

H_H0039: LICHEN IN MANGROVE FOREST AT KOH RUA SRI, TRAT PROVINCE IN THE EASTERN, THAILAND

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Abstract: The lichen samples, one hundred and twenty seven from thirteen phorophytes were collected and taxonomic classified to 18 families 28 genera and 56 species, comprising of 5 families of macrolichen; Coccocarpiaceae, Collemataceae, Pannariaceae, Parmeliaceae and Physciaceae and 13 families of microlichen; Arthoniaceae, Arthopyreniaceae, Atheliaceae, Bacidiaceae, Crocyniaceae, Ectolechiaceae, Gomphillaceae, Graphidaceae, Pertusariaceae, Pilocarpaceae, Pyrenulaceae, Roccellaceae and Trypetheliaceae. Twenty five percent of lichen taxa were in Graphidaceae. Whilst *Rhizophora apiculata* Blume and *Rhizophora mucronata* Poir were phorophytes that covered by lichenized fungi 38 and 12 taxa respectively.

Introduction: Koh Rua Sri of Trat province is located between latitude 12°14'06"N longitude 102°33'44"E in Figure 1. The area is covered 78 rai of mangrove forest with 13 species of trees. Among its location surrounding of water and rich of vegetations, lichen in this area was expected to vast discover. From the past decade until today, lichen investigations in Thailand were performed only on the mainland; coniferous forest, dry dipterocarp forest, dry evergreen forest, hill evergreen forest, lower montane rainforest, lower montane scrub, mixed deciduous forest and tropical rainforest. However study lichens in mangrove forest have been neglected. In order to update lichen database in Thailand collecting lichen samples in mangrove forest is indispensable for the known taxonomy, diversity and distribution as well as informations for the conservation and sustainable utilization of biodiversity resources.



Figure 1. Map of Koh Rua Sri of Trat province.

Methodology: The Lichen specimens collected from Koh Rua Sri, in Wang Kra Jhae, Muang district, Trat province during 4 November 2010-15 January 2012, were prepared for herbarium preservation. Taxonomic identification performed prior to herbarium storage, included examination of the lichens morphological and anatomical features under light microscope and dissecting stereomicroscope. Taxa were determined according to¹⁻⁵. Secondary metabolite were characterized by spot test and thin layer chromatography (TLC) following to⁶.

Result and Discussion: From the lichen samples, One hundred and twenty-seven were classified to 18 families, 28 genera and 56 species Table 1 comprising macrolichen 13 species in family Coccocarpiaceae, Collemataceae, Pannariaceae, Parmeliaceae and Physciaceae, calculated to 23.21 percentage. Whilst the dominant lichen was 43 microlichen species in families Arthoniaceae, Arthopyreniaceae, Atheliaceae, Bacidiaceae, Crocyniaceae, Ectolechiaceae, Gomphillaceae, Graphidaceae, Pertusariaceae, Pilocarpaceae, Pyrenulaceae, Roccellaceae and Trypetheliaceae, computed to 76.79 percentages. The highest species diversity was 14 taxa in graphidacean lichen (Graphidaceae), and estimated to 25 percentages of all species Figure 2. Since it is tropical lichens and distributes over *Cerriops tagal* (Perr.) C.B.Rob., *Rhizophora apiculata* Blume, *R. mucronata* Poir, *Thespesia populneoides* (Roxb.) Kostel. and *Xylocarpus granatum* Koen. However the second highest species diversity was 7 taxa in Pertusariaceae and designed to 12.5 percentages.

Table 1. Lichen taxa from 13 phorophyte trees.

Family	Lichen taxa	Phorophyte										Total		
		Unidentified tree	<i>Bruguiera gymnorhiza</i>	<i>Cerriops tagal</i>	<i>Drynaria quercifolia</i>	<i>Finlaysonia maritima</i>	<i>Hoya diversifolia</i>	<i>Lumnitzera racemosa</i>	<i>Melaleuca quinquenervia</i>	<i>Rhizophora apiculata</i>	<i>Rhizophora mucronata</i>		<i>Thespesia populneoides</i>	<i>Xylocarpus granatum</i>
Arthoniaceae	<i>Arthothelium macounii</i> ^a			1										1
	<i>Arthothelium ruanum</i>			1					8	1				10
	<i>Stirtonia macrocarpa</i> ^a									1				1
Arthopyreniaceae	<i>Arthopyrenia cinefaciens</i> ^a												1	1
	<i>Arthopyrenia consobrina</i>	1		2										3
Atheliaceae	<i>Dictyonema sericeum</i>						2							2
Bacidiaceae	<i>Bacidia convexula</i> ^a								2					2
	<i>Bacidia submedialis</i>								1					1
Coccocarpiaceae	<i>Coccocarpia dissecta</i>								3					3
	<i>Coccocarpia</i> sp.1								3					3
Collemataceae	<i>Leptogium azureum</i>						1							1
	<i>Leptogium marginellum</i>							1					1	2
Crocyniaceae	<i>Crocynia pyxinooides</i>								2	1				3
Ectolechiaceae	<i>Sporopodium phyllocharis</i>								1					1
Gomphillaceae	<i>Asterothyrium pernambucense</i> ^a					1			1					2
Graphidaceae	<i>Diorygma hieroglyphicum</i>								6					6

Table 1. Lichen taxa from 13 phorophyte trees (continue).

Family	Lichen taxa	Phorophyte										Total		
		Unidentified tree	<i>Bruguiera gymnorhiza</i>	<i>Ceritops tagal</i>	<i>Drynaria quercifolia</i>	<i>Finlaysonia maritima</i>	<i>Hoya diversifolia</i>	<i>Lumnitzera racemosa</i>	<i>Melaleuca quinquenervia</i>	<i>Rhizophora apiculata</i>	<i>Rhizophora mucronata</i>		<i>Thespesia populneoides</i>	<i>Xylocarpus granatum</i>
	<i>Graphis bakeri</i> ^a								3					3
	<i>Graphis caesiella</i>			1					5		1			7
	<i>Graphis cincta</i> ^a								2					2
	<i>Graphis streimannii</i>			1										1
	<i>Graphis sundarbanensis</i> ^a								1					1
	<i>Leucodecton compunctellum</i>			1					3			1		5
	<i>Leucodecton occultum</i> ^a									1				1
	<i>Leucodecton subcompunctum</i> ^a								2					2
	<i>Ocellularia arecae</i>								1					1
	<i>Ocellularia asiatica</i> ^a									1				1
	<i>Ocellularia berkeleyana</i> ^a								1	1				2
	<i>Ocellularia inturgescens</i> ^a								1					1
	<i>Sarcographina</i> sp.1								3					3
Pannariaceae	<i>Parmeliella mariana</i>	3	3						5					11
Parmeliaceae	<i>Parmotrema gardneri</i>								3					3
	<i>Parmotrema overeemii</i>								1					1
	<i>Parmotrema reticulatum</i>								1					1
	<i>Parmotrema saccatilobum</i>								1					1
Pertusariaceae	<i>Pertusaria balekensis</i> ^a								2					2
	<i>Pertusaria cicatricosa</i>								1	1				2
	<i>Pertusaria georgeana</i> ^a								1					1
	<i>Pertusaria leioplaca</i>									1				1
	<i>Pertusaria pertusa</i>								2					2
	<i>Pertusaria pertusa</i>								2					2
	<i>Pertusaria</i> sp.1								2	1				3
	<i>Pertusaria xanthonaria</i>			1										1
Physciaceae	<i>Cratiria dissimilis</i>								1					1
	<i>Dirinaria picta</i>								3					3
	<i>Pyxine endochrysin</i> ^a								6	1				7
	<i>Pyxine retirugella</i>								1					1
Pilocapaceae	<i>Byssoloma subdiscordans</i>					1								1
Pyrenulaceae	<i>Pyrenula chlorospila</i> ^a												1	1
	<i>Pyrenula laetior</i> ^a								1					1
	<i>Pyrenula microcarpa</i>								1					1

Table 1. Lichen taxa from 13 phorophyte trees (continue).

Family	Lichen taxa	Phorophyte												
		Unidentified tree	<i>Brugutera gymnorhiza</i>	<i>Cerlops tagal</i>	<i>Drynaria quercifolia</i>	<i>Finlaysonia maritima</i>	<i>Hoya diversifolia</i>	<i>Lumnitzera racemosa</i>	<i>Melaleuca quinquenervia</i>	<i>Rhizophora apiculata</i>	<i>Rhizophora mucronata</i>	<i>Thespesia populneoides</i>	<i>Xylocarpus granatum</i>	<i>Xylocarpus moluccensis</i>
	<i>Pyrenula nanospora</i> ^a									1				1
	<i>Pyrenula welwitschii</i> ^a	1												1
Roccellaceae	<i>Cresponia proximata</i>								1					1
	<i>Enterographa falcate</i> ^a					1								1
Trypetheliaceae	<i>Laurera subdiscreta</i>	1												1
	<i>Polymeridium albidum</i>			1										1
	<i>Trypethelium tropicum</i>								1					1
unidentified		2	1	1					9	1	1	2	2	19
	Total	8	3	10	1	1	2	3	1	92	12	2	3	143

^a new records to Thailand

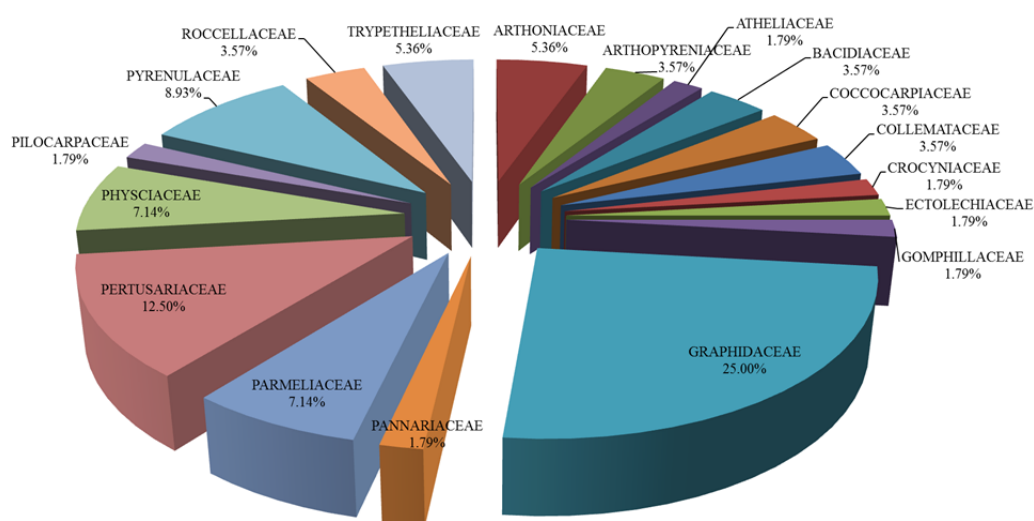


Figure 2. The proportion in species percentage of lichen family found in mangrove forest at Koh Rua Sri, Trat province.

Conclusion: The lichen lineages at Koh Rua Sri is more diverse than the previously found at Ban Pak Klong Num Chiew and Black Sand Beach, Trat province.⁷ Twenty one species are different and very interesting adding to the Thai lichen checklist. It is apparent to be new records namely; *Arthopyrenia cinefaciens*, *Arthothelium acounii*, *Asterothyrium pernambucense*, *Bacidia convexula*, *Enterographa falcata*, *Graphis bakeri*, *Graphis sundarbanensis*, *Leucodecton occultum*, *Leucodecton subcompunctum*, *Ocellularia asiatica*, *Ocellularia berkeleyana*, *Ocellularia inturgescens*, *Pertusaria balekensis*, *Pertusaria georgeana*, *Pyrenula chlorospila*, *Pyrenula laetior*, *Pyrenula nanospora*, *Pyrenula*

welwitschii, *Pyxine endochrysin* and *Stirtonia macrocarpa*.⁸⁻¹¹ Whilst the other thirty five species have been reported in published literature. However several underscribed species have been found mainly in sterile crustose.

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