

LIVERWORT DIVERSITY IN PALNI HILLS (TAMIL NADU), INDIA, – A CHECKLIST

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ABSTRACT

Current investigations show the occurrence of 75 taxa of liverworts in Kodaikanal and neighbouring areas. Each species has been enumerated along with the details of exsiccatae, ecology, range of distribution and status in the study area.

Keywords : Bryophyta, Distribution, Diversity, Kodai kanal, Liverwort, Palni hills.

INTRODUCTION

Palni hills, located in the Eastern offshoots of Western Ghats, have received inadequate attention for bryological studies though it provide conducive environment for the luxuriant preponderance of these little, non-vascular land plants. The past bryofloristic studies in the area are fragmentary and far from satisfactory (see Foreau, 1931, 1961, 1964; Udar, 1976, Dabhade, 1998, Srivastava, 1998). Many taxa described earlier are stated to be not traceable even in their original locations and our knowledge about the present status of each species is not clearly known, hence an attempt has been made to provide an up to date information about the current status of hepatic diversity of Palni hills.

The first ever record of Hepaticae (liverworts) from Palni hills comes from Stephani (1898 - 1924) who described 7 species. Chopra (1938a) listed 40 species of liverworts from various localities of Palni hills chiefly based on collections made by Rangachariar, Father Foreau, Mrs. Robinson and Rupinat between 1916 - 1934. Pande and Bhardwaj (1952) recognized 20 genuine species of liverworts from this region. Earlier contributions made by Indian workers provide morpho-taxonomic information of about 30 species. Current investigations have however, revealed 75 species which include significant additions in the floristic elements of the liverworts of the area (see Foreau, 1931, 1961, 1964; Udar, 1959; Kachroo, 1958; Udar & Srivastava, 1964, 1970, 1983; Srivastava & Udar, 1976, 1979; Udar & Kumar, A., 1981; Sharma & Srivastava, 1993; Bapna & Kachroo, 2000; Parihar & al., 1994; Srivastava, A & Srivastava, 2002; Srivastava, 1994, 1998). During the present investigations 10 species are added to the region as new records. Out of the 75 species 16 species (*) could not be located during the course of present investigations and are included on the basis of previous reports.

Investigations during last few years on several exhaustive collections and surveys made by the authors and their associates provide the first authentic record of the liverwort diversity occurring in this region. The areas explored include Kodaikanal, Shembaganur, Silver Cascade, Tiger Shola, Palangi, Attuvampatti and Periakulum, having variable topography and microclimate, with much diversified taxa in the region. The study eventually revealed the occurrence of 36 genera and 75 species falling under 3 orders and 21 families. The Metzgeriales is represented with 4 families, 5 genera and 15 species. The Jungermanniales with 11 families, 21 genera and 47 species have maximum representation, whereas Marchantiales have 6 families, 10 genera and 13 species in the study area.

TOPOGRAPHY

Palni hills, lying between 10°12' - 10°15' N latitude and 77°26' - 77°33' E longitude, comes under Dindigul district of Tamil Nadu, India, and is a part of Eastern Ghats. The area shows an altitudinal range of 360 - 2550 m. It extends in a North-east - South-west streak in Indian peninsula covering an area of about 75,000 sq km with an average width of 200 km in the North and 100 km in South. It extends over a length of 1750 km between Mahanadi and Vaigai rivers along the East coast. Mahanadi basin marks the northern boundary of the Eastern Ghats while the southern edge is the Nilgiri hills. The weather varies over the range, but much of the plateau receives an average of more than 1500 mm of rainfall annually, with not more than four dry months. In the higher areas mean day temperature in the coolest months is below 17°C.

ENUMERATION

ORDER : METZGERIALES

FOSSOMBRONIACEAE

1. Fossombronia cristula Austin.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 3 F/1966 (LWU).

Ecology : Terrestrial, grows in moist conditions, usually on wet and damp soil or soil covered rocks along with grasses, moss and other liverworts like *Cephaloziella* sp., etc.

Distribution : Asia : India, Japan, Taiwan; North America : United State of America (New Jersey, California, Texas) (see Udar & Srivastava, 1969; Srivastava & Udar, 1975b; Schuster, 1992a).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

2.*Fossombronia foreau Udar & S. C. Srivast.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal; CSIR No. 38F/1966 (LWU).

Ecology : Plants grow on moist soils on rocks in pure growth or sometimes associated with other species of *Fossombronia*.

Distribution : Endemic to India (Srivastava & Udar, 1975b).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

3. Fossombronia himalayensis Kashyap (**Plate:1; Fig.:1**).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 13052/2000 (LWU).

Ecology : Terrestrial, grows usually in moist and shady places, rarely on exposed rocks and soil covered rocks associated with other taxa.

Distribution : Endemic to India (Srivastava & Udar, 1975b).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

4. Fossombronia wondraczekii (Corda) Dumort.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal; 12961/2000, 12973/2000 (LWU).

Ecology : Terrestrial, grows normally in dense patches on moist and exposed rocks and soil covered rocks along with other terrestrial mosses.

Distribution : India, Europe (Srivastava & Udar, 1975b).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

PALLAVICINIACEAE

5.*Pallavicinia crispatus (Mont.) Steph.

Specimens examined : Included on the basis of listing by Bapna and Kachroo (2000).

Ecology : Terrestrial, grows on moist and shady rocks and soil covered wet rocks.

Distribution : Endemic to India (see Bapna & Kachroo, 2000).

Status in Palni hills : Not traceable hence doubtful.

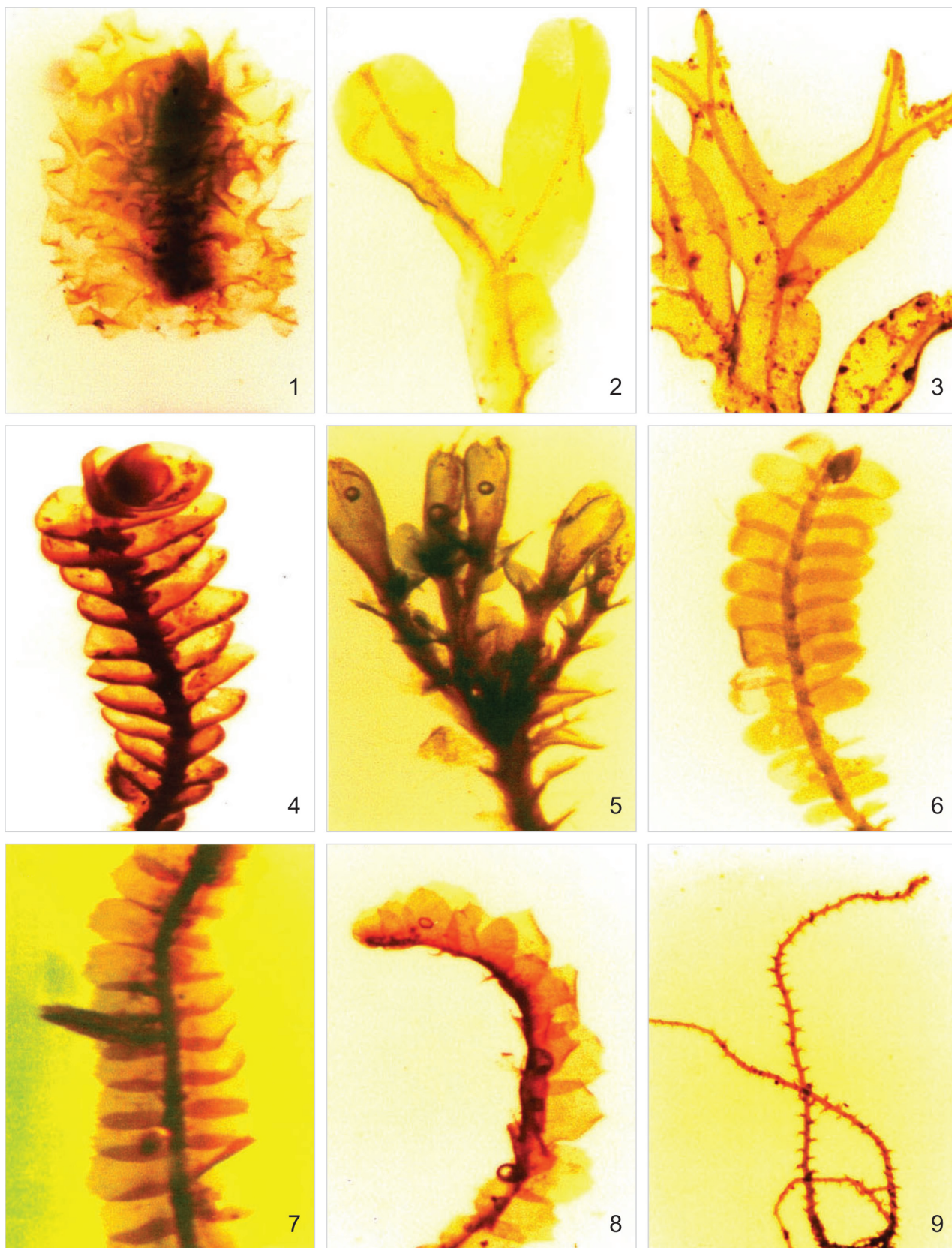


Plate 1. 1. *Fossombronia himalayensis* ($\times 14$); 2. *Metzgeria indica* ($\times 12$), 3. *Metzgeria nilgiriensis* ($\times 13$); 4. *Gottschelia schizopleura* ($\times 11$); 5. *Jungermannia* (Jung.) *lanceolata* ($\times 8$); 6. *Notoscyphus darjeelingensis* ($\times 9$); 7. *Heteroscyphus argutus* ($\times 9$); 8. *Heteroscyphus argutus* ($\times 9$) and 9. *Heteroscyphus orbiculatus* ($\times 8$).

METZGERIACEAE

6. *Metzgeria consanguinea Schiffn.

Specimen examined : South India : Tamil Nadu - Palni hills - Kodaikanal : Bryant Park; 53 M/1966 (LWU).

Ecology : Corticolous, grows in moist and shady conditions.

Distribution : India, Indonesia, Sri Lanka, Sumatra, New Guinea, Africa, Congo, Kenya, Korea, Japan. (see Srivastava & Udar, 1975a; Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

7. Metzgeria himalayensis Udar & S. C. Srivast.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Bryant Park; 59 M/1966 (LWU).

Ecology : Corticolous, grows in moist and shady conditions.

Distribution : Endemic to India (Srivastava & Udar, 1975a).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

8. Metzgeria indica Udar & S. C. Srivast. (**Plate : 1; Fig. : 2**).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal - Perumalmalai : 13065/2000, 13203/2000, 13206/2000 (LWU); Kodai Lake : 20084/2006, 20088/2006, 20090/2006, 20094/2006, 20100/2006, 20114/2006, 20127/2006, 20128/2006(LWU).

Ecology : Corticolous, grows in moist and shady conditions.

Distribution : Endemic to India (Srivastava & Udar, 1975a).

Status in Palni hills : Common; out of risk.

9. *Metzgeria nilgiriensis Udar & S. C. Srivast. (**Plate : 1; Fig. : 3**).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Bryant Park; 53 M/1966, 13203/2000, 13206/2000 (LWU).

Ecology : Corticolous, grows in moist and shady conditions.

Distribution : Endemic to India (Srivastava & Udar, 1975a).

Status in Palni hills : Common.

ANEURACEAE

10. Aneura maxima (Schiffn.) Steph.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 48 A/1966, 13048/2000, 13049/2000; 20093/2006, 20096/2006 (LWU).

Ecology : On soil covered moist rocks in shady places.

Distribution : Asia- India, Japan (see Srivastava & Udar, 1976; Bapna & Kachroo, 2000).

Status in Palni hills : Common.

11. Aneura pinguis (L.) Dumort.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 47 A/1966, 50 A/1966, 57 A/1966, 12965/2000, 12971/2000; 20120/2006, 20121/2006, 20123/2006 (LWU).

Ecology : On soil covered moist rocks.

Distribution : Asia- China, Japan, India, Indonesia (Java), Manchuria, Sri Lanka; Siberia; Australia,

New Zealand; North America- West Indies; South America- Brazil; Europe and Africa (see Srivastava & Udar, 1976; Bapna & Kachroo, 2000).

Status in Palni hills : Common; out of risk.

12. Riccardia levieri Schiffn.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 89 R/1966, 12971/2000, 20080/2006, 200124/2006(LWU).

Ecology : It grows on moist and shady soil surfaces near water in association with *Aneura* sp.

Distribution : Asia- Bhutan, India (Srivastava & Udar, 1976).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

13. Riccardia multifida (L.) Gray

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal, Perumalmalai; 38 R/1966, 12124/2000, 200125/2000 (LWU).

Ecology : It grows on moist and shady soil surface or soil covered rocks.

Distribution : Asia- China, India, Sri Lanka; North America; Europe; Alaska; Africa (Srivastava & Udar, 1976; Bapna & Kachroo, 2000).

Status in Palni hills : Vulnerable in Kodaikanal.

14. Riccardia perssonii S. C. Srivast. & Udar

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 100 R/1966 (LWU).

Ecology : It grows on moist and shady soil surfaces and soil covered rocks usually in pure population.

Distribution : Endemic to India (Srivastava & Udar, 1976).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

15. Riccardia tenuicostata Schiffn.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 76 R/1966, 84 R/1966 (LWU).

Ecology : It grows on moist and shady soil surfaces and soil covered rocks and as an epiphyte on bark at the base of trees.

Distribution : Asia- India, Indonesia, Singapore (Srivastava & Udar, 1976).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

ORDER : JUNGERMANNIALES

LOPHOZIACEAE

16. Gottschelia schizopleura (Spruce) Grolle (**Plate :1; Fig. : 4**).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 55 S/1972, 13027/200, 13033/2006 (LWU).

Ecology : Terricolous, grows on moist and shady soil surface.

Distribution : Africa- E. Africa, Madagascar; Asia- China, Celebes, India, Indonesia, Malaysia, Philippines, Sri Lanka, Norfolk Island, Papua New Guinea, Iran (see Udar & Kumar. A, 1982; Bapna & Kachroo, 2000).

Status in Palni hills : Common in Palni hills.

JUNGERMANNIACEAE

17. *Jungermannia lanceolata* L. emend Schrad. (Plate : 1; Fig. : 5).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 7429/1983 (LWU).

Ecology : Terrestrial, grows on soil covered rocks in damp conditions.

Distribution : Europe- Norway, Sweden, Finland, Denmark, Britain, Germany, France, Austria, Spain, Switzerland, CIS; Asia - India, Japan; North America (see Udar & Kumar, A. 1982; Schuster, 1969).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

18. *Jungermannia truncata* Nees

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 20086/2006, 13081/2000 (LWU).

Ecology : Terrestrial, grows in shady places over the soil/ rock surface on road sides either in pure patches or in association with *Riccardia* sp.

Distribution : Asia - India, Myanmar, China, Taiwan, Indonesia, Korea, Kwashyota Island, Malaysia, New Guinea, Philippines, Thailand (Kumar, A. 1982).

Status in Palni hills : Vulnerable. New record for Palni hill.

19. *Jungermannia pyriflora* Steph. (Plate : 1; Fig. : 6).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 12429/1966 (LWU).

Ecology : Terrestrial, grows in shady and moist condition on soil covered rocks.

Distribution : Asia – India, Japan (see Singh, P., 1991).

Status in Palni hills : Endangered. New to Kodaikanal (Palni hills).

20. *Notoscyphus darjeelingensis* Udar & A. Kumar (Plate : 1; Fig. : 8).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 13205/2000, 13207/2000 (LWU).

Ecology : Terrestrial, grows on soil covered rocks in wet condition.

Distribution : Endemic to India (Udar & Kumar, A. 1981a).

Status in Palni hills : Vulnerable. New record for Kodaikanal (Palni hills).

21. *Notoscyphus pandei* Udar & A. Kumar

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 13016/2000, 13029/2000 (LWU).

Ecology : Terrestrial, grows on the soil surface along road sides in shady places.

Distribution : Endemic to India (Udar & Kumar, A. 1981a).

Status in Palni hills : Vulnerable. New to the region.

22. *Notoscyphus paroicous* Schiffn.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 13005/2000 (LWU).

Ecology : Terrestrial, grows on the soil surface along road sides in shady places.

Distribution : Asia – Blanca, India, Indonesia, Japan, Sri Lanka (see also Udar & Kumar, A. 1981a).

Status in Palni hills : Vulnerable. New record for Kodaikanal (Palni hills).

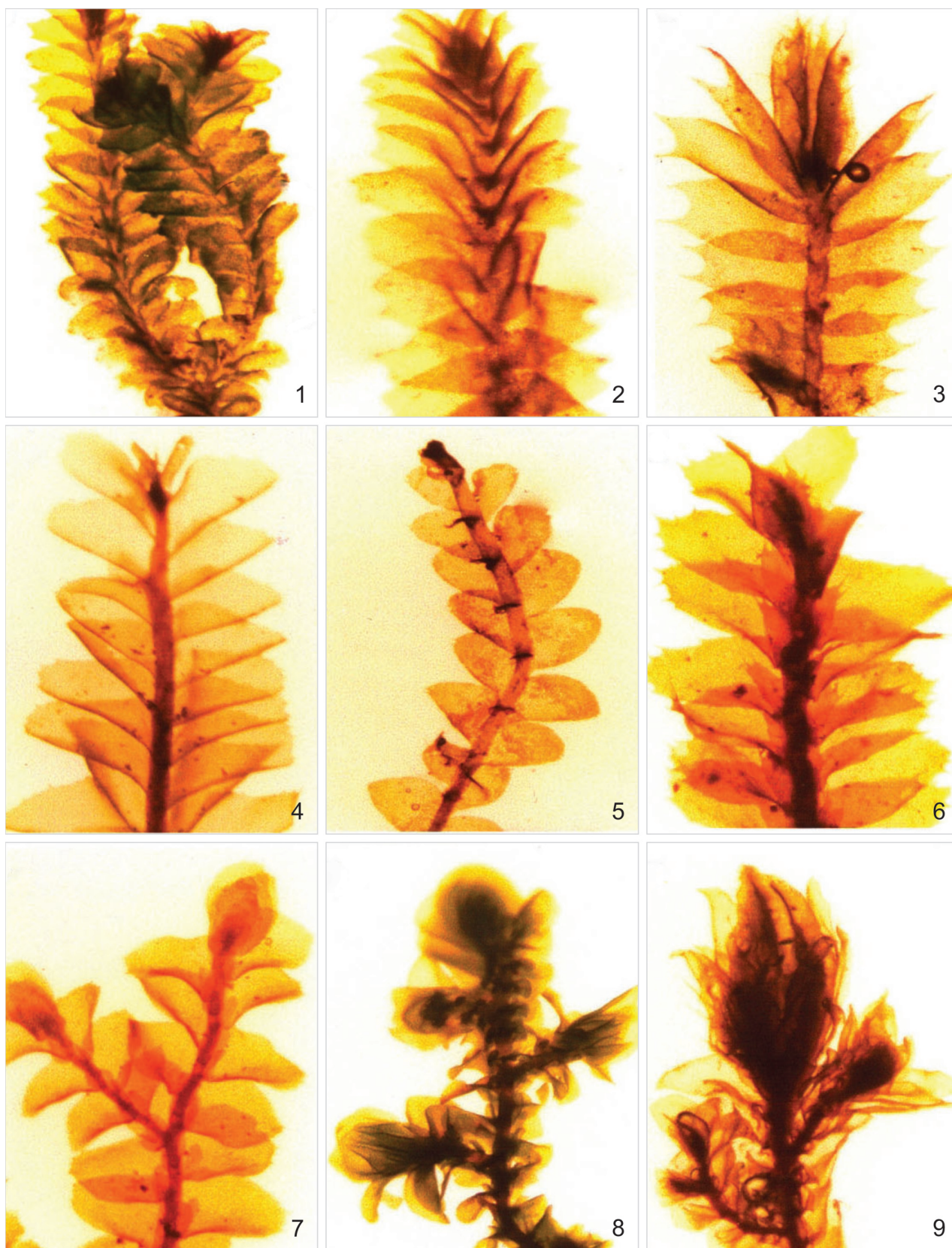


Plate 2. 1. *Lophocolea muricata* ($\times 11$); 2. *Lophocolea heterophylla* ($\times 9$), 3. *Lophocolea bidentata* ($\times 10$); 4. *Plagiochila nepalensis* ($\times 10$); 5. *Calypogeia azurea* ($\times 11$); 6. *Porella perrottatiana* ($\times 12$); 7. *Porella campylophylla* ($\times 12$); 8. *Frullania ericoides* ($\times 13$) and 9. *Frullania acutiloba* ($\times 12$).

GEOCALYCACEAE

23. *Heteroscyphus argutus* (Reinw., Blume & Nees) Schiffn. (Plate : 1; Fig. : 7).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Perumalmalai; 7212/1983, 7299/1983 (LWU).

Ecology : Terrestrial, grows on soil and rocks in shady places.

Distribution : Australia, New Zealand, Papua New Guinea, Hawaii, India, Indonesia, Malaysia, Nepal, China, Japan, Korea (see Srivastava & Srivastava; 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

24. *Heteroscyphus orbiculatus* Abha Srivast. & S. C. Srivast. (Plate : 1; Fig.:9)

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 7403/1983 (Type : LWU), 20110-112/2006 (LWU).

Ecology : Terrestrial grows on soil covered rocks.

Distribution : Endemic to India (Srivastava & Srivastava; 2002).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

25. **Heteroscyphus palniensis* Abha Srivast. & S. C. Srivast.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : 246/1966 (Type : LWU).

Ecology : Terrestrial, grows on soil covered rocks.

Distribution : Endemic to India (Srivastava & Srivastava, 2002).

Status in Palni hills : Rare in Kodaikanal.

26. *Lophocolea bidentata* (L.) Dumort. (Plate : 2; Fig. :3).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 13015/2000, 13030/2000, 13039/2000 (LWU).

Ecology : Grows as terricolous as well as corticolous, in moist and shady conditions.

Distribution : Australia, New Zealand, Africa-Cameroon, Madagascar, Nyasaland, South Africa, Reunion, Southern Africa including Uganda; North America-U.S.A. (Alaska etc.), Canada (British Columbia), Central America-Cuba, Mexico, Venezuela, Atlantic Islands, Austria, Azores, Bulgaria, Corsica, England, Finland, France, Germany, Hungary, Ireland, Italy, Madeira, Mediterranean Islands, Morocco, Norway, Portugal, Scandinavia, Switzerland, Slovak; Japan, Asia minor, Bhutan, China, India, Nepal (see Kim & al., 1995; Long & Grolle, 1990; Srivastava & Srivastava, 2002).

Status in Palni hills : Common.

27. *Lophocolea heterophylla* (Lehm.) Nees (Plate : 2; Fig. : 2).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 13000/2000, 13006/2000, 13031/2000, 13025/2000, 20083/2006, 20083/2006, 20086/2006 (LWU).

Ecology : Grows as terricolous as well as corticolous, in moist and shady conditions.

Distribution : Africa, Canada, U.S.A., CIS (Siberia), Altas mountain, Luxembourg, Norway, Sweden, Finland, Scotland, Portugal, Italy, Romania, Bulgaria, Japan, Manchuria, Azores, Canaries, Madeira, Netherlands; China, Philippines, India, Nepal (see Bates & al., 1997; Schuster, 1980; Srivastava & Srivastava, 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

28. *Lophocolea muricata* (L.) Dumort. (Plate : 2; Fig. :1).

Specimens examined : South India : Tamil Nadu – Palni hills- Kodaikanal (Kodai lake, Shembaganur) (see also Srivastava & Srivastava, 2002).

Ecology : Grows as terricolous as well as corticolous, in moist and shady conditions.

Distribution : Australia, Fiji Isl., New Zealand, Papua New Guinea, New Zealand Tasmania, Africa-Burundi, Cameroon, Ethiopia, Mozambique, South Africa, Tanzania, Uganda, Zaire, Zimbabwe, North America (Southern Appalachian and north Carolina), South America- Brazil, Chile, Colombia, Patagonia, Venezuela, West Indies, India, Indonesia (Java) (see also Srivastava & Srivastava, 2002; Wigginton & Grolle, 1996; Yamada, 1990; Yano, 1995).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

PLAGIOCHILACEAE

29. *Plagiochila elegans* Mitt. (Plate :2; Fig. :4).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : 17047/2003 (LWU).

Ecology : Plants grow as corticolous, in moist and shady habitat.

Distribution : Bhutan, China, India, Nepal (see Inoue, 1964; Long & Grolle, 1990; So, 2001a; So & Grolle, 2000; Rawat & Srivastava, 2007).

Status in Palni hills : New record for the Palni hills.

30. *Plagiochila indica* Mitt. & Steph.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : Shembaganur; 13168/2000, 20080/2006, 20092/2006, 20117/2006, 20129/2006 (LWU).

Ecology : Plants grow as corticolous, in moist and shady conditions in pure population.

Distribution : India, Thailand (Inoue, 1974a; So & Grolle, 2001; Rawat & Srivastava, 2007).

Status in Palni hills : Common. New record for the Palni hills.

31. *Plagiochila nepalensis* Lindenb. (Plate : 2; Fig. : 5).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 12949/2000 (LWU).

Ecology : Plants grow as corticolous, in moist and shady conditions in pure population

Distribution : Bhutan, China, India, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Vietnam, Japan (see Inoue, 1967; So & Grolle, 2000; Srivastava & Dixit, 1994; Rawat & Srivastava, 2007).

Status in Palni hills : Common.

32. *Plagiochila peradenyensis* Schiffn.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 12995/2000 (LWU).

Ecology : Plants grow as corticolous, in moist and shady habitat.

Distribution : India, Sri Lanka (Srivastava & al., 2002; Rawat & Srivastava, 2007).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

LEPIDOZIACEAE

33. **Bazzania tridens* (Reinw., Blume & Nees) Trevis.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : 199 S/1971 (LWU).

Ecology : Terrestrial, growing on soil covered rocks, in crevices, on sloppy cliffs, loosely fixed with the substratum commonly grows in association of *Cephaloziella* sp., *Dumortiera hirsuta*, *Herbertus* sp., *Heteroscyphus* sp. and *Notoscyphus* sp.

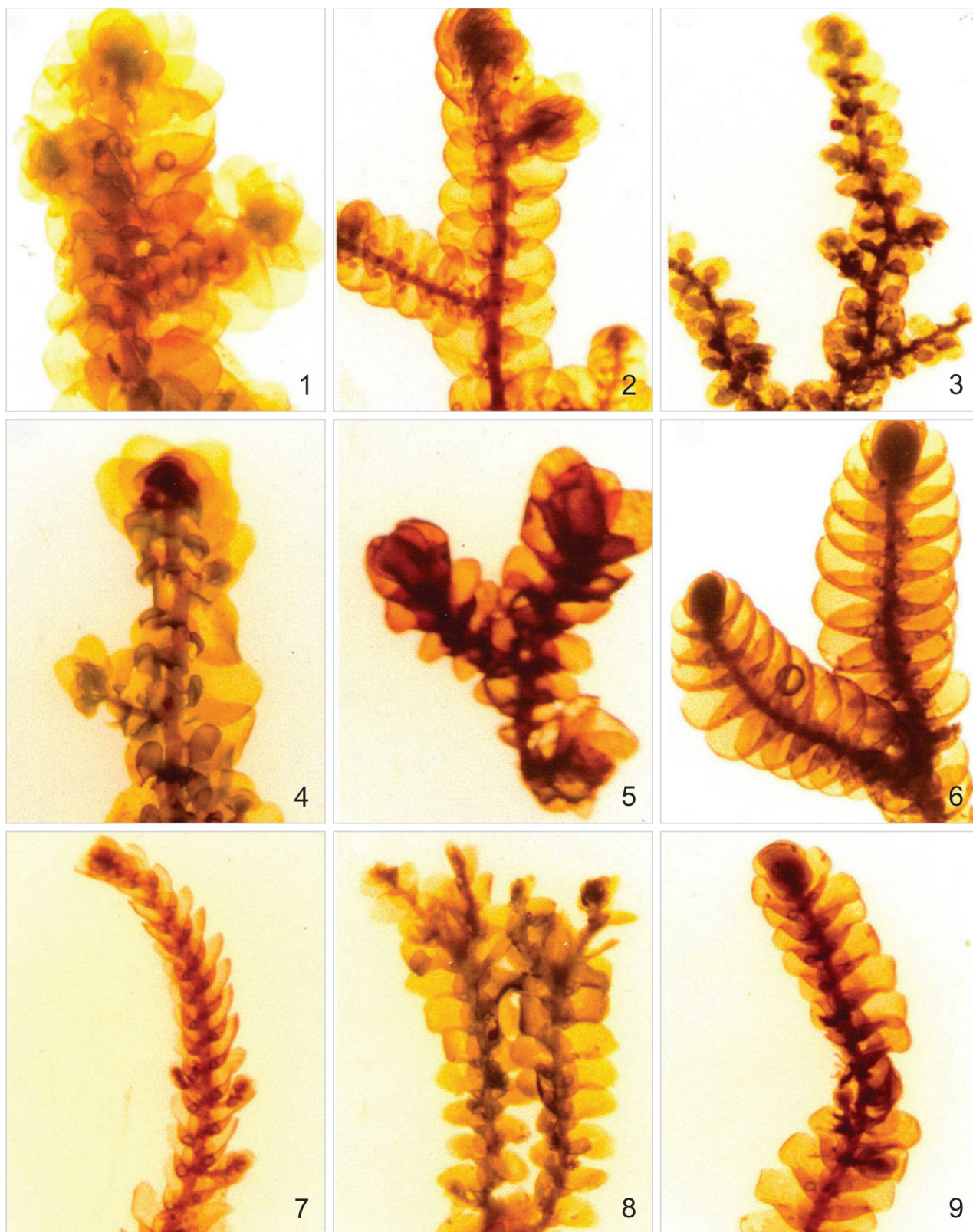


Plate 3. 1. *Frullania arecae* ($\times 13$); 2. *Frullania tamarisci* var. *obscura* ($\times 14$), 3. *Frullania campanulata* ($\times 15$); 4. *Frullania neurota* ($\times 11$); 5. *Lopholejeunea subfusca* ($\times 13$); 6. *Leucolejeunea xanthocarpa* ($\times 9$); 7. *Lejeunea discareta* ($\times 13$); 8. *Lejeunea flava* ($\times 14$) and 9. *Cheilolejeunea imbricata* ($\times 10$).

Distribution : India, Nepal, Sri Lanka, Taiwan, China, Japan, Korea, North America, Europe, Azores, Caucasus, Guatemala (see Sharma & Srivastava, 1993).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

CALYPOGIACEAE

34. *Calypogeia azurea* Stotler & Crotz. (Plate :2; Fig. : 6).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 7349/1983, 12966/2000, 12967/200, 20120/2006 (LWU).

Ecology : Commonly terrestrial, growing on soil covered rocks, rarely on humus, associated with *Heteroscyphus* sp., *Jungermannia* sp.

Distribution : India, Japan, CIS, Taiwan, Britain, Denmark, Feroe Islands, France, Germany, Hungary, Netherlands, Italy, Portugal, Spain, Sweden, Switzerland, Mexico (see also Sharma & Srivastava, 1993).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

CEPHALOZIACEAE

35. *Cephaloziella kiaerii* (Austin) Arnell

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 12935/2000, 12936/2000, 13014/2000, 13015/2000, 20086/2006 (LWU).

Ecology : Terrestrial, growing on soil covered rocks, in crevices, on sloppy cliffs commonly grows in association of *Notoscyphus* sp.

Distribution : Africa, Bhutan, Sri Lanka, China, India, Indonesia, Madagascar, Malaysia, Mozambique, New Caledonia, Papua New Guinea, Philippines, Tanzania, Thailand, Zaire, Zimbabwe (Udar & Kumar, A., 1985).

Status in Palni hills : Common.

CEPHALOZIACEAE

36. *Cephalozia hamatiloba* Steph.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 209 S/1971, 13499/2000, 20086/2006, 20087/2006 (LWU).

Ecology : Terrestrial, growing on soil covered rocks, loosely fixed with the substratum commonly grows in association of *Cephaloziella* sp., *Heteroscyphus* sp. and *Notoscyphus* sp.

Distribution : Bhutan, India, Thailand (Bapna & Kachroo, 2000; Udar & Kumar, A. 1982).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

PORELLACEAE

37. *Porella campylophylla* (Lehm. & Lindenb.) Trevis. (Plate :2; Fig. : 7).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 12996/2000 (LWU).

Ecology : Corticolous, grows under tree canopy as pendent.

Distribution : Bhutan, India, Laos, Cambodia, Vietnam, China, Nepal (Hattori, 1978; Udar & Shaheen, 1983 a, b).

Status in Palni hills : New record for Palni hills.

38. *Porella perottetiana* (Mont.) Trevis.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 6842/1954, 2901 S/1971 (LWU).

Ecology : Corticolous, grows under tree canopy as pendent.

Distribution : Bhutan, India, Cambodia, Vietnam, Laos, Myanmar, Philippines, Sri Lanka, Taiwan, Japan, China (see Hattori, 1967, 1969, 1975b, 1978; Hong, 2003; Yamada & al., 1981; Yamada & Choe, 1997; Udar & Shaheen, 1983a, b).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

JUBULACEAE

39. *Frullania acutiloba* Mitt. (Plate : 2; Fig. : 8).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal : 133 S/1971, 13190/2000, 13212/2000, 20084/2006 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : India, Indonesia, Sri Lanka (see also Hattori, 1979; Mitten, 1861; Srivastava & Alam, 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

40. *Frullania arecae* (Spreng.) Gottsche. (Plate : 3; Fig. : 1).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 13161/2000, 13162/2000, 13179/2000, 13189/2000, 13191/2000 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : Australia, New Guinea, Norfolk islands, Pacific islands, Bioko, Burundi, Cameroon, Ethiopia, Ghana, Mozambique, Madagascar, Reunion, Rwanda, Brazil, Columbia, Ecuador, Galapagos Isl., Panama, Venezuela, China, India, Indonesia, Malaysia, Nepal, Philippines, Sri Lanka, Thailand (see Wigginton & Grolle, 1996; Yamada & al., 1981; Yuzawa, 1983; 1991; Yuzawa & Koike, 1994; Srivastava & Alam, 2002).

Status in Palni hills : Vulnerable. New to Kodaikanal (Palni hills).

41. *Frullania campanulata* Taylor (Plate : 3; Fig. : 3).

Specimens examined : Palni hills – Kodaikanal- Shembaganur : 127 S /1971, 20088/2006 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : India, Indonesia, Sri Lanka (see Hattori, 1974b; Onraedt, 1981; Srivastava & Alam, 2002).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

42. *Frullania ericoides* (Nees) Mont. (Plate :2; Fig. : 9).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 12918/2000, 13073/2000, 13219/2000, 20082/2006 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : Australia, New Caledonia, Papua New Guinea, Arabian Peninsula; Angola, Ascension Island, Annobon, Bioko (Fernando Po), Burundi, Cameroon, Central African republic, Congo, Cape Verde Isl., Ethiopia, Gambia, Guinea, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Principe, Reunion, Rwanda, Seychelles, South Africa, Sierra Leone, Scotia, Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe; Canada, United States of America, Brazil, Venezuela, Galapagos Isl.; Antilles, Caribbean Isl., Mexico, Bhutan, India, Indonesia, Nepal, Philippines, China, Taiwan, Vietnam, Korea, Japan; Europe (see Fischer, 1993; Nath & Asthana, 1998; Srivastava & Alam, 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

43. *Frullania muscicola* Steph.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 12920/2000, 13195/2000 (LWU).

Ecology : Corticolous, grows under moist and shady as well as exposed conditions.

Distribution : Japan, Korea, Northern China, Mongolia; CIS, India, Nepal, Taiwan (see Hattori & al., 1977; Hattori & Lin, 1985; Vana & Ighatov, 1995; Yamada and Choe, 1997; Srivastava & Alam, 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

44. *Frullania neurota* Taylor (Plate : 3; Fig. : 4).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 12945/2000, 13204/2000 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : Africa, Hawaii, Jamaica, Mexico, Brazil, Colombia, Surinam, Bhutan, China, India, Indonesia, Nepal, Sri Lanka, China, Thailand, Vietnam (see Hattori, 1979; Hattori & Lin, 1985; Yuzawa, 1991; Srivastava & Alam, 2002).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

45. **Frullania tamarisci* var. *obscura* (L.) Dumort. (Plate :3; Fig. : 2).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 136 S /1972, 137 S/1972 (LWU).

Ecology : Corticolous, grows under moist as well as exposed conditions.

Distribution : China, India, Indonesia, Philippines, Sri Lanka, Taiwan, Asia Minor, CIS, Japan, Korea, China (see also Hattori & Lin, 1985; Yamada & Choe, 1997; Srivastava & Alam, 2002).

Status in Palni hills : Rare in Kodaikanal (Palni hills).

LEJEUNEACEAE

46. *Cololejeunea cardiocarpa* (Mont.) Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 13207/2000 (LWU).

Ecology : Corticolous and epiphyllous, grows under moist, humid and wet conditions.

Distribution : Australia, Burundi, Cameroon, Kenya, Madagascar, South Africa, Sierra Leone, Swaziland, Tanzania, Uganda, Zaire, Zimbabwe, Antilles, Bahamas, Cuba, Guadalupe, Mexico, Puerto Rico; Brazil, Galapagos Isl., India (Grolle, 1995; Schuster, 1980; Yano, 1995; Wigginton & Grolle, 1996; Asthana & Srivastava, 2003).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

47. *Cheilolejeunea imbricata* (Nees) S. Hatt. (Plate : 3; Fig. : 9).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 13196/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Bonin Isl., Papua New Guinea, India, Indonesia, Philippines, Taiwan, Thailand, Japan, Korea (see also Asthana & al., 1995; Hong, 2003; Piippo, 1990; Streimann, 1991).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

48. *Lejeunea aloba* Sande Lac.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 7342/1982, 7437/1983, 7461/1983, 7480/1983, 7577/1983, 7615/1983, 12996/2000, 13195/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Samoa, Zaire, India, Indonesia (see also, Agarwal, 1986; Grolle & Wigginton, 1996).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

49. *Lejeunea discreta* Lindenb. (Plate : 3; Fig. : 7).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Silver Cascade : 14272/1909 (G) ; 12999/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Norfolk Isl., New Caledonia, Papua New Guinea, Japan, Korea, Bhutan, Cambodia, China, India, Indonesia, Malaysia, Moluccas, Nepal, Sri Lanka, Taiwan (see Grolle, 1982; Mizutani, 1971; Piippo, 1990; Yamada & Choe, 1997; Zhu & So, 2001).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

50. *Lejeunea flava* (Sw.) Nees (Plate : 3; Fig. : 8).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 198 S/1971, 202 S/ 1971, 13003/2000, 13180/2000, 13181/2000, 13181/2000, 13186/2000, 13187/2000, 13194/2000, 20091/2006, 20096/2000, 20096/2006, 20102/2006, 20104/2006, 20104/2006, 20106/2006 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Australia, New Zealand, New Caledonia, Papua New Guinea, Samoa, Central African Republic, Congo, Ethiopia, Ghana, Kenya, Madagascar, Rwanda, South Africa, Sierra Leon, Tanzania, Uganda, Zaire, Zambia, India, Indonesia, Malaysia, Nepal, Sri Lanka, China, Thailand, Japan, Korea, Mongolia, Europe, Azores, Madeira, Bahamas, Bermuda, Cuba, Guadalupe, Guatemala, Honduras, Jamaica, Panama, Puerto Rico, Virgin Isl., Trinidad, Venezuela, U.S.A. (see also Mizutani, 1964; Schuster, 1957, 1980; Wigginton & Grolle, 1996; Zhu & So, 2001; Gupta & Udar, 1986).

Status in Palni hills : Very Common.

51. **Lejeunea neelgherriana* Gottsche.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 7342/1982 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Bhutan, India, Nepal, Sri Lanka, Korea (Hong, 2003; Long & Grolle, 1990; Yamada & Choe, 1997; Zhu & So, 2000, 2001).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

52. *Lejeunea perrottetii* Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Kodai Lake : 7693/1983 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Endemic to India (Agarwal, 1986).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

53. **Lejeunea tenerrima* Lindenb.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 138 S/1971 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Endemic to India (South India) (see Agarwal, 1986)

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

54. *Lejeunea wightii* Lindenb.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 7400/1983, 7413/1983, 7583/1983, 13005/2000, 13164/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Endemic to India (See Bapna & Kachroo, 2000).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

55. *Leucolejeunea xanthocarpa* (Lehm. & Lindenb.) A. Evans (Plate : 3; Fig. : 6).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 13210/2000 (LWU).

Ecology : Corticolous, grows under moist and shady conditions.

Distribution : Papua New Guinea, Bioko, Cape of Good hope, Ethiopia, Kenya, Madagascar, Mozambique, Rwanda, South Africa, St. Helena, Tanzania, Uganda, Zaire, Zimbabwe, Brazil, Colombia, Galapagos Isl., Puerto Rico, Venezuela; Bahamas, Guyana, Guadeloupe, Jamaica, New Providence, Maidenhead, Mexico, Trinidad, United States of America, Bhutan, Celebes, India, Indonesia, Malaysia, Sri Lanka, Philippines, Japan, Korea, China, Mangolia (Gradstein 1997; Grolle & Piippo, 1984; Menzel, 1988; Piippo, 1990; Schuster, 1980; Stephani, 1911; Yano, 1995; Wigginton & Grolle, 1996; Zhu & So, 1996, Udar & Awasthi, 1983).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

56. *Lopholejeunea sikkimensis* Steph.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 137 S/1971, 13012/2000 (LWU).

Ecology : Corticolous, grows under moist, wet and shady conditions.

Distribution : Endemic to India (Awasthi & al., 2000).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

57. *Lopholejeunea subfusca* (Nees) Steph. (Plate : 3; Fig. : 5).

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 13198/2000 (LWU).

Ecology : Corticolous, grows under moist and shady conditions.

Distribution : Endemic to India (Awasthi & al., 2000).

Status in Palni hills : New and vulnerable in Kodaikanal (Palni hills).

58. *Microlejeunea ulicina* (Taylor) A. Evans (Plate : 1; Fig. : 7).

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 416-445/1962, 384-409/1966, 198-200 S/ 1971, 12963/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Ivory Coast, U.S.A., Canada, Brazil, Chili, Japan, Azores, Britain, France, Italy, Luxembourg, Madeira, Canary Isl., India (see Aleffi & al., 1998; Gonzalez- Macebo & Losada-Lima, 2003; Werner, 1993; Yamada & al., 1981; Verma, 2005).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

59. *Schiffneriolejeunea polycarpa* (Nees) Gradst.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shembaganur : 13014/2000 (LWU).

Ecology : Corticolous, grows under moist as well as dry conditions.

Distribution : Angola, Central African republic, Congo, Fernando Po, Ghana, Guinea, Mozambique, Nigeria, Sao Tome, Sierra Leone, Tanzania, Zaire, Zambia, Zimbabwe, Brazil, Puerto Rico, India, Sri Lanka (see Gradstein & Inoue, 1980; Yano, 1995; Wigginton & Grolle, 1996; Udar & Awasthi, 1983).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

RADULACEAE

60. **Radula kurzii* Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : 8222 (G).

Ecology : Corticolous, grows on tree barks.

Distribution : India, Sri Lanka. (Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

61. **Radula meyeri* Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Shenbaganur : 5792/ 1982 (LWU).

Ecology : Corticolous, grows on tree barks.

Distribution : India, East and West Africa (see Udar & Kumar, D., 1982; Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

62. **Radula tabularis* Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 132 S/1971 (LWU).

Ecology : Corticolous, grows on tree barks.

Distribution : India, Australia, New Zealand, Mascarene Island, South Africa (Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

ORDER : MARCHANTIALES

CLEVEACEAE

63. **Athalamia pusilla* (Steph.) Kashyap

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- 1960 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks.

Distribution : India, Nepal (Udar & Srivastava, 1965).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

AYTONIACEAE

64. **Asterella khasyana* (Griff.) Pande & al.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12927/2000 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks, also on exposed rocks

Distribution : India, Indonesia, Thailand (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

65. **Mannia foreau* Udar & V. Chandra

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal : B5745/1962 ((LWU).

Ecology : Terrestrial, grows on moist soil and soil covered rocks.

Distribution : Endemic to India (Udar & Chandra, 1965; Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal (Palni hills).

66. Plagiochasma cordatum. Lehm. & Lindenb.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 158 S/1972, 12923/2000, 20089/2006 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks, also on exposed rocks.

Distribution : Afghanistan, Bhutan, China, Hawaii, India, Nepal, Taiwan. (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

67. Plagiochasma rupestre (J. R. Forst. & G. Forst.) Steph.

Specimen examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 20093/2006 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks, also on exposed rocks.

Distribution : Greece, Italy, Portugal, Tunisia, Turkey, Yugoslavia, Australia, New Zealand, India, Iran, Nepal, Taiwan, Sri-Lanka. Ethiopia. (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : New record for Kodaikanal (Palni hills).

68. Reboulia hemisphaerica (L.) Raddi.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12933/2000, 12992/2000 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks, also on exposed rocks.

Distribution- Asia Minor, Caucasus, India, Indonesia, Japan, Korea, Nepal, South Africa, Australia, New Zealand, Mexico, Brazil, Europe. (see Udar & Chandra, 1964b; Bapna & Kachroo, 2000).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

LUNULARIACEAE

69. Lunularia cruciata (L.) Dumort.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12927/2000, 12937/2000, 12958/2000, 13183/2000, 13184/2000, 20101/2006, 20107/2006 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks.

Distribution : Abyssinia, Australia, Europe, India, Japan, Norway, S. Africa (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : Common.

MARCHANTIACEAE

70. Dumortiera hirsuta (Sw.) Nees

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12957/2000, 12984/2000 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks and also on exposed rocks.

Distribution : Africa, Europe, Hawaii, India, Japan, N. America, Nepal, New Zealand, S. America (Srivastava & Sharma, 1987; Bapna & Kachroo, 2000).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

71. *Marchantia paleacea* Bertol.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12954/2000, 12955/2000, 12956/2000 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks and often on exposed rocks.

Distribution : Afghanistan, Africa, Azores, Bhutan, Brazil, China, Europe, Guatemala, Hawaii, India, Italy, Japan, Indonesia, Nepal, N. America, S. America, New Zealand, Pakistan, Somoa, Tahiti (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : New record for Kodaikanal (Palni hills); vulnerable.

72. *Marchantia palmata* Nees

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 156 S/1971, 12941/2000, 12984/2000 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks and also on exposed rocks.

Distribution : Sri Lanka, China, Europe, India, Japan, Indonesia, New Guinea, Pakistan, Tonkin (Bapna & Kachroo, 2000; Alam, 2005).

Status in Palni hills : Vulnerable in Kodaikanal (Palni hills).

TARGIONIACEAE

73. *Targionia hypophylla* L.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 12926/2000, 12923/2000, 12928/2000, 12929/2000, 12930/2000, 12938/2000, 13041/2000, 13060/2000, 13061/2000, 20093/2006 (LWU).

Ecology : Terrestrial, grows on wet soil and soil covered rocks.

Distribution : China, India, Japan, Korea, Taiwan, Australia, New Zealand, Africa, Chile, Ecuador, Madagascar, Hawaii, Peru, Tenerife (Udar & Gupta, 1983; Bapna & Kachroo, 2000).

Status in Palni hills : New record for Kodaikanal (Palni hills); common.

RICCIACEAE

74. *Riccia fluitans* L.

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 13040/2000, 13058/2000, 13059/2000 (LWU).

Ecology : Terrestrial, grows on extremely wet soil and soil covered rocks, often in water.

Distribution : Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, Nepal, CIS, Australia- New Zealand; Britain, West Indies; Argentina, Brazil (Pande & Udar, 1958; Bapna & Kachroo, 2000).

Status in Palni hills : New record for Kodaikanal (Palni hills); vulnerable.

75. **Riccia grollei* Udar

Specimens examined : South India : Tamil Nadu - Palni hills – Kodaikanal- Perumalmalai : 424/1962 (LWU).

Ecology : Terrestrial, grows on soil and soil covered rocks.

Distribution : Endemic to India (Pande & Udar, 1958; Bapna & Kachroo, 2000).

Status in Palni hills : Endangered in Kodaikanal.

DISCUSSION

Tropical and subtropical rain forests host various biotic communities, holding about 50% of the global species, but population density of individual is very low. Such forests also host a large number of endemic-native species found only in these locations. Rarity is a multifaceted concept and species can show different degree of rarity at global, regional and local levels. Any individual become rare either by unfavourable ecological niche or by man made disturbance. Poorly dispersing species become vulnerable due to habitat loss and its fragmentation. (see also Poós, 1982; Smith, 1982).

An assessment of current status of hepatic diversity in and around Kodaikanal in Palni hills revealed the presence of 36 genera and 75 species falling under 3 orders and 22 families. Of these 33 species are corticolous epiphytes, 38 species are terricolous and 4 species occur as both corticolous as well as terrestrial. This data is an outcome of investigations on several past and recent collections as well as those previously reported from this region. Of these only 68 species are at lower risk in the region (**Fig. 1**).

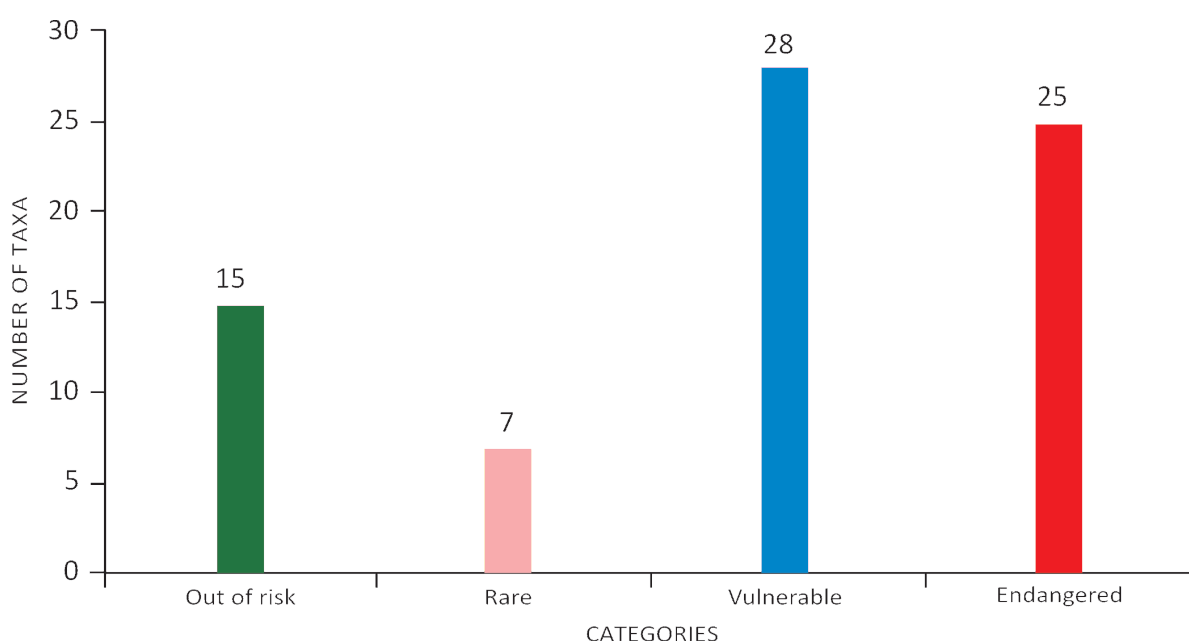


Fig. : 1. Distribution of Taxa under different categories in Palni hills.

The rarity of 7 species (4 terricolous and 3 corticolous) in Palni hills may be attributed to habitat destruction and degradation due to various reasons like tea and coffee plantation, uncontrolled grazing, increased tourism, etc. making the survival of these plants highly vulnerable. A couple of endemic species, *Fossombronia foreau* Udar & S.C. Srivast. (Srivastava & Udar, 1975b) and *Mannia foreau* Udar & V. Chandra (Udar & Chandra, 1965) described from Palni hills were never recollected from the area after their original discovery. A species which has declined to low numbers tend to suffer from loss of genetic diversity, reducing the potential for adaptation to changing environmental conditions. In this connection Mackenzie & al. (1999) rightly remarked that a minimum viable population (MVP) is required for a long term survival of species to ensure maintenance of genetic variability. There is a further need to assess the entire bryo-diversity of the area including mosses, liverworts and hornworts.

ACKNOWLEDGEMENTS

The authors are grateful to Ministry of Environment and Forests, Govt. of India, New Delhi for financial assistance under AICOPTAX and to the Head of the Botany Department, University of Lucknow for providing necessary facilities.

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पलनी पहाडियों (तमिलाडु, दक्षिण भारत) में लिवरवर्ट विविधता - एक चेक लिस्ट

अफरोज आलम एवं एस.सी.श्रीवास्तव

सार संक्षेप

वर्तमान अन्वेषण कोडङ्कनाल एवं निकटवर्ती अंचल में लिवरवर्ट के 75 टैक्सा की व्याप्ति दर्शाते हैं। प्रत्येक जाति एक्सिकेट, पारिस्थितिकी, व्याप्ति श्रेणी तथा अध्ययन के अंचल में उसकी स्थिति के विवरण के साथ सूचीबद्ध की गई है।