TÜBİTAK

Turkish Journal of Zoology

http://journals.tubitak.gov.tr/zoology/

Short Communication

Turk J Zool
(2014) 38: 373-374
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doi:10.3906/zoo-1110-22

Rutilus panosi Bogutskaya & Iliadou, 2006 specimens lacking pelvic fins

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Received: 24.10.2011 • **Accepted:** 17.11.2013 • **Published Online:** 21.03.2014 • **Printed:** 18.04.2014

Abstract: Here we report the absence of pelvic fins in specimens of the threatened species *Rutilus panosi*, caught in the shallow eutrophic lakes Pamvotis and Lysimachia (western Greece). No other deformations were observed.

Key words: Fish deformations, freshwater fish, lack of pelvic fins, shallow lakes, Greece

Absence or abnormal development of pelvic fins in teleost species has been previously reported and attributed to congenital or postnatal malformations (Papern, 1978; Alvarez-León, 1980; Graham et al., 1986; Valente, 1988), as well as to chemical pollution (Slooff, 1982). Abnormalities in development or the entire absence of this pair of fins raise questions on further acquired functional changes in body morphology as a consequence of environmental adaptation (Graham et al., 1986). Pelvic fins are generally considered as maneuvering structures, while their hydrodynamic function has received little attention compared to the pectoral and median fins (Lauder and Drucker, 2004; Yamanoue et al., 2010).

One specimen of Trichonis roach *Rutilus panosi* Bogutskaya & Iliadou, 2006 (total length = 23.5 cm, weight = 156.3 g) lacking the pelvic fins was found in the shallow Lake Pamvotis (western Greece; mean depth 4.5 m) in September 2010 (Figure 1a). In addition, 4 specimens of the same species with the same abnormality (total length range = 8.9–16.3 cm, weight range = 6.29–40.16 g) were caught in Lake Lysimachia (western Greece; mean depth 3 m) in August 2011 (Figures 1b–1e). Eutrophication and urban, industrial, and agricultural pollution are considered to be the main human pressures impacting both lakes (Theochari and Papadopoulos, 1990; Petridis, 1993; Kagalou et al., 2003).

In order to ensure correct species identification, some meristic characteristics (scales of the lateral line, scales between the lateral line and the origin of the dorsal fin, gill rakers, pharyngeal teeth, branched anal and dorsal rays) were measured and compared to those given by Bogutskaya and Iliadou (2006). In addition, 11 morphometric characters were measured in the deformed specimens in order to determine if they were within the range of the mean ± 2 SDs calculated for normal specimens (41 from Pamvotis and 35 from Lysimachia) caught during the same samplings. All morphometric measurements were expressed as percentages of body standard length except eye diameter, which was expressed as a percentage of head length. In order to confirm the lack of the entire pelvic structure, the deformed specimen caught in Lake Pamvotis was X-rayed and compared with a normal specimen of the same standard length (Figure 2). All specimens used were preserved in formalin.

External examination of the area where the bases of the pelvic fins should be present (underneath the pectoral fins) revealed a normal scale covering (in form and size), indicating that the specimens never developed the specific structures. This was further confirmed by the X-ray analysis (Figure 2). The shadows of the pelvic fins and the basipterygia were clearly distinct in the normal specimen (Figure 2a). In contrast, no trace of the pelvic girdle and the total absence of the basipterygia were evident in the deformed specimen (Figure 2b). However, the pterygiophores of the dorsal and anal fins, the vertebrae, and the air bladder in the X-ray image appeared normally developed (Figure 2b).

The meristic characters were consistent with the species description (Bogutskaya and Iliadou, 2006). Only the eye diameter of the deformed specimen caught in Pamvotis was out of the range of the results for the normal specimens. However, since only 5 deformed specimens were caught and no genetic analysis was possible, it could be assumed that the observed deformations may have been an effect of a genetic mutation, or could be attributed to the degradation of the water quality of both lakes.

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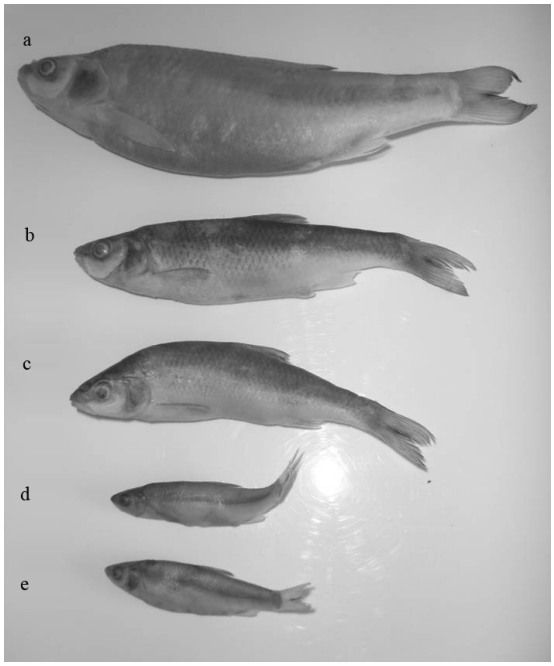

Figure 1. Fish specimens of *Rutilus panosi* lacking pelvic fins caught in Lake Pamvotis (a) and Lake Lysimachia (b–e), western Greece.

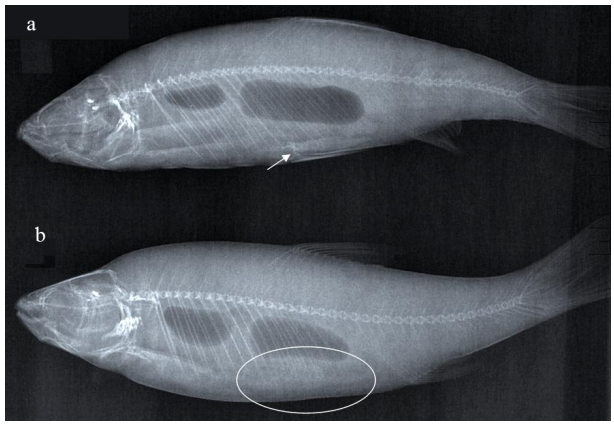

Figure 2. X-ray images of the a) normal specimen and b) deformed specimen of *Rutilus panosi*, Lake Pamvotis, September 2010, lacking pelvic fins. Shadow of the pelvic fins and the basipterygia in the normal specimen is indicated by an arrow, while the area with the lack of the entire structure in the deformed specimen is circled.

Rutilus panosi is an endemic species; it is considered threatened in its native range (western Greece) and it is protected under Habitat Directive 92/43/EC (Leonardos et al., 2008). It was introduced in Lake Pamvotis, where it established successfully and became abundant (Leonardos et al., 2008). This is the first report of a freshwater fish species from Greek inland waters that lacks pelvic fins. The specimens have been registered to the collection of the Laboratory of Ichthyology of Aristotle University of Thessaloniki, under the code numbers 2010–1 and 2011–2.

Acknowledgments

This research was co-financed by the European Union (European Social Fund) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework Research Funding Program Heracleitus II: Investing in knowledge society through the European Social Fund. We would like to thank Assoc Prof P Aggelidis, Faculty of Veterinary Medicine of Aristotle University of Thessaloniki, for his assistance in X-ray imaging.

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