

LICHENS FLORA OF PHULCHOKI (KATHMANDU)

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ABSTRACT

Study of lichens flora of Phulchoki showed that this area is rich in the lichen flora. A total of 250 different samples were collected from this area. The identification of collected specimens was done on basis of their morphological, anatomical and inimical studies. The lichens were collected from different altitudinal gradients extending from 1500-2700m. above sea level. The association of lichens with different substrata also studied. A total of 32 species of lichens were identified, which encompass 9 families and 10 genera. Among them family Parmeliaceae was largest.

Key words: Lichens, Morphology, Jhayao, Anatomy, Thin layer chromatography, Microcrystallography.

INTRODUCTION

In Nepali lichens are commonly known as Jhayao or Tare. They are dual organisms, i.e. they are product of mutually benefited two organisms (Sharma, 1995). It is an association of a fungus (mycobiont) and an alga (phycobiont). About 13,500 to 17,000 species of lichens extend from the tropics to the polar region. In Nepal, 471 spp. of lichens have been reported, of which 48 species are endemic. Baniya (1996) enumerated 99 species of lichens from Sikles and Shivapuri. Lichens are pioneer groups of organism that initiate vegetation in bare area. The components of lichen flora are governed by altitudinal variation. The growth forms of lichen also vary. Usually in Terai and Siwalik belt with alt. upto 1000m. the lichen flora consists of mainly crustose form. At higher alt. they remain either in foliose or fruticose form.

Very little work has been done in Nepal till now. Most of lichens of Nepal were recorded by foreigner as new record to science but not even a single type specimen kept in our herbaria. Most parts of Nepal remain lichenologically unexplored. It is felt that it is an important to make further exploration of lichen in order to make complete study on plant kingdom. So present study was undertaken with the objectives of collection of lichens and their identification.

MATERIALS AND METHODOLOGY

Materials were collected from Phulchoki (Ktm.) during 2nd Jan. 2003 to 9th Jan. 2003, by sampling 10m×10m quadrat and 5m×5m sub-quadrat (Vetas, 1997). Lichens growing on different substrata were collected by standwise manner from 1500m to 2700m above sea level. All specimens were dried properly and herbaria were prepared according to method given by Nash et al. (1993).

IDENTIFICATION

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Lichens specimens collected during study period, were identified in the laboratory of the Central Department of Botany, Tribhuvan University, Kirtipur. Each specimen was identified with the help of their morphology, anatomy, colour reaction, thin layer chromatography, microcrystallography and cross-checking of authentic samples deposited in Central Department of Botany.

To identify each genus and species, the Key to Macrolichens (Awasthi, 1988) and the Key to Microlichens (Awasthi, 1991) have been consulted.

RESULT AND DISCUSSION

A total of 32 species of lichens were identified in present study, which is given below. Their family, form and chemical constituents were also given.

1. *Peltigera polydactyla* (Neck.) Hoffm.,
Peltigereaceae
Thallus foliose, photobiont blue-green algae, muscicolous.
Chemical constituents - Tenuionin and Dolichorrhizin.
2. *Parmelia cirrhata* Fr. Syst. Orb. Veget., 1:383, 1825;
Parmenaceae
Thallus corticolous, lignicolous, foliose, grey to dark grey.
Chemical constituents - Altranorin, Salacinic acid and protolichesterinic acid.
3. *Parmelia nepalensis* Tayl., London J. Bot. 6:172, 1847; **Parmenaceae**
Thallus corticolous, foliose, grey to dark grey
Chemical constituents - Atranorin, Salacinic acid, protolichesterinic acid.
4. *Parmelia nilgherrensis* Nyl, Flora, 52:299, 1869, **Parmeliaceae**
Thallus corticolous, foliose, grey.
Chemical constituents - Atranorin, Alecoronic acid, α -collatolic acid.
5. *Parmelia reticulata* Tayl, In Mack, Fl. Hibern, 2:148, 1836,
Parmeliaceae
Thallus corticolous, Foliose, mineral grey to dark grey.
Chemical constituents- Atranorin, Salacinic acid.
6. *Parmelia sancti-angelii* Lyngé, Ark.F.Bot. 13(13); 35,1914;
Parmeliaceae
Thallus corticolous, foliose, grey to dark grey
Chemical constituents- Gyrophoric acid and Atranorin

7. *Parmelia tinctorum* Nyl, Flora, 55:547, 1872; **Parmeliaceae**
Thallus corticolous, foliose, loosely to closely adnate to substrature
glaucous grey.
Chemical constituents- Atranorin, Lecanoric acid.
8. *Parmelia wallichiana* Tayl. London J. Bot. 6:176, 1847; **Parmeliaceae**
Thallus corticolous, foliose, dark grey to whitish grey, rounded margin.
Chemical constituents- Atranorin and Salacinic acid.
9. *Parmelia sulcata* Tayl. In Mack; Flora Hibernica, 2:145, 1836;
Parmeliaceae
Thallus corticolous, foliose, loosely attached to the substratum, rosette
form, bluish grey.
Chemical constituents- Atranorin, Salacinic acid, Protocetraric acid.
10. *Parmelia stipitata* Tayl., Lond. J. Bot. Bot. 6:174, 1847; **Parmeliaceae**
Thallus corticolous, foliose, large, whitish grey, rotund.
Chemical constituents- Atranorin, Salacinic acid.
11. *Parmelia flesilis* Kurok., In Hara, The flora of Eastern Himalaya, 607,
1966; **Parmeliaceae**
Thallus corticolous, foliose, closely adnate to the substratum, margin
crenate whitish grey.
Chemical constituents- Atranorin, protolichesterinic acid.
12. *Parmelaria thomsonii* (Stirt) Awas. Journ. Hattori Bot. Lab. No. 63:368-
370, 1987; **Parmeliaceae**
Thallus corticolous, foliose, loosely attached to the substratum, ashy grey
to grey.
Chemical constituents- Aleatoronic acid and α -collatolic acid.
13. *Cladonia coniocraea* (Flor.) Spreng. Syst. Veg. Linn., ed. 16, 4:277
1827; **Cladoniaceae**
Having primary squamules irregularly incised lobe, podetia cylindrical.
Chemical constituents- Fumarprotocetraric acid.
14. *Cladonia ramulosa* (with.) Laundon, Lichenologist, 16(3):211-239,
1984 **Cladoniaceae**
Having persistent primary squamules, irregularly lobed, podetial cup
simple.
Chemical constituents- Fumarprotocetraric acid.

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15. *Heterodermia diademata* Tayl., J. Bot. London, 6:165, 1847;
Physciaceae
Thallus loosely attached to the substratum. gravish white. lobes dichotomously to irregularly branched.
Chemical constituents- Atranorin, Zeorin.
16. *Heterodermia dissecta* (Kurok.) Awas. Geophy. 3(1):113-116,1973
Physciaceae
Thallus mineral greyish. closely appressed to the substratum. lobes dichotomously to irregularly branched.
Chemical constituents- *Atranorin, Zeorin, Salacinic acid, Norstictic acid.*
17. *Heterodermia incana* (Stirt) Awas geophy. 3(1):113-116, 1973;
Physciaceae
Thallus whitish grey. *attached centrallv to the subsstratum; foliose.*
Chemical constituents- *Atranorin, Zeorin.*
18. *Heterodemia leucomela* (L.) Massal, Mem. Lich 35, 1853; **Physciaceae**
Thallus mineral grey. Loosely attached to the substratum, lobes dicholomously branched.
Chemical constituents- Atranorin, Zeorin, Salacinic acid.
19. *Heterodermia pseudospeciosa* (Kurok) W.culb.Brovologist 69:484, 1966; **Physciaceae**
Thallus mineral grey to grey, loosely attached to the substratum, growing in roucae parcnes.
Chemical constituents- *Atranorin. Zeorin. Salacinic acid. Zeorin.*
20. *Heterodermi punctifera* (Kurok.) Awas, Geophy: 3(1):114, 1973;
Physciaceae
Thallus whitish grey, closely apprissd to the substratum, occurring in small orbicular partcnes.
Chemical constituents- Atranorin. Zeorin. Norstictic acid.
21. *Heterodermia speciosa* Trev. Atti Soc. Ital. Sc. Nat. Milano xi:614, 1868; **Physciaceae**
Thallus whitish grey. closely appressed to the substratum.
Chemical constituents- Atranorin. Zeorin.
22. *Usnea aciculifera* Vain Bot. Mag. Tokyo 35:45 1921; **Usneaceae**

- Thallus corticolous, fruticose, decumbent to pendulous greenish yellow to brown.
Chemical constituents- Usnic acid, stictic acid.
23. *Usnea orientalis* Mot. Lich. Gen. Usnea stud. Monogr, Pars. syst. 547(1936-38); **Usneaceae**
Thallus corticolous, fruticose, erect upto 7cm, tall greenish grey.
Chemical constituents- Usnic acid. salacinic acid.
24. *Usnea thomsoni*; stirt. Scoot Nature 6:107; 1881; **Usneaceae**
Thallus corticolous. Erect 5-7 cm tall, dark brown to black.
Chemical constituents- Usnic acid and Stictic acid complex.
25. *Ramalina usnea* (L.) Howe, Bryologist 17:81, 1914; **Ramalinaceae**
Thallus erect to subpendulous ribbon like thallus.
Chemical constituents- Sekikaic acid.
26. *Ramalina sinensis* Jatta, Nuov. Giorn. Bot. Ital. 9:462, 1902; **Ramalinaceae**
Thallus erect to subpendulous. Firmly attached to the substratum by narrow basal disc, pale - grey to greenish grey.
Chemical constituents- Usnic acid.
27. *Stereocaulon coniophyllum* Lamb. Journ Hattori Bot. Lab. **Stereocaulaceae**
Pseudopodetia soresiate, upto 5cm. Tall, robust, rigid.
Chemical constituents- Atranorin, lobaric acid.
28. *Chrysothrix chlorina* (Ach.) Laundon, Lichenologist, 13(2):106-110 mm. diam.
Thallus thick, yellow cu/rust, corticolous. Granules 0.1-0.2 mm. diam.
Chemical constituents- calyan and Vulpinic acid.
29. *Leptogium delavayi* Hue, Bull. Soc. Bot. France, 36:25, 1889; **Collemataceae**
Thallus corticolous, as well as muscicolous on bark and ston, foliose, dark grey to pale grey in dry.
30. *Leptogium resupinas*, Nyl, Annal, Soc. Nat. Bot. 15(4), 368, 1861; **Collemataceae**
Thallus foliose, upto 3 cm. in size, ashy grey when dry, olive green when wet.

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Chemical constituents- No lichen substances.

31. *Leptogium indicum* Awas, and P. Akhtar, Geophy: 8(2): 191-198, 1979;
Collemataceae

Thallus foliose, 3-6cm in size, light to dark lead grey when dry, olive green when wet.

Chemical constituents- No lichen substances.

32. *Leptogium trichophiorwn* Mull Arg. Flora 72; 505, 1889;
Collemataceae

Thallus folise, upto 5cm in size, loosely attached to the substratum grey brown to brown black when dry, dark olivaceous green when wet.

Chemical constituents- No lichen substance.

CONCLUSION

This paper has presented 9 families of lichens, they are under 10 genera and 32 species, among them genus Parmelia is largest one.

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