I: List of host trees of Ergodium magiferae

Acacia arabica Willd.
A. leucophloea Willd.
Aegle marmelos Corr.
Albizia lebbek Benth.
A. odoratissima Benth.
Azadirachta indica Juss.
Bauhinia variegata Linn.
Bridelia retusa Spreng.
Butea monosperma Taub.
Cordia dichotoma Forst. f.
Dalbergia sissoo Roxb.
Diospyros melanoxylon Roxb.
Elaeodendron glaucum H.f. & T.
Eugenia jambolana Lamk. (Syzygium cumini (Linn.) Skeels.)
Feronia limonia (Linn.) Swingle.
Ficus bengalensis Linn.
F. religiosa Linn.
Holoptelea integrifolia Planch.
Mangifera indica Linn.
Madhuca indica Gmel.
Millingtonia hortensis Linn. f.
Mimusops elengi Linn.
Pongamia pinnata Pierre.
Pterocarpus marsupium Roxb.
Saccopetalum tomentosum Hk. f. & Th. (Miliusa tomentosa (Roxb.) J.Sinclair).

Salmalia malabarica (TC) Schott & Endl.

Tamarindus indica Linn.

Terminalia tomentosa Wt. & Arn.

Lannea coromandelica (Boutt.) Merr.

Zizyphus mauritiana Link.

II: Explanation to Figures

Fig.1: Graph showing minimum and maximum temperature of Nainital (Min.N, Max.N), Pachmarhi (Min.P, Max.P) and Sagar (Min.S, Max.S).

Fig.2: Graph showing relative humidity of Nainital, Pachmarhi and Sagar (% P and S).

Fig.3: Average rainfall in c.m. of Nainital, Pachmarhi and Sagar.

Fig.4: Gymnostomum recurvirostrenum 1. habit, 2. enlarged plant, 3. dry plant, 4. leaf, 5. capsule, 6. apex of the capsule, 7. lid, 8. peristome teeth, 9. basal cells of the leaf, 10. leaf apex, 11. spores.

Fig.5: Hymenostylhum dicranalloides, 1. habit, 2. portion of the branch enlarged, 3. dry plant, 4. leaf, 5 & 6. leaf cells.

Fig.6: Hyophila involuta, 1. habit, 2 & 3. fertile plants enlarged, 4. dry plant, 5. leaf, 6, 7, 8 & 9. leaf cells, 10. spores.

Fig.7: Bryoerythrophyllum atrorubens, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5 & 6. capsule, 7. lid, 8. apex of the leaf, showing toothed margin, 9. peristome teeth, 10. middle cells of the leaf, 11. spores.

Fig.8: Funaria calycescens, 1. habit, 2. dry plant, 3. enlarged plant, 4. leaf, 5. capsule, lid separated, 6. peristome teeth, 7 & 9. leaf cells.

Fig.9: Pohlia elongata, 1. habit, 2. fertile plant enlarged, 3. dry plant, 4 & 5. leaves, 6. capsule, 7. lid, 3. basal cells of leaf, 9. apex of leaf, costa is prominent, 10. spores.
Fig. 10: *Aneomobryum nitidum*, 1. habit, 2. plant enlarged, 3. leaf showing V shaped costa, 4. capsule, 5. peristome teeth, 6-8. leaf cells; 6. marginal, 7. middle and 3 cells of the leaf apex, 9. spores.

Fig. 11: *Bryum argenteum*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5. capsule, 6. apex of capsule 7. peristome teeth, 3, 9, 10. basal, middle and apical cells of leaf, 11. spores.

Fig. 12: *Rhodobryum roseum*, 1. plant with rosette leaves, 2. leaf, 3. marginal cells, 4. middle cells showing chloroplasts, 5. leaf apex.

Fig. 13: *Minium longirostrum*, 1. habit, 2. plant with capsules enlarged, 3. dry plant, 4. leaf, 5. capsule, 6. lid, 7 & 8. leaf cells, 9. spores.

Fig. 14: *Bartramia leptodonta*, 1. plant enlarged, 2. dry plant, 3 & 4. leaves, dorsal and ventral view, 5. cells of the sheathing leaf base, 6. marginal cells, 7. leaf apex, 8. capsule, 9. lid, 10. lid enlarged, 11. peristome teeth, 12. No. 11 enlarged, 13 & 14. spores.

Fig. 15: *Fossastroemia* sp., 1. habit, 2. plant enlarged, 3. leaf, 4. capsule, 5. lid, 6. peristome teeth, 7-9. leaf cells, 7. marginal, 8. middle and 9. apical region, 10. spores.

Fig. 16: *Faufonia minuta*, 1. habit, 2. plant enlarged, 3. leaf, 4 & 5. capsule, 6. lid, 7-9. leaf cells, basal middle and apex of the leaf, 10. spores.

Fig. 17: *Haplocladium* sp., 1. habit, 2. leaf, 3. portion of the stem enlarged, showing arrangement of leaves, 4. aerolation of the leaf.

Fig. 18: *Thuidium* sp., 1. plant enlarged, 2. dry plant, 3 & 4. leaves, 5 & 6. aerolation of the leaf.

Fig. 19: *Hygroamblystegium filicinum*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5-7. leaf cells; marginal, middle and apical region of the leaf.

Fig. 20: *Brachythecium populueum*, 1. habit, 2. plant with capsules enlarged, 3. dry plant, 4. leaf, 5 & 6. capsules, 7. lid, 3. peristome teeth, 9-13. leaf cells. basal, marginal, apical, and middle regions, 14. spores.

Fig. 21: *Ectodon wyurus*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5. capsule, 6. mouth of the capsule, 7. lid, 3. basal cells of leaf, 9. leaf apex, 10. spores.

Fig. 22: *Ectropothecium sikkimense*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5. capsule, 6. mouth of the capsule, 7. lid, 3. peristome teeth, 9 & 10. basal and apical cells of leaf, 11. spores.
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Fig. 24: *Taxiphyllum taxifolium*, 1. habit, 2. plant with capsule, 3. dry plant, 4. fertile shoot separated, 5. calyptra, 6. foot of the sporophyte, 7. leaf, 8. basal cells of the leaf, 9. leaf apex.

Fig. 25: *Stenotheciopsis serrula*, 1. habit, 2. dry plant, 3. plant enlarged, 4. leaf, 5. leaf showing toothed margin, 6-9. leaf cells, 6. basal, 7. marginal, 8. middle and 9 cells of the leaf apex, 10. spores.

Fig. 26: *Atrichum flavidum*, 1. plant, with capsule, 2. dry plant, 3. leaf, 4. capsule bearing calyptra, 5-6. lid, 7. mouth of the capsule, 8. peristome teeth, 9. spores.

Fig. 27: *Pogonatum nr. esii*, 1. dry plant, 2 & 3. plant with capsule, 4 & 5. side and front view of the leaf, 6. capsule, 7. lid, 8. peristome teeth, 9. spores.

Fig. 28: *P. microstomum*, 1. habit, 2. dry plant, 3. plant enlarged, 4 & 5. leaves, 6. calyptra, 7. capsule, 8. lid, 9. peristome teeth, 10. spores.

Fig. 29: *Fissidens sylvaticus*, 1. habit, 2. dry plant, 3. plant enlarged, 4. capsule, 5. lid, 6. leaf, 7. peristome teeth, 8. base of the leaf, 9. leaf apex, 10. spores.

Fig. 30: *Campylopus laetus*, 1. habit, 2. dry plant, 3. plant enlarged, 4 & 5. leaves showing radicals, 6. same enlarged, 7. basal cells, 8 & 9. marginal cells, 10. apex of leaf.

Fig. 31: *Leucobryum bowringii*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5. marginal cells, 6. middle cells, 7. cells of the leaf apex.

Fig. 32: *Octoblepharum albidum*, 1. habit, 2. plant enlarged, 3. leaf, 4. capsule, 5. lid, 6. peristome teeth, 7 & 8. cells of the leaf, 9. leaf apex, 10. cells of the capsule wall, 11. spores.

Fig. 33: *Calypogeia manzalorense*, 1. habit, 2. plant enlarged, 3. dry plant, 4. leaf, 5. 6 & 7. marginal, middle and apical cells of the leaf.

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Fig. 36: *Bryum truncorum*, 1. plant showing numerous rhizoids, enlarged, 2. dry plant, 3. leaf, 4, 5, 6, 7. leaf cells, basal, middle, upper and apical region respectively.

Fig. 37: *Philonotis secunda*, 1. habit, 2. a portion of the plant enlarged, 3. dry plant, 4. leaf, 5, 6 & 7. marginal and middle and apical cells of the leaf.

Fig. 38: *Rhacocladium orthocarpum*, 1. habit, 2. plant enlarged, 3. dry plant, 4 & 5. leaves showing leaf base, 6. marginal cells, 7. middle cells showing costa, 8. leaf apex.

Fig. 39: *Pinnatella calcutensis*, 1. habit, 2. a portion of stem enlarged, 3. dry plant, 4. leaf, 5. lower cells of the leaf, 6. middle and 7. cells of apex of leaf.

Fig. 40: *Hernatiphoreon toccosae*, 1. habit, 2. portion of plant enlarged, 3. dry plant, 4. portion of the stem showing the arrangement of leaves, 5. leaf, costa is represented only at the base (in pairs), 6-7. cells of middle and apical region of leaf.

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Fig. 44: *Semivarblula orientalis*, 1. habit, 2. fertile plant enlarged, 3. dry plant, 4. leaf, 5. capsule showing spiral peristome teeth, 6 & 7. peristome spirals enlarged, 8. capsule wall, 9, 10 & 11. middle, marginal and apical cells of leaf, 12. spores.

Fig. 45: *Physcomitrium pyriforme*, 1. 2. plants enlarged, 3-4. leaves, 5. capsule, 6. capsule after removing the calyptra, 7. leaf apex showing toothed margin, 8. spores.

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Fig. 48: *Eryodium mangiferae*, 1. plant showing branches, enlarged, 2-3. fertile shoots, 4. mature capsule, borne on shoot, 5, 6 and 7. lateral, dorsal and apical leaves respectively, 8. lid of the capsule, 9. apical bud, 10. antheridial bud, 11. rhizoid, 12. capsule showing liberation of spores, 13. empty capsule, 14 & 15. antheridia, 16. paraphyses, 17, 18 & 19. archegonia, 20-22. leaf cells, 23 basal marginal cells, 21 leaf apex, 22. middle cells, 23 & 24. inner and outer cells of the capsule wall, 25. spore with conspicuous rounded chloroplasts.

Fig. 49: *Hymenium* sp. 1. habit, 2. plant with capsule enlarged, 3-4. leaves, 5. foot region of the sporophyte, 6-9. leaf cells, marginal, basal, middle and apical cells, respectively, 10. capsule, 11. apex of the perichaetal leaf, 12. spores.

Fig. 50: *Bryum coronatum* - germination of spores (30-40).

Fig. 51-54: *Hyophila involuta*.

- 52. propagula growth in culture media (36-39).
- 53. protonema produced from the leaf base and formation of buds (40-42).
- 54. spore germination (43-56).

Fig. 55: *Eryodium mangiferae* - germination of spores (39-55).

Fig. 56: Graph showing comparative account of the germination percentage of *Bryum, Hyophila* and *Eryodium* under various light quality treatment.

Fig. 57: Graph showing the water holding capacity of certain tree barks investigated for the epiphytic moss *E. mangiferae*. 16 barks samples were studied and the data obtained are graphically represented.

Fig. 58: *Bryum coronatum* (25-29) - 25. young gametophore, 26. protonema produced from vegetative part, 27. T.S. of the leaf showing the costa, 28. T.S. of stem, 29. L.S. of growing apex, the inverted pyramidal cell is seen in the centre.

Fig. 59: *B. coronatum* - antheridial stages (1-8), 8. L.S. of mature antheridium.
Fig. 60: *B. coronatum*, Developmental stages in Archegonium (9-13).

Fig. 61: *B. coronatum*, Morphology of mature capsule (19-24), 19-L.S. of mature capsule, 20-21 peristome teeth, 22-L.S. of capsule wall, 23-outer of the capsule showing longitudinal thickening, 24-mature spores.

Fig. 51: *Hyophila involuta* (27-35):
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Fig. 62: *H. involuta* - antheridial stages.

Fig. 63: *H. involuta* - stages in development of Archegonia.

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Fig. 65: *Arpodium mangiferae* (33-33)- 33-leaf, 34-growing apex, 35-T.S. of stem, 36-leaf; transverse section, 37-branch primordia, 38-protonema produced from the central leaf cells.

Fig. 66: *B. mangiferae* (26-32), 26-L.S. of mature capsule, 27 & 28-L.S. of capsule wall, 29-foot of the sporophyte showing cells rich in protoplasm, 30-sporophyte in early stage of development, 31 & 32-antheridia.

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Fig. 1.

Fig. 2.
Fig. 28.

Fig. 29.
PLATE I

Close up showing growth of the moss *E. mangiferae*

on most common host plants

(a) On *Millingtonia hortensis*

(b) On *Mangifera indica*

(c) On *Madhuca indica*
PLATE II

Close up showing various conditions of the moss

E. mangiferae

(a) Moss in dry condition
(b) Moss in active growing condition
(c) Sporophytes are seen in profusion.
PLATE III

Plate showing the spectrum of various filters used for germination studies of the spores of Bryum, Hyophila and Erpodium. Colophane papers of the color Red, Blue, Green, Red+ Blue combinations were tested. The spectral analysis are obtained as follows:

The comparison was done with iron.

Below upwards:

1. Iron

2. Red paper - cutting light from 5615 above and upto 7000.

3. Blue paper - cutting light having longer wave length than 5569.

4. Green paper - 4528 - 4359 - suppressing this region.

5. Red + Blue (far red) - no light is transmitted.