

Liverwort and hornwort Flora of Tehsil Mendhar (North-West Himalaya), India*

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The present communication deals with the distribution of forty four taxa (25 foliose and 19 thallose including 1 hornwort) belonging to 24 genera, 16 families and 4 orders, from tehsil Mendhar of district Poonch (Jammu and Kashmir state). Out of these, 28 (marked*) are new records for the state as a whole.

Key-words– Enumeration, Liverworts, Hornworts, North-West Himalaya.

INTRODUCTION

JAMMU and Kashmir state is a mountainous region of North-West Himalaya. It is divided into three regions namely Jammu, Kashmir and Ladakh comprising 6, 6 and 2 districts respectively. Whatever little information on bryoflora of state is available, pertains to Kashmir division only (Gola, 1914; Kashyap, 1929 & 1932; Robinson, 1965; Kaul & Dhar, 1968; Srivastava, 1979; Banday *et al.*, 1998). Mendhar-a small part of the district Poonch of Jammu division having a rich bryophytic flora has been explored for the first time while Ladakh division is totally unexplored.

Stretching over an area of 1674 sq. km, district Poonch is the smallest of six districts of the Jammu division. It is situated between 33° 25' and 34° 0' North latitudes and 73° 58' and 74° 33' East longitudes. Barring few low lying valleys, the whole district is criss-crossed by mountains, some of which have the height up to 3,300 meters. The high altitude areas experience tremendous snowfall which remains upto March. However, the low lying areas are hotter in summer and pleasant in winter. Average temperature during the summer months (May and June) is around 30° C and in winter (December and January),

the temperature is as low as 10°C to – 6°C. Climate of the larger part of the district Poonch is temperate having rainfall between 60-170 cm.

Tehsil Mendhar, one of the three tehsils (Mendhar, Surankote and Haveli) of the district Poonch stretches over an area of 418.4 sq km. It exhibits remarkable altitudinal (600 – 1800 m), topographic and edaphic diversity. Consequently, the climate and vegetation of the area ranges from subtropical to temperate and alpine and, therefore, offers congenial climatic conditions favourable for the luxuriant growth of bryophytes.

Preliminary survey of various localities of Mendhar has yielded 43 liverwort and 1 hornwort taxa. The Voucher specimens are deposited in the herbarium, Department of Botany, University of Jammu, Jammu and the duplicate plants of each taxon have been submitted to the Hepatic Herbarium of Lucknow University, Lucknow. These have been enumerated below, along with a note on their habitat, altitude, locality and accession numbers. Schuster's (1984) system of classification has been followed for arrangement of orders and families. The genera within family and the species within genus are sequenced alphabetically. The species marked with asterisk (*) are new records for Jammu and Kashmir state.

*Based on M.Phil. dissertation of MT

Metzgeriales

Fossombroniaceae

1. *Fossombronia wondraczekii* (Corda) Dum.
Sanghiote (MT234 & MT235); On moist soil; 1700-1800m.

Pelliaceae

2. *Pellia endivaefolia* (Dicks.) Dum.
Sanghiote (MT004, MT035), Gajna Pahari (MT117), Mankote (MT139) and Balnoi (MT155); On moist soil among grasses or, on rocks covered with moist soil near, or under water fall; 600-1800 m.

Metzgeriaceae

3. *Metzgeria conjugata* Lindb.
Gajna Pahari (MT 105) and Sanghiote (MT106); Epiphytic on bark of *Taxus baccata*; 1700-1800 m.
4. *Metzgeria himalayensis* Kash.
Sanghiote (MT042), Gajna Pahari (MT074) and Bhimber Gali (MT096); On soil covered rocks between 1600-1750m. above the sea level.

Jungermanniales

Jungermanniaceae

- *5. *Jungermannia (Jungermannia) lanceolata* L.
Kalaban (MT101), Gohlad (MT109) and Maidan (MT142); On soil; 960-1600 m.
- *6. *J. (Luridae) gollanii* St.
Sanghiote (MT233); On moist black soil in association with *Plagiochasma appendiculatum* and *Selaginella* sp.; 1730 m.
- *7. *J. (Plectocolea) truncata* Nees.
Tota Gali (MT069), Mankote (MT132), Maidan (MT141) and Jagal (MT146); On soil; 910-1600 m.
- *8. *J. (Solenostoma) kanaii* Amak.
Sanghiote (MT121); On soil; 1730 m.

Geocalycaceae

- *9. *Chiloscyphus himalayensis* St.

Tota Gali (MT099), Goi (MT129), Maidan (MT140), Banola (MT148), Kasbalari (MT 185) and Bhata-Dhurian (MT215); On moist soil or soil-covered rocks; 800-1800 m.

- *10. *Heteroscyphus argutus* (Reinw. et al.) Schiffn.

Chhungan (MT171) and Ochhad (MT178); Saxicolous (growing on the surface of rocks and stones); 1200-1300 m.

Plagiochilaceae

- *11. *Plagiochila accedens* St.,
Ochhad (MT179) and Narol (MT188); On soil; 1290-1400 m.
12. *P. mittenii* St.
Bhata-Dhurian (MT017), Gajna Pahari (MT075) and Bhimber Gali (MT095); Saxicolous; 1680-1720 m.
- *13. *P. phalangea* Tayl.
Sanghiote (MT245); On bark of *Quercus leucotrichophora* at 1740 m.
- *14. *P. woronoffii* St.
Sanghiote (MT116); Saxicolous; 1750m.

Radulaceae

15. *Radula complanata* (L.) Dum.
Banola (MT190); On rock covered by very small quantity of soil; 1200 m.

Porellaceae

- *16. *Porella caespitans* (St.) Hatt.
Sanghiote (MT082); Epiphytic on bark of *Rhododendron arboreum*; 1680 m.
- *17. *P. caespitans* var. *nipponica* (St.) Hatt.
Kalaban (MT103); Epiphytic on bark of *Quercus leucotrichophora*; 1500 m.

18. *P. campylophylla* (L. et L.) Trev.

Bhimber Gali (MT067) and Tota Gali (MT068); Epiphytic on bark of *Quercus leucotrichophora* and *Aesculus indica*; 1650-1800 m.

*19. *P. chinensis* (St.) Hatt.

Pathanatir (MT192); On bark of *Quercus leucotrichophora*; 1500 m.

*20. *P. decurrens* (St.) Hatt.

Narol (MT189) and Pathanatir (MT195, MT196); Epiphytic on bark of *Quercus leucotrichophora*; 1200-1500 m.

*21. *P. densifolia* subsp. *appendiculata* (St.) Hatt.

Sanghiote (MT037); Saxicolous; 1690 m.

22. *P. platyphylla* (L.) Pfeiff.

Sanghiote (MT084); Saxicolous; 1650 m.

Jubulaceae

23. *Frullania muscicolai* St.

Bhimber Gali (MT064); Saxicolous; 1650m.

*24. *Frullania neurota* Tayl.

Sanghiote (MT247); On bark of *Quercus leucotrichophora*; 1730 m.

Lejeuneaceae

*25. *Lopholejeunea sikkimensis* St.

Banola (MT191); Epiphytic on bark of *Quercus leucotrichophora*; 1200 m.

*26 *Pycnolejeunea malaccensis* St.

Sanghiote (MT040); Saxicolous; 1700m.

*27. *Rectolejeunea subacuta* St.

Sanghiote (MT241); On the bark of *Quercus leucotrichophora*; 1730 m.

*28 *Tuzibeanthus chinensis* (St.) Mizut..

Sanghiote (MT248); Epiphytic on bark of *Quercus leucotrichophora*; 1750 m.

Marchantiales

Aytoniaceae

*29. *Asterella angusta* (St.) Kachroo.

Kalaban (MT107), Chitral (MT164) and Sanghiote (MT227); On soil; 1100-1750 m.

30. *A. reticulata* (Kash.) Kachroo.

Tota Gali (MT070) and Sanghiote (MT085); On soil but sometimes also on rock; 1650-1680 m.

31. *Plagiochasma appendiculatum* L. et L.

Sanghiote (MT001, MT043), Dhargloon (MT006), Harni (MT052), Gajna Pahari (MT073), Mendhar City (MT087), Gohlad (MT108) and Sagra (MT151); On soil or on rock; 850-1800 m.

*32. *P. articulatum* Kash.

Prat (MT092); On slightly moist soil. 1330 m.

*33. *P. intermedium* L. et G.

Bhimber Gali (MT065) and Manjiari (MT058); On moist soil; 1300-1680 m.

34. *Reboulia hemispherica* Raddi.

Sanghiote (MT002, MT041), Dhargloon (MT007), Nar (MT048), Harni (MT051), Bhimber Gali (MT066), Mendhar City (MT086), Dara Sheir (MT135) and Jagal (MT143); On moist soil or on soil covered rocks; 850-1800 m.

Conocephalaceae

35. *Conocephalum conicum* (L.) Dum.

Bhata Dhurian (MT012), Gajna Pahari (MT025), Sanghiote (MT036), Sagra (MT154) and Bhimber Gali (MT198, MT212); On sandy soil or on rock in association with *Dumortiera hirsuta* and *Pellia endivaefolia*; 1050-1800 m.

*36 *Wiesnerella denudata* (Mitten) St.

Sanghiote (MT024), Nar (MT027), Bhimber Gali (MT030), Chhungan (MT172) and Kalaban (MT176); On moist sandy soil; 1200-1650 m.

Marchantiaceae

*37. *Dumortiera hirsuta* Reinw Bl. et Nees.

Sanghiote (MT005, MT038), Bhimber Gali (MT015), Dhargloon (MT028), Chhungan (MT170), Pathanatir (MT193) and Bhata Dhurian (MT210); On moist soil or moist soil covered rocks near, or under waterfalls; 950-1670 m.

*38. *Marchantia kashyapii* Udar et Shaheen.

Nar (MT010), Kallar (MT013), Bhimber Gali (MT014) and Kasbalari (MT021); On moist soil near water; 1500-1650 m.

39. *Marchantia nepalensis* L. et L.

Sanghiote (MT039), Chhajla (MT128), Dara Sheir (MT137), Kasbalari (MT186) and Bhimber Gali (MT 204); On moist soil, or moist soil covered rock; 800-1700 m.

40. *Marchantia palmata* Nees.

Gajna Pahari (MT019), Sanghiote (MT045), Harni (MT049), Manjiari (MT057) and Sagra (MT055); On moist soil, or rock; 950-1700 m.

41. *M. polymorpha* L.

Sanghiote (MT003, MT046), Bhata Dhurian (MT011), Harni (MT055), Mendhar City (MT088), Chhajla (MT088), Sagra (MT152) and Balnoi (MT157); On moist soil; 600-1700 m.

Targioniaceae

*42 *Targionia hypophylla* L.

Bhimber Gali (MT016, MT213), Sanghiote (MT023, MT047), Gursai (MT091), Kalaban (MT111), Gohlad (MT112), Bhata Dhurian (MT115), Mankote (MT138), Chhajla (MT149), Sagra (MT156) and Chitral (MT165); On slightly dry soil or on soil covered rock; 950-1800 m.

Ricciaceae

43. *Riccia discolor* L. et L.

Gohlad (MT110); On moist soil covered rock, 1210 m.

Anthocerotales

Phaeocerotaceae

*44. *Phaeoceros laevis* (L.) Prosk. subsp. *laevis* Prosk.

Bhimber Gali (MT100), Dharana (MT125, MT126) and Mankote (MT131, MT133); On moist soil; 850-1710 m.

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