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Stibarobdella macrothela (Annelida, Hirudinida, Piscicolidae) from Elasmobranchs in Japanese Waters, with New Host Records

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Abstract. The piscicolid leech *Stibarobdella macrothela* (Schmarda, 1861) was collected from three elasmobranchs (ornate eagle ray *Aetomylaeus vespertilio*, banded houndshark *Triakis scyllium*, and tiger shark *Galeocerdo cuvier*) in Japanese waters. The first two species (*A. vespertilio* and *T. scyllium*) are new hosts, and *G. cuvier* is newly recorded as a host in Japan. The external morphology of the smallest leech specimen (total length 16 mm) is figured.

Key words: *Stibarobdella macrothela*, *Aetomylaeus vespertilio*, *Galeocerdo cuvier*, *Triakis scyllium*, Japan, new host records.

Introduction

The piscicolid leech, *Stibarobdella macrothela* (Schmarda, 1861) is a relatively large, warm-water species known to be distributed worldwide, primarily in the tropical regions of the Atlantic, Pacific, and Indian Oceans (Soós, 1965; Llewellyn, 1966; Furiness *et al.*, 2007). In Japan, this species was first reported as *Pontobdella bimaculata* by Oka (1910). Subsequently, the species was transferred to the genus *Stibarobdella* by Llewellyn (1966). Currently, however, it has been regarded as a junior synonym of *S. macrothela* by Furiness *et al.* (2007). The leech is known primarily from a variety of elasmobranch hosts, but rarely from crabs and old shells (Sawyer *et al.*, 1975). In Japanese waters, limited information has been available on this species of leech. We report here three specimens of *S. macrothela* collected from elasmobranchs in Japan, with new host records.

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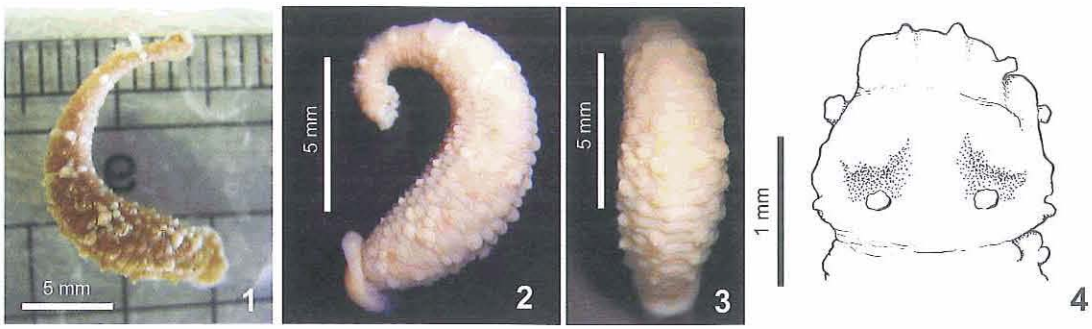
Materials and Methods

An ornate eagle ray *Aetomylaeus vespertilio* (Bleeker, 1852) (about 120 cm in disc width) was captured by a gill net in the western North Pacific off Umino fishing port, Chi-nen Village, Okinawa-jima Island, Nansei Islands, Japan on April 7, 2006. A leech attached to the tissue near the base of the teeth in the mandible was collected and photographed alive for its coloration (Fig. 1). The leech was then preserved in 70% ethanol without relaxation.

Tiger sharks *Galeocerdo cuvier* (Péron & Lesueur, 1822) (body size unmeasured) were caught by using longlines in the western North Pacific off Ishigaki-jima Island, Nansei Islands, Japan on September 2, 2006. One of a number of leeches found on the inner surface of the buccal cavity was collected and



Figs 1–4. *Stibarobdella macrothela* collected from *Aetomylaeus vespertilio*. 1: a live specimen, lateral view. 2: a preserved specimen, lateral view. 3: *Ditto*, dorsal view. 4: *Ditto*, oral sucker, dorsal view.

preserved in 70% ethanol without relaxation.

A banded houndshark *Triakis scyllium* Müller & Henle, 1839 (body size unmeasured) was captured by a setnet in Sagami Bay, the western North Pacific off the coast of Arasaki, Miura Peninsula in Kanagawa Prefecture, Japan in 2006 (date of capture unrecorded) and had been kept in a land-based concrete tank at the National Research Institute of Fisheries Science, Fisheries Research Agency near the sampling site. After death of the shark on May 1, 2007, a leech was collected from the ventral side of the caudal peduncle, preserved in a refrigerator, and fixed in 5% formalin on May 10, 2007.

The fixed leech specimens were examined under a stereoscopic microscope. Drawings were made with the aid of a Nikon microscope drawing attachment. The specimens examined in this paper have been deposited in the National Science Museum, Tokyo (NSMT-An 385, 386, 387). The common and scientific names of fishes follow those recommended by Froese & Pauly (2007).

Results and Discussion

All specimens found were identified as *S. macrothela* on the basis of the following characters: a pair of large, trumpet-shaped eye-spots on the oral sucker; large square tubercles on the a_2 annulus of the urosome; and the relatively large caudal sucker. The specimens ranged from 16.0–75.0 in total length and from 4.0–16.5 mm in maximum body width (Table 1).

The specimen (Figs 1–4) from *A. vespertilio* is quite small, 16 mm in total length. Its oral sucker is contracted in ethanol, but papillae and a pair of eye-spots are obvious in dorsal view of the oral sucker (Fig. 4).

The color of the specimen from *G. cuvier* was dark green in fresh but pale chocolate brown in ethanol, as described by Moore (1958) and Silva & Fernando (1965), whereas the specimen from *A. vespertilio* was chestnut in fresh (Fig. 4). Unfortunately, the color of the specimen from *T. scyllium* was unrecorded in fresh.

Stibarobdella macrothela is known primarily from a variety of elasmobranch hosts in the world

Table 1. Measurements of 3 specimens of *Stibarobdella macrothela* from Japan, examined in this study.

Registration number Locality	NSMT-An 385 Okinawa-jima Island	NSMT-An 386 Ishigaki-jima Island	NSMT-An 387 Kanagawa Pref.
Total length (mm)	16.0	75.0	42.5
Maximum width (mm)	4.0	16.5	7.5

Table 2. Host fish of *Stibarobdella macrothela*.

Host fish	Infection site	Locality	References
Heterodontidae			
Heterodontus japonicus	skin at base of pectoral fin	Shizuoka, Japan	Furiness *et al.* (2007)
Stegostomatidae			
Stegostoma fasciatum	pectoral fin	Wedge Bank, Ceylon	de Silva (1963)
Ginglymostomatidae			
Ginglymostoma cirratum	gill slit	Puerto Rico	Sawyer *et al.* (1975)
Ginglymostoma cirratum	mouth	Parguera, Puerto Rico	Williams *et al.* (1994)
Ginglymostoma cirratum	roof of mouth or tongue	Puerto Rico	Williams (1982)
Scyliorhinidae			
Cephaloscyllium umbratile	clasper	Shizuoka, Japan	Furiness *et al.* (2007)
Galeus eastmani	unknown	Shizuoka, Japan	Furiness *et al.* (2007)
Triakidae			
Triakis scylium	ventral side of caudal peduncle	Kanagawa, Japan	Present study
Carcharinidae			
Carcharhinus brachyurus	intergill ventral region	Santa Catarina coast, Brazil	Sato (2000)
Carcharhinus falciformis	unknown	North Carolina, USA	Sawyer *et al.* (1975)
Carcharhinus leucas	unknown	Florida, USA	Sawyer *et al.* (1975)
Carcharhinus longimanus	unknown	unknown	Sawyer *et al.* (1975)
Carcharhinus limbatus	unknown	unknown	Sawyer *et al.* (1975)
Carcharhinus melanopterus	unknown	unknown	Llewellyn (1966)
Carcharhinus obscurus	unknown	unknown	Sawyer *et al.* (1975)
Carcharhinus perezi (as *C. springeri*)	unknown	unknown	Sawyer *et al.* (1975)
Carcharhinus perezi	fin	Saba, Netherland Antilles	Williams *et al.* (1994)
Eulamia sp.	unknown	unknown	Llewellyn (1966)
Galeocerdo cuvier (as *Galeocerdo arcticus*)	unknown	unknown	Llewellyn (1966)
Galeocerdo cuvier	inner surface of buccal cavity	Ishigaki-jima Island, Japan	Present study
Galeocerdo cuvier (as *Galeocera cuvier*)	mouth	Parguera, Puerto Rico	Williams *et al.* (1994)
Galeocerdo cuvier (as *Galeocera cuvier*)	roof of mouth	Puerto Rico	Williams (1982)
Negaprion brevirostris	mouth	Parguera, Puerto Rico	Williams *et al.* (1994)
Negaprion brevirostris	roof of mouth	Puerto Rico	Williams (1982)
Scoliodon sp.	unknown	unknown	Llewellyn (1966)
Sphyrna mokarran	mouth	Puerto Rico	Williams (1982)
Sphyrna tudes	unknown	unknown	Sawyer *et al.* (1975)
Eusphyra or *Sphyrna* sp. (as *Zygaena* sp.)	side	Gobalpore, Indian coast	Harding & Moore (1927)
Odontaspididae			
Carcharias taurus	unknown	Virginia, USA	Furiness *et al.* (2007)
Rhinidae			
Rhina ancylostoma	head	Wedge Bank, Ceylon	de Silva (1963)
Rajidae			
Okamejei kenojei (as *Raja kenojei*)	body surface	Yamagata, Japan	Suzuki (1979)
Myliobatidae			
Aetomylaeus vespertilio	mouth	Okinawa-jima Island, Japan	Present study
Paralichthyidae			
Paralichthys dentatus (=*Chaenopsetta ocellaris*)	unknown	North Carolina, USA	Sawyer *et al.* (1975)

(Table 2). The present study represents the first record of *S. macrothela* from *A. vespertilio* and *T. scyllium*. While *S. macrothela* was recorded from *G. cuvier* only in the Caribbean Sea (Williams Jr., 1982; Williams *et al.*, 1994), the present paper is the first record of *S. macrothela* from *G. cuvier* in Japan.

In Japan, the leech is known to occur along the coast of Honshu, Shikoku, and Kyushu (Oka, 1927, 1947; Oka & Nagao, 1965; Nishimura, 1992), including the following prefectures: Yamagata, Niigata, Chiba (as "Awa"), Kanagawa (as "Sagami"), and Shizuoka (Oka, 1910; Suzuki, 1979; Kitami & Homma, 1968; Furiness *et al.*, 2007). Although a study was made on marine leeches in the Ryukyu Islands, southern Japan, by Williams *et al.* (1994), *S. macrothela* was unrecorded. Hence, our specimens from both Okinawa-jima Island and Ishigaki-jima Island represent the first records for the species from the southern islands of Japan.

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References

*de Silva, P. H. D. H., 1963. The occurrence of *Pontobdella* (*Pontobdellina*) *macrothela* Schmarda and *Pontobdella aculeate* Harding, in the Wadge Bank. *Spol. Zeylan.*, **30**: 35–38.

de Silva, P. H. D. H. & Fernando, C. H., 1965. Three marine leeches (Piscicolidae, Hirudinea) from the Malay Peninsula. *Spol. Zeylan.*, **30**: 227–232.

Froese, R. & Pauly, D. (Eds), 2007. *FishBase*. World Wide Web electronic publication. Available from URL: www.fishbase.org, version (11/2007).

Furiness, S., Williams, J. I., Nagasawa, K. & Burreson, E. M., 2007. A collection of fish leeches (Hirudinida: Piscicolidae) from Japan and surrounding waters including redescriptions of three species. *J. Parasitol.*, **93**: 875–883.

*Harding, W. A. & Moore, J. P., 1927. Hirudinea. In *The Fauna of British India, including Ceylon and Burma*: 1–302. London.

Kitami, T. & Homma, Y. 1968. On the marine invertebrates near Sado and Awa Islands. *In* Homma, Y. *et al.* (Eds), *Niigata-no-Shizen*, **1**: 167–173. Publication Committee for Niigata-no-shizen, Niigata.

Llewellyn, L. C., 1966. Pontobdellinae (Piscicolidae: Hirudinea) in the British Museum (Natural History) with a review of the subfamily. *Bull. Br. Mus. nat. Hist.* (Zool.), **14**: 389–439.

Moore, J. P., 1958. The leeches (Hirudinea) in the collection of the Natal Museum. *Ann. Natal Mus.*, **14**: 303–340.

Nishimura, S., 1992. Hirudinea. *In* Nishimura, S. (Ed.), *Guide to Seashore Animals of Japan with color Pictures and Keys*, **1**: 376–379. Hoikusha, Osaka. (In Japanese).

Oka, A., 1910. Synopsis der Japanischen Hirudineen, mit Diagnosen der Neuen Species. *Annotnes zool. jap.*, **7**: 165–183.

———, 1927. *Pontobdella bimaculata* Oka. *In* Oka, A. *et al.* (Eds), *Illustrated Encyclopedia of the Fauna of Japan*: 1601. Hokuryukan. Tokyo. (In Japanese).

———, 1947. *Pontobdella bimaculata* Oka. *In* Uchida, S. (Ed.), *Revised and enlarged illustrated Encyclopedia of the Fauna of Japan*: 1389. Hokuryukan. Tokyo. (In Japanese).

Oka, A. & Nagao, Z., 1965. *Pontobdella bimaculata* Oka. *In* Okada, Y., Uchida, S. & Uchida, T. (Eds.), *New illustrated Encyclopedia of the Fauna of Japan*, part 1: 569. Hokuryukan. Tokyo. (In Japanese).

Sawyer, R. T., Lawler, A. R. & Oversrteet, R. M., 1975. Marine leeches of the eastern United States and the Gulf of Mexico with a key to the species.

J. nat. Hist., **9**: 633–667.

Soós, A., 1965. Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. I. Family: Piscicolidae. *Acta zool. Acad. Sci. Hung.*, **11**: 417–466.

Soto, J. M. R., 2000. Marine leech, *Stibarobdella macrothela* (Schmarda, 1861) (Hirudinea, Piscicolidae), parasitic on the whaler shark, *Carcharhinus brachyurus* (Günther, 1870) (Chondrichthyes, Carcharhinidae), in southern Brazilian waters. *Rev. Brasil. Biol.*, **60**: 713–714.

Suzuki, S., 1979. Marine invertebrates in Yamagata Prefecture, Japan. Tamakibi-kai, Yamagata. (In Japanese).

Williams Jr., E. H., 1982. Leeches of some marine fishes from Puerto Rico and adjacent regions. *Proc. helminthol. Soc. Wash.*, **49**: 323–325.

Williams, E. H., Bunkley-Williams, L. & Burreson, E. M., 1994. Some new records of marine and freshwater leeches from Caribbean, southeastern U.S.A., eastern Pacific, and Okinawan animals. *J. helminth. Soc. Wash.*, **61**: 133–138.

[*not seen directly]

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