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A Comparative Morphological Study of *Loxococcus rupicola* (Thwaites) H.Wendl. & Drude and Related Two Taxa: *Oncosperma fasciculatum* Thwaites and *Areca concinna* Thwaites in Sri Lanka

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Abstract

Loxococcus rupicola (Thwaites) H.Wendl. & Drude is an endemic, monotypic palm in the family Arecaceae. It is mainly confined in forests of Southwestern and Central parts of Sri Lanka between 300 and 1,500 m in small populations on cliffs and rocks. The holotype of *L. rupicola* remains undesignated by its original author. There is a taxonomic uncertainty of identifying those morphological variants in the wild due to the morphological confusion between *L. rupicola* and other related taxa; *Areca concinna* and *Oncosperma fasciculatum*, due to shared morphological characteristics. Hence, this genus needs to be studied in detail for typification problems, together with the morphological variations of its varieties. The present study focused on reviewing protologues and other available taxonomic literature to identify key morphological characters to delimit the taxonomic boundaries of *L. rupicola* and related taxa. This research was carried out as an herbarium-based comparative morphological study, considering 51 morphological characters. Based on the morphological data captured from herbarium specimens housed at the National Herbarium, Peradeniya (PDA), a Multiple Correspondence Analysis (MCA) was performed. The results of the analysis showed three taxa seem to be clearly differentiated into three morphological clusters. By applying MCA only on the observations of *Loxococcus rupicola*, it does not seem to be fit into clear groups and therefore, cannot comment on the variabilities observed, especially in their inflorescence during the morphological study. The type localities and geographical distribution of three species were plotted in maps using ArcGIS by extracting locality data from herbarium specimens to identify their hotspots. Locating the geographic distributions of *L. rupicola* will help with future *in situ* conservation and management approaches and species distribution modelling. The relationships found in the morphometric study of herbarium specimens provide insights to the phylogeny of endemic *Loxococcus* species in Sri Lanka. A lectotype for *L. rupicola* could not be defined because the original collections were not coming from a single gathering. Hence, selecting a suitable lectotype for the taxon, considering historical literature, is also important from a nomenclatural standpoint. The results reveal the importance of combined multidisciplinary data analysis along with the molecular study for the genus *Loxococcus*.

Keywords: Endemic, Herbarium, Lectotypification, Morphological characters, Type material