

Impact of Climate Change on Distribution of Caterpillar Fungus, *Ophiocordyceps sinensis* in Sikkim Himalaya, India

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ABSTRACT

MaxEnt modelling has been used to predict the present and future distributions of caterpillar fungus, *Ophiocordyceps sinensis* in Sikkim Himalaya in four future climate change trajectories (viz. RCP 2.6, RCP 4.5, RCP 6.0 and RCP_8.5) for the year 2050. The result predicted an area of 311 km² (4.77 % of total area) to be suitable under current climatic condition. Under future climate change scenario the suitable habitat of caterpillar fungus would get drastically reduced (RCP_2.6, RCP_4.5 and RCP_8.5) with a minor expansion (i.e. ~71 km²) in addition to current potential suitable habitat under scenario RCP_6.0. Niche overlap analysis resulted in more than 90 % niche overlap among current and future distribution of species. The existing protected areas (PAs) accounts for only 0.54 % (~35 km²) of the total area of state of Sikkim and 1.64 % of the total area of PAs and shows variability in suitable habitat under climate change scenario. Therefore the establishment of new PAs especially towards Far-East and North-East region of Sikkim could be an alternative measure for the conservation of suitable habitat of caterpillar fungus. Alternatively, trans-boundary conservation programs connecting country like Bhutan in the West, Nepal in the East and Tibet in the North of Sikkim could be a feasible long term alternative plan for conservation of species.

Key words: Niche Modelling, *Ophiocordyceps sinensis*, Protected Area, Sikkim, Yartsha-gumbu