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

the genus. (The spelling must be "*grubei*", not "*grubii*"; see: ICZN 1985, art. 31 a.)

Sigambra robusta (Ehlers, 1908)

Ancistrosyllis robusta Ehlers, 1908: 59-61, pl. 6, figs 4-7. – Fauvel 1920: 210. – Augener 1918: 229-232. – Horst 1921: 76. – Zachs 1933: 128. – Hartman 1959: 194. – Uschakov 1965: 182. – Day 1967: 216, fig. 10.1.d-e. – Bogdanos & Satsmadjis 1983: 93; 1985: 56.

Sigambra robusta. – Pettibone 1966: 181. – Kirkegaard 1983 [1984]: 211-212. – Salazar-Vallejo 1990: 511. – Wu et al. 1990: 324.

Material examined:

Types: **SE Atlantic Ocean:** Holotype, SW Africa: Great Fish Bay, 16°38'S, 11°46'E, "Valdivia" Stn. 76, blue slick, ca. 14°C (ZMH V-3536).

Other material: **SE Atlantic Ocean:** SW Africa: Conception Bay, 23°54'S, 14°26'E, "Galathea" Stn. 149, green mud smelling of H_2S, 54 m, Petersen grab, 25 Dec 1950, bottom temperature 11.7°C, coll. "Galathea" Expedition (ZMUC Pol-398, 4 specimens); 23°54'S, 14°19'E, "Galathea" Stn. 152, sand with mud and many shells, 150 m, Petersen grab, 26 Dec 1950, bottom temperature 10.9°C, coll. "Galathea" Expedition (ZMUC Pol-399, 4 specimens).

Other type material

Paratype (ZMH V-8656), from "Valdivia" Stn. 77, 16°36'S, 11°46'E; syntypes (ZMB Verm. 6744) (not examined).

Distribution

SE Atlantic Ocean. Aegean Sea (Bogdanos & Satsmadjis 1983), W Pacific Ocean (Uschakov 1965), South China Sea (Wu et al. 1990), Sea of Japan (Zachs 1933, as *Ancistrosyllis robusta*).

Remarks

S. robusta differs from all other *Sigambra* species except *S. wassi* Pettibone, 1966 (see Remarks under *S. wassi*) in possessing ventral cirri on chaetiger 2; in addition, it has 15 or 16 pharyngeal papillae (16 according to Ehlers 1908, but 15 according to our investigation of the holotype), whereas all other species of the genus have fewer papillae.

Sigambra constricta (Southern, 1921)

Ancistrosyllis constricta Southern, 1921: 573-576, pl. 19, fig. 1a-g. – Fauvel 1932: 64-65; 1953: 111-112, fig. 54. – Hartman 1947: 498; 1959: 194.

Sigambra constricta. – Salazar-Vallejo 1990: 512.

Not *Ancistrosyllis* cf. *constricta*. – Day 1957: 71-73, text-fig. 2a-d; 1967: 215-216, fig. 10.1.a-c (both = *Sigambra tentaculata*).

Material examined:

Indian Ocean: Holotype, India: Chilka Lake, mud, in crevices of oyster shells (BMNH ZK 1938.5.7.18).

Distribution

India.

Remarks

S. constricta is similar to *S. robusta* (Ehlers, 1908) and *S. rugosa* Fauchald, 1972 in having dorsal hooks from chaetiger 30; however, in *S. robusta* ventral cirri are present on chaetiger 2, and in *S. rugosa* the median antenna is shorter than the lateral antennae.

Southern (1921) claimed a constriction at the fourth segment to be characteristic for this species. Investigation of the only available material (the holotype) proved this character to be very inconspicuous and questionable, and therefore, not useful for determining species.

Sigambra tentaculata (Treadwell, 1941)

Ancistrosyllis tentaculata Treadwell, 1941: 1-3, figs 1-3. – Hartman 1947: 498; 1959: 194; 1965b: 71. – Kisseleva 1964: 1557-1558, fig. a-e.

Ancistrosyllis ? tentaculata. – Hartman & Barnard 1960: 88.

Sigambra tentaculata. – Pettibone 1966: 182-186, figs 14-15. – Harper 1971: 26-27. – Taylor 1971: 183-185, table 59. – Hartmann-Schröder 1974: 112-113. – Perkins & Savage 1975: 29. – Gardiner 1976: 121, fig. 9c. – Kirkegaard 1980: 84. – Shin 1980: 164. – Britaev & Saphronova 1981: 1319, table 1. – Wolf 1984: 29-8 to 29-10 + 29-6, fig. 29-6. – Daoyuang & Yongting 1986: 177. – Salazar-Vallejo 1986: 202, table 3, figs 17-18; 1996: 18. – Daoyuang 1990: 139. – Salazar-Vallejo & Orensanz 1991: 275-277. – Arvanitidis 1994: 64. – Blake 1994: 285-287, fig. 10.6. – Huang 1994: 349.

Sigambra cf. *tentaculata*. – Simboura et al. 1995: 301.

Ancistrosyllis hanaokai Kitamori, 1960: 1086-1088, text-fig. 1. – Uschakov & Wu 1962: 76. – Imajima & Hartman 1964: 86-87. – Hartman 1965a: 26.

Sigambra hanaokai. – Pettibone 1966: 181. – Gallardo 1967: 61, pl. 2, fig. 1. – Britaev & Saphronova 1981: 1319, table 1. – Wu et al. 1990: 324. – Wu et al. 1992: 163. – Huang 1994: 349.

Ancistrosyllis parva Day, 1963: 395-396, fig. 3g-k. – Hartman 1965a: 26. – Day 1967: 216-218, fig. 10.1.f-j. – Bogdanos & Satsmadjis 1983: 93. – Wu et al. 1990: 324.

Sigambra parva. – Pettibone 1966: 181. – Day et al. 1970: 23. – Britaev & Saphronova 1981: 1319, table 1. – Diapolis & Bogdanos 1983: 131. – Kirkegaard 1983 [1984]: 212. – Hutchings & Murray 1984: 30. – Zenetos & Bogdanos 1987: 11.

Ancistrosyllis cf. *constricta*. – Day 1967: 215-216, fig. 10.1.a-c. [Not Southern, 1921.]

Not *Ancistrosyllis tentaculata*. – Banse & Hobson 1968: 14-15, fig. 3k; 1974: 50 (= *Sigambra bassi*).
Not *Sigambra* cf. *tentaculata*. – Katzmann et al. 1974: 21-27, figs 8-10. – Britaev & Saphronova 1981: 1319, table 1 (nomen dubium).

Material examined:
Types. **NW Atlantic Ocean:** Holotype of *Sigambra tentaculata*, Long Island: N.Y.: Crab Meadow State Park, New York State Conservation Commission (AMNH 2893). – **South Africa:** Paratypes of *Ancistrosyllis parva*, S. coast of Cape Province, Sta. FAL-390, 34°12.6'S, 18°29.1'E, 40 m, khaki mud, 15 Nov 1960, coll. J.H. Day (BMNH ZB 1963.1.23/24, 2 paratypes).

Other material. **NW Atlantic Ocean:** Texas: Port Aransas, 27°49.6'N, 97°01.6'W, 5 fms, mud, coll. M.L. Jones (USNM 31007, 5 specimens). – Virginia: York River, mud, Nov 1960, coll. M.L. Wass (USNM 31009, 8 specimens). – **W Pacific Ocean:** New Georgia: Marovo Lagoon, 11-20 m, mud, "Royal Soc. Exp. Solomon Islands 1965" (BMNH ZB 1970: 303-305, 3 specimens).

Description

Body dorsoventrally flattened, tapered gradually posteriorly, anterior segments somewhat inflated. Length to 15 mm, width to 2 mm, segments to 91. Integument smooth, without papillae. Pigment not determinable (irregular and crescent-shaped pigmented areas present in anterior part of peristomium, according to Pettibone 1966).

Posterior prostomial margin straight or bilobed, sometimes partly overlapped by peristomium. Palps biarticulate, with large palpophores and small palpostyles. 3 slender antennae; lateral antennae extending slightly beyond palps; median antenna about 1.5-2 times as long as lateral ones, positioned posteriorly. Eyes lacking. Pharynx unarmed, with 14 subequal, marginal papillae.

Peristomium longer than following segments. Peristomial cirri slender, similar to lateral antennae.

Parapodia biramous. Notopodia each with dorsal cirrus, acicula, and dorsal hook from chaetigers 4-8, which is accompanied by a single capillary in some posterior parapodia. Dorsal cirri of chaetiger 1 longer than those of following chaetigers, similar to median antenna but longer. Neuropodia each with ventral cirrus, acicula and several simple minutely serrated and distally pointed chaetae of different lengths. Ventral cirri slender, not extending beyond tip of parapodial lobe. Chaetiger 2 without ventral cirri.

Pygidium with 2 slender anal cirri, similar in length to median antenna.

Distribution

NW Atlantic Ocean; South Africa. NW Atlantic, off New England (Hartman 1965, as *A. tentaculata*); Gulf of Mexico (Harper 1971, Wolf 1984); Caribbean Sea (Salazar-Vallejo 1996); S Atlantic Ocean (Salazar-Vallejo & Orensanz 1991); Moçambique (Hartmann-Schröder 1974); British Isles (Kirkegaard 1980); Mediterranean Sea (Diapolis & Bogdanos 1983, as *S. parva*); Aegean Sea (Arvanitidis 1994); Red Sea (Kiseleva 1964, as *A. tentaculata*); Black Sea (Kiseleva 1964, as *A. tentaculata*); South Vietnam (Gallardo 1967, as *A. hanaokai*); South China Sea (Shin 1980); Yellow Sea (Uschakov & Wu 1962, as *A. hanaokai*; Daoyuang & Yongting 1986); Japan (Imajima & Hartman 1964, as *A. hanaokai*); NE Pacific Ocean (Blake 1994).

Remarks

Hartmann-Schröder (1974) mentioned that *Sigambra hanaokai* (Kitamori, 1960) and *S. parva* (Day, 1963) might be synonyms of *S. tentaculata* (Treadwell, 1941), because she noticed that the capillary neurochaetae in *S. hanaokai* and *S. parva* were actually serrated and apparently similar to those in *S. tentaculata*. Gardiner (1976) adopted this view and treated *S. tentaculata* and *S. parva* as synonyms. Our own investigations on material of these three species confirm the observations of Hartmann-Schröder (1974), as neuropodial capillaries in *S. tentaculata* (Pettibone 1966, fig. 14d) are in fact minutely serrated (compare with Blake 1994).

Pettibone (1966) and Fauchald (1972) separated *Sigambra hanaokai* and *S. parva* from *S. tentaculata* by the relative length of the median antenna in comparison with the lateral antenna, i.e., twice as long in *S. tentaculata* but subequal in *S. hanaokai* and *S. parva*. Our own investigations show that the median antenna is about 1.5 times as long as the lateral ones in the holotype of *S. tentaculata* (subequal according to Blake 1994), 1.2-1.8 times as long in nontypes of *S. hanaokai*, and about 1.5 times as long in paratypes of *S. parva*. This character, therefore, is

regarded as rather irrelevant for separating these species.

Britaev & Saphronova (1981) separated *Sigambra hanaokai* from *S. tentaculata* by the possession of a straight (not bilobed) posterior prostomial margin. Hartman & Barnard (1960) and Shin (1980), however, mentioned the variability of the shape of the prostomium in *S. tentaculata*. Our own investigations confirm the observations of the latter authors; thus, this character is also of little value for separating *Sigambra* species.

With respect to the extremely wide distribution of *S. tentaculata*, we do not exclude the possibility that a closer morphological examination of live animals or an investigation with molecular methods may show differences which could confirm the presence of different species. However, as additional reinvestigations on specimens available could not demonstrate any substantial differences, *S. hanaokai* and *S. parva* are here considered to be junior synonyms of *Sigambra tentaculata* (Treadwell, 1941): For instance, (i) *S. tentaculata*, *S. hanaokai* and *S. parva* all have notopodial hooks from chaetiger 3 or 4 (from chaetiger 4-8 in available material of *S. hanaokai*), (ii) assumed neuropodial capillaries are indeed serrated and similar in all of these species, (iii) body size, colour and general appearance correspond well in these species, and (iv) a special constriction at the fourth segment mentioned by Kitamori (1960) for *S. hanaokai* could not be justified. The type material of *S. hanaokai* cannot be reexamined because it very probably is lost, according to Prof. Dr. M. Imajima, National Museum of Science, Tokyo (pers. comm.).

The *Sigambra* cf. *tentaculata* described by Katzmann et al. (1974) differs from the holotype of *S. tentaculata* and from all other known genera previously placed in Pilargidae in possessing 1-3 pharyngeal teeth. Unfortunately, the only reported specimen is not available (Dr. W. Katzmann, pers. comm.) and probably lost, since the Muséum National d'Histoire Naturelle de Paris does not have the material.

Sigambra bassi (Hartman, 1947)

Figs 1-2.

Ancistrosyllis bassi Hartman, 1947: 501-504, pl. 61, figs 1-7. – Hartman 1945: 15 (nomen nudum); 1951: 36, pl. 11, figs 1-6; 1959: 193. – Reish 1968: 69, 74.

Sigambra bassi. – Pettibone 1966: 186, fig. 16a-f. – Hartman 1968: 389, figs 1-5. – Harper 1971: 26-27. – Taylor 1971: 186-188, tables 60-61. – Day 1973: 24. – Perkins & Savage 1975: 29. – Gardiner 1976: 123, fig. 9d-f. – Marrón-Aguilar 1976: 88-90. – Buzhinskaja 1982: 79. – Ibáñez-Aguirre 1983: 28, table 3. – Wolf 1984: 29-10 to 29-12 + 29-6, fig. 29-8. – Salazar-Vallejo 1986: 200; 1990: 512; 1996: 18. – Blake 1994: 287-288, fig. 10.7.

Sigambra tentaculata. – Banse & Hobson 1968: 14-15, fig. 3k; 1974: 50. [Not Treadwell, 1941]

Not *Sigambra bassi*. – Yang & Sun 1988: 78, 77, fig. 26e-h. – Huang 1994: 349.

Material examined:

Type. **Gulf of Mexico:** Holotype, Florida: Lemon Bay: Chadwick Beach: off Bass Biological Laboratory, 26°57'N, 82°21'W, sandy flats at low tide line, 17 Jan 1938, coll. O. Hartman (LACM-AHF 0142).

Other material. **Gulf of Mexico:** SOFLA Sta. 2c, 26°45'50"N, 82°45'11"W, 24 m, Nov 1980 (USNM 86966, 4 specimens). – **NE Pacific Ocean:** Washington: Puget Sound, 7°13'30"N, 122°49'36"W, 68 m, 29 Aug 1963, coll. K. Banse (USNM 36529, 4 incompl. specimens in alcohol + 1 SEM stub); (USNM 36530, 6 incompl. specimens); (USNM 169149, 1 specimen); (ZMH P-22030, 1 incompl. specimen).

Description

Body dorsoventrally flattened, anterior segments widest, chaetigers 3-9 gradually decreasing in width, tapering caudad. Holotype about 24 mm long (material somewhat coiled and twisted), with 146 chaetigers, 1.9 mm wide with parapodia and dorsal cirri excluding chaetae, and 1.1 mm wide with parapodia without dorsal cirri (largest specimen in Hartman (1947: 504) 35 mm long with 96 chaetigers). Segments distinctly demarcated laterally and dorsally. Integument without pigment. Colour in ethanol brown, smaller specimens from the Pacific whitish to yellowish.

Prostomium trapezoidal, wider than long, posterior margin broadly rounded, laterally concave. Palps biarticulate with large palpophores and small palpostyles (Figs 1B, 2B); palpophores dorsally fused with each other over one-half to two-thirds of their length; palpostyles conical. 3 slender antennae (Figs 1A, 2A-B); lateral ones slightly longer than length of prostomium, median antenna about two times as long as lateral ones, positioned somewhat behind level of lateral antennae, reaching to fifth chae-

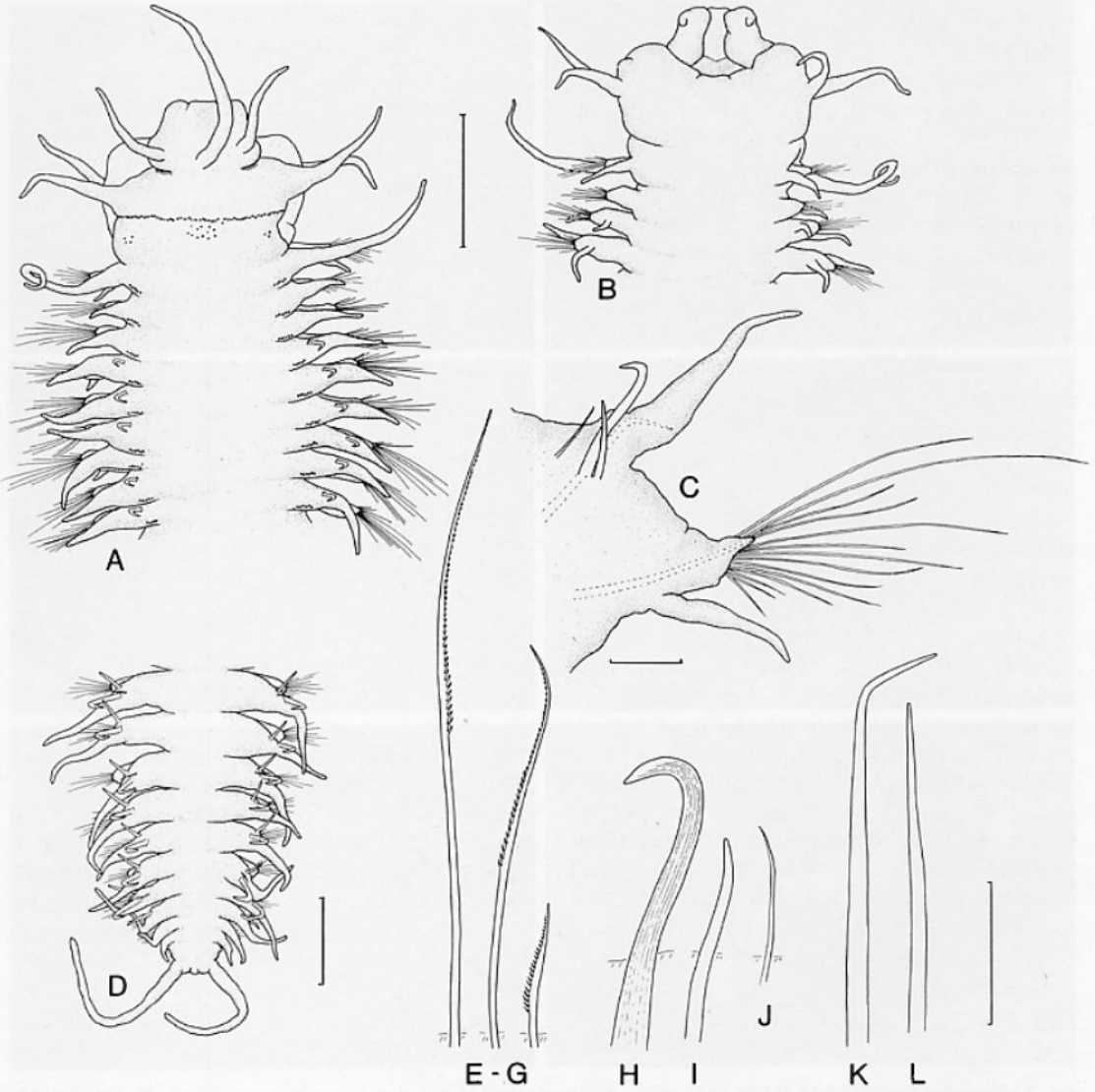

Fig. 1. *Sigambra bassi* [USNM 36529]. A. Anterior end, dorsal view. B. Anterior end, ventral view (antennae not drawn). C. Parapodium 70, anterior view (half of neuropodial fascicle omitted). D. Posterior end, dorsal view. E-L. Parapodium 70: E. Dorsalmost supraacicular neurochaeta. F. Dorsalmost subacicular neurochaeta. G. Ventralmost subacicular neurochaeta. H. Notopodial hook. I. Notopodial spine. J. Notopodial capillary. K. Notoacicula. L. Neuroacicula. Scales: A-B = 500 μm; C = 100 μm; D = 25 μm; E-L = 100 μm.

tiger. Eyes absent. Pharynx without jaws, with 14 equal-sized, spherical marginal papillae. One pair of elongate nuchal grooves (Figs 1A, 2A) at posterior end of prostomium.

Peristomium separated from prostomium by shallow groove, nearly twice as long as first chaetiger. 2 pairs of slender peristomial cirri in anterior half, arising from short, simple bases, resembling prostomial antennae in shape; dorsal peristomial cirri subequal in length to median

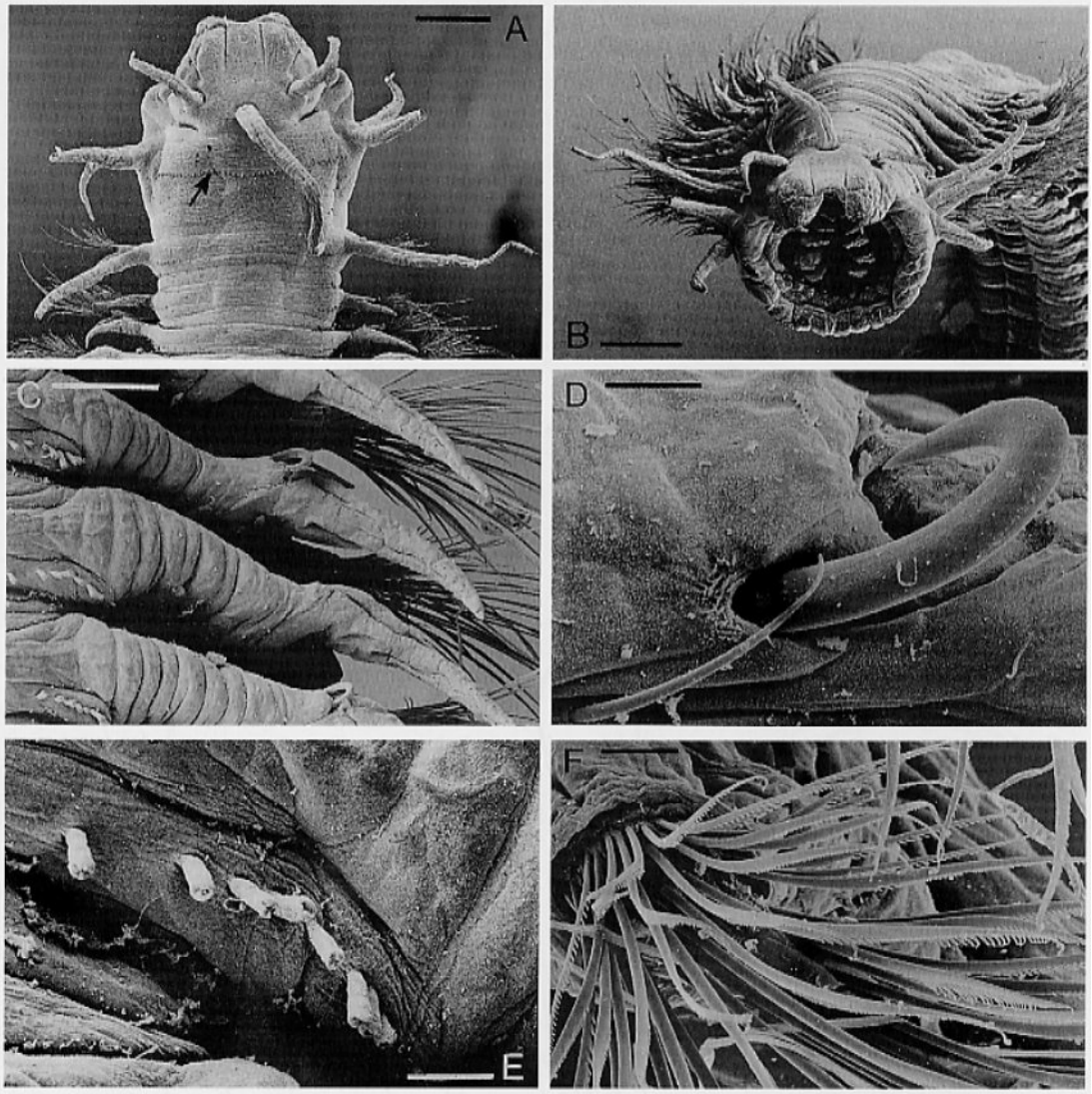

Fig. 2. *Sigambra bassi* [USNM 36529, SEM stub]. A. Anterior end, dorsal view (arrow shows papillae). B. Anterior end, frontal view. C. Parapodia of middle region, dorsal view. D-F. Parapodium of middle region: D. Notopodial hook and single capillary (spine lacking), dorsofrontal view. E. Papillae, dorsal view. F. Bundle of neurochaetae, dorsolateral view. Scales: A-B = 200 μm; C = 100 μm; D = 10 μm; E-F = 20 μm.

antenna, ventral cirri slightly shorter, about as long as lateral antennae (Fig. 1A). Peristomium dorsally with transverse line of closely arrayed papillae (Figs 1A, 2A).

Parapodia biramous (Figs 1C, 2C), large and fleshy, in middle region nearly as long as body width without parapodia. Surface smooth except for row of 7-9 conspicuous stalk-like papillae dorsally on anterior and posterior sides of notopodia, resembling the peristomial papillae (Fig. 2E). Notopodia each with yellowish acicula and conical dorsal cirrus, basally thick, tapering to thin tip. Notoacicula (Fig. 1C, K) distally bent, reaching into base of dorsal cirrus.

Dorsal cirri of chaetiger 1 about as long as median antenna, shape similar to that of peristomial cirri; dorsal cirri of chaetiger 2 smallest of all anterior dorsal cirri; dorsal cirri of chaetigers 3-5 gradually longer; those of following anterior chaetigers nearly uniform in length, about as long as body width without parapodia in middle region. From chaetigers 3-25 (chaetigers 14-15 in holotype, 3-5 in Pacific Ocean material, ca. 9 in Gulf of Mexico material, 14-25 in Day 1973) there is a stout hook-shaped notochaeta (Figs 1H, 2D), subcuticular in some anterior segments. Additionally, segments from chaetigers 12-15 with straight notopodial spine (Fig. 1C, I), becoming larger caudad and projecting far out of the epithelium in posterior segments. Some middle and posterior parapodia also bear a single, thin capillary (Figs 1C, J; 2D) inserted slightly proximal to notopodial hook, completely different in form from the stout notopodial spine (not ascertainable in holotype). Hooks and capillaries directed laterally or posterolaterally, spines directed anterolaterally. Hooks absent in last 3 chaetigers, spines absent in last 2 segments.

Neuropodial lobes well developed, each with acicula, ventral cirrus and several simple chaetae. Neuropodia of middle region with 8-12 supraacicular and 16-20 subacicular chaetae of various lengths, all distally pointed, distal half of chaeta bearing small teeth, distad becoming progressively smaller (Figs 1E-G, 2F) and often not discernible in light microscopy, so that chaetae appear smooth in the proximal and distal parts. Neuroacicula straight, reaching into tip of neuropodial lobe (Fig. 1C, L). Ventral cirrus thinner than dorsal cirrus, positioned at base of neuropodium; in middle segments about one-third of length extends beyond tip of neuropodial lobe. Neuropodia of chaetiger 2 without ventral cirri.

Pygidium bilobed, with 2 slender anal cirri about as long as lateral antennae (Fig. 1D).

Habitat

Burrowing in sand mixed with silt or with mud and shell fragments (Reish 1968, Gardiner 1976).

Distribution

Gulf of Mexico; NW Atlantic Ocean; NE Pacific Ocean. Intertidal to 113 m in sandy sediments (Blake 1994).

Remarks

This species was originally described as *Ancistrosyllis bassi* by Hartman (1947), although it was already mentioned (nomen nudum) in Hartman (1945). Pettibone (1966) recognised that this species, together with seven others previously placed in *Ancistrosyllis*, actually belongs to *Sigambra* Müller, 1858.

Sigambra bassi (Hartman, 1947) differs from all other genera previously referred to the Pilargidae in possessing notopodial hooks together with notopodial straight spines and notopodial capillaries. *S. wassi* Pettibone, 1966 resembles *S. bassi* in possessing notopodial hooks accompanied by capillaries; however, *S. wassi* clearly differs in being much larger and in lacking notopodial spines. Therefore, specimens that Banse & Hobson (1968, 1974) identified as *Sigambra tentaculata* (Treadwell, 1941) actually belong to this species.

In previous publications *S. bassi* is described as having the notopodial hooks occurring from chaetigers 11-15 (e.g., Pettibone 1966, Salazar-Vallejo 1990). Examination of specimens of this species from different localities showed that hooks may also occur in more anterior segments. Therefore, taking this character alone to identify or separate species from each other is regarded as misleading (see also Discussion).

Reinvestigation of the "*S. bassi*" specimens reported from Chinese waters (Yang & Sun 1988) showed that the specimens are different from the type material of *Sigambra bassi*. Their morphological characters are as follows: length up to 9.5 mm, up to 65 chaetigers, segments very short, pharynx with 14 papillae; dorsal cirri of chaetiger 2 larger than those of following chaetigers, ventral cirri of chaetiger 2 lacking; notopodial hooks from chaetiger 9-15, notopodial capillaries lacking, neuropodial capillaries, denticulate and pectinate chaetae present. Therefore, most similarities are shared with *Sigambra phuketensis* n.sp., and *S. grubei* Müller, 1858; the specimens differ from the first species in lacking notopodial capillaries, from the second in having notopodial hooks in some more-anterior

segments (Table 1). The material differs clearly from *Sigambra qingdaoensis* n.sp. in having 14 pharyngeal papillae and in lacking notopodial capillaries.

Phylogenetic conclusions

The question of homology of the notopodial hook with the straight notopodial spine of those genera previously placed in the Pilargidae has been raised repeatedly (e.g., Fitzhugh & Wolf 1990, Licher & Westheide 1994). In their cladistic analysis of the taxon, Licher & Westheide (1994) regarded them as homologous. The fact that *Sigambra bassi* bears both types of chaetae, however, speaks strongly against homology. As the combination of well developed antennae, peristomial and dorsal cirri, parapodia, together with a diversity of chaetae was regarded to be plesiomorphic by Licher & Westheide (1994), *Sigambra* probably takes the most basal position within genera previously referred to the Pilargidae; this may require a slight revision of the cladogram in Licher & Westheide (1994, fig. 4).

Sigambra ocellata (Hartmann-Schröder, 1959)

Ancistrosyllis ocellata Hartmann-Schröder, 1959: 109-111, figs 47-50. – Hartman 1965a: 26.
Sigambra occelata [sic]. – Salazar-Vallejo 1990: 511.

Type material

Holotype (ZMH P-14210), 3 paratypes (ZMH P-14209) (not examined).

Type locality

Estero Jaltepeque, Gulf of Fonseca, El Salvador.

Distribution

Only known from the type locality.

Remarks

S. ocellata is the smallest known species of the genus; only the species newly described here, *S. phuketensis* n.sp. and *S. qingdaoensis* n.sp., are similar in size. In the latter species, however, eyes are lacking, dorsal cirri on chaetiger 2 are smaller than those on the following chaetigers (of equal size in *S. ocellata*), and neuropodial capillaries are lacking.

Dr. G. Hartmann-Schröder (pers. comm.) informed us that *S. ocellata* lacks ventral cirri on chaetiger 2, which had previously not been reported. This character is considered in the key above.

Sigambra wassi Pettibone, 1966

Sigambra wassi Pettibone, 1966: 186-190, figs 17-18. – Wolf 1984: 29-8 + 29-6, fig. 29-4. – Salazar-Vallejo 1990: 511; 1996: 18.

Material examined:

NW Atlantic Ocean: Holotype, Virginia: Chesapeake Bay: off Rappahanock River, 37°37.3'N, 75°59'W, 6 fms, sand, Jun 1962, coll. M. Wass (USNM 30988, incompl.).

Distribution

NW Atlantic Ocean. Gulf of Mexico (Wolf 1984), Caribbean Sea (Salazar-Vallejo 1996).

Remarks

S. wassi is different from all other species except *S. robusta* (Ehlers, 1908) in possessing ventral cirri on chaetiger 2. It differs from *S. robusta* in possessing 14 pharyngeal papillae, in having dorsal cirri on chaetiger 2 that are subequal in size to those of following chaetigers (smaller in *S. robusta*), and in having dorsal hooks from chaetiger 23 (from chaetiger 43 in *S. robusta*). *S. wassi* is the largest known species of the genus.

Sigambra rugosa Fauchald, 1972

Sigambra rugosa Fauchald, 1972: 60-62, pl. 9, figs. a-e. – Salazar-Vallejo 1986: 200, pl. 2, figs 13-14; 1990: 511.

Type material

Holotype (LACM-AHF Poly 1065) (not examined).

Type locality

Isla Espíritu Santo, Baja California Sur, Mexico; 400 m.

Distribution

Mexico, NE Pacific Ocean.

Remarks

S. rugosa is similar to *S. robusta* (Ehlers, 1908) in having dorsal hooks from chaetiger 43; however, in *S. robusta* ventral cirri are present on chaetiger 2. *S. rugosa* differs from all other

known species of the genus in possessing a median antenna that is smaller than the lateral antennae.

Salazar-Vallejo (1990: 511) in his key states that *S. rugosa* possesses ventral cirri on chaetiger 2. This does not agree with the original description and was later stated by Dr. S. I. Salazar-Vallejo (pers. comm.) to be a mistake.

Sigambra setosa Fauchald, 1972

Sigambra setosa Fauchald, 1972: 62-64, pl. 7, figs a-c. – Britaev & Saphronova 1981: 1319, table 1. – Salazar-Vallejo 1986: 201, pl. 2, figs 15-16; 1990: 511. – Blake 1994: 288-290, fig. 10.8.

Type material
Holotype (LACM-AHF Poly 1066), paratype (LACM-AHF Poly 1067) (not examined).

Type locality
Isla Espíritu Santo, Baja California Sur, Mexico; 1,700-2,500 m.

Distribution
Mexico, NE Pacific Ocean.

Remarks
S. setosa is different from all other known species of the genus except *S. bidentata* Britaev & Saphronova, 1981 in possessing 2-3 notopodial capillaries; *S. bidentata* has 2 of them. However, in *S. setosa* eyes are present and the pharynx has 14 (not 8) marginal papillae.

Sigambra pettiboneae Hartmann-Schröder, 1979

Sigambra pettiboneae Hartmann-Schröder, 1979: 154-155, figs. 37-42; 1980: 47; 1991: 24. – Salazar-Vallejo 1990: 512.

Type material
Holotype (ZMH P-15497), 4 paratypes (ZMH P-15498) (not examined).

Type locality
Broome, NW Australia.

Distribution
Only known from the type locality.

Remarks
See Remarks for *Sigambra elegans*.

Sigambra bidentata Britaev & Saphronova, 1981

Sigambra bidentata Britaev & Saphronova, 1981: 1315-1316, textfig. 1. – Salazar-Vallejo 1990: 511.

Material examined:
Sea of Japan: Paratype, off Petra Velikogo, 42°15'3N, 131°04'3E, 1,300 m, "Vityaz" 59th trip, Stn. 7459, 1976 (ZISP 3/44287).

Other type material
Holotype (ZISP 1/44285), 2 paratypes (ZISP 2/44286, 4/44288) (not examined).

Type locality
Sea of Japan.

Distribution
Only known from the type locality.

Remarks
S. bidentata is similar to *S. ocellata* (Hartmann-Schröder, 1959) and *S. qingdaoensis* n.sp. in having 8 pharyngeal papillae. However, it differs in having 2 capillaries in each of the posterior notopodia (1 in *S. ocellata* and *S. qingdaoensis*); in addition, *S. bidentata* is different from all other known species of *Sigambra* in possessing bidentate neurochaetae.

Sigambra elegans Britaev & Saphronova, 1981

Sigambra elegans Britaev & Saphronova, 1981: 1316-1319, textfig. 2. – Salazar-Vallejo 1990: 511.

Type material
Holotype (ZISP 1/44283), paratype (ZISP 2/44284) (not examined).

Type locality
Sea of Japan.

Distribution
Only known from the type locality.

Remarks
S. elegans is the only known species with 13 pharyngeal papillae except for *S. pettiboneae* Hartmann-Schröder, 1979. It differs from *S. pettiboneae* in possessing pectinate neurochaetae and in being unpigmented.

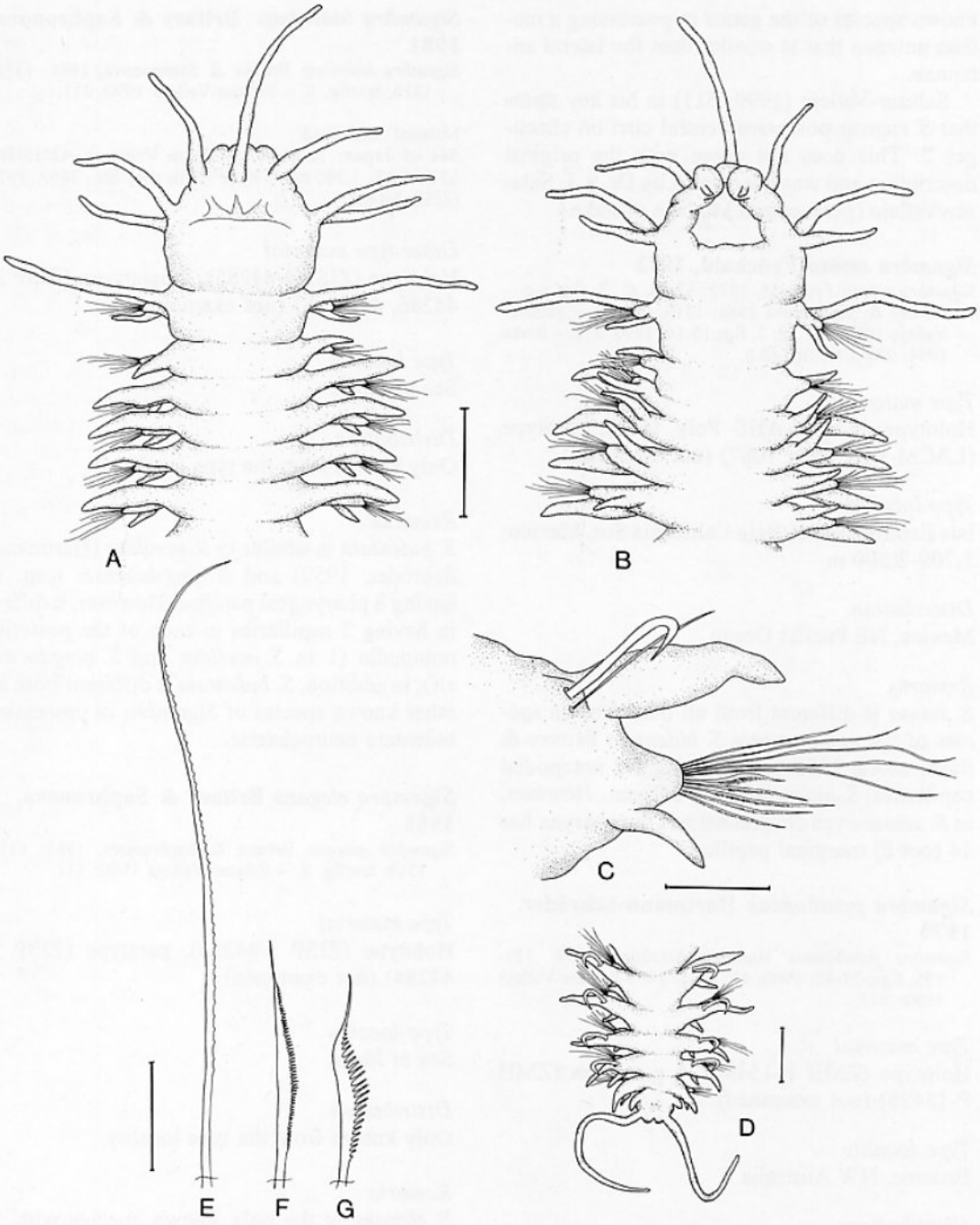

Fig. 3. *Sigambra phuketensis* n.sp. [PMBC 9211]. A. Anterior end, dorsal view. B. Anterior end, ventral view. C. Parapodium, anterior view (some chaetae omitted). D. Posterior end, dorsal view. E-G: Chaetae: E. Dorsal supraacicular neurochaeta. F. Straight denticulate subacicular neurochaeta. G. Bent pectinate subacicular neurochaeta. Scales: A-B = 200 µm; C = 50 µm; D = 100 µm; E-G = 20 µm.

***Sigambra phuketensis* n.sp.**
Fig. 3.

Material examined:
Types. **Andaman Sea:** Thailand: Phuket Island (8°00'N, 98°20'E): Bang Tao Bay, Sta. 3, 10 m, 27 Feb 1982, coll. A. Nateewathana & J. Hylleberg (PMBC 9211, complete holotype), (USNM 157696, 1 complete paratype); same locality, 26 Apr 1982, coll. A. Nateewathana & J. Hylleberg (ZMH P-21906, 2 complete paratypes). – Kamala Bay, Sta. 8, 10 m, 18 June 1982, coll. A. Nateewathana & J. Hylleberg (BMNH 1993: 15-16, 1 complete paratype, 1 paratype lacking posterior end); Sta. 10, 10 m, 27 Feb 1982, coll. A. Nateewathana & J. Hylleberg (PMBC 9212, 1 paratype lacking posterior end). – Patong Bay, Sta. 13, 20 m, 23 Dec 1981, coll. A. Nateewathana & J. Hylleberg (SMF 4484, 1 complete paratype, 2 paratypes lacking posterior end); same locality,18 Jun 1982, coll. A. Nateewathana & J. Hylleberg (ZMUC Pol-867, 1 complete paratype, 2 paratypes lacking posterior end). – West coast of Phuket Island, different stations, 23 Dec 1981 to 18 Jun 1982, coll. A. Nateewathana & J. Hylleberg (PMBC 9213, 32 paratypes). – Off Lon Island, 8 m, Oct 1984, coll. W. Westheide (LACM-AHF Poly 1857, 3 paratypes).

Other material. **South China Sea:** Hongkong (22°18' N, 114°10'E): Cape D'Aguillar, Shek O., subtidal, muddy sand, Jan 1995, coll. Z. Ding (LACM-AHF, 7 specimens).

Type locality
Bang Tao Bay, west coast of Phuket Island, Thailand, Andaman Sea (8°00'N, 98°20'E). Temperature approximately 28°C, salinity 33‰ (Hylleberg et al. 1985: 2). Stations of type material refer to the locations described in Hylleberg et al. (1985: 3, fig. 1).

Description
Body dorsoventrally flattened, tapering posteriorly. Length 4-5.5 mm, max. width 600 µm including parapodia, without chaetae. Segments clearly separated from each other by a distinct shallow transverse groove. Integument smooth, normally without pigment except for a few specimens with small dark spots dorsolaterally in anterior and middle segments, whitish to milky in ethanol. Largest complete type (holotype) with 46 chaetigers, 4.5 mm long and anteriorly 550 µm wide with parapodia (largest nontype from Hong Kong: female with 85 chaetigers, 9.3 mm long, 750 µm wide with parapodia; oocytes in about 50 segments from chaetiger 13, each ca. 100 µm in diameter).

Prostomium trapezoidal, rounded, wider than long. Palps biarticulate, with massive palpophores and small, slightly elongated palpostyles (Fig. 3B). 3 slender antennae (Fig. 3A); lateral ones nearly as long as intersegmental body width (300 µm), median antenna nearly twice as long as lateral ones, positioned somewhat behind level of the latter. Eyes lacking. Pharynx unarmed, with 14 subequal marginal papillae.

Peristomium separated from prostomium by an inconspicuous dorsal groove. 2 pairs of slender peristomial cirri; dorsal ones slightly longer than ventral ones, nearly as long as lateral antennae (Fig. 3A).

Parapodia biramous (Fig. 3C). Notopodia of middle segments each with fleshy, conical dorsal cirrus, nearly two-thirds of intersegmental width in length; and with a thin and light-coloured acicula; in middle and posterior segments one strong hook-shaped notochaeta (protruding out of notopodium from chaetigers 3-22, lacking in 2 posteriormost segments), usually accompanied by a single long capillary (may be lacking in some anterior and posterior parapodia). Dorsal cirri of chaetiger 1 long and slender (ca. 550 µm), similar to peristomial cirri in shape, nearly as long as median antenna; second dorsal cirri much shorter than following ones.

Neuropodial lobe cylindrical. Chaetation comprising a single acicula and 10-14 neurochaetae of different types: (i) 6-8 supraacicular, long and slender chaetae, similar to capillaries, but slightly serrated (Fig. 3E), (ii) 3-4 subacicular, short and straight denticulate chaetae, distally pointed (Fig. 3F), and (iii) 1-2 subacicular, short and slightly bent pectinate chaetae, distally pointed (Fig. 3G). Ventral cirrus more slender than dorsal cirrus, inserted in middle of neuropodium, extending beyond tip of lobe. Chaetiger 2 without ventral cirri. Posteriormost parapodia lacking chaetae and ventral cirri.

Pygidium rounded, with 2 posterior lobes (Fig. 3D). 2 slender anal cirri, nearly as long as lateral antennae.

Etymology
This species is named for the type locality, Phuket Island.

Distribution
Andaman Sea; South China Sea.

Remarks

S. phuketensis n.sp. is similar to *S. constricta* (Southern, 1921), *S. tentaculata* (Treadwell, 1941) and *S. bassi* (Hartman, 1947) in lacking ventral cirri on chaetiger 2 and in possessing 14 pharyngeal papillae and 1 capillary in most of the posterior notopodia (Table 1). However, *S. constricta* has notopodial hooks from chaetigers 30-40 and lacks pectinate neurochaetae (in *S. phuketensis* hooks are present from chaetigers 3-23, and pectinate neurochaetae are present); *S. tentaculata* lacks pectinate neurochaetae (present in *S. phuketensis*), and *S. bassi* possesses emergent notopodial spines (lacking in *S. phuketensis*); in addition, *S. phuketensis* is much smaller than any of these three species.

Sigambra qingdaoensis n.sp.

Fig. 4.

Sigambra sp. – Licher & Westheide 1994: 225, fig. 1b-d.
? *Sigambra bassi*. – Yang & Sun 1988: 78 + p. 77, fig. 26e-h. [Not Hartman, 1947.]

Material examined:

Yellow Sea: Holotype, North China: Bay of Jiazhou Wan, near Qingdao, 36°05'N, 120°19'E, oozy surface of muddy sediment, Oct 1987, coll. W. Westheide (SMF 5239); 1 paratype (SMF 5240); 1 paratype (LACM-AHF Poly 18589).

Description

Small individuals, about 20-23 segments, up to 2.5 mm long. Body dorsoventrally flattened, tapered posteriorly. Integument smooth. Living specimens with light, almost transparent anterior end, middle segments brownish-reddish,

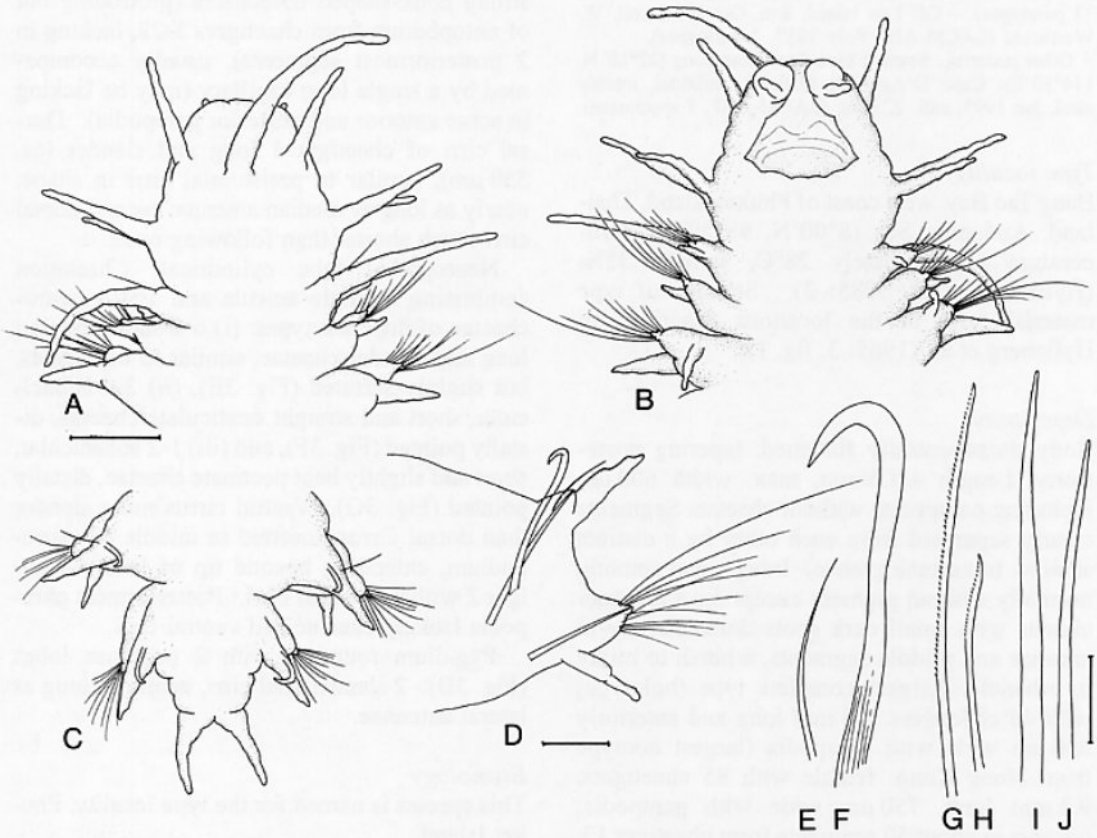

Fig. 4. *Sigambra qingdaoensis* n.sp. [SMF 5239]. A. Anterior end, dorsal view. B. Anterior end, ventral view. C. Posterior end, dorsal view. D. Parapodium. E-G: Chaetae: E. Notopodial capillary. F. Notopodial hook. G. Longer, slender serrated chaeta. H. Shorter serrated chaeta. I. Notopodial acicula. J. Neuropodial acicula. Scales: A-C = 100 µm; D = 50 µm; E-J = 20 µm.

probably due to the intestine, posterior end colourless. Largest specimen (holotype) complete, with 22 chaetigers, 2.3 mm long, anteriorly 380 µm wide including parapodia, 200 µm wide without parapodia.

Prostomium not clearly demarcated, anteriorly fused with palps, posteriorly with peristomium (Fig. 4A). Palps biarticulate, with massive palpophores, dorsally fused with each other, and small, elongated palpostyles (Fig. 4B). 3 slender antennae; median one twice as long as lateral antennae with much thicker base, placed somewhat behind level of lateral antennae. Eyes lacking. Pharynx unarmed, with 8 equal-sized papillae.

Peristomium longer than following segments. 2 pairs of slender peristomial cirri; dorsal ones 1.5 times as long as ventral ones.

Parapodia biramous (Fig. 4D), larger in middle region, becoming gradually smaller posteriorly. Notopodia each with dorsal cirrus and one acicula (Fig. 4I); in middle and posterior segments with one hook-shaped notochaeta (Fig. 4F), emerging out of notopodia from chaetigers 3-8, always accompanied by a single long capillary (Fig. 4E). These capillaries are also present in some anteriormost chaetigers in which a notopodial hook is lacking. Notopodia of chaetiger 1 with elongated and very slender dorsal cirri, 1.5 times as long as dorsal peristomial cirri. Dorsal cirri of chaetiger 2 much smaller, about half as long as those of chaetiger 3. Posteriormost segment without notopodial hooks.

Neuropodial lobe cylindrical, with ventral cirrus, acicula (Fig. 4J) and several simple chaetae. Chaetae comprising 2 types: (i) 2-3 longer, slender serrated chaetae (Fig. 4G), and (ii) 8-12 shorter serrated chaetae (Fig. 4H), both types distally pointed. Number of chaetae reduced in posterior segments. Ventral cirrus shorter and thinner than dorsal cirrus, extending beyond tip of neuropodial lobe. Chaetiger 2 without ventral cirri.

Pygidium rounded. 2 slender anal cirri, nearly as long as lateral antennae (Fig. 4C).

Etymology

This species is named for the type locality, Qingdao.

Distribution

Known only from the type locality.

Remarks

The new species is similar to *S. ocellata* (Hartmann-Schröder, 1959) and *S. bidentata* Britaev & Saphronova, 1981 in possessing 8 pharyngeal papillae and in lacking ventral cirri on chaetiger 2 (Table 1). However, *Sigambra qingdaoensis* is different from *S. ocellata* in having dorsal cirri that are larger than ventral cirri, in having dorsal cirri on chaetiger 2 that are smaller than those on the following chaetigers, in lacking eyes, in lacking neuropodial capillaries, and in possessing serrated neurochaetae; it differs from *S. bidentata* in having only 1 (not 2) notopodial capillary and in lacking bidentate neurochaetae. *Sigambra qingdaoensis* n.sp. is different from all known species of the genus in having a single small notopodial capillary in some anteriormost segments in which a notopodial hook is lacking.

DISCUSSION

Taxonomic value of the position of the notopodial hook

In *Sigambra,* notopodial hooks are lacking in the anterior chaetigerous segments; in the first hook-bearing segment the hook can be present on the right, left or both parapodia. It is likely that in most cases the only species-specific aspect is the range of segments in which the hook first appears (e.g., from chaetigers 16-20 in *S. grubei* Müller, 1858; from chaetigers 43-70 in *S. robusta* (Ehlers, 1908); see Table 1).

Only in a few species do the first chaetae occupy a constant position: for example, chaetiger 4 in *S. tentaculata* (including *S. hanaokai* and *S. parva*; Pettibone 1966, Salazar-Vallejo 1990). However, when examining *S. hanaokai* material we found that in this species, too, the position of the first segment with a hook can vary.

The general variability of this character has long been known and limits its taxonomic value. In particular, it would be necessary to know whether the number of hook-free segments depends on the size or age of the individual.

Table 1. *Sigambra* species. List of characters (Cap = capillary, DC = dorsal cirri, L = length, LA = lateral antennae, MA = median antenna, PC = peristomial cirri, VC = ventral cirri; +, – = presence or absence of character).

Species	Size	Body	Eyes	Antennae	Palps	Pharynx	Parapodium										
							Cirri				Notochaetae			Neurochaetae			
	No. seg. L mm	Pigment		MA/LA	Fused basally	No. of papillae	DC1/ PC	DC2< following	DC> VC	VC2	Hooks from chaetiger	Dorsal spine	Dorsal caps	Caps	Pointed dentate	Pointed pectinate	Bidentate
S. grubei Müller, 1858	82 10-26	–	–	>1	–	14	1.5	+	+	–	16-20	–	–	+	+	+	–
S. robusta (Ehlers, 1908)	182 54	–	–	>1.5	–	15-16	2	+	+	+	43-70	1	–	+	+	–	–
S. constricta (Southern, 1921)	>120 >23	–	–	2	–	14	1.5	+	+	–	30-40	–	1	–	+	–	–
S. tentaculata (Treadwell, 1941) [1]	135 20	–	–[2]	1.5-2	+	14	1.5	+	+	–	4	–	0-1	–	+	–	–
S. bassi (Hartman, 1947)	146 >19	–	–	2	+	14	1	+	+	–	3-25	+	0-1	–	+	–	–
S. ocellata (Hartmann-Schröder, 1959)	25 1.5	–	+[3]	2	+	8	2	–	–	–	6-7	–	1	+	–	–	–
S. wassi Pettibone, 1966	107-192 45-70	–	–	1-1.3	–	14	2	–	+	+	23-60	–	1	+	+	–	–
S. rugosa Fauchald, 1972	80 14	–	–	<1	–	?	<1.5	+	+	–	43-66	–	–	+	+	?	–
S. setosa Fauchald, 1972	60 14	–	+	>1	+	14	>2	–	+	–	3-4	–	2-3	+	+	–	–
S. pettiboneae Hartmann-Schröder, 1979	66 ?	+	–	2	–	13	>1	+	+	–	7-10	–	1	–	+	–	–
S. bidentata Britaev & Saphronova, 1981	45-60 ?	–	–	>1	–	8	2	+	+	–	3-4	–	2	–	+	–	+
S. elegans Britaev & Saphronova, 1981	101 16	–	–	2	+	13	1.5	+	+	–	1-16	–	1	–	+	–	–
S. phuketensis n.sp.	46-85 4-9.3	(+)[4]	–	2	–	14	1.5	+	+	–	3-23	–	1	–	+	–	–
S. qingdaoensis n.sp.	22 2.3	–	–	2	+	8	1.5	+	+	–	3-8	–	1	–	+	–	–

[1] Including *S. hanaokoi* (Kitamori, 1960) and *S. parva* (Day, 1963).
[2] Some specimens with pigmented prostomium (Treadwell 1941).
[3] Visible only in living material (Hartmann-Schröder 1959).
[4] Present as little pigmented spots in some specimens.

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