



Is a suitable character the presence or absence of the posterior oculoscapular canal for distinguishing between *Knipowitschia caucasica* and *K. panizzae* species (Pisces, Gobiidae)?

Alkalmas-e a *Knipowitschia caucasica* és a *K. panizzae* faj (Pisces, Gobiidae) elkülönítésére a hátsó okuloszkapuláris csatorna megléte vagy hiánya?

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Abstract

The identification keys still differentiate between the species *Knipowitschia caucasica* and *K. panizzae* on the basis of the presence or absence of the posterior oculoscapular canal. Examining the preserved specimens of *K. panizzae* stored in the collection of the Museum of Natural History of Vienna, several variations were found in this trait. The canal was present in some specimens. In others, there was only a groove in its stead, and in one case, it appeared as a tube split lengthwise. There was also a specimen in which the canal was present in a regular form on one side and was absent on the other. Thus, this trait cannot be used for distinguishing between the species. An evolutionary process acting towards a total reduction of the posterior oculoscapular canal is probably taking place here.

Kivonat

A határozókulcsok a *Knipowitschia caucasica* és a *K. panizzae* fajokat még ma is a hátsó okuloszkapuláris csatorna megléte vagy hiánya alapján különböztetik el. A *K. panizzae* bécsi természettudományi múzeumban őrzött konzervált egyedeit vizsgálva többféle variációt találtunk. Egyes példányokon jelen volt ez a csatorna, másoknál csak egy árok volt a helyén, egy esetben pedig hosszában nyitott csőként jelent meg. Akadt azonban olyan példány is, amelynek egyik oldalán szabályos formában megvolt a csatorna, a másik oldalán ellenben hiányzott. Ez a bélyeg tehát a fajok elkülönítésére alkalmatlan. Feltehetőleg egy olyan evolúciós folyamatnak vagyunk tanúi, amely a hátsó okuloszkapuláris csatorna teljes redukciójának, eltűnésének irányába halad.

Introduction

Cephalic sensory canals of the lateral line system play an important part in the identification of gobiid species. For instance, identification keys (Miller 2004, Kottelat & Freyhof 2007) still consider the presence or absence of the posterior oculoscapular canal an important trait for distinguishing between *Knipowitschia caucasica* (Berg, 1916) and *Knipowitschia panizzae* (Verga, 1841), in spite of the fact that Ahnelt et al. (1995) found specimens of *Knipowitschia caucasica* in which this canal was absent. The same applies to Hungarian populations of the species (Halasi-Kovács et al. 2011, Halasi-Kovács et al. 2011, Harka et al. 2012), whose identity with *K. caucasica* was proven by genetic studies (Harka et al. 2013). For comparison, we also studied some specimens of *Knipowitschia panizzae* in the Natural History Museum of Vienna, the results of which are described in this paper.

Material and methods

Our study material consisted of 9 fish specimens from the fish collection of the Natural History Museum Vienna. The fishes of the lot NMW29805, registered as *Gobius panizzae*, were collected by Franz Steindachner in 1881 near Isola, a town lying on the Adriatic coast, in the Gulf of Trieste (today's Slovenian town of Izola). The alcohol-preserved fishes of the lot and their cephalic sensory canals were studied one by one under a stereoscopic microscope on 11 June 2013.

Results

In accordance with the identification keys, the posterior oculoscapular canal was actually missing in some of the studied specimens, there was only a furrow-like groove in its stead. The edges of these grooves were generally rounded, but there was a specimen where they slightly curved back toward the midline, forming a sharp edge. We also found a specimen in which the recurving edges met, resulting in a canal resembling a tube split lengthwise, as well as others where the canal was present as a regular tube opening on both ends with ρ_1 and ρ_2 pores (Fig. 1). In yet another specimen, it was peculiar that the posterior oculoscapular canal was absent on the left side of the head, while it was present in a regular form on the right side of the head.

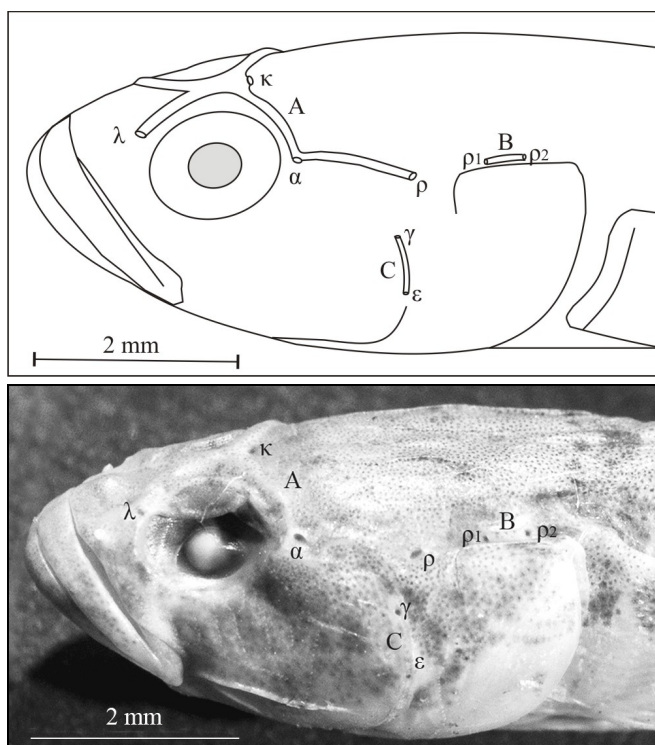


Fig. 1. Location of the cephalic sensory canals on a museum specimen of *Knipowitschia panizzae*:
 A - anterior oculoscapular canal, B - posterior oculoscapular canal, C - preopercular canal
 (drawing by Á. Harka, photo by B. Halasi-Kovács)

Discussion

Beside the earlier publications (Georghiev 1964, 1966, Miller 1972) some of the recent literatures consider that the presence or absence of the posterior oculoscapular canal is the

key or at least significant trait in the diagnosis at the *Knipowitschia* species. So the pontocaspic and aegean *K. caucasica* has, while mediterranean *K. panizzae* has not posterior oculoscapular canal. They consider similar situation at the ponto-caspic *K. longicaudata*, which also lack the posterior oculoscapular canal.

The cephalic lateral line system of *Knipowitschia* genus considered an intrapopulation trait based on extensive investigations by Economidis & Miller (1990), and Ahnet et al. (1995). The latter found that the variation and reduction prove the periodic isolation of the Aegean populations of the *K. caucasica* from the Myocene. About 50% variation were found in presence of the posterior oculoscapular canal in the *Knipowitschia* population at the Croatian coast of Adriatic-sea, what was identified as *K. caucasica* (Kovačić & Pallaoro 2003).

The study of museum specimens of *Knipowitschia panizzae* confirm the results of latest publications and authors' earlier finding (Harka et al. 2013) that the presence or absence of the posterior oculoscapular canal is a trait not suitable for distinguishing between *Knipowitschia* species. The intermediate forms of the canal (tube not fully closed on the surface, furrow with sharp edge) allow to conclude that evolution proceeds towards a gradual reduction of the canal.

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