

MOSSES COLLECTED DURING NILKANTH AND CHAUKHAMBHA EXPEDITION—1959

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ABSTRACT

The mosses collected during I.A.F. Expedition to Nilkanth and Chaukhamba peaks in the year 1959 are listed with brief field notes. These comprise 60 species covering 13 families and 35 genera and include 2 new records for India and 3 for Western Himalayas.

In October 1959, an Indian Air Force Expedition was sent to Garhwal-Himalayas for scaling Nilkanth and Chaukhamba peaks and to make scientific observations in the valleys at the foot of these peaks, which are very close to Badrinath, a place of pilgrimage. Dr. M. A. Rau, Regional Botanist, Northern Circle, Botanical Survey of India, Dehra Dun, was deputed to accompany the expedition for botanical exploration. The senior author of this paper went with him as an assistant and was entrusted to collect lower group of plants especially the mosses. The party made Mana (3000 m) as the base camp and surveyed the following areas : Joshimath, Pandukeshwar, Mana, Vasudhara, Nar Parbat, Satopant glacial bed, Badrinath, Rishiganga valley, Ghastoli, Hanumanchatti and Khiraun valley.

The moss vegetation is comparatively rich in Khiraun valley (2500 m) where the humidity is quite high. A number of mosses were collected from this area and more common ones were : *Desmatodon latifolius*, *Didymodon recurvus*, *Fissidens cristatus*, *Funaria hygrometrica*, *Grimmia ovalis*, *Pohlia flexuosa* and *Racomitrium himalayana*. Some of the interesting and rare species collected from Mana and Ghastoli areas are : *Aloina rigida*, *Andreaea rupestris*, *Barbula unguiculata*, *Mielichhoferia badhwari*, *Mniobryum delicatulum* and *Polytrichum piliferum*.

In all 200 specimens comprising 60 species, representing 13 families and 35 genera were collected. The classification of Brotherus (1924-25) is followed. Nomenclature has been made upto date based on Wijk *et al.* (1959, 1962). For each taxon the following data are given : habit, habitat, locality, altitude, field number and date of collection.

The specimens are deposited in the Herbarium of the Northern Circle, Botanical Survey of India, Dehra Dun and some in the Herbarium of the Headquarters Organisation, Botanical Survey of India, Calcutta.

ENUMERATION ANDREAEACEAE

Andreaea rupestris Hedw.

Lax decumbent tufts on exposed rock. Above Mana, 4000 m. *Vohra* 33. Oct. 10, 1959. It is a new record from W. Himalayas.

FISSIDENTACEAE

Fissidens cristatus Wils. et Mitt.

Loose tufts on rocks, in running stream. Khiraun valley, 2500 m. *Vohra* 174. Oct. 26, 1959.

F. grandifrons Brid.

Extensive mats on submerged rocks. Hanumanchatti, 2500 m. *Vohra* 119. Oct. 25, 1959.

F. gollani Broth.

Lax tufts on clayey bank. Mana, 3500 m. *Vohra* 116. Oct. 16, 1959.

DITRICHACEAE

Ditrichum tortipes (Mitt.) O. Kuntze, Rev. Gen. Pl.

2 : 835, 1891. *Leptotrichum tortipes* Mitt. J. Linn. Soc. Bot. Suppl. 1 : 10, 1859.

Low tufts on moist soil. Pandukeshwar, 2300 m. *Vohra* 145. Oct. 26, 1959.

Distichium capillaceum (Hedw.) B.S.G. Bryol. Eur.

2 : 156, t. 193, 1846. *Cynontodium capillaceum* Hedw. Spec. Musc. 57, 1801.

Compact cushions along forest road. Satopant glacial bed, 3000 m, Mana, 3500 m, Ghastoli, 4000 m. *Vohra* 50, 52, 60, 102, 181, 182. Oct. 10, 15 & 26, 1959.

DICRANACEAE

Dicranella varia Schimp.

Low tufts on clay soil. Mana, 3000 m. *Vohra* 173. Oct. 26, 1959.

Symblepharis vaginata (Hook.) Wijk et Marg. Taxon

8 : 75, 1959. *Didymodon vaginatus* Hook. Icon. Pl. t. 18, fig. 4, 1836.

Dense close cushions on calcareous soil. Rishiganga valley, 3000 m. *Vohra* 87. Oct. 13, 1959.

Dicranum kashmirens Broth.

Compact tufts, near stream. Satopant glacial bed, 3500 m. *Vohra* 58. Oct. 10, 1959.

POTTIACEAE

Timmiella diminuta (C. Muell.) Chen, Hedwigia 80 :

176, 1941. *Trichostomum diminutum* C. Muell. in Nuov. Giorn. Bot. Ital. 177, 1898.

In small lax cushions on wet soil. Badrinath, 3000 m. *Vohra* 135. Oct. 25, 1959.

Tortella tortuosa (Hedw.) Limpr. Laubm. Deutschl.

1 : 599, 1888. *Tortula tortuosa* Hedw. Spec. Musc. 124, 1801.

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Dense tufts on rock and damp ground. Khiraun valley, 2500 m, Badrinath. 3000 m. *Vohra* 150, 127. Oct. 25 & 26, 1959.

Hyophila involuta (Hook.) Jaeg. Ber. S. Gall. Naturw. Ges. 354, 1871-72. et Ad. 1: 202, 1873. *Gymnostomum involutum* Hook. Musci Exot. 2: 154, 1819.

Scattered lax cushions on soil along road-side. Pandukeshwar, 2000 m. *Vohra* 159, 162. Oct. 26, 1959.

Didymodon recurvus (Griff.) Broth. in Nat. Pfl. 1 (3): 405, 1902. *Gymnostomum recurvum* Griff. Cal. J. Nat. Hist. 2: 482, 1842.

Compact tufts on exposed rocks. Vasudhara, 3500 m, Khiraun valley, 2500 m. *Vohra* 27, 146. Oct. 7 & 26, 1959.

Barbula constricta Mitt.

Dense cushions on exposed rock. Khiraun valley, 2500 m. *Vohra* 166. Oct. 26, 1959.

B. reflexa (Brid.) Brid. Mant. Musc. 93, 1819. *Tortula reflexa* Brid. Sp. Musc. 1: 255, 1806.

Small close tufts on grassy ground near stream. Rishiganga valley, 3500 m. *Vohra* 92. Oct. 12, 1959.

B. unguiculata Hedw.

Small scattered plants on calcareous rock. Mana 3000 m. *Vohra* 117 A. Oct. 16, 1959.

This species was growing in association with *Aloina rigida* (Hedw.) Limpr. and *Anomobryum nitidum* (Mitt.) Jaeg.

B. vinealis Brid.

Loose tufts on exposed rock. Rishiganga valley, 3500 m. *Vohra* 28. Oct. 13, 1959.

Bryoerythrophyllum atrorubens (Besch.) Chen, Hedwigia 80: 262, 1941. *Trichostomum atrorubens* Besch. Ann. Sc. Nat. 1: 55, 1892.

Compact reddish brown cushions on wet sandy ground. Below Vasudhara Fall, 3500 m. *Vohra* 28. Oct. 7, 1959.

It was in association with *Anomobryum cymbifolium* (Lindb.) Broth.

Desmatodon latifolius (Hedw.) Brid. Mant. Musc. 86, 1819. *Dicranum latifolium* Hedw. Spec. Musc. 140, 1801.

Loose tufts on wet mountain slopes. Rishiganga valley, 4000 m, Khiraun valley, 2500 m, Ghastoli, 4000 m. *Vohra* 80, 63, 97. Oct. 13 & 16, 1959.

Aloina rigida (Hedw.) Limpr. Laubm. Deutschl. 1: 632, 1888. *Barbula rigida* Hedw. Spec. Musc. 115, 1801.

Gregarious, very small plants on calcareous rock. Mana, 3000 m, Ghastoli, 4000 m. *Vohra* 117, 175. Oct. 16, 1959.

This genus is being reported for the first time from India.

Tortula princeps De Not.

Loose tufts on rock. Khiraun valley, 2500 m. *Vohra* 153. Oct. 26, 1959.

GRIMMIACEAE

Grimmia apiculata Hornsch.

Small dense cushions of dark green colour on rock. Nar Parbat, 4000 m. *Vohra* 35, 36. Oct. 8, 1959.

G. ovalis (Hedw.) Lindb. Act. Soc. Sc. Fenn. 10: 75, 1871. *Dicranum ovale* Hedw. Spec. Musc. 140, 1801. *Grimmia ovata* Web. et Mohr, Naturh. Reise Schwedens. 132, 1804.

Compact hoary cushions on rock. Khiraun valley, 2500 m. *Vohra* 176 A. Oct. 26, 1959.

Schistidium apocarpum (Hedw.) B.S.G. Bryol. Eur. 3: 7, 1844-45. *Grimmia apocarpa* Hedw. Spec. Musc. 76, 1801.

Small tufts or cushions of reddish-brown colour on rocks, common. Nar Parbat, 4,000 m. *Vohra* 38. Oct. 8, 1959.

Rhacomitrium canescens (Hedw.) Brid. Mant. Musc. 78, 1819. et Bryol. Univ. 1: 208 1826. *Trichostomum canescens* Hedw. Musc. Frond. 3: 5, t. 3, 1823-24.

Lax tufts of bright yellowish-green colour on forest humus, under the shade of *Betula* trees. Satopant glacial bed, 3500 m. *Vohra* 53. Oct. 11, 1959.

It is reported for the first time from Western Himalayas.

Rh. himalayanum (Mitt.) Jaeg. Ad. 1: 375, 1872. *Grimmia himalayana* Mitt. J. Linn. Soc. Bot. Suppl. 1: 45, 1859.

Loose tufts of pale green colour on soil alongside spring. Nar parbat, 4000 m, Khiraun valley, 2500 m. *Vohra* 30 & 176. Oct. 8 & 26, 1959.

This is a new record for Western Himalayas.

FUNARIACEAE

Funaria hygrometrica Hedw.

Extensive carpets on soil, very common. Pandukeshwar, 2300 m, Khiraun valley, 2500 m. *Vohra* 5, 142, 147, 163. Oct. 4 & 26, 1959.

BRYACEAE

Mielichhoferia badhwari Dix.

Dense compact tufts on calcareous rock. Ghastoli, 4000 m, Mana, 3500 m. *Vohra* 177, 123. Oct. 16 & 25, 1959.

Pohlia cruda (Hedw.) Lindb. Dillenii Hist. Musc. 33, 1883. *Mnium crudum* Hedw. Spec. Musc. 189, 1801.

Dense tufts on soil, along forest road. Satopant glacial bed, 3500 m. *Vohra* 51. Oct. 11, 1959.

P. elongata Hedw.

Dense tufts along roadside. Joshimath, 2000 m. *Vohra* 178. Oct. 26, 1959.

P. flexuosa Hook.

Lax tufts on clay soil, under the shade. Khiraun valley, 2500 m, Hanumanchatti, 2500 m. *Vohra* 141, 130, 131. Oct. 26 & 25, 1959.

Pohlia acuminata Hoppe et Hornsch.

Dense tufts on mountain slopes, along roadside. Ghastoli, 4000 m. *Vohra* 113. Oct. 16, 1959.

Mniobryum delicatulum (Hedw.) Dix. Rev. Bryol. N. S. 6: 107, 1933. *Bryum delicatulum* Hedw. Spec. Musc. 179, 1801.

Loose tufts on clay soil near spring. Mana 3500 m. *Vohra* 179. Oct. 16, 1959.

Brachymerium nepalense Hook.

Small bright cushions on mountain slopes in moist places. Badrinath, 3500 m. *Vohra* 10, 11 A. Oct. 4, 1959.

Anomobryum cymbifolium (Lindb.) Broth. Rec. bot. Surv. India. 1: 320, 1899. *Bryum cymbifolium* Lindb. Not. Saellsk. F. Fl. Fenn. 1: 45, 1870.

Compact tufts on wet sandy soil. Below Vasudhara Falls, 3500 m. *Vohra* 28 A. Oct. 7, 1959.

A. nitidum (Mitt.) Jaeg. Ber. S. Gall. Naturw. Ges. 1873-74: 142, 1875. *Bryum nitidum* Mitt. J. Linn. Soc. Bot. Suppl. 1: 67, 1859.

Small tufts on calcareous rock. Hanumanchatti, 2500 m, Mana, 3000 m. *Vohra* 121, 117 B. Oct. 25 & 15, 1959.

Bryum argenteum Hedw.

Low tufts in rocky crevices, common. Vishnuparyag, 1500 m. *Vohra* 4. Oct. 4, 1959.

B. cellulare Hook.

Compact tufts on gravelly stream bed. Satopant glacial bed, 3600 m. *Vohra* 42. Oct. 10, 1959.

B. duvalii Voit.

Very lax tufts on stream bed. Satopant glacial bed, 4000 m. *Vohra* 41. Oct. 10, 1959.

B. prophyron C. Muell. var. **erythrinum** (Mitt.) Fleisch. Broth in Nat. Pfl. 1(3): 590, 1904. *B. erythrinum* Mitt. J. Linn. Soc. Bot. Suppl. 1: 70, 1859.

Dense cushions on mountain slopes. Vishnuprayag, 1500 m. *Vohra* 167, Oct. 26, 1959.

Rhodobryum roseum (Hedw.) Limpr. in Radenh. Dr. Kr. Fl. Laubm. 2: 445, 1893. *Mnium roseum* Hedw. Spec. Musc. 194, 1801.

Large loose mats on humus in shady mountain slopes. Pandukeshwar, 2000 m. *Vohra* 8, Oct. 4, 1959.

MNIACEAE

Mnium cuspidatum Hedw.

Green mats on humus. Pandukeshwar, 2000 m. *Vohra* 16. Oct. 4, 1959.

M. marginatum (Dicks. ex With.) P. Beauv. Prodr. 75, 1805. *Bryum marginatum* Dicks. ex With. Syst. Arr. Brit. Pl. edit. 4, 3: 824, 1801.

Small tufts on humus, under shade of *Betula* trees. Satopant glacial bed, 3500 m. *Vohra* 46. Oct. 10, 1959.

M. orthorrhynchum Brid.

Close tufts on shady mountain slope. Rishiganga valley, 3500 m. *Vohra* 70. Oct. 13, 1959.

BARTRAMIACEAE

Bartramia subpellucida Mitt.

Compact cushions on mountain slopes. Satopant glacial bed, 3500 m. *Vohra* 48, Oct. 10, 1959.

Philonotis calcarea (B.S.G.) Schimp. Coroll. 86, 1856. et. Syn. edit. 2, 520, 1876. *Bartramia calcarea* B.S.G. Bryol. Eur. 4: 19, t. 325, 1841-42.

Tall compact tufts alongside stream. Nar Parbat, 4000 m. *Vohra* 183. Oct. 8, 1959.

Ph. fontana (Hedw.) Brid. Bryol. Univ. 2: 18, 1827. *Mnium fontanum* Hedw. Spec. Musc. 195, 1801.

Tall wide tufts in stream beds, common. Rishiganga valley, 3500 m. *Vohra* 75. Oct. 13, 1959.

Ph. leptocarpa Mitt.

Close tufts on mountain slopes. Badrinath, 3000 m. *Vohra* 11. Oct. 4, 1959.

Ph. lutea Mitt.

Tall tufts in rocky crevices. Vasudhara, 3500 m. *Vohra* 20. Oct. 7, 1959.

Ph. revoluta Doz. et Molck.

Dense cushions near stream bed. Badrinath, 3100 m. *Vohra* 9. Oct. 4, 1959.

[TIMMIACEAE

Timmia bavarica Hessel.

Compact tufts on clay soil. Joshimath, 1800 m. *Vohra* 206, 208. Oct. 26, 1959.

AMBLYSTEGIACEAE

Drepanocladus uncinatus (Hedw.) Warnst. Beih. Bot. Centralbl. 13: 402, 417, 1903. *Hypnum uncinatum* Hedw. Spec. Musc. 289, 1801.

Dense mats on wet rocks, common. Nar Parbat, 4000 m. *Vohra* 32. Oct. 8, 1959.

POLYTRICHACEAE

Atrichum pallidum Ren. et Card.

Loose extensive patches on moist clay soil under shade. Pandukeshwar, 2000 m. *Vohra* 170. Oct. 26, 1959.

A. undulatum (Hedw.) P. Beauv. Prodr. 42, 1805. *Polytrichum undulatum* Hedw. Spec. Musc. 98, 1801.

Loose extensive patches on humus or clay soil under shade. Badrinath, 3000 m. *Vohra* 8. Oct. 4, 1959.

Pogonatum himalayanum Mitt.

Loose extensive carpets alongside forest road. Rishiganga valley, 3500 m, Khiraun valley, 2500 m. *Vohra* 72, 137, 160. Oct. 13 & 26, 1959.

P. perichaetiale (Mont.) Jaeg. Ad. 1: 719, 1873-74. *Polytrichum perichaetiale* Mont. Ann. Soc. Nat. 252, 1841. et Syll. 28, 1856.

Loose carpets on rock. Hanumanchatti, 2500 m. *Vohra* 120. Oct. 25, 1959.

Pogonatum stevensii Ren. et Card.

Dense carpets on rock. Vishnuparyag, 1500 m. *Vohra* 172. Oct. 27, 1959.

P. thomsonii Mitt.

Short tufts on moist ground near stream. Mana, 3500 m. *Vohra* 171. Oct. 16, 1959.

Polytrichum juniperinum Willd.

Lax tufts on open dry land. Ghastoli, 4000 m. *Vohra* 88, 100. Oct. 13 & 15, 1959.

P. piliferum Schreb.

Wide patches on alpine meadow, Ghastoli, 4000 m. *Vohra* 101. Oct. 16, 1959.

This is reported for the first time from India.

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