INTRODUCTION: While parasites often speciate faster than their hosts, African freshwater lates perches (Latidae) host only a single monogenean gill parasite, Dolicirroplectanum lacustre. This species shows limited diversification across various habitats. In contrast, marine and brackish latids in the Indo-Pacific region host a more species-rich assemblage of gill parasites. The introduction of Nile perch (Lates niloticus), an invasive species transported from lakes Albert and Turkana to the Lake Victoria basin, presents an opportunity to study the parasite's genetic and morphological diversification.

MATERIALS AND METHODS: To understand the diversity patterns in D. lacustre, we studied its populations across multiple sites, including Lake Albert, Lake Victoria, Lake Turkana, and the Congo River. Morphological and genetic analyses were conducted to explore genetic differentiation within the species.

RESULTS: Our analysis revealed two morphotypes within D. lacustre, with one restricted to Lake Albert displaying a distinct mitochondrial haplotype. Despite this mitochondrial divergence, nuclear gene markers confirmed conspecificity. Only one of the two morphotypes was found in Lake Victoria, where D. lacustre showed reduced genetic and morphological diversity. The screening of host gills in Lake Turkana and the Congo River has expanded the known range of D. lacustre.

CONCLUSION: Despite occupying diverse freshwater habitats across Africa, D. lacustre remains a single, morphologically constrained species with minimal diversification. The co-introduction to new environments has reduced the parasite's diversity through founder effects. Overall, diversification within D. lacustre has been limited to morphotype differentiation rather than full speciation. Further examination of populations from Lake Turkana and the Congo River will give us more insight into its diversification and that of its hosts, and comparative genomics will shed light on the genomic mechanisms behind the observed lack of speciation. Altogether, this study may highlight how the stability of aquatic environments may limit diversification potential in host-parasite systems.