

## Original Research Article

### A Diploid Cytotype of *Ceratopteris thalictroides* (L.) Brongn. (Parkeriaceae - Pteridophyta) from Uttar Pradesh, India

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#### ABSTRACT

##### Keywords

Diploid cytotype, *Ceratopteris thalictroides*, Parkeriaceae, Uttar Pradesh

*Ceratopteris thalictroides* (L.) Brongn is a tropical and sub-tropical species, grows marshy places, or ponds, rivers or streams, often as aquatic ferns with some leaves submerged, others floating and others above the surface, or even as floating plants. The tetraploid cytotype ( $n = 76,77$ ) has been reported widely from several localities in India and the diploid cytotype of  $n = 38$  has been reported only from Kerala – Parambikulam and Rajasthan - Udaipur for this species. Hence the present report of the diploid cytotype is first for this species from Uttar Pradesh and UP becomes third distributional area for this cytotype in India.

## Introduction

The genus *Ceratopteris* is represented by 1 species in India (Dixit, 1984), 1 from South India (Manickam and Irudayaraj, 1992), 1 from Western Himalaya (Khullar, 1994), 1 from Assam (Borthakur, 2001) and in Uttar Pradesh so far only species is reported (Chandra, 2000). The diploid cytotype of *Ceratopteris thalictroides* is new to Uttar Pradesh. *Ceratopteris thalictroides* is reported to be present in many localities in India like Himachal Pradesh: Chamba, Kangra; Garhwal: Dehra Dun, Kumaun: Nanital, Almora, Pithoragarh, Meghalaya, Nagaland, Kohima, Madhya Pradesh, Rajasthan, Karnataka, Tamil Nadu and Andaman Nicobar. During the recent exploration of Kushmi forest range of Gorakhpur, Uttar Pradesh *Ceratopteris*

*thalictroides* was collected for chromosome count. The diploid cytotype of  $n=38$  diploid was recorded. This is the first report of this cytotype for this species for Uttar Pradesh. The present study area (Fig. 1) Gorakhpur is bounded by Nepal on the North, Uttarakhand on the North- East, Himachal Pradesh on the North –West and Bihar on the East. They are situated between  $23^{\circ} 52'N$  and  $31^{\circ} 28'N$  latitudes and  $77^{\circ} 30'E$  and  $84^{\circ} 39'E$  longitude.

## Materials and Methods

For cytology, the methodology of Manton (1950), and conventional method of preparation of herbarium was followed. The collected specimens are preserved and

deposited in Department of Botany, St. Andrew's College, Gorakhpur, Uttar Pradesh, bearing the accession numbers: 201.

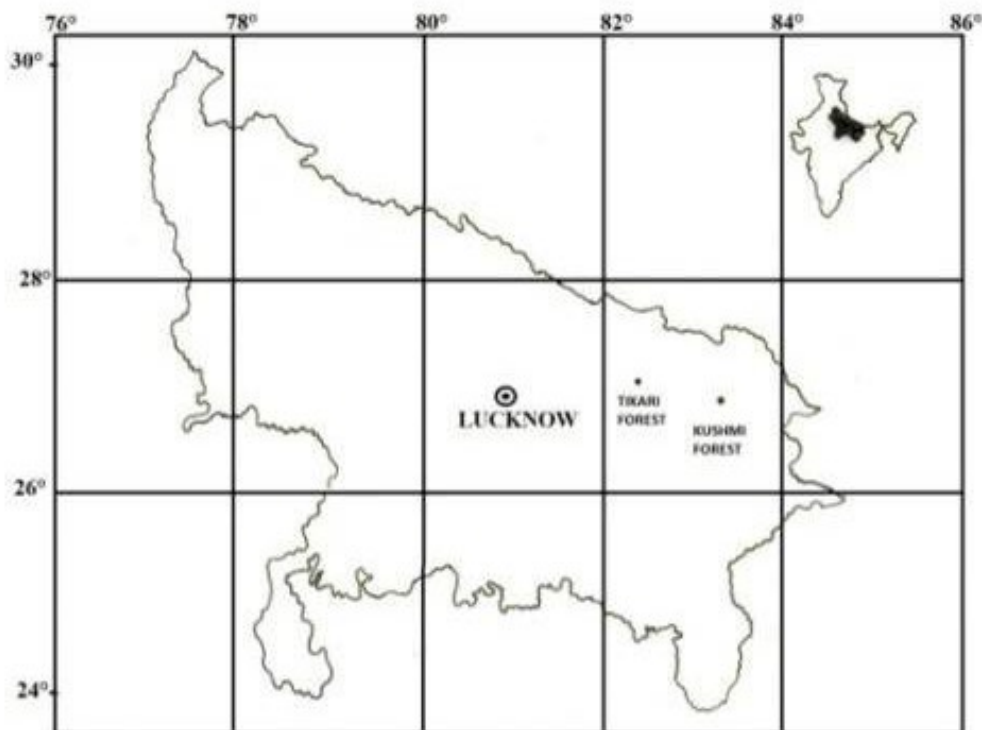
**Specimens examined:** Kusmi forest - Gorakhpur, SACH-201: 19.09.13: 90m

### Results and Discussion

*Ceratopteris thalictroides* is a very common species in the study area. In *Ceratopteris thalictroides* the tetraploid cytotype (n = 76,77) have been reported widely from North America by Robert M. Lloyd (1974, 1993) and from several localities in India; Kerala – Trivandrum Veli (Ninan, 1956), Maharashtra – Bombay Nimal Tank Island, wild (Javalekar, 1960), Western Ghats - Kerala (Abraham *et al.*, 1962), Kerala -

Nilambore (Kurichan, 1968), Nepal – Kathmandu Valley (Roy *et al.*, 1971), Kerala - Manavalakurichy (Kurichan, 1978), Western Ghats – Tamil Nadu, Tiruchi (Irudayaraj and Manickam, 1987). Diploid cytotype (n = 38) has been also reported from two places in India: Kerala - Parambikulam (Kurichan, 1968) and Rajasthan - Udaipur, Bhilwara (Pareek *et al.*, 2005). There is no cytological record of this plant from Uttar Pradesh. The present report of the diploid cytotype (n = 38) (Fig. 2) for *Ceratopteris thalictroides* from Gorakhpur, Uttar Pradesh signifies that it is the first report of this cytotype from Uttar Pradesh and UP becomes the third distributional area for this cytotype in India. The sporangia (Fig. 3) and Spore (Fig. 4) structures were studied and were found to be normal in appearance.

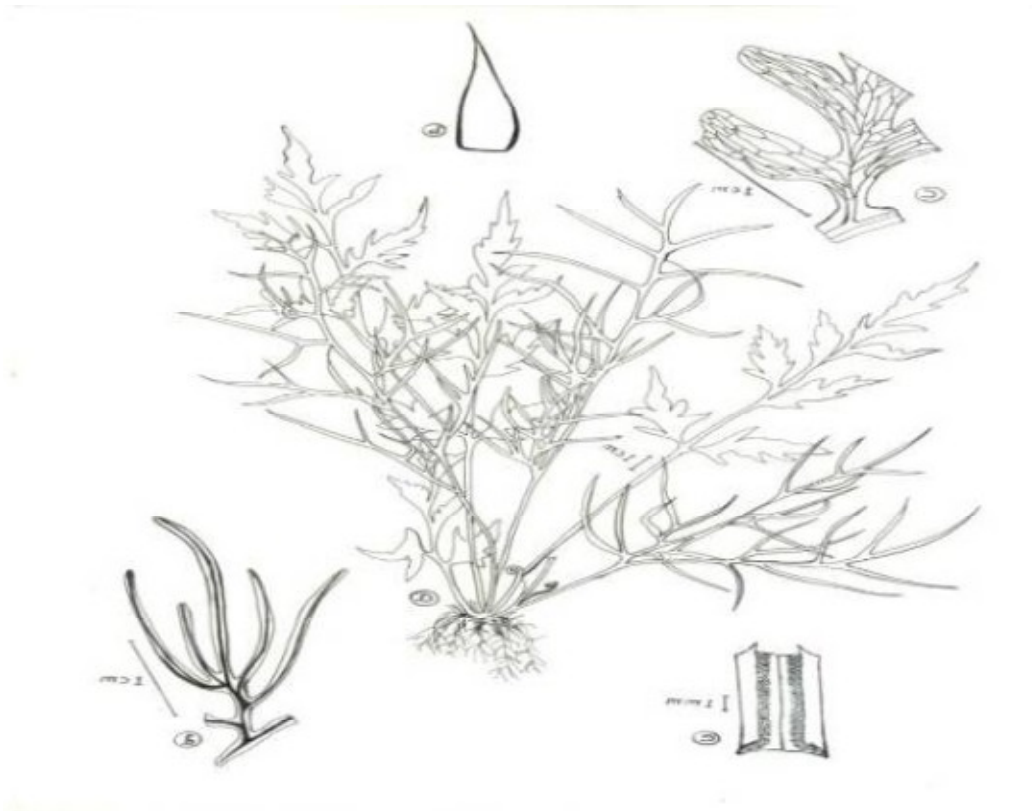
**Fig.1** Map of the study area – Uttar Pradesh



**Fig.2** Habitat photo of plant (*Ceratopteris thalictroides*)



**Fig.3** a. Frond of *Ceratopteris thalictroides*; b. Portion of fertile Part; c Venation pattern of Leaf; d. Enlarged portion of Scale; e. Enlarged portion of pinnule



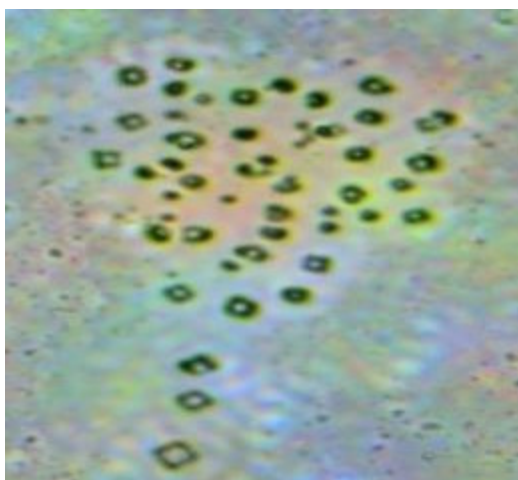


Fig.4 - *Ceratopteris thalictroides* (n=38)

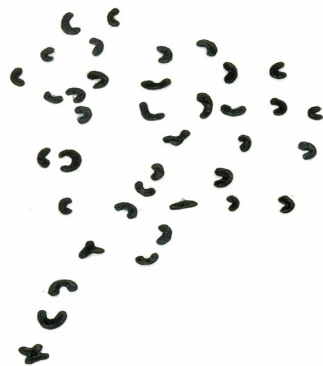


Fig.5 - *Ceratopteris thalictroides* (n=38) Line diagram

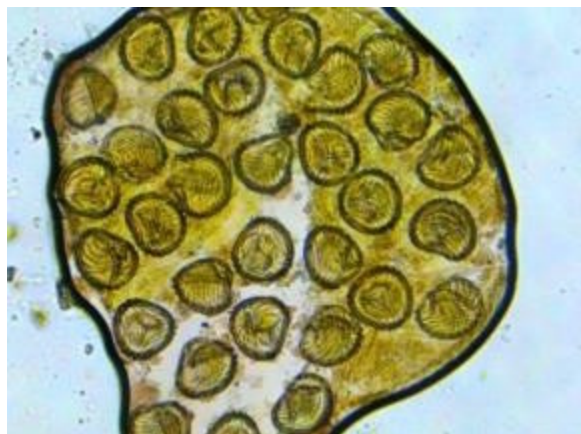


Fig.6 - *Ceratopteris thalictroides* (4x)

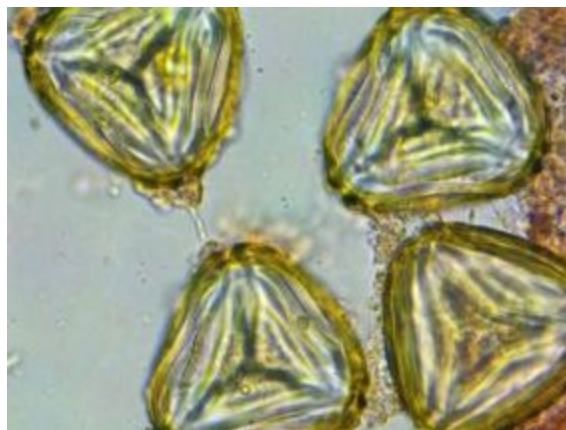


Fig.7 - *Ceratopteris thalictroides* (10x)

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