



Abstract

# Complete Mitochondrial Genome of the Spanish Toothcarp, *Apricaphanius iberus* (Valenciennes, 1846) (Actinopterygii, Aphaniidae) and Its Phylogenetic Position within the Cyprinodontiformes Order <sup>†</sup>

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**Abstract:** The Spanish Toothcarp (*Apricaphanius iberus*) is a small fish species endemic to the eastern coast of the Iberian Peninsula. Its area of distribution includes a variety of salt and freshwater habitats that experience large fluctuations in temperature and salinity throughout the year. The Spanish Toothcarp belongs to the Cyprinodontiformes order and to the family Aphaniidae. It is currently considered “Endangered” (category IUCN: EN), i.e., facing a very high risk of extinction in the wild. The genetics of *A. iberus* are not well known since most studies have only evaluated the genetic structure of the species under a conservation framework in order to identify its potential conservation units. In this study, the whole mitochondrial genome of *A. iberus* was obtained for the first time in the context of an *A. iberus* genome reference sequencing. The mitogenome was reconstructed and aligned against 83 other cyprinodontiformes and two outgroup taxa. From this, a phylogenetic reconstruction was created using PartitionFinder to test the best evolutionary model for both the 13 protein coding genes and two non-coding ribosomal genes. Following this, a phylogenetics analysis was conducted using two methods: Maximum-Likelihood approximation (IQTree) including bootstrap branching support and Bayesian inference (MrBayes) applying the partitions models obtained. By doing so, it was possible to find the molecular position of *A. iberus* within the Cyprinodontiformes order. The results showed *A. iberus* grouped together with *Orestias ascotensis* and both species formed a sister group with North American and Caribbean cyprinodontiformes. These new data will be valuable for a better understanding of the evolution of *A. iberus* and will be highly useful for future genetic studies.

**Keywords:** mitogenome; *Apricaphanius iberus*; cyprinodontiformes; phylogeny



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