

ไลเคนแบบแผ่นใบและพลาคอยด์ของวงศ์ฟิสเซีย ในเขตรักษาพันธุ์สัตว์ป่าภูหลวง จังหวัดเลย

## FOLIOSE AND PLACOID LICHENS OF THE FAMILY PHYSCIACEAE AT PHU LUANG WILDLIFE SANCTUARY, LOEI PROVINCE

สัญญา มีสิม พชร มงคลสุข ขจรศักดิ์ วงศ์ชีวีรัตน์ กวินนาถ บัวเรืองและชัยณรงค์ คูคดิม

Sanya Meesim, Pachara Mongkolsuk, Kajonsak Vongshewarat, Kawinnat Buaruang and Chainarong Doodurm

Department of Biology, Faculty of Science, Ramkhamhaeng University, Bangkok, Bangkok 10240, Thailand. E-mail address: [meesim\\_sanya@hotmail.com](mailto:meesim_sanya@hotmail.com)

**บทคัดย่อ :** จากการรวบรวมตัวอย่าง ไลเคนวงศ์ ฟิสเซีย (Physciaceae) แบบแผ่นใบและพลาคอยด์ในเขตรักษาพันธุ์สัตว์ป่าภูหลวง จังหวัดเลย 4 สภาพป่า คือ ป่าไม้พุ่ม ป่าสนเขา ป่าดิบเขา และป่าเต็งรัง ระหว่างเดือน มิถุนายน 2551 – พฤษภาคม 2552 ได้ไลเคนทั้งหมด 206 ตัวอย่าง บนเปลือกไม้และบนหิน เมื่อวิเคราะห์ตัวอย่างทางด้านอนุกรมวิธาน สามารถจำแนกได้ 6 สกุล คือ *Dimelaena*, *Dirinaria*, *Heterodermia*, *Phaeophyscia*, *Physcia* และ *Pyxine* 33 ชนิด พบว่า *Heterodermia granulose*, *H. pacifica*, *Phaeophyscia orbicularis*, *Physcia atrostriata* และ *Physcia erumpens* เป็นชนิดที่ไม่มีรายงานการพบในประเทศไทยมาก่อนและ ชนิดที่คาดว่าจะจะเป็นชนิดใหม่ของโลก คือ *Heterodermia* PL 1., PL 2., PL 3. และ PL 4. ชนิดที่พบเสมอ คือ *Heterodermia appendiculata*, *H. lepidota*, *H. microphylla* และ *H. pseudospeciosa* ตามลำดับโดย 66% ป่าไม้พุ่มมีความหลากหลายของชนิดไลเคนมากที่สุด ขณะที่ป่าดิบเขามีความหลากหลายของชนิดไลเคน 24%

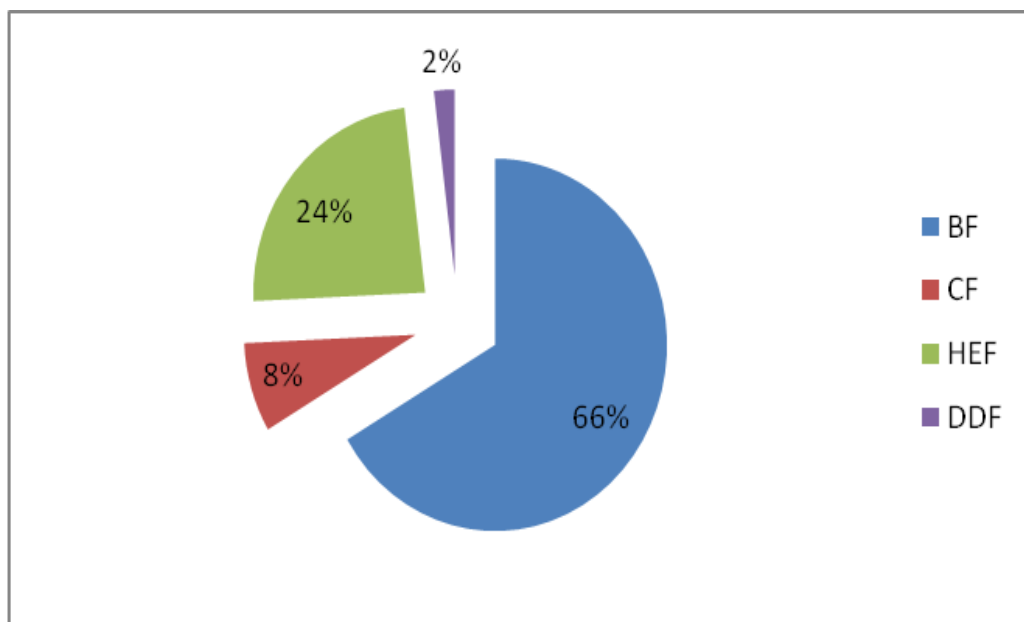
**Abstract:** As collecting foliose and placoid lichens family Physciaceae samples at Phu Luang wildlife Sanctuary of Loie Province from 4 difference forest types bush forest, coniferous forest, hill evergreen forest and dry dipterocarp forest, during June 2008 – May 2009, they were compiled totally 206 samples from bark and rock. Basically of taxonomy identifications were made and found 6 genera, *Dimelaena*, *Dirinaria*, *Heterodermia*, *Phaeophyscia*, *Physcia* and *Pyxine*, 33 species *Heterodermia* cf. *granulosa*, *H. pacifica*, *Phaeophyscia orbicularis*, *Physcia atrostriata*, and *Physcia erumpens* were new record of Thailand. Otherwise, *Heterodermia* PL 1., PL 2., PL 3. and PL 4. were expected to be new species. *Heterodermia appendiculata*, *H. lepidota*, *H. microphylla* and *H. pseudospeciosa* were common species. The highest lichen diversity were 66 percent in bush forest type, 24 percent in hill evergreen forest.

**Introduction:** Phu Luang Wildlife Sanctuary has an area of 897 square kilometers. The geological features, landscapes and natural beauty of the area are well reserved. The highest peak of the mountain is 1,571 meter above sea level. The terrain composes of bush forest, hill evergreen forest and rock, which provide habitats for various plant species, including mosses, ferns and especially lichen. Lichens are abundant and have never been explored extensively. For the lichens family Physciaceae is characterized by the thick wall and dark color of 1–3 transeptate ascospore within cylindrical bitunicate

ascus. They may produce lecideine or lecanorine apothecium. They are generally found in strong intensity of light and good aeration as foliose and crustose thallus type. The purpose of this study is to investigate the genus species in different forest types, and construct a local systematic key of Phu Luang Wildlife Sanctuary.

**Methodology:** Lichen samples collected from 4 forest types, bush forest (BF), hill evergreen forest (HEF) coniferous forest (CF) and dry dipterocarp forest (DDF) at Phu Luang Wildlife Sanctuary were dried under room temperature for herbarium preservation and taxonomic study. The investigation of morphological and anatomical character as well as chemistry is performed, according to Nash III *et. al* 2004, Galloway, 1985, Moberg, 2002, Mongkolsuk, 2003, Swinscow & Krog (1988), White & Jame (1985). And the specimens were comparing with HERBARIUM (TUR), Department of Biology University of Turku SF – 20500 Turku Finland.

**Results, Discussion and Conclusion:** A total of 216 Physciaceae collecting samples were identified into 6 genera 33 species. Five genera were foliose lichens and one genus was placoid lichen (Table 1). The lichen species diversity of this family were found 66, 28, 8 and 2 percent in bush forest, hill evergreen forest, coniferous forest and dry dipterocarp forest type respectively (fig. 1). *Heterodermia appendiculata*, *H. lepidota*, *H. microphylla* and *H. pseudospeciosa* were nearly dispersed all over the area. However *Dimelaena thysanota*, the placoid lichen, only found in strong intensity of light and good aeration of dry dipterocarp forest type. *Heterodermia cf. granulose*, *H. pacifica*, *Phaeophyscia orbicularis*, *Physcia atrostriata* and *Physcia erumpens* were the first record of Thailand, while exotic *Heterodermia* PL 1., PL 2., PL 3. and PL 4. were expected to be new species of The world.



**Figure 1.** Percent of lichens taxa that belong to 6 genera found in bush forest (BF), coniferous forest (CF), hill evergreen forest (HEF) and dry dipterocarp forest type (DDF) at Phu Luang Wildlife Sanctuary.

**Table 1.** A total of species from four types of forest at Phu Luang Wildlife Sanctuary.

| Genera              | Species               | no. of lichen samples |    |     |     |
|---------------------|-----------------------|-----------------------|----|-----|-----|
|                     |                       | BF                    | CF | HEF | DDF |
| <i>Dimelaena</i>    | <i>thysanota</i>      |                       |    |     | 4   |
| <i>Dirinaria</i>    | <i>confluens</i>      | 5                     |    |     |     |
|                     | <i>picta</i>          |                       |    | 1   |     |
| <i>Heterodermia</i> | <i>antillarum</i>     | 1                     | 1  | 6   |     |
|                     | <i>appendiculata</i>  | 16                    | 4  | 4   |     |
|                     | <i>cf. granulosa</i>  |                       |    | 1   |     |
|                     | <i>chilensis</i>      | 12                    |    |     |     |
|                     | <i>comosa</i>         | 2                     |    |     |     |
|                     | <i>diademata</i>      | 21                    |    |     |     |
|                     | <i>flabellata</i>     | 6                     |    |     |     |
|                     | <i>hypoleuca</i>      | 1                     |    |     |     |
|                     | <i>japonica</i>       | 18                    |    |     |     |
|                     | <i>lepidota</i>       | 2                     | 2  | 4   |     |
|                     | <i>leucomela</i>      | 2                     |    |     |     |
|                     | <i>microphylla</i>    | 8                     | 4  | 1   |     |
|                     | <i>obscurata</i>      |                       |    | 5   |     |
|                     |                       | PL 1                  | 1  |     |     |
| <i>Heterodermia</i> | PL 2                  | 3                     |    |     |     |
| <i>Heterodermia</i> | PL 3                  | 1                     |    |     |     |
|                     | PL 4                  | 1                     |    |     |     |
|                     | <i>pacifica</i>       | 4                     |    |     |     |
| <i>Heterodermia</i> | <i>podocarpa</i>      | 3                     |    |     |     |
|                     | <i>pseudospeciosa</i> | 21                    | 2  | 3   |     |
| <i>Phaeophyscia</i> | <i>chloantha</i>      | 3                     |    |     |     |
|                     | <i>orbicularis</i>    | 1                     |    |     |     |
| <i>Physcia</i>      | <i>atrostriata</i>    |                       |    | 4   |     |
|                     | <i>erumpens</i>       |                       |    | 13  |     |
|                     | <i>integrata</i>      |                       |    | 1   |     |
| <i>Pyxine</i>       | <i>consocians</i>     | 3                     | 1  |     |     |
|                     | <i>coralligera</i>    | 2                     | 2  |     |     |
|                     | <i>katendei</i>       |                       |    | 1   |     |
|                     | <i>reticulata</i>     |                       |    | 1   |     |
|                     | <i>subcinerea</i>     |                       |    | 4   |     |

(BF = bush forest, CF = coniferous forest, HEF = hill evergreen forest, DDF = dry dipterocarp forest)

## References:

- (1) Galloway, D.J. 1985. *Flora of New Zealand Lichens*.
- (2) Moberg, R.2002. *Physcia. Nordic lichen Flora 2* : 33-38
- (3) Nash III, T. H., Ryan, B.D., Diederich, P., Gries, C. and Bungartz, F. (2004). *Lichen*

*Flora of the Greater Sonoran Desert Region. Vol II, 93-95*

- (4) Mongkolsuk, P. (2003.) Study on Chemical and Morphological Properties of Physciaceae Lichen Collection Samples from Different Locals in Thailand. Ramkhamhaeng University, *ResearchJournal* 6: 91-112.
- (5) Swinscow T.D.V. and Krog H. (1988.) *Macrolichen of East Africa*. British Museum, London.
- (6) White, F. J. and Jame, P.W. (1985.) A new guide to microchemical techniques for the identification of lichen substances, *British Lichen Society Bulletin* No.57.

### **Acknowledgement**

This work was supported by a grant from Thai Government we are in debt. We would like to acknowledge Professors Klaus Kalb for kind advice and confirms species. And we are grateful to officers and staff at Phu Luang Wildlife Sanctuary for their kind cooperation. We are also grateful to Ramkhamhaeng University, faculty of Science, Biology Department, especially Lichen Research Unit which gave us to do this research.

**Keywords:** Foliose, Placoid lichen, Physciaceae and Phu Luang Wildlife Sanctuary