

## **Phylogenetic position and molecular delimitation of an undescribed species of *Characidium* (Crenuchidae, Characiformes) from coastal streams of Espírito Santo and Bahia, Brazil**

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*Characidium* comprises a diverse Crenuchidae genus with eighteen species described along coastal drainages in eastern Brazilian rivers. Among these, seven species are known from the northeastern Mata Atlântica: *Characidium bahiense*, *C. bimaculatum*, *C. clistenesi*, *C. deludens*, *C. helmeri*, *C. samurai*, and *C. timbuiense*. Although recent studies were dedicated to species diversity of northeastern coastal rivers, several areas are still in need of further investigation. An undescribed species of *Characidium* was previously reported from coastal streams extending between the Jucuruçu drainage in southern Bahia and the Itapemirim drainage in southern Espírito Santo. It belongs to a diverse clade of species with a naked area in the isthmus. A diagnosis of the species among other members of this group, however, has proven elusive, as most external characters are plesiomorphic and widespread among congeners, and fin pigmentation is ontogenetically variable, with caudal bars only visible in some large specimens (>32 mm SL). In order to investigate the limits of the species and its phylogenetic position, DNA sequences of the COI gene were produced using standard barcoding methods and high-throughput Sanger sequencing. The resulting sequence is more than 4% divergent in relation to the closest relative, which is well beyond the 2% level of divergence usually accepted as evidence of reproductive isolation among species. A phylogenetic analysis using maximum likelihood methods corroborated the hypothesis of membership on the diverse clade of species with a naked isthmus. Within this group the species is included within the monophyletic clade that also comprises *C. alipioi* and at least two additional cryptic species from the Paraíba do Sul drainage. The pigmentation pattern of the caudal fin in large specimens and the large distance (when compared with specimens of the *C. grajahuense* group) between the anal pore and the anal fin is consistent with the hypothesis of a close relationship with *C. alipioi*. The plesiomorphic pattern of pigmentation (similar to that prevailing in the *C. zebra* species complex), however, stands out among members of the clade of coastal species with a naked isthmus. The ontogenetically delayed appearance of the dark bars in the caudal fin suggests that the lighter pigmentation of the body may be a

paedomorphic process, possibly correlated with the occurrence of the species in areas of low altitude, such as the tableland areas of southern Bahia.

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