Preliminary survey of Jammu District (North West Himalaya) for liverwort and hornwort flora

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The present communication enlists 16 liverwort and 1 hornwort taxa recorded from Jammu (J & K). These are assignable 4 orders, 8 families and 11 genera. *Jungermannia* (*Luridae*) *gollani* St., *Asterella angusta* (St.) Kachroo, *Asterella pathankotensis* (Kash.) Kachroo, *Mannia indica* (Steph.) Kachroo, *Plagiochasma intermedium* Ldbg. et G., *Cyathodium cavernarum* Kunze, *Riccia crystallina* Linn., *Riccia melanospora* Kash. and *Anthoceros angustus* St. are reported for the first time from the state.

Key-words—Liverworts, Hornworts, Jammu, North-West Himalaya.

INTRODUCTION

DISTRICT Jammu of J & K state covers an area of 3,250 sq. km. and is flanked by the Rajouri and Udhampur districts on the north-east, Kathua district in the south and Pakistan in the west. The area has an altitudinal range from 300m to 900m. The climate is characterized by a dry and increasingly hot season from March to June, a warm monsoon period from July to September and a dry and cold weather from October to December. The average rainfall varies from 16.0mm (Nov.) to 449.1mm (Aug.). During summer (April to June), average maximum temperature is 38.9° C and average minimum temperature is 26.9° C. In winter, the average maximum and minimum temperatures are 19.8° C and 6.8° C respectively. Relative humidity is minimum (23.0%-38.4%) during April to June and maximum (66.8%-83.6%) in July to September. The vegetation of the district is tropical dry deciduous type, dominated by either pine (Chir) forests or by deciduous broad leaved trees.

A preliminary survey of the district during the last two years has yielded 16 liverwort (15 thallose and 1 foliose) and 1 horwort taxa. Of these, 9 taxa (marked with asterisk) have been recorded for the first time from J & K state. These have been enumerated below, along with the information regarding their habitat.

Schuster's (1984) system of classification has been followed for arrangement of orders and families. The genera within family and species within genus are sequenced alphabetically. The voucher specimens have been deposited in the herbarium of Department of Botany, University of Jammu, Jammu.

Metzgeriales

Pelliaceae

1. *Pellia endivaefolia* (Dicks.) Dum.

Ecology: On damp slopes near water, in shady areas, partially exposed to sunlight, or in fully exposed areas.

Specimens examined: Nagbani (SG 048) and Domana (SG 154).

Aneuraceae

2. *Aneura pinguis* (L.) Dum.

Ecology: On moist shady soil among shrubs, partially exposed to sunlight.

Specimen examined: Kalidhar (near temple) (SG 190).

Jungermanniales

Jungermanniaceae

*3. *Jungermannia* (Luridae) gollani St.

Ecology: On moist slopes, boulders or rocks in shady area, not at all or partially exposed to sunlight, often found near water.

Specimens examined: Purmandal (SG 129), Nagbani (SG 145), Jhajjar Kotli (SG 159) and Panj garain (SG 171).

Marchantiales

Aytoniaceae

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

Ecology: On dry or moist stony walls, or rocks; often fully but sometimes partially exposed to sunlight.

Specimens examined: B.C. Road (SG 020), Nagrota (SG 036) and Jhajjar Kotli (SG 164).

*5. *Asterella pathankotensis* (Kash.) Kachroo.

Ecology: On moist stony walls, stones or rocks in shady area, not or partially exposed to sunlight.

Specimens examined: Guest house, Jammu University, (SG 002), Jhajjar Kotli (SG 058), Domail (SG 179) and Kalidhar ranges (SG 194).

Specimen examined: Nud (SG 127).

*6. *Mannia indica* (Steph.) Kachroo

Ecology: On dry, or moist brick wall, or rock in an area, partially or fully exposed to sunlight.

Specimens examined: Gole Gujral (SG 025), Sidhra (SG 120) and Jhajjar Kotli (SG 163).

7. *Plagiochasma appendiculatum* L. et L.

Ecology: On dry, or moist brick or stony walls, slopes, rocks, boulders or stones in the fully exposed, or shady areas partially exposed to sunlight; also found near water, or above water level.

Specimens examined: Botanical Garden (SG 001), Gole Gujral (SG 027), Nagrota

(SG 038), Nagbani (SG 043), Jhajjar Kotli (SG 052), Chak Aslam (SG 074), Domail

(SG 090), Purkhoo (SG 109) and Kalidhar ranges (SG 195).

*8. *Plagiochasma intermedium* Ldbg. et G.

Ecology: On dry, or moist stony wall, slope or rock in an area partially or fully exposed to sunlight; also found near water.

Specimens examined: Domana (SG 097) and Nud (SG 206).

9. *Reboulia hemispherica* (Linn.) Raddi.

Ecology: On dry, or moist stony walls, slopes or rocks in shady area, not al all, or partially exposed to sunlight.

Specimens examined: Nagrota (SG 039), Jhajjar Kotli (SG 050), Domail (SG 091) and Nagbani (SG 177).

Marchantiaceae

10. *Marchantia nepalensis* L. et L.

Ecology: On moist, or very moist slopes, stones, boulders or rocks in shady areas, not exposed, or partially exposed to sunlight; often found near water.

Specimens studied: Purmandal (SG 135) and Nagbani (SG 175).

11. *Marchantia palmata* Nees.

Ecology: On moist, or very moist slopes, stones, boulders, rocks or pillars in the shady area, not exposed, or partially exposed to sunlight; rarely in fully exposed area; often found growing near water.

Specimens examined: Nagrota (SG 032), Nagbani (SG 042), Jhajjar Kotli (SG 053), Mamka (SG 079), Akhnoor (SG 083), Gadigarh (SG 094), Gole Gujral (SG 108), Purmandal (SG 134) and Panj Garain (SG 173).

12. *Marchantia polymorpha* L.

Ecology: On moist, or very moist slopes or rocks in shady areas, not exposed or partially exposed to to sunlight; rarely in fully exposed areas; often found growing near water.

Specimens examined: Purmandal (SG 137), Nagbani (SG 149) and Jhajjar Kotli (SG 155).

Targioniaceae

*13. *Cyathodium cavernarum* Kunze

Ecology: On moist brick wall, in a highly shady area.

Specimen examined: Botanical garden, Jammu University (SG 121).

Ricciaceae

*14. *Riccia crystallina* Linn.

Ecology: On moist cemented wall of an old house, fully exposed to sunlight.

Specimen examined: Rehari Chungi, Jammu (SG 040).

15. *Riccia discolor* L. et L.

Ecology: On dry, or moist brick wall in shady area, partially exposed to sunlight.

Specimen examined: Botanical garden, Jammu University (SG 004).

*16. Riccia melanospora Kash.

Ecology: On moist brick path in shady area, not or partially exposed to sunlight.

Specimen examined: Nagbani (SG 103).

Anthocerotales

Anthocerotaceae

*17. Anthoceros angustus *St.*

Ecology: On moist rock near water, in shady area, partially exposed to sunlight.

Specimen examined: Purmandal (SG 131).

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