FOLIICOLOUS LICHENS FROM NAGALAND, INDIA

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Abstract

The paper records 31 species under 15 genera of foliicolous lichens from Nagaland along with a key to species. Of these, *Lecidea nagalandica* is a new species and 3 species, viz., *Mazosia paupercula*, *Tricharia vainioi* and *Lopadium nymanii* are reported for the first time from India.

Introduction

The State of Nagaland in eastern part of India has a rich flora of all the groups and many research papers (Clarke, 1887, 1889 ; Kanjilal, 1934-40 ; Hynniewta, 1978a, 1978b, 1979) have already been published on the flowering plants. However, little is known about the non-flowering plants, particularly of lichens. Recently Patwardhan and Nagarkar (1979, 1980) and Nagarkar and Patwardhan (1981, 1982) have reported 10 species from the area. In context with the vast and lichenologically rich area, this number appears to be insignificant. Therefore, in order to get precise information about the floristic composition of the lichens, a project was initiated in 1984, under the auspices of Botanical Survey of India, and during preceding two years extensive collections were made from various localities in Nagaland. Subsequently critical studies on these collections have revealed some interesting results which have already been communicated (Sinha & K. Singh, 1986). The present paper, dealing with 31 species under 15 genera of foliicolous lichens, is in continuation of the same studies. Out of these,one species *Lecidea nagalandica* described here as new and three species, viz., *Mazosia paupercula*, *vainioi* and *Lopadium nymanii* are new records for Indian lichen flora. The remaining 27 taxa have been reported for the first time from Nagaland.

Majority of foliicolous lichens occur in moist, warm and shady places along the banks of streams, lakes, rivulets or ravines on the lower branches of trees, shrubs and under shrubs in tropical and subtropical forests. All the species grow on the upper surface of living leaves. Usually more than one species have been found to grow on the same leaf or on different leaves of the same plant. For example *Mazosia phyllosema*, *Mazosia melanophthalma* and *Porina epiphylla* grow together ; *Byssolecania fumosonigricans* grows in association with *Byssoloma leucoblepharum* and *Tricharia albostrigosa*. The presence of different foliicolous species on the same leaf is apparent due to differential colouration of thalli and ascocarps. For example *Porina epiphylla* and *Porina nitidula* have pale brown and black perithecia respectively. Similarly, the species of *Strigula* are quite distinct due to their thick, green, subcuticular thallus with prominent black semi-immersed perithecia. *Byssoloma leucoblepharum* is distinctive by its brown to dark brown apothecia with white margin (exciple) composed of loose hyphae.

All the taxa are arranged according to the system of Santesson (1952). Three taxa reported for the first time from India (marked with an asterisk*) have been provided with brief description to facilitate their identification. The description of other taxa is

omitted here as it is already available in Awasthi (1953), Awasthi and Singh (1972, 1973), A. Singh (1973, 1979) and K. Singh (1977). However, a general key is provided to all the species in order to identify them in the area. For detailed descriptions of foliicolous species; the monumental work of Santesson (1952) can be consulted. Each species is enumerated with brief citation along with their frequency of occurrence in the area, association with other species, locality and specimen numbers, etc. The specimens studied are deposited in Kanjilal Herbarium (Assam) at Shillong.

Key to species known from the area

1a. Ascocarps pseudothecia or perithecia

2a. Ascocarps pseudothecia

3.a Pseudothecia lirellaeform spores transversely 3-5 septate, 15-22×4 μm — 1. *Opegrapha filicina*

3b. Pseudothecia rounded

4a. Thallus verrucose, spores transversely 3-septate, 15-21 × 3-5μm. — 2. *Mazosia melanophthalma*

4b. Thallus smooth

5a. Excipuloid tissue, black, spores transversely 3-septate, 18-40×3-5 μm. — 4. *Mazosia phyllosema*

5b. Excipuloid tissue brownish black, spores transversely 5-septate, 18-32 × 3.5 μm. — 3. *Mazosia paupercula*

2b. Ascocarps perithecia

6a. Thallus thick, occurring in the form of of small scattered patches, subcuticular perithecia partially exposed.

7a. The two cells of the spore of equal size, 9-13×2-3 μm. — 5. *Strigula elegans*

7b. The two cells of the spore of unequal size, 15-21×3-4 μm — 6. *Strigula subelegans*

6b. Thallus, thin, supracuticular

8a. Perithecial wall black

9a. Perithecial wall differentiated into a black involucrellum (outer wall) and a colourless excipulum (inner wall), spores transversely 1-septate, 9-16 ×3 μm. — 12. *Porina phyllogena*

9b. Perithecial wall not differentiated into an involucrellum and an excipulum, spores transversely 5-septate, 14-36 ×3-7 μm. — 11. *Porina nitidula*

8b. Perithecial wall yellowish brown to reddish brown

10a. Perithecia provided with whitish hairs

around the ostiole, spores transversely 8-15 septate, 15-54 × 3-4, μm. — 10. *Porina multiseptata*

10b. Perithecia without such hairs

11a. Perithecia yellowish brown to reddish brown, spores transversely, 5-septate, 18-25 × 5-6 μm. — 9. *Porina monocarpa*

11b. Perithecia yellowish brown, spores transversely 7-septate

12a. Perithecia covered by a crystalline layer, spores 27-45 × 3-4 μm. — 8. *Porina epiphylla*

12b. Perithecia without crystalline layer, spores 21-36 × -46 μm. — 7. *Porina cupreola*

13a. spores simple or transversely septate

14a. Spores simple, oval to ellipsoid, 9—15 × 5-7.5 μm. — 17. *Lecidea nagalandica*

14b. Spores transversely septate

15a. Spores transversely 1-septate

16a. Thallus farinose sorediate, apothecia greyish flesh coloured, spores 12—15 × 3—4 μm. — 18. *Catillaria bouteillei*

16b. Thallus smooth

17a. Apothecia whitish to yellowish, urceolate with a spreading base, disc concave, spores 6-11 × 3-4 μm. — 13. *Calenia conspersa*

17b. Apothecia flesh coloured, lecideate with a constricted base, disc plane, spores 9-15 × 3-4 μm. — 19. *Catillaria semicarpi*

15b. Spores transversely 3-5 septate

18a. Hypothecium purple, K+dark purple brown

19a. Apothecia sessile, exciple not spreading on thallus surface, paraplectenchymatous, spores 6—18 × 3—5 μm. — 26. *Tapellaria bilimbioides*

19b. Apothecia adnate to sessile, exciple - of spreading on the thallus surface and formed of loosely intricate hyphae

20a. Thallus farinose sorediate, apothecial disc dark brown, spores 10-22 × 2-3 μm. — 23. *Byssoloma chlorinum*

20b. Thallus smooth

21a. Apothecia black, usually constricted at base, spores 10-21 × 3—6 μm. — 25. *Byssoloma rotuliforme*

21b. Apothecia grey to brown, adnate, usually not constricted at base, spores 6—18 × 3—5 μm. — 24. *Byssoloma leucoblepharum*

18b. Hypothecium colourless to brownish, K—,

22a. Thallus, smooth, apothecia adnate on thalline tissue, exciple very much reduced, lateral exciple absent, spores 9—19×3—5 μm. — 31. *Byssolecania fumosonigricans*

22b. Thallus farinose, apothecia sessile, exciple well developed, lateral exciple present.

23a. Apothecia dark brown, spores, constantly 3—septate, 12-15×3—5 μm. — 21. *Bacidia rhaphidophylli*

23b. Apothecia pale grey, spores constantly 5—septate, 12—27×3—4 μm. — 20. *Bacidia fuscatula*

13b. Spores muriform

24a. Epithecial algae present

25a. Apothecia immersed in the thallus but disc open, hypothecium colourless, exciple without crystals, spores 32—45 ×18 μm. — 14. *Gyalectidium filicinum*

25b. Apothecia constricted at base, hypothecium dark brown, exciple with crystals, spores 54—80×16—19 μm. — 26. *Sporopodium xantholeucum.*

24b. Epithecial algae absent

26a. Thallus furnished with white or black hairs, hymenium I-

27a. Thallus hairs wihte, spores 36-45×9 15 μm. — 15. *Tricharia albostrigosa*

27b. Thallus hairs black, spores 27—45× 12.5 —16 μm. — 16. *Tricharia vainioi*

26b. Thallus without hairs, hymenium I+blue.

28a. Asci 8-spored, spores 54—110×7—13x μm. — 28. *Lopadium nymanii*

28b. Asci 1-spored

29a. Apothecia light brown, hypothecium yellowish brown, spores 50—72×17—20μm — 27. *Lopadium fuscum*

29b. Apothecia brown or black, hypothecium dark brown or aeruginous

30a. Apothecia brown, hypothecium dark brown, spores 54—75×18—23 μm. — 29. *Lopadium puiggarii*

30b. Apothecia black, hypothecium aerugious spores 60—72×15—18 μm. — 30. *Lopadium subcoerulescens*

Systematic Description

OPEGRAPHACEAE

OPEGRAPHA Ach.

1. *Opegrapha filicina* Mont., *Symb. Bot. Upsal.*, **12**(1) : 100. 1952.

The species grows scarcely in the area in association with *Mazosia phyllosema* and *Porina epiphylla*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 784 A.

MAZOSIA Mass.

2. *Mazosia melanophthalma* (Müll. Arg.) Sant. *Symb. Bot. Upsal.*, **12**(1) : 117. 1952.

The species grows in association with *Porina cupreola* and *Mazosia phyllosema*. Earlier reported by Awasthi and Singh (1972, 1973) and A. Singh (1979) from South Indian hills and Andaman Islands respectively.

Locality Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt.ca. 1200 m. Sinha N. 785 I.

*3. *M. paupercula* (Müll. Arg.) Sant., *Symb. Bot. Upsal.*, **12**(1) : 128. 1952. (Text-figs. 1-3).

Thallus smooth, occurs in ±circular patches, greenish grey, up to 40 mm across ; ascocarps (pseudothecia) immersed with open disc, black, up to 0.5 mm diam., disc plane, epruinose ; excipuloid tissue brown black, covered margially by thalloid tissue; hymenial layer colourless, 70-80 μm thick ; asci 8-spored ; spores fusiform, colourless, transversely 5-septate, 25 –29 × 4 –5 μm ; paraphyses branched and anastomosed.

In anatomical features *Mazosia paupercula* closely resembles *Mazosia phyllosema*, but can easily be distinguished from the latter species by its 5-septate spores. The species grows in association with *Porina epiphylla*. It is widely distributed in pantropical regions of the world, and is a new record for Indian lichen flora.

Locality—Kohima, Jalukie, near Rubber plantations, alt. ca. 500 m. Sinha N. 779 G.

4. *M. phyllosema* (Nyl.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 123.1952.

The taxon grows usually in association with *Mazosia melanophthalma* and *Porina epiphylla*, and is moderately common in the area. Earlier reported by Awasthi and Singh (1972, 1973) and A. Singh (1979) from South Indian hills and Andaman Islands respectively.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt., ca. 1200m, Sinha N. 784 C and Sinha N. 785 H.

STRIGULACEAE

STRIGULA Fr.

5. *Strigula elegans* (Fée) Müll. Arg., Sant., *Symb. Bot. Upsal.*, **12**(1) : 160. 1952.

The species grows in association with *Porina cupreola*. Earlier reported by Santesson

(1952), Awasthi and Singh (1972, 1973) and A. Singh (1979) from Dehradun and Assam, South Indian hills and Andaman Islands respcetively.

Locality—Phek, Meluri, near lake, ca. 1 km. on -eluri-Phek Road, alt. ca. 1200 m, Sinha N. 787 D.

6. *S. subelegans* vain., Sant., *Symb. Bot. Upsal.*, **12**(1) : 158. 1952.

The taxon usually grows in association with *Porina cupreola* and *Mazosia melanophthalma* and is moderately common in the area. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills and Andaman Islands respectively.

Locality—Phek, Meluri, nera lake ca. 1 km on Meluri-Phek Road, alt., ca. 1200 m, Sinha N. 785 F.

PORINA Müll., Arg.

7. *Porina cupreola* (Müll. Arg.) Schilling, Sant., *Symb. Bot. Upsal.*, **12**(1) : 257. 1952.

The species is very common in the area and grows usually in association with *Porina epiphylla*. Earlier reported by Awasthi and Singh (1972, 1973, from South Indian hills.

Locality—Kohima, Peren, near New Colony, alt., ca. 1200 m. Sinha N. 780 A ; Phek, Ketchapi forest, alt., ca. 1250 m, Sinha N. 1633 A.

8. *P. epiphylla* (Fée) Fée, Sant., *Symb. Bot. Upsal.*, **12**(1) : 234. 1952.

The species is very common on the leaves of *Wallichia* spp. Earlier reported by Nylander (1873), Awasthi and Singh (1972, 1973) and A. Singh (1979) from Andaman Islands, South Indian hills and South Andaman Islands respectively.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 784 C and Sinha N. 785 E.

9. *P. monocarpa* (Krempelh.) Schilling, Sant., *Symb. Bot. Upsal.*, **12**(1) : 256. 1952.

The taxon grows usually in association with *Porina nitidula*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 783 A.

10. *P. multiseptata* Müll. Arg., Sant., *Symb. Bot. Upsal.*, **12**(1) : 244, 1952.

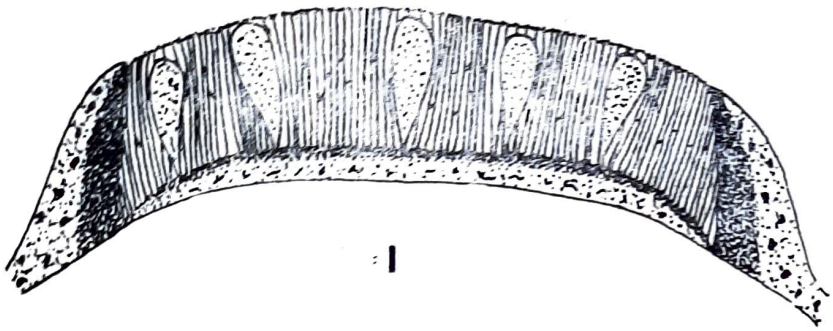
The species grows in association with *Porina epiphylla* and *Mazosia paupercola*, and is moderately common in the area. Earlier reported by A. Singh (1979) from Andaman Islands.

Locality—Kohima, Jalukie, near Rubber Plantations, alt. ca. 500 m., Sinha N. 779B.

11. *P. nitidula* Müll. Arg., Sant., *Symb. Bot. Upsal.*, **12**(1) : 225. 1952.

The taxon is very common in the area and grows in association with *Porina spiphylla*. Earlier reported by Awasthi and Singh (1972) and A. Singh (1979) from South Indian hills and Andaman Islands respectively.

Locality—Phek, Meluri, near lake ca. 1 km. on Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 782 A and Sinha N 783 C.



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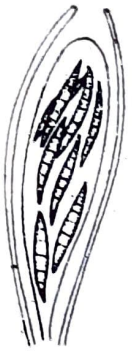

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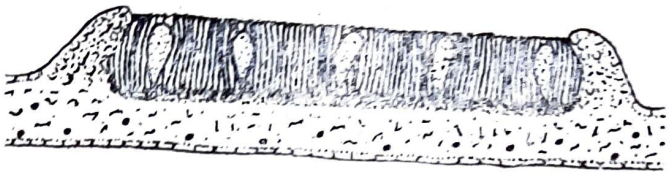

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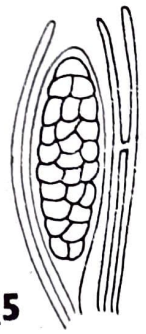

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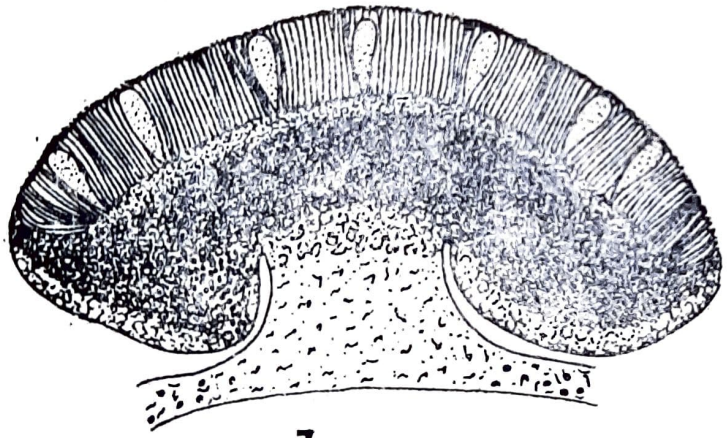

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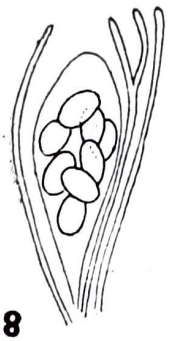

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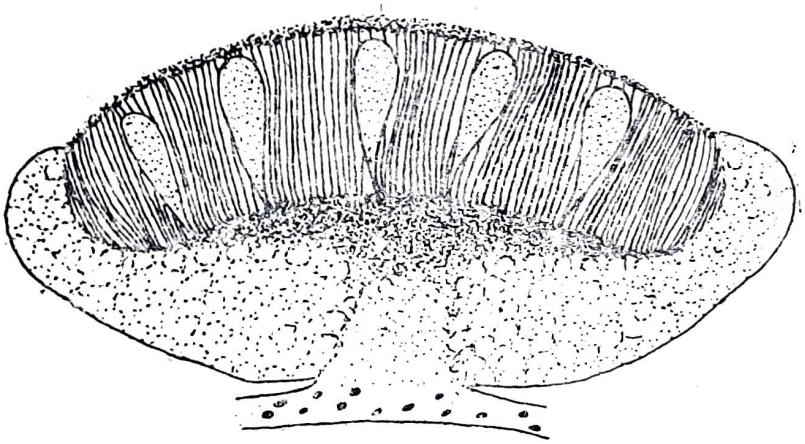

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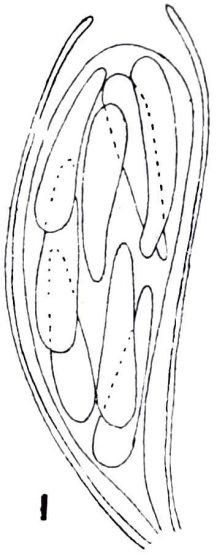

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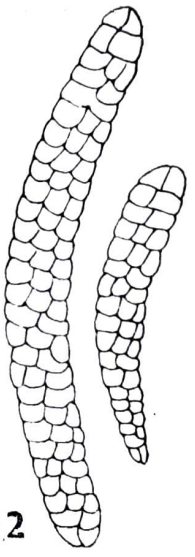

12

Figs.1,4,7,10. 50 µm Figs.2,3,5,6,8,9,11,12. 50 µm

Text-figs. 1-12

12. *P. phyllogena* Müll. Arg., Sant., *Symb. Bot. Upsal.*, 12(1) : 211. 1952.

The species grows scarcely in the area in association with *Porina cupreola*. Earlier reported by A. Singh (1979) from Andaman Islands.
Locality—Phek, Ketchapi forest, alt. ca. 1250 m, Sinha N. 1633 B.

ASTEROTHYRIACEAE

CALENIA Müll. Arg. em Sant.

13. *Calenia conspersa* (Strit.) Sant., *Symb. Bot. Upsal.*, **12**(1) : 340. 1952.

The taxon grows usually in association with *Porina cupreola*, and is moderately common in the area. Earlier reported by K. Singh (1977) from Manipur.
Locality—Phek, Ketchapi forest, alt. ca. 1250 m, Sinha N. 1633 C.

GYALECTIDIUM Müll. Arg.

14. *Gyalectidium filicinum* Müll. Arg. Sant., *Symb. Bot. Upsal.*, **12**(1) : 355. 1952.

The taxon grows in association with *Tapellaria bilimbioides*. It is moderately common in the area. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.
Locality—Kohima, Rangapahar, Coffe plantations, Sinha N. 1645 A.

TRICHARIA Fée em Sant.

15. *Tricharia albostrigosa* Sant., *Symb. Bot. Upsal.*, 12(1) : 383. 1952.

The species is very common and grows usually in association with *Byssoloma rotuliforme*. Earlier reported by Awasthi and Singh (1973) from South Indian hills.
Locality—Phek, Ketchapi forest, alt. ca. 1250 m, Sinha N. 1638 H ; Kohima, Rangapahar, Coffee plantations, Sinha N. 1642 B.

*16. *T. vainioi* Sant., *Symb. Bot. Upsal.*, **12**(1) : 382, 1952.
Text-figs 4, 5, 6

Thallus smooth provided with black hairs, greyish green, upto 10 mm across. Apothecia adnate, rounded, upto 0.3 mm diam ; disc light brown to dark brown plane, epruinose ; exciple colourless prosoplecten-chymatous, 18-21 μm thick at base as well as at margins ; hymenium colourless, 36-45 μm thick. I- ; hypothecium colourless ca. 10 μm thick ; asci 1-spore, spores colourless, muriform, oblong-ellipsoid, 27-46 $\times$ 12-16 μm.

The species is known to occur in tropical regions of Africa, Australia and Malaysia. In external characters *Tricharia vainioi* resembles *Tricharia triseptata*, but can easily be distinguished from the latter species by 1-spored asci. It grows usually in association with *Tricharia albostrigosa*, and is moderately common in the area.
Locality—Kohima, Rangapahar, Coffee plantations, Sinha N. 1644 B.

Text-fig. 1—1-3. Anatomical details of *Mazosia paupercula*, 1. V. S. through pseudothecium, 2. Ascus and paraphyses, 3. Spores; 4-6. Anatomical details of *Tricharia vainioi:* 4. V. S. through apothecium, 5. Ascus and paraphyses, 6. Spore; 7-9. Anatomical details of *Lecidea nagalandica:* 7. V.S. through apothecium, 8. Ascus and paraphyses, 9. Spores; and 10-12. Anatomical details of *Lopadium nymanii:* 10. V. S. through apothecium, 11. Ascus and paraphyses, 12. Spores.

LECIDEACEAE

LECIDEA Ach. em Th. Fr.

*17. *Lecidea nagalandica* Sinha & Singh sp. nov.

Text-figs. 7-9

Thallus tenuissimus, dispersus, verrucolosus, viridi-cinereus. Apothecia fusca, rotundata, basi bene constricta vel peltata, 0.5-1.00 mm diam., margine prominente, albide ; disco plano demum convexo fusco, epruinoso ; hymenium incoloratum, 55-72 μm altum ; hypothecium incoloratum 10-15 μm altus ; excipulum paraplectenchymaticum, fuscum ; asci 8-spori, clavati ; sporae decolores, simplices, ovoido-ellipsoideae, 8-15 μm longae, 5-7.5 μm crassae ; paraphyses simplices, apicibus furctae.

Thallus thin, crustaceous, verruculose, occurs in rounded to irregular patches, greenish grey, ca. 35 μm thick, hypothallus absent. Algal cells green, globose, ca. 5 μm diam.

Apothelia rounded, constricted below in beginning but becomes peltage at maturity, 0.5-1.00 mm in diam., ca. 330-335 μm high ; margin whitish, disc dark brown, plane to little convex, epruinose ; epithecium colourless, 8-10 μm thick ; hymenium colourless, 55-72 μm thick ; hypothecium colourless, 10-15 μm thick ; exciple brown black, gradually becoming narrower towards margin, paraplectenchymatous, 30-36 μm at margins and 88-97 μm thick at base; outer marginal part of exciple colourless, 14-15 μm thick, crystals present near the base below excipullar region ; asci 8-spored, clavate, 45-60 × 14-17 μm ; spores colourless, simple, oval to ellipsoid, 8-15 × 5-7.5 μm; paraphyses simple, septate, sometimes furcated above, ca. 1 μm thick.

In his monumental work, Santesson (1952) reported only one foliicolous species—*Lecidea traliena* Müll. Arg. from Brazil. But this species differs from the present described new species by its colorless esciple. The species grows in association with *Mazosia pauperscula*.

Holotype—Nagaland, Kohima, Jalukie (India) near Rubber plantations, on the leaves of *Goniothalamus sesquipedalis* (wall.) Hk. f. & T, alt. ca. 500 m, dt. 11-10-1984 leg G. P. Sinha N. 779 A. (Assam).

CATILLARIA A. Mass em Th. Fr.

18. *Catillaria bouteillei* (Desm.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 430. 1952.

It grows scarcely in association with *Byssoloma leucoblepharum*. Earlier reported by Awasthi and Singh (1973) from South Indian hills.

Locality—Phek, Ketchapi forest, alt. ca. 1250m, Sinha N. 1634 A.

19. *C. semicarpi* Vain, Sant., *Symb. Bot. Upsal.*, **12**(1) : 435. 1952.

The species grows abundantally on the leaves of *Piper nigrum*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Kohima, Rangapahar, Coffee plantations, Sinha N. 778 B.

BACIDIA Dont. em Zahlbr.

20. *Bacidia fuscatula* (Müll. Arg.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 456. 1952.

The species grows scarcely in the area in association with *Porina epiphylla* and *Byssoloma leucoblepharum* on the leaves of *wallichia* spp. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt. ca. 1200 m, Sinha N.786 E.

21. *B. rhaphidophylli* (Rehm.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 457. 1952.

The taxon grows on the leaves of *Coffea arabica*. It is moderately common in the area. Earlier reportd by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Kohima, Rangapahar, Coffee plantations, Sinha N. 1648 A.

BYSSOLOMA Trevis.

22. *Byssoloma chlorinum* (Vain.) Zahlbr., Sant., *Symb. Bot. Upsal.*, 12(1) : 489. 1952.

The species grows in association with *Porina nitidula*. Earlier reported by A. Singh (1973) from Andaman Islands.

Locality—Phek, Meluri, near lake ca. 1 km om Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 783 B.

23. *B. leucoblepharum* (Nyl.) vain., Sant., *Symb. Bot. Upsal.*, **1**(1) : 483. 1952.

The species is very abundant and grows usually in association with *Porina epiphylla*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Phek, Meluri, near lake ca. 1 km on Melui-Phek Road., alt., ca 1200 m, Sinha N. 786 B ; Kohima, Phulabadge reserve forest, alt., ca. 1,600 m. Sinha N. 1640 C.

24. *B. rotuliforme* (Mull. Arg.) Sant., *Symb. Bot. Upsal.*, **12**(1) : 490. 1952.

The species grows abundantally in association with *Byssoloma leucoblepharum*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Kohima, Phulabadge Reserve Forest, alt., ca. 1500 m, Sinha N. 1640 B and Sinha N. 1642 C.

TAPELLARIA Mull. Arg. em Sant.

25. *Tapellaria bilimbioides* Sant., *Symb. Bot. Upsal.*, 12(1) : 498. 1952.

The taxon grows abundantally in the area associated with *Tricharia albostrigosa* Sant. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Phek, Ketchapi forset, alt. ca. 1250 Om, Sinha N. 1635 A and Sinha N. 1642 E.

SPOROPODIUM Mont. em Sant.

26. *Sporopodium xantholeucum* (Müll. Arg.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 519. 1952.

The species grows scarcely in association with *Porina epiphylla*. Earlier reported by Awasthi (1963), Awasthi and Singh (1972, 1973) and A. Singh (1979) from South Indian hills and Andaman Islands respectively.

Locality—Kohima, Jalukie near Rubber plantations, alt., ca. 500 m, Sinha N. 779 F.

LOPADIUM Korb.

27. *Lopadium fuscum* Mull. Arg., Sant., *Symb. Bot. Upsal.*, **12**(1) : 532. 1952.

The species grows usually in moist shady places on the leaves of cucurbitaceous plants. Earlier reported by Awasthi and Singh (1972, 1973), A. Singh (1973) and Patwardhan

and Makhija (1981) from South Indian hills, Andamon Islands and South Western India respectively.

Locality—Phek, Pfutsero, near Korba Village, alt. ca. 2100 m, Sinha N. 1632..

*28. *L. nymanii* Sant., *Symb. Bot. Upsal.*, **12**(1) : 526. 1952.

Text. figs. 10, 11, 12

Thallus smooth, scattered in small patches, greenish-grey. Apothecia rounded, constricted at base, ca. 0.5 mm, dark brown, margin thin, plane, epruinose ; hymenium colourless, 110-112 μm thick ; hypothecium dark brown, 36-50 μm thick ; exciple colourless, paraplectenchymatous, at margins ca. 40-45 μm thick, in basal part ca. 110-120 μm thick ; asci clavate, (2-4) 8 spored, 90-120×16-28 μm ; spores colourless, muriform, cylindrical, 54-110×7-13 μm.

In external morphology and anatomy *Lopadium nymanii* closely resembles *Lopadium phyllogenum*, but the latter species possesses 2-3 spored asci. The species grows scarcely in the area in association with *Tricharia vainioi*. It is known so far from Malaysia, and is a new record for Indian flora.

Locality—Kohima, Rangapahar, Coffee plantations, Sinha N. 1644.

29. *L. puiggarii* (Müll. Arg.) Zahlbr., Sant., *Symb. Bot. Upsal.*, **12**(1) : 535. 1952.

The species grows scarcely in association with *Porina nitidula*. Earlier reported by Awasthi and Singh (1972) and Patwardhan and Makhija (1981) from South Indian hills and South Western India respevtively.

Locality—Phek, Meluri, near lake ca. 1 km on Meluri-Phek Road, alt. ca. 1200 m, Sinha N. 782 C.

30. *L. subcoerulescens* Zahlbr., Sant., *Symb. Bot. Upsal.*, 12(1) : 538. 1952.

The species grows on the leaves of *Coffea arabica*. Earlier reported by Awasthi and Singh (1972, 1973) and A. Singh (1973) from South Indian hills and Andaman Islands respectively.

Locality—Kohima, Rangapahar, Coffee plantations, Sinha N. 1647.

BYSSOLECANIA Vain.

31. *Byssolecania fumosonigricans* (Müll. Arg.) Sant., *Symb. Bot. Upsal.*, **12**(1) : 553, 1952.

The taxon grows usually in association with *Byssoloma rotuliforme* and *Tricharia albostrigosa*. Earlier reported by Awasthi and Singh (1972, 1973) from South Indian hills.

Locality—Kohima, Phulabadge reserve forest, alt. ca. 1600 m, Sinha N. 1641 A ; Kohima, Rangapahar, Coffee plantations, Sinha N. 1644 G.

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