



## SP11\_010\_PF

### SP11\_010\_PF: LICHEN HERBARIUM DATABASE AND MANAGEMENT AT RAMKHAMHAENG UNIVERSITY I

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#### Abstract:

The Lichen herbarium of Ramkhamhaeng University being registered with the international museum system under the RAMK code is an evidence for rich biological resources and lichenological research in Thailand. Arising from the surveys and studies lichens nationwide since 1993, RAMK began collecting data in the database and managing the samples in 2006. Currently more than 80,000 lichen samples from Thailand and 43 other countries around the world are housed here. All samples are systematically managed and collected in the Lichen herbarium. In alphabetical order genus A-M, 8,569 samples from 42 provinces of Thailand, consisting of lichens classified according to taxonomy, 60 families, 150 genera, 551 species.

**Keywords:** herbarium, database and RAMK

#### Introduction:

Lichen herbarium of Ramkhamhaeng University is one of the important places in natural history studies in Thailand and SE Asia. It keeps important information on biological resources of the countries. Its primary function is to provide taxonomic records focused on lichen. This record is improved upon through loans and outright exchanges of specimens with researchers at other institutions, who are authorities of particular lichen groups and able to apply annotation labels as part of their review process, thus often correcting earlier determinations, and in general, improving the scientific value of a given specimen. Loan requests that we receive from other institutions are honored and fulfilled by careful packaging and shipping to the requesting institution.

#### Methodology:

Process and operation of the Lichen herbarium of Ramkhamhaeng University are divided into 3 parts as follows. **Part 1;** Sample Preparation and Packaging: The samples collected from the field are dried at room temperature for 3-5 days, then the specimens sachets are placed in the brown sample sachets and recorded the details of the specimens as including: Scientific name, Collectors number, compiler number, TLC number, surname, sample location, national parks and sanctuaries, sampling province, substrate and author, forest type, elevation reference and tables, and so on after which separate. Samples were packaged into groups for researchers to classify. **Part 2;** The classified samples are successfully into the database process as follows: RAMK, Collector no, TLC no, Genus, Species, Author name, Family, Localities, Storage, National Park and Sanctuary, Province, Substrate, Author, Forest type, Altitude, Grid ref, Collector, Date collector, Determine by, Date Determine, Chemistry and Remark. After check the details of specimens with the specimens guide (log book), the specimens sachets include index card (for note the specimens study details), solid tissue paper to support the specimens, and stamping RAMK number as 3 points as follows; inside some white paper top right corner, index card and inside edge of specimens sachets, all of the above put in a zip envelope and attach the front of the specimens sachets completely. The specimens into a brown specimens file for storage in the Lichen Herbarium, sort samples by species, each species by RAMK number. Next, put the specimens sachets in a brown specimens file with the name and green paper (color indicated for Asia) and into the freezer for 24-48 hours (sample envelope in the freezer for 24 hours, and sample brown file/large brown box for 48 hours). **Part 3;** Collection of specimens in the Lichen Herbarium. Take them out of the freezer, before into the Lichen Herbarium. Check specimens sachets and a brown specimen file with Lichen Herbarium file for specimens storage cabinet by alphabetical of the genus and each genus sorted by species and each genus is separated by green futures boards (color indicated for Asia)

**Result, discussion and conclusion:**

Databasing and organizing of lichen specimens at the Lichen herbarium of Ramkhamhaeng University resulted in 8,569 samples from 42 provinces of Thailand in the genera starting with A-M, consisting of specimens from 60 families, 150 genera and 551 species (Table 1).

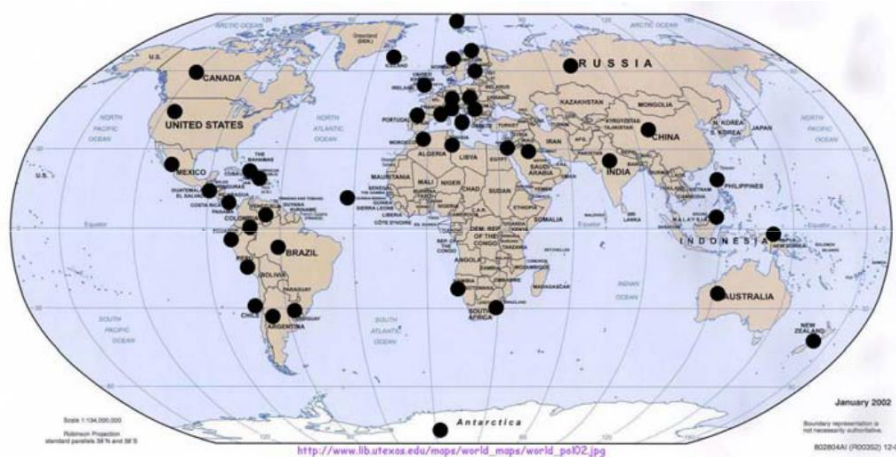
**Table 1.** Classification of lichens according to the current taxonomy, 60 Families, 150 Genera from stored 8,569 specimens in the RAMK herbarium (A – M genera).

Family	Genus
ARTHOPYRENIACEAE	<i>Arthopyrenia</i>
ASPIDOTHELIACEAE	<i>Aspidothelium</i>
	<i>Austroblastenia</i>
BAEOMYCETACEAE	<i>Baeomyces</i>
BIATORACEAE	<i>Biatora</i>
BRIGANTIAACEAE	<i>Brigantiaea</i>
BRIGANTIAEACEAE	<i>Brigantiaea</i>
BYSSOLOMATACEAE	<i>Byssoloma</i>
CALICIACEAE	<i>Calicium</i>
	<i>Diplotomma</i>
	<i>Gassicurtia</i>
	<i>Melanaspicilia</i>
	<i>Candelariella</i>
CANDELARIACEAE	<i>Dichosporidium</i>
CHIODECTONACEAE	<i>Cladonia</i>
CLADONIAACEAE	<i>Gymnoderma</i>
COCCOCARPIACEAE	<i>Coccocarpia</i>
	<i>Coccocarpia</i>
COENOGONIAACEAE	<i>Coenogonium</i>
	<i>Dimerella</i>
COENOGONIAACEAE	<i>Coenogonium</i>
COLLEMATAACEAE	<i>Collema</i>
	<i>Leptogium</i>
CONIOCYBACEAE	<i>Chaenotheca</i>
CROCYNIAACEAE	<i>Crocynia</i>
DOTHIDEOMYCETIDAE	<i>Mycoporellum</i>
ECTOLECHIAACEAE	<i>Badimia</i>
	<i>Calenia</i>
	<i>Calopadia</i>
	<i>Lasioloma</i>
	<i>Lecania</i>
FUSCIDEACEAE	<i>Fuscidea</i>
	<i>Maronea</i>
	<i>Aulaxina</i>
	<i>Calenia</i>
	<i>Echinoplaca</i>
	<i>Gyalectidium</i>
	<i>Gyalidea</i>
	<i>Gyalideopsis</i>
GRAPHIDACEAE	<i>Acanthographis</i>
	<i>Acanthothecis</i>
	<i>Cyclographina</i>
	<i>Diorygma</i>
	<i>Dyplolabia</i>
	<i>Fissurina</i>
	<i>Glyphis</i>
	<i>Graphina</i>
	<i>Graphis</i>
	<i>Gymnographa</i>
	<i>Gyrostomum</i>
	<i>Haematomma</i>
	<i>Hemithecium</i>

Family	Genus
	<i>Leiorreuma</i>
	<i>Melanotrema</i>
	<i>Myriotrema</i>
GYALECTACEAE	<i>Cryptolechia</i>
	<i>Gyalecta</i>
HAEMATOMMATACEAE	<i>Haematomma</i>
HYMENELIACEAE	<i>Hymenelia</i>
	<i>Ionaspis</i>
HYPOGYMNIACEAE	<i>Hypogymnia</i>
HYSTERIUMCEAE	<i>Hysterium</i>
LECANORACEAE	<i>Cryptolechia</i>
	<i>Haematomma</i>
	<i>Laurera</i>
	<i>Lecanora</i>
	<i>LecidellaMaronina</i>
	<i>Lecidea</i>
LECIDEACEAE	
LEPROCAULACEAE	<i>Leprocaulon</i>
LETROUITIACEAE	<i>Letrouitia</i>
LOBARIACEAE	<i>Lobaria</i>
MALMIDEACEAE	<i>Malcolmiella</i>
	<i>Malmidea</i>
MEGALARIACEAE	<i>Megalaria</i>
MEGALOSPORACEAE	<i>Aspicilia</i>
	<i>Austroblastenia</i>
	<i>Megalospora</i>
MEGASPORACEAE	<i>Aspicilia</i>
MELASPILEACEAE	<i>Melaspilea</i>
	<i>Micarea</i>
MICROTHELIOPSISIDACEAE	<i>Microtheliopsis</i>
MILTIDEACEAE	<i>Miltidea</i>
MONOBLASTIACEAE	<i>Anisomeridium</i>
	<i>Caprettia</i>
MYCOCALICIACEAE	<i>Lecanora</i>
MYCOPORACEAE	<i>Mycoporum</i>
MYELOCONACEAE	<i>Myeloconis</i>
NAETROCymbACEAE	<i>Leptorhaphis</i>
PANNARIACEAE	<i>Erioderma</i>
	<i>Leioderma</i>
	<i>Bulbothrix</i>
	<i>Canoparmelia</i>
	<i>Dirinaria</i>
	<i>Everniastrum</i>
	<i>Flavopannaria</i>
	<i>Hypogymnia</i>
	<i>Hypotrachyna</i>
	<i>Imshaugia</i>
	<i>Myclochroa</i>
	<i>Myelochroa</i>
PHYSICIACEAE	<i>Buellia</i>
	<i>Dirinaria</i>
	<i>Gassicurtia</i>
	<i>Hafellia</i>
	<i>Heterodermia</i>
	<i>Hyperphyscia</i>
	<i>Hypotrachyna</i>
PILOCARPACEAE	<i>Byssolecania</i>
	<i>Byssoloma</i>
	<i>Eugeniella</i>
	<i>Fellhanera</i>
	<i>Logilvia</i>
	<i>Malcolmiella</i>
	<i>Micarea</i>
PILOCARPACEAE	<i>Fellhanera</i>
PORPIDIACEAE	<i>Amygdalaria</i>
PYRENULACEAE	<i>Anthracotheicum</i>
	<i>Lithothelium</i>
	<i>Mazosi</i>

Family	Genus
RAMALINACEAE	<i>Bacidia</i> <i>Bacidina</i> <i>Badimia</i> <i>Lecania</i>
ROCCELLACEAE	<i>Acanthothecis</i> <i>Chiodecton</i> <i>Dictyographa</i> <i>Enterographa</i> <i>Graphidastra</i> <i>Lecanactis</i> <i>Lecanographa</i> <i>Maronina</i>
STEREOCAULACEAE	<i>Lepraria</i>
STICTIDACEAE	<i>Leproloma</i> <i>Conotrema</i>
TELOSCHISTACEAE	<i>Caloplaca</i>
THELOTREMATAEAE	<i>Chapsa</i>  <i>Chroodiscus</i> <i>Diploschistes</i> <i>Leucodecton</i> <i>Myriotrema</i> <i>Lithographa</i>
TRAPELIACEAE	<i>Clathroporina</i>
TRICHOHELIAEAE	<i>Astrothelium</i>  <i>Campylothelium</i> <i>Cryptothelium</i> <i>Laurera</i> <i>Megalotremis</i> <i>Mycomicrothelia</i> <i>Melanotheca</i>
VERRUCARIACEAE	

Locations of lichen specimens from 42 countries from Rundel’s collection deposited at RAMK lichen herbarium are shown in Figure 1.



**Figure 1.** Location of 42 countries where lichen specimens from Rundel’s collections are curated at RAMK lichen herbarium.

RAMK lichen herbarium is the first of its kind in Thailand and Southeast Asia. It keeps important information on biological resources of the countries. They are organized in international standard, which are easy to search and are available to everybody. However, research on lichens in Thailand and Southeast Asia is



relatively new. A large number of new species and unknown taxa at the herbarium indicate that lichens in this area need further intensive studies to be discovered and understood about their biology. Future studies on sustainable utilization of lichen resources and management needs these curatorial information from this lichen herbarium.

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#### **Reference:**

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**Keyword:** Lichen Herbarium, RAMK, global collection