

***PTERIS GEMINATA* WALL. EX J. AGARDH
(PTERIDACEAE): A CRITICALLY ENDANGERED
PTERIDOPHYTE IN INDIA**

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The genus *Pteris* is commonly known as 'Brake ferns' and was established by Linnaeus (1753). It is estimated to contain about 250 species (Tryon et al. 1990) in the world. In India, the genus is represented by 50 species (Fraser-Jenkins 2008), though Chandra (2000) reported 45 species, two subspecies and two varieties. The pantropical genus *Pteris* in India is found in the eastern Himalayan region of northeastern India and the Western Ghats of southern India. Manickam & Irudayaraj (1992) reported 15 species of *Pteris* from the Western Ghats, and later several authors added new species and new records to the southern Indian fern flora. Some of the species of *Pteris* are very rare and their representation in various herbaria is scanty. *P. geminata* is a threatened species and has been reported from Palakkad and Idukki districts of Kerala and Coimbatore, Nilgiri and Tirunelveli districts of Tamil Nadu (Manickam & Irudayaraj 1992). Wallich (1828) catalogued this species from 'India orientalis' without any description, but later Agardh (1839) validly published this species. *P. geminata* is characterized by its veins ending in hydathodes (vein not reaching the margin). The sterile pinnule and apex of the fertile pinnule is crenate and the lower pair of veins

are united to form costal areoles along the midrib.

Materials and methods: The present study is based on the field trips conducted from May 2007 to April 2010 in different parts of southern India including biosphere reserves, national parks, and wild life sanctuaries. Apart from this, specimens deposited in CAL, CALI, KFRI, MGMC, MH, RHT, SKU, TBGT, XCH were also examined. But, this species could be collected only from the Periyar Tiger Reserve, Idukki, Kerala (V.K. Sreenivas 124025, CALI).



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***Pteris geminata* Wall. ex J. Agardh, Recens. Spec. Pter. 31. 1839. (Image 1; Figs 1 & 2)**

Material examined: Reg. No. 124025, 22.iii.2009, Idukki District, Kerala, Near Injippara-Periyar Tiger Reserve (alt. 900m), coll. V.K. Sreenivas.

Type: Nepal, Wallich 2180 (CAL!; CALI, Microfishe!).

Syn: *Campteria anamallayensis* Bedd., Ferns S. India 14. pl. 45. 1863.

Height 60–70 cm. Rhizome erect to suberect, 4–6 cm long x 4–6 cm thick, cylindrical with tuft of stipes, scaly. Palea light brown, 3–5 mm long, 0.4–0.6 mm wide at base, lanceolate, entire, acuminate, auriculate, thin uniformly. Stipe 45–55 cm long, 3–6 mm thick, green (fresh specimens) or stramineous (dry materials) above and chestnut below, grooved throughout, glabrous above, scaly below. Lamina bipinnate, 35–45 cm long x 25–30 cm broad, ovate, basal pair bipartite, herbaceous (thin). Pinnae 5–7 pairs, 20–25 cm long x 4–6 cm broad, opposite, ovate, acute, basal pinna bipartite, green, and glabrous. Pinnules 16–23 pairs,

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Figure 1. Distribution map of *Pteris geminata* in India

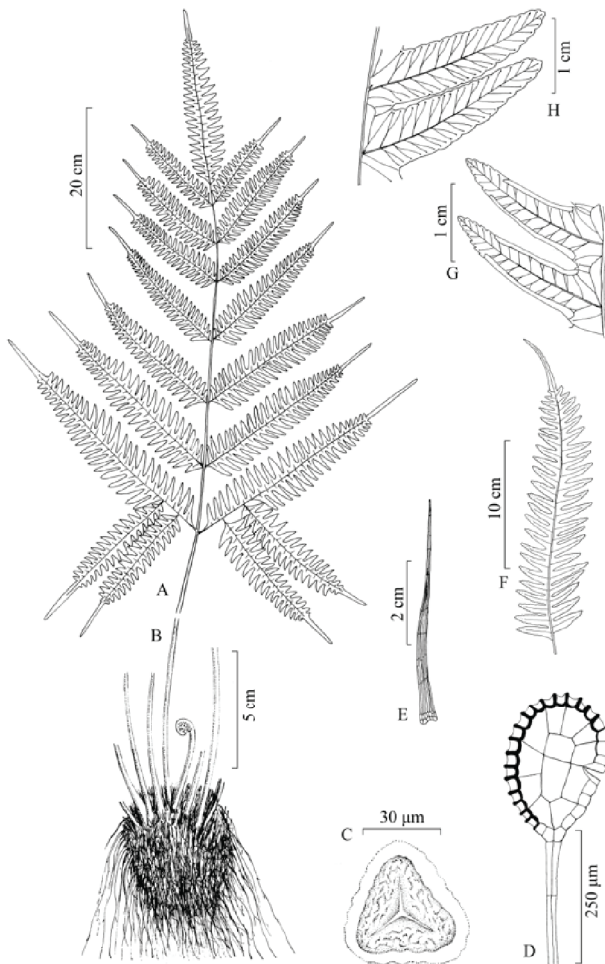


Figure 2. *Pteris geminata* Wall. Ex J. Agardh
A-B - habit; C - spore; D - sporangium; E - palea; F - pinna; G - fertile pinna; H - sterile pinnules (V.K. Sreenivas 124025, CALI)

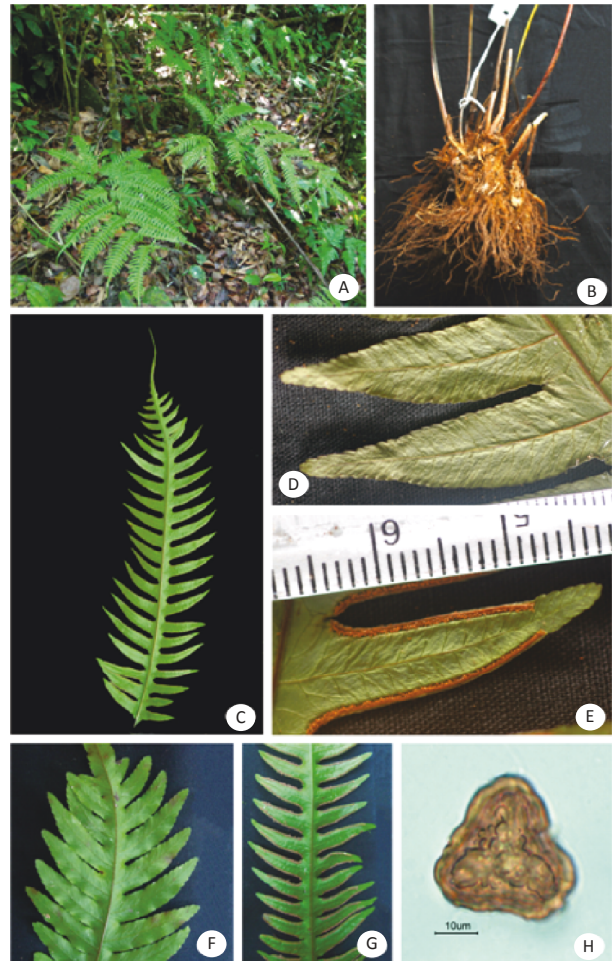


Image 1. *Pteris geminata* Wall. ex J. Agardh
A - habit; B - rhizome; C - single pinna; D - sterile pinnules; E - fertile pinnule; F - sterile pinna; G - fertile pinna; H - spore.

30–50 cm long x 3–9 mm broad, oblong, acute, crenate (sterile), only apex is crenate in fertile ones, sinus c. 3mm away from costa, 2mm apart, glabrous. Costae grooved above with short inconspicuous spines at the base of costules, and raised below. Veins 13–16 pairs, free, forking, distinct, lower pair of veins form costal areoles along midrib, veins ending submarginally in hydathodes. Sori brown, linear, crowded, 1.2–2 cm long, marginal except at base and apex. Indusium false, brown at maturity. Sporangium: capsule globose, 200µm long; stalk 250µm long, biseriate; annulus 18–22 celled. Paraphyses uniseriate. Spores brown, c. 45x50 µm, trilete-tetrahedral, rugate.

Habitat: A rare species present only in moist evergreen forests at high altitudes (800–2300 m).

Notes: It was found that the population of this species is decreasing at an alarming rate due to habitat destruction and climate change. Recently, Chandra et al.

(2008) included this species in the 'Critically Endangered' category. A cursory look at the population based on the IUCN Red List (2001) seems that the species meets the criteria B1ac(iii) under the Endangered category. So it is proposed to conserve the species by vegetative propagation as well as clonal propagation by tissue culture methods.

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