

2023-06-12

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Springer Berlin Heidelberg

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## Mitochondrial DNA revealed a single stock structure of the Spotted sardinella *Amblygaster sirm* (Walbaum, 1792) (Teleostei; Clupeidae) in Tanzanian coastal waters

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### **Abstract**

The Spotted sardinella *Amblygaster sirm* are small pelagic fish that are important protein source to coastal communities in the Indo-West Pacific. In this study, a cytochrome c oxidase subunit 1 (COI) gene of *A. sirm* from Tanzania was amplified to assess the species' genetic structure and demographic history. All individuals collected were identified using both morphological examination and genetic barcoding as *A. sirm*. A total of 19 haplotypes were found in the dataset, with low overall nucleotide ( $\pi = 0.13 \pm 0.001$ ) and moderate haplotype diversities ( $h = 0.45 \pm 0.07$ ). AMOVA revealed a very low and non-significant genetic differentiation in the dataset ( $F_{st} = 0.002$ ,  $\Phi_{st} = -0.004$ ,  $p > 0.05$ ), indicating a lack of population structure. The minimum spanning haplotype network revealed additional evidence for the lack of population structure, which grouped all the sampled haplotypes into one cluster, regardless of their geographical regions. The Tajima's D, Fu's  $F_s$  tests, and mismatch distribution analyses supported a hypothesis of recent demographic expansion. The lack of population structure identified suggests that the fishery should be treated as a single-stock management unit, consistent with the existing management regime for the species in Mainland Tanzania that currently does not consider genetic structure in managing the fishery. The lack of population structure suggests that populations with low genetic diversity, such as Dar es Salaam, can rebuild by recruiting from other sites if regulations against unsustainable fishing are strictly enforced.