

THE GENUS *DRYMARIA* IN INDIA

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ABSTRACT

The genus *Drymaria* (Caryophyllaceae), which is now represented by only two species in India, has been studied, and an account of the Indian species with synonymy and full descriptions has been given here.

INTRODUCTION

The genus *Drymaria*, with only four species, was established by Willdenow (1819). Since then, many new taxa have been described under it. Edgeworth & Hooker f. (1874) recorded *D. cordata* to occur in India. Mizushima (1957) studied in detail the geographical distribution of *D. cordata* Willd. Moreover, he re-instated *D. diandra* Bl. which was a synonym under *D. cordata*, to specific status. Duke (1961), in his revision of the genus, recognised 48 species, which he distributed under 17 series. He also reduced Mizushima's species *diandra* to a subspecies, considering the occurrence of intermediates between the two and considering other factors also. Only two taxa, *D. cordata* subsp. *diandra*, belonging to the series Cordatae and *D. villosa* subsp. *villosa*, belonging to the series Villosae, have been recorded so far to occur in India. Mizushima (1963), while studying the Caryophyllaceae of Sikkim Himalaya, first recorded the occurrence of the villose plant from Eastern Himalaya. This species is believed to have been introduced recently from Indonesia.

Drymaria is a tropical cum subtropical genus, unlike other typical genera of Caryophyllaceae. The genus is mainly American. Most of the material from continental Asia belongs to the subsp. *diandra*, the only taxon completely absent in America. The other species *D. villosa* migrated from America to Indonesia, and from there it has migrated to India.

For the present study, the area under consideration is India, including Nepal, Sikkim and Bhutan.

The genus shows a wide range of variation in its habit and also in the characters of the different vegetative and reproductive parts of the plant. *D. cordata* subsp. *diandra* has been used in India as a medicine. Juice of the plant has been found to be anti-febrile, having a cooling effect, also acting as a laxative.

The herbaria consulted for this study are Central National Herbarium (CAL), Herbarium of the Eastern Circle, Botanical Survey of India, Shillong (ASSAM), Herbarium of the Forest Research Institute, Dehra Dun (DD); and Herbarium of the Botany Department, Calcutta University (CALU).

Drymaria Willd. ex Roem. & Schult. Syst. Veg. 5: 31 (1819); Seringe in DC. Prodr. 1: 395 (1824); Benth. & Hook. f. Gen. Pl. 1: 152 (1862); Edgeworth & Hook. f. in Fl. Brit. Ind. 1: 244 (1874); Pax & Hoffmann in Engl. & Harms Nat. Pflanzenfam. ed. 2, 16 C: 306 (1934); Mizushima in Journ. Jap. Bot. 32: 78 (1957); Duke in Ann. Missouri Bot. Gard. 48: 173 (1961); *Pinosia* Urban, in Arkiv. Bot. 23 A (5): 70. pl. 2 (1930); *Mollugophytum* M. E. Jones in Extr. Contr. West. Bot. 18: 35 (1933).

Annual or perennial herbs, usually suberect or diffuse. Leaves opposite, glabrous or glandular to villose, sessile to long-petiolate, stipulate. Flowers in dichasial cymes, rarely solitary, axillary or terminal. Sepals 5, free. Petals 3-5, white, usually bifid, often auriculate. Stamens 2-5, anthers versatile, 2-celled, filaments slightly connate at base. Ovary superior, shortly stipitate, carpels 3, styles 3, united below, ovules campylotropous on free-central placentae. Capsule dehiscent into 3 entire valves. Seeds 1 to many, cochleate, foetiform or of other shapes, usually tuberculate.

48 species in the tropical and subtropical regions throughout the world. Chiefly American.

Type species: *Drymaria cordata* (L.) Willd.

KEY TO THE INDIAN SPECIES

- Plants glabrous to stipitate-glandular.
 Petals with ciliate auricles. Stipules
 lacerate. Seeds 1 or 2, 1.2 to 2 mm
 across, with domical tubercles ... *D. cordata* ssp. *diandra*

Plants villose with long septate hairs.

Petals without auricles. Stipules entire.

Seeds many, 0.5 to 0.9 mm across, with stellate tubercles ... *D. villosa* ssp. *villosa*

Drymaria cordata (L.) Willd. ex Roem. & Schult. Syst. Veg. 5 : 406 (1819); Mizushima in Journ. Jap. Bot. 32 : 78 (1957); Duke in Ann. Missouri Bot. Gard. 48 : 251, fig. 18, A-C (1961). *Holoscium cordatum* L. Sp. Pl. ed. 1 : 88 (1753); Lectotype after Mizushima : Linn. Herb. Sp. No. 109-1.

subsp. ***diandra*** (Bl.) J. Duke, l.c. 253, fig. 18, D-E (1961); Mizushima, l.c. 38 : 150 (1963); *D. diandra* Blume, Bijdr. Fl. Nederl. Ind. 62 (1825); *D. retusa* Wall. ex Wight & Arn. Prodr. Fl. Ind. Or. 359 (1834) as synonym; *D. extensa* Wall. Cat. 647, nom. nud.; "*D. cordata* Willd.": Edgew. & Hook. f. in Fl. Brit. Ind. 1 : 244 (1874) excl. syn. *Cerastium cordifolium* Roxb. Lectotype after Mizushima : Sect. 99, 143-199 at L.

Annual herbs, prostrate or ascending, internodes longer than leaves, glabrous to stipitate-glandular. Leaves opposite, blades glabrous, deltoid-ovate to orbicular or subreniform, rounded at apex and often apiculate, entire, truncate to obtuse, rarely cordate at base, 5-25 mm × 3-20 mm, 3-7 nerved; petioles 2-8 mm long, usually exceeding the stipules; stipules lacerate, segments filiform, 1-3 mm long. Inflorescence terminal, 3 to many-flowered cyme, peduncles 1-12 cm long, glabrous or glandular-puberulent; bracts lanceolate, 2-5 mm long; pedicels glandular-puberulent, 1-8 mm long. Sepals 5, narrowly obovate, 2.0-4.5 mm long, the outer glandular-puberulent, strongly carinate, strongly 3-ribbed, connecting cross-veins often present. Petals 3-5, 1.5-3.0 mm long, bifid upto the middle or more, lobes oblong, 1-nerved, obtuse to emarginate, base narrowed to the linear claw. Stamens 2-3, 1.6-2.2 mm long, anthers sub-orbicular, filaments connate at base into a shallow cup. Ovary globose, styles short, bifid or trifid from half to all their length. Capsules 2-3 valved, 1.5-2.5 mm long, 1-2 seeded. Seeds cochleate, 1.4-2.0 mm across, densely tuberculate.

Flowering : Throughout the year.

Distribution : India, Ceylon, Malaysia, Indo-china, Formosa, China, Australia, Tropical Africa.

Specimens examined : WESTERN HIMALAYA : Kumaon, 1220 m, T. T. s.n. (CAL); without precise locality, Mackinnon s.n. (CAL); Bhalnety, Kumaon,

1220 m, N. Gill 595 (CAL); Nainital, U. P., H. Champion s. n. (DD); Dehra Dun, A. K. Chakravarty s.n. (CALU). EASTERN HIMALAYA : NEPAL : Balaja, 1370 m, B. D. Pande 20 (DD); Kuwapani to Banipa, 1676 m, Banerji 1110 (CAL). SIKKIM : Without precise locality, J. D. H. s.n. (CAL); Kyang valley, G. A. Gammie s.n. (CAL); Kyang, 610 m, G. H. Cave s. n. (CAL); Punkabaree, S. Kurz s. n. (CAL); Palmazoa to Batasi, Dr. Agharkar s. n. (CALU). BHUTAN : Birti, Sarbhang, G. Sen Gupta 1319 (CAL); Changtar, Samchi, 305 m, K. Thothathri 10311 (CAL); Hatipaley, Gaylegphug, Sarbhang, 300 m, G. Sen Gupta 887 (CAL); Dorokha, Dr. Mukerjee 6127 (CAL); N.E.F.A. : Without precise locality, R. S. Rao 1213 (ASSAM); Sissini, Kameng, 1230 m, G. Panigrahi 6093 (ASSAM); Kameng, G. Panigrahi 6922 (ASSAM); Tuting Koppu, Siang, R. S. Rao 17404 (ASSAM); Badasu, Lohit, R. S. Rao 10241 (ASSAM); Kimiu Khuni, Subansiri, G. Panigrahi 19437 (ASSAM). ASSAM : Chennap hills, Khasia, 1524 m, Geo Gallally 19 (CAL); Konoma, Naga hills, Prain s. n. (CAL); Haflong, N. Cachar, 762 m, W. G. Craib 482 (CAL); Ukhrul, Manipur, Naga hills, 1828 m, Dr. S. K. Mukherjee 3428 (CAL); Panirihat & Gabru, A. C. Chatterji s. n. (CAL); Dumar Dullang, R. E. P. no. 10494 (CAL); Renging, Abor, I. H. Burkill 36697 (CAL); Khasia, without precise locality, J.D.H. & T.T. s.n. (CAL); Shillong, K. Chaudhuri s.n. (CALU); Laban, Khasia mt., 1524 m, R. K. Sarkar 449 (CALU); Mawphlong, near Shillong, A. K. Ghosh 2380 (CALU); Kamrup, Mauman forest, A. S. Rao 39090 (ASSAM); K. & J. hills, Shillong, G. K. Deka 21660 (ASSAM); Mawmluh forest, R. S. Rao 2694 (ASSAM); Aka hills, N. L. Bor 18953 (ASSAM). TRIPURA : Without precise locality 685 m, D. B. Deb 27064 (CAL). WEST BENGAL : Kalimpong, 1220-1525 m, Thornton Ripley 82 (CAL); Birch hill, Darjeeling, 2438 m, Raizada 18926 (DD); Darjeeling, 2133 m, A. K. Chakravarty s.n. (CALU); Sylhet station, C. B. Clarke 7112 (CAL). ORISSA : Keonjhar State, 914 m, H. F. Mooney 2771 (DD). SOUTH INDIA : Peria Kanai, A. Meebold 1334 (CAL); Jolpod, Kanara Dist., C. A. Barber 2377 (CAL); Santaveri, Mysore, 1220 m, without collector's name, 3029 (CAL); Madras, without precise locality, Wight 108 (CAL); Mettupalayam, S. Jain & R. Bharadwaja 22619 (DD).

This taxon differs from subsp. *cordata* in its herbaceous, densely glandular, opaque, strongly 3-ribbed and carinate sepals.

Drymaria villosa Cham. & Schlecht. in Linnaea 5: 232 (1830).

subsp. ***villosa*** Duke in Ann. Missouri Bot. Gard. 48: 226, fig. 11, D-E (1961); Mizushima in Journ. Jap. Bot. 38: 150 (1963); *Drymaria hirsuta* Bartl. in Presl, Rel. Haenk. 2: 8 (1831); *D. cordata* var. *pilosa* Schlecht., in Linnaea 26: 374 (1853); *D. stylosa* Backer in Bull. Jard. Bot. Buitenz. 2(12): 15 (1913); *D. tepicana* M. E. Jones in Contr. West. Bot. 15: 124 (1929); *D. barrancae* M. E. Jones, l.c. 18: 65 (1931). Holotype: Schiede & Deppe 505, probably destroyed, Isotype at LE.

Annual herbs, prostrate to ascending, upto 40 cm long, internodes usually longer than leaves, villose to hirsute with septate hairs upto 2 mm long, leaves opposite, blades villose or hirsute, orbicular to reniform, rounded to acute and apiculate at apex, cordate to truncate at base, 3-7 veined, 5-15 mm × 5-15 mm, petioles 1-10 mm long, stipules mostly entire, 0.5-1.5 mm long, not easily distinguishable from the hairs. Cymes terminal or axillary, 4- to many-flowered, ultimate branches often tending to be racemose; peduncles 1-5 cm long; bracts 0.5-1.5 mm long; pedicels 2-20 mm long, villose. Sepals 5, 2.0-3.5 mm × 1-2 mm, ovate or elliptic, acute to

obtuse, villose, rarely glabrescent, indistinctly 3-nerved, with scarious margins. Petals 5, 2.0-3.6 mm long, bifid upto about the middle or more, lobes acute to deeply emarginate, 4-nerved, with caducous filiform auricles at base. Stamens 5, 2.0-3.5 mm long, anthers oblong, filaments shallowly connate. Ovary ovoid to globose; style 1.0-1.5 mm long, trifid to half its length. Capsules ovoid to ellipsoid, 2.0-3.5 mm long, equalling or exceeding the sepals, many seeded; seeds cochleate, 0.5-0.9 mm across, tuberculate; facial tubercles stellate.

Flowering: April-June.

Distribution: Mexico, Central America, South America—along the Pacific coast to Peru. Introduced and widespread in Indonesia, and recently in India, occurring in the Eastern Himalaya.

Specimens examined: EASTERN HIMALAYA: BHUTAN: Bindu river bed, marshy land, 1220 m, U.S. P.L. 480 project, no. 553 (CALU). WEST BENGAL: Birch hill, Darjeeling, 2070 m, *Satyabrata Sarkar* 128 (CALU); Roadside, Darjeeling, 2040 m, *A. B. Chowdhuri* s.n. (CALU); Munsong, 1500 m, *H. Santapau & S. K. Mukerjee* 187 (CAL).

This species was added to the Indian flora first by Mizushima in 1963. It is believed that this plant has been introduced from Indonesia, probably at the beginning of the present century.