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## Effectiveness of conservation planning for endangered *Garcinia gummi-gutta* species on the Western Ghats: predicting habitat suitability under current and future climate

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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 study. The present study aimed to predict the influence of current and future climate on an ecologically vulnerable medicinal species, *Garcinia gummi-gutta*, of the south Western Ghats using Maximum Entropy (MaxEnt) modelling. The future projections were made for the period of 2050 and 2070 with RCP scenario of 4.5 and 8.5 using 84 species occurrence data, and climatic variables from three different models (HadGEM2-CC, GFDL-CM3, and NorESM1-M) of IPCC fifth assessment. Climatic variables contributions were assessed using Jackknife test and mean value of AOC 0.888, TSS 0.698, and kappa 0.733 indicate the model performs with very high accuracy. The major influencing variables will be annual precipitation ( $32.51 \pm 1.4\%$ ), precipitation of coldest quarter ( $16.57 \pm 0.6\%$ ), precipitation seasonality ( $12.56 \pm 1.3\%$ ), and precipitation of driest quarter ( $11.73 \pm 0.73\%$ ). 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. The results based on future prediction 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. Moreover, the suitability results also shown that the species shifted downward (equatorward), which may cause local extinction from the south Western Ghats under all climate change scenarios. The current and predicted suitability maps and climatic understanding that could be a significant guide for a non-governmental organisation, the government responsible for the management and conservation of vulnerable medicinal plants as well as forest resources.

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