

A Pacific Polychaete in Southeastern United States

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THE marine polychaete worm *Poecilochaetus johnsoni* Hartman was originally described from a specimen taken near the mouth of Mission Bay, southern California (Hartman, 1939), and has not been previously reported from the Gulf of Mexico or the Atlantic seaboard (Hartman, 1965). This report records the occurrence of *P. johnsoni* in the southeastern United States and presents information on the biology of this rarely collected species. Specimens were collected in Florida at Seahorse Key, Tampa Bay, Naples, and Biscayne Bay in 1958-65. During the same period, the worm was also taken in North Carolina at Cape Lookout and in Core and Bogue Sounds.

EXTERNAL MORPHOLOGY

Specimens of *P. johnsoni* from southeastern United States correspond with the species description (Hartman, 1939) except for a greater variability in spinous setae and anal cirri. The original account reported three, four, or perhaps five falcate spines on the second and third setigers and described three simple and subequal cirri along the ventral border of the anus, and one on its middorsal border.

Most specimens collected in the southeast have four falcate spines on the second setiger and three on the third. Exceptions are fairly common, however, and some individuals have three to six spines on either setiger. Anal cirri usually form a ventral series of three, consisting of one median and two lateral processes. The midventral cirrus is simple, but the lateral pair may be divided distally once or several times. Only one specimen has a single middorsal cirrus; some have two dorsal cirri arising separately or jointly at a common base; and on others, the dorsal border of the anus appears plain. These features are evidently labile for eastern races of the species and do not seem of sufficient meristic importance to warrant establishment of a distinct taxonomic separation between southeastern and Pacific forms of the worm.

ECOLOGY

Environmental conditions in areas where *P. johnsoni* has been collected are summarized in Table 1. These records show that

the worm commonly occurs in coastal situations having temperate or subtropical characteristics, moderate tidal flow, and a substrate of silty sand.

At most localities the mean annual salinity is above 30 o/oo and fairly stable, but at Seahorse Key, Florida, and in Bogue and Core Sounds, North Carolina, the mean value is lower and freshets periodically create brackish conditions. Although the benthic habit of *P. johnsoni* may mitigate the effects of dilute seawater, it seems likely that the worm has some capacity for osmoregulation or other physiological adjustment during periods of osmotic stress.

Marine grasses are a conspicuous feature in many areas where *P. johnsoni* occurs. The friable dwelling tube has been taken among roots and rhizomes, as well as in clear areas between patches of vegetation. In May 1965, 189 specimens were collected in a bottom sample one-half meter square, at the southern end of Core Sound, North Carolina, adjacent to Whitehurst Island, in tidal flats densely vegetated with *Zostera marina*.

Commensal pinnotherid crabs tentatively identified as juvenile *Pinnixa chaetoptera* were found in tubes of *P. johnsoni* at Seahorse Key, Florida, and Whitehurst Island, North Carolina. In both areas adult *P. chaetoptera* were collected from tubes of larger polychaetes. The small tube of *P. johnsoni* imposes a size limit on commensal crabs that can be accommodated; the association is probably temporary, providing a refuge for young crabs during early post-larval stages.

Reproduction of *P. johnsoni* apparently takes place in spring, summer, and fall when water temperature is about 20 C or above. Plankton from Tampa Bay contained larval stages of *P. johnsoni* in April, May and August (John A. Kelly, Jr., and Alexander Dragovich, unpublished). At Cape Lookout, North Carolina, a specimen taken by Lawrence McCloskey in November had ruptured median and posterior parapods, presumably damaged during release of gametes.

In comparison with other species of Poecilochaetidae (Hannerz, 1956), *P. johnsoni* has been considered most closely related to *Poecilochaetus tropicus* Okuda from the Pacific (Hartman, 1939 and 1959). From an ecological standpoint, however, *P. johnsoni* resembles in many respects the eastern Atlantic species, *Poecilochaetus serpen* Allen, studied on the English coast (Allen, 1904). The population concentration of *P. johnsoni* at Whitehurst Island,

North Carolina, provides an excellent opportunity for detailed studies and clarification of the biology of this unusual and little-known spioniform polychaete.

MATERIAL EXAMINED

Seahorse Key, Florida: 2 specimens (anterior portion only), E. Lowe Pierce, coll., 1958, U. S. National Museum No. 32616; 3 specimens (anterior portion only), John L. Taylor, coll., September 22, 1960; 1 specimen (anterior portion only), John L. Taylor and Carl H. Saloman, coll., August 5, 1964.

Tampa Bay, Florida: 2 specimens (median fragments only), John L. Taylor and Carl H. Saloman, colls., August 10, 1964; 4 specimens (juvenile, meroplankton), Alexander Dragovich and John Kelly, Jr., colls., April 11, 1961, May 8, 1962, August 16, 1962 (2).

Naples, Florida: 1 specimen (anterior portion only), Charlene Long, coll., December 1958.

Biscayne Bay, Florida: 1 specimen (anterior portion only), Robert T. Paine, coll., January 26, 1960.

Cape Lookout, North Carolina: 1 specimen (anterior portion only), Lawrence McCloskey, coll., November 4, 1963.

Core Sound, North Carolina: 189 specimens (entire specimens and fragments), John L. Taylor, coll., May 4, 1965.

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TABLE 1
Ecological conditions at points of collection of *Poecilochaetus johnsoni*

Locality	Sediment type	Ambient current (knots)	Annual range of water temperature (°C)	Salinity (o/oo)		Proximal vegetation
				Mean	Range	
Mission Bay, California	Silty-sand ^{1,2}	No data	10-25	34	30-35	No data
Seahorse Key, Florida	Coarse sand and shell, 2% silt and clay	0.5	10-34	25 ³	10-32	<i>Thalassia testudinum</i>
Bunces Pass, Tampa Bay, Florida	do	2 ⁴	12-34 ^{3,5}	34 ^{3,5}	33-38	do
Johns Pass, Tampa Bay, Florida	Coarse sand and shell, 11% silt and clay	1 ⁴	12-34 ^{3,5}	34 ^{3,5}	33-38	do
Naples, Florida	Silty-sand	No data	17-32 ⁶	33 ⁶	32-39	No data
Bear Cut, Biscayne Bay, Florida	Calcareous sand	1	24-30	35	35-38	<i>Diplanthera wrightii</i> <i>Syringodium filiforme</i> <i>Thalassia testudinum</i>

TABLE 1 (continued)
Ecological conditions at points of collection of *Poecilochaetus johnsoni*

Locality	Sediment type	Ambient current (knots)	Annual range of water temperature (°C)	Salinity		Proximal vegetation
				Mean	Range	
Cape Lookout, North Carolina	Silt deposited on living coral, <i>Oculina arbuscula</i>	1	15-28	32	30-36	No data
Whitehurst Island, Core Sound, North Carolina	Coarse sand and shell, 10% silt and clay	1	6-30	30	10-35	<i>Zostera marina</i>
Bogue Sound, North Carolina	Medium sand, 4% silt and clay	0.5 ⁴	6-30	30	10-35	<i>Diplanthera wrightii</i>

¹Hartman, 1939; ²Hartman, 1961; ³U. S. Coast & Geodetic Survey, 1960; ⁴U. S. Coast & Geodetic Survey, 1964; ⁵Saloman, Finucane, and Kelly, 1964; ⁶Dragovich, 1961.

Closkey, Duke University Marine Laboratory, and Hugh Porter, University of North Carolina Institute of Fisheries Research, gave notes and records for environmental conditions in Bogue Sound, Core Sound, and at Cape Lookout. Dr. John Bradshaw, Scripps Institution of Oceanography, furnished temperature and salinity records for Mission Bay, California, and vicinity.

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