

**H\_H0034: *Hypotrachyna* (LICHENIZED ASCOMYCOTA) IN PHULUANG WILDLIFE SANCTUARY, LOEI PROVINCE**

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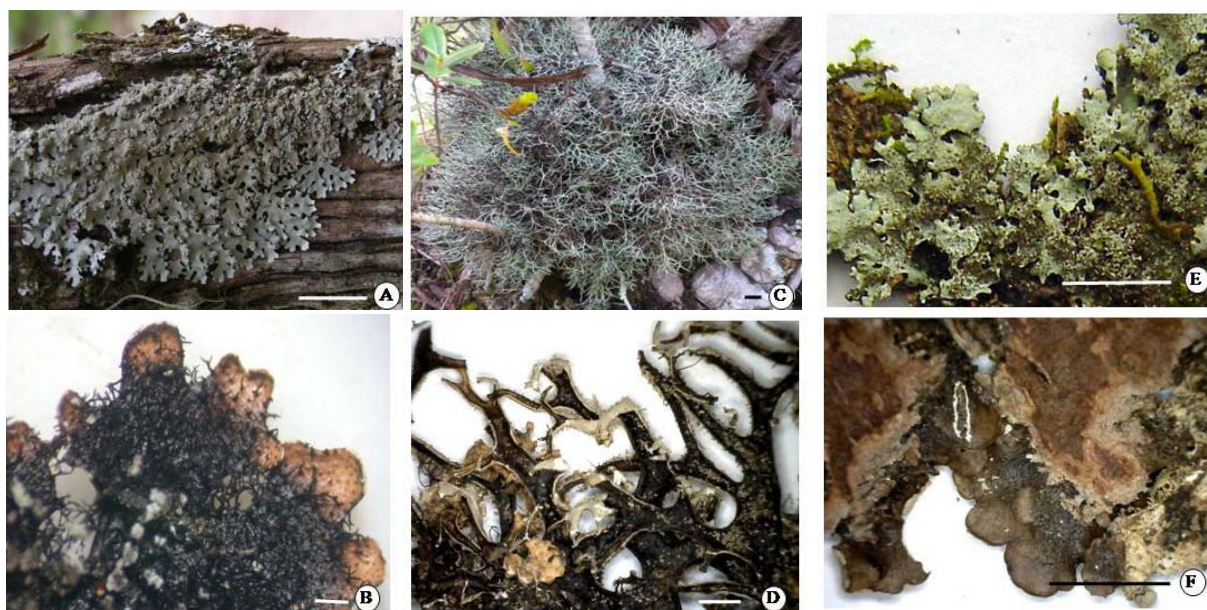
**Abstract:** The genus *Hypotrachyna* (Parmeliaceae) are distinguished by peripheral dichotomously branched rhizines all lower surface, rounded axils of eciliate lobe. Normally dichotomously branched rhizine is presented, but some species has simple to sparsely branched rhizine. Based on phylogenetic analysis, Divakar and *et al.* propose to reduce the genera *Cetrariastrum*, *Everniastrum*, and *Parmelinopsis* to synonymy with *Hypotrachyna* as *Hypotrachyna* subgen. *Everniastrum* and *Hypotrachyna* subgen. *Parmelinopsis*. Twelve species of the genus *Hypotrachyna* were found in Phu Luang Wildlife Sanctuary. Atranorin and lichenxanthone are chemical substances on upper cortex. Medullary substances are 4-O-demethylbarbatic acid, barbatic acid, consalazinic acid, gyrophoric acid, lividic acid, physodic acid, protocetraric acid, protolichensterinic acid, salazinic acid and stictic acid. *Hypotrachyna* mostly distributed in the moist and expose area of the bush forest, the coniferous forest, the lower montane forests and the dry dipterocarp forests in Phuluang wildlife sanctuary.

**Introduction:** *Hypotrachyna* is a segregate of the collective genus *Parmelia* by Hale<sup>1</sup>, that characterized by narrow, apically truncate lobe, a black lower surface, and clear-cut groups in the Parmeliaceae because of the distinctive rhizine branching. After Divakar *et al.*<sup>2</sup> propose to reduce the genera *Cetrariastrum*, *Everniastrum*, and *Parmelinopsis* to synonymy with *Hypotrachyna* as *Hypotrachyna* subgen. *Everniastrum* and *Hypotrachyna* subgen. *Parmelinopsis* (Figure 1.). About 188 species of *Hypotrachyna* worldwide, which was including *Hypotrachyna* subgen. *Everniastrum* 40 species and *Hypotrachyna* subgen. *Parmelinopsis* 25 species.<sup>2-3</sup> Thirty three species were reported in Thailand.<sup>4-10</sup> In this study, intensive investigation of all collections from Phu Luang Wildlife Sanctuary and evaluates the status of parmelioids in Phu Luang Wildlife Sanctuary.

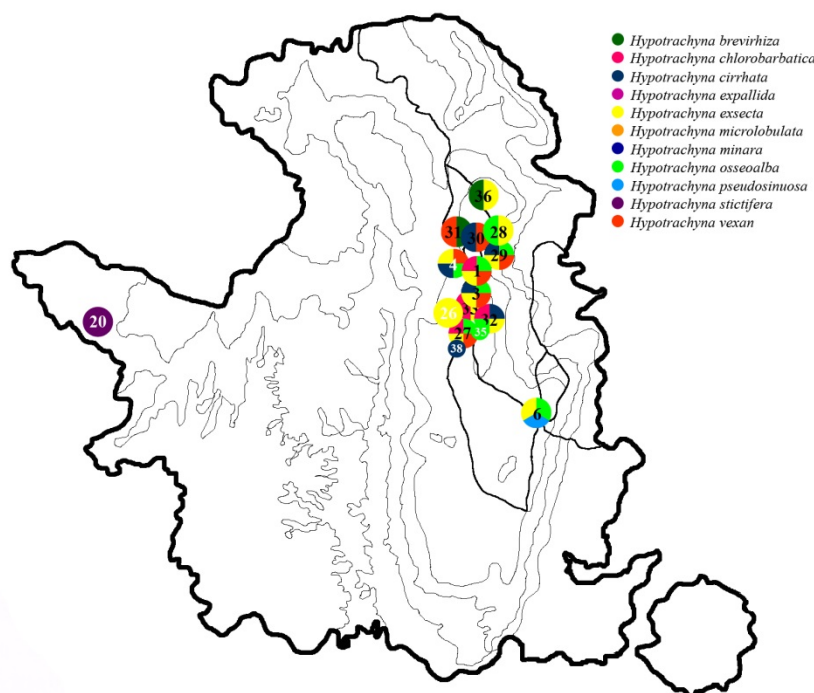
**Methodology:** Lichen samples collected from 7 forest types, bush forest (BF), lower montane forest (LMF), dry dipterocarp forest (DDF), coniferous forest (CF), dry evergreen forest (DEF), mixed deciduous forest (MDF) and tropicalrain forest (TRF) at Phu Luang Wildlife Sanctuary (between 17°16'48.5"N latitudes and 101°31'29.3"E longitude) were dried under room temperature for taxonomic study and preservation at Lichen herbarium of Ramkhamhaeng University. The investigation of morphological and anatomical characters under light microscope (Olympus CH and Olympus BX51) and stereomicroscope (Olympus SZ30) as well as chemistry is performed by spot test and Thin Layer Chromatography (TLC), according to<sup>1,2,11,12</sup>

**Results and Discussion:** From various morphological characters of *Hypotrachyna* (Figure 1), a total 12 species of the genus *Hypotrachyna* were found in at Phu Luang Wildlife Sanctuary. Thallus colors vary from whitish gray, yellowish green to grayish green. Lobe shape, linear, very narrow and elongated with parallel margin to regular with a broad and rounded outline and no parallel margins were found. Dichotomously branched or simple rhizine, the structure is root-like cluster of hyphae adapted for attaching thallus to its substrate, which developed from the lower cortex. The bitunicate ascus which hyaline, simple

and ellipsoid ascospores were produced inside. Twelve major substances were found, that atranorin is common chemical substances on upper cortex of the 11 taxa (Table 1). Species distribution was shown in Figure 2; where the high diversity of *Hypotrachyna* is occur in the high humid and exposed area of the sanctuary except *H. stictifera* found only in the expose area of the dry dipterocarp forest. *Hypotrachyna* is distributed in the moist and expose area of the bush forest (50%), the lower montane forests (25%), the coniferous forest (15 %) and the dry dipterocarp forests (10%), whereas there are not found in the dry evergreen forest, mixed deciduous forest and tropicalrain forest.



**Figure 1.** Characteristic of *Hypotrachyna* (Vain.) Hale: A. Serrate margins of irregular outline colony of *Hypotrachyna*, B. Lower surface black and pale brown with a narrow marginal zone with dichotomously branched rhizines of *Hypotrachyna*, C. Pendulous thallus of *Hypotrachyna* subg. *Everniastrum*, D. Lower surface black with simple rhizines of *Hypotrachyna* subg. *Everniastrum*, E. Irregularly outline thallus of *Hypotrachyna* subg. *Parmelinopsis*, F. Brown lower surface with simple rhizines of *Hypotrachyna* subg. *Parmelinopsis* (bars: A = 1 cm; B = 1 mm; C = 10 mm; D = 2 mm; E = 10 mm; F = 3 mm).



**Figure 2.** Species distribution of lichen genus *Hypotrachyna* (Vain.) Hale in Phu Luang Wildlife Sanctuary.

**Table 1.** Lichen substances found among species of the genus *Hypotrachyna*.

Lichen substances	Scientific name
<b>Upper cortex</b>	
atranorin	<i>Hypotrachyna brevirhiza</i> , <i>H. chlorobarbatica</i> , <i>H. cirrhata</i> , <i>H. expallida</i> , <i>exsecta</i> , <i>H. jamesii</i> , <i>H. microlobulata</i> , <i>H. minarum</i> , <i>H. pseudosinuosa</i> , <i>H. stictifera</i> and <i>H.vexans</i>
lichexanthone	<i>Hypotrachyna osseoalba</i>
<b>Medulla layer</b>	
4-O-demethylbarbatic acid	<i>Hypotrachyna chlorobarbatica</i>
barbatic acid	<i>Hypotrachyna chlorobarbatica</i> and <i>H. exsecta</i>
consalazinic acid	<i>Hypotrachyna brevirhiza</i>
gyrophoric acid	<i>Hypotrachyna minarum</i>
lividic acid	<i>Hypotrachyna osseoalba</i>
physodic acid	<i>Hypotrachyna osseoalba</i>
protocetraric acid	<i>Hypotrachyna jamesii</i> and <i>H.pseudosinuosa</i>
protolichensterinic acid	<i>Hypotrachyna expallida</i> and <i>H.microlobulata</i>
salazinic acid	<i>Hypotrachyna brevirhiza</i> , <i>H.cirrhata</i> and <i>H.vexans</i>
stictic acid	<i>Hypotrachyna stictifera</i>

**Conclusion:** *Hypotrachyna* are characterized by peripheral dichotomously branched rhizines all lower surface, rounded axils of eciliate lobe. Normally dichotomously branched rhizine is presented, but some species has simple to sparsely branched rhizine. Twelve species were found in Phu Luang Wildlife Sanctuary. Atranorin is major chemical substances on upper cortex. Medullary substances are 4-O-demethylbarbatic acid, barbatic acid, consalazinic acid, gyrophoric acid, lividic acid, physodic acid, protocetraric acid, protolichensterinic acid, salazinic acid and stictic acid. *Hypotrachyna* mostly distributed in the moist and expose area of the bush forest, the coniferous forest, the lower montane forests and the dry dipterocarp

forests in Phuluang wildlife sanctuary. However, the geographic ranges of each species will undoubtedly be extended as more collections are made, but geography is still a valuable aid.

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