

***Pseudatherospio fauchaldi*, a new genus and species  
of Spionidae (Polychaeta, Annelida) from  
southern California, USA**

Lawrence L. LOVELL

1036 Buena Vista Drive, Vista  
California 92083-7411, USA

ABSTRACT

*Pseudatherospio fauchaldi*, a new genus and species of Spionidae is described from material collected from a depth of 197 m off Huntington Beach, southern California. The main characteristics of the genus are the distribution and shape of branchiae, the presence of fringed neuropodial setae in anterior setigers and the structure of modified neuropodial hooks in posterior setigers. Generic affinities are discussed. *Pseudatherospio* most closely resembles *Atherospio* Mackie & Duff, 1986 and *Pygospio* Blake, 1983.

RÉSUMÉ

*Pseudatherospio fauchaldi*, genre et espèce nouveaux de Spionidae (Annélides, Polychètes) de Californie du Sud

*Pseudatherospio fauchaldi*, genre et espèce nouveaux de Spionidae est décrit à partir de matériel récolté par 197 m de profondeur au large d'Huntington Beach, Californie du sud. La distribution et la forme des branchies présentes dès le premier sétigère, la présence de soies neuropodiales frangées aux sétigères antérieurs et la structure des crochets modifiés des sétigères postérieurs dont la dent secondaire est située au-dessous de la dent principale du côté concave du crochet sont les caractéristiques essentielles du genre. Les affinités génériques avec les genres les plus proches, *Atherospio* Mackie & Duff, 1986 and *Pygospio* Blake, 1983 sont discutées.

INTRODUCTION

A new genus and species of Spionidae is described from a sample collected at a depth of 197 m off Huntington Beach, southern California, during July 1991. Specimens were collected by MEC Analytical Systems, Inc. (contract number 02091) as part of the E.P.A. 301(h) waste water outfall monitoring program of the County Sanitation Districts of Orange County (CSDOC).

Type material has been deposited in the following museums: Allan Hancock Foundation Polychaete Collection

of the Los Angeles County Museum of Natural History, Los Angeles, California (LACM-AHF) and National Museum of Natural History, Washington, D.C. (USNM).

## SYSTEMATICS

### *Pseudatherospio* gen. nov.

**Type species.** — *Pseudatherospio fauchaldi* sp. nov. Gender, feminine.

**Diagnosis.** — Prostomium longer than wide, anterior margin bilobed, tapering posteriorly; eyes absent; occipital tentacle present. Branchiae from setiger 1 to at least setiger 36; outer margin fused with notopodial lamellae on setigers 7-15 or 16, free otherwise; terminate with short, digitate process. Interramal 'genital' pouches absent. Setigers 2-16 with dorsal intrasegmental and intersegmental ciliary bands. Parapodia biramous. Notosetae capillary. Neurosetae include capillary setae; fringed setae; bidentate, strongly-curved, hooded hooks. Sabre setae absent. Pygidium unknown.

**Etymology.** — The generic name refers to the close resemblance to *Atherospio* Mackie & Duff, 1986.

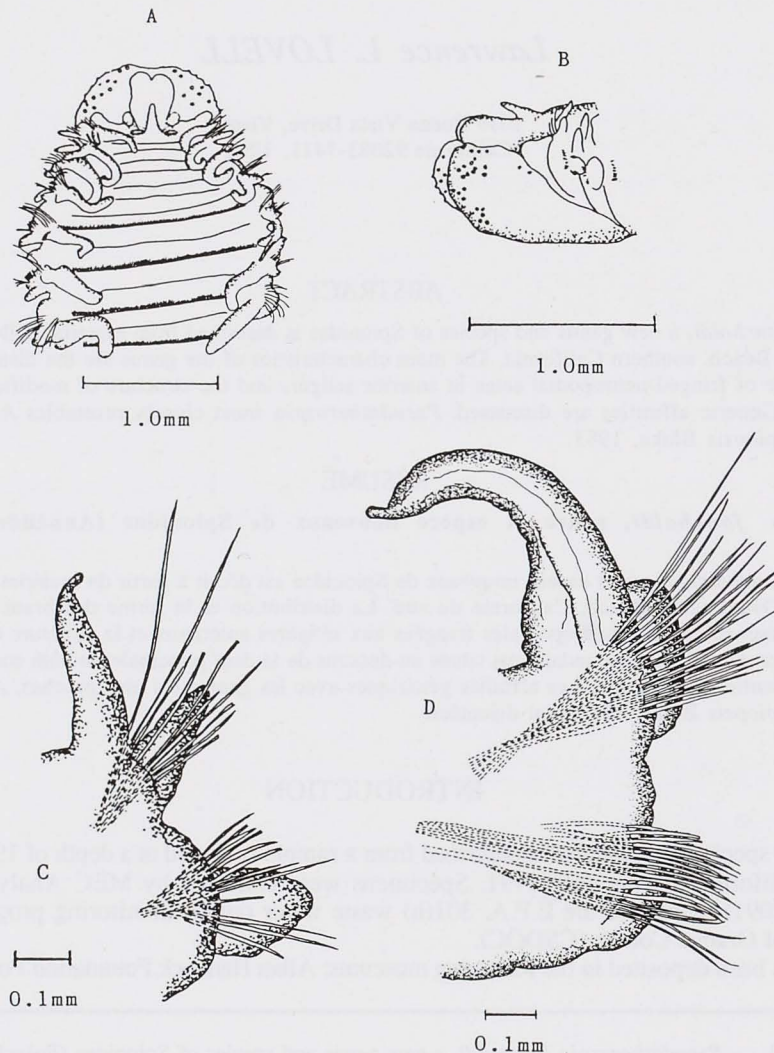


FIG. 1. — *Pseudatherospio fauchaldi* gen. sp. nov. A, Anterior end, dorsal view. B, Anterior end, lateral view. C, Parapodium from setiger 1, anterior view. D, Parapodium from setiger 5, anterior view.

*Pseudatherospio fauchaldi* sp. nov.

(Figs 1 &amp; 2)

**Material.** — Pacific Ocean, Southern California, R. V. CRUSADER; collector: C. FULLER, station 25, 33°33'48"N, 118°02'11"W, 197 m, green mud, 24 July 1991, holotype (LACMNH-AHF1650), 1 paratype (LACM-AHF1651) and 1 paratype (USNM163804).

**Description.** — Holotype incomplete, with 36 setigers; total length 9.5 mm; width 0.8 mm (excluding parapodial lobes) at setiger 1, 1.3 mm at setiger 6. Paratypes incomplete, each with 22 setigers; total length 6.7 mm and 9.6 mm, respectively; width 0.8 and 1.8 mm at setiger 1, and 1.9 and 3.7 mm at setiger 6, respectively.

Prostomium longer than wide, anterior margin bilobed, tapering posteriorly to setiger 1; eyes absent; occipital tentacle short, distally tapering, emerging from anterior margin of setiger 1 (Fig. 1A-B). Pair of grooved palps inserted on peristomium near postero-lateral margins of prostomium, extending to setiger 12. Peristomium poorly developed, only visible along postero-lateral margin of prostomium, remainder fused to setiger 1. Small, transverse nuchal organs present behind palps at anterior margin of setiger 1. Everted proboscis delicate, translucent sac with medial groove and low, conical papillae on the fronto-lateral margin (Fig. 1A-B).

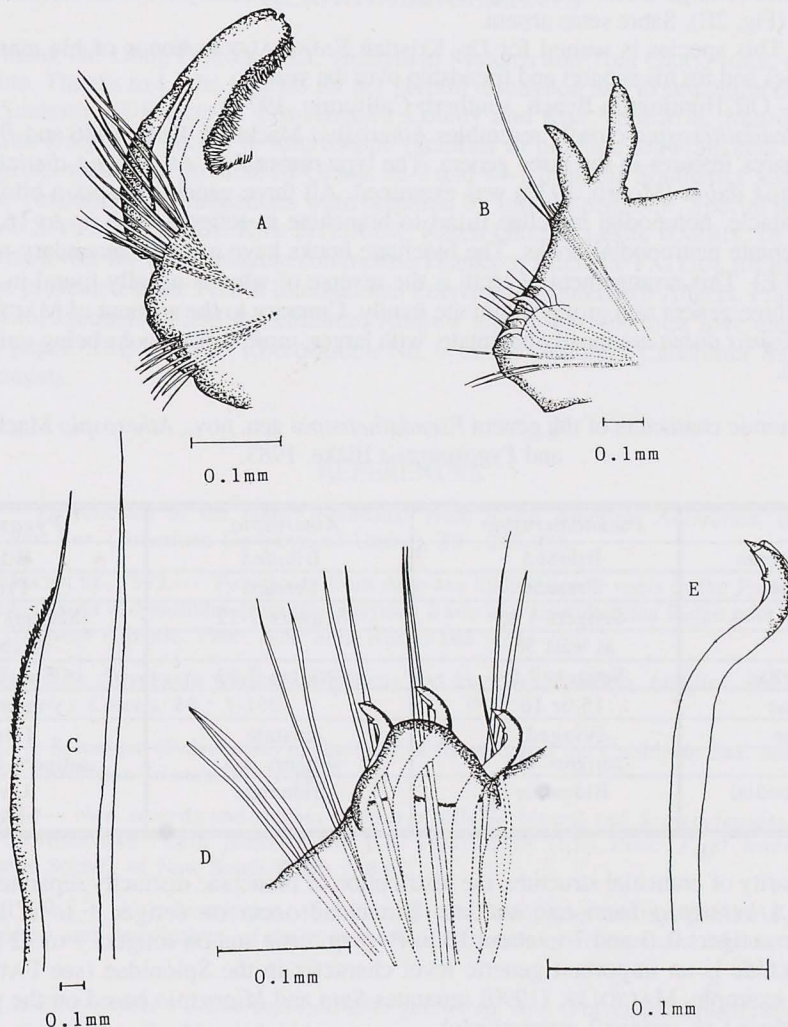


FIG. 2. — *Pseudatherospio fauchaldi* gen. sp. nov. A, Parapodium from setiger 9, anterior view. B, Parapodium from setiger 26, posterior view. C, Fringed seta and capillary seta from setiger 5. D, Neuropodial ramous from setiger 20. E, Neuropodial hooded hook from setiger 20.

Parapodia biramous. Notopodial postsetal lamellae long, triangular on setiger 1 (Fig. 1C); shorter and more broad by setiger 5 (Fig. 1D); completely fused with outer branchial margin on setigers 7-15 or 16 (Fig. 2A); long, triangular after setiger 15 or 16 (Fig. 2B). Neuropodial postsetal lamellae broadly triangular on setiger 1 (Fig. 1C); shorter and more broad by setiger 5 (Fig. 1D); a low mound on setigers 7-15 or 16 (Fig. 2A); lamellae short, broadly triangular after setiger 16 or 17 (Fig. 2D). Ventral scutes or pads absent.

Branchiae begin on setiger 1, on all setigers present. Branchiae cirriform and free from notopodial lamellae on setigers 1-6 and 15 or 16-36 (Figs 1C-D, 2B); branchiae fused to lamellae on setigers 7-14 or 15, with inner lateral margins densely ciliated (Fig. 2A). Branchiae terminate with a short, narrow, digitate process; greatly reduced in size on setigers 7-14 or 15 (Figs 1C-D, 2A-B). Intersegmental ciliary bands on setigers 2-10 poorly-developed (Fig. 1A). Intrasegmental ciliary bands on setigers 2-4 poorly-developed, well-developed on setigers 5-16 (Fig. 1A). Interramal "genital" pouches absent. Pygidium unknown. Body color white in ethanol.

Notosetae capillary. Neurosetae include capillary setae, fringed setae, and bidentate hooded hooks. Capillary neurosetae of setigers 1-3 and 7-16 arranged in large superior bundle and small inferior bundle. Neuropodia of setigers 4-6 with two rows of 8-9 fringed setae each in superior bundle and 5-6 capillary setae in inferior bundle (Fig. 2C). Neuropodia from setiger 17 with 3-5 strongly-curved, bidentate hooded hooks alternating with paired capillary setae in the superior bundle; 2-6 capillary setae in the inferior bundle (Fig. 2D). Hooks with secondary tooth subdistal, inferior to large tooth; hood originating just below secondary tooth and terminating leaving tip of distal tooth exposed (Fig. 2E). Sabre setae absent.

**Etymology.** — This species is named for Dr. Kristian FAUCHALD in honor of his many contributions to polychaete systematics and for his support and friendship over the years.

**Distribution.** — Off Huntington Beach, southern California, 197 m.

**Remarks.** — *Pseudatherospio* closely resembles *Atherospio* Mackie & Duff, 1986 and *Pygospio* Blake, 1983. Table 1 compares features in the three genera. The type material of *Atherospio disticha* Mackie & Duff, 1986 and *Pygospio dubia* (Monro, 1930) was examined. All three genera possess a bilobed prostomium, a median occipital tentacle, notopodial lamellae fused to branchiae in setigers 7-12 up to 16, modified anterior neurosetae, and bidentate neuropodial hooks. The bidentate hooks have a small, secondary tooth inferior to the large tooth (Figs 2D,E). This arrangement of teeth is the reverse of what is usually found in the Spionidae, and readily unites these three genera as a group within the family. Contrary to the account of MACKIE & DUFF (1986), the hooks of *Pygospio dubia* are mostly bidentate, with larger, more worn, hooks being unidentate or having a reduced inferior tooth.

TABLE 1. — Taxonomic characters of the genera *Pseudatherospio* gen. nov., *Atherospio* Mackie & Duff, 1986, and *Pygospio* Blake, 1983.

	<i>Pseudatherospio</i>	<i>Atherospio</i>	<i>Pygospio</i>
Anterior prostomium	Bilobed	Bilobed	Bilobed
Occipital tentacle	Present	Present	Present
Branchiae	Setigers 1 to at least 36	Setigers 7-12	Setigers 2,3 and 7 to about 16
Notopodial lamellae fused to branchiae	Setigers 7 to 15 or 16	Setigers 7-12	Setigers 7 to about 16
Modified anterior neurosetae	Fringed, setigers 4-6	Aristate, setigers 4-5	Fringed, setigers 4-7 up to 9
Posterior neuropodial hooded hooks	Bidentate	Bidentate	Uni- and bidentate

Despite the similarity of branchial structure, the distribution of branchiae distinctly separates *Pseudatherospio*, *Pygospio* and *Atherospio* from one another. Branchiae occur on setiger 1 to at least setiger 36 in *Pseudatherospio*, on setigers 2, 3 and 7 to about 16 in *Pygospio* and on setigers 7 to 12 in *Atherospio*. The distribution of branchiae is an important generic level character in the Spionidae (see FAUCHALD, 1977 and FOSTER, 1971). For example, MACIOLEK (1990) separates *Spio* and *Microspio* based on the position of the first pair of branchiae (setiger 1 vs. setiger 2, respectively).

The presence of anterior neuropodial modified setae is not common in the Spionidae (see MACKIE & DUFF, 1986). *Pseudatherospio* and *Pygospio* both have fringed neurosetae setae in setigers 4-6 and 4-7 up to 9, respectively. The presence of these fringed anterior neurosetae in *Pygospio* was not reported in previous

accounts by MONRO (1930) or BLAKE (1983). *Atherospio* has aristate neurosetae in setigers 4-5. Two other spionid genera, *Scolecopides* (Ehlers, 1907) and *Lindaspio* Blake & Maciolek, 1992, also have modified anterior neuropodial setae; but these genera can be separated based on the presence of prostomial frontal horns, the absence of an occipital tentacle, and the presence of notopodial modified hooks in posterior setigers (see MACIOLEK, 1984 and BLAKE & MACIOLEK, 1992).

The anteriorly bilobed prostomium, occipital tentacle, similarity of branchial structure, presence of modified anterior neurosetae, and structure of neuropodial hooded hooks all suggest that *Pseudatherospio*, *Atherospio*, and *Pygospio* are a closely related, geographically wide-spread complex of genera. MACKIE (pers. comm.) is currently investigating the status of a second species of *Atherospio* from the south coast of England, as well as some related forms that appear to belong to two undescribed genera. One of the proposed new genera is present in the coastal waters of both the United Kingdom and Hong Kong, providing further evidence for a widely distributed complex.

#### ACKNOWLEDGEMENTS

I would like to thank Dr. Doug DIENER MEC Analytical Systems and Tom GERLINGER, CSDOC, for making the material available. Thanks to Leslie HARRIS for her helpful discussion and examination of specimens; to Tom PARKER, County Sanitation Districts of Los Angeles County and Ron VELARDE, Metro Ocean Monitoring Program, City of San Diego for access to microscope facilities to produce drawings and photos. Funding for illustrations and reprints was made possible by Grants 92-2 and 94-1 from the Southern California Association of Marine Invertebrate Taxonomists. Illustrations were prepared by Julie SCHNEIDER. Special thanks to Dr. Kristian FAUCHALD, Andrew S.Y. MACKIE, Dr. Kirk FITZHUGH, Karen GREEN, Leslie HARRIS, Dr. James A. BLAKE, and an anonymous reviewer for their valuable comments. Thanks to Michelle PATZIUS for help in the production of the poster version presented at the Fourth International Polychaete Conference Angers, France. Finally, I would like to thank my wife, Jacqueline, and my children, Andrew and Robin, for their love and support during the preparation of this paper. This paper is Contribution No. 9 of the Southern California Association of Marine Invertebrate Taxonomists.

#### REFERENCES

- BLAKE, J.A., 1983. — Polychaetes of the family Spionidae from South America, Antarctica, and adjacent seas and islands. *Antarct. Res. Ser.* (American Geophysical Union), **39** : 205-288.
- BLAKE, J.A. & N.J. MACIOLEK, 1992. — Polychaeta from deep-sea hydrothermal vents in the Eastern Pacific. III. A new genus and two new species of Spionidae from the Guaymas Basin and Juan de Fuca Ridge with comments on a related species from the Western Atlantic. *Proc. Biol. Soc. Wash.*, **105** : 723-732.
- FAUCHALD, K., 1977. — The polychaete worms. Definitions and keys to the orders, families, and genera. *Sci. Ser. Nat. Hist. Mus. Los Angeles County*, **28** : 1-190.
- FOSTER, N.M., 1971. — Spionidae (Polychaeta) of the Gulf of Mexico and the Caribbean Sea. *Studies on the Fauna of Curacao and other Caribbean Islands*, **36** : 1-183.
- MACIOLEK, N.J., 1984. — New records and species of *Marenzelleria* Mesnil and *Scolecopides* Ehlers (Polychaeta: Spionidae) from northeastern North America. In: P.A. HUTCHINGS (ed.), *Proc. First International Polychaete Conference*. Linnean Society of New South Wales : 48-62.
- MACIOLEK, N.J., 1990. — A redescription of some species belonging to the genera *Spio* and *Microspio* (Polychaeta: Annelida) and descriptions of three new species from the northwestern Atlantic Ocean. *J. Nat. Hist.*, **24** : 1109-1141.
- MACKIE, A.S.Y. & A.L. DUFF, 1986. — *Atherospio disticha* gen. et sp. nov. (Polychaeta: Spionidae) from Loch Tuirnaig, West Coast of Scotland. *Ophelia*, **25** : 139-146.
- MONRO, C.A.A., 1930. — Polychaete Worms. *Discovery Rep.*, **2** : 1-222.