

## Documents

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**Moss as bioindicators for pollution at Fraser Hill and Cameron Highland Pahang Malaysia**  
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**Abstract**

Tropical Montane Cloud Forest (TMCF) is one of Earth's most neglected ecosystems around the globe. More than half of these forests are situated within Southeast Asia. Malaysia is known for its numerous mountains that are exceptionally rich in biodiversity and locally endemic species, but they are also threatened by expanding human activity such as forestry, agriculture, infrastructure, and climate change. The study aims to critically assess the current state of moist TMCF, focusing on their physical and biological potentials as Bio indicators through Bio monitoring at Fraser Hill and Cameron Highland, Pahang, Malaysia. The mix-methods of observation surveys are to identify physical attributes such as light intensity, altitudes, temperature, wind velocity and air humidity. Secondly, laboratory tests are to identify heavy metal contamination absorbed by mosses. Based on the findings collected around the trails, a connection between altitude and microclimate could be found. The study finds that as the altitude increases and the temperature decreases, the vegetation becomes more dwarfed. Secondly, results from the analysis at Abu Suradi trail within Fraser Hill and Brinchang Trail within Cameron Highland have a higher average of aluminium and iron concentration. Mosses were manifested as good key indicators of air pollution with heavy metals to Malaysia highland forest ecosystems. It showed differential accumulation of heavy metals located near sources of pollution. Thus, the moss data confirms the persistence of risk of pollution of highland forest ecosystems in Malaysia, which demands environmental management. Furthermore, decision makers, planners and designers around the region can evaluate and improve their local strategies related to Tropical Montane Cloud Forest (TMCF) conservation and preservation, especially highlands such as Fraser Hill and Cameron Highland. © 2021 by MIP.

**Author Keywords**

Bio Indicator; Bio monitoring; Ecosystem; Tropical Montane Cloud Forest (TMCF)

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