

Transfer of *Cobitis laterimaculata* to the Genus *Niwaella* (Cobitidae)

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Taxonomic review of *Cobitis laterimaculata* was carried out based on 17 specimens collected from the Caozejiang River, Huangzezhen, Shengxian county, Zhejiang province, China. The species shares several notable characters with *Niwaella* spp., including the posterior position of the dorsal fin, small head, color pattern without pigmentary zones of Gambetta, short and curved suborbital spine, short and subequal barbels, strong carina on caudal peduncle, and lack of a lamina circularis on the pectoral fin base in males. We conclude that *Cobitis laterimaculata* should be transferred from *Cobitis* to *Niwaella*.

Key words : *Niwaella laterimaculata*, Cobitidae, China, description

Introduction

The loaches of the subfamily Cobitinae are widely distributed in the Eurasia and North Africa, until now the subfamily comprises 16 genera and about 100 species (Nalbant, 1963, 1993, 1994). Seven genera of Cobitinae are described in China, that is, *Acanthopsis*, *Lepidocephalus*, *Cobitis*, *Acanthopsoides*, *Paralepidocephalus*, *Misgurnus* and *Paramisgurnus* (Zhu, 1995). *Cobitis laterimaculata* was described by Yan and Zheng (1984) but they did not explain on the morphological features such as the pigmentary zones of Gambetta, the lamina circularis and so on which were diagnostic characters of genus *Cobitis*.

This paper is based on the specimens collected by authors from the upper parts of Caozejiang River, Shengxian County, Zhejiang Province, China 1996. By analyzing morphological characters of these specimens, the authors tried to reveal whether *C. laterimaculata* belongs to the genus *Niwaella* or not.

Materials and Methods

Methods for obtaining measurements follow Hubbs and Lagler (1964). Measurements taken by dial caliper were presented as percentages of standard length or head length, which also were compared with that of original description of *Cobitis laterimaculata* (Yan and Zheng, 1984). Specimens were sexed by examination of gonad. Scales were prepared from the subdorsal region between dorsal fin and lateral line. Micrographs were taken using an Olympus SZH-ZB with PM-10AK Stereo Microscope System. Specimens examined for this study were collected from the river of Zhejiang province, China (Fig. 1) and deposited at the Department of Science Education, Seowon University, Chongju, Korea.

Results

1. The status of the specimens examined for this study

Examination data of these specimens agreed well with the original description of *Cobitis laterimaculata* (Table 1, Fig. 2). These materials

Table 1. Morphometrics of the type species (Yan and Zheng, 1984) and population of this study in *Niwaella laterimaculata*

	Yan et Zheng (n = 43)		This study (n = 17)	
	Mean	Range	Mean	Range
Standard length (mm)		41 ~ 63		52.0 ~ 72.4
In % of standard length				
Body depth	14.4	11.6 ~ 16.7	12.9	10.8 ~ 15.8
Head length	16.8	15.4 ~ 18.6	17.2	16.3 ~ 19.1
Caudal peduncle length	10.6	9.7 ~ 12.3	11.4	10.3 ~ 12.8
Predorsal length	56.0	53.0 ~ 59.0	54.4	52.4 ~ 56.9
Preventral length	–	–	56.7	54.9 ~ 58.2
In % of head length				
Snout length	45.3	38.5 ~ 47.6	42.7	40.1 ~ 44.7
Eye diameter	18.0	15.0 ~ 21.3	16.8	14.1 ~ 18.9
Interorbital length	17.9	15.0 ~ 20.3	15.9	13.3 ~ 17.7

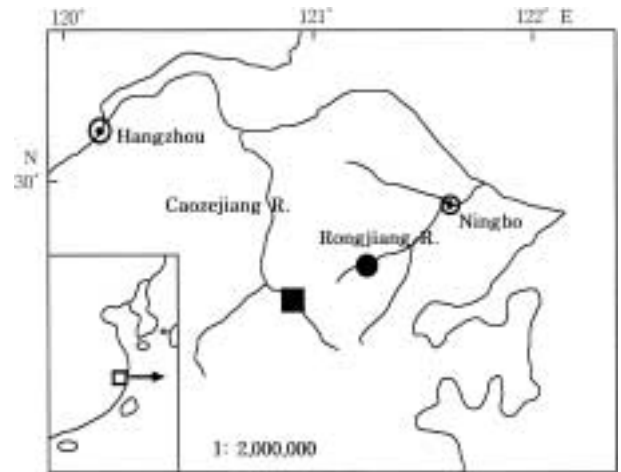


Fig. 1. Map showing the collecting localities of *Niwaella laterimaculata*.

- : type locality from Yan et Zheng (1984)
- : locality of this study

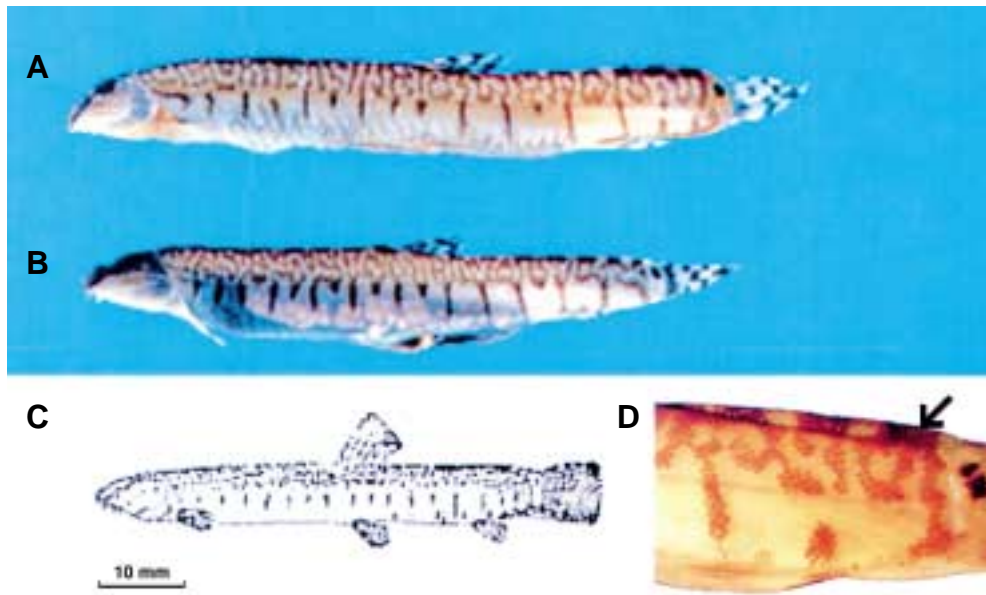


Fig. 2. *Niwaella laterimaculata*

- A : male, 66.5 mm SL, collected by authors, B : female, 51.2 mm SL, collected by authors
 C : figure of type specimen, from Yan et Zheng (1984), D : carina (↓) on caudal peduncle

also came from a close locality with the type locality of *C. laterimaculata* (Fig. 1). The size was smaller, the largest specimen collected in this study was 72.4 mm in standard length, and female was already sexually matured at a standard length of 51.2 mm, containing 176 matured eggs. By judging from this comparison of morphological features, this specimens were identifi-

ed as *C. laterimaculata* first.

2. Descriptions

Standard length and body proportions are given in Table 1. The morphometric features of this species: smaller size, 52.0 ~ 72.4 mm SL; smaller head length, 16.3 ~ 19.1% SL; slender body depth, 10.8 ~ 15.8% SL; short caudal peduncle length

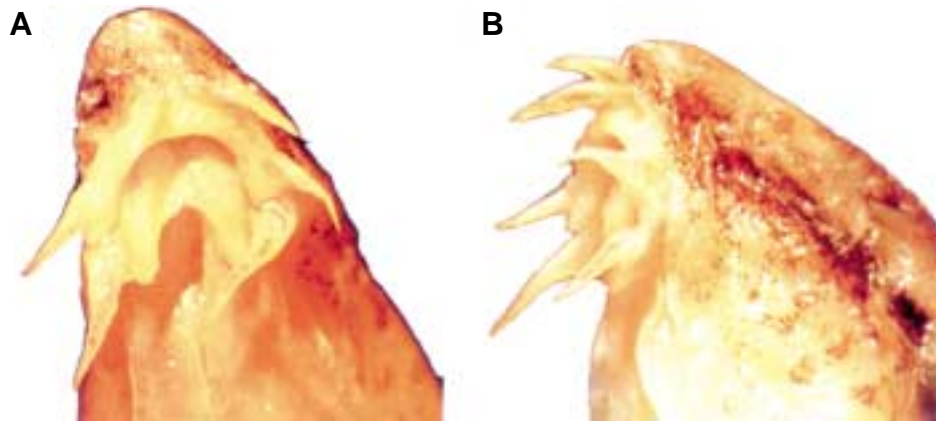


Fig. 3. Mouth part of *Niwaella laterimaculata*. A : Ventral view B : Lateral view

th, 10.3~12.8% SL; more posterior dorsal origin, 52.4~56.9% SL; narrower interorbital width, 13.3~17.7% HL.

Mouth small and inferior, upper lip continued by lower one without individuated mental lobes, numerous transversal wrinckles on the surface of lips, barbels relatively short and subequal, the maxillomandibular barbels not reach to front margin of eye (Fig. 3). Pectoral fin small and roundish, second ray of pectoral fin of male neither longer nor thicker than other rays, no lamina circularis at the base of the second ray of pectoral fin in male (Fig. 4). Body of suborbital spine relatively short and thick, laterocaudal process very short but mediocaudal process long and curved (Fig. 5). Scales small and slightly oval, with a large central focal area and 25~30 radial grooves but circular striae relatively scarce (Fig. 5). Strong carina on the upper and lower margin of caudal peduncle; carina on dorsal side extending anteriorly more than half of the distance between the end of dorsal fin and caudal fin base (Fig. 2D).

3. Color in formalin (Fig. 2)

Body pale yellowish; a series of 17~22 dark brownish thin vertical bars on body sides, longer vertical bar reaching to belly bottom; irregular brownish speckles on upper part of body sides; a conspicuous black spot on upper part of caudal base; a dark brown strip from tip of snout through eye to nape; no pigmentary zones of Gambetta.

4. Habitat and Distribution (Fig. 1)

This species has been collected from upper part

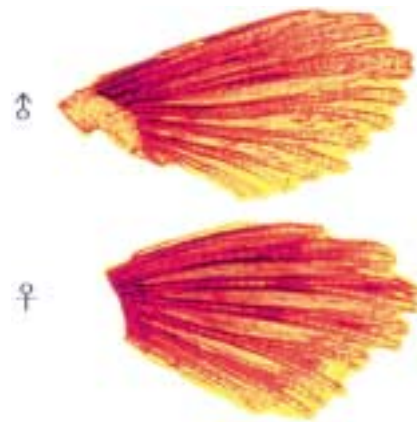


Fig. 4. Pectoral fin of *Niwaella laterimaculata*.

of the Caozejiang River with gravel and stone substratum, partially forming rapids. Previously the species was known only from the type locality, the upper reaches of the Yongjiang River at Xikou, Fenghua County, Zhejiang Province, China.

Discussion

A comparative study of six genera in the subfamily Cobitinae from China was carried out by Chen (1981), and then Zhu (1995) added one genus. So the subfamily Cobitinae from China became to consist of seven genera : *Acanthopsis*, *Lepidocephalus*, *Cobitis*, *Paralepidocephalus*, *Misgurnus*, *Paramisgunus* and *Acanthopsoides*.

The genus *Cobitis* is characterized by the marked sexual dimorphism, that is, long and thick second ray of pectoral fin with an osseous

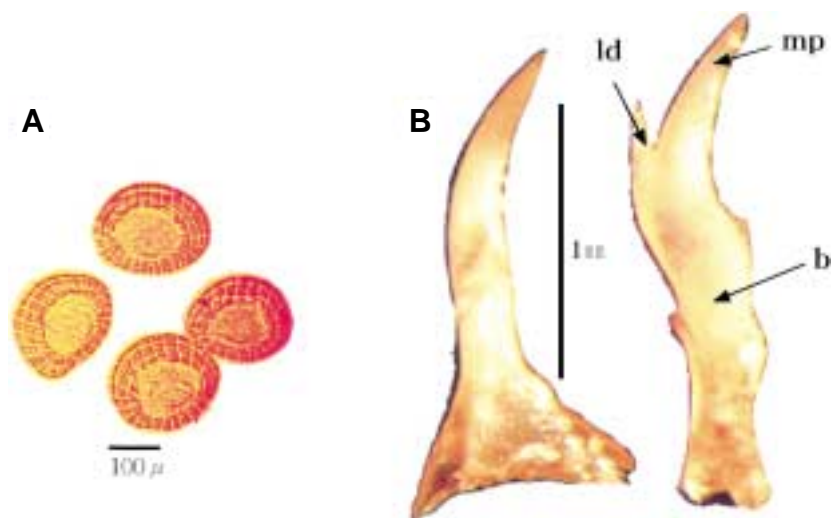


Fig. 5. Subdorsal scales and suborbital spine of *Niwaella laterimaculata*. A: Scales, B: Suborbital spine. Abbreviations are as follows: b: body, mp: mediocaudal process, ld: laterocaudal process.

lamina circularis on the base of fin, and the color pattern on the body side with four pigmentary zone of Gambetta. The genus *Niwaella* is similar to *Cobitis* in size and shape of body, number and position of barbels, presence of suborbital spine and size and shape of scale. However the notable morphological features of the genus *Niwaella* differentiated from *Cobitis* were small head, barbels relatively short and subequal, lower lip without individuated mental lobes, suborbital spine relatively thick and curved, dorsal fin situated on second half of body, a strong carina between dorsal and caudal, small oval scales with large central focal area and no sexual dimorphism. Nalbant (1963) erected a genus *Niwaella* based on the type species *Cobitis delicata* (Niwa, 1937) as the above reasons.

Till now the genus *Niwaella* comprised two species of *N. delicata* from Japan and *N. multifasciata* from Korea. Yan and Zheng (1984) described *N. laterimaculata* as a species of genus *Cobitis* without consideration on the sexual dimorphism, color pattern, suborbital spine and carina which are differentiating characters between *Cobitis* and *Niwaella*. The present species shares important characters with *Niwaella* spp., that is, posterior position of dorsal fin, small head, color pattern without Gambetta zones, lack of sexual dimorphism, strong carina and short and subequal barbels. Furthermore *Niwaella laterimaculata* closely resembles *Kichulchoia brevifasciata* from Korea (Kim and Lee, 1995;

Kim *et al.*, 1997; 1999) in its morphometric characters. But the former is easily distinguished from the latter by its color pattern of thin vertical bar, the reduced mental lobes and 5 branched rays in anal fin.

This genus is supposed to have penetrated the rivers of China, Korea and Japan through Paleo-Hwangho River System which was connected during Glacial era of the Quaternary period and then to differentiated each other (Fig. 6).

By judging from results above mentioned, the authors conclude that present species should be transferred from the genus *Cobitis* to the genus

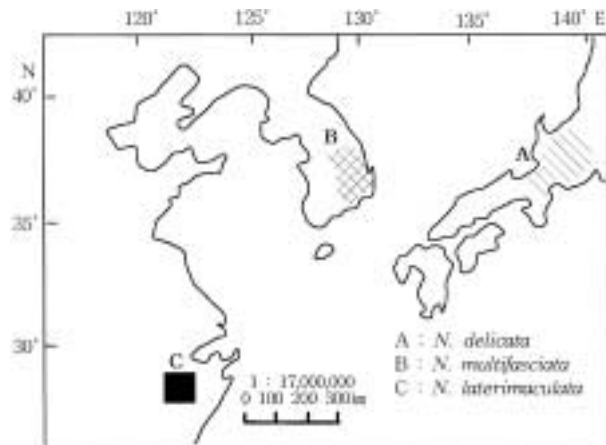


Fig. 6. The geographical distribution of the genus *Niwaella*.

Niwaella.

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*Cobitis laterimaculata*의 屬의 移動

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*Cobitis laterimaculata*는 Yan and Zheng (1984)에 의해서 *Cobitis* 屬의 一新種으로 記載되었으나 著者들은 1996年 本 種의 模式地와 매우 隣接한 浙江省의 曹娥江에서 採集한 標本을 對象으로 形態的 特徵을 調査한 結果, 本 集團은 口部, 胸鰭, 班紋, 眼下棘, 尾柄稜의 形態와 背鰭의 位置 등의 特徵으로 보아 *Niwaella*屬으로 歸屬시키는 것이 妥當하다고 判斷되었다.