(3B-2-P7) Submission ID: IAL0094-00001

VARIATIONS IN THE GROWTH RATES OF LICHENS OVER THE COURSE OF A LONG-TERM INVESTIGATION IN THE TROPICAL FORESTS AT KHAO YAI NATIONAL PARK, THAILAND

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Long term monitoring of the growth of lichens in five types of tropical forests in Thailand was conducted between 1999 and 2010 at Khao Yai National Park. The objectives of this study were to observe (1) the longevity of lichen thalli in a tropical climate; and (2) variations of the growth rates of lichens in various types of tropical forests under different climate. A total of 73 species with 306 thalli were monitored, of which 45 were crustose and 28 were foliose species composing of 146 and 160 thalli, respectively. After twelve years only 23% of the observed thalli remained intact with 32% of the crustose and 14% of the foliose lichens. The largest proportions of intact thalli of both crustose and foliose were observed under dry dipterocarp forest conditions at 58% and 31%, respectively. The average growth rate for crustose lichens was 2.8 mm/year with a range between 0.29 and 7.89 mm/year, whereas those of foliose lichens was 6.36 mm/year with a range between 0.11 and 17.43 mm/year. Lichens in the five forest types differed in average growth rates. The lowest rate was observed under dry evergreen forest and with the highest growth rate being noted under tropical rain forest. In contrast, the growth rate of foliose lichens varied from 1.24 to 14.53 mm/year with the lowest rate being found under tropical rain forest and the highest rate measured under lower montane forest. Average growth rates of the crustose lichens measured after two, four, six, eight, ten, and twelve years, respectively, fluctuated at 1.30, 2.46, 2.52, 2.59, 2.03 and 2.28 mm/year, while those of the foliose thalli were 6.04, 5.58, 4.78, 5.89, 6.24 and 6.36 mm/year. This study demonstrated that lichen thalli in a sunny and dry habitat in the tropics live longer than in shady warm-wet places. Variations in the growth rates at differing ecosystems and over the years reflected variability of climatic conditions. These results require amplification and must be further addressed for the sake of conserving biodiversity under a changing climate.