
ORIGINAL ARTICLE

***Cheilanthes tenuifolia* (Burm. f.) Sw. (Pteridaceae): A New Record of Fern For Gujarat, India**

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ABSTRACT

A genus, *Cheilanthes* Sw. is reported for the first time based on species *Cheilanthes tenuifolia* (Burm. F.) Sw. as a new fern record for Gujarat state. Morphological characters and spore structures of *Cheilanthes tenuifolia* were examined and illustrated in this paper.

Keywords: *Cheilanthes*, New Record, Gujarat, Spore

Received 02.02.2018

Revised 15.03.2018

Accepted 15.05.2018

How to cite this article

Mitesh Patel and Mandadi Narsimha Reddy. *Cheilanthes tenuifolia* (Burm. f.) Sw. (Pteridaceae): A New Record of Fern For Gujarat, India. Adv. Biores., Vol 9 [4] July 2018:48-51.

INTRODUCTION

Pteridophytes including ferns and ferns allies, are first vascular plants on earth considered to evolved in mid-paleozoic era. Pteridophytes are commonly known as 'plant reptiles', attracting botanist of the world not only for their attractive and distinctive foliage but also for their valuable aspects. They are very specific in distribution and grow luxuriantly in moist tropical to the temperate forests and their occurrences in diverse eco-geographically threatened regions from sea level to elevated mountains are of much interest [1]. Although ferns and fern-allies constitute a fairly good percentage of our flora and are often quite conspicuous in certain localities, ferns and fern-allies are neglected by most flora writers in our country and received due attention in only last few years. Pteridophyte diversity of Gujarat state is carried out by few researchers and reported 36 species from the state [2-19]. During this year, we reported a new species, *Ophioglossum malviae* as world's smallest terrestrial pteridophyte [20] and three more species as new record for the pteridophyte flora of Gujarat [21].

The Swartz genus *Cheilanthes* commonly known as "lip fern" belongs to the fern sub family Cheilanthesoideae of Pteridaceae of order Polypodiales. It comprises more than 150 species in tropical and temperate regions around the world [22], mainly growing in warm, dry, rocky regions, oftenly in small crevices high up on cliffs. In India, it is represented by more than 30 species [23]. Since, no record of ferns belongs to genus *Cheilanthes* is reported from the state till date, this paper report a new fern record *C. tenuifolia* for the Gujarat state of India.

MATERIALS AND METHODS

During a botanical expedition in September to November-2017, a fern species was collected from the forest of Jambughoda, Panchmahal, Gujarat, India (22°22'05.79" N 73°38'44.65" E). Photographs of plant specimens were taken in its natural habitat. Plant specimens were collected and transferred to the laboratory for morphological as well as microscopic analysis and for herbarium preparation. The collected taxa were identified using appropriate flora, journals and monographs [24-28]. Furthermore, collected specimen was confirmed by making comparisons with high resolution images of preserved specimens at MBG (Herbarium No. 6053538 and 6186526). Spores characters were examined and photographed by using light microscope (Axioscope A1, ZEISS, Germany). Herbarium sheets are

deposited in herbarium of Bapalal Vaidhya Botanical Research Centre (BVBRC), Department of Biosciences, Veer Narmad South Gujarat University, Surat, Gujarat.

RESULTS AND DISCUSSION

Taxonomic accounts: *Cheilanthes tenuifolia* (Brum.f.) Swartz Syn. Fil. 129, 332. 1806; Clarke in Trans. Linn. Soc. Ser. 2 (Bot.) 1: 455. 1880; Bedd., Handb. Ferns Brit. India: 92. 1883. *Trichomanes tenuifolia* Burm. Fl. Indica: 237. 1768. *Cheilosoria tenuifolia* (Burm.f.) Trevis, Atti Reale Ist. Veneto Sci. Lett. Arti 5(3):579. 1877.

Description (Figure 1 A-D): Rhizome short creeping, hairy, scaly, bearing much divided roots with small lateral tips; scales light brown, lanceolate-acuminate, 2-4 mm long. Stipes shiny, chestnut colour, 9-28 cm long, slender, erect, grooved on adaxial surface, faintly swollen and densely scaly at base and minutely scaly upwards. Fronds are dimorphic; sterile lamina smaller than the fertile lamina, stipe 8-11 cm in length, deltoid in outline. Fertile lamina 18×7 cm, tripinnate or the finely quadripinnatifid, subdeltoid in outline, delicate, glabrous; rachis and pinna rachis grooved on upper surface and bearing some scattered minute glandular hairs; pinnae more than ten in numbers, lowest one being the largest, subtriangular acute at apex and middle pinnae are oblong-subtriangular; pinnules pinnatisect with few pairs of lobes and with a long terminal one, ultimate lobes are 2-3 mm long and 1-2 mm wide, green, ovate, subacute, entire or shallowly lobed, a long terminal lobe is 4-6 mm long and 2-3 mm wide, oblong, round at apex; veins are free. Sporangia marginal on each ultimate lobe and protected by reflexed margin, edges uneven. Spores 40-52 µm, globose-tetrahedral bearing flap-like protuberances.

Habitat: Growing on dry clay slopes at low altitude in forest.

Fertile: September–November

Specimen examined: India, Gujarat state, Jambughoda, Panchmahal, Gujarat, India (22°22'05.79" N 73°38'44.65" E) Mitesh Patel BVBRC111, November, 2017.

Distribution

World: Taiwan, Cambodia, Laos, Australia, Bangladesh, China, Malaysia, Nepal, New Zealand, Philippines, Thailand, Vietnam, Sri Lanka, Tasmania, Uruguay and India.

India: Arunachal Pradesh, Kerala, Darjeeling, Karnataka, Sikkim, Maharashtra, West Bengal and Gujarat (new record).



Figure 1: *Cheilanthes tenuifolia* A - Fertile lamina of plant. B - sterile lamina of plant. C - Pattern of sori on pinna. D - Structure of spores under light microscope.

Proposed IUCN conservation assessment: Least Concern (LC).

From decades, generic delimitation of cheilanthoids species is difficult because majority of the cheilanthoids species grow in arid and semiarid environments which leading to incredibly variable morphology with phenomenon like polyploidy, apogamy and hybridization [29]. Recently, few species of *Cheilanthes* have been transferred to newly described genera *Gaga* based on molecular phylogenetics analysis [30]. Therefore, molecular phylogenetics study is needed in future to confirm the systematic position of Indian *C. tenuifolia* species. However, Gujarat state is pteridologically less explored and recent discovery of the world's smallest terrestrial pteridophyte [21] with four new records (including *C. tenuifolia*) of pteridophyte [22] indicate that dedicated surveys could yield more pteridological discoveries from the state.

ACKNOWLEDGEMENT

This study was supported by a National Fellowship for Students of OBC, (NFO-2015-17-OBC-GUJ-29274) from University Grants Commission (UGC), New Delhi, India. Authors are also thankful to forest department of Gujarat state of India to provide necessary permissions for work.

COMPETING INTERESTS

The authors declare no competing interests.

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