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Taxonomy and systematics of the herichthyins (Cichlidae: Tribe Heroini), with the description of eight new Middle American Genera

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Abstract

In recent years great strides have been made for improving our understanding of the evolutionary relationships among neotropical cichlids, particularly within the clade Heroini and its crown clade the herichthyins. Most phylogenetic studies have largely converged on congruent topologies for relationships among species and major lineages within the herichthyins. One major aspect missing from previous studies of these cichlids is a formal taxonomic revision, including the redefining of genera. Based on analysis of 52 species and three mitochondrial and two nuclear loci, we generate a Bayesian phylogeny for the herichthyin cichlids, and formally revise the taxonomy for genera within this clade using morphological features. Eight new genera are recognized and a key to all 16 genera of herichthyin cichlids is also presented.

Key words: cichlid, revision, Mexico, Central America, morphology

Resumen

Grandes pasos se han dado en años recientes en la mejora de nuestro conocimiento de las relaciones evolutivas entre ciclidos Neotropicales, particularmente dentro del clado Heroini. En el clado corona de Heroini están los herichthyins. Los estudios filogenéticos más recientes, han coincidido ampliamente con topologías congruentes para definir las relaciones entre especies y linajes mayores en este clado. La falta de una revisión taxonómica formal de estos ciclidos, es un gran vacío que han dejado estudios anteriores, incluyendo la redefinición de géneros. Basados en un muestreo taxonómico completo y un set de datos molecular casi-completo, nosotros generamos una filogenia para el grupo de ciclidos conocido como los herichthyins, y revisamos formalmente la taxonomía de cada género en este clado usando caracteres morfológicos. Una clave para los 16 géneros de ciclidos herichthyinos es también presentada.

Introduction

Progressive strides have been made in recent years to understand the evolutionary relationships among neotropical cichlids (López-Fernández *et al.* 2010; Říčan *et al.* 2013; Matamoros *et al.* 2015). This is particularly true for the tribe Heroini (subfamily Cichlinae), the second most diverse clade of neotropical cichlids (De la Maza-Benignos *et al.* 2014) that makes up the vast majority of cichlids in Middle America (Mexico, Central America, and the Greater Antilles). Numerous studies, regardless of differences in sampling of genetic markers or slight differences in taxonomic sampling, have recovered largely congruent relationships across some portions of the heroin tree.

The clade of herichthyins (*sensu* Říčan *et al.* 2013) includes some 45 species of heroin cichlids, many of which