

Redescription of *Cottus volki* (Scorpaeniformes: Cottidae), with remarks on its intraspecific variation and dispersal

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The sculpin *Cottus volki* from the mainland rivers emptying into the northwestern Sea of Japan is here redescribed and a lectotype is designated. The species is easily distinguished from the congeners by having palatine teeth; two rays articulated on first dorsal-fin pterygiophore; usually one chin pore; pectoral-fin rays unbranched; lateral line canal remarkably above body midline, with a bend on the caudal peduncle, interrupted under rays 11–18 of second dorsal fin, but with solitary segments reaching either the caudal fin base, or at least the caudal peduncle; internal ray of ventral fin 37–75 % of its longest (3rd) ray; and specific shape of prickles. Intraspecific variation caused by rivers geography, allometry, and sexual dimorphism has been described on the basis of extensive material collected from all over the range. The hypothetical dispersal of the species is discussed.

Introduction

Identification and classification of freshwater sculpins of the genus *Cottus* pose a significant challenge due to the high phenotypic similarity and high morphological plasticity (McAllister & Lindsey, 1961; Freyhof et al., 2005). Their relatively low mobility and preference for suitable habitats (Hendricks, 1997; Freyhof et al., 2005;) lead to partial or complete restriction of gene flow between populations from neighboring drainages. On the other hand, habitat similarity often leads to similar phenotypic responses within the same lineage (Dennenmoser et al., 2015) or across different *Cottus* lineages due to their common ancestry. Progress in understanding the biological diversity of freshwater sculpins can be achieved through

accumulation of data on the limits of variation in morphology and genetic markers of each form across the species' ranges.

A suitable object to examine the limits of intraspecific variation is the Volk's sculpin *Cottus volki* Taranetz, 1933, an East Asian representative of the *C. poecilopus* lineage, having a narrow range that cover the drainage basins from the Partizanskaya River to the Velikaya Kema River in the northwestern Sea of Japan mainland (Taranetz, 1936; Berg, 1949; Shedko & Miroshnichenko, 2007) (Fig. 1). Along with *Gymnogobius taranetzi* Pinchuk 1978 (Gobiidae), *Phoxinus oxyrhynchus* (Mori 1930) (Leuciscidae), *Gobio macrocephalus* Mori 1930 (Gobionidae), and *Cottus czerskii* Berg 1913, it constitutes the endemic freshwater ichthyofauna of the eastern slope of

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Sheiko greatly advised on nomenclatural issues. Eugeny Shvetsov proofread the text of the draft version of the manuscript. The author also thanks anonymous reviewers for valuable comments and suggestions to an earlier version of the manuscript.

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Received 1 July 2024
 Revised 24 November 2024
 Accepted 11 August 2025

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