



## Description of a new annual rivulid killifish genus from Venezuela

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### Abstract

We describe a new genus to accommodate the species originally described as *Rivulus stellifer* Thomerson & Turner, 1973, but currently referred to the genus *Rachovia* Myers, 1927. *Rachovia stellifer* has had a complicated taxonomic history and has, at various times since its description, been placed in and out of three genera: *Rivulus* Poey, 1860, *Pituna* Costa, 1989 and *Rachovia*. However, phylogenetic analyses using 3537 mitochondrial and nuclear characters, and 93 morphological characters indicate it is not a member of any of these genera, but place it as a deeply divergent sister species to the genus *Gnatholebias* Costa, 1998. In addition to molecular characters, it is distinguished from the genera *Rachovia* and *Gnatholebias* by 13 and 33 morphological character states, respectively.

**Key words:** Rivulidae, total evidence, phylogenetic analysis, taxonomic revision

### Introduction

In the last three decades, several phylogenetic hypotheses have been proposed for the fish order Cyprinodontiformes, as well as for its taxonomic subsets. Parenti (1981) presented the first cladistic analysis of the Cyprinodontiformes, including an analysis of phylogenetic relationships of the South American family Rivulidae. Nearly 10 years later Costa (1990a) published a phylogeny focusing solely on the family Rivulidae. Costa (1990a) used data similar to those of Parenti (1981), but came to a startlingly different phylogenetic hypothesis. Among the major points of disagreement between Costa's and Parenti's phylogenies is the taxonomic placement of *Rivulus stellifer* Thomerson & Turner, 1973. While Parenti (1981) retains this annual species in the genus *Rivulus* Poey, 1860 as originally described by Thomerson and Turner (1973), Costa (1990b) places this species into the genus *Pituna* Costa, 1989 based on a set of shared derived characters. The other member of the genus is *Pituna poranga* Costa, 1989 from the Cerrado region of the upper Araguaia River system of Brazil. Later, Costa (1998b) revises the genus *Pituna*, synonymizes *P. poranga* Costa, 1989 with the newly rediscovered *Rivulus compactus* Myers, 1927 which is transferred to the genus *Pituna* (*P. poranga* was subsequently removed from synonymy with *P. compacta* by Costa (2007)), and also removes *Pituna stellifer* from the genus *Pituna*, placing it back into the genus *Rivulus*, but suggesting that it might be related to the genera *Rachovia* Myers, 1927 and *Austrofundulus* Myers, 1932. A second major revision of the Rivulidae came with the publication of Costa's (1998a) work, where he transfers *R. stellifer* to the genus *Rachovia* based on a new set of shared derived characters.

Hrbek and Larson (1999) published a molecular phylogeny of the Rivulidae based on a 1972 nucleotide dataset of mitochondrial genes. In this study, *Rachovia stellifer* is found to be the sister species to *Gnatholebias zonatus* (Myers, 1935). *Rachovia maculipinnis* Radda, 1964, the other *Rachovia* species analyzed in Hrbek and Larson (1999) is strongly supported as the sister species of *Austrofundulus limnaeus* Schultz 1949.