
Cerebratulus californiensis

A ribbon worm

Phylum: Nemertea

Class: Anopla, Heteronemertea

Order:

Family: Lineidae

Description

Size: Up to 15 cm in length and 4–5 mm in width in posterior, flattened region (Haderlie 1980; Roe et al. 2007).

Color: Usually yellowish to rosy salmon, but may be slate colored, with paler cephalic lobe, reddish brain, conspicuous red lateral nerve cords and pale lateral margins (Haderlie 1980; Roe et al. 2007).

General Morphology:

Body: Firm, cylindrical anterior, but flattened posteriorly to aid in swimming (Haderlie 1980; Roe et al. 2007).

Anterior: Head is narrower than body with pointed snout and deep, lateral cephalic grooves (Roe et al. 2007).

Posterior: Caudal cirrus is short and often lost during collection (Fig. 1).

Eyes/Eyespots: None.

Mouth: Ventral and behind the brain, distinct from proboscis pore (order Heteronemertea) (Kozloff 1974).

Proboscis: Eversible (phylum Nemertea) and, when not everted, coiled inside rhynchocoel (cavity). Proboscis of moderately sized with bears sticky glandular surface and is everted more frequently than in *C. marginatus*. No stylet (class Anopla) (Kozloff 1974).

Tube/Burrow: An excellent swimmer and strong burrower, *C. californiensis* does not inhabit a permanent tube or burrow.

Possible Misidentifications

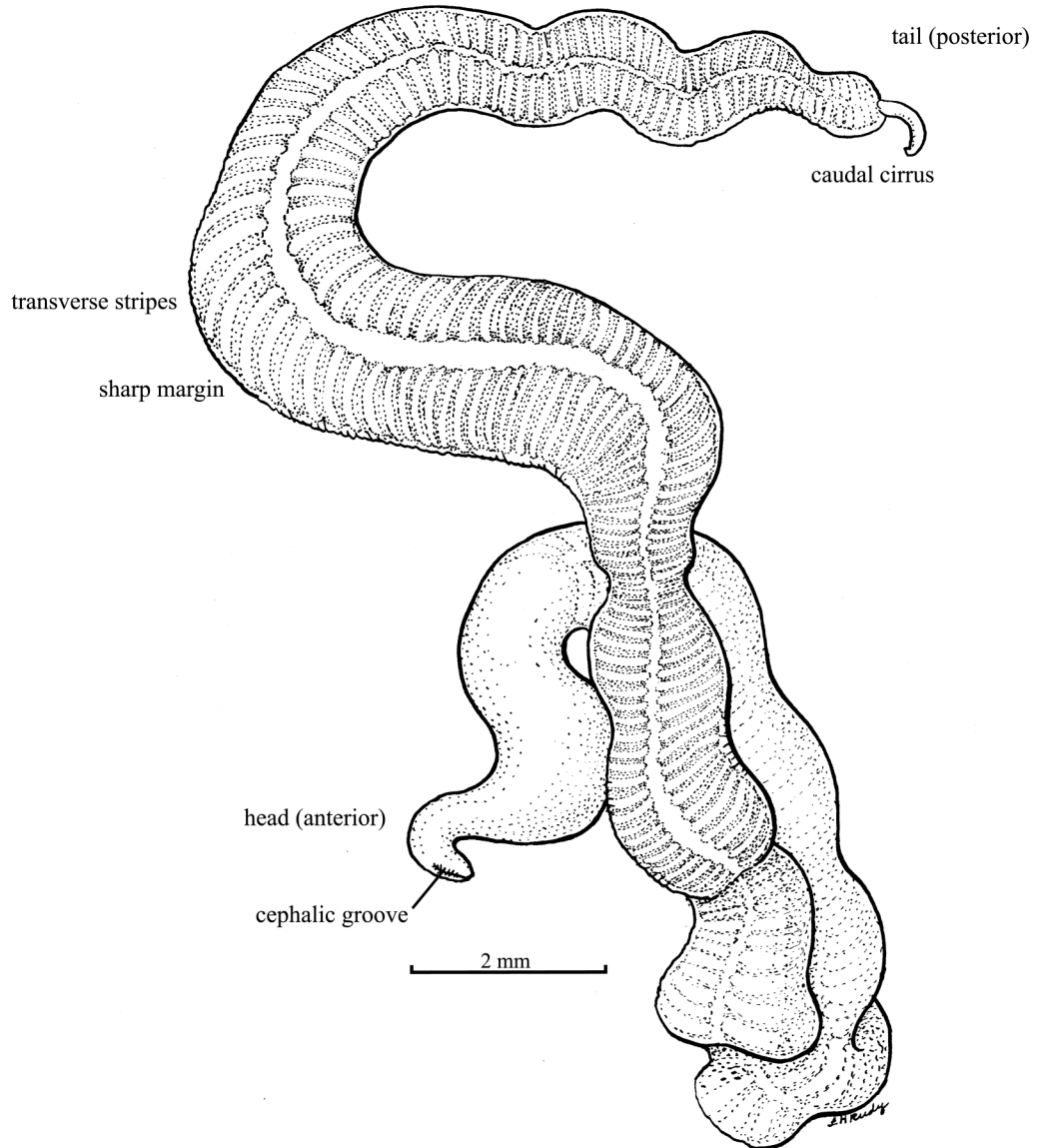
Eight *Cerebratulus* species are reported from central CA to OR (Roe et al. 2007). Species in this genus have firm, non-contractile and often ribbon-like bodies. One species that is easily mistaken for *C.*

californiensis is *C. marginatus*. Both are slate colored and possess thin lateral margins that are colorless or white. *Cerebratulus californiensis* can be identified by a head that is smaller than the body width (compare Figs. 1a and 1b) and by thin wide margins that span anteriorly farther than in *C. marginatus* (T. Hiebert and S. Maslakova, pers obs).

Locally, research suggests that there are at least two more *Cerebratulus* species, which are currently undescribed, and closely related to *C. californiensis* (T. Hiebert and S. Maslakova, pers obs).

Other NE Pacific *Cerebratulus* species include: *C. albifrons*, a dark brown species with white head, up to 30 cm in length and found intertidal and subtidal in Alaska to San Diego, CA (Coe 1901; Kozloff 1974; Roe et al. 2007); *C. montgomeryi* with red body and head with white tip, occurs intertidal and subtidally from Alaska to Monterey Bay (Coe 1901); *C. occidentalis* is a subtidal species, up to 30 cm in length, reddish-brown dorsally with lighter ventral pigment, from Alaska to Puget Sound and San Francisco Bay (Coe 1901); *C. longiceps* is found in the low intertidal, dredged, is up to 30 cm in length, dark reddish-brown with pale anterior and occurs from Alaska and Tamales Bay (Coe 1901; Corrêa 1964); *C. herculeus* is enormous in size (up to 2 m long and 25 mm wide), burrows in soft sediment intertidally and subtidally from Alaska to southern California (Coe 1901); *C. lineolatus* is pale grey with olive longitudinal lines extending the entire body length (up to 20 cm) and is found intertidally up to 70 m from southern California to Mexico, and also in Miami, Florida (Coe 1905; Cor-

Cerebratulus californiensis



1. *Cerebratulus californiensis* x15:
pale orange with white stripes, head and tail.

rêa 1964).

Because of the many identifying characteristics, which are internal and not visible, it is sometimes very difficult to distinguish among Nemerteans without dissecting them. Ways in which the worms flatten, contract, and coil are useful as aids to identification of live specimens.

Ecological Information

Range: Described from specimens collected at San Pedro Harbor, Dead Man's Island and San Diego, California by Coe (1905). Known range includes Jalisco, Mexico to Puget Sound (Haderlie 1980).

Local Distribution: Coos Bay sites include several mudflats along South Slough and North Spit.

Habitat: Burrows in soft sediment, including sand and mudflats of bays and harbors, and sand of exposed beaches (Kozloff 1974; Haderlie 1980; Roe et al. 2007).

Salinity:

Temperature:

Tidal Level: Low intertidal zone and subtidal to at least 50 m (Gibson 1995).

Associates: Polychaetes, tanaidaceans (*Leptochelia spp.*), amphipods.

Abundance: Fairly common, but not as common as its congener, *C. marginatus*.

Life-History Information

Reproduction: Breeds in July in northern distribution, but breeding in southern California occurs in May and June (Coe 1940; Haderlie 1980).

Larva: Development is indirect with planktotrophic pilidium larval stage (Haderlie 1980). The larvae of *C. californiensis* are unique in having distinct pigment on larval lobes and lappets (Maslakova and Hiebert 2014).

Juvenile:

Longevity:

Growth Rate:

Food: Preys on polychaetes.

Predators:

Behavior: Swims with rapid dorsoventral undulations of flattened body. Frequently fragments when disturbed (Haderlie 1980; Roe et al. 2007). Regeneration of lost posterior end can occur (MacGinitie and MacGinitie 1949).

Bibliography

1. COE, W. R. 1901. Papers from the Harriman Alaska Expedition. The Nemerteans. Proceedings of the Washington Academy: 1-110.
2. —. 1905. Nemerteans of the west and northwest coasts of North America. Bulletin of the Museum at Harvard College. xlvii: 1-318.
3. —. 1940. Revision of the nemertean fauna of the Pacific coasts of north, central and northern South America. Allan Hancock Pacific Expeditions. Reports. 2:247-323.
4. CORRÊA, D. D. 1964. Nemerteans from California and Oregon. Proceedings of the California Academy of Sciences (series 4). 31:515-558.
5. GIBSON, R. 1995. Nemertean genera and species of the world: an annotated checklist of original names and description citation, synonyms, current taxonomic status, habitats and recorded zoogeographic distribution. Journal of Natural History. 29:271-562.
6. HADERLIE, E. C. 1980. Nemertea: the ribbon worms, p. 84-90. *In*: Intertidal invertebrates of California. R. H. Morris, D. P. Abbott, and E. C. Haderlie (eds.). Stanford University Press, Stanford, CA.
7. KOZLOFF, E. N. 1974. Keys to the marine invertebrates of Puget Sound, the San Juan Archipelago, and adjacent regions. University of Washington Press, Seattle.
8. MACGINITIE, G. E., and N. MACGINITIE. 1949. Natural history of marine animals. McGraw-Hill Book Co., New York.
9. MASLAKOVA, S. A., and T. C. HIEBERT. 2014. From trochophore to pilidium and

back again: a larva's journey. International Journal of Developmental Biology. 58:585-591.

10. ROE, P., J. L. NORENBURG, and S. MASLAKOVA. 2007. Nemertea, p. 221-233. *In*: Light and Smith manual: intertidal invertebrates from central California to Oregon. J. T. Carlton (ed.). University of California Press, Berkeley, CA.

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