

ไลเคน : ความหลากหลายทางชีวภาพและการแพร่กระจาย บนเกาะเสมสาร

LICHEN : BIODIVERSITY AND DISTRIBUTION AT SAMAESAN ISLAND

วาสนา เชื้อสุข, สุภาวดี สุมน, เสกสรร เปรมสุขทวี, สนธยา ศรีสมปอง, เวชศาสตร์ พลเยี่ยม และ กัณทรัย์ บุญประกอบ

Wasana Cheusook, Supawadee Sumon, Sekson Premasuktee, Sontaya Srisompong, Wetchasart Polyiam and Kansri Boonpragob
Lichen Research Unit, Department of Biology, Faculty of Science, Ramkhamhaeng University, Bangkapi, Bangkok 10240, Thailand; e-mail address: lichen@ram1.ru.ac.th

บทคัดย่อ: ตัวอย่างไลเคนจากเกาะเสมสารที่เก็บในเดือนพฤษภาคม 2548 สามารถจำแนกได้เป็น 15 วงศ์ 28 สกุล 69 ชนิด จากตัวอย่างไลเคนทั้งหมด 102 ตัวอย่าง พื้นที่เก็บตัวอย่างแบ่งตามระดับความสูงจากน้ำทะเลได้เป็น 4 เขต คือ เขต A, B, C และ D ซึ่ง อยู่เหนือระดับน้ำทะเล 5-30, 50-80, 100-120 และ 130-160 เมตร ตามลำดับ ไลเคนแบบครัสโตสเป็นชนิดที่เด่นในทุกเขต พบไลเคนแบบโฟลิโอสที่มีสาหร่ายสีเขียว 4 ชนิด และไลเคนที่มีสาหร่ายสีเขียวแกมน้ำเงิน 2 ชนิด จากการจำแนกประเภทตามหลักอนุกรมวิธาน พบชนิดของไลเคนในเขต B มีมากถึงร้อยละ 51 ของชนิดที่พบทั้งหมด รองลงมาคือชนิดที่พบในเขต D, A และ C ซึ่งเป็นจำนวนร้อยละ 33, 20 และ 12 ตามลำดับ โดยพบ *Dirinaria picta* ในทุกเขตที่เก็บตัวอย่าง ชนิดที่เด่นในเขต A, B, C และ D คือ *Graphis* sp.1, *Parmotrema praesorediosum*, *Dimerella isidiata* และ *Laurera benguelensis* ตามลำดับ พบ *Caloplaca* sp.2 ซึ่งเป็นไลเคนที่มีสีส้ม เป็นชนิดเด่นบนผาหินที่มีสภาพแวดล้อมรุนแรง ไลเคนที่พบบนเกาะประกอบด้วยชนิดที่ทนต่อสภาพแห้งแล้ง ซึ่งแสดงถึงระบบนิเวศอยู่ระหว่างการเปลี่ยนแปลงแทนที่ สภาพภูมิอากาศเฉพาะแห่งที่บันทึกได้ในแหล่งอยู่อาศัยของไลเคนระหว่าง วันที่ 28-29 พฤษภาคม 2548 พบความชื้นสัมพัทธ์สูงสุดในช่วงกลางคืนต่ำกว่าร้อยละ 75 ในขณะที่ความเข้มแสงช่วงเช้าวัดได้ $600 \mu\text{mol m}^{-2} \text{s}^{-1}$ และสูงสุดถึง $1600 \mu\text{mol m}^{-2} \text{s}^{-1}$ อุณหภูมิเฉลี่ย 32.1 องศาเซลเซียส และอุณหภูมิสูงสุด 42 องศาเซลเซียส ควรมีการศึกษาความเปลี่ยนแปลงของประชากรไลเคนและสภาพภูมิอากาศเฉพาะแห่งต่อไป เพื่อให้เข้าใจถึงปัจจัยที่ควบคุมการกระจายพันธุ์ของไลเคน อันนำมาซึ่งการอนุรักษ์และใช้ประโยชน์ไลเคนอย่างยั่งยืนต่อไป

Abstract: A total of 69 species, 28 genera and 15 families of lichens were identified from 102 specimens collected at Samaesan Island in May 2005. Collection sites can be separated into four elevation zones; Zone A, B, C and D, which are 5-30, 50-80, 100-120 and 130-160 meters above sea level respectively. Crustose lichen dominated in every zone, only four species of green algae foliose and two species of cyano-foliose lichen were recorded. The largest number of taxa was found at zone B, which contributed 51 % of the total species found. Lesser number of species was recorded from zone D, A and C, which shared 33, 20 and 12 % respectively of the total species. *Dirinaria picta* was found in every zone. Dominant species in zone A, B, C and D were *Graphis* sp.1, *Parmotrema praesorediosum*, *Dimerella isidiata* and *Laurera benguelensis*. The orange lichen, *Caloplaca* sp.2, dominated at the rock exposure cliff, which has severe environmental condition. Species composition of lichens at the island are those tolerate to relatively dry habitat, which indicated successional stage of the ecosystem. Microclimate of lichen habitat measured during 28-29 May 2005 revealed that the highest relative humidity during the night never exceeded 75 %, whilst light intensity during early morning reach $600 \mu\text{mol m}^{-2} \text{s}^{-1}$, with maximum $1600 \mu\text{mol m}^{-2} \text{s}^{-1}$, and temperature were 32.1 °C with a maximum of 42 °C. Future monitoring of changes in lichen

community and microclimate are necessary to understand factors govern lichen distribution, which lead to conservation and sustainable utilization of lichens.

Introduction: Samaesan Island situated in amphur Sattahip, Chonburi province is two kilometers from the south of the peninsula. The area is 2,738 rai, with the highest elevation of 167 m above sea level. The land is dominated by small shrub vegetations of 3-5 meters high. Investigation of lichens in this study is part of the Plant Genetic Conservation Project under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn. Lichens as part of the diversity of the flora in the area is largely unknown.

Methodology: Investigation of lichen at Samaesan Island was performed along the north side along the elevations 5-30, 50-80, 100-120 and 130-160 m above sea level designated as zone A, B, C, and D respectively. Lichen specimens were collected on bark, wood, and rock. Lichen classification was performed at the Lichen Herbarium, Ramkhamhaeng University (RAMK). Identifications were based on taxonomical literatures [1, 2, 3, 4, 5].

Microclimates, light intensity, air temperature and relative humidity, were measured at Zone B. The data were collected in every 10 minutes from 12:00 am to 12:00 am on 28-29 May 2005 by using micrologger LI-1400 (LI-COR, Inc., USA).

Results, Discussion and Conclusion: Sixty-nine species, 28 genera and 15 family of lichen were identified. The crustose lichens were dominated consisting of 63 sp. or 91 % of the total species found. They consisted of genus *Antracothecium* spp., *Arthonia* sp., *Buellia* spp., *Caloplaca* spp., *Cyclographina* sp., *Dimerella* spp., *Graphina* spp., *Graphis* spp., *Laurera* spp., *Lecanora* spp., *Letrouitia* sp., *Mycoporum* spp., *Myriotrema* sp., *Phaeographina* spp., *Phaeographis* spp., *Porina* sp., *Pyrenula* spp., *Rinodina* sp., *Sarcographa* sp., *Thelotrema* spp., *Trypethelium* spp. and 7 unidentified species. The green algae contributed only 4 species. They were *Dirinaria picta*, *Parmotrema praesorediosum*, *Pyxine copelandii* and *Relicinaopsis rahengensis* and 2 species of foliose with blue-green photobiont were recorded, which were *Coccocarpia* sp. and *Pannaria* sp..

The highest species richness to was observed at zone B with 35 species identified (Fig. 1). It contributed half of the total species found at this island. This zone is on the lee side of the steep hill, which was slightly protected from strong wind and oceanic influence. Large lobe foliose lichens, *Parmotrema praesorediosum*, as well as *Peltula* sp., a cyanolichen was found. The second highest in species number was recorded at the hill top, zone D, with 23 species was found. This zone has relative bright light and windy, when *D. picta* and *R. rahengensis* were recorded. The lowest in diversity was note from zone C, which probably due to small collecting area in addition to different microclimate which was not measured.

The crustose that dominate Samaesan Island are those characterize the dry habitat such as *Antracothecium* sp., *Graphis* sp., *Laurera madreporiformis*, *Trypethelium tropicum*. This indicates successional stage of the vegetation of the island after human inhabitants were removed more than 10 year ago. The green-algal foliose lichens found are those favor sunny habitats, which can be found at the secondary forest and canopy at Khao yai national park as well. Two cyano-lichens indicated moist habitat with available liquid water, which implied slightly change toward moist habitat has occurred. The cyano-lichens usually found in the lowest strata of the tropical rain forest, where light intensity is low with high atmospheric moisture. However, twenty-four hour microclimate measurement indicated that the highest relative humidity at night was only 75 %, which was far from saturation. High humidity over 90 % at night is necessary for lichen growth and survival because they absorb atmospheric moisture during the night for photosynthesis of organic food in early morning. Light intensity in early morning was $600 \mu\text{mol m}^{-2}\text{s}^{-1}$, and reach a maximum of $1600 \mu\text{mol m}^{-2}\text{s}^{-1}$ at about noon time. This seems to be appropriate for lichen growth. Average day and night temperature were 35 and 29 °C, which was less different and characterized maritime environment. The temperature factor may play important role, indirectly, on lichen

distribution at this island. Therefore, long term monitoring of changes in lichen communities and microclimate would be tremendously useful to understand factors that govern lichen distribution. Consequently, conservation and sustainable utilization of lichens and other flora can be managed efficiently.

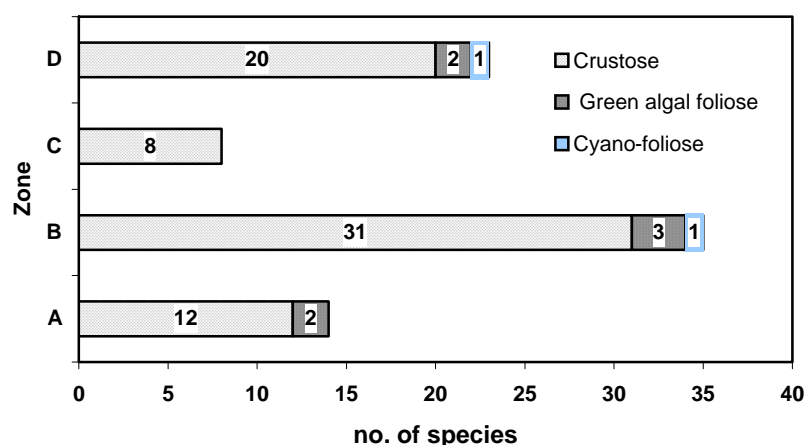


Figure 1 Number of species of lichens inhabited four elevation zone at Smaesan Island. Zone A, B, C and D are 5-30, 50-80, 100-120, 130-160 meters above sea level.

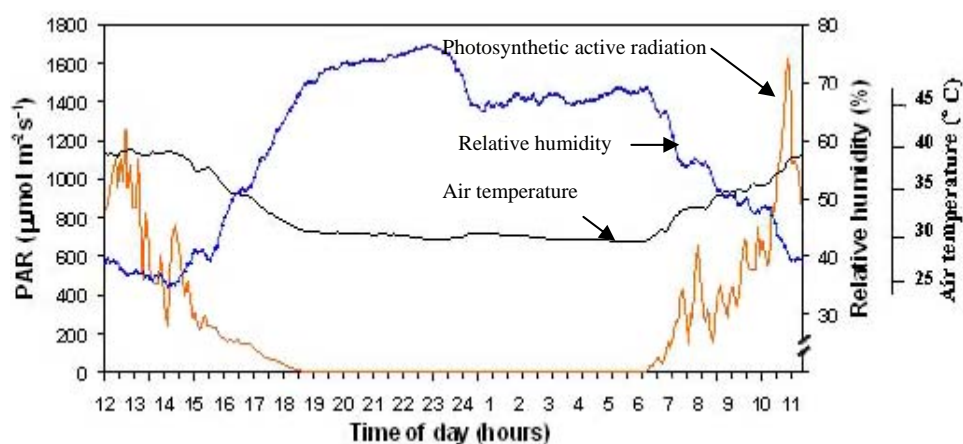


Figure 2 Microclimate of lichen habitat measured at 65 m above sea level (zone B) at Samaesan Island. The sensors were installed near the cliff. Light intensity and air temperature were relatively high during the day and night, relative humidity at night never reach saturation (Measurement on 28-29 May 2005).

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Key world: Biodiversity, Distribution, Lichen, Microclimate, Samaesan Island