

ASPLENIUM × *GERMANICUM* AUCT., A FERN HYBRID, RARE IN INDIA

A. DATTA AND R. K. GHOSH

Botanical Survey of India, Howrah

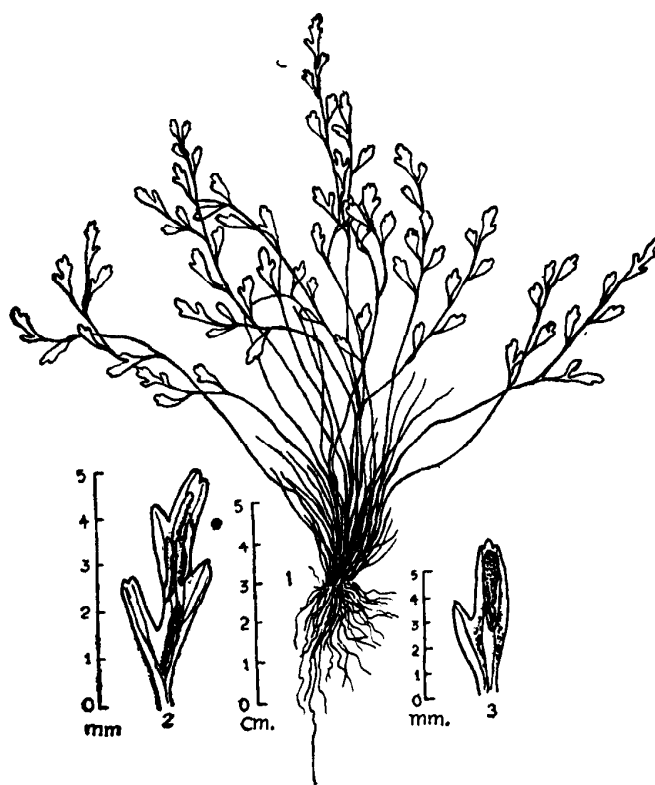
ABSTRACT

Asplenium × *germanicum* auct., a rare and little known taxon in Indian flora, is reported from Kashmir and described as there is no standard description available in the published form.

Asplenium × *germanicum* auct., a hybrid of the putative parents *Asplenium septentrionale* (L.) Hoffm. and *A. trichomanes* L., was first described as a species, *A. germanicum* by Weis from Germany in 1770 (Pl. Crypt. Fl. Gott., 299). Subsequently it is reported by others from different parts of Europe (Janichen, 1963; Defilipps, 1972; Diels, 1902; Crabbe *et al.*, 1964; Henderson, 1965; Tosco, 1973), where both the parents occur in close association. Though its hybrid nature was first recognised by Murbeck in 1892, the taxon continued to be recorded for long as *A. germanicum* (Christensen, 1906, 1933; Heilbronn, 1910; Fomin, 1934), *A. breynii* Retz. or *A. alternifolium* Wulf (Koch, 1857), and sometimes confused with *A. heufleri* Reich. From India Beddome (1892) reported it from Kashmir, followed by Hope (1900) from Kishenganga Valley (Kashmir) and Stewart (no date, but before Hope's collection—vide Hope, 1900) from Ravi and Chenab basin, Chamba, Punjab. Hope believed that the taxon was very rare in Kashmir Valley and its occurrence was sometimes recorded on information only. Stewart (1945) who collected it from Pahalgam, Kashmir recorded it as "one of the rarest of Kashmir plants." Ever since Stewart the taxon has not been collected from anywhere in India.

In 1983 we collected a few specimens of *Asplenium* × *germanicum* from Tulian Lake base, ca 12 Km., north-east of Pahalgam; both the putative parents *A. septentrionale* and *A. trichomanes* are also abundant in the area. In view of its rarity and since no detailed description is available in literature, the taxon is described here. The specimens are deposited in Calcutta Herbarium (CAL).

Asplenium × *germanicum* auct. Crabbe,



Asplenium × *germanicum* auct.

Figs. 1-3 : 1. General habit of the plant. 2. Fertile pinnae with sori. 3. A fertile pinna (magnified).

Jermy and Lovis, in Fl. Europ. 1 : 16. 1964 ; Tosco in Webbia 28 (2) : 314. 1973. *Asplenium germanicum* F. G. Weis in Pl. Crypt. Flor. Gotting. 299. 1770., St. II. t. 5 ; Willd. Sp. Pl. ed. 4, 5 : 330. 1810 ; Heufler, Verh. Zool.-Bot. ver. Wien 6. 1856. t. 5. fig. 6 ; Wagner, Ill. Deutsche. Fl. ed. 2, 895. 1882 ; Waldner Deutsche Farne t. 28. 1883 ; Fiori and Paol. Ic. Fl. Ital. 4. 1895 ; Coste, Fl. France 3 : 695. 1906 ; Christensen, Index Fil. 113. 1906, 95. 1933 (1973 reprinted ed.) ; Fitch and Smith, Ill. Brit. Fl. rev. ed. 4 : 2. 1919, fig. 1303 ; Fomin, Fl. USSR, 50. 1968 (IPST) ; *A. breynii* Retz. in Observ. Bot. 1 : 32. 1779 ; Schkuhr, Krypt. Gewachse, 97. 1809 t. 81 ; Mettenius, Fil. Hort.

Bot. Lips. 76. 1856 t. 12 fig. 1-2 ; Koch, Syn. Fil. Germ. Helv. 2 : 737. 1857 ; *A. alternifolium* Wulfen in Jacquin, Miscell. 2 : 51. 1781 t. 5. fig. 2 ; Mettenius, Fil. Hort. Bot. Lips. 76. 1856 ; *Scolopendrium alternifolium* Roth, Tent. Fl. Germ. 3 : 53. 1800 ; *Asplenium septentrionale* × *trichomanes* Murbeck in Lunds. Un. Arsskr. 27 : 36. 1892.

Plants forming small scattered dark brown or reddish black patches on crest of boulders. Rhizome short, thick apparently formed by the remains of old stipites scarcely palaeaceous, densely rooting. Stipe densely tufted, rusty-red to blackish at base, dull greenish above, 8-14 cm long, slender. Root fibrous, long and branched, rusty

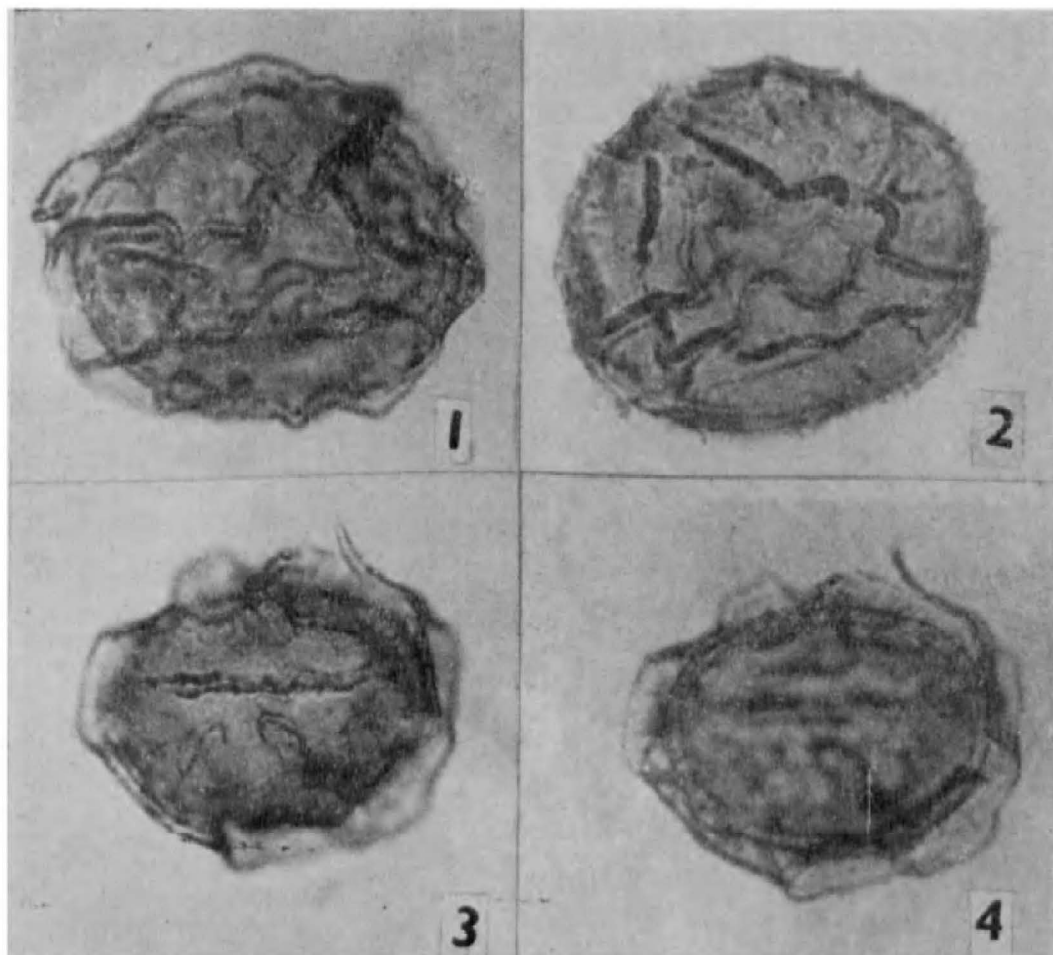


Plate I : Figs. 1-4 : 1. *Asplenium trichomanes* : spore in distal view showing perine foldings. 2. *A. septentrionale* : spore in distal view. 3-4. *A. x germanicum* (hybrid) 3, spore in proximal view showing aperture and surface. 4. spore in optical cross section showing exine and perine folds. Magnification : × 1000.

brown. Leaves coriaceous to subcoriaceous, dull green, sub-bipinnate in the basal half but simply pinnate upwards. Pinnae 7-10 × 2.5 mm, oblong to oblanceolate, loose, alternate, pointing upwards, short-petioled, apex rounded, irregularly lobed or segmented, segment cuneiform to linear cuneiform; veins obscure, sub-parallel. Sori linear, 2-3 in each pinna, when mature covering the whole breadth but falling short of the base of the pinnae, indusia covered by a flap having margin entire (Figs. 1, 2 & 3). Spore plano-convex (lat.), ovate-oblong (polar); size, $29 \times 43 \times 31 \mu$. Exine deep brown in colour, 2μ thick; perine highly wrinkled into irregular folds and spinulose, perine protruding about 4μ from exine surface. The spores are similar to those of the parents in size and ornamentation. Most of the sporangia of the hybrid are sterile, very few are detected having spores (Plate 1 : figs. 1, 2, 3 & 4).

Habitat : Growing in the crest of rock boulders in exposed areas.

Distribution : Kashmir : *Fide* Beddome, in Hand Book Supplement, 31. 1892; Kishanganga Valley, Mc Donnell s.n. 1891, *fide* Hope in JBNHS 13 : 660. 1901; Pahalgam, R. R. Stewart 7883 no date (Gordon Herb. Rawalpindi 7); Tulian Lake base, Kanimarg, 12 km. NE Pahalgam, A. Datta and R. K. Ghosh 58194 dt. 27.8. 1983 (CAL); Chamba, Ravi and Chenab basin, Punjab, 6000-8500 ft (1800-2550 m), J. L. Stewart 824, no date, *fide* Hope in JBNHS 13 : 660. 1901.

ACKNOWLEDGEMENTS

The authors wish to express their sincerest thanks to Dr. S. K. Jain, former Director for providing facilities in making the collection and to Dr. M. P. Nayar,

Director, Botanical Survey of India for encouragement and keen interest in the work. Thanks are also due to Dr. G. V. S. Murthy, Palynologist, Central National Herbarium for helping immensely in the microscopic study of the spores and taking photographs of the same.

REFERENCES

- BEDDOME, R. H., *Supplement to the Ferns of British India, Ceylon and the Malay Peninsula*. Calcutta. 1892.
- BAKER, J. G. *Handbook of the Fern-allies*. George Bell & Sons, London. 1887.
- CHRISTENSEN, C. *Index Filicum*. Copenhagen. 1906.
- *Index Filicum Supplementum Tertium pro annis-1917-1933*. Copenhagen. 1934.
- CLARKE, C. B. A review of the Ferns of Northern India. *Trans. Linn. Soc. Lond. Ser. II. Bot.* 1 : 425-611. 1880.
- CRABBE, J. A., A. C. JERMY AND J. D. LOVIS. Filicales. In T. G. Tutin *et al.* (eds.) *Flora Europaea* Vol. I. Lycopodiaceae to Platanaceae. University Press, Cambridge. p. 16. 1964.
- DEFILIPPS, R. A. Index to taxa cited in a survey of taxonomic and floristic research in Europe since 1945 (*Webbia* 18. 1963). *Webbia* 27(2) : 299-368. 1972.
- DIELS, L. Polypodiaceae. In Engler, A. and K. Prantl (eds.) *Die Natürlichen Pflanzenfamilien*. Leipzig. p. 235. 1902.
- FOMIN, A. V. Filicales. In Komarov, V. L. (ed.) *Flora of the U.S.S.R.* Vol. 1. Archegoniatae and Embryophyta, English Ed., I.P.S.T. 1968. Jerusalem. p. 50. 1934.
- HEILBRONN, VON, A. Apogamie Bastardierung und Erblchkeitsverhältnisse bei einigen Farnen. *Flora* 101 : 1-42. 1910.
- HENDERSON, D. M. Filices. In Davis, P. H. (ed.) *Flora of Turkey* Vol. 1. University Press, Edinburgh. p. 51. 1965.
- HOPE, C. W. The Ferns of North Western India. *Journ. Bombay nat. Hist. Soc.* 13(4) : 660. 1901.
- JANHGEN, E. Die floristische durch forschung Osterreichs. In V. H. Heywood & R.E.G. Pichi Sermolli (eds.) A Survey of taxonomic and floristic research in Europe since 1945. *Webbia* 18 : 105-106, 1963.
- KOCH, W. D. J. *Synopsis Florae Germanicae et Helveticae*. Ed. 3, Part 2. Gebhardt et Reisland. Leipzig. p. 737. 1857.
- STEWART, R. R. The Ferns of Kashmir. *Bull. Torrey Bot. Cl.* 72(4) : 399-426. 1945.
- TOSCO, U. Catalogo floristico del parco nazionale del gran paradiso. Prima parte : Tallofite, Briofite, Pteridofite. *Webbia* 28(2) : 227-322. 1973.