
Mediomastus californiensis

A mud dwelling thread worm

Phylum: Annelida

Class: Polychaeta, Sedentaria, Scolecida

Order:

Family: Capitellidae

Description

Size: Individuals range from 25–35 mm in length, are less than 1 mm in width and have 100 segments (Hartman 1969). Specimens from Coos Bay have 60–120 segments.

Color: Translucent (Hartman 1969), light tan to colorless (fixed, Blake 2000). Specimens from Coos Bay are reddish brown.

General Morphology: Long and thread-like (Hartman 1969), resembling an earthworm with pointed anterior (family Capitellidae, Blake and Ruff 2007).

Body: Body divided into anterior thoracic and posterior abdominal regions. Widest at thoracic setigers two and three and at anterior abdominal segments. Segments annulate, with ridges (Fig. 2) and short anteriorly becoming longer and cylindrical posteriorly. Change from thorax to abdomen indistinct where texture of thorax is wrinkled and abdomen is smooth.

Anterior: Prostomium small and conical with short palpode at anterior end, followed by a depressed ring (often lost in collecting, Fig. 2).

Trunk: Thoracic region is wrinkled in texture and includes segments 1–11 (= setigers 1–10) which are biannulate (genus *Mediomastus*, Hartman 1944) (Fig. 2). The first segment is achaetous and longer than following setiger (setiger 1). Thoracic setigers bear both simple capillary setae (setigers 1–4) and hooded hooks (= uncini, setigers 5–10) and segments bearing capillary setae are shorter than those with hooks (Blake 1975, 2000). Abdominal segments are smooth and coiled with first

segment (=setiger 11) shorter than following (Hartman 1944). Abdominal setigers bear hooded hooks only, which vary in number anteriorly and posteriorly (Blake 2000). Most posterior segments become short again, have more elevated parapodia but are not conspicuous. Many Coos Bay specimens with short, bell-shaped posterior segments (Fig. 3).

Posterior: Pygidium with single cirrus attached ventrally and easily lost in collecting (Fig. 4).

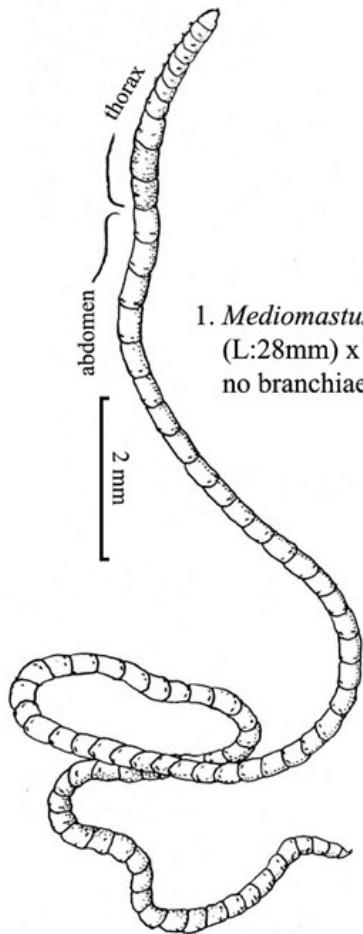
Parapodia: Biramous and inconspicuous (Hartman 1944). Thoracic parapodia more developed than abdominal (Blake 2000).

Setae (chaetae): Simple and unjointed consisting of capillary setae (setigers 1–4) and long handled hooded hooks (=uncini, setigers five and on). Thoracic capillaries limbate and abdominal capillaries absent. Thoracic notosetae with 5–15 setae per fascicle, neurosetae with 5–11 setae per fascicle. Thoracic notopodial uncini with 4–8 hooks per fascicle and neuropodial uncini with 5–10 hooks per fascicle. Anterior abdominal notopodia bear 5–7 uncini with posterior region reduced to two hooks per fascicle while neuropodial anterior abdominal uncini have 8–10 uncini which are reduced posteriorly to four hooks per fascicle (Blake 2000) (Fig. 2, 5). Abdominal uncini with shorter hoods than thoracic (Blake 2000) and uncini on segments 10–11 are dorsolateral but not modified for copulation (Hartman 1944). Each uncini bears a large fang with 3–12 apical teeth in 1–3 rows.

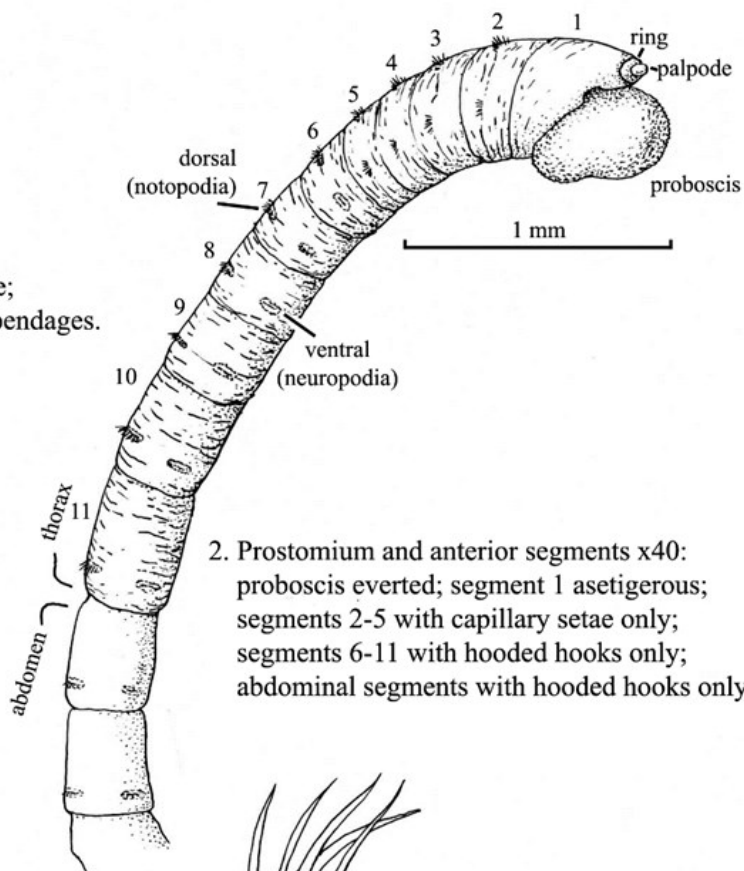
Eyes/Eyespots: Two small eyes, mid-dorsally on prostomium (Blake 2000).

Anterior Appendages: None (family Capitellidae)

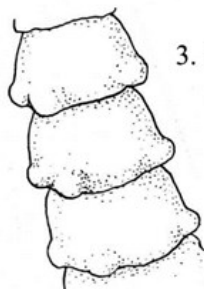
Mediomastus californiensis



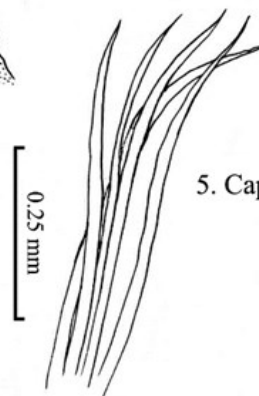
1. *Mediomastus californiensis* (L:28mm) x12: earthworm-like; no branchiae or prostomial appendages.



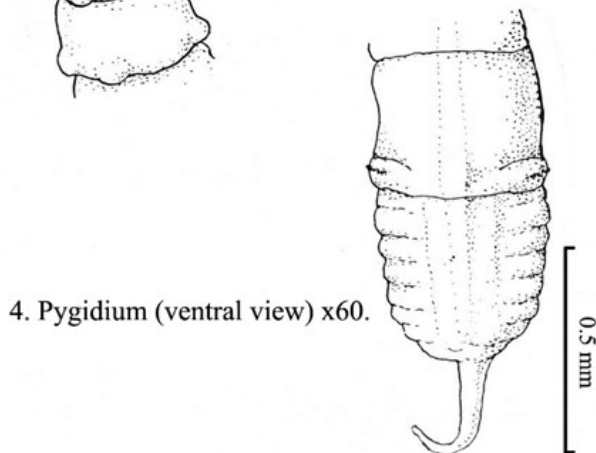
2. Prostomium and anterior segments x40: proboscis everted; segment 1 asetigerous; segments 2-5 with capillary setae only; segments 6-11 with hooded hooks only; abdominal segments with hooded hooks only.



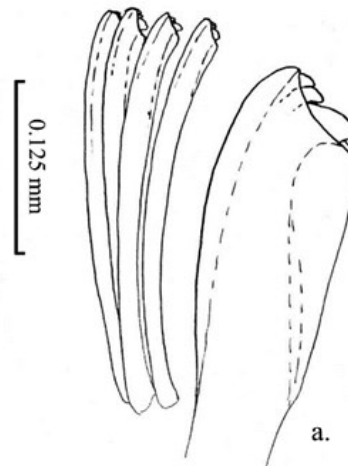
3. Some posterior segments x60.



5. Capillary setae x100.



4. Pygidium (ventral view) x60.



6. Hooded hooks (uncini) x200: a. enlargement x800.

lidae, Fauchald 1977).

Branchiae: None.

Burrow/Tube: In soft often anoxic sediments and near the surface to 15 cm depth (family Capitellidae, Blake 2000).

Pharynx: Bears proboscis with is a soft, papillose, glandular sac with tiny widely scattered low papillae (Hartman 1944) (Fig. 2) are sometimes dense in distribution (Blake 2000).

Genitalia: No thoracic genital spines.

Nephridia: Nephridiopores present between setigers 5–6, 7–8, 8–9, 9–10 (Blake 2000).

Possible Misidentifications

The Capitellidae lack conspicuous parapodia, branchiae, lobes and prostomial appendages. Their superficial appearance is earthworm-like. Capitellid genera are defined by characters, which are ontogenically dependent (e.g. numbers of thoracic setigers with and without capillary setae and the first appearance of hooks (Blake 2000). Identification requires adult specimens because the same species could be identified to two different genera at different developmental stages (Fredette 1982). Several genera occur locally in muddy estuarine situations:

Capitella spp. have hooks as well as capillary spines on the thoracic setigers but lack an achaetous first segment. They have large genital spines on segments eight and nine and all nine thoracic segments bear setae.

Heteromastus spp. have 12 thoracic segments (not 11) and one is achaetous. Uncini begin on setiger six (not five) and they have notopodial branchiae on distal posterior segments.

Notomastus spp. like *Heteromastus*, have 12 thoracic segments (not 11) and one is achaetous. Some species possess branchiae. All thoracic setigers have capillary setae (as in Fig. 5).

Three species in the genus *Mediomastus* occur locally (including *M. californiensis*, Blake and Ruff 2007). *Mediomastus acutus* occurs in fine silty mud in the shallow subtidal (Blake and Ruff 2007) has a long pointed prostomium and limbate as well as paddle-like thoracic capillaries (Warren et al. 1994). This very thin species, only about 9 mm in length, has been found in Coos Bay (H. Jones pers. com.) and off southern California (Hartman 1969). *Mediomastus ambiseta* co-occurs with *M. californiensis* (Blake 2000). *M. californiensis* can be differentiated from *M. ambiseta* by its large size, similarity of thoracic and abdominal hooks (which are dimorphic in *M. ambiseta*), lack of abdominal capillaries or spine-like hooks (Blake 2000). *Mediomastus ambiseta* also has posterior notopodia with 1–2 capillary setae and has been found subtidally in Washington (Hobson and Banse 1981). (see Warren et al. 1994 for differentiating *Mediomastus* species).

Ecological Information

Range: NE Pacific distribution includes the Aleutian Islands and Alaska (H. Jones pers. com.), British Columbia, Washington, Oregon, California and Gulf of Mexico (Blake 2000). Also along Atlantic coast in Florida (Santos and Simon 1980), New England to Chesapeake Bay (Blake 2000).

Local Distribution: Coos Bay intertidal. Also Yaquina Bay.

Habitat: Compact, fine muddy sand (Hartman 1947).

Salinity: Found in salinities of 30.

Temperature:

Tidal Level: At low water line (Hartman 1947) and intertidal to shelf depths (Blake and Ruff 2007).

Associates: *Capitella* sp. *capitata* in Coos Bay and *Notomastus tenuis* in Tomales Bay, California (Hartman 1944).

Abundance: A Coos Bay (South Slough) core (13cm height x 15 cm diameter) at high

tide (=1.10 m) yielded one specimen, at mid tide (=1.04 m) up to five specimens and at low tide (=0.90 m) up to 10 specimens (Posey 1985). 5000 individuals/m have been reported in Massachusetts Bay, MA (Blake et al. 1987).

Life-History Information

Reproduction: Oocyte diameter approximately 60 μm (Warren et al. 1994). Gametes were observed in *M. ambiseta* where oocytes were 75 μm (Grassle and Grassle 1985 in Blake 2000).

Larva: Development is highly variable among capitellids and *M. californiensis* larvae have not been described. The larvae of *M. fragile* hatch from egg masses after 3–4 days and develop as planktotrophic trochophore larvae (Hansen 1993). Artificially fertilized *M. ambiseta* embryos were swimming trochophore larvae after three days, were metatrochophores by eight days and settled at 13 days when larvae were 13-setiger stage (Grassle and Grassle 1985 in Blake 2000).

Juvenile:

Longevity: *Mediomastus ambiseta* juveniles were sexually mature after 74 days (Grassle and Grassle 1985 in Blake 2000).

Growth Rate: An “R-strategist”, *M. californiensis* can attain a large population rapidly (e.g. Florida, Santos and Simon 1980).

Food: A direct deposit feeder.

Predators:

Behavior:

Bibliography

1. BLAKE, J. A. 1975. Phylum Annelida: Class Polychaeta, p. 151-243. *In: Light's manual: intertidal invertebrates of the central California coast.* S. F. Light, R. I. Smith, and J. T. Carlton (eds.). University of California Press, Berkeley.
2. —. 2000. Family Capitellidae, p. 47-96. *In: Taxonomic atlas of the benthic fauna of the Santa Maria Basin and Western Santa Barbara Channel.* J. A. Blake, B. Hilbig, and P. H. Scott (eds.). Santa Barbara Museum of Natural History, Santa Barbara, CA.
3. BLAKE, J. A., and R. E. RUFF. 2007. Polychaeta, p. 309-410. *In: The Light and Smith manual: intertidal invertebrates from central California to Oregon.* J. T. Carlton (ed.). University of California Press, Berkeley, CA.
4. FAUCHALD, K. 1977. The polychaete worms: definitions and keys to the orders, families, and genera. Natural History Museum of Los Angeles County Science Series. 28:1-190.
5. FREDETTE, T. J. 1982. Evidence of ontogenetic setal changes in *Heteromastus filiformis* (Polychaeta: Capitellidae). Proceedings of the Biological Society of Washington. 95:194-197.
6. HANSEN, B. 1993. Aspects of feeding, growth and stage development by trochophora larvae of the boreal polychaete *Mediomastus fragile* (Rasmussun) (Capitellidae). Journal of Experimental Marine Biology and Ecology. 166:273-288.
7. HARTMAN, O. 1944. Polychaetous annelids from California: including the descriptions of two new genera and nine new species. University of Southern California Press, Los Angeles.
8. —. 1947. Polychaetous annelids. Allan Hancock Pacific Expeditions. Reports. 10:391-481.
9. —. 1969. Atlas of the Sedentariate Polychaetous annelids from California. Allan Hancock Foundation, University of Southern California, Los Angeles, CA.
10. HOBSON, K. D., and K. BANSE. 1981. Sedentariate and archiannelid polychaetes of British Columbia and Washington. Canadian Bulletin of Fisheries and Aquatic Sciences. 209:1-144.
11. POSEY, M. H. 1985. The effects upon the

macrofaunal community of a dominant burrowing feeder, *Callianassa californiensis*, and the role of predation in determining its intertidal distribution.

Ph.D. University of Oregon.

12. SANTOS, S. L., and J. L. SIMON. 1980. Response of soft-bottom benthos to annual catastrophic disturbance in a South Florida estuary. *Marine Ecology Progress Series*. 3:347-355.
13. WARREN, L. M., P. A. HUTCHINGS, and S. DOYLE. 1994. A revision of the genus *Mediomastus* Hartman, 1944 (Polychaeta: Capitellidae). *Records of the Australian Museum*. 46:227-256.

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