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Coreoleuciscus aeruginos (Teleostei: Cypriniformes: Cyprinidae), a new species from the Seomjin and Nakdong rivers, Korea

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Abstract

Coreoleuciscus splendidus was first reported as a monotypic species. Recent morphological and genetic studies have revealed that the species is represented by two disjunct and distinct lineages. The two lineages of *C. splendidus* include populations inhabiting the Han and Geum rivers in the East Korea Subdistrict and populations inhabiting the Seomjin and Nakdong rivers in the South Korea Subdistrict. In this study, significant differences were found between these two independent lineages through a high degree of genetic divergence in the mitochondrial cytochrome *c* oxidase subunit I gene as well as conspicuous morphological differences in body coloration and shapes of black stripes on dorsal, anal and caudal fin rays. These morphological and genetic differences provide supporting evidence that the populations in the South Korea Subdistrict represent a new species, *Coreoleuciscus aeruginos*.

Key words: *Coreoleuciscus aeruginos*, *Coreoleuciscus splendidus*, Korea, new species

Introduction

There are 33 species from 17 genera in the subfamily Gobioninae in Korea. The genus *Coreoleuciscus* consists of a monotypic species (Mori, 1935; Kim *et al*. 2005), the Korean shinner *C. splendidus*. This freshwater fish species is endemic to Korea and inhabits middle and upper stream and river reaches draining into all three of Korea's coasts (Choi *et al.* 1990; Kim & Park 2005). Mori (1935) first reported *C. splendidus* based on specimens from the Han River at Hoeyang, Kangwon-do, Korea. However, the subfamilial assignment of *C. splendidus* has been controversial; this species was frequently assigned to the Leuciscinae. In the Gobioninae the species has been placed in a separate phyletic position, with closely related genus *Gnathopogon*, from most species based on morphological features of urohyal and cephalic muscle (Kim and Kang, 1989). However, Banarescu and Nalbant (1973) suggested that *C. splendidus* is a gudgeon, and more recently Nam and Yang (1998) reported homologous osteological features of *C. splendidus* with gobionine species. Kim *et al.* (2012) also argued that *C. splendidus* is phylogenetically separate from the Leuciscinae and clusters with all gobionine species, a relationship with strong statistical support.

Based on patterns of endemism of freshwater fishes, Kim *et al*. (2005) divided the Korean Peninsula into three biogeographic regions (West, South, and Northeast Korea subdistricts). Vicariant barriers separating the three subdistricts include the Noryeong and Sobaek mountain ranges between the West and South Korea subdistricts, and the Taeback, Nangnim, Hamgyrong and Macheollyeong mountains between the West and Northeast Korea subdistricts. These geographic barriers have been hypothesized to have played a key role in allopatric speciation in the freshwater fish fauna of Korea (Song *et al.* 2010).

Inconsistent with this biogeographic separation is *Koreocobitis nakdongensis* and *K. rotundicaudata,* two species that inhabit only the Han River in the West Korea Subdistrict and only the Nakdong River in the South Korea Subdistrict, respectively. These species were separated taxonomically after recognizing differences in body coloration, shape of caudal fin, number of vertebrate, length of head, and biogeographical distribution (Kim *et al.* 2000). In addition, based on complete mitogenome sequences, Kim & Bang (2012) presented disjunct separation in the biogeography of species of *Koreocobitis* .

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