



## SP11\_003\_PF

### SP11\_003\_PF: BIODIVERSITY OF CRUSTOSE DISCOLICHEN IN MANGROVE FOREST AT PRACHUAP KHIRI KHAN PROVINCE, THAILAND.

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#### Abstract:

Exploration of crustose discolichen in mangrove forest of Bang Saphan, Bang Saphan Noi and Pranburi districts in Prachuap Khiri Khan province was collected during March 2019. One hundred and sixty-nine specimens were compiled from seven-teen phorophytes of mangrove forest. Based on morphological and chemical identification was taxonomically catalogued into six families belonging to eight genera and eight species. The *Lecanora helva* was most abundant and diverse in the area. In addition, *Biatora* Prachup1 is expected to be new.

#### Introduction:

Prachuap Khiri Khan is one of the western provinces of Thailand. The latitude is situated in between 10° 50' 12" 45" N and 99° 00' 100° 00" E. The area covered from north to south about 212 kilometers with 6,368 square kilometers, covering eight districts along coast of the gulf of Thailand (about 224.8 square kilometers Coastline) such as Mueang Prachuap Khiri Khan, Kui Buri, Thap Sakae, Bang Saphan, Bang Saphan Noi, Pran Buri, Hua Hin and Sam Roi Yot district (19.35 square kilometers of mangrove forest).

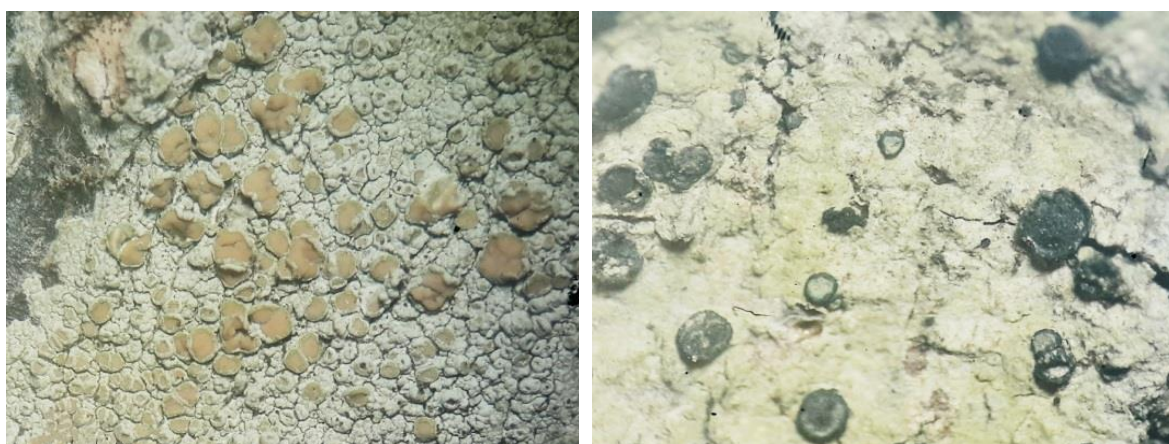
Area with a humid tropical climate is influenced by the southwest monsoon, which blows from the Indian Ocean. Winter season is influenced by the northeast monsoon during December to February. Summer starts from late March to the end of late April is influenced by high-pressure areas of southeast monsoon winds from the South China Sea. Rainy season extends from May to November with heavy rains in May. The rain will terminate during June to July and starts raining heavily from August to November. Annual precipitation averages 798.3-1581.0 mm. per year. The temperature averages between 27.2 to 28.6 °C. Relative humidity averages about 77 % [20]. The most common plant species is the Rhizophoraceae (*Rhizophora apiculata* Blume.) followed by Combretaceae (*Lumnitzera racemosa* Willd), and Myrtaceae (*Melaleuca leucadendra* Linn. var. minor Duthie., respectively[20]. The diversity of crustose discolichen in mangrove forest is poorly known and never been explored extensively. The main feature of cocrustose discolichen is a crustose lichens with disc-like apothecia. The apothecial disc may be exposed, flat, convex or concave and normally upraised on the thallus. Two types of apothecia include lecanorine and lecideine or biatorine. The lecanorine type has algae incorporated in apothecia, whereas lecideine was absent. Ascospores are colorless and produced in the ascus with a variety of ascospores type including simple, septate submuriform or muriform ascospores [6]. Hence, this study focused on the biodiversity of crustose discolichen in the mangrove ecosystem of Prachuap Khiri Khan Province.

### Methodology:

Crustose discolichens were collected in the mangrove forest of Prachuap Khiri Khan province (10° 50' 12° 45" N, 99° 00' 100° 00" E). All specimens were examined for their anatomical, morphological and chemical characteristics. Lichen substances were identified using spot test and thin layer chromatography (TLC). Preliminary color tests for lichen substances carried out the following reagents according to Elix's method [7]. Thin layer chromatography was performed according to the standard method of White and James [19]. Taxonomic identification were classified according to Awasthi [2], Brodo et. al [3], Lumbsch [11], Printzen et. al [4], and Rambold [13].

### Results and Discussion:

One hundred and sixty-nine samples of crustose discolichens from Prachuap Khiri Khan province were collected and identified into six families belonging to eight genera and eight species (Table 1). Our results revealed that that the mangrove forest type of this province has more species diversity of lichens than mangrove forest of Bang Saphan, Bang Saphan Noi and Pranburi district due to their vegetation and environmental climates such as air ventilation, light direction and acidic smooth bark of dominant phorophyte trees are amiable reformed for lichen colonizing [10]. A total of 10 families 12 genera and 17 species of phorophyte were explored of discocrustose lichen. List of lichen-taxa on phorophyte in mangrove forest is shown in table 2. The highest species diversity was observed in the family Ramalinaceae (3 taxa). Observation on the occurrence of lichens on the various phorophytes revealed that eight species found on the various mangrove trees. However, the highest species diversity of lichen was recovered eight taxa on *Ceriops decandra* and *Excoecaria agallocha* (5 species) followed by *Bruguiera cylindrica* and *Rhizophora apiculata* (4 species), *Ceriops tagal* (3 species), *Avicennia officinalis*, *Derris indica*, *Hibiscus tiliaceus*, *Rhizophora mucronata*, and *Xylocarpus moluccensis* (2 species). However, *Avicennia alba*, *Avicennia marina*, *Crateva adansonii*, *Lanea coromandelica*, *Lumnitzera racemosa*, and *Sonneratia alba* were discovered for one species of lichen. *Lecanora helva* and *Cresponia proximate* were frequently found in the area. Interestingly, *Biatora* Prachup1 is expected to be new to science. Morphologically, *Biatora* Prachup1 was shared morphology similar to *Bacidia offlorescens*, *Biatora australis* and *Micarea* [17]. However, they were different in pattern and size of ascospore as well as the vegetative propagules such as the presence or absence of soralia.



**Figure 1.** Common species: *Lecanora helva* figure (left) and *Cresponia proximate* figure(right)

**Table1.** Lichen-taxa from four study sited of Prachuap Khiri Khan Province.

Lichen-taxa	District			Total of specimens
	BS	BSN	PB	
LECANORACEAE <i>Lecanora helva</i>	40	31	15	86
MALMIDEACEAE <i>Malmidea aurigera</i>	3	1	-	4
OPEGRAPHACEAE <i>Cresponia proximate</i>	28	8	-	36
PILOCARPACEAE <i>Byssoloma leucoblepharum</i>	1	-	-	1
RAMALINACEAE <i>Bacidea submedialis</i>	13	3	-	16
<i>Bacidia igniarii</i>	-	1	-	1
<i>Biatora Prachup1</i>	3	-	-	3
ROCELLACEAE <i>Bactrospora myriadea</i>	12	-	10	22
Total of specimens	100	44	25	169

**Note:** BS=Bang Saphan, BSN= Bang Saphan Noi and PB= Pranburi district

**Table 2.** List of Lichen-taxa on phorophyte trees of mangrove forest in Prachuap Khiri Khan province.

Lichen-taxa	District																	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<i>Lecanora helva</i>	9	8	11	4	-	4	3	1	1	2	13	-	2	20	6	1	1	86
<i>Malmidea aurigera</i>	-	-	-	-	2	-	-	-	1	1	-	-	-	-	-	-	-	4
<i>Cresponia proximate</i>	-	-	-	-	9	3	1	-	-	4	1	-	-	11	4	-	3	36
<i>Byssoloma leucoblepharum</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Bacidea submedialis</i>	-	-	-	-	1	2	-	-	-	2	-	-	-	11	-	-	-	16
<i>Bacidia igniarii</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
<i>Biatora Prachup1</i>	-	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	3
<i>Bactrospora myriadea</i>	-	-	-	3	-	1	-	-	-	1	-	-	-	17	-	-	-	22
Total of specimens	9	8	12	7	13	11	5	1	2	10	14	1	2	59	10	1	4	169

**Note:** 1=*Avicennia alba*, 2=*Avicennia marina*, 3=*Avicennia ocinalis*, 4=*Bruguiera cylindrica*, 5=*Bruguiera cylindrica*, 6=*Ceriops decandra*, 7=*Ceriops tagal*, 8=*Crateva adansonii*, 9=*Derris indica*, 10=*Excoecaria agallocha*, 11=*Hibiscus tiliaceus*, 12=*Lanea coromandelica*, 13=*Lumnitzera racemosa*, 14=*Rhizophora apiculata*, 15=*Rhizophora mucronata*, 16=*Sonneratia alba*, 17=*Xylocarpus moluccensis*,

**Conclusion:**

Crustose discolichens from Prachuap Khiri Khan province were collected and identified into six families belonging to eight genera and eight species. The distributions of crustose discolichens were found as seven species in Bang Saphan district, five species in Bang Saphan Noi district, and two species in Pranburi district from seventeen phorophyte were scrutinized and taxonomic classified to six families, eight genera and eight species. *Ceriops decandra* and *Excoecaria agallocha* showed highest lichen species rich (five species) in mangrove forest while *Avicennia alba*, *Avicennia marina*, *Crateva adansonii*, *Lanea coromandelica*, *Lumnitzera racemosa*, and *Sonneratia alba* are only one species. The lichen communities that occur in mangroves indicate their tolerance

to hot, humid and saline breeze environmental conditions prevailing in mangrove forest, it would be an interesting aspect to study in detail the environmental factors and the physiology of these lichens enabling them for the successful in further collection and classification of crustose discolichen. Currently, the mangrove forest area of Prachuap Khiri Khan province was invasion, destruction use in mangrove areas for other activities such as agriculture, shrimp farms and jettys. However, in this study of lichen distribution crustose discolichen shown the effect of invasion and destruction of mangrove forests is information in study for the management of mangrove forest resources in Thailand systematic and sustainable.

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