
Polydora nuchalis

A spionid worm

Phylum: Annelida
Class: Polychaeta
Order: Canalpalpita, Spionida
Family: Spionidae

Taxonomy: *Polydora* was revised in 1996 by Blake who noted two distinct categories within the genus which were consistently recognizable with both adult and larval phenotypes. These two categories led to the two genera, *Polydora* and *Dipolydora* (Blake 1996).

Description

Size: Specimens up to 28 mm in length.

Color: The illustrated specimen (Fig. 2) is pale orange, with a broad red vertical dorsal stripe, red cirri and palps.

General Morphology: A small, thin and delicate spionid worm.

Body: Body morphology is easily recognizable as *Polydora* because of a modified fifth setiger (Fig. 4).

Anterior: Prostomium blunt, trilobed and with obvious nuchal (olfactory) tentacle dorsally (Fig. 1). Caruncle extends to third segment (Woodwick 1953) (Fig. 1).

Trunk: Main body consists of eighty segments or more.

Posterior: Pygidium lacks papillae (Fig. 2).

Parapodia: Biramous.

Setae (chaetae): The first setiger has several short and winged neurosetae, but no notosetae. Setigers 2–4 have capillary setae (Bailey-Brock 1990). Setiger five is modified with special setae, no post-setal lobe and, instead, bears a crescent shaped row of spines (Fig. 4). Two types of spines are present on setiger five: one simple and falcate (Fig. 3a) and the other plumose (Fig. 3b). Hooded hooks on neuropodia begin on setiger seven.

Eyes/Eyespots: Two eyespots situated anteriorly, at the base of each palp (Fig. 1) (Bailey-Brock 1990).

Anterior Appendages: Tentacular palps are long and coiling and extend to 25 segments (Fig. 2).

Branchiae: Strap-like branchiae begin on setiger seven (Fig. 4).

Burrow/Tube: Orange tubes are approximately 2 cm in length.

Pharynx:

Genitalia:

Nephridia:

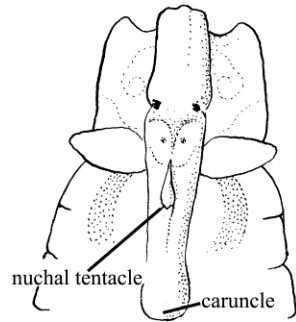
Possible Misidentifications

Spionidae can be distinguished by a pair of long prehensile grooved palps which arise from the posterior peristomium (Blake 1996). Two other polychaete families have long palps: the Magelonidae, with adhesive palps (not long and flowing) and with flattened spade-like prostomiums and the Chaetopteridae which have palps, but their bodies are very obviously divided into three quite different regions, which is not the case in spionids. The similar family Cirratulidae may also have a large pair of palps, but they have tentacular filaments, which are lacking in the spionids. Spionids also have hooded hooks in posterior segments, may or may not have prostomial appendages or branchiae, the prostomium is well developed and fused with peristomium, the pharynx is without jaws and the setae are mostly simple (Blake 1975). Often certain segments are highly modified and have special setae, for example prostomial horns are present in some genera. Spionid parapodia are biramous, with acicula (see *Leitoscoloplos pugettensis*) and sometimes have stout saber setae. There are 19 local spionid genera (Blake and Ruff 2007).

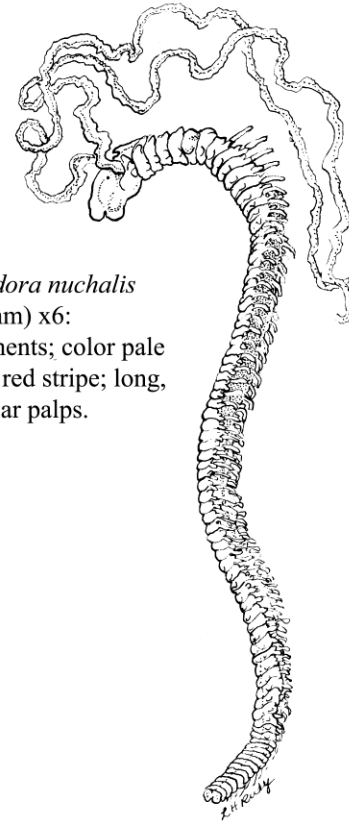
Superficially similar species in the genus recently separated from *Polydora*, *Diplopolydora*, are *D. elegantissima* and *D. socialis* (Blake and Ruff 2007).

Diplopolydora elegantissima, a boring species, has very short branchiae beginning on the eighth setiger, but rarely on the

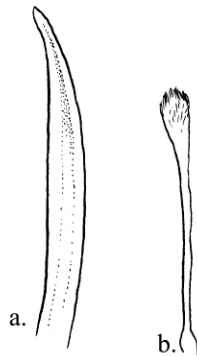
Polydora nuchalis



1. Prostomium (dorsal view).

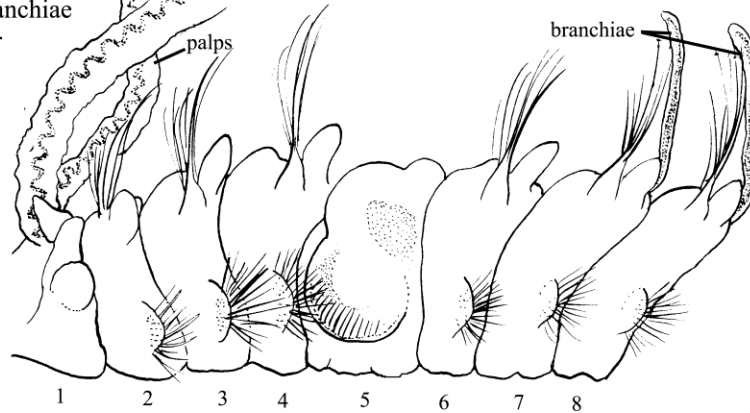


2. *Polydora nuchalis*
(L: 28mm) x6:
80 segments; color pale
orange, red stripe; long,
tentacular palps.



3. Spines of setiger five:
a. heavy spines; simple, falcate
(sickle-like).
b. companion setae, fine, plumose.

4. First eight setigers (lateral view):
showing modified fifth setiger with
crescentic row of spines, no post
setal lobe; strap-like branchiae
(gills) beginning setiger
seven.



seventh, and its nuchal caruncle extends back over several segments. *Diplopolydora socialis*, common in San Francisco, California also has branchiae beginning on the eighth setiger. *Diplopolydora* species are recognizable from *Polydora* species by the following characteristics: hooded hooks having curved shafts and no constriction or manubrium, the main fang is directed apically, notosetae are present on setiger one and the anterior digestive tract is enlarged (Blake 1996).

The genus *Polydora* contains ten locally occurring species (see Blake 1996 for dichotomous key), most are known only to California, but many likely occur in Oregon as well. *Polydora allopuris* is a subtidal species and bores into the shells of *Stylaster californicus*. It has a rounded prostomium, no occipital antennae and two eyes. *Polydora pygidialis* and *P. websteri* bore into mollusk shells, ectoprocts and other calcareous substrates, the former species with a rounded prostomium and up to four eyes, while the latter has an incised prostomium and four eyes. *Polydora bioccipitalis* occurs in southern California and Chile in intertidal and shallow subtidal zones and has a prostomium with a deep anterior notch, two occipital antennae and four eyes. *Polydora brevipalpa* can be found among bivalve and gastropod shells and *P. limicola* can be found in large groups and attached to rocks, wharves and ships. *Polydora brevipalpa* has a rounded prostomium and palps with black bands. *Polydora limicola* has a weakly incised prostomium and four eyes and black pigment bands, anteriorly and dorsally. *Polydora narica* occurs subtidally off Monterey, California and has a large and blunt prostomium and inflated caruncle. *Polydora spongicola* is a commensal species living with sponges that possesses a weakly rounded prostomium and four eyes (Blake 1996).

Polydora cornuta (= *P. ligni*), the type species for this genus is also the most similar species to *P. nuchalis*. *Polydora cornuta* has a nuchal tentacle and its branchiae also begin on setiger seven. Its heavy spines on setiger five have an accessory tooth and its companion setae are feather-like. This species has four eyes anteriorly, arranged in a square and,

posteriorly, a large cup-like pygidium with dorsal notch. Differing from *P. nuchalis*, *P. cornuta* has a bilobed prostomium, rather than incised. *Polydora cornuta* is found in mud or water-logged wood and it is also an oyster borer (Blake and Evans 1973).

Ecological Information

Range: Type locality is southern California (Blake 1996) and the distribution ranges from Oregon to California.

Local Distribution: Coos Bay distribution includes South Slough.

Habitat: Mudflats of estuaries and bays (Blake 1975) or bottom of a drainage channel, *Salicornia* sp. marshes and on non-calcareous substrates (Blake and Evans 1973).

Salinity: Collected at salinities of 10 in surface waters of Coos Bay.

Temperature: Collected at temperatures ranging from 8–18°C in surface waters of Coos Bay.

Tidal Level: Collected at +1.4 m in South Slough.

Associates: Associates include amphipods, isopods, the gastropod *Ovatella* sp. and the alga *Fucus* sp.

Abundance:

Life-History Information

Reproduction: Fertilization is internal and females release pinkish eggs (120 µm in diameter) into transparent capsules through nephridial canals (Woodwick 1960). Up to 100 eggs are kept in the capsules in chains or attached to adult tube walls. Only 1–8 larvae (of 100) will survive. Larvae develop by ingesting nurse eggs within the capsules and at 9–12 segments, they leave the capsule and become planktonic (Woodwick 1960).

Larva: The early larval development was described soon after the description of *P. nuchalis* (Woodwick 1960). Trochophore larvae are 180 µm in length at 18 hours and possess rudiments of a prototroch and telotroch, by 72 hours the larva elongates to 200 µm and, although the telotroch is well developed, there is no segmentation. By five days, the larva has two segments, is 260 µm in length, with budding anterior palps and a distinct pygidium. One day later the larva has three segments, three pairs of eyes and

begins to feed on nurse eggs. Five segments are reached after one week and 15 by three weeks (Woodwick 1960). Spionid larvae were collected in plankton samples from under the South Slough Bridge in June in concentrations between 300 to 4000/m³ in February (Blake and Evans 1973). Larvae settle, metamorphose, and begin building tubes at the 13-17 segment stage (Woodwick 1960).

Juvenile

Longevity: The longevity of *Polydora nuchalis* is not known, but its congener *P. ligni* completes a life cycle in 30 days.

Growth Rate:

Food: Individuals collect detritus using long tentacular palps.

Predators:

Behavior:

Bibliography

1. BAILEY-BROCK, J. H. 1990. *Polydora nuchalis* (Polychaeta: Spionidae), a new Hawaiian record from aquaculture ponds. *Pacific Science*. 44:81-87.
2. 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.
3. —. 1996. Family Spionidae, p. 81-224. *In: Taxonomic atlas of the benthic fauna of the Santa Maria Basin and Western Santa Barbara Channel*. Vol. 6. J. A. Blake, B. Hilbig, and P. H. Scott (eds.). Santa Barbara Museum of Natural History, Santa Barbara, CA.
4. BLAKE, J. A., and J. W. EVANS. 1973. *Polydora* and related genera as borers in mollusc shells and other calcareous substrates. *Veliger*. 15:235-249.
5. BLAKE, J. A., and E. R. RUFF. 2007. Polychaeta, p. 309-410. *In: Light and Smith manual: intertidal invertebrates from central California to Oregon*. J. Carlton (ed.). University of California Press, Berkeley, CA.
6. WOODWICK, K. H. 1953. *Polydora nuchalis*, a new species of Polychaetous annelid from California. *Journal of the Washington Academy of Science*. 43:381-383.
7. —. 1960. Early larval development of *Polydora nuchalis* Woodwick, a spionid polychaete. *Pacific Science*. 14:122-128.