PHYLOGENOMICS AND EVOLUTIONARY UNITS DELIMITATION OF THE CONTINENTAL WIDESPREAD GENUS *HOPLIAS* (CHARACIFORMES, ERYTHRINIDAE)

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ABSTRACT

Hoplias is a genus of Neotropical predatory freshwater fishes that lives in lentic and lotic habitats in most drainages of Central and South America, from Costa Rica to northern Argentina. Currently, 13 species are recognized as valid. However, several mitochondrial lineages have been proposed as potentially undescribed species and the taxonomy and systematics of the group still require further investigation. Here, we integrate DNA barcode sequences, a phylogenomic dataset of ultraconserved elements (UCEs), and wide coverage of populations throughout the broad geographic distribution to investigate the evolutionary history and to assess the species diversity of *Hoplias*. Our results partially support the recognition, as monophyletic clades, of the traditional species groups based on morphology (*H. lacerdae*, *H. aimara*, and *H. malabaricus* groups), suggest several potentially undescribed species in both regions west and east of the Andes Cordillera, and support the reassessment of the geographic ranges of some species. *Hoplias malabaricus* sensu stricto is redefined as having a distribution restricted to the region east of the Andes. It is found in most of the major basins within this area, including the Amazon, Orinoco, Paraná, São Francisco, and Atlantic coastal drainages of Guianas and Brazil. Furthermore, comparisons across our different datasets underscore the need for caution with descriptions of new species within the *H. malabaricus* group distributed east of the Andes, particularly when a single mitochondrial marker (COI) is the only molecular evidence and diagnostic morphological characters overlap. Despite recent efforts in the

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taxonomy of the group, our results indicate an underestimated species diversity and offer important guidelines for integrating the taxonomy and evolutionary history of *Hoplias.*

Keywords: Andes, Neotropical freshwater fishes, Ostariophysi, ultraconserved elements.