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Exploring Gastropod Diversity in Mangrove Habitats of the Maldives: Implications for Conservation and Management

The Maldives is widely recognised for its exceptional coral reefs, which have attracted substantial public and scientific interest. However, there remains a noticeable gap in scientific research focusing on other equally critical marine ecosystems, particularly mangrove forests. Mangrove forests of the archipelago are vital ecosystems that provide numerous ecological services and support high biodiversity. Within the diverse fauna inhabiting mangrove ecosystems, gastropods play a vital role in mangroves by maintaining ecosystem functions, such as nutrient cycling, supporting biodiversity, and providing food and habitat for other organisms. In this study, we conducted an investigation into gastropod diversity in Addu Atoll, with a specific focus on two islands known to harbor mangrove forests, namely Hithadhoo and Hulhumeedhoo.

Gastropods were collected using both handpicking and sediment coring methods from the selected sites. Samples were processed by sorting and identifying specimens to the family level. Identification was conducted following taxonomical descriptions found in the literature. During specimen identification, detailed morphological characteristics were recorded, including shell shape, size, coloration, and any distinctive features.

A total of 160 gastropods specimens were collected from Hithadhoo and Hulhumeedhoo and preliminary taxonomical analyses revealed representatives from six main families: Littorinidae, Neritidae, Volutidae, Epitoniidae, Turritellidae, Cerithiidae, Potamididae. Within these families, we identified species exclusively associated with mangroves, such as the mangrove periwinkle (*Littoraria sp.*) and mangrove whelk (*Terabalis sp.*). Additionally, our analysis indicates site-specific differences in the distribution of gastropod families. Environmental variables, such as sediment characteristics, salinity, and temperature, are likely drivers of the site-specific differences observed in the distribution of gastropod families within the mangrove habitats. These factors influence habitat suitability and resource availability, shaping the composition and abundance of gastropod communities in different areas of the Addu Atoll.

These findings underscore the significance of mangrove habitats as unique ecosystems supporting specialised biodiversity. Species such as the mangrove periwinkle and mangrove whelk serve as vital indicators of mangrove health and ecosystem integrity, suggesting favourable conditions for colonisation and reproduction and reflecting the overall ecological balance. This study provides crucial baseline data on the diversity and distribution of gastropods within the mangrove forests of the Maldives archipelago. Ongoing efforts, including DNA analysis, aim to further enhance species-level identification. Understanding the diversity and distribution patterns of gastropods within these unique habitats is essential for comprehending the ecological dynamics and ensuring the effective conservation and management of mangrove habitats.