

Microclimatic Buffering Potential of Forest Types in the Wasgamuwa National Park, Sri Lanka

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The habitat-wise differences in microclimatic conditions have the ability to create heterogeneous landscapes by generating different potential buffering capacities. The objective of this study was to evaluate the microclimatic buffering potential across habitat types in a mosaic dry zone landscape in Sri Lanka. The Vapour Pressure Deficit (VPD) values which have been previously used in studies conducted elsewhere in the world, were used as a suitable indicator. The study was conducted in three forest types including Dry-Mixed Evergreen Forests (DMEF), Riverine Forests (RVF), and Scrub Forests (SCF) in the Wasgamuwa National Park from September 2021 and March 2022. The Grasslands (GR) closest to each sampling station were used as reference sites. Forty-five sampling stations were randomly picked RVF(n=8), DMEF(n=15), SCF(n=11), and GR(n=11) and ambient temperature (T) and relative humidity (RH) were recorded at ground level and at 2 m, using specially constructed sensors and data loggers (NodeMCU sensor node and DHT22 digital temperature and humidity sensor) that recorded data every 30 minutes for 24 hours. The study revealed that the highest VPD was in GR (1.05-1.08) and the lowest in RVF (0.51-0.55), at both height levels. All three forest habitats were moister than the GR. The magnitude of the buffering capacity decreased in the order of RVF>DMEF>SCF. This study generated novel information on the microclimatic buffering capacities of Sri Lankan forests, which highlights the need to protect these ecosystems because local-scale microclimatic conditions in forest understories play a key role in shaping the composition, diversity, and function of the ecosystems.

Keywords: *dry zone forest, microclimatic buffering potential, vapor pressure deficit, Sri Lanka*