

## A fish parasite, *Isoparorchis eurytremum* (Digenea: Isoparorchidae), newly recorded in Tokushima Prefecture, Shikoku, Japan

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**Abstract.** An immature specimen of the isoparorchiid digenean *Isoparorchis eurytremum* (Kobayashi, 1915) was collected from the mesentery of a dark sleeper, *Odontobutis obscura* (Temminck & Schlegel, 1845), in an irrigation canal, Tokushima City, Tokushima Prefecture, Shikoku, the fourth largest island of Japan. This represents a new prefectural record for *I. eurytremum* and the third record of the species in Shikoku.

**Key words:** Digenea, fish parasite, *Isoparorchis eurytremum*, new prefectural record, *Odontobutis obscura*

The isoparorchiid digenean *Isoparorchis eurytremum* (Kobayashi, 1915), previously known as *I. hypselobagri*, is an endoparasite of various freshwater fish in Japan and the Russian Far East (Shimazu *et al.*, 2014). In Japan, this digenean has been reported from 18 prefectures in central and western Honshu, Shikoku, and Kyushu islands (Nagasawa *et al.*, 2013). Of these islands, Shikoku which consists of four prefectures (Kagawa, Ehime, Kochi, and Tokushima) is the least studied region for the geographical distribution of *I. eurytremum*. There are only two records of the species each in Kochi and Ehime prefectures (Komatsu & Matsumura, 1963; Nagasawa *et al.*, 2013). During a parasitological survey of freshwater fish of Shikoku, we found a specimen of *I. eurytremum* from a dark sleeper, *Odontobutis obscura* (Temminck & Schlegel, 1845) (Perciformes: Odontobutidae), for the first time in Tokushima Prefecture.

One specimen of *O. obscura* and eight specimens of the medaka *Oryzias latipes* (Temminck & Schlegel, 1846) (Beloniformes: Adrianichthyidae) were

collected using a hand net on 6 December 2013 in an irrigation canal (34°02'17"N, 134°31'14"N) connected to a brook flowing into the Sonose River at Kami-Hachiman, Tokushima City, Tokushima Prefecture, Shikoku. The fish were transported alive to the laboratory at Hiroshima University, Higashi-Hiroshima City, Hiroshima Prefecture, where they were measured for standard length (SL) in millimeters and examined for metazoan parasites. A specimen of *I. eurytremum* was collected from the mesentery of *O. obscura* (n=1, 42.1 mm SL), but this parasite was not found from *O. latipes* (n=8, 19.1–22.7 mm SL). The digenean specimen was fixed in 70% ethanol with slight pressure under a coverslip, stained in Heidenhain's iron hematoxylin, dehydrated through a graded ethanol series, cleared in xylene, and mounted in Canada balsam as a permanent slide. A drawing was made with the aid of a drawing tube fitted on an Olympus BX51 light microscope. The specimen is deposited in the Platyhelminthes (PI) collection of the National Museum of Nature and Science (NSMT-PI 6173), Tsukuba City, Ibaraki Prefecture, Japan.

The specimen of *I. eurytremum* (Fig. 1) was im-

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mature, measuring 4.55 mm long by 1.30 mm maximum width; body elongate with smooth surface; oral sucker subterminal; pharynx muscular; esophagus short; ventral sucker larger than oral sucker, nearly equatorial; intestines slightly undulating, extending posteriorly close to posterior end of body; genital atrium median, situated between esophagus and ventral sucker; small primordia of testes just posterolateral to ventral sucker; uterus weakly developed, undulating; primordium of ovary small, median, situated in posterior quarter of body; and excretory vesicle posterior to ovary. The present specimen had a more

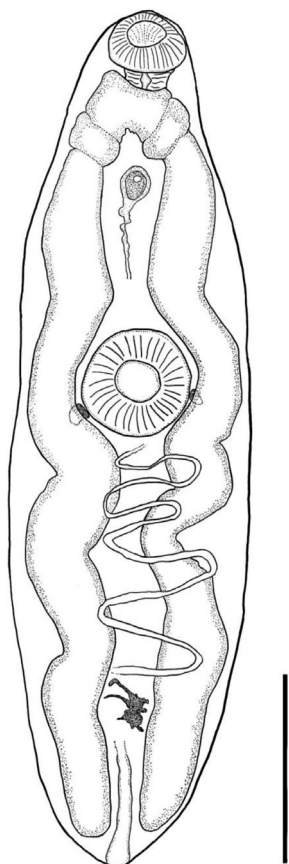


Fig. 1. *Isoparorchis eurytremum* (Kobayashi, 1915), immature specimen, NSMT-PI 6173, from the mesentery of *Odontobutis obscura* (Temminck & Schlegel, 1845). Scale bar: 1 mm.

elongated body than the immature specimens of the species reported by Yamashita & Nishida (1955, fig. 1), Shimazu & Urabe (2005, fig. 17), and Nagasawa *et al.* (2013, fig. 1) from Japan, but this is perhaps an artifact due to coverslip pressure. *Odontobutis obscura* has been reported to harbor immature worms of *I. eurytremum* in the body cavity and air bladder in other locations of Japan (Yamaguti, 1934).

The present finding of *I. eurytremum* represents a new prefectural record of the species in Japan and its third record in Shikoku, where it is known to infect the snakehead *Channa argus* (Cantor, 1842) (Komatsu & Matsumura, 1963) and the Japanese eel *Anguilla japonica* Temminck & Schlegel, 1847 (Nagasawa *et al.*, 2013). Many freshwater fish are distributed in various rivers of Shikoku (e.g., 71 spp. in the Katsuura River, Tokushima Prefecture [Sato *et al.*, 1998] and 199 spp. in the Shimanto River, Kochi Prefecture [Otsuka *et al.*, 2010]). Nevertheless, besides *I. eurytremum*, only nine species of digeneans (excluding the species recorded as metacercaria) have been reported from Shikoku's freshwater fish (Shimazu, 2008, 2014). This is caused by the fact that only a few investigations into the fish parasites have been conducted in this region, and more work is needed to clarify the digenean fauna of freshwater fish of Shikoku.

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## References

- Komatsu, T. & Matsumura, S., 1963. The analysis of educational technique for health education. IV Report: On a fresh-water fish, *Channa argus* (Cantor) as a vector of human gnathostomiasis in Kochi Prefecture. *Res. Rep. Kochi Univ.*, **11** (Nat. Sci., II): 1–4. (In Japanese).
- Nagasawa, K., Katahira, H. & Nitta, M., 2013. *Isoparorchis hypselobagri* (Trematoda: Isoparor-

- chiidae) from freshwater fishes in western Japan, with a review on its host-parasite relationship in Japan (1915–2013). *Biogeography*, **15**: 11–20.
- Otsuka, T., Nomura, S. & Sugimura, M., 2010. *Fish guide of Shimanto-gawa*. 163 pp., Ikadasha Publ., Tokyo. (In Japanese with English title).
- Sato, Y., Takahashi, H. & Suzawa, Y., 1998. Fish fauna of the Katsuura River, Tokushima Prefecture, Shikoku, Japan. *Bull. Tokushima Pref. Mus.*, **8**: 25–66. (In Japanese with English abstract).
- Shimazu, T., 2008. Digeneans (Trematoda) found in freshwater fishes of Wakayama, Tokushima, and Kochi Prefectures, Japan. *Bull. Natl. Mus. Nat. Sci., Ser. A*, **34**: 41–61.
- Shimazu, T., 2014. Digeneans parasitic in freshwater fishes (Osteichthyes) of Japan. II. Gorgoderidae and Orientocreadiidae. *Bull. Natl. Mus. Nat. Sci., Ser. A*, **40**: 53–78.
- Shimazu, T. & Urabe, M., 2005. Digeneans found freshwater fish of the Uji River at Uji, Kyoto Prefecture, and the Takami River at Higashiyoshino, Nara Prefecture, Japan. *J. Nagano Pref. Coll.*, (60): 1–14.
- Shimazu, T., Cribb, T. H., Miller, T. L., Urabe, M., Ha, N. V., Binh, T. T. & Shed'ko, M. B., 2014. Revision of *Isoparorchis* Southwell, 1913 (Digenea, Hemiuroidea, Isoparorchidae), parasites of the air bladder of freshwater catfishes: a molecular and morphological study. *Bull. Natl. Mus. Nat. Sci., Ser. A*, **40**: 15–51.
- Yamaguti, S., 1934. Studies on the helminth fauna of Japan. Part 2. Trematodes of fishes, I. *Japan. J. Zool.*, **5**: 249–541.
- Yamashita, J. & Nishida, H., 1955. On the occurrence of *Isoparorchis hypselobagri* Southwell in the muscle of *Ophicephalus argus* (Cantor). *Mem. Fac. Agr., Hokkaido Univ.*, **2**: 160–163. (In Japanese with English abstract).

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