



# Article

urn:lsid:zoobank.org:pub:E107064F-2E8D-4312-B426-1CFF9E6E5C65

## Taxonomic study of the *Cobitis striata* complex (Cypriniformes, Cobitidae) in Japan

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### Abstract

Three new species and six new subspecies of the genus *Cobitis* from the western part of the Japanese archipelago are described: *Cobitis kaibarai* sp. nov., *Cobitis magnostriata* sp. nov., *Cobitis minamorii* sp. nov., *Cobitis striata fuchigamii* subsp. nov., *Cobitis striata hakataensis* subsp. nov., *Cobitis minamorii oumiensis* subsp. nov., *Cobitis minamorii tokaiensis* subsp. nov., *Cobitis minamorii saninensis* subsp. nov., and *Cobitis minamorii yodoensis* subsp. nov. *Cobitis striata* Ikeda, 1936 was redescribed on the basis of specimens collected from the type locality. The four striated spined loaches, *C. striata*, *C. kaibarai*, *C. magnostriata*, and *C. minamorii* were clearly distinguished by the pelvic myotome number, shape of the lamina circularis, black spots at the caudal base, body shape, and egg diameter. Although these subspecies of *C. striata* and *C. minamorii* are remarkably alike in morphology, the adult males of the subspecies had different longitudinal patterns of pigmentation during the non-spawning season.

**Key words:** Teleostei, striated spined loach, freshwater fish, East Asia

### Introduction

Spined loaches of the genus *Cobitis* Linnaeus, 1758 (Cypriniformes: Cobitidae) are small, slender freshwater fishes distributed in most of Eurasia and northwestern Africa (Sawada 1982; Kottelat & Freyhof 2007). This genus is characterized by the following features: suborbital spine erectile, mouth small and inferior with three pairs of barbels, body pigmentation usually organized in one dorsal and four lateral longitudinal zones, 14 branched caudal rays, and adult males with lamina circularis at base of pectoral-fin rays (Kottelat & Freyhof 2007; Kim 2009).

*Cobitis striata* Ikeda, 1936 was described as a subspecies of *Cobitis taenia* Linnaeus, 1758 on the bases of specimens collected near Takamatsu, Kagawa prefecture, Honshu, Japan (Ikeda, 1936; Okada & Ikeda, 1939; Aoyagi 1957). Later, Minamori (1955a) found that the *C. striata* divided into at least five distinguishable groups (large race, middle race, small race, Biwa small race, and spotted small race) on the bases of the results of crossing and physiological experiments, and differences in body length and size of the eggs, spermatozoa and blood cells (Minamori 1950, 1951a, b, 1952, 1953, 1955b, c). Saitoh and Aizawa (1987) and Saitoh (1989) divided the *C. striata* into three species (large race, middle race, and small race) and six subspecies of small race (Tokai small, Biwa small, Yodo small, Sanyo small, Sanin small and Kyushu small) on the basis of a detailed morphological survey. Genetic relationships among the striated spined loaches revealed by mitochondrial DNA analysis, confirmed that the *C. striata* consisted of multiple species/subspecies and all endemic loaches in the Japanese archipelago (Kitagawa *et al.* 2005, 2009; Saitoh *et al.* 2010). The striated spined loaches, characterized by a striped coloration pattern on the lateral midline, represent the *C. striata* complex (Kitagawa *et al.* 2005; Saitoh *et al.* 2010). However, the taxonomic study was not performed, and these species/subspecies remain undescribed.

Here, I have described three new species and six new subspecies of the *C. striata* complex from Japan, and have redescribed *C. striata* Ikeda 1936.