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A preliminary study of air pollution around Maptaphut industrial estate, Thailand, by transplanting the lichen Parmotrematinctorum (Despr. ex Nyl.) Hale

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Lichens have been widely employed as bioindicators for assessing air quality during the past few decades. Accordingly, this work transplanted the lichen *Parmotrema tinctorum* (Despr. ex Nyl.) Hale from an unpolluted site in KhaoYai National Park to three locations around Maptaphut industrial estate in Rayong province, Thailand. These included Prasae reservoir (PR), herbal garden (HG) and Mapchalood temple (MT), which were 54, 8 and 4 km from the main industrial area. Transplantation was also performed within the control site. The objective of the study was to detect atmospheric pollutants absorbed by the lichen at this industrial park, the largest in Thailand. After 56 days of transplantation, the amounts of As and Hg in the lichen thalli at MT were significantly higher ($p < 0.001$), and Pb was greater than at the other sites. The chlorophyll fluorescence parameter, Fv/Fm, of the lichen at this site was significantly lower ($p < 0.01$) than at the control site. Net photosynthesis (NP) and chlorophyll a+b of the lichen at the control site seems to have been affected by drought rather than by pollutants, as the values were lower than those from the sites that were located near water resources. Nevertheless, the lowest values of both NP and chlorophyll a+b among the polluted sites was observed from the lichen at MT, suggest that this site, which borders the main industrial estate, was affected by As, Hg and Pb more than the far-off locations, herbal garden and Prasae reservoir.

Keywords: Lichen, air pollutant, Maptaphut industrial estate, *Parmotrema tinctorum*

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