(21)

Habitat Prediction Modelling Towards Conservation of *Lagenandra lancifolia* (Schott) Thw.

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Abstract

Genus *Lagenandra* (family Araceae), with 19 species recorded in the world, is restricted to Sri Lanka, India and Bangladesh. Sri Lanka comprises of 11 species where ten are endemic to the island. *Lagenandra lancifolia* (Schott) Thw., is an endemic and an endangered species which is exported as an ornamental aquatic plant and this has posed a threat to its natural populations. Plants are confined to the Wet Zone of the country and according to the last revision of the Flora in 1987, it has been recorded only from the Ambagamuwa area in Nuwara Eliya District, Rathnapura District near Kuruwita, and in another unknown location. Hence, the objective of the present study was to identify potential areas of occurrence or suitable habitats using species distribution modeling and explore those areas to validate the model. Extensive field visits were conducted in the Wet Zone exploring new locations in addition to the recorded, and GPS locations of the identified populations were logged. To determine potential areas of occupancy, we modeled the realized niche of *L. lancifolia* using the maximum-entropy (Maxent) technique, implemented in the software Maxent. We used a compiled list of occurrence localities (n=11) of *L. lancifolia* and environmental variable layers (bio 2, bio 3, bio 4, bio 5, bio 7, bio 9, bio 12, bio 15, bio 16 and bio 19 and elevation) as input data in Maxent. Twenty-five percent of the data points were used for model testing with 10,000 background points (default) and 5,000 iterations for the model building purpose. Output map was processed and interpreted using ArcMap 10.4 software. The new locations recorded during field excursions were in the Makandawa Forest Reserve and Guruluwana close to Siripagama. The resulting model identified the most possible area of occurrence (75-100) covering an extent of about 340.64 km^2 which is concentrated in Rathnapura and Kegalle Districts that included a part of the Peak-Wilderness Sanctuary, and few other fragmented forests. Based on the information revealed, several field excursions were carried out to the forests/suitable habitats that encompassed the possible areas predicted by the model. These excursions resulted in recovering six new locations; one within the highest probable range (75-100) in Kanegalla, Siripagama and Udamaliboda; two within the next probable range (50-75) in Rathganga and way to Raththurugala and one in the following probable range (25-50) in the border of the Gilimale forest reserve validating the prediction of the model. Therefore, further exploration could reveal more populations while in-situ conservation within the protected areas that fall within the suitable range could be initiated in the view of uplifting the number of healthy populations of this endangered species and restoring any degraded habitats.

Keywords: Conservation, Endangered species, Species distribution model, Biodiversity

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27