

## MISCELLANEOUS NOTES

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## 29. CONTRIBUTION TO THE FERNS OF MIZORAM

### INTRODUCTION

Mizoram (previously known as Lushai Hills or Mizo-Hills district) situated in the north-eastern corner of India, is flanked by Bangladesh and Tripura on the west and Burma (Chin Hills) on the east and south. On the north, are Manipur and Cachar Districts of Assam. It has remained practically unexplored due to its difficult hilly terrain and inaccessible disturbed forest areas. Gage (1899) and Fischer (1938) listed the ferns of Southern Lushai Hills. During 1963, we surveyed Aizal area and made an extensive collection of ferns along with the other groups of plants between the altitudinal range of 600-800 m. The present communication which deals with the ferns only, is the first record of the area.

The Mizo hill ranges extend from north to south at an average height of c. 900 m, with rather steep slopes separated by fast flowing rivers which create deep gorges between the hill ranges. The climate is generally cool in summer (temperature ranges from 18°C to 29°C) and not very cold in the winter (tem-

perature varies from 11°C to 24°C); the average rainfall is 208 cm. The vegetation of the area is dominated mainly by epiphytes, scitamineous plants, aroids and ferns.

### ENUMERATION OF SPECIES

The arrangement of the families followed here is after Ching (1978). Species under each genus are arranged alphabetically, along with a brief account of ecology. Voucher specimens are deposited in the herbarium of the National Botanical Research Institute, Lucknow (LWG).

#### LYGODIACEAE Presl

##### *Lygodium* Swartz

**L. flexuosum** (L.) Sw. Schrad. Journ. Bot., 106. 1801; Bedd., Handb. Ferns Brit. Ind. 457. 1883.

In scattered patches at lower altitude: *P. & S. Chandra*, LWG 81165.

#### LINDSAEACEAE Ching ex Pichi Sermolli

##### *Lindsaea* Dryander apud Smith

**L. ensifolia** Sw. Schrad. Journ. Bot., 77. 1801. *Schizoloma ensifolia* Sw., Bedd. Handb. Ferns Brit. Ind. 80. 1883.

*Schizoloma ensifolia* (Sw.) Alston in Bot., Soc. Broter. Ser. 2, 30:24. 1956.

Common on wet hill slopes in crevices of rocks: *P. & S. Chandra*, LWG 81184.

PTERIDACEAE Ching

*Pteris* L.

**P. pellucida** Presl, Rel. Haenk., 1: 55. 1825; Bedd. Handb. Ferns Brit. Ind. 106. 1883.

In comparatively dry and exposed places at lower altitude c. 800 m. Not common: *P. & S. Chandra*, LWG 81169.

SINOPTERIDACEAE Koidzumi

*Aleuritopteris* Fee

**A. farinosa** (Forsk.) Fee, Gen. Fil., 154, t 12 B. f1, 1852. *Cheilanthes farinosa* (Forsk.) Kaulf., Enum. Fil., 212. 1824, Bedd. Handb. Ferns Brit. Ind. 92. 1883.

In rock crevices at rather exposed places; very common on road sides: *P. & S. Chandra*, LWG 81162.

*Onychium* Kaulf.

**O. siliculosum** (Desv.) C. Chr., Index Fil. 20. 1905; 469. 1906; *Onychium auratum* Kaulf., Bedd. Handb. Ferns Brit. Ind. 96. 1883.

Common on road sides and exposed clayey hill slopes at lower altitudes between 100-300 m: *P. & S. Chandra*, LWG 811930.

ADIANTACEAE (Presl) Ching

*Adiantum* L.

\***A. assamicum** (Nayar) Nayar, in Bull. natn. bot. Gdns. no. 94: 1. 1964. *A. caudatum* L. var. *assamicum* Nayar in Bull. natn. bot. Gdns. no. 52: 10. 1961.

Very common in plains and foot hills, on more or less exposed hill slopes and in moder-

ately dry localities: *P. & S. Chandra*, LWG 81183.

HEMIONITIDACEAE Pichi-Sermolli

*Pityrogramma* Link

**P. calomelanos** (L.) Link., Handb. Gewachs: 3: 20. 1883; Holtt., Fl. Malaya 2: The Ferns: 593. 1968; Schelpe, Fl. Zam., 170 (1970).

Common especially on earth cuttings and forest clearings, forming isolated dense clumps near water drains: *P. & S. Chandra*, LWG 81161.

ATHYRIACEAE Alston

*Athyrium* Roth

**A. falcatum** Bedd., Ferns S. Ind. 151. 1863; Nayar and Kaur, Comp. Bedd. Ferns Brit. Ind. 40. 1974.

Sparsely distributed on hill slopes and by the sides of water channels and water falls: *P. & S. Chandra*, LWG 81160.

*Diplazium* Swartz

**D. umbrosum** (J. Smith under *Athyrium*) Bedd. Handb. Ferns Brit. Ind. 188. 1883; Nayar and Kaur, Comp. Bedd. Ferns Brit. Ind. 45. 1974.

Growing gregariously in shady and humid dense forests: *P. & S. Chandra*, LWG 81185.

THELYPTERIDACEAE Ching ex Pichi Sermolli

*Cyclosorus* Link

**C. crinipes** (Hook.) Ching in Bull. Fan Mem. Inst. Biol. Bot. 8:179. 1938. *Nephrodium crinipes* Hook., Spec. Fil. 4:71. 1862; Bedd. Handb. Ferns. Brit. Ind. 279. 1863. *Christella crinipes* (Hook.) Holtt., Kew Bull. 31:326. 1976.

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Common near waterfalls and water channels: *P. & S. Chandra*, LWG 81199.

**C. evolutus** (Bedd.) Ching in Bull. Fan Mem. Inst. Biol. Bot. 8:219. 1938. *Nephrodium evolutum* Bedd., Handb. Suppl. Ferns Brit. Ind. 76. 1892. *Christella evoluta* (Bedd.) Holtt., Kew Bull. 31:330. 1976.

Common in humus-rich forests: *P. & S. Chandra*, LWG 81176, 81198.

*Metathelypteris* (H. Ito) Ching

**M. gracilescens** (Bl.) Ching in Acta Phytotax. Sin. 8:305. 1963; Holttum, Philipp. J. Biol. 5: 116. 1976. *Lastrea gracilescens* Bl., Bedd. Handb. Ferns Brit. Ind. 234. 1883.

Common in humus-rich forests: *P. & S. Chandra*, LWG 81195.

*Pronephrium* Presl

**P. lakhimpurens** (Rosenst.) Holtt., Blumea 20:110. 1972; in Nayar and Kaur, Comp. Bedd. Ferns Brit. India, 95, 1974.

Common in moist shaded places: *P. & S. Chandra*, LWG 81175.

**P. nudatum** (Roxb.) Holtt., Blumea, 20:111. 1972; in Nayar and Kaur, Comp. Bedd. Ferns Brit. India, 66, 1974.

In somewhat exposed forest areas and by the side of river beds: *P. & S. Chandra*, LWG 81187.

*Pseudocyclosorus* Ching

**P. ciliatus** (Wall. ex Benth.) Ching, Acta phytotax. Sin 8:324. 1963. *Trigonospora ciliata* (Benth.) Holtt., in Nayar and Kaur, Comp. Bedd. Ferns Brit. India, 203, 1974.

Growing on rocks near and on beds of streams where it is frequently submerged in the rainy season: *P. & S. Chandra*, LWG 81157.

ASPLENIACEAE Mett. ex Frank

*Asplenium* L.

**A. crinicaule** Hance, Ann. Sci. Nat. Ser. 5:254. 1866; Bedd. Handb. Ferns Brit. Ind. 150. 1883.

Quite common on tree trunks and moss covered rocks between 500-600 m: *P. & S. Chandra*, LWG 81177.

**A. excisum** Pr., Epim., Bot. 74. 1851; Nakaike, Enum. Jap. Pterid. Filicales:96. 1975. *A. unilaterale* var. *majus* (C. Chr.) Sledge, Bull. Brit. Mus. (N.H.) Bot. 3:246. 1965. *A. unilaterale* Bedd., Handb. Ferns Brit. Ind.: 152. 1883 (p.p.)

On wet rocks by streams and on wet banks; common in primary forest: *P. & S. Chandra*, LWG 81181.

**A. finlaysonianum** Wall. ex Hook., Icones Pl., t. 937. 1854. *Hemidictyum finlaysonianum* Hook., Bedd. Handb. Ferns Brit. Ind. 195. 1883.

On wet soils in shade, occasionally occurring on tree trunks: *P. & S. Chandra*, LWG 81169, 81191.

BLECHNACEAE Ching ex Copel.

*Blechnum* Linn.

**B. orientale** Linn., Spec. Pl., 2: 1077. 1753; Bedd. Handb. Ferns Brit. Ind. 132. 1883; Ching, Acta Phytotax. Sin. 16:14. 1978.

In fully exposed areas, on roadsides and river banks: *P. & S. Chandra*, LWG 81192.

DRYOPTERIDACEAE Ching

*Dryopteris* Adanson

**D. sparsa** (Ham. ex D. Don) Kuntze, Rev., Gen. Pl. 2:813. 1891; Sledge, Bull. Brit. Mus. (N. H.) 5:13. 1973. *Lastrea sparsa* Don. Bedd. Handb. Ferns Brit. Ind. 252. 1883 excl. parte.

Common in low-altitude mountain forest: *P. & S. Chandra*, LWG 81197.

*Polystichum* Roth.

**P. biaristatum** (Bl.) Moore, Index Fil.: 86. 1858; Sledge, Bull. Brit. Mus. (N.H.) Bot. 5:35. 1973. *Polystichum aculeatum* Sw. var. *biaristatum* Bl., Bedd. Handb. Ferns Brit. Ind. 209. 1883;

On rather dry slopes in dense evergreen forests: *P. & S. Chandra*, LWG 81179.

**P. lentum** (D. Don) Moore, Index Fil., 86. 1858. *Polystichum auriculatum* Linn., Type var. *lentum* Don, Bedd. Handb. Ferns Brit. Ind. 204. 1883.

Common in semi exposed places throughout the valleys: *P. & S. Chandra*, LWG 81180.

ASPIDIACEAE Mett. ex Frank

*Tectaria* Cavanilles

**T. fuscipes** (Wall. ex Bedd.) C. Chr., Contr. U.S. Nat. Herb., 26:290. 1931. *Pleocnemia membranifolia* Presl, Bedd. Handb. Ferns Brit. Ind. 225. 1883 (p.p.)

Common at low altitudes, occurring scattered in dry, shady places: *P. & S. Chandra*, LWG 81188.

**T. polymorpha** (Wall. ex Hook.) Copel., Philipp. J. Sci., 2 C: 413. 1907. *Aspidium polymorphum* Wall., Bedd. Handb. Ferns Brit. Ind. 218. 1883 (p.p.)

Low-land species, usually growing near water: *P. & S. Chandra*, LWG 81172, 81182.

BOLBITIDACEAE (Pichi-Sermolli) Ching

*Bolbitis* Schott

**B. appendiculata** (Willd.) K. Iwats. ssp. *appendiculata* Hennip., Leiden Univ. Bot. Ser. 2: 190. 1977. *Egenolfia appendiculata* (Willd.) J. Sm., Nayar and Kaur in Bull. natn. bot. Gdns., no. 100:17. 1964.

Creeping on rocks and soil at moist places in deciduous and evergreen forest: *P. & S. Chandra*, LWG 81154.

**B. scalpturata** (Fee) Ching in C. Chr., Ind. Fil., Suppl. 3:50. 1934; Hennip., Leiden Univ. Bot. Ser. no. 2:163. 1977.

On slopes in the forest and on boulders in stream beds: *P. & S. Chandra*, LWG 81152.

**B. sinensis** (Baker) K. Iwats., Acta Phytotax. Geobot. 18:49. 1959; Hennip., Leiden Univ. Bot. Ser. no. 2:202. 1977. *Egenolfia sinensis* Maxon; Nayar and Kaur in Bull. natn. bot. Gdns. Lucknow. 100:32. 1964.

Usually terrestrial, creeping either on soil or on rocks, sometimes epiphytic in evergreen forest: *P. & S. Chandra*, LWG 81171.

POLYPODIACEAE Berchtold et J. S. Presl

*Lepisorus* (J. Sm.) Ching

**L. thunbergianus** (Kaulf.) Ching, Bull. Fan Mem. Inst. Biol. Bot. 4:88. 1933. *Pleopeltis linearis* Thunb., Bedd. Handb. Ferns Brit. Ind. 346. 1883 (p.p.)

Common epiphyte, occasionally forming dense patches on moist rocks: *P. & S. Chandra*, LWG 81166.

*Schellolepis* J. Smith

**S. subauriculata** (Bl.) J. Sm., Ferns brit. and For. 82. 1866. *Goniophlebium subauriculatum* (Bl.) Bedd. Handb. Ferns Brit. Ind. 322. 1883.

Common epiphyte, in shaded humid places: *P. & S. Chandra*, LWG 81190.

*Pyrrosia* Mirbel

**P. flocculosa** (D. Don) Ching, Bull. Chin. Bot. Soc., 1:66. 1935; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:51. 1965.

Epiphyte with drooping fronds in evergreen forest: *P. & S. Chandra*, LWG 81168.

**P. mannii** (Gies.) Ching, Bull. Chin. Bot. Soc., 1:55. 1935; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:63. 1965.



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An epiphyte (sometimes also on shaded rocks) in the primary forest: *P. & S. Chandra*, LWG 81158, 81164.

*P. mollis* (Kze.) Ching, Bull. Chin. Bot. Soc., 1:53. 1935; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:67. 1965.

Commonly met with on shaded rocks and seldom on trees as an epiphyte: *P. & S. Chandra*, LWG 81175.

*P. obovata* (Bl.) Ching, Bull. Chin. Bot. Soc., 1:47. 1935; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:76. 1965.

Abundant at low altitudes up to 750 m: *P. & S. Chandra*, LWG 81153.

*P. subfurfuracea* (Hook.) Ching, Bull. Chin. Bot. Soc., 1:68. 1935; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:83. 1965.

Epiphyte on tree trunks: *P. & S. Chandra*, LWG 81158.

*P. varia* (Kaulf.) Farwell. Amer. Midland Natur. 12:302. 1931; Nayar and Chandra in Bull. natn. bot. Gdns., no. 117:87. 1965.

Occasional on rocks, walls etc. at 150 m: *P. & S. Chandra*, LWG 81163.

*Microsorium* Link

*M. membranaceum* (D. Don) Ching, Bull. Fan Mem. Inst. Biol. Bot. 4:309. 1933; Nayar in Bull. natn. bot. Gdns., no. 58:17. 1962.

A common epiphyte or lithophyte in moist and damp places, forming dense patches throughout the valley: *P. & S. Chandra*, LWG 81170.

*M. pteropus* (Bl.) Copel., Univ. Calif. Publ. Bot. 16:112. 1929. *Pleopeltis pteropus* (Bl.) var. *minor* Bedd., Bedd. Handb. Ferns Brit. Ind. 361. 1883.

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Frequently seen on rocks on the bed and sides of streams: *P. & S. Chandra*, LWG 81155.

*M. punctatum* (Linn.) Copel., Univ. Calif. Publ. Bot., 16:111. 1929; Nayar in Bull. natn. bot. Gdns., no. 58:19. 1961.

Exceedingly common, growing either as an epiphyte or a lithophyte at 800 m: *P. & S. Chandra*, LWG 81173.

*Colysis* Presl

*C. elliptica* (Thunb.) Ching, Bull. Fan Mem. Inst. Biol. Bot., 4:333. 1933. *Selliguea elliptica* Thunb., Bedd. Handb. Ferns Brit. Ind. 392. 1883.

Terrestrial, quite rare: *P. & S. Chandra*, LWG 81156.

*Dendroglossa* Presl

*D. minutula* (Fee) Copel., Gen. Fil. 199. 1947. *Gymnopteris minus* Mett., Bedd. Handb. Ferns Brit. Ind. 430. 1883.

On sandy riverbeds, quite rare: *P. & S. Chandra*, LWG 81159.

*Drynaria* (Bory) J. Sm.

*D. propinqua* (Wall. ex Mett.) J. Sm., Hook., Jour. Bot., 4:61. 1842; Nayar in Bull. natn. bot. Gdns. 56:9. 1961.

Profusely on tree trunks or on moss covered rocks: *P. & S. Chandra*, LWG 81167.

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30. A NEW TAXON OF THE RUBIACEAE FROM NORTH EAST INDIA

(With two text-figures)

In course of studies on taxonomic revision of Indian *Psychotria* L. (Rubiaceae) we examined several specimens which could not be placed under the known taxa and appeared to be distinct. The present paper is based on such a collection

*Psychotria silhetensis* Hook. f. *Fl. Brit. Ind.* 3:174. 1880 is based on a collection from Sylhet by De Silva which is extant in *Wall. Cat.* 8336C (K—W, Photo in CAL!). A specimen bearing the same number in CAL, however, does not represent this taxon.

In course of Abor Expedition, I. H. Burkill collected a specimen *I. H. Burkill* 35726 (CAL) in fruiting condition from Makum, Assam in Nov. 1911. He assigned it doubtfully to *P. silhetensis*. G. Panigrahi collected a similar specimen (*G. Panigrahi* 11251) in Nov. 1957 from Dulong Reserve Forest, Assam. This is also in similar fruiting condition and collected from a locality near the former one. These were provisionally considered to form a new variety of *P. silhetensis*.

While these studies were going on, the late K. M. Vaid of Forest Research Institute, Dehra Dun, sent several specimens to the senior author for determination, one of which *K. N. Vaid* and *H. B. Naithani* 156 represented this new taxon.

On further study of all the material of *P. silhetensis* and those of the new taxon and in

consideration of their distribution we assign these material to a new subspecies. Specimens available bear leaves with stipules, fruits with seeds and persistent calyx. This is described below.

***Psychotria silhetensis* Hook. f. subsp. *tomentosa* subsp. nov.** (Fig. 1).

differt a *P. silhetensis* Hook. f. subsp. *silhetensis* foliis infra ferrugineo tomentosis, stipulis infra et secus marginem pubescentibus, fructibusque parvioribus ovoides.

This differs from *P. silhetensis* Hook. f. subsp. *silhetensis* in having leaves ferruginous tomentose beneath, stipules pubescent beneath and along the margin and smaller broadly ovoid fruit.

*Shrubs* 1.5 – 2 m high; branches stout, thick, quadrangular when young, terete in age, ferruginous tomentose. *Leaves* petiolate, 15 – 24 x 7 – 9 cm, elliptic or slightly elliptic-obovate, shortly acuminate at the apex, entire, cuneate or obtuse at the base, coriaceous, glabrous above, densely ferruginous tomentose beneath; midrib stout beneath, less so above, lateral nerves 14 – 20 on each side, subparallel, arcuate, close, conspicuous beneath, less so above; axil of the midrib and lateral nerves imperforate; nervules reticulate conspicuous beneath, less so above; petioles 1 – 1.5 cm long, thick, tomentose; stipules deciduous, 1.5–2.5 x 0.6–0.7 cm, ovate, caudate-acu-