Efficacy of Conservation Strategies for Endangered Garcinia gummi gutta under Climate Change in Western Ghats

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Abstract : Climate change is continuously affecting the ecosystem, species distribution as well as global biodiversity. The assessment of the species potential distribution and the spatial changes under various climate change scenarios is a significant step towards the conservation and mitigation of habitat shifts, and species' loss and vulnerability. In this context, the present study aimed to predict the influence of current and future climate on an ecologically vulnerable medicinal species, Garcinia gummi-gutta, of the southern Western Ghats using Maximum Entropy (MaxEnt) modeling. The future projections were made for the period of 2050 and 2070 with RCP (Representative Concentration Pathways) scenario of 4.5 and 8.5 using 84 species occurrence data, and climatic variables from three different models of Intergovernmental Panel for Climate Change (IPCC) fifth assessment. Climatic variables contributions were assessed using jackknife test and AOC value 0.888 indicates the model perform with high accuracy. The major influencing variables will be annual precipitation, precipitation of coldest quarter, precipitation seasonality, and precipitation of driest quarter. The model result shows that the current high potential distribution of the species is around 1.90% of the study area, 7.78% is good potential; about 90.32% is moderate to very low potential for species suitability. Finally, the results of all model represented that there will be a drastic decline in the suitable habitat distribution by 2050 and 2070 for all the RCP scenarios. The study signifies that MaxEnt model might be an efficient tool for ecosystem management, biodiversity protection, and species re-habitation planning under climate change.