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continued on the back inside cover

Cover: Digital illustration of *Impatiens chamchumroonii* in Krita by Dupati Poojitha.



## Occurrence of the wood fern *Arachniodes sledgei* Fraser-Jenk. (Pteridophyta: Dryopteridaceae) in the northern Western Ghats, India

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**Abstract:** The genus *Arachniodes* (Dryopteridaceae) is mainly distributed in tropical Asia, with Indian records largely confined to the Himalaya, northeastern India, and southern Western Ghats. No confirmed report existed from the northern Western Ghats of Maharashtra. The present note discusses the occurrence of *Arachniodes sledgei* Fraser-Jenk. as a new distributional record for the northern Western Ghats of Maharashtra. A detailed morphological description, distribution, ecology, conservation status, and photographs are given. The field surveys conducted during 2023–2025 in Kolhapur District yielded specimens that were identified through morphological comparison with standard floras and herbarium collections. This finding extends the known distribution of the species and highlights the need for further pteridophyte exploration and conservation assessment in the northern Western Ghats.

**Keywords:** Africa, Asia, diversity, distribution, *Dryopteris*, ecology, Kolhapur, *Polystichum*, pteridophytes, taxonomy.

The genus *Arachniodes* Blume (Dryopteridaceae) comprises a group of medium- to large-sized terrestrial ferns characterised by distinctive morphological features, including erect or long-creeping rhizomes densely covered with brown scales, scaly stipes, and pinnae often bearing a characteristic auricle resembling those of *Polystichum*. The lamina is typically glossy on the adaxial surface, bipinnate to tripinnate, and coriaceous in texture. The sori are indusiate, usually arranged near the margins of the lobes, with indusia

reniform and occasionally ovoid, resembling those seen in *Dryopteris*. These diagnostic characters collectively distinguish *Arachniodes* from closely related genera within Dryopteridaceae and are important for accurate taxonomic identification.

Globally, the genus includes approximately 60–70 accepted species distributed primarily in subtropical and tropical forest regions. The highest diversity occurs in eastern and southeastern Asia, particularly in China, Japan, India, and neighbouring regions extending to southern and southeastern Asia. A smaller number of species are reported from Africa, Central & South America, Australia, Madagascar, Madeira, and various Pacific Islands, indicating a wide but uneven geographical distribution (Lu et al. 2019; POWO 2026). The genus generally prefers shaded, moist forest habitats, often occurring on rocky slopes, forest floors, and montane ecosystems.

In India, about 14 species of *Arachniodes* have been documented, mainly from the Himalayan region, Northeast India, and the southern Western Ghats (Fraser-Jenkins et al. 2018; Benniamin & Sundari 2020). However, before the present study, no representatives of the genus had been reported from the northern Western Ghats, highlighting a significant gap in the

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known distribution of this fern group in the Indian subcontinent.

### Collection of plant materials

The collection was made during the period from June 2023–December 2025 from different locations (Tilhari Nagar, Amboli, Panhala, Gargoti, Radhanagari, Mahabaleshwar, and Lonavala) of the northern Western Ghats. However, the collection of *Arachniodes sledgei* was made exclusively from the forests of Gargoti in the Kolhapur District of Maharashtra.

### Identification

The collected plant materials were processed in the laboratory by cleaning, pressing, and preparing herbarium specimens following standard botanical methods. Identification was carried out through detailed morphological examination of vegetative and reproductive characters such as rhizome scales, frond architecture, pinnae & pinnule morphology, venation pattern, sori arrangement, and indusium characteristics under a stereomicroscope. The specimens were identified by consulting relevant taxonomic literature, including Manickam & Irudayaraj (1992) and Fraser-Jenkins et al. (2018), and further confirmed by comparison with authenticated voucher specimens available at the JCB herbarium. The voucher specimens: SMPJAP 1001 and 1002 were deposited in the BARO herbarium of the Department of Botany, The Maharaja Sayajirao University of Baroda and SMPJAP 1003 and 1004 at BJB, Herbarium of the Department of Botany, Hon. Balasaheb Jadhav Arts, Commerce and Science College, Ale.

## RESULTS

### Taxonomic treatment

*Arachniodes sledgei* Fraser-Jenk., Taxon. Revis. Three Hundred Indian Subcont. Pterid. 323–324. 2008; Fraser-Jenkins et al., An Annot. Check. Ind. Pterid. Part-II. 205–206. 2018.

**Type:** from Sri Lanka, Corbet's Gap, 1,320 m, W.A. Sledge 559, 9.12.1950, BM.

*Arachniodes tripinnata* (Goldm.) Sledge, Bull. Brit. Mus. (Nat. Hist.), Bot. 5: 41. 1973; Manickam & Irudayaraj, Pterid. Fl. W. Ghats. 219. 1992 & Pterid. Flora Nilgiris, 2003; Madhusoodanan., Handb. Ferns and Fern allies Kerala. 2015; Rajagopal & Bhat, Pterid. Karnataka St., Ind. 2016.

*Arachniodes coniiifolia* (T.Moore) Ching, Acta Bot. Sin. 10: 257 (1962); Nair et al., J. Econ. Taxon. Bot. 18: 449–476. 1994; Nayar & Geevarghese, *Fern F. Malabar*, 1993.

Plant terricolous or saxicolous, medium-sized herb, reaching a height up to 120 cm; rhizome 2–3 cm long, 5–15 mm thick, erect, dark brown, densely scaly; scales 5–10 mm long, 2–3 mm broad, concolorous, brown-black, linear-lanceolate, apex long acuminate, base broad, margin toothed; fronds monomorphic, ovate-deltoid, dark green; stipe 30–40 cm long, green when young, becoming brown at maturity, adaxially grooved, abaxially round, covered with brown scales; stipe scales same as of rhizome; lamina 70–80 cm long, 15–20 cm wide, bipinnate-tripinnate, ovate-deltoid, dark green, glossy above, with 10–12 pairs of pinnae; *rachis* adaxially grooved, abaxially round, covered with brown scales; *rachis* scales similar to that of rhizome; pinnae 7–10 cm long, 3–5 cm wide, ovate-deltoid, alternately arranged, apex acuminate, base cuneate, margin lobed, 5–8 pairs or pinnules; pinnules 1–1.5 cm, 5–8 mm wide, oblong-lanceolate, dark green, acroscopically lobed, basiscopically less lobed; texture coriaceous; *veins* forked, free, 2–3 pairs, reaching up to margin; *sori* at the base of lobe, 8–12 per pinnae, reniform or orbicular, indusiate; indusium reniform or orbicular, thin, membranaceous, pale green at young, brown at maturity, more or less persistent; spores 30 x 35 µm in diameter, trilete, brown, ellipsoid or planoconvex with thinly folded perine.

**Global distribution:** India, Indonesia, Sri Lanka (Fraser-Jenkins et al. 2018).

**India:** Maharashtra (present report), Karnataka, Kerala, and Tamil Nadu.

**Ecology:** It is a common element of the forests of southern India. At the present study site, the species was observed growing as a terricolous and saxicolous fern along the edges of rocky hill slopes and within caves, at altitudes ranging from 600–1,100 m. More than 300 individuals were recorded within a 1 km<sup>2</sup> area in the Gargoti region of Kolhapur District. The population occurs in dense forest habitats and is commonly associated with *Asplenium inaequilaterale*, *Thelypteris dentata*, and *Pteris biaurita*.

**Specimens examined:** INDIA, Karnataka, Chickmangalur District, Bagavathi to Gangamula, 08.x.1979, C.J. Saldanha, KFP 9720 (JCB!); Hasan Dt., Devarunde & Devalkere, 26.x.1970, F.M. Jarrett & T.P. Ramamoorthi, 1048 (JCB!); Maharashtra, Kolhapur District, Gargoti, Berry Land near Pal, 16.396° N, 74.191° E, 14.xii.2024, S.M. Patil & J.M. Patil, 1001, 1002 (BARO); 23.ii.2025, S.M. Patil & J.M. Patil, 1003, 1004 (BJB).



Image 1. *Arachniodes sledgei* Fraser-Jenk.: a— Habit | b— enlarged view of rhizome covered with dense brown scales | c— enlarged view of rachis and costa covered with scales | d— dorsal surface of pinnae showing sori arrangement. © Sachin Patil.

## DISCUSSION

Fraser-Jenkins et al. (2018) reported four species of *Arachniodes* from southern India, namely *A. amabilis*, *A. cornu-cervi*, *A. palmipes*, and *A. sledgei*. However,

no representatives of the genus were previously documented from the northern Western Ghats of Maharashtra. The present collection, therefore, represents the first confirmed occurrence of *A. sledgei* in

this region, significantly extending its known distribution range northwards within the Western Ghats.

The species has historically been confused with *A. tripinnata* and *A. conifolia*. However, Fraser-Jenkins (2008) and Fraser-Jenkins et al. (2018) clarified that true *A. tripinnata* is restricted to the Malesian region and that earlier Indian records under this name correspond to *A. sledgei*. Similarly, *A. conifolia* does not occur in southern India, and previous reports were based on misidentifications. The morphological characters observed in the present specimens, particularly the bipinnate–tripinnate fronds, glossy lamina, auriculate pinnae, and reniform indusia, are consistent with the diagnostic features of *A. sledgei*, confirming its identity.

In southern India, the genus *Arachniodes* is largely confined to the Western Ghats, highlighting this mountain system as an important centre of diversity. The occurrence of *A. sledgei* in the Gargoti region of Maharashtra suggests floristic continuity between the southern and northern segments of the Western Ghats and indicates that suitable habitats for the species may be more widespread than previously recognised.

The taxonomic ambiguity and nomenclatural status of *Arachniodes sledgei* were thoroughly examined and resolved by Fraser-Jenkins (2008) and Fraser-Jenkins et al. (2018) through detailed morphological comparisons and critical evaluation of earlier literature. Their studies

provided a stable taxonomic framework for the genus in the Indian subcontinent.

From a conservation perspective, the discovery of a relatively large population (>300 individuals within 1 km<sup>2</sup>) indicates that the species may be locally well established in suitable habitats. However, comprehensive population data across its range remains insufficient. Further surveys are therefore necessary to more accurately evaluate its conservation status.

Thus, the present record not only adds to the fern diversity of Maharashtra but also contributes to a better understanding of the distribution, taxonomy, and biogeography of *Arachniodes* in India.

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## Articles

**Floristic composition and conservation significance of vascular plants in Kalatop-Khajjiar Wildlife Sanctuary, Himachal Pradesh, India**

– Sumit, Gulshan Kumar, Sumit Singh, Kanwaljeet Singh, Taslima Sheikh, P. Vishal Ahuja & Arvind Kumar, Pp. 28263–28274

**Assessing the tree diversity along the Dudhganga River in Kolhapur District of Maharashtra, India**

– Sachin Chavan & Rajaram Gurav, Pp. 28275–28286

**Flower bud growth, mortality rate, and population structure of *Sapria himalayana* Griffith f. *albavinosa* Banziger & Hansen (Rafflesiaceae) in a subtropical forest, northeastern India**

– K. Shamran Maring & Athokpam Pinokiyo, Pp. 28287–28295

**Comparing three sampling techniques for surveying and monitoring arthropods in Moroccan agroecosystems**

– Hanae El Harche, Pp. 28296–28306

**Community structure of Lepidoptera in Nantu-Bolihuto Wildlife Reserve, Sulawesi, Indonesia**

– Chairunnisah J. Lamangantjo, Marini Susanti Hamidun, Sasmianti & Dewi Wahyuni K. Baderan, Pp. 28307–28316

**Foraging niche segregation among woodpeckers in the oak-pine forest of Kumaon Himalaya, Uttarakhand, India**

– Rafat Jahan, Satish Kumar & Kaleem Ahmed, Pp. 28317–28328

**Local knowledge, attitudes, and perceptions of ecosystem services and disservices provided by the Painted Stork *Mycteria leucocephala* Pennant, 1769 (Aves: Ciconiidae) in northern India: insights for conservation**

– Yashmita-Ulman & Manoj Singh, Pp. 28329–28342

## Communications

**Analysis revealed minuscule DNA sequence data availability for Indian marine macroalgal diversity**

– Digvijay Singh Yadav, Aswin Alichen & Vaibhav A. Mantri, Pp. 28343–28349

**Checklist of rust fungi of the Nuratau Nature Reserve, Uzbekistan**

– I.M. Mustafae, M.M. Iminova, I.Z. Ortiqov, S.A. Teshaboyeva & N.Q. Iskanov, Pp. 28350–28357

**Checklist of moths (Lepidoptera: Heterocera) from the campus of University of North Bengal, Siliguri, India**

– Abhirup Saha, Ratnadeep Sarkar, Rujas Yonle, Subhajit Das, Prapti Das & Dhiraj Saha, Pp. 28358–28369

**Vulture diversity and long-term trends in the Ranikhet region, Kumaon Himalaya, Uttarakhand, India**

– Mirza Altaf Baig, Nazneen Zehra & Jamal Ahmad Khan, Pp. 28370–28377

**Nesting dynamics of Red-wattled Lapwing *Vanellus indicus* Boddaert, 1783 in urban and rural regions of Indore, India**

– Kratika Patidar & Vipul Keerti Sharma, Pp. 28378–28386

**Assessing avian diversity and conservation status in Dhamapur Lake World Heritage Irrigation Structure, Sindhudurg, Maharashtra, India**

– Yogesh Koli, Pravin Sawant & Mayuri Chavan, Pp. 28387–28398

**Population status and habitat use of Indian Grey Wolf *Canis lupus pallipes* in Pench Tiger Reserve, Madhya Pradesh, India**

– Iqra Rabbani & Sharad Kumar, Pp. 28399–28405

**Activity budgets of a zoo-housed Mishmi Takin *Budorcas taxicolor taxicolor* (Mammalia: Artiodactyla: Bovidae) herd**

– Nabanita Ghosh, Pranita Gupta, Joy Dey & Basavaraj S. Holeyachi, Pp. 28406–28412

**Extended distribution of *Nymphoides peltata* (S.G.Gmel.) Kuntze (Menyanthaceae) in Manipur, India**

– Aahen Chanu Waikhom & Bimolkumar Singh Sadokpam, Pp. 28413–28418

## Short Communications

***Impatiens chamchumroonii* (Balsaminaceae), a new record for the flora of Vietnam**

– Cuong Huu Nguyen, Diep Quang Dinh, Dinh Duc Nguyen & Keoudone Souvannakhoumane, Pp. 28419–28423

**Occurrence of the wood fern *Arachniodes sledgei* Fraser-Jenk. (Pteridophyta: Dryopteridaceae) in the northern Western Ghats, India**

– Sachin Patil & Jagannath Patil, Pp. 28424–28427

## Notes

**A note on the Petal-less Caper *Maerua apetala* (B. Heyne ex Roth) Jacobs (Capparaceae)**

– Shamsudheen Abdul Kader & Bagavathy Parthipan, Pp. 28428–28429

**Record of *Euploea mulciber* (Cramer, [1777]) (Lepidoptera: Nymphalidae) in Delhi, India: evidence of range extension in a restored urban ecosystem**

– Aisha Sultana, Mohammad Shah Hussain & Balwinder Kaur, Pp. 28430–28432

**Hump-nosed Pit Viper *Hypnale hypnale* feeding on an Allapalli Skink *Eutropis allapallensis* in Karwar, India**

– Nonita Rana, Karthy Shivapushanam, S.J.D. Frank & Govindan Veeraswami Gopi, Pp. 28433–28435

**Sighting of vagrant Red-backed Shrike *Lanius collurio* in the coastal areas of Thoothukudi, Tamil Nadu, India**

– Kishore Muthu, Anand Shibu & Santhanakrishnan Babu, Pp. 28436–28437

**First record of the Diamond Dove *Geopelia cuneata*, an Australian endemic, in Sikhna Jwhlwao National Park, Assam, India**

– Bibhash Sarkar, Bijay Basfore, Leons Mathew Abraham & Anjana Singha Naorem, Pp. 28438–28440

**First photographic record of the Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in Kuldiha Wildlife Sanctuary, Odisha, India**

– Tarun Singh, Harshvardhan Singh Rathore, N. Abhin, Subhalaxmi Muduli, Yash Deshpande, Vivek Sarkar, Diganta Sovan Chand, Samrat Gowda, Prakash C. Gogineni, Manoj V. Nair, Bivash Pandav & Samrat Mondol, Pp. 28441–28443

**First photographic evidence of the Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in Kapilash Wildlife Sanctuary, Odisha, India**

– Alok Kumar Naik, Sumit Kumar Kar, Shyama Bharati, Ashit Chakraborty & Ashis Kumar Das, Pp. 28444–28446

**Record of a Tiger *Panthera tigris* (Linnaeus, 1758) (Mammalia: Carnivora: Felidae) in Saptari District of eastern Nepal: implications for conservation and habitat connectivity**

– Gobinda Prasad Pokharel, Chiranjibi Prasad Pokharel, Ashish Gurung, Bishnu Singh Thakuri, Ambika Prasad Khatiwada, Aastha Joshi, Birendra Gautam, Mithilesh Mahato, Naresh Subedi & Madhu Chetri, Pp. 28447–28450

## Book Review

**At the Point of No Return? – Reading Pankaj Sekhsaria's Island on Edge: The Great Nicobar Crisis**

– Himangshu Kalita, Pp. 28451–28454

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