

Research Article

**THELYPTERIS PROLIFERA (RETZ.) COPEL. – A NEW FERN RECORD
FOR GUJARAT STATE AND AN ADDITIONAL DISTRIBUTION
RECORD FOR CERATOPTERIS THALICTROIDES (L.)
BRONGN. IN GUJARAT**

***Sumesh N. Dudani and Deepa J. Gavali**

Gujarat Ecology Society, 3rd Floor, Synergy House, Subhanpura, Vadodara – 360023

*Author for Correspondence

ABSTRACT

This paper reports the occurrence of *Thelypteris prolifera* (Retz.) Copel. (Thelypteridaceae) as a new fern record for Gujarat state. In addition to this, a new locality of occurrence for the aquatic fern – *Ceratopteris thalictroides* (L.) Brongn. in Gujarat state is also reported hitherto in this paper.

Keywords: *Thelypteris Prolifera*, *Ceratopteris Thalictroides*, Gujarat, New Record

INTRODUCTION

Pteridophytes evolved as most primitive vascular plants in the mid-paleozoic era and formed an important connecting link between the non-vascular and higher seed plants group. Occupying various habitats, these plants are distributed from the tropics to the temperate regions and prefer to grow in shady moist places (Dudani *et al.*, 2013). Despite forming an important part of the flora, only second to that of angiosperms, these plants have received due attention only in the last couple of years with still some lacunae existing that need to be addressed. The biodiversity of Gujarat state has been well explored by numerous researchers over last few decades. However, the only earliest mention of Pteridophytes can be found in the Flora of North Gujarat (Saxton & Sedgwick, 1918) wherein *Ceratopteris thalictroides* was reported from the banks of Watrak River. Thereafter, the same species was also collected after a gap of three decades from the Sabarmati River bank in Ahmedabad (Mahabale, 1948; 1963). Besides this, the other pteridophyte studies in the state include the works of Phatak *et al.*, (1953), Chavan and Mehta (1956), Gaekwad and Deshmukh (1956), Chavan and Sabnis (1961), Chavan and Padate (1962, 1963), Mahabale (1948, 1963), Shah and Vaidya (1964), Nayar and Devi (1964), Padate (1969), Inamdar and Shah (1967), Inamdar (1970), GEC (1996). However, the only latest comprehensive account of Pteridophytes came out in the study of Rajput *et al.*, (2016), wherein they reported 23 species of pteridophytes from some parts of Gujarat based on primary survey and secondary data through published literatures. The study did not cover entire state of Gujarat missing out on some important and less explored habitats for the Pteridophytes. Hence, this paper aims at reporting a new fern record and an additional distribution record for *Ceratopteris* in the state as recorded from some of the under-explored ecological habitats in south and western coastal parts of the state.

MATERIALS AND METHODS

The fern species were recorded in the months of August – September, 2016. The field images of the specimens were clicked with the help of a Nikon DSLR camera. The geographical co-ordinates of the locations surveyed were noted down using pre-calibrated GPS (global positioning system). The taxa were identified using appropriate floras, journals, monographs and revisions (Beddome, 1883; Manickam and Irudayaraj 1992; Fraser-Jenkins, 2008). The details on their botanical and ecological characteristics were noted and are presented in the paper. The fresh samples of the species were collected and preserved in form of herbarium in the institute.

RESULTS AND DISCUSSION

The fern species – *Thelypteris prolifera* is hitherto reported as a new fern record for the Gujarat state and is described below:

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Botanical Name: *Thelypteris prolifera* (Retz.) C.F. Reed

Syn. *Ampelopteris prolifera* (Retz.) Copel.

Family: Thelypteridaceae

Distribution: Throughout India

Collection Locality: Mahuva taluk, Surat district, Gujarat state

Description: Large scrambling herb having creeping rhizome with ovate scales. Lamina is elliptic-lanceolate; rachis proliferous, bearing tuft of fronds and rooting at several places, glabrous; pinnae numerous sub-sessile with crenate margin. Sori is circular to elongate, 4–12 on each side of the pinna lobe, without indusium, at maturity uniting with adjacent sori.

Ecology: Often found scrambling amongst tall grasses, sedges or shrubs in freshwater swamps, or beside rivers, ponds and lakes.

Threat Status: None



Figure 1: *Thelypteris Prolifera* Recorded at a Stream Bank in Mahuva Taluka

Another species of pteridophyte recorded in the survey is – *Ceratopteris thalictroides*, which was found growing in stagnant stream water in the Veraval taluka. After its last report from Sabarmati river bank (Mahabale, 1948; 1963), Rajput *et al.*, (2016) reported its occurrence from some marshy areas of South Gujarat. Our study reports this specimen to be present in an area which is hundreds of kilometers away from the previous reports. The details of this plant are mentioned below:

Botanical Name: *Ceratopteris thalictroides* (L.) Brongn.

Family: Parkeriaceae

Distribution: Throughout India

Collection Locality: Veraval taluka, Gir – Somnath district, Gujarat state

Description: Aquatic plants with erect stock, bearing thick, fibrous and fleshy roots. Fronds arranged in a rosette with fleshy and pale green stipes. Lamina dimorphous, primary pinnae about five pairs, alternate, shortly stalked, glabrous above and below, pale green, texture soft and herbaceous. Fertile lamina ovate, tripinnate, margin reflexed and completely covering lower surface on which two rows of larger sporangia are borne; spores trilete, pale green.

Ecology: Gregarious in fully exposed canals at foothills, paddy fields, ponds and other such marshy places.

Threat Status: None



Figure 2: *Ceratopteris thalictroides* Growing in Stagnant Stream Water in Veraval Taluka

The records of these ferns highlight the lacunae still persisting in biodiversity documentation in Gujarat state. The cryptogams including Pteridophytes have been grossly neglected which has rendered them vulnerable to the effects of habitat degradation and loss. Water being essential for the growth and development of Pteridophytes, the occurrence of these ferns in and around the perennial streams further fortifies the ecological richness and sensitivity of fresh water ecosystems. These perennial streams are often under the brunt of various human induced activities which pose a threat to hamper the water quality and bring about drastic change in the aquatic flora and fauna. The gravity of situation can be highlighted from the fact that only two developing individuals of *C. thalictroides* were found in the stagnant part of the stream which is in close proximity of villages. In contrast the stream along which *T. prolifera* was found growing lies close to a forest patch and is little interior of a passing state highway. Efforts need to be stepped up for exploring more such habitats and meticulously documenting the diversity of Pteridophytes. Pteridophytes have economical value with respect to ornamental plants in gardens and homes, as source of drug from rhizome or petiole and as source as food. There is need to popularize this lowers forms of plants to include the same while designing in the conservation measures of the ecosystem at large. The allied Forest Departments or Botanical Survey of India needs to identify critical areas and habitats for long-term conservation of these species.

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REFERENCES

- Beddome RH (1883).** *Handbook to the Ferns of British India, Ceylon and the Malay Peninsula*, (Thacker Spink & Co., Calcutta, India) 501.
- Chavan AR and Mehta AR (1956).** Occurrence of *Ophioglossum gramineum* Willd in Gujarat. *Science and Culture* **21** 538-540.
- Chavan AR and Padate SN (1962).** The hydrophytes of Savali taluka. *Journal of M S University of Baroda* **11**(3) 63-78.

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Chavan AR and Sabnis SD (1961). A study of the hydrophytes of Baroda and Environs. *Journal of Indian Botanical Society* **40**(1) 121-130.

Dudani SN, Mahesh MK, Mukri V, Subash Chandran MD and Ramachandra TV (2013). An appraisal and conservation strategies for the Pteridophytes of Uttara Kannada. CES Technical Report 129, Centre for Ecological Sciences, IISc, Bengaluru.

Fraser-Jenkins CR (2008). *Taxonomic Revision of Three Hundred Indian Sub-Continental Pteridophytes with a Revised Census List – A New Picture of Fern-Taxonomy and Nomenclature in the Indian Subcontinent*, (Bishen Singh Mahendra Pal Singh Publishers, Dehradun, India).

Gaekwad LK and Deshmukh YS (1956). Occurrence of *Isoetes* at Baroda in Gujarat from Bombay state. *Science and Culture* **22** 346.

GEC (Gujarat Ecology Commission) (1996). Biological diversity of Gujarat; current knowledge. Technical Report, GERI Campus, Gandhinagar, Gujarat.

Inamdar JA (1970). Development of stomata in some *Ophioglossum* species. *Annals of Botany* **34** 975-981.

Inamdar JA and Shah JJ (1967). Occurrence of *Ophioglossum nudicaule* L.f. and *Ophioglossum nudicaule* var. *macrorrhizum* (Kze.) Clausen in Dharampur forest. *Indian Forester* **93**(2) 95-97.

Mahabale TS (1948). Prothalli of *Ceratopteris thalictroides* (Linn.) Brongn. *Botanical Gazette* **109** 349-354.

Mahabale TS (1963). Cultural behavior of prothalli of *Stenochlaena palustris*, *Ceratopteris thalictroides* and *Athyrium hohenackerianum*. *Plant and Organ Culture, Symposium* Published by International Society of Plant Morphology 382-389.

Manickam VS and Irudayaraj V (1992). *Pteridophyte Flora of Western Ghats – South India*, (BI Publications Pvt Ltd, New Delhi, India).

Nayar BK and Devi S (1964). Spore morphology of Indian ferns I. Aspidiaceae. *Grana Palynologica* **5**(1) 80-120.

Padate SN (1969). A contribution to the flora of Savli taluka, Gujarat state, India. *The Journal of M S University of Baroda* **17**(3) 101-112.

Rajput KS, Kachhiyapatel RN, Patel SK and Raole VM (2016). Assessment of Pteridophyte diversity and their status in Gujarat state, Western India. *Plant Science Today* **3**(4) 337-348.

Shah JJ and Vaidya BS (1964). Occurrence of *Ophioglossum* in Dangs forests. *Vidya* **7** 92-95.