

UNIVERSITI TEKNOLOGI MARA

**THREE-PHASE FIELD
EXPERIMENT TO ASSESS THE
EFFECT OF NITROGEN
DEPOSITION AND SELECTED
ABIOTIC FACTORS ON EPIPHYTIC
TERRESTRIAL ALGAE**

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ABSTRACT

Nitrogen (N) concentration on the atmosphere has risen steadily over the years in Asian countries including Malaysia which leads to the significant changes in the structure and landscape of the terrestrial ecosystems. The epiphytic terrestrial algae are ideal to assess the effect of nitrogen enrichment to lower plants due to their high sensitivity to atmospheric pollutants. A three-phase study was carried out to determine species diversity and the effect of some relevant abiotic factors on algal density. Quadrat sampling method, algal collection, algal quantification, algal identification, acid rain simulation method and field experiment involving huge poultry farms are among the methods used in this study. The study revealed a total of 4 main algal species were found namely *Apatococcus* sp., *Trebouxia* sp., *Trentepohlia* sp. and *Printzina* sp. Abiotic factors such as the bark acidity, aspect/shading and bark roughness was significantly related to algal density ($p < 0.05$) while the inclination of the trees does not affect algal density (r -value nearest to 0). In addition to that, the algal density is higher in density upon reaching the source of nitrogen ($p = 0.005$) and becomes very low in area polluted with sulphur dioxide ($p = 0.008$). The present study shows that the increasing N provides an encouraging condition for the epiphytic terrestrial algae particularly of nitrophytic species (*Apatococcus* sp.) to grow in abundance. Contrastingly, the existence of S causes algal density to reduce due to its toxicity effect to algae.

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