

***Arachniodes miqueliana* (Dryopteridaceae) – An addition to the Pteridophytic flora of India**

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Published: 15 December, 2012; Vol.1(2):1-4; © Gayathri Teknological Publication, 2012.

Abstract

Arachniodes miqueliana (Maximowicz ex Franchet & Savatier) Ohwi. A species so far known only from Yunnan, Japan and Korea, is recorded for the first time in India from Eastern Himalaya, India. This species is very rare and known only one location in India. This species can be distinguished from other ferns abaxially scattered with brown bullate basal scales. A key to the related to Arunachal Pradesh taxa and taxonomic description, phenology, distribution map and photograph are provided here for easy identification.

Key words: *Arachniodes miqueliana*, Dryopteridaceae, Pteridophyte, India.

Introduction

Arachniodes Blume. is a pantropical genus of the family Dryopteridaceae with 149 species in the world, It is distributed in the subtropical to tropical forest regions of mostly in China and southern to south eastern Asia (Proctor, 1985; Wu, 1997). In Central America Only 11 species are listed by Ching (1962), but only 4 species are accepted by Nakaike (2001) who excluded three African and one Australian species (Ching, 1962; Gibby et al., 1992; Nakaike, 2001). A comparison of Japanese ferns (Kurata, 1962; Nakaike 1975; 1992; Iwatsuki, 1992) revealed that China and Japan have the greatest species diversity as well as the most species in common. In India, the genus is represented by 10 species (Dixit, 1984, Chandra 2000) with a preponderance in North East India where 3 species in Nagaland (Jamir and Rao 1988) 2 species in Assam (Borthakur et al 2001), one species in Meghalaya (Baishya and Rao 1982) 5 species in Mizoram (Benniamin 2012 in ed) and 5

species viz., *Arachniodes assamica* (Kuhn) Ching, *Arachniodes conifolia* (Moore) Ching, *Arachniodes henryi* (Christ) Ching, *Arachniodes rhomboidea* (Wall.) Ching, *Arachniodes superba* Fras.-Jenk. are distributed in Arunachal Pradesh.(Benniamin 2012). During the course of studies on the Pteridophytes of Eastern Himalaya, the authors came across some interesting specimens of the genus *Arachniodes* from Tawang district of Arunachal Pradesh which differed from the hitherto known species from India. A scrutiny of literature ((Jamir and Rao, 1988; Vasudeva, 1990; Singh and Panighahi, 2005, Rawat, 2005; Fraser-jenkins & Benniamin, 2010; Benniamin and Fraser-jenkins 2009) revealed that this species is not reported from India and known so far only from Yunnan, Japan, Korea. On sending images to Fraser jenkins (per.comm) he identity as *Arachniodes miqueliana*. Therefore, it is reported here as an addition to the flora of India. The citation, description, specimen examined, ecology, earlier records, provided along with the photograph. The voucher specimens are deposited in the herbarium of Botanical survey of India, Arunachal Pradesh Regional Centre, Itanagar. This description of this newly collected specimen from Arunachal Pradesh is furnished below.

Key to the species of genus *Arachniodes* in Arunachal Pradesh

- 1. Rhizome with dense tuft brown scales -----
-----*Arachniodes superba*
- 1a. Rhizome without scales ----- 2
- 2. Lamina rigescent, Sori terminal on veinlets -
-----3
- 2a. Lamina soft shining green, Sori dorsal on veinlets ----- *Arachniodes henryii*

- | | |
|--|---|
| 3. Fronds 4 pinnate in basal part -----4 | 4a. Veins abaxially not scattered without scales -----5 |
| 3a. Fronds 5 pinnate in basal part ----- <i>Arachniodes coniifolia</i> | 5. Rhizome long creeping, ultimate pinnule 1.5cm long ----- <i>Arachniodes rhomboidea</i> |
| 4. Veins abaxially scattered with brown bullate basal scales ----- <i>Arachniodes miqueliana</i> | 5a. Rhizome short creeping, ultimate pinnule 3.5cm long ----- <i>Arachniodes assamica</i> |



Fig. 1. a. View of Dirang forest area, b. Habitat of *A. miqueliana*. c. Close view of *A. miqueliana*, d. sori, e. unicellular acicular hairs, f- spores

Taxonomic Treatments

Arachniodes miqueliana (Maximowicz ex Franchet & Savatier) Ohwi, J. Jap. Bot. 37: 76. 1962. *Aspidium miquelianum* Maximowicz ex Franchet & Savatier, Enum. Pl. Jap. 240, 634. 1876; *Arachniodes borealis* Serizawa; *Aspidium fargesii* Christ; *Dryopteris miqueliana* (Maximowicz ex Franchet & Savatier) C. Christensen; *Leptorumhra fargesii* (Christ) Nakaike & Yamato; *L.*

miqueliana (Maximowicz ex Franchet & Savatier) H. It; *Nephrodium miquelianum* (Maximowicz ex Franchet & Savatier) Komarov; *Polystichopsis miqueliana* (Maximowicz ex Franchet & Savatier) Tagawa; *Rumohra miqueliana* (Maximowicz ex Franchet & Savatier) Ching.

Rhizome long creeping, densely clothed with brown lanceolate scales along growing parts. Frond 0.5x1m; stipes 31x60 cm and 4-6 mm in diam., brownish stramineous, copiously scaly throughout primary rachis; lamina herbaceous, obscurely green to yellowish green when dried, deltoid-pentagonal, 34 x 51 – 25-35 cm, apex acuminate, 4-pinnate; pinnae 5-10 pairs, alternate, obliquely spreading, lowest pinna deltoid-ovate, 26-31 x 20-25 cm, apex acuminate, 3-pinnate; first order pinnules ca. 18 pairs, obliquely spreading, deltoid-lanceolate, basal basisopic one ca. 14 x 7 cm, 2-pinnate; penultimate pinnules 5-7 pairs, stalked, blunt deltoid to oblong, ca. 3.5 x 2.5 cm, base broadly cuneate, apex obtuse, 1-pinnate; ultimate pinnules 3-4 pairs, ovate or rhombic, to 1.2 x 0.9 cm, apex obtuse or acute, margin deeply pinnatifid or obtusely serrate; upper pinnae gradually reduced; axes and main veins adaxially with pale grey unicellular acicular hairs, veins abaxially scattered with brown, ovate and bullate-based scales. Sori 1-3 per ultimate segment; indusia brown, entire. (fig.1.)

Fertile: September - December

Ecology: Under broad-leaved or mixed forests, on earth or occasionally on shaded moist and moss covered rock surface at 1200-1450m

Distribution: India: North East India: Arunachal Pradesh, YUNNAN, JAPAN, KOREA.

Specimen examined: Arunachal Pradesh: Kameng, Jang, Tawang, A.Benniamin, 12.12.2010 BSI, 28050, (ARUN).

Notes: The genus *Arachniodes* is closely related with *Polystichum*, but differs in having reniform-orbicular indusium attached at the sinus and almost entire frond-scales.

Acknowledgements

The author is grateful to the Director, Botanical Survey of India, Kolkata and the Dr. A. A.

Mao, Scientist E & HOO, Botanical Survey of India, Itanagar for providing facilities and encouragement. The author is also thankful to C.R. Fraser Jenkins, England for identifying the specimens.

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Manuscript Progress Date

Received : 21.07.2012
Revised : 12.11.2012
Accepted : 03.12.2012
