

## ***Odontobutis hikimius* (Perciformes: Odontobutidae), a new host for *Argulus coregoni* (Crustacea: Branchiura: Argulidae)**

Kazuya NAGASAWA<sup>1)\*</sup>, Tomoharu KUWABARA<sup>2)</sup> and Hiroshi NAKANO<sup>2)</sup>

<sup>1)</sup> Graduate School of Biosphere Science, Hiroshima University,  
1-4-4 Kagamiyama, Higashi-Hiroshima, Hiroshima 739-8528, Japan

<sup>2)</sup> Gobius, Shinjiko Nature Museum, 1659-5 Sono-cho, Izumo, Shimane 691-0076, Japan

**Abstract** An adult female of the argulid branchiuran *Argulus coregoni* Thorell, 1864 was collected from the body surface of a recently described, rare odontobutid *Odontobutis hikimius* (called “ishidonko”) in the Ishitani River, a tributary of the Hikimi River within the Takatsu River system, Shimane Prefecture, Japan. This collection represents a new host record for *A. coregoni*. This branchiuran is the first species of parasite found from *O. hikimius*.

**Key words:** *Argulus coregoni*, Branchiura, fish parasite, new host, *Odontobutis hikimius*

### INTRODUCTION

Two species of the odontobutid genus *Odontobutis* occur in fresh waters of Japan (Akihito *et al.*, 2013): *O. obscura* (Temminck and Schlegel, 1845) (called “donko” in Japanese), and *O. hikimius* Iwata and Sakai, 2002 (called “ishidonko”). *Odontobutis obscura* is widely distributed in western Japan (Iwata *et al.*, 1985; Sakai *et al.*, 1998), and its parasite fauna has been well studied. Dr. Satyu Yamaguti, for example, reported as many as 18 species of helminth parasites, including one monogenean, seven trematodes, two cestodes, five nematodes, and three acanthocephalans from *O. obscura* (see Kamegai and Ichihara, 1972). An ergasilid copepod is also known to parasitize *O. obscura* (Muroga *et al.*, 1974). On the other hand, *O. hikimius* was recently described as a new species (Iwata and Sakai, 2002), and its geographic distribution is restricted to Shimane and Yamaguchi prefectures, western Honshu, the main island of Japan (Iwata and Sakai, 2002; Sakai *et al.*, 2012). It is rare and has been designated as a vulnerable species (Ministry of the Environment, 2013). No information is yet available on the parasites of *O. hikimius*.

Recently, we collected a specimen of the argulid branchiuran *Argulus coregoni* Thorell, 1864 from *O. hikimius* in Shimane Prefecture. This collection represents a new host record for *A. coregoni*.

### MATERIALS AND METHODS

Five individuals of *O. hikimius* were collected using a cast net and a hand net in the Ishitani River, a tributary of the Hikimi River within the Takatsu River system, Hikimi Town, Masuda City, Shimane Prefecture, Japan, on August 2, 2012. The fish were transported alive in a container to the laboratory of Gobius, the Shinjiko Nature Museum, where they were examined for external parasites before released into a quarantine tank. A branchiuran was collected from the fish’s body surface and fixed in 70% ethanol. The specimen will be deposited in the crustacean collection at the National Museum of Nature

---

\*E-mail: ornatus@hiroshima-u.ac.jp

and Science, Tokyo, after examined for the detailed morphology. The scientific names of fishes used in this paper follow Nakabo (2013).

## RESULTS AND DISCUSSION

One (ca. 17.5 cm in total length) of the five individuals of *O. hikimius* examined was infected with a single branchiuran, which is identified as *A. coregoni* (Fig. 1). It is an adult female, measuring 9.3 mm long and 6.2 mm wide. The morphology of the specimen corresponds to that of the species reported by Yamaguti (1937), Hoshina (1950), and Fryer (1982).

The present collection of *A. coregoni* from *O. hikimius* represents a new host record for this parasite. This argulid is an ectoparasite of freshwater fishes in the Northern Hemisphere (Yamaguti, 1963). In Japan, it has been reported from various salmonids (brook trout *Salvelinus fontinalis*, gogi char *Salvelinus leucomaenis imbrius*, yamato char *Salvelinus leucomaenis japonicus*, brown trout *Salmo trutta*, amago salmon *Oncorhynchus masou ishikawae*, cherry salmon *Oncorhynchus masou masou*, and rainbow trout *Oncorhynchus mykiss*), ayu (*Plecoglossus altivelis altivelis*), and bitteling (*Acheilognathus melanogaster*) (see Nagasawa, 2011). In Shimane Prefecture where the present material was collected, *A. coregoni* also infects *S. leucomaenis imbrius* (Nagasawa and Kawai, 2008).

*Odontobutis hikimius* was recently described (Iwata and Sakai, 2002) and occurs only in Shimane and Yamaguti prefectures, Japan (Iwata and Sakai, 2002; Sakai *et al.*, 2012). No parasitological survey of this fish species has been conducted to date. *Argulus coregoni* is the first species of parasite found from *O. hikimius*. As stated in the Introduction section, *O. obscura*, another species of the genus, has been well studied for its parasite fauna in Japan. It is, therefore, important to clarify the parasite fauna of *O. hikimius* and compare it with that of *O. obscura* from a viewpoint of the host and parasite's coevolution and biogeography.

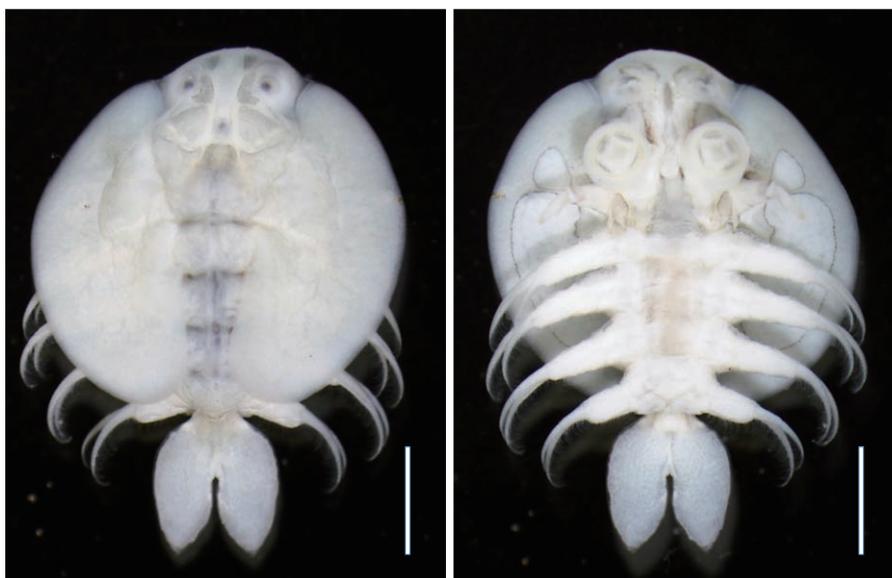


Fig. 1. An adult female specimen of *Argulus coregoni* (9.3 mm in total length) from the body surface of *Odontobutis hikimius* in the Ishitani River, a tributary of the Hikimi River within the Takatsu River system, Shimane Prefecture, Japan. Alcohol-preserved specimen. A. dorsal view; B. ventral view. Scale bars: 2 mm.

## ACKNOWLEDGMENTS

We thank Katsuhide Yamaguchi and Shinji Asatsu of the Shinjiko Nature Museum for fish sampling. The fish were collected with a special permission from the Shimane Prefectural Government and the Takatsu Fisheries Cooperative Association.

## REFERENCES

- Akihiko, Sakamoto, K., Ikeda, Y., Aizawa, M., 2013. Odontobutidae. In: *Fishes of Japan with Pictorial Keys to the Species. Third Edition*, ed., Nakabo, T., Tokai University Press, Hadano: 1351. [In Japanese].
- Fryer, G., 1982. *The Parasitic Copepoda and Branchiura of British Freshwater Fishes: A Handbook and Key*. Scientific Publication No. 46, Freshwater Biological Association, Ambleside, Cumbria: 87 pp.
- Hoshina, T., 1950. Über eine *Argulus*-Art im Salmonidenteiche. *Bulletin of the Japanese Society of Scientific Fisheries* **16**: 239-243.
- Iwata, A., Sakai, H., 2002. *Odontobutis hikimius* n. sp., a new freshwater goby from Japan, with a key to species of the genus. *Copeia* **2002**: 104-110.
- Iwata, A., Jeon, S. R., Mizuno, N., Choi, K. C., 1985. A revision of the eleotrid goby genus *Odontobutis* in Japan, Korea and China. *Japanese Journal of Ichthyology* **31**: 373-388.
- Kamegai, S., Ichihara, A., 1972. A check list of the helminths from Japan and adjacent areas. Part I. Fish parasites reported by S. Yamaguti from Japanese waters and adjacent areas. *Research Bulletin of the Meguro Parasitological Museum*, (6): 1-43.
- Ministry of the Environment, 2013. [Brackish-water and freshwater fishes: the fourth red-list (2013)]. Ministry of the Environment, Tokyo: 7 pp. [http://www.env.go.jp/press/file\\_view.php?serial=21437&hou\\_id=16264](http://www.env.go.jp/press/file_view.php?serial=21437&hou_id=16264) [In Japanese].
- Muroga, K., Uye, S., Ueki, N., 1974. [On a parasitic copepod, *Ergasilus japonicus*, from bluegill sunfish]. *Fish Pathology* **8**: 152-155. [In Japanese].
- Nagasawa, K., 2011. The biology of *Argulus* spp. (Branchiura, Argulidae) in Japan: a review. In: *New Frontiers in Crustacean Biology*, eds., Asakura, A. et al., Proceedings of the TCS Summer Meeting, Tokyo, 20-24 September 2009. *Crustacean Monographs* **15**: 15-21.
- Nagasawa, K., Kawai, K., 2008. New host record for *Argulus coregoni* (Crustacea: Branchiura: Argulidae), with discussion on its natural distribution in Japan. *Journal of the Graduate School of Biosphere Science, Hiroshima University* **47**: 23-28.
- Nakabo, T., ed., 2013. *Fishes of Japan with Pictorial Keys to the Species. Third Edition*. Tokai University Press, Hadano: xlix+2428 pp. [In Japanese].
- Sakai, H., Yamamoto, C., Iwata, A., 1998. Genetic divergence, variation and zoogeography of a freshwater goby, *Odontobutis obscura*. *Ichthyological Research* **45**: 363-376.
- Sakai, H., Hatama, T., Iwata, A., 2012. A rare freshwater goby *Odontobutis hikimius* collected from the Nishiki River flowing down the southern slope of the drainage divide opposite to the Takatsu River, the type locality. *Biogeography* **14**: 19-24.
- Yamaguti, S., 1937. On two species of *Argulus* from Japan. In: *Papers on Helminthology Published in Commemoration of the 30 Year Jubileum of the Scientific, Educational and Social Activities of the Honoured Worker of Science K. J. Skrjabin, M. Ac. Sci. and of 15th Anniversary of All-Union Institute of Helminthology*. Moscow: 781-784.
- Yamaguti, S., 1963. *Parasitic Copepoda and Branchiura of Fishes*. Interscience Publishers, New York: 1103 pp.

## イシドンコはチョウモドキの新宿主

長澤和也<sup>1)</sup>・桑原友春<sup>2)</sup>・中野浩史<sup>2)</sup>

<sup>1)</sup> 広島大学大学院生物圏科学研究科, 〒739-8528 東広島市鏡山1-4-4

<sup>2)</sup> 鳥根県立宍道湖自然館ゴビウス, 〒691-0076 出雲市園町1659-5

**要 旨** 鳥根県高津川水系匹見川の支流、石谷川で採集したイシドンコ *Odontobutis hikimius* の体表からチョウモドキ *Argulus coregoni* Thorell, 1864の雌成体を得た。イシドンコはチョウモドキの新宿主である。また、チョウモドキはイシドンコから見出された最初の寄生虫である。

**キーワード**：イシドンコ, エラオ類, 魚類寄生虫, 新宿主, チョウモドキ