



<http://dx.doi.org/10.11646/zootaxa.3700.1.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:0AD268EB-968F-4E14-A139-51B25AD45059>

The phylogenetic position of *Lepidopygopsis typus* (Teleostei: Cyprinidae), a monotypic freshwater fish endemic to the Western Ghats of India

NEELESH DAHANUKAR^{1,2}, SIBY PHILIP^{3,4}, K. KRISHNAKUMAR³,
ANVAR ALI³ & RAJEEV RAGHAVAN^{2,3,5}

¹Indian Institute of Science Education and Research (IISER), Pune, 411 021 India. E-mail: n.dahanukar@iiserpune.ac.in

²Zoo Outreach Organization (ZOO), 96, Kumudham Nagar, Villankurichi Road, Coimbatore 641 035, India.

³Conservation Research Group (CRG), St. Albert's College, Kochi 682 018, India. E-mail: kkaqua@gmail.com, anvaraliif@gmail.com

⁴CIMAR/CIIMAR, Centro Interdisciplinar de Investigação Marinha e Ambiental, Rua dos Bragas, Porto, Portugal.

E-mail: philipsiby@gmail.com

⁵Research Group Zoology: Biodiversity & Toxicology, Center for Environmental Sciences, University of Hasselt, Diepenbeek, 3590 Belgium. E-mail: rajeevraq@hotmail.com

Abstract

Lepidopygopsis, known as the peninsular-Indian hill trout, is a monotypic genus endemic to the Periyar stream-reservoir system, in the Western Ghats. Due to the morphological similarity of its only species, *L. typus*, with the Himalayan schizothoracine fishes, it was considered to be a relict species and a classic example of disjunct distribution. Using mitochondrial and nuclear gene sequence datasets, we show that *L. typus* is not allied to the schizothoracine fishes. Phylogenetic hypothesis-testing unequivocally supports a scenario in which *L. typus* and a clade comprising various genera of Asian and African barbins such as *Tor*, *Gonoproktopterus*, *Kosswigobarbus* and *Varicorhinus* are sister groups. Based on our results, we suggest that the sheath of tile-like scales covering the anal-fin base of schizothoracine fishes and *Lepidopygopsis typus* could be a symplesiomorphy or a homoplasy.

Key words: biogeography, convergence, disjunct distribution, Schizothoracinae, Western Ghats

Introduction

The river systems of the Western Ghats of peninsular India, part of a Global Biodiversity Hotspot (Myers *et al.* 2000) are home to several genera and species of freshwater fish known for their puzzling biogeographic relationships (Benziger *et al.* 2011; Britz *et al.* 2012a, b, c; Vincent 2012). Several endemic fishes of this region have their closest relatives in the Eastern Himalaya, Indo-Burma and the Sunda Islands, an affinity that forms the basis of an enduring evolutionary conundrum (Dahanukar *et al.* 2011). The Satpura hypothesis (Hora 1944, 1949) was the first to suggest that this apparent disjunct distribution was due to the Satpura hill ranges in peninsular India connecting the Malayan peninsula with the Western Ghats, thus creating a passage for species dispersal in the late Miocene to Pleistocene. Although the Satpura hypothesis did not survive (see Karanth 2003), the growing evidence from subsequent surveys, taxonomic revisions, and recent work on phylogeny (see Daniels 2001; Dahanukar *et al.* 2011) makes it obvious that our knowledge on the factors that influenced speciation and evolution of endemic freshwater fish lineages in the Western Ghats is still nascent. Several new discoveries of fish species with disjunct distributions (Arunachalam & Muralidharan 2008; Radhakrishnan *et al.* 2010; Britz *et al.* 2012a, b, c) have only increased our curiosity on the evolutionary biogeography of the peninsular-Indian ichthyofauna.

Lepidopygopsis, the peninsular hill trout, is a monotypic genus endemic to the Periyar stream-reservoir system in the southern Western Ghats (Raj 1941). It has hitherto been considered a schizothoracine fish, the only representative of this group found south of the Himalayan ranges (Raj 1941) and one of the most enigmatic freshwater fish species of the Indian subcontinent. The remarkable discontinuous distribution of 'sister groups' in the Himalayas and peninsular India baffled Raj (1941), who attributed it to Pleistocene glaciation (Medlicott &