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Assessment of Mangrove Snail Diversity in Mangrove Ecosystems; A Case Study in Kandakuliya, Sri Lanka

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Abstract

Mangrove ecosystems play a crucial role in sustaining mangrove-associated snails by providing essential functions such as breeding habitats, nurseries, food sources, and protection from predators. They are also vital for nutrient cycling within mangrove ecosystems. Despite their importance, there has been limited research on mangrove snail diversity in Sri Lanka. Therefore, this study aimed to evaluate the diversity of snail species in the mangrove ecosystems along the western coast of Kandakuliya, Kalpitiya, Sri Lanka. A purposive sampling method was employed at five selected sites, with sampling conducted during low tide in the daytime across the dry (February) and wet (September) seasons of 2023. At each site, 30 m transects were laid out, with six 1 m² quadrats placed at 5 m intervals along the transect as replicates and soil samples within 10 cm depth were collected to observe the snail species. The study identified six snail species from three families, with *Pirenella cingulata* being the most widely distributed and abundant, particularly at site 3 followed by *Telescopium telescopium* and *Terebralia palustris*. The total abundance of *Pirenella cingulata* reached 85,840 individuals in m². *Pirenella cingulata* also showed the highest number of individuals in both wet and dry seasons. Diversity indices showed that site 1 had the highest Shannon-Wiener index ($H' = 1.14$), site 5 showed the highest Pielou's evenness index ($J = 0.96$), and site 1 had the highest Simpson's diversity index ($D = 0.67$). These variations in findings could be linked to water quality factors like temperature and dissolved oxygen, mangrove dominance and local climate conditions. The study suggests that incorporating environmental parameters could provide a more thorough understanding of how environmental variables affect the distribution of mangrove snail populations.

Keywords: Bioindicators, Mangrove-associated snails, *Pirenella cingulata*, Snail population, Western coast of Kandakuliya