Protecting tanzania's marine giants: the power of dna barcoding for species identification

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Protecting Tanzania's Marine Giants: The Power of DNA Barcoding for species Identification
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Elasmobranchs (sharks and rays) are crucial for maintaining balance in marine ecosystems as top predators. Despite their ecological importance, they are among the most threatened marine vertebrates globally, with nearly 37 % of species at risk of extinction. This is due to factors like bycatch, overfishing, and shark finning. Their population size remains underestimated to this day, a situation also true for Tanzania, due to limited data. For example, while around 200 species of sharks are recorded in the East African region, only a small fraction has been genetically barcoded. For instance, a study published in June 2023 only identified 23 different elasmobranch species in Tanzanian fish markets, leaving many species and potential cryptic ones unstudied. Certain groups such as the great hammerhead (*Sphyrna mokarran*), oceanic whitetip shark (*Carcharhinus longimanus*), and pelagic thresher (*Alopias pelagicus*) which are protected under Tanzanian law, face increasing threats and require urgent research focus.

Identifying species in Tanzanian fish markets is particularly challenging because specimens are often processed into fins, fillets, or other fragmented forms, making morphological identification unreliable. To address these challenges, DNA barcoding has proven to be a powerful tool for species identification. By amplifying a standard mitochondrial DNA region, such as CO1, barcoding allows for reliable species identification even in processed specimens. DNA sequences generated from samples are compared to global reference libraries, such as the Barcode of Life Database (BOLD) or GenBank, to match species accurately.

This study aims to collect tissue samples from sharks and rays in fish markets along the Tanzanian coast. Samples will undergo DNA extraction and sequencing to generate genetic data, while photographs will be used to complement morphological analysis. This study mainly aims to provide new data on the elasmobranch species present in the region, assist in species delineation, and potentially uncover cryptic or previously undocumented species.

Ultimately, the findings from this research might contribute to a better understanding of elasmobranch biodiversity in Tanzania and potentially lead towards sustainable conservation of these ecologically important but threatened species.

Keywords
Elasmobranch; DNA Barcoding; Tanzania; Species Identification; Species Delineation; Data