

Sigambra healyae sp. n., a New Species of Polychaete (Polychaeta: Pilargidae) from the Canadian Basin of the Arctic Ocean

S. Yu. Gagaev

Zoological Institute, Russian Academy of Sciences, St. Petersburg, 197034 Russia

e-mail: gagaev24@yahoo.com

Accepted September 13, 2007

Abstract—Examination of material from the Hidden Ocean 2005 expedition to the Canadian Basin aboard the USCGC (WAGB-20) *Healy* revealed a new species of polychaete, *Sigambra healyae* sp. n., of the family Pilargidae. A description of the new species is given. It differs from other closely related species by having a second acicula in the notopodia, the presence of only bidentate neuropodial setae, and the pigmentation of the prostomium.

Key words: Pilargidae, *Sigambra healyae* sp. n., polychaete, morphology, taxonomy, distribution.

DOI: 10.1134/S1063074008010100

Until the present, the literature on the polychaetes of the Arctic Ocean has provided no clear information about the presence in these waters of polychaetes of the family Pilargidae, in particular, the species *Sigambra tentaculata* (Threadwell, 1941) [2]. A finding from the Canadian Basin that was referred by American scientists, without any description, as belonging to this species has been called into question by I.A. Zhirkov. He conjectured that they could have erroneously identified one of the members of the family Nereidae, most probably *Nereis gracilis*, as *S. tentaculata*. I.A. Zhirkov also emphasized that different authors have reported various species that probably belong to different genera [1] under the name of *Sigambra tentaculata*; therefore, the finding of this family and, all the more so, of this particular species, in the Arctic Ocean needs to be corroborated.

In June–July 2005, working under the framework of the Hidden Ocean 2005 Program, from aboard the ice-cutter *Healy* (US Coast Guard), in the Canadian Basin we collected eight specimens of polychaetes of the family Pilargidae belonging to the genus *Sigambra* from a depth of 1825–1852 m, using a 0.1 m² Box Core bottom grab sampler. In our opinion, in some characteristics these polychaetes do not correspond to the original description of *Sigambra tentaculata* [8] and therefore should be referred to as belonging to a new species, *Sigambra healyae* Gagaev sp.n.

Materials. The US Coast Guard Cutter USCGC (WAGB-20) *Healy*; Stn. 3, 72|21(N, 155|20OW; Canadian Basin; 1825–1852 m depth; substrate—5–6 cm thick brown fine silt, underlined with gray clay; altogether eight specimens. The holotype (no. 1/50550) is

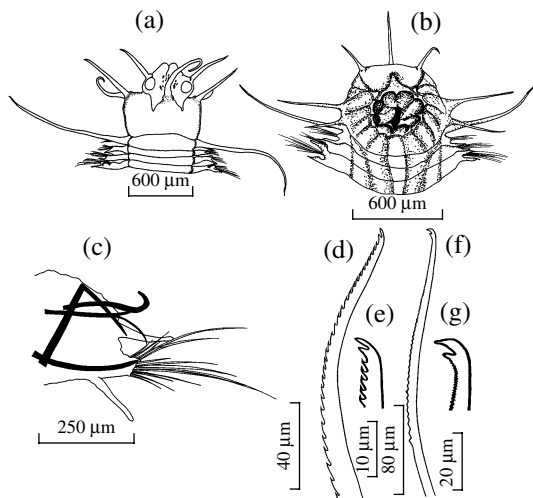
an incomplete specimen (only the anterior region), the body is 0.7 mm wide (excluding parapodia), and is deposited in the Zoological Institute of the RAS, St. Petersburg. Paratypes (no. 2/50551), consisting of seven incomplete specimens, were collected at the same station, four of these are deposited at Fairbanks, in the USA.

Description. Body is flattened dorsoventrally, is widest in the area of the sixth to seventh segments, significantly narrowing toward the posterior end. Adult specimens obviously have about 60 segments. Integument bears no papillae, golden-pearly, smooth.

Prostomium bears two large palps with a wide palpophore and relatively small palpostyle and three antennae (see figure, A, B). The medial antenna is about 1.5 times longer than the lateral ones; the antennae are arranged almost in a line, the lateral ones are somewhat displaced toward the anterior edge of head lobe. Antennae are longer than the prostomium and extend beyond the palps. Posterior edge of prostomium is notched, bipartite, overlaps the following segment.

Behind the lateral antennae there is one pair of reddish–brown eyespots; irregular spottiness of the same color is characteristic of the medium part of prostomium; in alcohol the pigment is gradually bleached and turns almost invisible. In the inner part of prostomium, in front of the pharynx, there are small and hardly discernible cruciform denticles, the paragnaths.

Peristomium bears two pairs of cirri. Ventral cirri are shorter, in form and size they are comparable with lateral antennae of prostomium; dorsal cirri are somewhat longer than the ventral ones. In specimens with an inverted pharynx the peristomium is somewhat longer



Sigambra healyae sp.n. A) dorsal view; B) anterior view; C) 29th parapodium; D–G) neuropodial setae; D) a short seta; E) tip of a short seta; F) a long seta; G) tip of a long seta.

than the prostomium. Ventral margin of peristomium is undulated, provided with 13 folds (see figure, B).

Pharynx is simple, bears eight marginal papillae with oval tips, which are closely applied to each other (see figure, B).

The dorsal cirri of the first setiferous segment (SS) are twice longer than the peristomeal cirri. On the second SS ventral, the cirri are absent.

Parapodia are well-developed throughout the body; however, in size they do not exceed body width. Each parapodium bears a dorsal and a ventral cirrus; in the middle part of the body the dorsal cirrus is bottle-shaped, as long as the ventral cirrus or somewhat longer than the latter (see figure, C).

Notopodia of anterior segments differ from those of medium segments. On the anterior segments a notopodium bears a curved acicula. By the posterior 20th segment this acicula turns clearly visible in the upper branch of the parapodium. One its halves crosses the parapodium from the bottom upward; the other half is strongly curved and passes along the dorsal surface, perpendicular to the first half (the angle can be different). Moreover, in the notopodium there is a stout hooked seta (always beginning from fourth SS) and one hair-like long seta (in young specimens; in adults it is located on anterior eight to ten segments). The latter seta also has a very strong basis that is comparable in size with that in the hooked seta. In the middle segments of adult specimens it turns into a true acicula that breaks through to the outside on the lateral side of the notopodium. Starting from the posterior 20th segments, another long seta appears, also having a strong base, which extends far beyond the tissues of the parapodium.

Neuropodium has one acicula and a bundle of setae of two types, with bifid tips that are visible only at high magnification under a microscope (see figure, D–G). Above and beneath the neuropodial bundle there are rather short sabreform setae with densely serrate convex edges. Most of the setae are of this type, they can differ from each other in length; the size of denticles gradually decreases and by the posterior extremity of the seta they almost disappear. The setae of the second type, located closer to the middle of the bundle, are presented in smaller numbers. They consist of a base (rounded in transverse section) that constitutes approximately a third of the entire seta and a flattened finely serrate sabreform distal part, bearing two long and approximately equal in size pointed distal denticles. The setae may look like hairs, if one looks at a certain angle (not perpendicular to the plane of the seta).

Pigidium has a pair of long slender cirri, which are as long as the seven to eight preceding segments.

Differential diagnosis. As in the case in *Sigambra healyae*, hooked setae begin from the fourth SS in *S. parva* (Day, 1963) [4], *S. hanaokai* (Kitamori, 1960) [6], *S. tentaculata* (Treadwell, 1941) [8], *S. setosa* (Fauchald, 1972) [5], and *S. bidentata* Britaev et Saphronova, 1981 [1]. The new species differs from all the listed ones in having two types of aciculae in the notopodia. The acicula of the first type is usually thick, stout and strongly curved, and it is present in most species of the genus. The acicula of the second type, characteristic only of *S. healyae*, is somewhat more slender and extends far beyond the dorsal surface of the notopodium. Moreover, the new species is characterized by segmentation of the prostomium. The new species also differs from *S. parva* and *S. hanaokai* in the structure of the setae, the number of marginal papillae on the pharynx, and the presence of hair-like setae in the notopodia; from *S. tentaculata* it differs in the number of papillae on the pharynx, the absence of smooth hair-like setae in the neuropodia, and the presence of bifid setae. The new species differs from *S. setosa* in the size of the medial antenna, which is 1.5 times longer than the lateral antennae; while @ it differs from the most closely related species, *S. bidentata*, in the presence of very long anal cirri and neuropodial setae with a characteristic bifid tip.

Distribution. This is an Arctic deep-sea species. It was found in the Canadian Basin, at depths of 1825–1852 m. The available information about the finding of *Sigambra tentaculata* in the Canadian Basin [3] seems doubtful, first of all because the inhabitation depth of this species was reported there as being 447–3010 m. It is known that the type locality of this species is the shallow waters of Southern California. Therefore, we have every reason to suppose that the species previously identified as *S. tentaculata*, should actually be considered as belonging to the newly described species, *Sigambra healyae*.

ACKNOWLEDGMENTS

The author is deeply indebted to Senior Curator of the Collection of the Department of Higher Worms in the Zoological Institute of the RAS, V.V. Potin, for invaluable recommendations and technical assistance during the work with the manuscript; to Senior Scientist of the Laboratory of Marine Investigations, E.N. Egorova and the Head of the Department, B.I. Sirenko, for helpful remarks, and to the crew of the *Healy* Cutter for assistance during the collection of the material and kindness. The author is sincerely thankful to all his colleagues for kindness and helpful assistance during the expedition, especially to the members of the benthos group including Bodil Bluhm, Katrin Iken, and Brenda Holladay from the University of Fairbanks, Alaska. The author is deeply grateful to Dr. Ken Coil from the same university. The studies were supported by the facilities of the NOAA Arctic Research Office, NOAA National Ocean Service, and Alfred P. Sloan Foundation. This paper is a minor contribution to the Compendium of Marine Life project.

REFERENCES

1. Britaev, T.A. and Safronova, M.A., New Species of Polychaetes of the Family Pilargidae from the Sea of Japan and Revision of the Genus *Cabira*, *Zool. Zhurn.*, 1981, vol. 60, iss. 9, pp. 1314–1324.
2. Zhirkov, I.A., *Polikhety Severnogo Ledovitogo okeana* (Polychaetes of the Arctic Ocean), Moscow: Yanus, 2001.
3. Bilyard, G.R. and Carey, A.G., Zoogeography of Western Beaufort Sea Polychaeta (Annelidae), *Sarsia*, 1980, vol. 65, pp. 19–26.
4. Day, J.H., The Polychaete Fauna of South Africa. Part 8: New Species and Records from Grab Samples and Dredgings, *Bull. Brit. Mus. Natur. Hist.*, 1963, vol. 10, no.E7, pp. 384–445.
5. Fauchald, K., Benthic Polychaetous Annelids from Deep Water of Western Mexico and Adjacent Areas in the Eastern Pacific Ocean, *Allan Hancock Monogr. Marine Biol.*, vol. 7, California, 1972, pp. 1–575.
6. Kitamori, R., Description of Two Species of Pilargiidae (Annelida: Polychaeta) from the Seto Inland Sea, *Bull. Jap. Soc. Sci. Fish.*, 1960, vol. 26, pp. 1086–1090.
7. Pettibone, M., Revision of the Pilargidae (Annelida: Polychaeta), Including Descriptions of New Species, and Redescription of the Pelagic *Podarmus ploa* Chamberlin (Polynoidae), *Proc. U. S. Nat. Mus.*, 1966, vol. 118, no. 3525, pp. 155–207.
8. Treadwell, A.L., Polychaetous Annelids from the New England Region, Porto Rico and Brasil, *Amer. Mus. Nov.*, 1941, no. 1138, pp. 1–4.

SPELL: OK