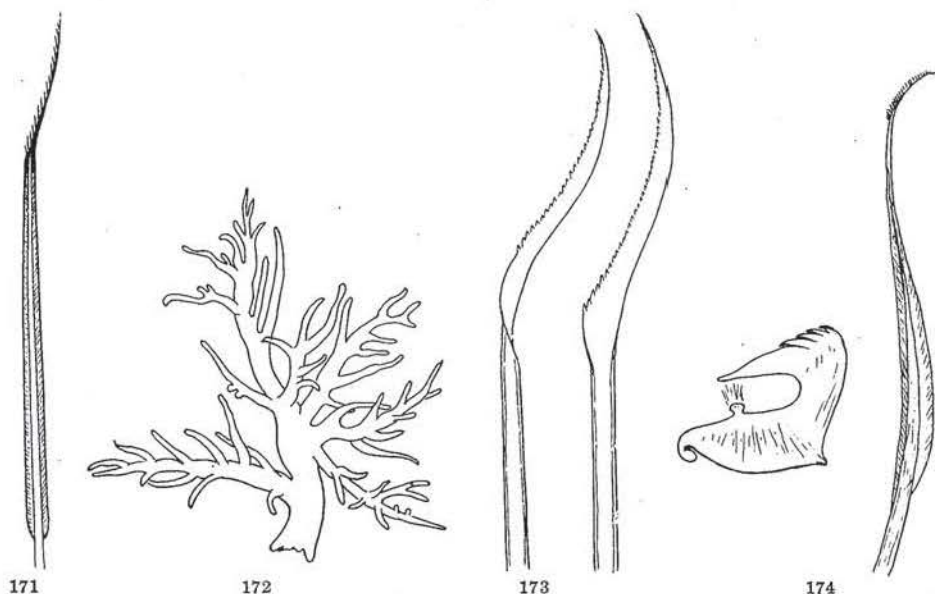


Fig. 171. *N. spiralis* (Johnson), capillary seta.
 Fig. 172. *T. ehrenbergi* Grube, branchia (after Marenzeller).
 Fig. 173. *T. ehrenbergi* Grube, tips of twisted and untwisted capillaries.
 Fig. 174. *N. robusta* (Johnson), capillary seta and uncinus.

Genus **NEOAMPHITRITE** Hesse

Capillaries on a limited number (seventeen to twenty-five) segments. Posterior region of numerous segments. Rarely eyes. Three (rarely two) pairs of branched branchiae. Lateral lobes and ventral plates present. Capillaries, beginning on the fourth segment, with ciliated tips. Uncini beginning on the fifth segment, avicular, with crests of many denticles, in double rows on some segments.

N. robusta (Johnson). 37 (as *Amphitrite*). (Fig. 174.)

Form robust. Up to at least 150 mm. long and 13 mm. wide; 20 thoracic segments, of which 17 are setigerous. No eyes. A pair of dense branched branchiae, on the second, third and fourth segments respectively. About twelve ventral plates. Lateral lobes extended ventrally on the second segment, shorter and narrower on the third. Nephridial papillae starting on the third segment and extending to about the fourteenth. Capillaries with blades and finely ciliate tips. Uncini in double rows on the eleventh to the twentieth segment, single on others. Tubes, usually with heavy mud walls, under rocks. Commensals the same as occur in *Thelepus setosus*.

East coast Vancouver Island, littoral and dredged in 25 to 170 fathoms. West coast Vancouver Island, littoral and dredged in 80 to 250 fathoms. Queen Charlotte Islands. Alaska. Oregon. California.

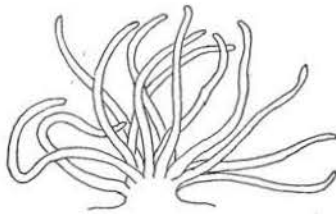
Genus **AMPHITRITE** O. F. Müller (*Hessle char. emend.*)

As *Neoamphitrite* except that the branchiae have reduced stems and unbranched filaments.

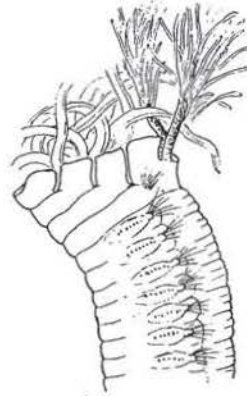
A. cirrata (O. F. Müller). 24, 35 (synonymy). (Fig. 175.)

Form attenuated posteriorly. Up to 160 mm. long and at least 10 mm. wide; 20 thoracic segments, of which 17 are setigerous. No eyes. A pair of branchiae on the second, third and fourth segments respectively, each branchia consisting of a tuft of simple filaments on a common low base. About twelve ventral plates. Lateral lobes on the branchiferous segments. Nephridial papillae on the third, and the sixth to the eleventh segments. Capillaries with wide blades and finely ciliated tips. Uncini in double rows from the eleventh to the twentieth segment. Tubes thick-walled, muddy.

Queen Charlotte Islands, littoral. Alaska. Japan. N. Atlantic. Arctic.



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Fig. 175. *A. cirrata* (O. F. Müller), branchia.

Fig. 176. *S. japonica* Moore, anterior region, lateral view (ends of tentacular filaments removed).

Genus **SCIONELLA** Moore

Prominent lateral lobes on first four segments. A single pair of branchiae with numerous filaments spirally arranged. A transverse dorsal ridge or fold on the fourth segment. Notosetae, with tips appearing smooth at ordinary magnification, beginning on the fourth segment. Uncini in double interlocking rows on some thoracic segments.

KEY TO SPECIES

1 (2) Branchiae on the fourth segment.

2 (1) Branchiae on the second segment.

japonica

estevanica

S. japonica Moore. 17, 46. (Fig. 176.)

Up to about 80 mm. long and 6 mm. wide at widest point; 20 thoracic

segments, of which 17 are setigerous. Point of transition from thoracic to abdominal region not well defined. Cephalic lobe with rather heavy, grooved tentacular filaments and, sometimes, eyes. Peristomium produced laterally into prominent lobes. Similar, but even more prominent, lateral lobes on the second, third and fourth segments. The origins of these lobes rise successively to a more dorsal level. The lobes of the fourth segment united across the dorsum by a short, high fold which carries the branchiae on its free edge. Branchiae with about three spiral turns. From the fifth to the fourteenth the segments are triannulate dorsally and there are distinct ventral plates. Notosetae varying in length and curvature and with blades of various widths. Uncini, starting on the fifth segment, with five transverse rows of denticles above the main fang.

East coast Vancouver Island, dredged in about 25 fathoms. Friday Harbour, Washington. Japan.

S. estevanica Berkeley. 14.

A slender form, up to about 30 mm. long and not more than 1 mm. wide. Otherwise resembling *S. japonica* except in the following particulars: (1) There is a long, low ridge on the fourth segment. (2) The origins of the lateral lobes of the first four segments rise successively very little. (3) The branchiae are attached to the anterior edge of the second segment. (4) The branchiae are bottle-brush shaped and have about twenty densely packed whorls. Tubes thin, membranous, sandy, fitting the animal tightly.

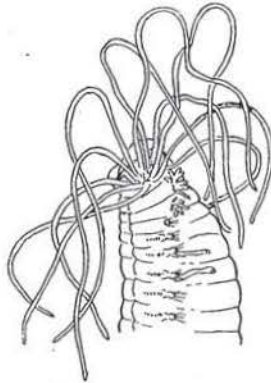
West coast Vancouver Island in about 65 fathoms.

Genus **NICOLEA** Malmgren

Fifteen to twenty-two thoracic segments; abdominal segments numerous. Eyes often present. Two pairs of ramified branchiae. No lateral lobes. Well marked ventral plates. Notosetae with smooth tips beginning on the fourth segment. Uncini in alternating single rows, or in double interlocking rows, on a certain number of thoracic segments.

N. zostericola (Oersted). 24. (Figs. 177 and 178.)

Body small, delicate, up to 25 mm. long and 2 mm. wide. (Larger in Arctic forms.) Fifteen thoracic setigers. Cephalic lobe with large pad bearing numerous long, unequal tentacular filaments. Superior lip concave. Numerous eye-spots. Peristomium forming a thick inferior lip. About fifteen ventral plates. Two pairs of branchiae with very short trunks and short, wide branches dichotomously divided in one plane. Long nephridial tubes on the sixth and seventh segments in males. Notosetae straight with narrow blades and smooth tips. Uncini, starting on the fifth segment, in single rows on the first six uncinigerous segments, in alternating rows on the eight following ones. Very prominent uncinigerous pinnules in the abdominal region. Uncini with very massive base, with one or two teeth above the main fang and several denticles above them. Tubes very fragile, attached to algae or eel-grass or hydroids, to which also the cocoons of eggs are attached.



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Fig. 177. *N. zostericola* (Oersted), anterior region, lateral view.
 Fig. 178. *N. zostericola* (Oersted), branchia.

Masset Inlet, Queen Charlotte Islands, on eel-grass. Alaska. N. Atlantic. Arctic.

Genus **EUPOLYMNIA** Verrill

Usually seventeen thoracic segments. Eyes numerous. Three pairs of arborescent branchiae. Well marked ventral plates. Notosetae with smooth tips beginning on the fourth segment. Uncini squat, with long base, a small lateral salient, and a fixing ligament, in double interlocking, or single alternating, rows, on a certain number of thoracic segments.

E. heterobranchia (Johnson). 37 (as *Lanice*). (Figs. 179 and 180.)

Up to 120 mm. long, and 10 mm. wide; 17 (occasionally 18) thoracic setigers. Numerous small eyes. Lateral lobes inconspicuous. A pair of



179



180

Fig. 179. *E. heterobranchia* (Johnson), branchia (after Johnson, modified).
 Fig. 180. *E. heterobranchia* (Johnson), uncinus.

arborescent branchiae on the second, third and fourth segments respectively, the first pair the longest. Uncini in single alternating rows, with two or three teeth above the main fang. Coloration very variable, body-colour green or greenish fawn to orange-red, the tentacular filaments brown, the branchiae often light green. Tubes also very variable, muddy or constructed of fragments of shell on a membranous base. Pea-crabs often present in tubes as commensals.

East coast Vancouver Island, littoral or dredged in shallow depths. West coast Vancouver Island and Queen Charlotte Islands, littoral. Alaska. Oregon. California. Mexico.

OPHELIIDAE

Body sometimes vermiform, sometimes relatively wide in relation to length, divided into regions or not; the dorsal surface convex, the ventral less so and often with a gutter for the whole or part of its length. Prostomium more or less conical, no appendages. Cephalic eyes obscure, lateral eyes sometimes present. Evertible nuchal organs. Cirriform branchiae present or absent. Parapodia biramous, not prominent, often reduced to bundles of setae; often a lateral organ between the rami. No dorsal cirri, ventral cirri rare. Setae all capillaries. Pygidium with terminal papillae and often prolonged into an anal funnel.

KEY TO GENERA

- | | |
|--|------------------------------|
| 1 (2) Ventral groove absent. | TRAVISIA (p. 89) |
| 2 (1) Ventral groove present. | |
| 3 (6) Ventral groove over whole length. | |
| 4 (5) With lateral eyes. | ARMANDIA (p. 91) |
| 5 (4) Without lateral eyes. | AMMOTRYPANE (p. 92) |
| 6 (3) Ventral groove in posterior region only. | THORACOPHELIA (p. 93) |

Genus **TRAVISIA** Johnston

Body stout, fusiform. Segments annulate and, towards the posterior region, partially telescoped, forming folds which end in lappets above and below the rami. These parapodial lappets may be low and rounded, or form triangular points, or be large and leaf-like. Prostomium small, conical. Parapodia reduced to dorsal and ventral bundles of fine capillaries, the first bundles on the second segment. A lateral organ between the rami. Cirriform branchiae starting on the third segment (second setiger). Pygidium with a ring of stout and unequal papillae.

KEY TO SPECIES

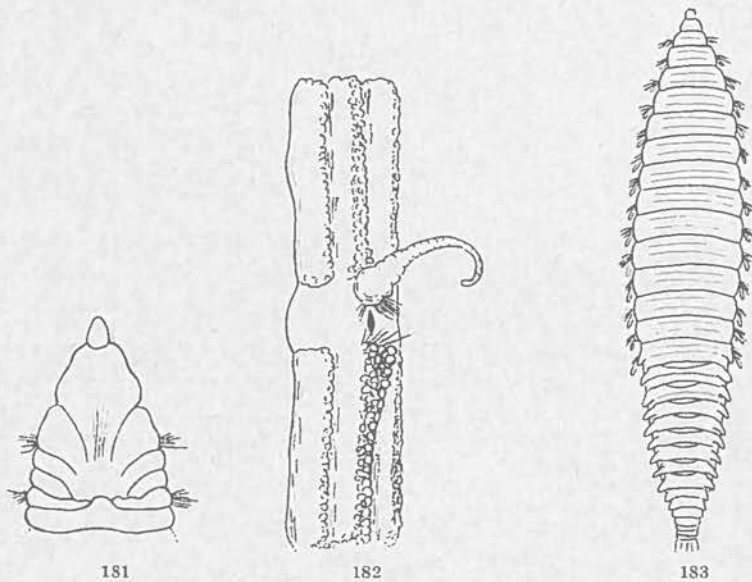
- | | |
|---|---------------|
| 1 (2) Thirty-one to thirty-two segments; parapodial lappets inconspicuous. | pupa |
| 2 (1) Twenty-nine segments; prominent triangular parapodial lappets on segments 15 to 23. | brevis |

T. pupa Moore. 52. (Figs. 181 and 182.)

Up to 85 mm. long, 30 mm. wide. Body stout, tapered nearly equally at both ends, the surface covered with vesicles of various sizes, the largest arranged in transverse rows on the overlapping edge of the middle ring of the triannulate

segments. Prostomium smooth, small, conical. Peristomium uniannulate, extending ventrally into the first setiger, which is biannulate, to form the upper lip of the mouth. Second setiger triannulate, crenulated on the anterior ventral surface to form the lower lip. Subsequent twelve setigers triannulate. From the fifteenth to about the twentieth the setigers are biannulate and they are uniannulate for the remainder of the body length. Parapodial lappets low, rounded, and inconspicuous throughout. Parapodial rami marked by bundles of fine capillary setae some of which are finely ciliated. Cirriform branchiae occur singly on each dorsal ramus from the second to the twenty-fifth setigers. Pygidium a ring of stout unequal lobes or papillae. No coloration.

East coast Vancouver Island in 20 to 200 fathoms. West coast Vancouver Island in about 70 fathoms. Jervis Inlet in 10 to 20 fathoms. Alaska. California.



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Fig. 181. *T. pupa* Moore, head, ventral view.

Fig. 182. *T. pupa* Moore, twelfth setiger (showing lateral organ).

Fig. 183. *T. brevis* Moore.

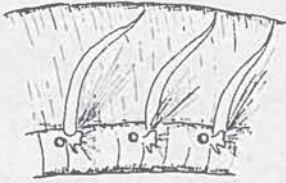
***T. brevis* Moore. 56. (Fig. 183.)**

Up to 30 mm. long, 5 mm. wide. Maggot-like in appearance, the skin covered with small and fairly uniform vesicles. The anterior region much as in *T. pupa*, but at about the fourteenth setiger the dorsal and ventral parapodial lappets begin to be pointed and prominent, become increasingly so until about the twenty-third, and are again inconspicuous at about the twenty-fifth. Setae all smooth capillaries. Single cirriform branchiae on each dorsal ramus from the second to the twenty-third setiger. Pygidium a ring of stout, unequal lobes. No coloration.

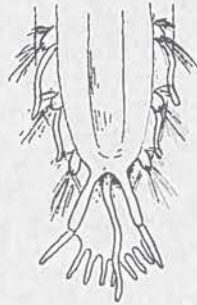
East coast Vancouver Island in 10 to 30 fathoms. West coast Vancouver Island in 100 fathoms. Princess Louise Inlet in 20 fathoms. Jarvis Inlet in 20 fathoms. Alaska. Oregon. California.

Genus **ARMANDIA** Filippi

Body elongate, not divided into regions, a deep ventral groove and two lateral grooves the whole length of the body. Prostomium conical, with eyes. Annulate segments. Cirriform branchiae the whole length of the body starting on the second setiger. Parapodia with two bundles of capillaries. A small ventral cirrus. Pygidium prolonged into an anal funnel with a fringe of papillae and a long unpaired cirrus.



184



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Fig. 184. *A. brevis* (Moore), three median setigers (showing lateral eyes).
Fig. 185. *A. brevis* (Moore), anal end, ventral view.

A. brevis (Moore). 12, 51 (as *Ammotrypane*), 67 (as *Ammotrypane*). (Figs. 184 and 185.)

Up to 20 mm. long, 1.5 mm. wide, annulate throughout, narrowed at both ends. Twenty-nine setigers, the segmental boundaries not clearly demarcated by furrows. Prostomium a sharp cone terminating in a palpode, slightly flattened dorso-ventrally, two eyes, often obscure in adult specimens. Peristomium with large, retractile, nuchal organs and, ventrally, a large mouth. Parapodia small rounded prominences bearing bundles of long capillaries, small ventral cirri, and, from the second setiger to the end of the body, long cirriform branchiae, the last of the series often very small. Lateral eyes between the parapodia from the seventh to the seventeenth setiger. A deep ventral groove extending from the mouth to the pygidium bounded by muscular ridges above which there are shallow lateral grooves in which the parapodia lie. The pygidium consists of a short flap overhanging and almost surrounding the anus, forming an incomplete funnel. Each lateral edge of this flap is thickened and extended into a rather long heavy papilla; between these there is a row of four to seven smaller ones; in addition there is a long cirrus proceeding from within the funnel on the ventral side and sometimes

extending beyond the papillae. Coloration light red, usually without markings.

East coast Vancouver Island, littoral and swarming in shallow water. West coast Vancouver Island, littoral. Queen Charlotte Islands. Alaska. California. Mexico.

Genus **AMMOTRYPANE** Rathke

As *Armandia* except that branchiae are absent from some terminal setigers and, sometimes, from some median ones, and there are no lateral eyes.

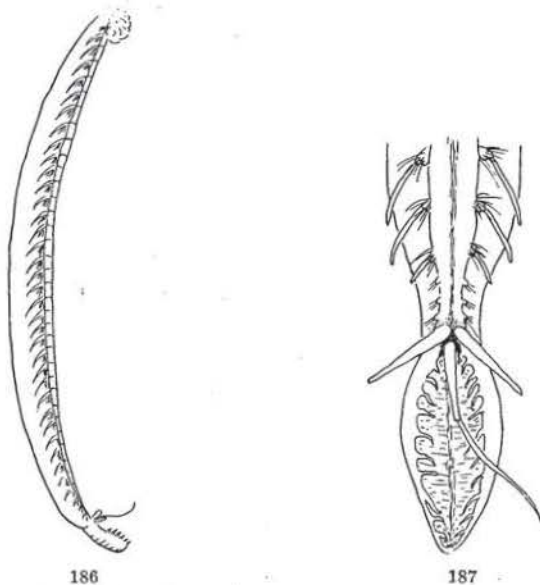


Fig. 186. *A. aulogaster* Rathke (after Fauvel).
Fig. 187. *A. aulogaster* Rathke, anal end, ventral view.

A. aulogaster Rathke. 24. (Figs. 186 and 187.)

Up to 60 mm. long, 5 mm. wide. Body long and slender, narrowed at both ends, about fifty setigers. Segments finely annulate, the annulations sometimes indistinct, intersegmental boundaries not clearly demarcated. Prostomium conical, terminating in an oval palpode. Peristomium with well developed nuchal organs. Long cirriform branchiae from the second to the forty-seventh or forty-eighth setiger. Two or three last setigers very small and abranchiate. Parapodia, setae, ventral furrow and lateral furrows as in *Armandia brevis*. Pygidium spoon-shaped, open ventrally, the rim fringed with slender papillae and, at its base, three stout papillae, the median of which bears a long cirrus. Coloration yellow to reddish brown as preserved.

East coast Vancouver Island in 10 to 60 fathoms. Berry Point, near Vancouver, in 100 fathoms. Alaska. California. Japan. Cosmopolitan.

Genus **THORACOPHELIA** Ehlers

Body slender, vermiform, divided into three distinct regions, the segments annulate throughout. The cephalic region almost globular, but narrowed anteriorly into the small conical prostomium and bearing setae, nuchal organs and, sometimes, eyes. The thoracic region divided from the cephalic by a definite constriction and from the abdominal by marked lateral ridges. The abdominal region longer than the thoracic, with a ventral groove the greater part of its length and with branchiae on the majority of its segments. Parapodia reduced to dorsal and ventral bundles of capillaries, these minute in the cephalic region and the branchial region of the abdomen. No parapodial cirri. The pygidium with a ventral anal plate and a bundle of long papillae.

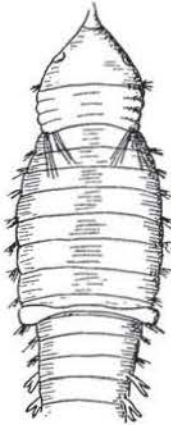


Fig. 188. *T. mucronata* (Treadwell), anterior region.

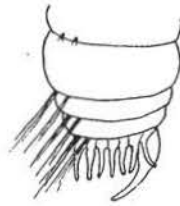


Fig. 189. *T. mucronata* (Treadwell), anal end, lateral view.

T. mucronata (Treadwell). 26, 40, 66 (as *Ophelina*). (Figs. 188 and 189.)

Up to 40 mm. long, 2 mm. wide. The cephalic region consists of the small, smooth, conical prostomium, on which, in young specimens, a pair of eyes can be made out, the peristomium with nuchal organs dorsally and a large mouth ventrally, the first setiger with minute tufts of setae, and the second with long, conspicuous setae. The thoracic region is made up of eight setigers which are well defined by intersegmental furrows on the ventral surface and conspicuous bundles of setae. The tenth setiger (eighth thoracic) swollen laterally to form a well marked ridge defining the posterior end of the thoracic region. The abdominal region consists of twenty-eight segments, the first two of which bear well defined bundles of setae; thereafter the setae are inconspicuous until the last three segments where they are long and conspicuous. Branchiae bifid, first present on the third abdominal segment and continuing for eighteen segments. A deep ventral groove begins at, or a little before, the first branchiferous segment and continues

to the end of the body. The pygidium carries ventrally a triangular anal plate, broad at the base and extended into a cirrus-like tip; dorsal to this plate and on either side of the anus there is a row of seven long papillae. Coloration bright red without markings, but often appearing black, or with black patches, when distended with dark sand.

West coast Vancouver Island, littoral, in sand beds. Oregon. California.

ARICIIDAE

Body usually elongate and with many segments; divided into two regions, the anterior (thoracic) more or less flattened and the posterior (abdominal) much longer and more or less cylindrical. Branchiae, usually simple, on all but most anterior segments, well developed and heavily ciliated. Notopodium represented throughout by a bunch of setae and a well developed postsetal lobe. Neuropodium in thoracic region a low prominence with or without an extended postsetal lobe, with or without papillae, and with several rows of setae; in the abdominal region bilobed, usually carried vertically and with or without a ventral cirrus. Frequently an intermediary cirrus between the rami. Setae all simple and of very varied forms. Pygidium with two or four anal cirri.

KEY TO GENERA

- | | |
|--|-------------------------------|
| 1 (2) Prostomium rounded. | NAINEREIS (p. 94) |
| 2 (1) Prostomium pointed. | |
| 3 (4) Papillae on thoracic neuropodium numerous, in a vertical row. | ARICIA (p. 95) |
| 4 (3) Papillae on thoracic neuropodium few (one to three) or absent. | |
| 5 (6) Crotchets present in thoracic neuropodium. | SCOLOPLOS (p. 96) |
| 6 (5) Crotchets absent in thoracic neuropodium. | HAPLOSCOLOPLOS (p. 97) |

Genus **NAINEREIS** Blainville

Prostomium rounded, wide, and often depressed. Two eyes. Proboscis soft, with large, more or less branched, lobes. Thoracic and abdominal notopodia with crenate capillaries and forked setae. Thoracic neuropodium with lamelliform postsetal lobe and with capillaries, several rows of crotchets and, sometimes, subuluncini. Abdominal neuropodium with capillaries only. No ventral cirrus. No intermediary cirrus. Four anal cirri.

N. laevigata (Grube). 24. (Figs. 190 to 193.)

Recorded up to 25 cm. long, but not known from Canadian Pacific coast more than 8 cm. long and about 4 mm. wide; up to 400 setigers. Prostomium symmetrically rounded, a little depressed. Proboscideal lobes digitate and branched. Fifteen to thirty-one thoracic setigers. Branchiae beginning at the fourth to the fourteenth setiger (usually at about the seventh or eighth), inserted laterally leaving the dorsum well exposed. Thoracic notopodium with

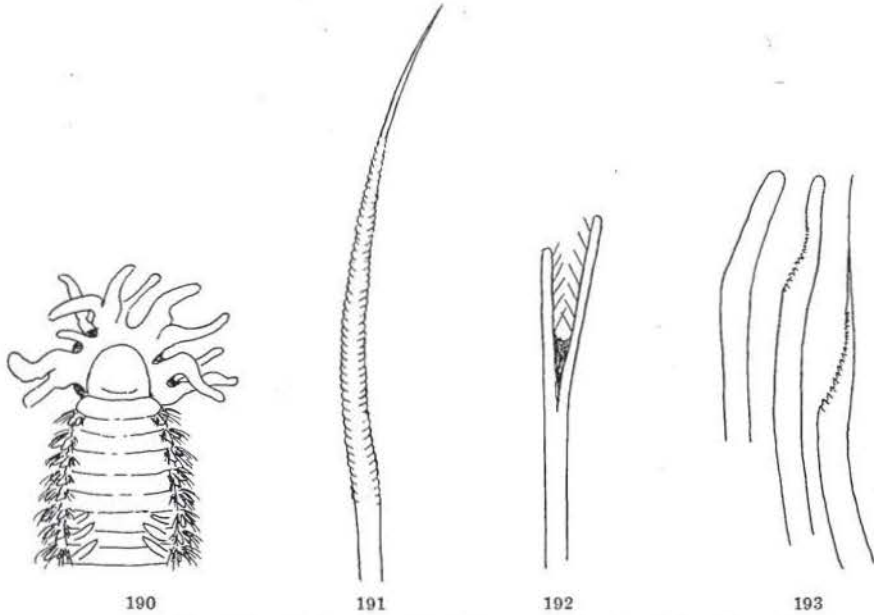


Fig. 190. *N. laevigata* (Grube), anterior region (after Fauvel).
 Fig. 191. *N. laevigata* (Grube), crenate capillary seta.
 Fig. 192. *N. laevigata* (Grube), forked seta.
 Fig. 193. *N. laevigata* (Grube), subuluncini, worn and unworn.

hatchet-shaped lamella, a bundle of setae containing crenate capillaries, forked setae with short, unequal branches ciliated interiorly, and some fine subulate acicula. Thoracic neuropodium a wide depressed pad with the lamelliform post-setal lobe extended dorsally; the setae consisting of fine crenate capillaries, numerous shorter recurved bristles with their tips abruptly contracted and toothed (subuluncini), and five to ten small, transparent, almost straight true crotchets, with or without hoods, in a small ventral bundle. In the abdominal region the notopodium has a lamella somewhat smaller than in the thorax, a bundle of capillary setae, one or two forked setae, and three to five slender acicula. The neuropodium has two lobes with a bundle of long capillary setae and three to five heavy acicula. Coloration usually reddish brown, occasionally with a dark pattern on the dorsum.

East coast Vancouver Island, littoral and dredged. West coast Vancouver Island, littoral. Queen Charlotte Islands. California. Cosmopolitan.

Genus **ARICIA** Savigny

Prostomium pointed, sometimes two eyes. Proboscis soft, forming a rosette round the mouth. Thoracic neuropodium a compressed pad with a row of papillae and several rows of setae. Often subpodial papillae, which may more or less completely encircle the body, on some segments. A ventral cirrus. Often an intermediary cirrus between the rami. Two long anal cirri.

A. michaelsoni Ehlers. 21, 44, 59. (Figs. 194 to 196.)

Longest recorded specimen 220 mm., greatest width 4 mm.; 17 to 25 thoracic setigers. Branchiae begin on fifth or sixth setiger. In the mid-thoracic region the neuropodium bears a postsetal lamella with a fringe of twelve to fifteen papillae. Subpodial papillae begin between the ninth and fourteenth setiger and extend to the twentieth to the twenty-ninth; the rows are single and contain a maximum of about thirty-five papillae. Neuropodia of anterior thoracic setigers with five rows of setae consisting of long crenate capillaries and heavy crotchets. Starting at the eleventh to the fourteenth setiger and extending to the end of the thoracic region many of the crotchets are replaced by a single row of a few spear-headed spines, one or two of which in each setiger extend well out from the body and are of characteristic form. The remaining crotchets are confined to the ventral part of the ramus. In the abdominal region there is a

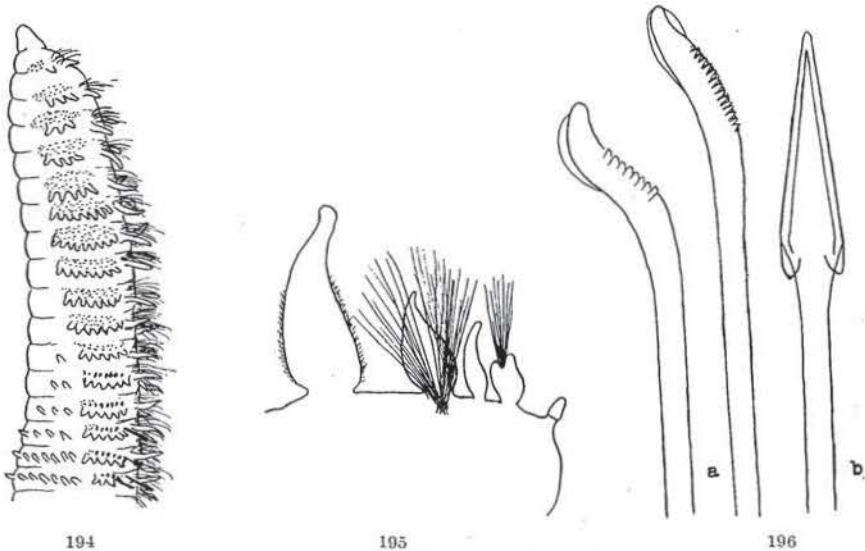


Fig. 194. *A. michaelsoni* Ehlers, anterior region.
 Fig. 195. *A. michaelsoni* Ehlers, abdominal parapodium (after Ehlers).
 Fig. 196. *A. michaelsoni* Ehlers, (a) crotchets (b) tip of spear-headed spine.

well developed intermediary cirrus. Forked setae with unequal arms, ciliated interiorly, are present in the notopodia together with capillaries. Coloration reddish grey.

West coast Vancouver Island, littoral. Strait of Magellan. Falkland Islands.

Genus **SCOLOPLOS** Blainville

Prostomium pointed. Proboscis as in *Aricia*. Thoracic neuropodium with one to three papillae, or they may be absent. Abdominal notopodium with or without forked setae. A ciliated lateral organ between the rami. Ventral cirrus often absent.

S. armiger (O. F. Müller). 24. (Figs. 197 to 199.)

Body attenuated, more than 200 setigers; up to 12 cm. long, 3 mm. wide. Two eyes deeply set in posterior region of prostomium. Thoracic region of twelve to twenty setigers. Branchiae starting at the ninth to the seventeenth setiger, longer than the dorsal cirri. Thoracic neuropodium with a single papilla in the more anterior setigers, two to three in more posterior ones, and a bundle of capillary setae, together with more or less numerous toothed crotchets, in some, or all of the setigers. Sometimes one or two subpodial papillae on the first to the fourth setiger. Abdominal notopodium with long capillaries and sometimes forked setae with unequal arms and no ciliation interiorly. Abdominal neuropodium with two unequal lips, a bundle of capillaries, and with bent acicula. A ciliated button-shaped lateral organ between the abdominal rami. Coloration reddish.

West coast Vancouver Island. Alaska. Cosmopolitan.

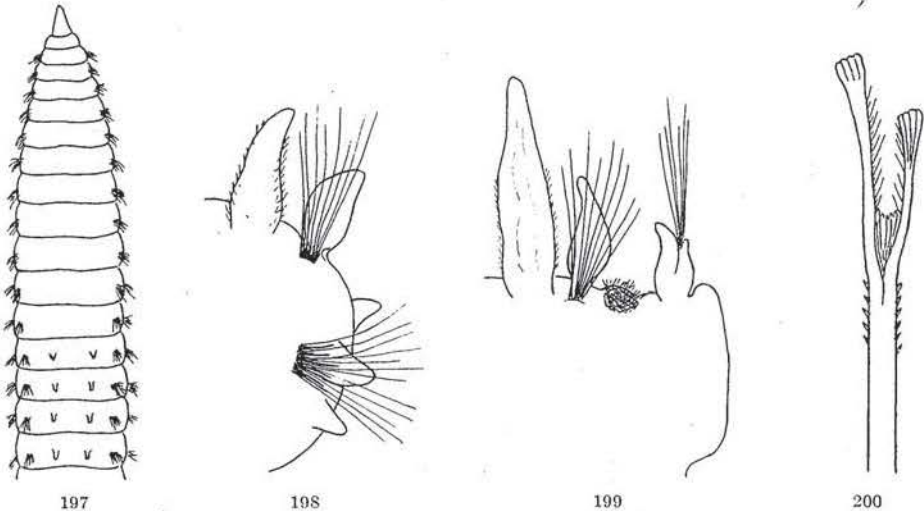


Fig. 197. *S. armiger* (O. F. Müller), anterior region (after Okuda).
 Fig. 198. *S. armiger* (O. F. Müller), thoracic parapodium.
 Fig. 199. *S. armiger* (O. F. Müller), abdominal parapodium.
 Fig. 200. *H. elongata* (Johnson), forked seta.

Genus **HAPLOSCOLOPLOS** Monro

As *Scoloplos* except that there are no crotchets in the thoracic region and an intermediary cirrus may be present in the abdominal region.

H. elongata (Johnson). 35, 37 (as *Scoloplos*). (Fig. 200.)

Form long and slender. Thoracic region slightly flattened. Up to 190 mm. long, 3 mm. wide and 290 segments, but commonly much smaller than this. Thoracic region of nineteen to twenty-two setigers. Branchiae begin on the sixteenth

to the eighteenth setiger as small papillae, soon developing into lingulate processes longer than the notopodial lobes. Thoracic neuropodium with a ridge bearing a well developed cirriform postsetal lobe. Only crenate capillaries in both rami. Parapodia in the abdominal region as in *Scoloplos armiger* except that the forked setae are ciliated interiorly. Ventral cirri absent throughout. Coloration grey to brown, as preserved.

East coast Vancouver Island, littoral and dredged in 10 to 30 fathoms. Alaska. Oregon. California.

ARENICOLIDAE

Body stout and opaque or slender and translucent. Two or three distinct regions. Numerous short segments, mostly annulate. Prostomium blunt, without appendages. Peristomium and the segment posterior to it achaetous. Nuchal organs present. Branchiae dorsal, on a limited number of segments. Parapodia biramous. Notopodia with bladed capillaries only; neuropodia with sigmoid crotchets without hoods. Statocysts sometimes present. Oesophageal caeca present.

KEY TO GENERA

- | | |
|--|-------------------------------|
| 1 (2) Body stout, branchiae complex; not tubicolous. | ARENICOLA (p. 98) |
| 2 (1) Body small and slender, branchiae simple or with few branches; tubicolous. | BRANCHIOMALDANE (p.99) |

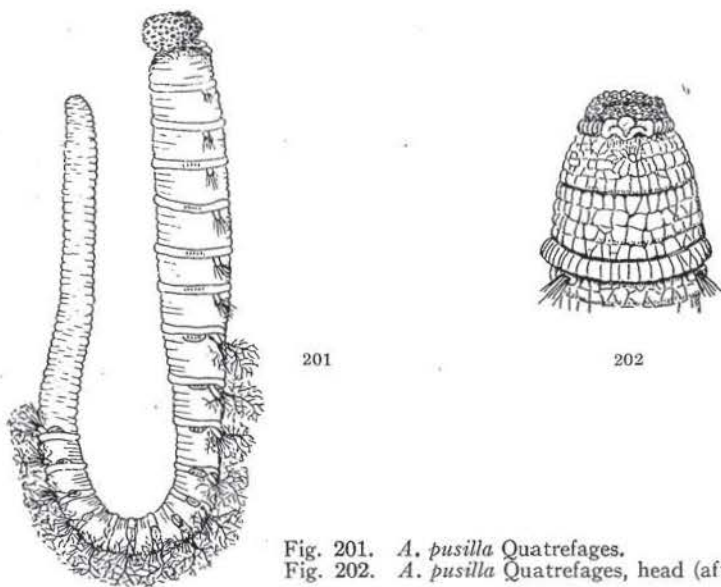
Genus **ARENICOLA** Lamarck

Body circular in section, segments (except the three or four anterior ones) divided into five superficial rings broken by short longitudinal furrows. Prostomium small, simple or trilobate. Proboscis evertible, covered with papillae. Anterior region abranchiate but setigerous; median region with both branchiae and setae; caudal region, if present, with neither. Branchiae pinnate or arborescent, posterior to, and at the base of the notopodia.

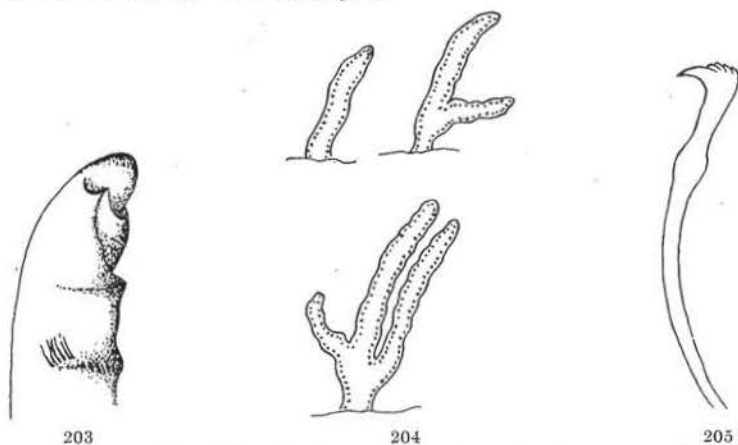
A. pusilla Quatrefages. 4 (as *A. Claparedii*), 5, 24 (as *A. Claparedii*). (Figs. 201 and 202.)

Up to 160 mm. long, 19 mm. wide, but usually longer in relation to width. Nineteen setigerous segments followed by a non-setigerous papillated tail region of indefinite length. Branchiae starting at the seventh setiger and continuing for thirteen setigers; usually pinnate, but, occasionally, arborescent, the first pair often vestigial. Prostomium trilobate, the lateral lobes much larger than the median one. Nephridial openings on the fifth to the ninth setigers. Statocysts absent. Four to ten pairs of oesophageal caeca, the anterior pair long and slender, the others short and pyriform. Capillaries with narrow and finely spiny blades. Crotchets with a single large fang and a finely denticulated crest.

East and west coasts Vancouver Island, littoral. California. Oregon. Alaska. Chile. Japan. Mediterranean.

Fig. 201. *A. pusilla* Quatrefages.Fig. 202. *A. pusilla* Quatrefages, head (after Ashworth).Genus **BRANCHIOMALDANE** Langerhans

Body divided into a branchiate and an abranchiate region. Branchiate segments biannulate. Prostomium prominent and simple. Branchiae simple or with up to four branches. No statocysts.

Fig. 203. *B. vincenti* Langerhans, head.Fig. 204. *B. vincenti* Langerhans, branchiae.Fig. 205. *B. vincenti* Langerhans, crotchet.***B. vincenti*** Langerhans. 5, 17. (Figs. 203 to 205.)

Form small, slender and translucent. Up to about 25 mm. long, 0.5 mm. wide, about 65 segments. Prostomium a blunt cone with inconspicuous nuchal grooves

and, sometimes, two pairs of minute eyes. The peristomium leaving the prostomium completely uncovered. Capillaries and crotchets uniform throughout the body, the former with narrow striated or fringed blades, the latter without hoods, with short, curved shafts, and with four rows of small teeth surmounting the long main fang. Branchiae begin at about the thirtieth segment, at which region the biannulation of the segments is well defined. The parapodia are carried on the broader annulation of each segment and the branchiae dorsally on the alternate rings. The branchiae begin as frail, simple, short, digitate processes but posteriorly they lengthen; the majority are bifid, but occasionally, one with three or four branches appears. They continue almost to the end of the body. The body gradually narrows from about the fortieth segment and terminates in a slightly lobed ring. Only two pairs of nephridial openings, these on the sixth and seventh segments. Tubes delicate and membranous, coated with fine sand.

West coast Vancouver Island, littoral. Oregon. Teneriffe. Normandy.

CAPITELLIDAE

Body cylindrical, red, earthworm-like in general aspect; divided into two regions, the thoracic usually somewhat swollen, often with a more or less areolated skin, consisting of a few (nine to twenty) segments, and the abdominal with a larger and variable number of segments, usually longer and smoother. The point of transition from the thoracic to the abdominal region is sometimes difficult to determine. Prostomium conical, more or less retractile, with or without minute ocular spots. Nuchal organs present. Branchiae present or absent, if present they are confined to the abdominal region and consist of simple or compound digitate processes or mere expansions of the rami. Thoracic rami reduced to little more than rows of either capillaries or crotchets. A lateral organ sometimes present between the rami. Usually genital openings on a certain number of segments. A copulatory apparatus sometimes present with specialized setae.

KEY TO GENERA

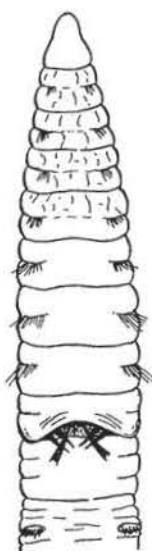
- | | |
|--|------------------------------|
| 1 (2) Apparent first segment with setae. | CAPITELLA (p. 100) |
| 2 (1) Apparent first segment without setae. | |
| 3 (4) Thorax with capillaries only. | NOTOMASTUS (p. 101) |
| 4 (3) Thorax with capillaries and crotchets. | HETEROMASTUS (p. 103) |

Genus **CAPITELLA** Blainville

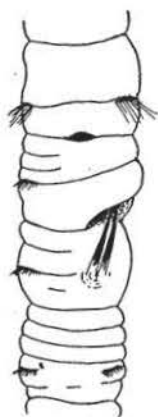
Thoracic region consisting of nine biannulate segments (morphologically ten, but the peristomium is fused with the prostomium). The first seven setigers with capillaries, sometimes accompanied by crotchets in the fifth, sixth, or seventh. The notopodia of the eighth and ninth setigers with copulatory hooks in males, crotchets in females. Abdominal region with crotchets only. No branchiae. Genital pores between the seventh and eighth setigers.

C. capitata (Fabricius). 23, 34, 39. (Figs. 206 to 208.)

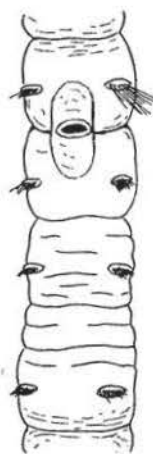
Up to 10 cm., or more, long, 2 mm. wide; 90 setigers or more. Body attenu-



206



207



208

Fig. 206. *C. capitata* (Fabricius), anterior region, dorsal view, male.

Fig. 207. *C. capitata* (Fabricius), seventh to tenth setiger, lateral view, male.

Fig. 208. *C. capitata* (Fabricius), seventh to tenth setiger, lateral view, female.

ated at both ends. Areolation of skin in thoracic region not pronounced. Prostomium a flattened cone, sometimes with ocular specks (not visible in preserved material). Setae of first seven setigers all capillaries (crotchets have been recorded in the seventh setiger in European forms). Generative openings laterally, between the seventh and eighth setigers in both sexes, centrally placed on a raised oval area in females. Heavy recurved copulatory hooks dorsally, between the eighth and ninth setigers, in males. Crotchets with well developed hoods, the main fang surmounted by a crest of three small teeth.

East coast Vancouver Island, dredged in 25 to 30 fathoms in mud. Alaska. Oregon. California. Strait of Magellan. Atlantic. Mediterranean. Arctic. Black Sea.

Genus **NOTOMASTUS** Sars

Prostomium with or without eyes. Thoracic region of twelve biannulate segments, of which eleven are setigerous and have capillary setae only. Definite branchiae present or absent, if present consisting of retractile or non-retractile processes on, or near, some of the abdominal ridges. Abdominal setae crotchets, with or without hoods, in both rami. Abdominal notopodia almost meeting dorsally in the more anterior segments and the neuropodia close to them. More posteriorly the rami well separated. Round, ciliated lateral organs between the parapodial rami. Distinct genital openings present or absent.

KEY TO SPECIES

- | | |
|--|-------------------|
| 1 (2) Crotchets without hoods. | giganteus |
| 2 (1) Crotchets with hoods. | |
| 3 (4) Notopodial and neuropodial setae on first setiger. | lineatus |
| 4 (3) No neuropodial setae on first setiger. | |
| 5 (6) Seventh to eleventh setigers light in colour. | variegatus |
| 6 (5) No such light colored region. | tenuis |

N. giganteus Moore. 34, 52.

The significant characters of this species, given in the first, and only, record of its occurrence are as follows. Length of only complete specimen 140 mm., width 7 mm. Prostomium a small rounded lobe with a minute conical palpode. Thoracic segments strongly biannulate, the anterior ring the shorter. Surface of the thorax areolated through the first six setigers, thereafter smoother and glandular and the segments shorter. Abdominal segments simple or obscurely biannulate, short and with ill-defined furrows. Neuropodial tori very long, not raised above surface. Notopodial tori raised and prominent, shorter than neuropodial and with fewer uncini. Branchiae "rather long inconspicuous folds". Crotchets without hoods (Moore describes a "depressed hood", but his figure indicates this to be a structural part of the crotchet itself). No eyes, nuchal organs, lateral organs, or genital pores are described.

Although known only from the original, somewhat incomplete, description this species is included here because it was recorded (52) from the Gulf of Georgia in 31 to 90 fathoms.

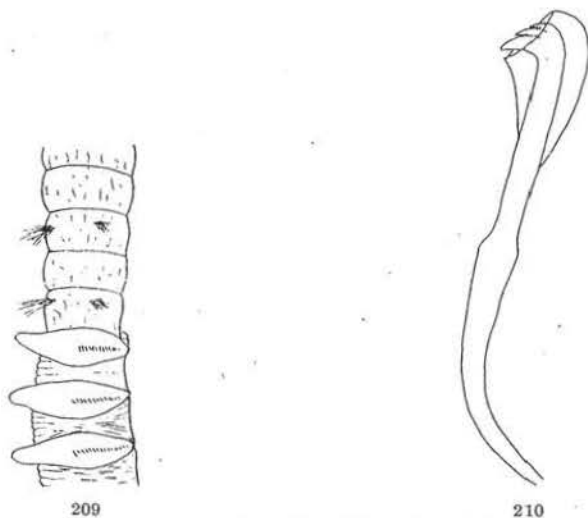


Fig. 209. *N. lineatus* Claparède, last two thoracic and first three abdominal setigers, lateral view.
Fig. 210. *N. lineatus* Claparède, crotchet.

N. lineatus Claparède. 23, 24, 34. (Figs. 209 and 210.)

Up to 150 mm. long, 3 mm. wide, but specimens known from Canadian Pacific region not more than 50 mm. long and 2 mm. wide. Prostomium an acute

cone with two patches of ocular specks and two large retractile nuchal organs at its base. First six to nine thoracic segments strongly areolated. Abdominal segments with well defined uncinigerous tori, the neuropodial extended upward, forming free lobes which function as branchiae. Crotchets with well developed hoods, bent shafts, and beaks surmounted by five small teeth. Genital openings in the intersegmental furrows following the eighth, ninth, and tenth thoracic setigers.

East coast Vancouver Island. California. Mediterranean. Antarctic.

N. variegatus Berkeley. 17.

No entire specimen known. Width across thorax about 1.5 mm. Prostomium a shallow, wide cone with a rather long, wide and blunt, palpode. No eyes or ocular specks. Nuchal organs present. Surface of peristomium and a few anterior setigers lightly areolated. Seventh to tenth setigers smooth and light (almost white) in colour and opaque. Transition from thorax to abdomen obscure. Coloration changes at eleventh setiger, but no crotchets appear until the twelfth; no alteration of width occurs at this point. No neuropodial setae on first setiger. No branchiae and no branchial expansions of parapodial rami. Lateral organs present, but no genital organs apparent. Crotchets hooded with a single main fang and four or five small teeth in crest.

West coast Vancouver Island, dredged in about 45 fathoms.

N. tenuis Moore. 34 (synonymy), 54.

Up to 200 mm. long, 0.8 mm. wide. Prostomium and thoracic region much as in *N. lineatus* except that the areolation of the thorax is less marked and the first setiger lacks neuropodial setae. Abdominal segments well defined, the neuropodia not extended, but, towards the posterior end the notopodia may become elevated and possibly perform a branchial function. Hooded crotchets similar to those of *N. lineatus*. No genital openings apparent.

East and west coasts Vancouver Island, littoral. Oregon. California.

Genus **HETEROMASTUS** Eisig

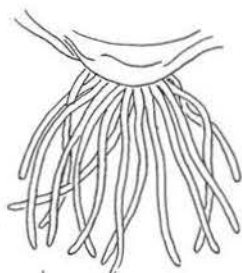
Thoracic region of twelve biannulate segments, of which eleven are setigerous; the second to the sixth with capillaries only, the seventh to the twelfth with crotchets with long stems. Filiform branchiae present or absent. Abdominal setae hooded crotchets with shorter shafts than those of the thorax. Lateral organs thoracic only or extending to the middle of the abdomen. Genital pores thoracic only.

H. filobranchnus Berkeley. 34. (Figs. 211 and 212.)

Up to 200 mm. long, 4 mm. wide. Prostomium small, conical, no eyes. First five segments of thorax lightly areolated, remainder smooth. Transition from thorax to abdomen sometimes obscure. Anterior abdominal segments with

numerous annular wrinklings, smoother towards the posterior end. All abdominal segments more or less campanulate. Branchiae filiform, placed dorsally just behind the notopodia, beginning at about the fifteenth abdominal segment as simple filaments and gradually increasing in number and length more posteriorly until sixteen or more in each bunch are present at about the twenty-fifth. This condition persists until near the anal end. Pygidium with a digitiform anal cirrus. Both thoracic and abdominal crotchets with a crest of three teeth in a row surmounting the main fang, the thoracic with elongate hoods. Lateral organs thoracic only.

East coast Vancouver Island, dredged in 15 to 50 fathoms. Washington. California.



211



212

Fig. 211. *H. filobranthus* Berkeley, branchia.

Fig. 212. *H. filobranthus* Berkeley, anal end.

PECTINARIIDAE (Amphictenidae)

Body short, conical, few segments, divided into three regions; the anterior (thoracic) consisting of the head, two achaetous segments with branchiae and three uniramous setigers; the median (abdominal) with almost entirely biramous setigers; and the posterior (scapha) in the form of a small, short, foliaceous terminal scoop, concave on the dorsal side, made up of rudimentary segments and folded beneath the abdomen. Prostomium indistinct, fused with the peristomium. These together produced to form a thin membranous lobe (tentacular membrane), with or without marginal papillae, beneath which there is a bunch of tentacular filaments. Posterior and dorsal to this a cephalic plate carries on its anterior edge a row of paleae arranged in two obliquely overlapping groups forming jointly an operculum which closes the mouth of the tube. The cephalic plate has a conspicuous posterior rim, which may be smooth or denticulate, and bears laterally two pairs of tentacular cirri. Notopodial setae all capillaries. Neuropodia pinnules bordered by uncini. A group of short acicular setae (scaphal hooks) on either side of the scapha near its junction with the median region.

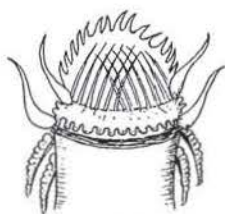
Genus **PECTINARIA** Lamarck

Tentacular membrane with marginal papillae. Rim of cephalic plate smooth

or toothed. A pair of pectinate branchiae on each of the two following segments. Scapha sharply separated from the median region. Capillaries of two kinds, the one straight and with smooth tip, the other bent terminally and the tip finely denticulate. Uncini with a single or several rows of major teeth. Tube sandy, tapered, straight or curved.

KEY TO SPECIES

- | | |
|---|------------------|
| 1 (2) Dorsal edge of cephalic plate toothed. (S-G. <i>Amphictene</i> .) | auricoma |
| 2 (1) Dorsal edge of cephalic plate smooth. | |
| 3 (4) Thirteen uncinigerous tori. (S-G <i>Pectinaria s. str.</i>) | belgica |
| 4 (3) Twelve uncinigerous tori. (S-G <i>Cistenides</i> .) | brevicoma |



213

Fig. 213. *P. auricoma* (Müller), head (after Fauvel).



214

Fig. 214. *P. auricoma* (Müller), scapha (after Fauvel).

P. (Amphictene) auricoma (Müller). 24. (Figs. 213 and 214.)

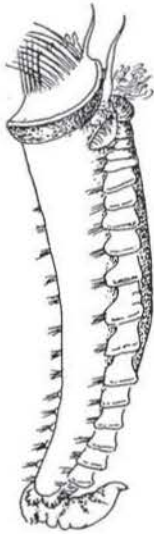
Up to 40 mm. long and 9 mm. wide across the anterior end; 17 segments with capillaries, 13 of these with uncini (one without uncini at the posterior end of the abdomen). Tentacular membrane with long marginal papillae. Cephalic plate strongly toothed on the dorsal edge, ten to fifteen flexible, recurved, golden paleae on each side. Scapha oval with an irregularly lobed border and a terminal, pointed, anal ligule. Uncini (as seen in profile) with five or six large teeth and a group of very fine ones. Scaphal hooks with recurved tips. Tube of fine sand, curved.

Recorded from the Nanaimo region, east coast Vancouver Island (53), but known to the authors from only a single example dredged in 80 to 90 fathoms off the west coast of Vancouver Island. Alaska. Atlantic. Arctic.

P. (Pectinaria) belgica (Pallas). 24, 29 (as *P. Californiensis*). (Figs. 215 to 217.)

Up to 70 mm. long. Setigers as in *P. auricoma* except that occasionally the capillaries are absent on one side of the last setiger. Tentacular membrane and paleae as in *P. auricoma*. Rim of cephalic plate smooth. Scapha oval, slightly lobed, the margin with or without minute papillae, the anal ligule blunt with the free edge sometimes crenulate. The scaphal hooks stout, the tips of the outermost sharply curved, the innermost almost straight. Uncini with two rows of major teeth, five to eight (usually five or six on Pacific coast) in each row and a group of fine ones. Tube of fine sand, straight.

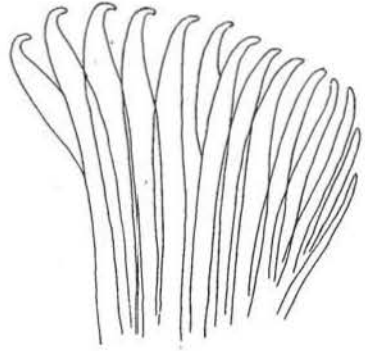
East coast Vancouver Island, dredged in 15 to 30 fathoms. West coast Vancouver Island, dredged in 18 to 68 fathoms. Queen Charlotte Islands. Alaska. Oregon. California. Atlantic.



215



216



217



218



219

- Fig. 215. *P. belgica* (Pallas) (after Malmgren).
 Fig. 216. *P. belgica* (Pallas), scapha.
 Fig. 217. *P. belgica* (Pallas), scaphal hooks.
 Fig. 218. *P. brevicoma* Johnson, uncinus.
 Fig. 219. *P. brevicoma* Johnson, tube.

***P. (Cistenides) brevicoma* Johnson.** 8, 29, 37. (Figs. 218 and 219.)

Up to 30 mm. long; 17 segments with capillaries, 12 of these with uncini (2 without uncini at the posterior end of the abdomen). Papillae of tentacular membrane heavy. Rim of cephalic plate smooth, nine to thirteen short, blunt, dull yellow paleae on each side. Scapha much as in *P. belgica*, the anal ligule heavy, projecting very little, the scaphal hooks short and heavy.

Uncini with a single row of four or five major teeth. Tube curved and constructed of coarse sand-grains, usually dark and light grains intermixed.

East coast Vancouver Island, littoral. West coast Vancouver Island, dredged in 80 to 90 fathoms and littoral. Jervis Inlet. Washington. California. Mexico.

SABELLARIIDAE

Body circular to subquadrangular in section, divided into four regions, widest anteriorly and tapered to the end of the abdominal region. Prostomium indistinct. Cephalic region mainly consisting of two heavy columns (peduncles), more or less fused, each terminating in a lobe with rows of much modified setae (paleae) which together form an operculum. Thoracic region of two short segments with capillaries only, followed by three or four segments with both capillaries and specialized setae; abdominal region with uncini in the notopodia, capillaries in the neuropodia; caudal region unsegmented, apodous and achaetous, uniform width throughout. Dorsal branchiae on most segments.

KEY TO GENERA

1 (2) Two rows of opercular paleae.

IDANTHYRSUS (p. 107)

2 (1) Three rows of opercular paleae.

SABELLARIA (p. 109)

Genus **IDANTHYRSUS** Kinberg

Opercular peduncles more or less separate, each with two rows of paleae. Heavy nuchal hooks dorsally. A pair of palps and a median tentacle. Numerous oral filaments on the ventral side of the peduncles. Thoracic region consisting of the first and second setigers each with a single bundle of fine capillaries and the third to the fifth setigers with notopodia in the form of rectangular plates bearing setae with flattened ends together with some capillaries, and neuropodia with capillaries only. Abdominal region with dorsal tori bearing pectinate uncini, the tori long in the more anterior setigers, shorter in the posterior ones, the neurosetae capillaries. Falciform dorsal branchiae.

I. armatus Kinberg. 61. (Figs. 220 to 222.)

Up to 60 mm. long over the caudal region. Up to twelve opercular paleae in the inner row on each peduncle; up to thirty in the outer row. The former heavy and smooth tapering to acute tips, the latter relatively slender and barbed, slightly curved in both cases. A row of papillae exterior to the outer paleae. Oral filaments conspicuous, behind these a pair of palps and between the palps a single tentacle. Capillaries of the first and second setigers finely pinnate. Specialized notosetae of the third to the fifth setigers with flattened, paddle-shaped ends terminating in fine hairs, neurosetae finely pinnate capillaries. Abdominal uncini pectinate, with eight or nine teeth; neurosetae long barbed capillaries. Coloration, as preserved, light brown with darker patches, the paleae golden. Tubes constructed of coarse sand-grains firmly cemented together.

East coast Vancouver Island, dredged in 10 to 25 fathoms. West coast Vancouver Island, dredged in about 30 fathoms and littoral. Alaska. Japan. S. America. Panama. Mexico. California.

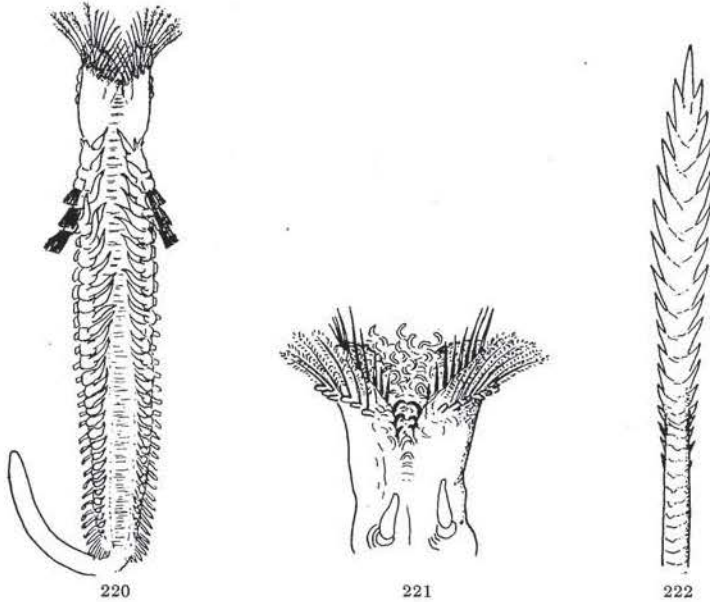


Fig. 220. *I. armatus* Kinberg (after Okuda).

Fig. 221. *I. armatus* Kinberg, head, dorsal view (after Ehlers).

Fig. 222. *I. armatus* Kinberg, outer opercular palea (after Okuda, modified).

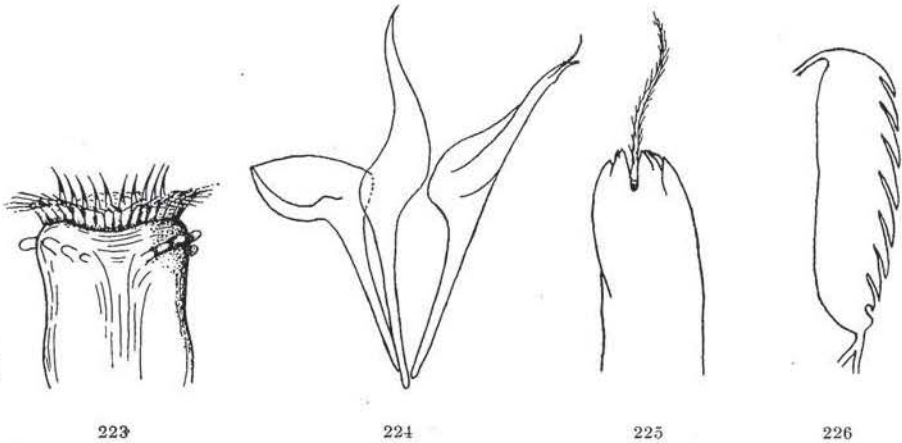


Fig. 223. *S. cementarium* Moore, head, dorsal view.

Fig. 224. *S. cementarium* Moore, paleae in relative positions (after Moore).

Fig. 225. *S. cementarium* Moore, tip of outer palea.

Fig. 226. *S. cementarium* Moore, uncinus.

Genus **SABELLARIA** Lamarck

Opercular peduncles more or less fused, each apparently with three rows of paleae, (actually there are only two rows, but the paleae of the inner row are so arranged as to make it look double). Due to the approximation of the opercular lobes the paleae of the two sides together form concentric circles. No nuchal hooks. Otherwise as *Idanthyrus*.

S. cementarium Moore. 52, 61. (Figs. 223 to 226.)

Up to 80 mm. long, 6 mm. wide at the widest point. On each opercular lobe up to thirty-five paleae in the outer row, up to sixteen in the median row, and up to fifteen in the inner. The paleae all hard, stout and rigid with slender elongated stems and heavy irregular blades. Those of the outer row have each a massive twisted base extending into a flattened projection terminating in a fringed tip with a prolonged, finely hairy central process. Those of the median row, also have each a thickened base, which is produced into a prominent, upright spine with an acute tip. Those of the inner row are spoon-shaped, deeply concave and shorter than the paleae of the median row. Mouth small, oral filaments fine and closely grouped. Other characters much as in *Idanthyrus armatus*. Coloration in life striking, thoracic region rich brown with dark violet purple round the mouth and the oral filaments, the outer opercular paleae golden, the others a rich golden brown. Little but the colour of the paleae remains in preserved specimens. Tubes thick and hard, constructed of sand firmly cemented; usually encrusting rocks.

East coast Vancouver Island, usually dredged in 10 to 20 fathoms, occasionally littoral. West coast Vancouver Island, dredged in 25 to 45 fathoms. Oregon. California. Alaska. Japan.

SABELLIDAE

Body elongate and tapered, or fusiform, divided into two distinct regions. Prostomium small and indistinct. Peristomium with the mouth terminal and with two fleshy, membranous, or filiform palps. It bears a pair of branchial lobes more or less surrounding the mouth and is often folded into an entire or lobed collar which, excepting a break mid-dorsally, surrounds the base of the branchial lobes. The branchial lobes may be semi-circular or spiral and terminate anteriorly in a more or less complex system of filaments bearing rows of barbules, the branchiae thus forming a conspicuous terminal plume. Thoracic region of body consisting of a few segments with dorsal rami represented by bundles of simple setae and ventral rami by uncinigerous tori; the abdominal region usually of relatively many segments having the positions of the two kinds of setae reversed (i.e. the uncinigerous tori dorsal, the simple setae ventral). A median ciliated faecal groove runs the whole length of the body, ventral in the abdominal region and crossing to the dorsal surface in the thoracic region. Simple setae may have

blades of various widths or spatulate or sub-spatulate terminations. Uncini are generally avicular and usually accompanied by specialized pennoned setae, but both are sometimes replaced by long-stemmed crotchets. Otocysts sometimes present on the first setiger. Pygidium with terminal anus with or without papillae, sometimes with eyes. Always tubiculous, the tubes usually horny, parchmenty, muddy or sandy, sometimes ornamented with broken shell or other debris.

KEY TO GENERA

- | | |
|---|---------------------------------|
| 1 (2) Branchial filaments with subterminal eyes. | BRANCHIOMMA (p. 110) |
| 2 (1) Branchial filaments without subterminal eyes. | |
| 3 (16) Thoracic neuropodia with avicular crotchets and pennoned setae. (Fig. 233.) | |
| 4 (7) Branchial lobes spiral. | |
| 5 (6) Inferior notosetae subspatulate. (Fig. 232.) | DISTYLIA (p. 111) |
| 6 (5) Inferior notosetae spatulate. (Fig. 235.) | EUDISTYLIA (p. 112) |
| 7 (4) Branchial lobes not spiral. | |
| 8 (9) Thoracic notopodia having setae with elongated blades only. (Fig. 231.) | SABELLA (p. 114) |
| 9 (8) Thoracic notopodia with both setae with elongate blades and spatulate or subspatulate ones. | |
| 10 (13) Collar two lobed. | |
| 11 (12) Collar with ends separated dorsally. | DEMONAX (p. 115) |
| 12 (11) Collar with ends in contact. | POTAMILLA (p. 115) |
| 13 (10) Collar four lobed. | |
| 14 (15) Branchial filaments unbranched. | PSEUDOPOTAMILLA (p. 116) |
| 15 (14) Branchial filaments dichotomously branched. | SCHIZOBRANCHIA (p. 117) |
| 16 (3) Thoracic neuropodia with long-stemmed crotchets only. (Fig. 243a.) | |
| 17 (18) Uncinigerous tori not well defined; uncini almost completely encircling abdomen. | MYXICOLA (p. 118) |
| 18 (17) Uncinigerous tori well defined and short. | |
| 19 (20) Branchial filaments free. | FABRICIA (p. 119) |
| 20 (19) Branchial filaments united by a membrane. | |
| 21 (22) With a ventral anal depression. | EUCHONE (p. 121) |
| 22 (21) With no ventral anal depression. | CHONE (p. 122) |

Genus **BRANCHIOMMA** Kölliker (Claparède *char. emend.*).

Body elongate. Collar of two or four lobes. Branchial lobes symmetrical, equal, semicircular, with one or more filaments on each side bearing a large subterminal compound eye. Notosetae in thorax and neurosetae in abdomen all bladed with blades of various widths. Spatulate or subspatulate setae sometimes present in the thorax of young forms. Neurosetae in thorax avicular crotchets accompanied by pennoned setae. Notosetae in abdomen avicular crotchets only.

B. burrardum Berkeley. 9. (Figs. 227 to 229.)

Up to 170 mm. long and 7 mm. wide. Branchial filaments (eighteen to twenty-five on each lobe) with stout bases and barbules within about 1 mm. of

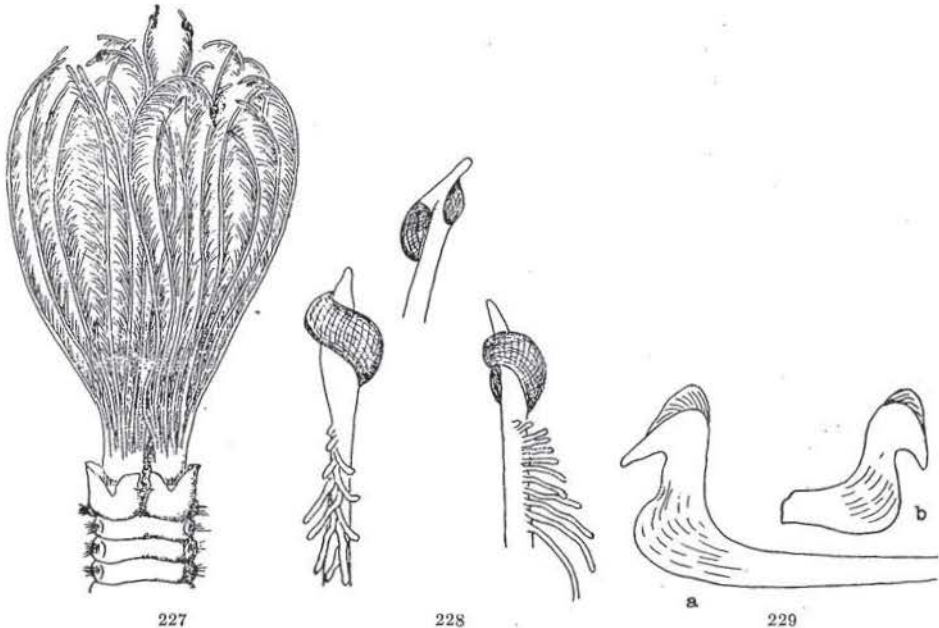


Fig. 227. *B. burrardum* Berkeley, anterior region.

Fig. 228. *B. burrardum* Berkeley, tips of branchial filaments with eyes.

Fig. 229. *B. burrardum* Berkeley, uncini, (a) thoracic (b) abdominal.

the tip. Two to four of these on each side (the most dorsal) bear large subterminal eyes. The eyes are sausage-shaped, deep red, and curled round the filament spirally. Collar four-lobed, high at the sides and mid-dorsally, the notch between the lateral and dorsal lobes being more dorsal than lateral. Eight thoracic setigers. Uncini as shown in figures. Coloration in life a light orange, somewhat deeper and redder in the anterior dorsal region; the branchial filaments honey-coloured with about four bands of rose and touches of white pigment, the latter most conspicuous on the filaments bearing the eyes. Tubes parchmenty covered with sand, ending in a conical point into which the anal end of the occupant fits.

East coast Vancouver Island, dredged in 25 to 60 fathoms. West coast Vancouver Island in about 90 fathoms. Burrard Inlet and Princess Louise Inlet, B.C., in about 20 fathoms. California.

Genus **DISTYLIA** Quatrefages

Body subcylindrical. Collar of two lobes. Branchial lobes rolled spirally, the filaments with or without eye-spots. First setiger with bladed setae only. Some of notosetae in remaining thoracic setigers similar to these, the remainder being subspatulate. Thoracic neuropodia with avicular uncini accompanied by pennoned setae. Abdomen with avicular uncini in the notopodia, bladed setae in the neuropodia.

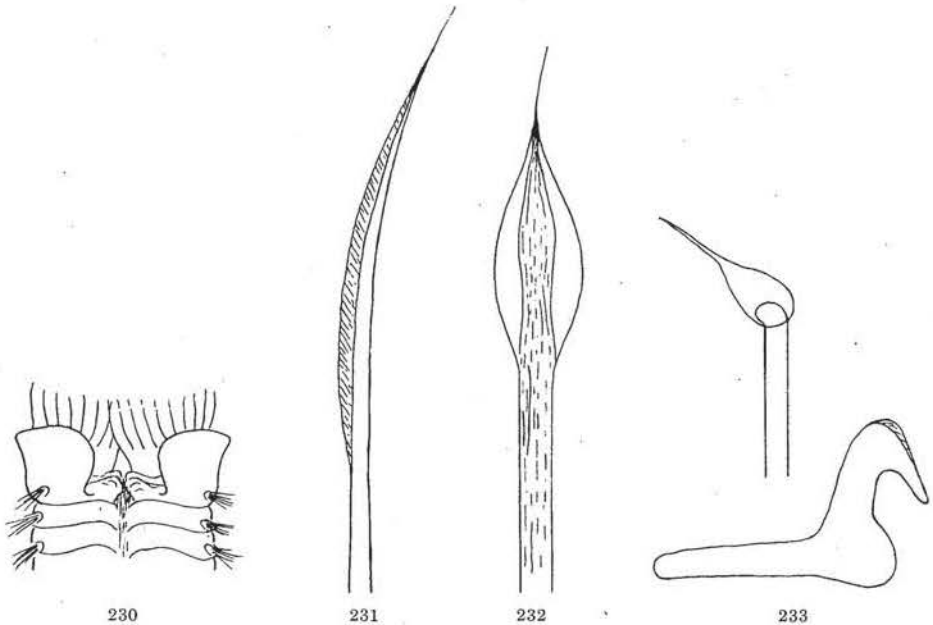


Fig. 230. *D. rugosa* Moore, anterior region (ends of branchial filaments removed).
 Fig. 231. *D. rugosa* Moore, superior thoracic notoseta.
 Fig. 232. *D. rugosa* Moore, inferior thoracic notoseta.
 Fig. 233. *D. rugosa* Moore, thoracic uncinus and pennoned seta.

***D. rugosa* Moore. 47, 54. (Figs. 230 to 233.)**

Up to 110 mm. long and 11 mm. wide. Branchial lobes coiled spirally about one and a half turns. Branchial filaments numerous (up to sixty or seventy on each lobe). Eye-spots may be present in large numbers very irregularly distributed and may be more or less well defined or mere specks and dashes of pigment, or they may be entirely absent. Collar thick and flaring, two-lobed, the dorsal opening wide, the ventral ends not produced. Eight thoracic setigers. Setae as described for the genus. Coloration as preserved grey to dark brown, occasionally with darker inter-segmental bands; the branchial filaments very variable, usually mottled with dark brown on a lighter base. Tubes horny, semi-transparent, lightly coated with sand.

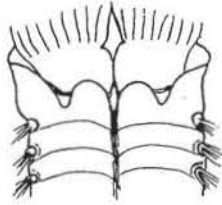
East and west coasts Vancouver Island, littoral. California.

Genus **EUDISTYLIA** Bush

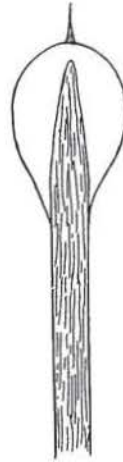
As *Distyilia* except that the collar is four-lobed and the subspatulate notosetae are replaced by spatulate ones.

KEY TO SPECIES

- 1 (2) First few uncinigerous tori of abdomen as long as (or longer than) those of thorax. **vancouveri**
- 2 (1) First few uncinigerous tori of abdomen shorter than those of thorax. **polymorpha**



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Fig. 234. *E. vancouveri* (Kinberg), anterior region (ends of branchial filaments removed).
 Fig. 235. *E. vancouveri* (Kinberg), inferior thoracic notoseta.

E. vancouveri (Kinberg). 27, 57 (as *E. gigantea*). (Figs. 234 and 235.)

Up to at least 480 mm. long and 18 mm. wide. Body very robust. Branchial lobes rolled spirally through about two and a half turns. Branchial filaments very numerous (up to one hundred and fifty or so on each lobe) with four to eight transverse pigment bands of alternating dark green and maroon. Occasionally a few of the filaments are split at the ends. Eye-spots usually present, but very irregularly distributed. Collar four-lobed, the dorsal lobes short but well defined and divided by a wide cleft from the laterals which rise by a steep incline to end ventrally in wide triangular points. Eight thoracic setigers. The thoracic notopodia, as seen laterally, forming a more or less oblique line, the most anterior being the most dorsal. Setae as described for the genus. Coloration, as preserved, a dull buff, the maroon bands of the branchial filaments remaining, but the green bands fading to a tawny shade. Tubes of large individuals thick, heavy and of a rubbery consistency, though not elastic; dark brown, free from shell and sand and cylindrical at the upper end, more or less compressed, more lightly coloured, and coated with sand and debris at the lower end. Smaller individuals in thinner tubes coated with sand.

Sparsely distributed at low-tide mark amongst rocks on both coasts of Vancouver Island. Common in colonies of large individuals near Brockton Point, Vancouver. Queen Charlotte Islands, (colonies of small individuals). Alaska. Oregon. California.

E. polymorpha (Johnson). 17 (synonymy).

Up to 170 mm. long and 12 mm. wide. Branchial lobes rolled spirally two to two and a half times. Branchial filaments not very numerous (up to about forty on each lobe) with many well defined eye-spots. Collar much as in *E.*

vancouveri, but the lateral lobes not very sloping and the ventral ends with less wide triangular points. Eight thoracic setigers. The thoracic notopodia all strictly lateral and at one level. Setae as *E. vancouveri*. Coloration, as preserved, a greyish brown with darker thoracic region and collar, the branchial filaments maroon to brown (sometimes in alternating bands) with lighter distal ends. In life the parapodia and the ventral surface are white and the branchial filaments a rich claret red, sometimes with touches of white, lighter terminally. Tubes tough, grey to light brown, fairly thin, parchmenty and opaque.

East coast Vancouver Island, littoral. West coast Vancouver Island, dredged in about 250 fathoms. Alaska. California.

Genus **SABELLA** Linné

Body usually long and attenuate. Branchial lobes semicircular, the filaments usually with eye-spots. First setiger with bladed setae only. Remaining thoracic setigers with bladed setae in notopodium and avicular uncini, accompanied by pennoned setae, in neuropodium. Abdominal setigers with avicular uncini in notopodium, bladed setae in neuropodium.

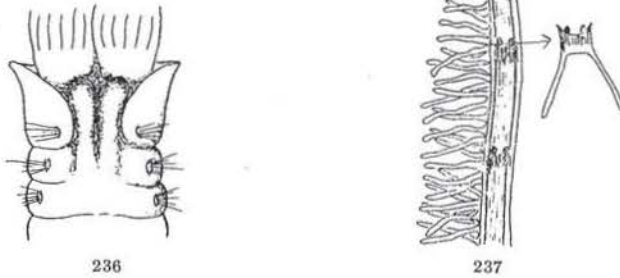


Fig. 236. *S. crassicornis* Sars, anterior region (ends of branchial filaments removed).
Fig. 237. *S. crassicornis* Sars, tip and cross-section of branchial filament.

S. crassicornis Sars. 18 (as *S. elegans*), 31 (synonymy), 36 (synonymy).
(Figs. 236 and 237.)

Up to 50 mm. long and 4 mm. wide. Branchial filaments with grooved outer sides bounded by sharp longitudinal ridges and with two to eight pairs of eye-spots in the grooves of each. In the region of the eye-spots the filaments

are regularly banded with maroon pigment and are united at the base by a low, frail membrane. Palps long, slender and canaliculate, with their bases widened into small, triangular membranes. Collar consisting of two lateral lobes, each weakly divided by a shallow median notch, widely separated dorsally. A pair of longitudinal rounded ridges extend along the dorsum from the second setiger, through the dorsal opening of the collar, to the branchial lobes. Eight thoracic setigers. Interramal eye-spots well defined towards the posterior end. Setae as described for the genus, the abdominal bladed setae being somewhat longer and more slender than the thoracic and the uncini somewhat smaller. Tubes membranous, covered with fine mud or shelly sand.

East and west coasts Vancouver Island, dredged in 25 to 230 fathoms. Alaska. California. Atlantic. Arctic.

Genus **DEMONAX** Kinberg (*Johansson char. emend.*).

Branchial lobes semicircular, the filaments without eye-spots. Collar two-lobed, the ends widely separated dorsally. First setiger with slender bladed setae only. Notopodia of remaining thoracic setigers with similar bladed setae and some (the most inferior) subspatulate. Thoracic neuropodia with avicular crotchets and pennoned setae. Only avicular crotchets in abdominal notopodia and slender bladed setae in neuropodia.

D. medius (Bush). 18 (as *Parasabella*), 31 (as *Sabella*).

Length up to at least 110 mm., breadth up to 6mm. Branchial filaments few (about twenty on each lobe), with more or less convex outer sides and no eye-spots. Palps triangular folded membranes extended forward into canaliculate processes. Collar thin and soft, two lobed, the lobes sometimes slightly notched, each lobe ending in a bluntly rounded lappet ventrally. Eight thoracic setigers. Interramal eye-spots in abdominal region, distinguishable, but not very clearly defined. Setae as described for the genus. Anterior dorsal region and branchiae usually marked with irregular patches of russet to chestnut pigment, but this pigmentation may be faint or absent. Tubes thin, horny, translucent, little sand.

East coast Vancouver Island, dredged in about 25 fathoms. West coast Vancouver Island, just below low tide mark. Alaska. Oregon. California. Japan.

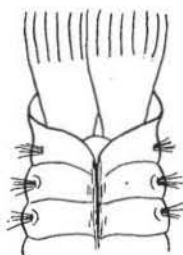
Genus **POTAMILLA** Malmgren

Branchial lobes semicircular, not spiral, the filaments with or without eye-spots. Collar two-lobed. First setiger with bladed setae only. Some notosetae of remaining thoracic setigers similar to these, the rest spatulate or subspatulate. Thoracic neuropodia with avicular crotchets and pennoned setae. Abdominal notosetae avicular crotchets, neurosetae bladed.

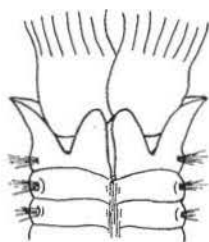
P. neglecta (Sars). 14 (as *P. torelli*), 36. (Fig. 238.)

Up to 60 mm. long, but the only specimens known from the Canadian Pacific region much shorter. Body thin, flattened, fragile. Branchial filaments few (eight to eighteen on each lobe). No eyes or eye-spots. Collar only slightly sloping, the dorsal ends vertical and almost meeting, the ventral ends extended into triangular points. Five to eight thoracic setigers. Setae as described for the genus, spatulate or subspatulate (according to age) in all but the first thoracic notopodia. Coloration in life reddish to brown, the branchial filaments variable, often with narrow, transverse, brown bands. No colour remains in preserved specimens.

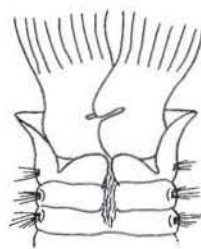
West coast Vancouver Island in fragile tubes embedded in the walls of the tubes of *Idanthyrus armatus* Kinberg, collected littorally at low tide mark. Alaska.



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Fig. 238. *P. neglecta* (Sars), anterior region (ends of branchial filaments removed).

Fig. 239. *Ps. reniformis* (Leuckhart), anterior region (ends of branchial filaments removed).

Fig. 240. *Ps. ocellata* Moore, anterior region (ends of branchial filaments removed).

Genus **PSEUDOPOTAMILLA** Bush

As *Potamilla* except that the collar is four-lobed.

KEY TO SPECIES

1 (2) Dorsal edge of branchial lobes entire.

reniformis

2 (1) Dorsal edge of branchial lobes deeply cleft.

occelata

Ps. reniformis (Leuckhart). 14, 24 (as *Potamilla*). (Fig. 239.)

Up to 100 mm. long and 2 mm. wide. Branchial filaments few (ten to fifteen on each lobe) with one to four eyes, usually large, on some of them (the more dorsal). Collar with high dorsal lobes nearly meeting, lateral lobes starting at about the same height and extended ventrally into long triangular flaps. Seven to twelve thoracic setigers. Thoracic spatulate setae wide and with short, fine, mucrons. Avicular crotchets in the most posterior thoracic neuropodia with long base and striated vertex. Coloration in life orange to brick red, the branchial filaments variable, often banded with rich wine red. Little colour remains in preserved specimens. Tube horny, transparent, sometimes coated with fine sand and often rolled at the orifice when the occupant is withdrawn.

East coast Vancouver Island, littoral and dredged in 30 to 60 fathoms. West coast Vancouver Island, littoral. Alaska. Japan. Atlantic. Mediterranean. Arctic.

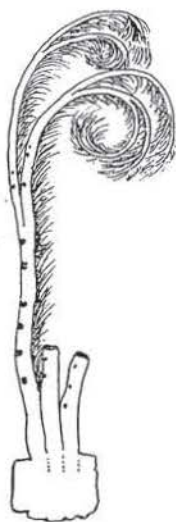
Ps. ocellata Moore. 27 (synonymy), 49. (Fig. 240.)

Up to 150 mm. long. The dorsal edge of the branchial base deeply cleft, the lobes thus formed overlapping. Seventeen to twenty-four branchial filaments on each lobe, all with large dark eyes. There may be up to twelve eyes on the more dorsal filaments, fewer on the ventral ones. Collar with broad, low dorsal lobes and relatively high and flaring lateral lobes terminating ventrally in pointed processes. Seven to eleven thoracic setigers. Setae as in *Ps. reniformis*. Coloration generally brown to colourless, the branchial filaments with two or three bands of rich purplish brown which may be merged into a wide coloured area in the region of the eyes. Tubes horny, translucent, often in groups.

East and west coasts Vancouver Island, both littoral and dredged in moderate depths (10 to 30 fathoms). Alaska. Oregon. California.

Genus **SCHIZOBRANCHIA** Bush

As *Pseudopotamilla* except that the branchial filaments are dichotomously branched.



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Fig. 241. *S. insignis* Bush, branchial filament.

S. insignis Bush. 17, 18, 35. (Fig. 241.)

Up to 165 mm. long. Branchial filaments dichotomously branched once to five times. Numerous black eye-spots on most filaments arranged in single

rows and largely confined to the basal half. Collar with high dorsal lobes. Lateral lobes about the same height and ending ventrally in projections; these flaring except in specimens fixed in their tubes. Five to ten thoracic setigers (most usually six to eight). Coloration, as preserved, fawn to red-brown with maroon to almost colourless branchial filaments. A very variable species. Tubes thick-walled, clear, horny, and solitary; or thinner, coated with sand and in clusters.

East coast Vancouver Island, littoral and dredged in 10 to 25 fathoms. West coast Vancouver Island, littoral. Queen Charlotte Islands, littoral. Alaska. Oregon.

Genus **MYXICOLA** Koch

Body elongate, fusiform, thick. Branchial lobes semi-circular, not spiral. Branchial filaments without eye-spots and united for the greater part of their length by a well developed membrane. Collar low and inconspicuous. First setiger with bladed setae, other thoracic setigers with setae similar to these in the notopodium, crotchets with long stems in the neuropodium. Abdominal notosetae avicular uncini nearly encircling the body; bladed setae in the neuropodium.

KEY TO SPECIES

- | | |
|--|---------------------|
| 1 (2) One to four thoracic setigers. | aesthetica |
| 2 (1) Eight or nine thoracic setigers. | infundibulum |

M. aesthetica (Claparède). 24. (Figs. 242 and 243.)

Up to 40 mm. long and 3 mm. wide. Five to fourteen branchial filaments on each lobe united by a membrane for about two-thirds of their length, the remainder being free, but bordered by an extension of the membrane. When the branchiae approximate the plume forms a funnel which is smooth externally, but thickly coated with the long, fine barbules of the filaments internally. The reduced collar is represented by two low dorsal lobes separated from each other by only a slight groove and a single, triangular, ventral one. One to four thoracic setigers. Setae as described for the genus. Three to eight long stemmed crotchets in each thoracic neuropodium unidentate or with a small secondary tooth. Abdominal uncini very small, with short bases and prominent beaks, each with a single apical tooth. Abdominal bladed setae very fine and frail and often lacking towards the anal extremity. One or more eye-spots laterally, behind the parapodia, on each abdominal segment and often a row on the pygidium. Tube mucous, easily vacated and reoccupied by the animal; often in colonies. Coloration very variable in life. As preserved little colour remains except a slight suffusion of brown pigment in the thoracic region and the lower part of the branchiae in some specimens.

East coast Vancouver Island, littoral and dredged in 20 to 30 fathoms. West coast Vancouver Island, littoral. Alaska. California. Atlantic. Mediterranean.

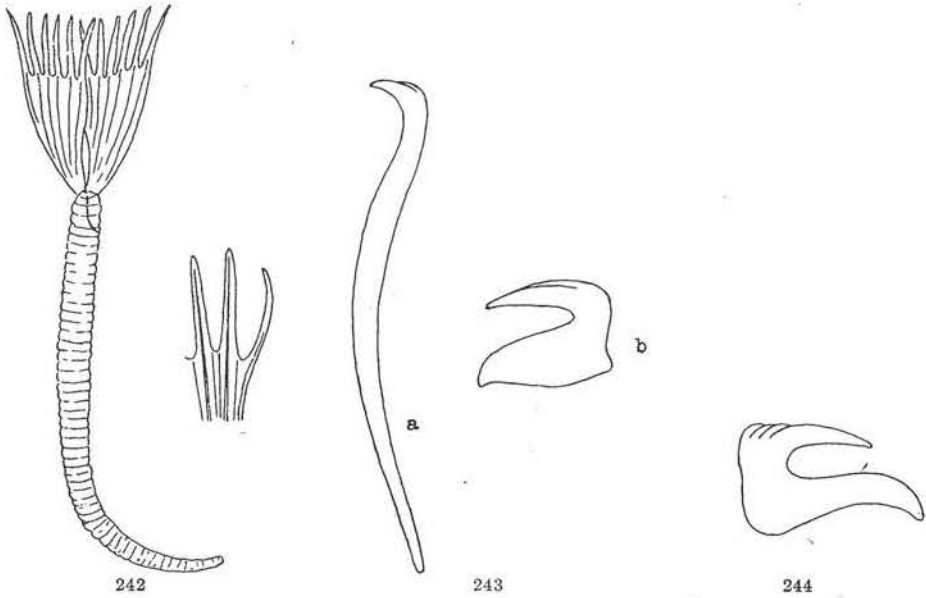


Fig. 242. *M. aesthetica* (Claparède) (after Fauvel, modified).

Fig. 243. *M. aesthetica* (Claparède), (a) thoracic crotchet (b) abdominal uncinus.

Fig. 244. *M. infundibulum* (Rénier), abdominal uncinus.

M. infundibulum (Rénier). 24, 35 (synonymy). (Fig. 244.)

Differs from *M. aesthetica* mainly in size (recorded up to 20 cm. in length) and as indicated in key. There may be as many as forty branchial filaments on each lobe. The abdominal uncini have a longer base and one to three apical teeth.

Widely distributed, but hitherto known from western Canada by only a single specimen taken littorally on the west coast of Vancouver Island. Alaska. California. Atlantic. Mediterranean. Arctic.

Genus **FABRICIA** Blainville (Berkeley *char. emend.*)

Body very small, slightly flattened. Few segments. Branchial lobes semi-circular, not spiral. Branchial filaments with no eye-spots and no uniting membrane. Collar absent or developed in varying degree. First setiger with narrow bladed setae only. Subsequent thoracic setigers with bladed setae, sometimes accompanied by subspatulate setae, in the notopodium, crotchets with long stems in the neuropodium. Abdominal notosetae short or elongate uncini, bladed capillaries in the neuropodium.

KEY TO SPECIES

- | | |
|--|-----------------|
| 1 (2) Abdominal uncini short. | minuta |
| 2 (1) Abdominal uncini elongate. | |
| 3 (4) Collar represented by a ventral lobe only. | sabella |
| 4 (3) Collar completely surrounding the branchial lobes. | pacifica |

F. minuta Berkeley. 10. (Figs. 245 and 246.)

About 1 mm. long, 0.1 mm. wide. Eleven to thirteen setigers of which eight are thoracic. Two branchial filaments on each lobe with few barbules. No peristomial collar. A pair of peristomial eyes. Pygidium with two eye-spots. Thoracic notosetae, after the first setiger, of two kinds, one with slender blades, the others subspatulate. Thoracic neurosetae strongly bent crotchets with long manubria and terminating in one large tooth and a crown of three or four smaller ones. Abdominal uncini square in outline with a long beak pointing downwards and the termination of the base pointing upwards more or less meeting the beak. West coast Vancouver Island, littoral.

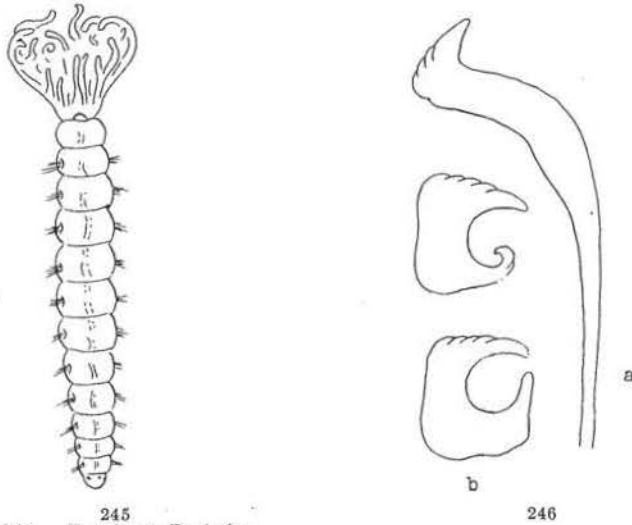


Fig. 245. *F. minuta* Berkeley.
 Fig. 246. *F. minuta* Berkeley, (a) thoracic crotchet (b) abdominal uncini.

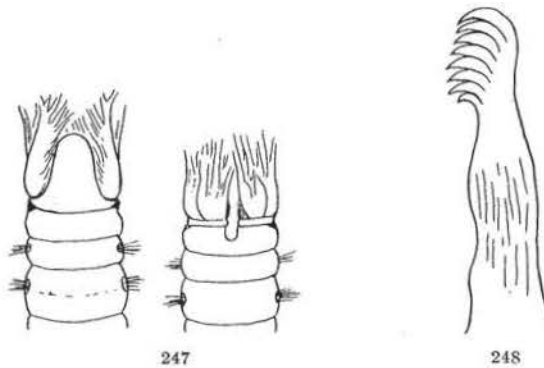
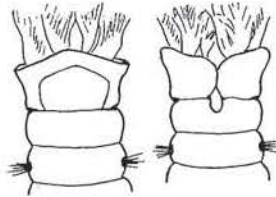


Fig. 247. *F. sabella* (Ehrenberg), anterior region, dorsal and ventral views (ends of branchial filaments removed).
 Fig. 248. *F. sabella* (Ehrenberg), abdominal uncinus.

F. sabella (Ehrenberg). 9, 24. (Figs. 247 and 248.)

Up to 3 mm. long, 0.25 mm. wide. Eleven setigers, of which eight are thoracic. Three branchial filaments on each lobe with only a few barbules, the basal longer than the distal. Collar represented by a single, long ventral lobe. A pair of peristomial eyes laterally placed. Pygidium with dorsal anus and two eye-spots. Thoracic notosetae, after the first setiger, with slender blades, except the most ventral one or two which may have shorter and broader blades with very long tips. Thoracic crotchets with long bent stems widening at the distal end and bearing a single large tooth and a crown of three or four smaller ones. Abdominal uncini with long manubria and pectiniform terminations with six or seven coarse teeth. Tube mucous, often muddy, easily vacated by the occupant. Coloration yellowish in life; colourless as preserved.

East and west coasts Vancouver Island, littoral. N. Atlantic. Arctic. Mediterranean.



249

Fig. 249. *F. pacifica* Berkeley, anterior region, dorsal and ventral views (ends of branchial filaments removed).

F. pacifica Berkeley. 17. (Fig. 249.)

Exactly as *F. sabella* (Ehrenberg) except in the possession of a high, well developed, peristomial collar deeply incised on the dorsal side. Occurring together with *F. sabella*.

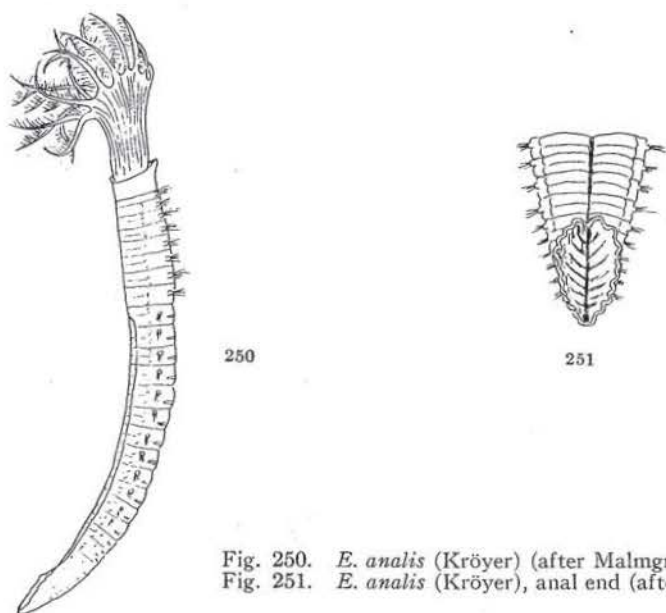
East coast Vancouver Island.

Genus **EUCHONE** Malmgren

Body more or less cylindrical, tapered at posterior end to a wide ventral anal depression. Branchial lobes semi-circular, not spiral. Branchial filaments without eye-spots, united for a large part of their length by a membrane. Cirriform intrabranial filaments present. Collar and otocysts present. Bladed setae in first setiger. Similar setae, with or without subspatulate ones, in subsequent thoracic notopodia, crotchets with long manubria in thoracic neuropodia. Abdominal notosetae avicular uncini; slender bladed setae in neuropodium.

E. analis (Kröyer). 41. (Figs. 250 and 251.)

Up to 37 mm. long, 3.5 mm. wide. About forty setigers, of which eight are thoracic. About ten branchial filaments on each lobe, united by a membrane

Fig. 250. *E. analis* (Kröyer) (after Malmgren).Fig. 251. *E. analis* (Kröyer), anal end (after Malmgren).

for about two-thirds of their length. Branchial barbules long and slender. About ten intrabranchial tentacular filaments with no barbules. Collar two-lobed, the lobes well developed and of uniform height, a wide opening dorsally and a shallow incision ventrally. Anal depression a wide extension of the faecal groove extending over the ten or twelve most posterior setigers, bordered by a high sinuous membrane. Thoracic notopodium, after the first setiger, with long and short bladed setae and some spatulate. Remaining setae as described for the genus. Tube usually very frail, sandy. No coloration as preserved.

East coast Vancouver Island, dredged in 10 fathoms. Alaska. N. Atlantic.

Genus **CHONE** Kröyer

Body more or less cylindrical, tapered at posterior end, but with no anal depression. Branchial lobes semi-circular, not spiral. Branchial filaments without eyes and united by a membrane. Cirriform intrabranchial filaments present or absent. Collar well developed. Bladed setae in first setiger. Similar blades, together with spatulate setae, in notopodium of remaining thoracic setigers; crotchets with long manubria in neuropodium. Abdominal uncini short; neurosetae bladed capillaries, usually geniculate.

KEY TO SPECIES

- | | |
|--|--------------------------|
| 1 (2) More than ten branchial filaments on each lobe. | infundibuliformis |
| 2 (1) Less than ten branchial filaments on each lobe. | |
| 3 (4) Branchial filaments with long, bare, linear tips. | gracilis |
| 4 (3) Branchial filaments with short, flattened tips obscured by the barbules. | ecaudata |

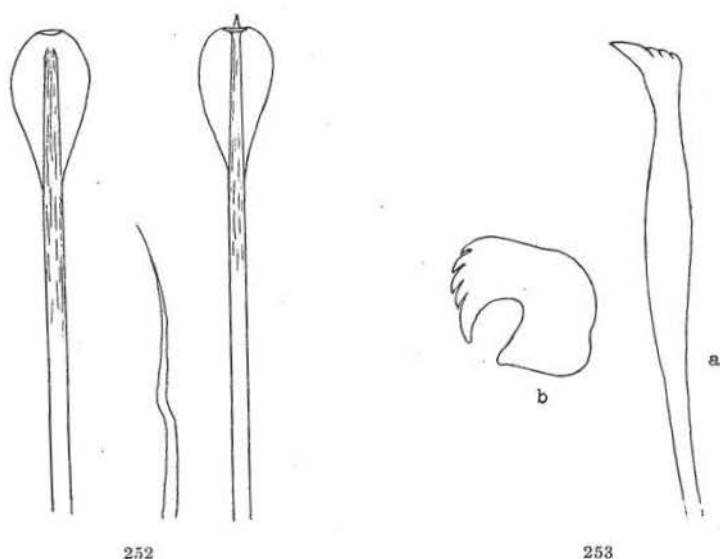


Fig. 252. *C. infundibuliformis* Kröyer, spatulate setae and associated geniculate seta.
 Fig. 253. *C. infundibuliformis* Kröyer, (a) thoracic crotchet (b) abdominal uncinus.

***C. infundibuliformis* Kröyer. 24. (Figs. 252 and 253.)**

Up to 120 mm. long and 6 mm. wide, but those known from Canadian Pacific waters much smaller. Fifty to ninety setigers, of which eight are thoracic. Twelve to thirty-six branchial filaments on each lobe with more or less foliaceous bare tips bordered by extensions of the branchial membrane which unites the filaments for about three quarters of their height. Some intrabranchial filaments without barbules present. Collar high, straight (i.e. not oblique) and entire ventrally, deeply incised on the dorsal side. Thoracic notopodium, after the first setiger, with setae of three kinds; narrow bladed, spatulate (with or without short mucrons), and fine geniculate setae associated with the latter. Remaining setae as described for the genus. Tube membranous, more or less incrustated with sand or mud. Coloration orange-red or greenish with yellowish branchiae; often most of the colour lost on preservation.

West coast Vancouver Island, littoral. Queen Charlotte Islands. California. Alaska. Atlantic. Arctic.

***C. gracilis* Moore. 52. (Fig. 254.)**

Up to 32 mm. long and 2 mm. wide. Canadian Pacific specimens only about a third this size. Thirty to sixty setigers, of which eight are thoracic. Six to ten branchial filaments on each lobe with long, bare tips, the filaments united by a

membrane for only half, or less, of their height. Collar as in *C. infundibuliformis*. Setae very similar to those of the latter species except that the spatulate-ended ones in the thoracic notopodia have long, slender mucrons. No colour remains in preserved specimens. Tubes nearly transparent.

East and west coasts Vancouver Island, littoral. Alaska.

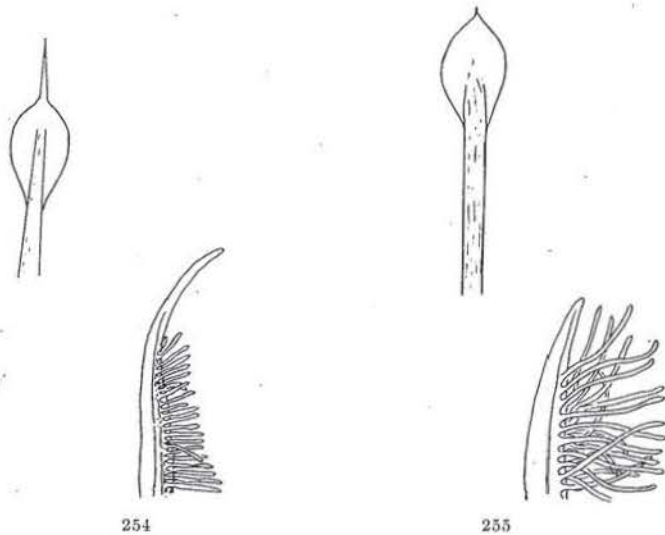


Fig. 254. *C. gracilis* Moore, tip of spatulate seta (after Moore) and tip of branchial filament.
Fig. 255. *C. ecaudata* (Moore), tip of spatulate seta and tip of branchial filament.

C. ecaudata (Moore). 17, 32, 56 (as *Jasminiera*). (Fig. 255.)

Up to 14 mm. long; the branchial plume about a quarter of the entire length. About thirty setigers, of which eight are thoracic. Seven to nine branchial filaments on each lobe with flattened, bare tips, united by a very delicate membrane extending over half their length, the barbules very long, the terminal barbules long enough to cover the tips. The branchial membrane is often broken and not easily seen in preserved specimens. Collar fairly high and slightly undulate, otherwise as in the foregoing species. The thoracic spatulate setae with mucrons of moderate length and the abdominal neurosetae straight, only slightly bladed, capillaries. Other setae as described for the genus. Tubes delicate, covered with sand or mud. No coloration as preserved.

West coast Vancouver Island, littoral. California.

SERPULIDAE

Body cylindrical or fusiform, slightly flattened, divided into two distinct regions, the thoracic, of few segments (three to seven) with bundles of capillaries in the notopodium and uncinigerous tori in the neuropodium, and the abdominal

of many segments with the incidence of the capillaries and uncinigerous tori reversed. Prostomium usually indistinct. Peristomium with a more or less developed collar, sometimes with eyes, and a pair of semicircular or spiral branchial lobes surrounding the mouth. The lobes bearing a number of filaments, each with two rows of ciliated barbules, which form a terminal plume expanding into a funnel. The most dorsal filament on one side usually carries a horny, calcareous, or membranous operculum and, in this case, is usually free from barbules and forms a peduncle. Setae always simple and very variable; some of those of the first setiger (generally termed "collar setae") often distinctive. Uncini pectinate plates arranged in single rows. Always tubicolous, the tubes calcareous.

KEY TO GENERA

- | | |
|--|-----------------------------|
| 1 (12) Body symmetrical, more than five thoracic setigers. | |
| 2 (9) Operculum present. | |
| 3 (6) Operculum funnel-shaped. | |
| 4 (5) Operculum without basal processes. | SERPULA (p. 125) |
| 5 (4) Operculum with conspicuous basal processes. | CRUCIGERA (p. 126) |
| 6 (3) Operculum not funnel-shaped. | |
| 7 (8) Operculum globular, transparent, carried by a normal branchial filament. | APOMATUS (p. 127) |
| 8 (7) Operculum flattened anteriorly by a horny plate. | CHITINOPOMA (p. 129) |
| 9 (2) Operculum absent. | |
| 10 (11) Collar setae with long, narrow blades; uncini humpbacked, with very numerous minute teeth. | PROTULA (p. 130) |
| 11 (10) Collar setae with crenulated wings; uncini with backs parallel to the teeth. | SALMACINA (p. 131) |
| 12 (1) Body asymmetrical, less than five thoracic setigers. | SPIRORBIS (p. 132) |

Genus **SERPULA** Linné

Operculum cartilaginous, funnel-shaped with serrated margin, the peduncle smooth. A rudimentary secondary operculum also present. Branchial filaments without eyes. Collar with three lobes. A thoracic membrane. Collar setae of two kinds, the one smooth capillaries, the other bayonet-shaped with spines at the base of the blade. Subsequent thoracic setigers with simple bladed setae in the notopodium, uncini with a few (five to seven) teeth in the neuropodium. Abdominal notopodia with uncini like those of the thorax and neuropodia with setae having chalice-shaped ends with serrated edge, and smooth capillaries, which alone are present in the last setigers.

S. vermicularis Linné. 24. (Figs. 256 to 259.)

Up to at least 100 mm. long and 8 mm. wide; 200 or more setigers, of which 7 are thoracic. Thirty to forty branchial filaments on each lobe; the filaments united for a short distance above their bases, the tips bare, short, and filiform, the barbules fine and very numerous. The most dorsal filament on one side larger than the others and free from barbules, carrying a funnel-shaped operculum

terminating in a shallow, concave plate, the edge with numerous (up to one hundred and sixty) teeth. The corresponding filament on the other side shorter, also free from barbules, and with a thickened end ("false operculum"). The two branchial lobes connected ventrally by a flap. Peristomium with two eyes. Collar three-lobed, the ventral lobe large and entire, the lateral lobes continuous with the thoracic membrane which carries, and extends beyond, the thoracic parapodia and terminates in a rounded free edge on the ventral side. Setae as described for the genus, the capillaries of the first setiger long and directed forward. Coloration very variable, from pale yellow to brick red; branchiae and operculum rose to deep red, often banded with white. Tubes smooth and round, usually more or less coiled and attached, often in masses, to rocks and stones.

Common throughout Canadian Pacific region at moderately low tide-mark and dredged. Cosmopolitan.

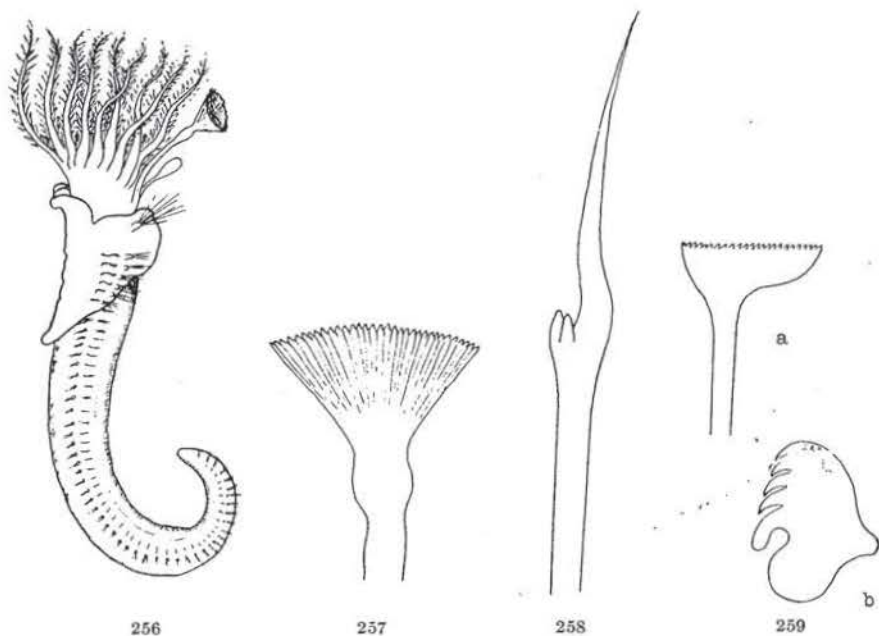


Fig. 256. *S. vermicularis* Linné, lateral view (after Fauvel).

Fig. 257. *S. vermicularis* Linné, operculum.

Fig. 258. *S. vermicularis* Linné, bayonet-shaped collar seta (after Fauvel).

Fig. 259. *S. vermicularis* Linné, (a) chalice-shaped abdominal neuroseta (b) thoracic uncinus (after Fauvel).

Genus **CRUCIGERA** Benedict (Pixell, *char. emend.*).

As *Serpula* except in that the operculum has "comparatively few radii forming a scalloped margin to the funnel and with conspicuous basal processes".

KEY TO SPECIES

- 1 (2) Operculum with circular margin and with three basal processes.
2 (1) Operculum with irregular margin and with two basal processes.

zygophora
regularis

C. zygophora (Johnson). 37, 62. (Fig. 260.)

Up to 45 mm. long and 4 mm. wide; 170 to 200 setigers, 7 of which are thoracic. Up to thirty branchial filaments on each lobe, the tips long and filamentous. Operculum funnel-shaped, terminating in a very slightly concave circular plate with up to thirty radii, the margin with a corresponding number of small rounded lobes, the base with three rounded processes; a sharp constriction at the point at which the operculum joins the peduncle, which is long and smooth. "False operculum", collar, thoracic membrane, setae and coloration much as in *Serpula vermicularis*. Tubes smooth and round, or somewhat angular, in section.

East and west coasts Vancouver Island, dredged in 15 to 50 fathoms. Alaska. California.

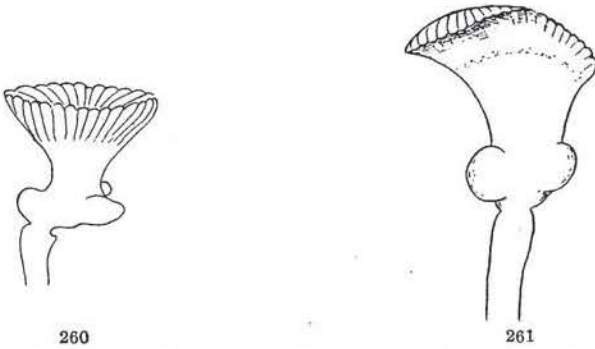


Fig. 260. *C. zygophora* (Johnson), operculum (after Johnson).
Fig. 261. *C. irregularis* Bush, operculum.

C. irregularis Bush. 18, 62. (Fig. 261.)

Similar to *C. zygophora* in all respects except that the branchial filaments are more coiled and have shorter filamentous tips and in the characters of the operculum, which is longer dorsally than ventrally, is compressed from side to side, the margin is rolled outwards, and there are two low, rounded basal processes which may be bilobed.

East coast Vancouver Island, dredged in 10 to 30 fathoms. West coast Vancouver Island, littoral and dredged in 60 to 80 fathoms. Alaska.

Genus **APOMATUS** Philippi

Operculum spherical, membranous, transparent, carried on a branchial filament with barbules. Branchial filaments sometimes with eyes. A collar often with eyes and a thoracic membrane present. Collar setae all narrow-bladed and subsequent thoracic notosetae similar together with (in posterior thoracic segments) others with more or less double-curved ends with denticles or corrugations on the concave side, beneath which there is a short convex blade ("apomatus seta", fig. 263a). Uncini with humped backs and a series of minute teeth terminating in a single larger one in thoracic neuropodia. Similar uncini

in the notopodia in the abdominal region; geniculate or somewhat sickle-shaped setae in the neuropodia.

KEY TO SPECIES

- 1 (2) Abdominal neurosetae somewhat sickle-shaped and dentate.
2 (1) Abdominal neurosetae sharply geniculate and smooth.

timmsii
geniculata



Fig. 262. *A. timmsii* Pixell, operculum on end of branchial filament.
Fig. 263. *A. timmsii* Pixell, (a) apomatus seta (b) abdominal seta (c) uncinus.
Fig. 264. *A. geniculata* Moore, abdominal seta (after Moore).

A. timmsii Pixell. 62. (Figs. 262 and 263.)

Up to 80 mm. long and 160 setigers, 7 of which are thoracic. Branchial lobes each with up to forty filaments with only short, bare tips. Operculum large, transparent, and globular, usually carried on the second branchial filament from the dorsal side, the barbules remaining present. A small club-shaped "false operculum" on the corresponding filament on the other side. Collar entire ventrally and with a deep incision on each side, the lateral lobes continuous with the wide thoracic membrane. Thoracic notosetae with simple narrow blades, accompanied by a few apomatus setae in more posterior segments. Abdominal neurosetae only slightly sickle-shaped with wide, finely dentate ends. Uncini, starting on the third setiger, with a series of very numerous minute teeth ending in a single, heavy, long one with a bulbous tip, those of the thoracic region larger than those of the abdomen. The most posterior abdominal segments with only long, slender capillaries without blades. Coloration more or less orange-red in the thoracic region, lighter in the abdominal region. A white strap-shaped glandular area on the dorsal side of the pre-anal region. The branchial filaments almost

colourless, with pairs of red spots on the outer surfaces. Tubes solitary, sinuous, smooth.

Nanaimo region, east coast Vancouver Island, in about 20 fathoms. California.

A. geniculata Moore. 48 (as *Protula*), 53. (Fig. 264.)

Up to about 30 mm. long; 77 setigers, of which 7 are thoracic. Branchial lobes each with about eighteen filaments with moderately long bare tips. The operculum as described for the genus. Collar entire ventrally and with short, rounded lateral lobes. A prominent thoracic membrane. Thoracic notosetae all limbate with short, narrow blades, some slightly curved. Abdominal neurosetae geniculate, bent almost at right angles to their shafts and with perfectly smooth margins. Uncini very similar to those of *A. timmsii*. A white glandular area at the posterior extremity on the dorsal side. Tubes similar to those of *A. timmsii*. It is doubtful whether *A. geniculata* and *A. timmsii* are specifically distinct.

East coast Vancouver Island, dredged in 30 to 90 fathoms in 1908 by U.S.S. "Albatross", not recorded from Canadian waters since. California. Japan.

Genus **CHITINOPOMA** Levinsen

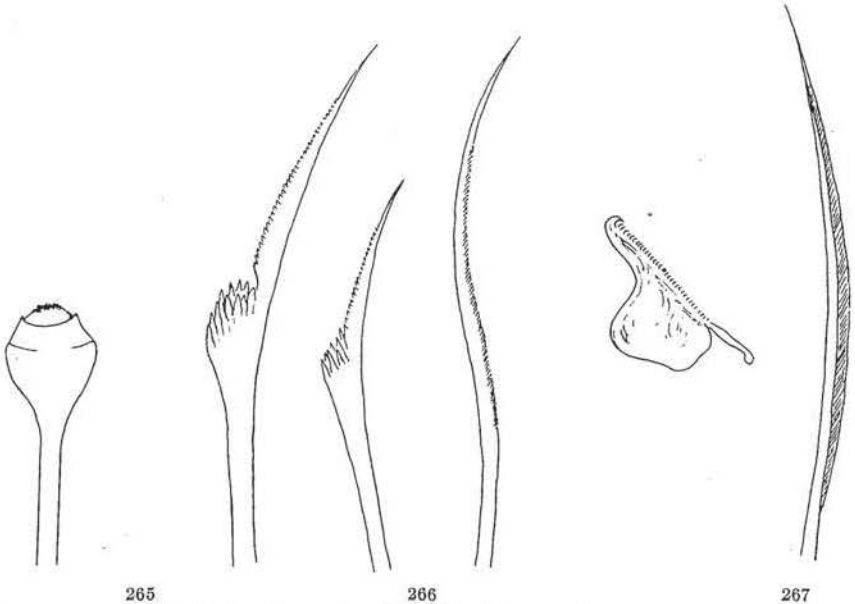
Operculum subglobular, terminating anteriorly in a slightly convex chitinous plate, carried on a smooth peduncle. Six to eight pairs of branchial filaments, with long or short bare tips, on each lobe. Collar well developed. Thoracic membrane absent. Collar setae of two kinds, both more or less geniculate, some with a toothed expansion. Remaining thoracic notosetae also of two kinds, the one smooth fine capillaries, the others heavier and of a different type; uncini with a series of nine to ten teeth terminating in a single large one, in the neuropodium. Abdominal notopodia with uncini similar to these, neuropodia with toothed geniculate setae.

C. groenlandica (Mörch). 62, 35 (as *C. occidentalis*). (Figs. 265 and 266.)

Up to 12 mm. long. Number of branchial filaments somewhat variable, usually six to eight on each lobe, the tips fairly long and filamentous. Operculum with thick horny terminal plate, often covered with sand, the peduncle smooth, usually on the lobe on the left side of the dorsum. No "false operculum" nor thoracic membrane. Collar very wide, the entire ventral lobe generally reflexed, the lateral lobes produced on the dorsal side beyond the second setiger. Seven thoracic setigers. Abdominal region with twenty-five to forty setigers. Collar setae geniculate, with long denticulate blade with toothed expansion at the base more or less separated from the blade by a notch, together with a few shorter curved forms with very narrow blades. Remaining thoracic notosetae fine capillaries and a few sickle-shaped setae. Thoracic and abdominal uncini and abdominal neurosetae as described for the genus. Almost no coloration. Tubes sinuous, usually adherent to rocks, stones, or other Serpulid tubes, for their whole

length, with a conspicuous dorsal keel ending in a spine overhanging the aperture.

East coast Vancouver Island, littoral at lowest tide mark, and dredged in about 30 fathoms. West coast Vancouver Island, dredged in 30 to 70 fathoms. N. Atlantic. Arctic.



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Fig. 265. *C. groenlandica* (Mörch), operculum.

Fig. 266. *C. groenlandica* (Mörch), collar setae.

Fig. 267. *P. pacifica* Pixell, collar seta and uncinus (after Pixell).

Genus **PROTULA** Risso

No operculum. Otherwise as *Apomatus*.

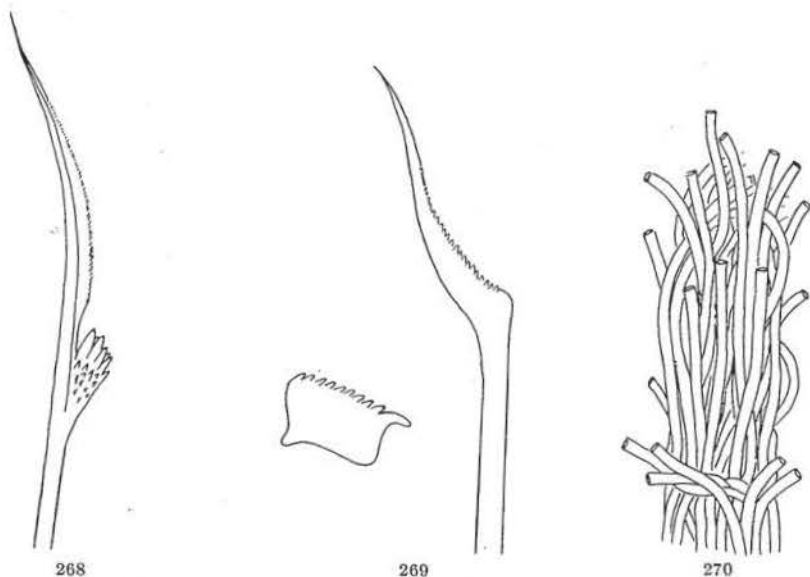
P. pacifica Pixell. 62. (Fig. 267.)

Up to 75 mm. long and about 7 mm. wide. Branchial lobes each with about sixty filaments, the barbules extending almost to their tips. A membrane connecting the filaments for about a third of their length. Collar with a notched ventral lobe and deep incisions between the ventral and dorsal lobes. A wide thoracic membrane. A white glandular area at the posterior extremity on the dorsal side. Thoracic notosetae (including collar setae) with simple narrow blades, accompanied by a few of the apomatus type in more posterior segments. Thoracic uncini with humped backs, beginning on the third setiger, with a series of numerous very small teeth terminating in a single long, bulbous-ended one. Abdominal uncini similar to these. Abdominal neurosetae somewhat sickle-shaped in the anterior region, narrowly bladed in posterior setigers. Little coloration. Tubes smooth, sinuous, attached to substrate for only a portion of their length.

East coast Vancouver Island, dredged in 15 to 30 fathoms.

Genus **SALMACINA** Claparède

No operculum. Branchial filaments few, often expanded at their extremities, no connecting membrane. Prostomium distinct. Eyes present. Collar and thoracic membrane well developed. Collar setae simple blades and geniculate bladed setae, the blade with a toothed expansion at the base separated from the blade itself by a deep notch. Remaining thoracic notosetae, bladed, sickle-shaped, or geniculate. Uncini of both thorax and abdomen pectiniform, with many teeth in one or more rows, the backs of the uncini parallel to the teeth, and with an inferior tooth larger than the rest. Abdominal neurosetae simple capillaries or geniculate and bladed ones.



268

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Fig. 268. *S. dysteri* var. *tribranchiata* Moore, collar seta.

Fig. 269. *S. dysteri* var. *tribranchiata* Moore, thoracic geniculate seta and uncinus.

Fig. 270. *S. dysteri* var. *tribranchiata* Moore, portion of tube mass.

***S. dysteri* (Huxley) var. *tribranchiata* (Moore).** 24, 56 (as *Filograna tribranchiata*). (Figs. 268 to 270.)

Up to 5 mm. long; about 30 setigers, of which 5 to 8 are thoracic. Three branchial filaments on each lobe, with few barbules and terminating in bare, swollen tips. Collar with two lateral lobes widely separated on the dorsal side and an undivided ventral lobe. Collar setae with finely dentate blades, the basal expansion having six to eight large teeth and a number of fine ones. Remaining thoracic notosetae fine, with a few heavier geniculate ones. Anterior region of abdomen unsegmented and non-setigerous. Abdominal neurosetae simple capillaries. Uncini as described for the genus. Coloration red to orange, branchiae uncoloured. Tubes very fine and aggregated in masses.

West coast Vancouver Island, littoral. California.

Genus **SPIRORBIS** Daudin

Body very small, coiled and, therefore, asymmetric. Few thoracic setigers. Operculum varied in shape, terminating anteriorly in a calcareous structure (plate) beneath which there is frequently a characteristic projection (talon), carried by a smooth peduncle. Eyes often present. A thoracic membrane. Anterior region of abdomen unsegmented and non-setigerous. Characteristic collar-setae, very variable, usually accompanied by some slender, smooth, bent spines. Often apomatus setae in posterior thoracic setigers. Abdominal neurosetae geniculate or sickle-shaped, often accompanied by slender, smooth, bent spines. Uncini with numerous small teeth and a larger inferior one. Tubes usually one to two millimetres in diameter, always more or less spiral, at least at the base, the spiral coiled clock-wise (dextral) or counter-clockwise (sinistral). (The direction of the spiral is measured from the aperture inwards.) Incubation of eggs in the tube (sometimes in a dorso-lateral brood-pouch), or in the operculum. In the latter case the operculum develops a basal calcareous plate.

KEY TO SPECIES

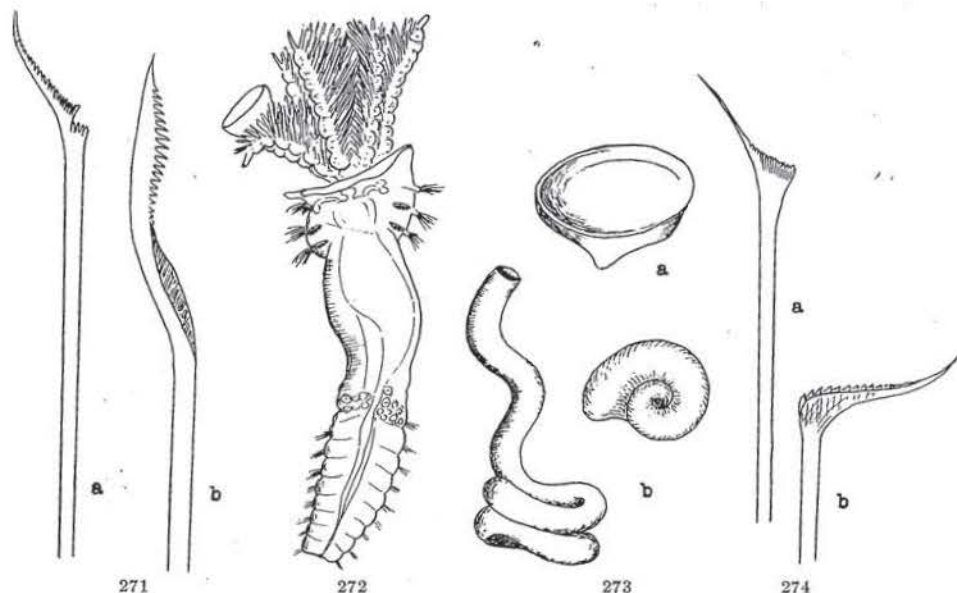
- | | |
|---|----------------------|
| 1 (6) Tube dextral. (Fig. 273b.) | |
| 2 (3) Four thoracic setigers. (S-G <i>Paradexiospira</i> .) | vitreus |
| 3 (2) Three thoracic setigers. (S-G <i>Dexiospira</i> .) | |
| 4 (5) Incubation in tube. | spirillum |
| 5 (4) Incubation in operculum. (See Fig. 286.) | pusilloides |
| 6 (1) Tube sinistral. (Fig. 283.) | |
| 7 (10) Four thoracic setigers. | |
| 8 (9) Fourth setiger with setae complete. (S-G <i>Protolaeospira</i> .) | ambilateralis |
| 9 (8) Fourth setiger without notosetae and with uncini on the concave side of the body only. (S-G <i>Paralaeospira</i> .) | racemosus |
| 10 (7) Three thoracic setigers. (S-G <i>Laeospira</i> .) | |
| 11 (14) Incubation in tube. | |
| 12 (13) Collar-setae with serrate blades with, or without, posterior shallow notch. | medius |
| 13 (12) Collar-setae with serrate blades with posterior fin. | variabilis |
| 14 (11) Incubation in operculum. | |
| 15 (16) Collar-setae with simple blades. | validus |
| 16 (15) Collar-setae blades with posterior fins. | |
| 17 (18) Blades of collar-setae finely serrated. | granulatus |
| 18 (17) Blades of collar-setae coarsely serrated. | |
| 19 (20) Opercular plate an almost regular inverted cone. | langerhansi |
| 20 (19) Opercular plate a convex cap. | mörchi |

Sp. (*Paradexiospira*) vitreus (Fabricius). 24, 62. (Fig. 271.)

About 24 setigers, of which 4 are thoracic, but the fourth is incomplete in having no notosetae, and uncini on the concave side of the body only. Six or seven branchial filaments. Operculum cup-shaped with a more or less concave terminal plate with a small talon in young forms. Collar well developed. Collar-setae geniculate with serrate blades having a small crenulate wing at the base. Second setiger with bladed notosetae. Third setiger with

similar blades and also some apomatus notosetae with the concave side very heavily toothed. Abdominal neurosetae strongly geniculate with finely dentate triangular blades. Eggs incubated in the tubes. Tube semi-transparent, smooth or transversely striated, sometimes with a median ridge ending in a sharp projection above the aperture. Attached to stones and rocks.

East coast Vancouver Island, littoral. Queen Charlotte Islands, littoral. N. Atlantic. Arctic.



- Fig. 271. *Sp. vitreus* (Fabricius), (a) collar seta (after Pixell) (b) apomatus seta (after Fauvel).
 Fig. 272. *Sp. spirillum* (Linné), ventral view (after Cunningham and Ramage).
 Fig. 273. *Sp. spirillum* (Linné), (a) opercular plate (after Caullery and Mesnil) (b) tubes (after Pixell).
 Fig. 274. *Sp. spirillum* (Linné), (a) collar seta (after Pixell) (b) abdominal seta (after Fauvel).

Sp. (*Dexiospira*) *spirillum* (Linné). 24, 62. (Figs. 272 to 274.)

Setigers 15 to 23, of which 3 are thoracic. Six to eight branchial filaments. Operculum an inverted, asymmetric cone with a slightly concave terminal plate which has a small talon. Collar well developed. Collar-setae geniculate with serrate edge with no wing at the base. Second and third setigers with bilimbate notosetae, straight or curved, no apomatus setae. Abdominal neurosetae strongly geniculate with dentate triangular blades. Eggs incubated in the tubes. Tubes smooth, in flat coils on smooth surfaces, often with the base coiled and the upper end uncoiled and rising vertically on rough surfaces.

East coast Vancouver Island, littoral and dredged. West coast Vancouver Island, littoral. Washington. Alaska. Oregon. California. Mexico. Japan. N. Atlantic. Arctic.

Sp. (*Dexiospira*) *pusilloides* Bush. 24, 62. (Fig. 275.)

Setigers 11, 3 thoracic. Six branchial filaments with rather long bare tips. Operculum an inverted blunt cone with calcareous plates anteriorly and posteriorly, the talon inconspicuous. Collar slightly notched ventrally. Collar-setae more or less geniculate, the blades crenulate at the base, the tips somewhat sickle-shaped. Notosetae simple blades in the second setiger, both similar blades and also sickle-shaped ones in the third. Abdominal neurosetae sickle-shaped, dentate. Eggs incubated in opercula. Tubes fragile, very small.

East coast Vancouver Island (Taylor Bay, Gabriola Island), on stones. N. Atlantic. Mexico. Unknown to authors.

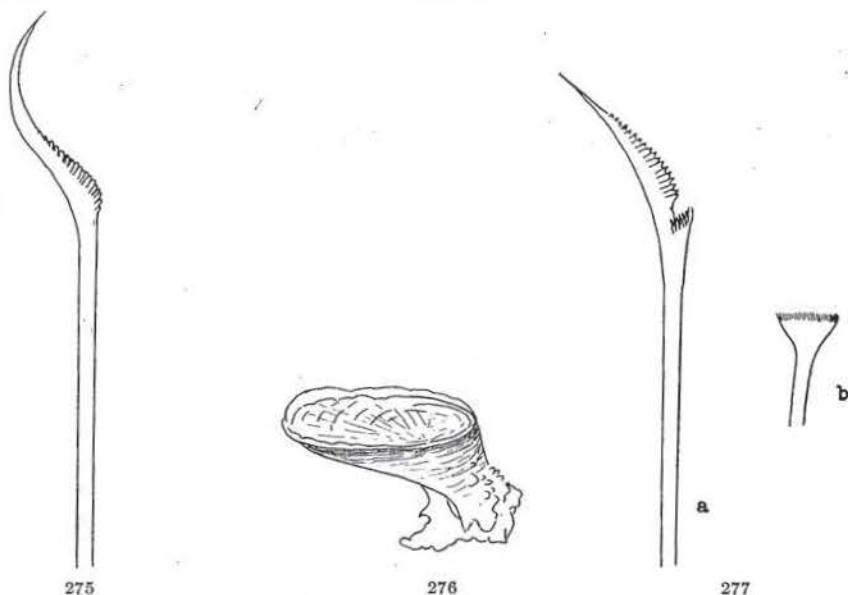


Fig. 275. *Sp. pusilloides* Bush, collar seta (after Pixell).

Fig. 276. *Sp. ambulateralis* Pixell, opercular plate (after Pixell).

Fig. 277. *Sp. ambulateralis* Pixell, (a) collar seta (b) tip of abdominal seta (after Pixell).

Sp. (*Protolaeospira*) *ambulateralis* Pixell. 62. (Figs. 276 and 277.)

Setigers 22 to 24, of which 4 are thoracic. Eleven functional branchial filaments. Operculum terminating in an inclined plate with a much enlarged excentric talon which has a series of basal flanges extending to the exterior of the peduncle. Collar entire. Collar-setae very large with conspicuously serrated blades which have a fin-like expansion at the base. Notosetae in the second setiger simple blades, in the third setiger similar blades and, with them, shorter bladed setae with their extremities more or less curved and fringed, in the fourth setiger some simple blades and some sickle-shaped ones. Abdominal neurosetae brush-like. Eggs incubated in a dorso-lateral brood-pouch. Tubes translucent, the surface distinctly corrugated.

East and west coasts Vancouver Island, littoral and dredged in 15 to 25 fathoms.

Sp. (*Paralaeospira*) *racemosus* Pixell. 62. (Figs. 278 and 279.)

Setigers 25, of which 4 are thoracic, but the fourth incomplete in having no notosetae and uncini on the concave side of the body only. Twelve functional branchial filaments. Operculum as in *Sp. ambilateralis* except that the plate is almost hemispherically concave and the talon is more massive. Collar-setae geniculate, large, the blade very coarsely serrated with a fin-like expansion at the base. Remaining thoracic notosetae and abdominal neurosetae as in *Sp. ambilateralis*. Eggs incubated in a dorso-lateral brood-pouch as in *Sp. ambilateralis*. Tubes loosely coiled, the surface corrugated.

East coast Vancouver Island in 15 to 25 fathoms. West coast Vancouver Island and Queen Charlotte Islands, littoral.

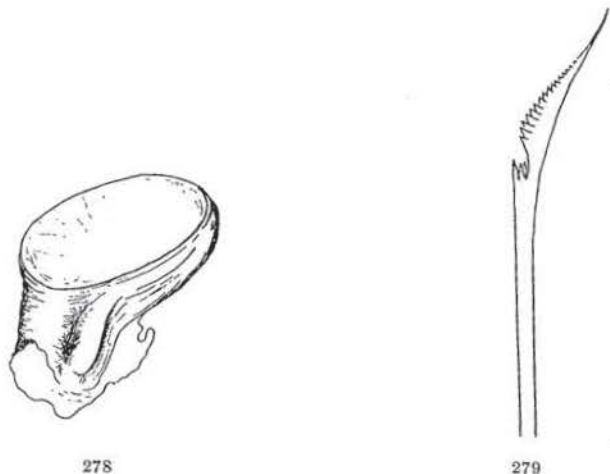


Fig. 278. *Sp. racemosus* Pixell, opercular plate (after Pixell).

Fig. 279. *Sp. racemosus* Pixell, collar seta (after Pixell).

Sp. (*Laeospira*) *medius* Pixell. 14, 62. (Figs. 280 to 283.)

Setigers 23 to 28, of which 3 are thoracic. Thirteen functional branchial filaments more or less united by a thin membrane. Opercular plate concave terminally, with an oblique talon with large wing-like expansions at its sides. When unworn the terminal plate is densely covered with sharp spines. Collar-setae with serrate blades with, or without, a more or less shallow notch.

Notosetae of second setiger simple blades and those of the third setiger similar but with some apomatus setae added. Abdominal neurosetae strongly geniculate. Eggs incubated in tube. Tubes somewhat flattened and wide (up to 2 mm. aperture).

East and west coasts Vancouver Island, littoral. Ireland.

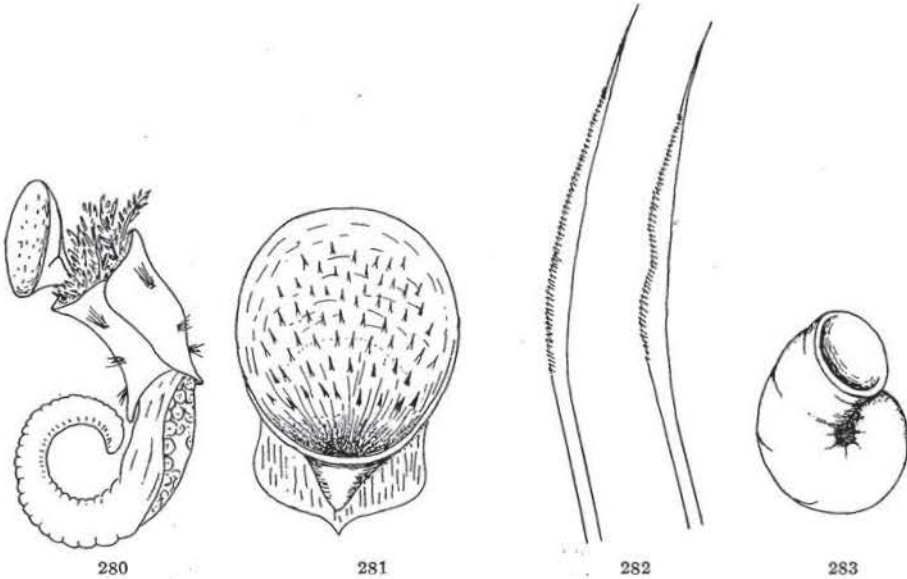


Fig. 280. *Sp. medius* Pixell.
 Fig. 281. *Sp. medius* Pixell, opercular plate.
 Fig. 282. *Sp. medius* Pixell, collar setae.
 Fig. 283. *Sp. medius* Pixell, tube.

Sp. (*Laeospira*) *variabilis* Bush. 62. (Fig. 284.)

Setigers 18 to 31, of which 3 are thoracic. Seven functional branchial filaments. Opercular plate concave with a small, almost central, talon without projections. Collar high, nearly covering the branchial filaments. Collar-setae with coarsely serrate blades with a prominent fin at the base. Posterior abdominal neurosetae geniculate. Eggs incubated in tube. Body orange, ova cerise. Tubes thick, the outer whorls tending to spread over the others; with or without ridges.

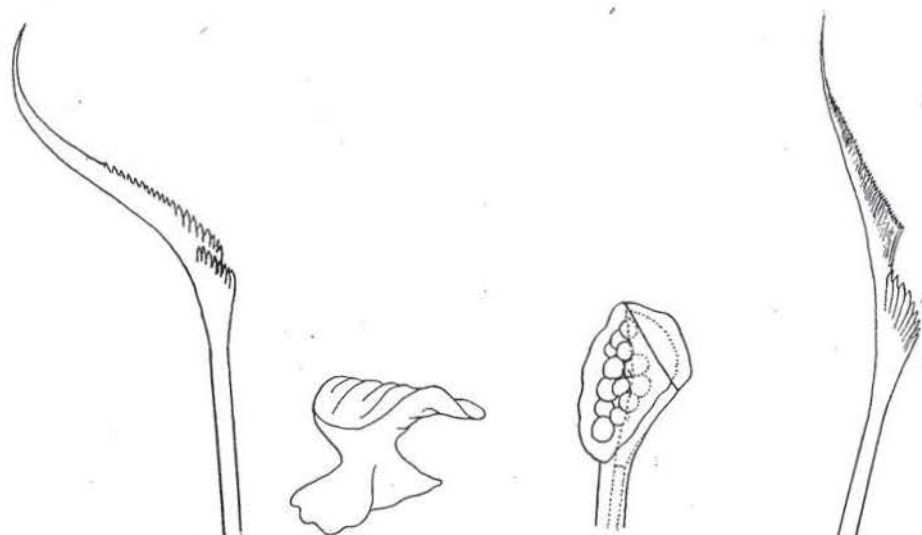
East coast Vancouver Island. Alaska. Mexico.

Sp. (*Laeospira*) *validus* Verrill. 62. (Fig. 285.)

Setigers 28, of which 3 are thoracic. Thirteen functional branchial filaments. Opercular plate of characteristic shape (fig. 285), the talon in the form of wide wings. All thoracic notosetae with long, finely serrate, narrow

blades. Abdominal neurosetae geniculate, together with some simple hooks. Incubation in operculum. Tubes smooth and opaque; up to 3 mm. diameter.

East coast Vancouver Island, dredged in 15 to 28 fathoms, (Pixell). Alaska. N. Atlantic. Unknown to authors.



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Fig. 284. *Sp. variabilis* Bush, collar seta (after Bush).

Fig. 285. *Sp. validus* Verrill, opercular plate (after Bush).

Fig. 286. *Sp. granulatus* (Linné), operculum (after Bush).

Fig. 287. *Sp. granulatus* (Linné), collar seta (after McIntosh).

Sp. (*Laeospira*) *granulatus* (Linné). 24, 62 (as *Sp. quadrangularis*). (Figs. 286 and 287.)

Setigers about 23, of which 3 are thoracic. Seven to nine functional branchial filaments with rather long, bare extremities. Operculum a deep, irregular, inverted cone, the terminal plate thick and strongly convex, the talon inserted excentrically, narrow at the origin and enlarged into a bilobed plate terminally. Collar entire. Collar-setae with finely serrated blades with a well developed crenulated fin at the base. Notosetae of second setiger bladed capillaries and, of the third setiger, some similar blades and some sickle-shaped setae. Abdominal neurosetae strongly geniculate. Eggs incubated in operculum. Tubes very variable, with two or three longitudinal ridges, entire or broken up into teeth, or without ridges, the aperture quadrangular; coiled, more or less regularly, on stones, shells, etc.

East coast Vancouver Island. Alaska. Mexico. Atlantic. Arctic.

Sp. (*Laeospira*) *langerhansi* Caullery and Mesnil. 19, 62. (Figs. 288 and 289.)

Setigers 12, of which 3 are thoracic. Opercular plate an almost regular

inverted cone without talon and with the outer surface convex. Collarsetae with coarsely serrated blades with a crenulated fin at the base. Notosetae of third setiger few in number, some sickle-shaped. Eggs incubated in operculum. Tubes small, marked with fine transverse lines and, frequently, longitudinal ridges; more or less quadrangular in section.

Departure Bay, east coast Vancouver Island, on *Serpula vermicularis* tubes (Pixell). Panama. Unknown to authors.

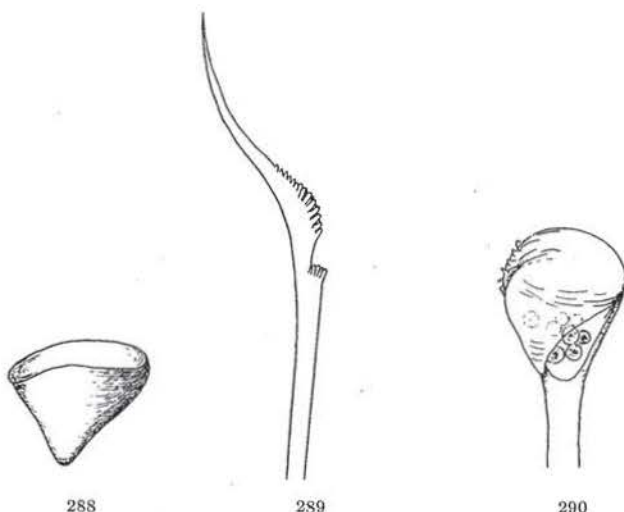


Fig. 288. *Sp. langerhansi* Caullery and Mesnil, opercular plate (after Caullery and Mesnil)
 Fig. 289. *Sp. langerhansi* Caullery and Mesnil, collar seta (after Pixell).
 Fig. 290. *Sp. mörchi* Levinsen, operculum.

Sp. (*Laeospira*) *mörchi* Levinsen. 62. (Fig. 290.)

Setigers 23 to 32, of which 3 are thoracic. Seven functional branchial filaments. Operculum an inverted funnel with an opaque, convex, slightly bilobed terminal plate extending nearly to the base of the cavity of the operculum on one side. Collar deep. A wide thoracic membrane on one side of the body. Collar-setae similar to those of *Sp. langerhansi*. Notosetae of the second and third setigers with long, very narrow, delicately serrate blades, together with a few shorter ones in the third. Abdominal neurosetae strongly geniculate. Eggs incubated in operculum. Tubes smooth, the apertures circular, about 1 mm. in diameter.

East coast Vancouver Island and Queen Charlotte Islands, littoral. Mexico. Greenland.

Addendum to
POLYCHAETA ERRANTIA 9b(1)

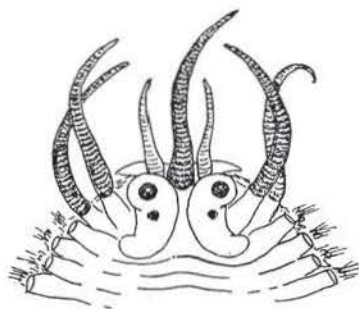
SYLLIDAE

Genus **Trypanosyllis** Claparède (p. 71)

T. ingens Johnson (Johnson, H. P. *Am. Naturalist*, Vol. 36, p. 295, 1902).
(Figs. 291 and 292.)

Up to 130 mm. long, 7 mm. wide; upwards of 350 segments. Prostomium with lobes as shown in Fig. 291. The lateral tentacles colourless, the median tentacle and tentacular cirri deeply coloured. All tentacular cirri approximately one length. Proboscis terminating in ten long papillae with rounded ends. Pharynx chitinized and terminating in a trepan of ten teeth. Parapodia short and supported by four acicula. Dorsal cirri long and heavy, the articles short, crowded, and of two lengths, the longer with about thirty-six articles, the shorter with little more than half that number, these irregularly alternated. As many as fifteen setae in some parapodia. They are uniform throughout the body, the end-pieces strictly unidentate (Fig. 292). Reproduction by collateral budding of stolons. General body colour ivory to tawny, the cirri deep purple-brown. Easily differentiated from *T. gemmipara* by coloration, shape of prostomium, and setae.

Quatsino Sound, west coast Vancouver Island, in about 4 fathoms. California.



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Fig. 291. *T. ingens* Johnson, head.



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Fig. 292. *T. ingens* Johnson, seta.