

**EFFECTS OF CLIMATIC VARIATION ON EPIPHYTIC CRYPTOGRAMIC DIVERSITY IN THE KOTTAWA RAINFOREST, SRI LANKA**

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Cryptogams offer early warning signals to identify climate change mitigation and adaptation strategies. Studying the responses of epiphytic cryptogams to changing environmental conditions is pivotal for conserving biodiversity. The Kottawa Rainforest in Sri Lanka hosts a rich diversity of epiphytic cryptogams, including fungi, lichens, bryophytes (mosses, liverworts, hornworts) and pteridophytes (ferns and fern allies). The present study investigated the impact of temperature, precipitation and humidity on the diversity of these organisms. Nine permanent sampling plots (10 m × 10 m) were randomly established in the Kottawa Rainforest. The presence and coverage of epiphytic cryptogams (fungi, lichens, bryophytes, and ferns) on the bark of each tree, from the base to Diameter at Breast Height (DBH), were determined using a transparent grid quadrat (20 cm × 20 cm). Sampling was conducted once a month from January to December 2023. Climatic factors, including precipitation, humidity and temperature, were recorded throughout the year. Specimens of epiphytic cryptogams in the study plots were collected and observed using a stereo microscope and identified to the species level using taxonomic keys. Pearson correlation coefficients and multiple regression analysis were conducted to assess the correlation between temperature, precipitation, humidity, and species diversity. The analysis revealed a significant negative correlation between temperature and species diversity ( $r = -0.92$ ,  $p < 0.05$ ), indicating higher temperatures are associated with lower cryptogam diversity. Conversely, precipitation positively correlated with species diversity ( $r = 0.35$ ,  $p < 0.05$ ), suggesting that increased precipitation supports greater cryptogam diversity. There was no significant correlation between humidity and species diversity ( $r = 0.42$ ,  $p > 0.05$ ). These findings indicate the sensitivity of cryptogam diversity to climatic variations, particularly temperature and precipitation. Therefore, conservation efforts are crucial to safeguard the biodiversity of epiphytic cryptogams in the face of ongoing climatic changes.

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