

## Vegetation succession in the mangroves of Unawatuna, Galle, Sri Lanka: comparison of current and historic vegetation structure and stratification

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Galle-Unawatuna is a dynamic mangrove ecosystem in Sri Lanka that is under threat from both natural and sustained anthropogenic factors[1]. This ecosystem is well-known for its socio-economic and ecological significance in providing ecosystem processes, functions, goods, and services[3]. Long-term monitoring is thus necessary to assess the pattern of species succession and to understand underlying factors.

A pioneering study predicted that *Bruguiera gymnorrhiza* (L.) would eventually dominate the mangrove forest's surface cover[1]. A follow-up study revealed that the dominant layer of young species and went on to predict that a decade later, *B. gymnorrhiza* would supplant other species and dominate the mangrove adult forest[2]. This decade later is "now" and the main objective of this study is to therefore test these predictions made ten years ago in Galle-Unawatuna mangrove forest. Thus, the current comparative research is designed to: 1) assess the structure and stratification of mangrove species composition, 2) investigate the potential link between vegetation composition and selected environmental factors.

The ground truth survey will use a plot-based method to revisit historical transects and collect vegetation structural parameters from a total of 120 plots. Within each 10 × 10 m<sup>2</sup> plot along the transects, we will identify species, count individuals, and measure tree height and diameter ( $D_{130}$ ) for both young and adult trees. Within each main plot, we will set up a 5 × 5 m<sup>2</sup> subplot to determine the percentage cover of juvenile species. In addition, within each main plot, we will record topography/water level, crab borrowing diameter, and snail density in 1 m<sup>2</sup> subplots. Finally within a 20 × 50 m<sup>2</sup> section of the forest a detailed triangulation of all trees will be done in an area that was already investigated about 20 years ago to document vegetation dynamics on tree level. Therefore, we will gain an understanding of the current complexity, succession, and stratification of the forest by calculating stem density, basal area, frequency, and their relative values, as well as the importance value and complexity index. We will use non-metric multidimensional scaling (NMDS) to identify the link between species composition in different locations and the relationship of species with selected environmental variables. Understanding species composition, shifts in distribution, structure, and stratification is critical for the scientific management of dynamic mangrove.

### References

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