ความหลากหลายทางชีวภาพของไลเคนวงศ์อูสเนียซิอิ ณ อุทยานแห่งชาติภูหินร่องกล้าประเทศไทย BIODIVERSITY OF THE LICHEN FAMILY USNEACEAE AT PHU HIN RONG KLA NATIONAL PARK, THAILAND.

<u>นาถวิดา ควงผุย</u>, พิบูลย์ มงคลสุข, ณัฐสุรางค์ หอมจันทร์, ขจรศักดิ์ วงศ์ชีวรัตน์ และ กวินนาถ บัวเรื่อง

<u>Natwida Dangphui,</u> Piboon Mongkolsuk, Natsurang Homchantara, Kajonsak Vongchewarat and Kawinnat Buarueng

Lichen Research Unit, Department of Biology, Faculty of Science, Ramhkamheang University

E-mail: natwida_new@gmail.com, Tel. (02) 3108410 # 132, Fax: 02 3108416

บทคัดย่อ: การศึกษาความหลากหลายของ โลเคนวงศ์อูสเนียซิอิ ณ อุทยานแห่งชาติภูหินร่องกล้า ระหว่างปี พ.ศ. 2546 ถึง 2548 จำนวน 1,500 ตัวอย่าง พบ 2 สกุลย่อย ทั้งหมด 13 ชนิค สกุลย่อย Eumitria พบจำนวน 1 ชนิค คือ *Usnea baileyi* (Stirt.) Zahlbr. และ สกุลย่อย Usnea พบจำนวน 12 ชนิค คือ *Usnea abissinica* Motyka, *U. bornmuelleri* Steiner, *U. exasperata* (Müll.Arg.) Motyka, *U. himantodes* Steiner, *U. leprosa* Motyka, *U. maculata* Stirt., *U. nodulosa* Swinscow & Krog, *U. perhispedella* Steiner, *U. roseola* Vain., *U. rubicunda* Stirt., *U. submollis* Steiner และ *U. undulata* Stirt. โลเคนในวงศ์นี้พบแพร่กระจายได้ในเกือบทุกสภาพป่า ส่วนมากพบเปลือกไม้ และ บนพื้นหิน เมื่อตรวจสอบสารเบื้องต้นด้วยวิธีทินแลร์โครมาโตกราฟฟี(TLC) พบสารโลเคนทั้งหมด 17 ชนิค และพบ usnic acid เป็นสารเค่นในทุกชนิคพันธ์

Abstract: Studies on biodiversity of lichen family usneaceae collected at Phu Hin Rongkla National Park during 2003 – 2005. They consisted of 1,500 samples. Currently, 2 subgenera, 13 species have been identified. The subgenus *Eumitria* had one species, which was *Usnea baileyi* (Stirt.) Zahlbr. The subgenus *Usnea* had 12 species, namely *Usnea abissinica* Motyka, *U. bornmuelleri* Steiner, *U. exasperata* (Müll.Arg.) Motyka, *U. himantodes* Steiner, *U. leprosa* Motyka, *U. maculata* Stirt., *U. nodulosa* Swinscow & Krog, *U. perhispedella* Steiner, *U. roseola* Vain., *U. rubicunda* Stirt., *U. submollis* Steiner and *U. undulata* Stirt. These families are distributed in almost all forest types. Most of them were found on bark and rock. Seventeen lichen substances were detected by thin layer chromatography. The most common chemical substance is usnic acid.

Introduction: The family usneaceae are lichen-forming fungi (Ascomycotina: Lecanorales) that include 2 genera 600 species that are distributed throughout the world (Hawksworth et al., 2000). This family is characterized by fruticose thallus. The thalli vary from erectile to pendent longer than 1 meter in some species, attaching on the substrates by basal holdfasts. The tissues are heteromerous with axis at the center and cortex as outer surface. The aims of this study are primarily to classify and then to conserve the diversity and bring about sustainable uses.

Methodology: The lichen specimens collected from various forest types were identified according to Swinscow & Krog (1988), Stevens (1999) and others. The

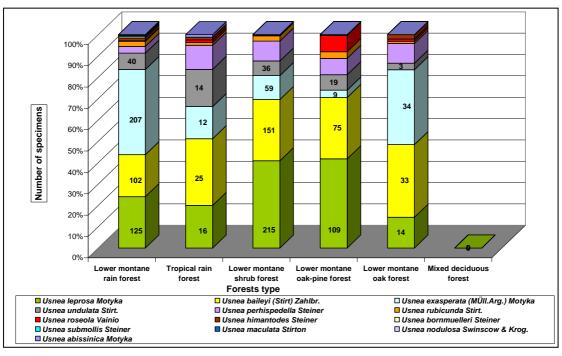
lichen substances were identified by thin layer chromatography. Two standard solvent systems, A and G were used, for routine examinations. The basic solvent systems were prepared according to White and James (1985) as follows.

A = Toluene (180 ml): dioxin (60 ml): acetic acid (8 ml) (T.D.A.)

G = Toluene (139 ml): ethylacetate (83 ml): formic acid (8 ml)

Results, Discussion, and Conclusion: Six ecosystems, including lower montane shrub forest, lower montane oak-pine forest, lower montane oak forest, lower montane rain forest, tropical rain forest and mixed deciduous forest of Phu Hin Rong Kla served as study areas of the diversity of lichen family usneaceae. Collected 1,500 specimens were identified into 2 subgenera and 13 species. The subgenus Eumitria had one species, which was Usnea baileyi (Stirt.) Zahlbr. The subgenus Usnea had 12 species, namely Usnea abissinica Motyka, U. bornmuelleri Steiner, U. exasperata (Müll.Arg.) Motyka, U. himantodes Steiner, U. leprosa Motyka, U. maculata Stirt., U. nodulosa Swinscow & Krog, U. perhispedella Steiner, U. roseola Vain., U. rubicunda Stirt., U. submollis Steiner and U. undulata Stirt. Most of the specimens (11 species) were found on barks. Two species, U. bornmuelleri and U. maculate, were found on rocks. U. baileyi, U. leprosa and U. exasperate were found to be most abundant while U. abissinica, U. maculate and U. nodulosa were found in smaller numbers. Lower montane rain forest had highest diversity of the lichen family (26% of all studied specimens). The percentage in tropical rain forest was 20, while that of lower montane shrub forest, lower montane oak-pine forest and lower montane oak forest was 18 (Figure 1). There have been no reports of this family in mixed deciduous forest. Light intensity, air temperature, relative humidity and bark surface were limiting factors affecting distribution of the family usneaceae. Generally, the habitats of the collected specimens had low temperature and high humidity.

Figure 1 Number of species found on different forest types at Phu Hin Rongkla National Park



References:

- (1) Hawksworth, D.L., Kirk, P.M., Sutton, B.C. & Pegler D.N. (1995). Dictionary of the fungi. CABI.
- (2)Stevens, G.N. (1999), A revision of the lichen family Usneaceae in Australia, *Bibliotheca Lichenologica 72*. 128 p.
- (3)Swinscow, T.D.V. and H. Krog (1988). *Macrolichen of East Africa*, British Museum (Natural History), London. :321-347.
- (4) White, F.J. and P.W. James (1985). New guide to Microchemical techniques for the identification of Lichen substances, *British Lichen Society Bulletin NO.57*.

Keywords: Usnea, Eumitria, Usnic acid,