Review of the genus *Sigambra* (Polychaeta: Hesionidae), redescription of *S. bassi* (Hartman, 1947), and descriptions of two new species from Thailand and China

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The taxon *Sigambra* Müller, 1858 is reviewed. *Sigambra bassi* (Hartman, 1947) – originally assigned to the "pilargid" genus *Ancistrosyllis* – is redescribed. *S. hanaokai* (Kitamori, 1960) and *S. parva* (Day, 1963) are discussed and regarded as synonyms of *Sigambra tentaculata* (Treadwell, 1941). *Sigambra phuketensis* n.sp. from Thailand and *S. qingdaoensis* n.sp. from China are described scientifically for the first time. A key to the 14 recognized species of the genus *Sigambra* is included. The taxonomic value of the notopodial hook is discussed.

Keywords: Polychaeta, Hesionidae, Pilargidae, *Sigambra*, taxonomy, systematics, SEM, China, Thailand.

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INTRODUCTION

The genus *Sigambra* was erected by Fritz Müller for the monotypic *Sigambra grubei* Müller, 1858 and placed in a new taxon Amytidea related to the present Orbiniidae. As *Sigambra* was overlooked for more than one hundred years, descriptions of seven new species belonging to this genus were placed in the "pilargid" taxon *Ancistrosyllis* McIntosh, 1879 (Ehlers 1908, Southern 1921, Treadwell 1941, Hartman 1947, Hartmann-Schröder 1959, Kitamori 1960, Day 1963). Pettibone (1966) recognized that those seven species and one new one belong to the "old" taxon *Sigambra*, which she included in the family Pilargidae Saint-Joseph, 1899. Further *Sigambra* species were described by Fauchald (1972), Hartmann-Schröder (1979), and Britaev & Saphronova (1981). At present the genus includes 16 described species, 14 of which are herein considered distinct (see below), including the two new ones described here. However, there is disagreement as to the validity of some *Sigambra* species and a revision of the genus is needed.

The present paper reviews the genus *Sigambra*, redescribes *S. bassi* from type material from the Gulf of Mexico and describes *S. phuketensis* n.sp. from Thailand and *S. qingdaoensis* n.sp. from China. *Sigambra hanaokai* (Kitamori, 1960) and *S. parva* (Day, 1963) are regarded as synonyms of *S. tentaculata* (Treadwell, 1941). *Sigambra* Müller, 1858 is placed in the Hesionidae in accordance with Licher & Westheide (1994).

MATERIAL AND METHODS

For light microscope preparations, fixed specimens (stored in 70% ethanol) were transferred to glycerine. Observations, drawings, and measurements were made using a Leitz Diaplan microscope with interference contrast optics and a camera lucida. For SEM investigations, three specimens were dehydrated, critical point dried with carbon dioxide, sputter-coated with gold, and observed with a Cambridge Stereoscan 250.

Material is deposited in the following museums or institutes: American Museum of Natural History, New York (AMNH); Natural History Museum [formerly British Museum (Natural History)], London (BMNH); Institute of Oceanology, Chinese Academy of Sciences, Qingdao (IOCAS); Los Angeles County Museum of Natural History, collection of the Allan Hancock Foundation, Los Angeles (LACM-AHF); Phuket Marine Biological Center, Thailand (PMBC); Senckenberg Museum, Frankfurt (SMF); National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); Zoological Institute, Russian Academy of Sciences, St. Petersburg (ZISP); Zoologisches Museum, Museum für Naturkunde der Humboldt-Universität Berlin (ZMB); Zoologisches Institut und Museum, Universität Hamburg (ZMH); and Zoological Museum, University of Copenhagen (ZMUC).

TAXONOMY

Family Hesionidae Malmgren, 1867

Genus *Sigambra* Müller, 1858

Type species: *Sigambra grubei* Müller, 1858, by monotypy.

Diagnosis

Body dorsoventrally flattened, integument smooth or papillated. Prostomium with 2 biarticulate palps and 3 slender antennae, the latter positioned on posterior half of prostomium. Eyes normally absent. Pharynx unarmed, with marginal papillae. Peristomium achaetous, with 2 pairs of peristomial cirri. Parapodia biramous; notopodia each with dorsal cirrus, notoacicula, stout emergent hook in middle and posterior segments, may be accompanied by 1-3 capillaries or single spine. Neuropodia well developed, each with ventral cirrus (not present on chaetiger 2 except for two species) and only simple chaetae. Pygidium with 2 anal cirri.

Remarks

Sigambra was assigned to the Hesionidae by Licher & Westheide (1994). The taxon "Pilargidae" is regarded as representing a monophyletic subtaxon of the Hesionidae (the correct spelling is Pilargidae, not Pilargiidae; see: International Commission on Zoological Nomenclature, 1985 (ICZN): art. 35 d (ii)).

Among those genera previously referred to the Pilargidae, *Sigambra* is similar to *Ancistrosyllis* McIntosh, 1879 in being dorsoventrally flattened and possessing notopodial hooks. However, *Sigambra* has slender and much longer prostomial, peristomial, parapodial and pygidial appendages and a three-lobed brain, whereas that of *Ancistrosyllis* is five-lobed (Fitzhugh & Wolf 1990). *Sigambra* is similar to *Glyphohesione* Friedrich, 1950 (resurrected by Licher 1994) in having well developed prostomial, peristomial, parapodial and pygidial apendages; however, *Sigambra* has notopodial hooks, which are absent in *Glyphohesione*.

Harpochaeta cingulata Korschelt, 1893 was suggested by Pettibone (1966) to belong to *Ancistrosyllis* McIntosh, 1879, *Cabira* Webster, 1879 or *Sigambra* (see also Ehlers 1908). Since Korschelt's animals apparently are juvenile stages, at present it cannot be decided to which genus they actually belong. The type material could not be located.

Key to recognized species of *Sigambra*

1		Ventral cirri present in chaetiger 2 . . . 2
–		Ventral cirri absent in chaetiger 2 3
2	(1)	Notopodia each with single capillary in middle or posterior segments; all dorsal cirri of same size; notopodial hooks from chaetigers 23-30 . . . . . *S. wassi*
–		Notopodial capillaries lacking; dorsal cirri in chaetiger 2 smaller than those in following chaetigers; notopodial hooks from chaetigers 43-70 . . . . . *S. robusta*
3	(1)	Pharynx with 8 papillae 4
–		Pharynx with 13 or 14 papillae 6
4	(3)	Dorsal and ventral cirri subequal; eyes present (not visible in fixed material); notopodial hooks from chaetiger 6; specimens ca. 1.5 mm long . . . . . *S. ocellata*
-		Dorsal cirri larger than ventral cirri; eyes lacking; specimens larger 5
5	(4)	Notopodia of middle or posterior segments each with 2 capillaries; some

neurochaetae bidentate . . . *S. bidentata*
– Notopodia of middle or posterior segments maximally with 1 capillary; bidentate neurochaetae lacking . . . . . *S. qingdaoensis* n.sp.
6 (3) Notopodia of middle or posterior segments each equipped with notopodial hook, emergent spine and simple capillary; notopodial hooks from chaetigers 3-25; 14 pharyngeal papillae . . *S. bassi*
– Emergent spines lacking; notopodial hooks present; capillaries may be present 7
7 (6) Notopodia of middle or posterior segments each with 2-3 capillaries; notopodial hooks from chaetigers 3-4; anterior segments somewhat inflated and inconspicuously demarcated from each other; 14 pharyngeal papillae *S. setosa*
– Maximally 1 capillary notochaeta in middle or posterior parapodia 8
8 (7) Median antenna shorter than lateral antennae; notopodial hooks from chaetigers 43-66 . . . . . *S. rugosa*
– Median antenna longer than lateral antennae or subequal 9
9 (8) Notopodia lacking capillaries; neuropodia with three kinds of chaetae: capillaries, denticulate and pectinate chaetae; notopodial hooks from chaetigers 16-20 . . . . . *S. grubei*
– Otherwise 10
10 (9) Pharynx with 13 papillae; notopodial hooks from chaetigers 7-16 11
– Pharynx with 14 papillae; notopodial hooks from chaetigers 3-40 12
11 (10) Notopodial hooks from chaetigers 7-10; neuropodia with pectinate chaetae; dorsum pigmented . . . . . *S. pettiboneae*
– Notopodial hooks from chaetigers 11-16; neuropodial pectinate chaetae lacking; no pigment . . . . . *S. elegans*
12 (10) Notopodial hooks from chaetigers 30-40; body may be constricted at chaetiger 4 . . . . . *S. constricta*
– Notopodial hooks also present in more anterior chaetigers 13
13 (12) Notopodial hooks from chaetigers 3-23; neuropodial pectinate chaetae present; specimens smaller than 10 mm . . . . . *S. phuketensis* n.sp.
– Notopodial hooks from chaetigers 4-8; neuropodial pectinate chaetae absent, specimens larger (about 20 mm) . . . . . *S. tentaculata*

Sigambra grubei Müller, 1858

Sigambra grubei Müller, 1858: 214-215, pl. 6, fig. 9. – Hartman 1959: 194.
Sigambra grubii. – Quatrefages 1866: 89. – Pettibone 1966: 182, fig. 13. – Fauchald 1977: 78. – Amaral 1980: 83. – Salazar-Vallejo 1990: 507-511.
? *Sigambra* sp. – Nonato & Amaral 1979: 54, fig. 102. – Dueñas 1981: 87.

Material examined:
SW Atlantic Ocean: Brazil: Santa Catarina Island: Lagoa de Conceiçao, 27°36'24"S, 48°27'42"W, 17 Nov 1965, beach, coll. M.J. Jones & T.P. Lowe (USNM 103016, 2 specimens).

Type material
Syntype (ZMB Verm. Q. 4375). [Neotype (USNM 123091), designated by Salazar-Vallejo (1990), not valid.]

Type locality
Santa Catharina [= Catarina], Brazil.

Distribution
SW Atlantic Ocean: Brazil.

Remarks
A detailed redescription of *S. grubei* was given in Salazar-Vallejo (1990), together with the designation of a neotype. However, a syntype is present in the Zoologisches Museum, Museum für Naturkunde der Humboldt-Universität Berlin. The species is similar to *S. constricta* (Southern, 1921), *S. bassi* (Hartman, 1947), *S. rugosa* Fauchald, 1972, and *S. phuketensis* n.sp. with respect to the lack of ventral cirri on chaetiger 2, the possession of 14 pharyngeal papillae and dorsal hooks occurring in chaetigers posterior to chaetiger 15. However, in *S. constricta*, *S. bassi* and *S. phuketensis* one notopodial capillary is present in most chaetigers posterior to chaetiger 15 and neuropodial capillaries are lacking; in *S. rugosa* the median antenna is smaller than either of the lateral antennae and notopodial hooks occur from chaetiger 43. *Sigambra grubei* is the type species of