

**CYTOLOGICAL INVESTIGATIONS IN THE
TRIBE VERNONIEAE (ASTERACEAE)**

THE tribe Vernoniae occurring in South India is represented by about 40 species of the genera *Adenoon*, *Centratherum*, *Elephantopus*, *Lamprachaenium*, and *Vernonia*¹. Of these, *Adenoon* and *Lamprachaenium* are monotypic with limited distribution. Some of these species are already on the verge of eradication due to intensive and indiscriminate utilization of forest land. Of the above species, adequate cytological information is available for only 7 species². The present study deals with the karyotypic analysis in *Adenoon indicum* Dalz. and the recording of chromosome numbers for 15 taxa of the tribe for the first time,

guished from the other members of the tribe by the absence of pappus.

Flower buds were collected in the field and fixed in modified Carnoy's 4 : 3 : 1 (chloroform, glacial acetic acid, ethanol) fluid. They were stored in the fixative 10 to 12° C until anthers were squashed for examination. In addition, mature achenes were collected for germination and to obtain the root tips for mitotic studies. Somatic chromosomes were analysed from healthy root tip squashes using Tjio and Levans technique³ and aceto-Iron haematoxylin stain⁴. The chromosome counts made are given in Table I. Photomicrographs of the somatic squashes taken from temporary preparations were used for karyotype study.

TABLE I

Chromosome numbers in the tribe Vernoniae

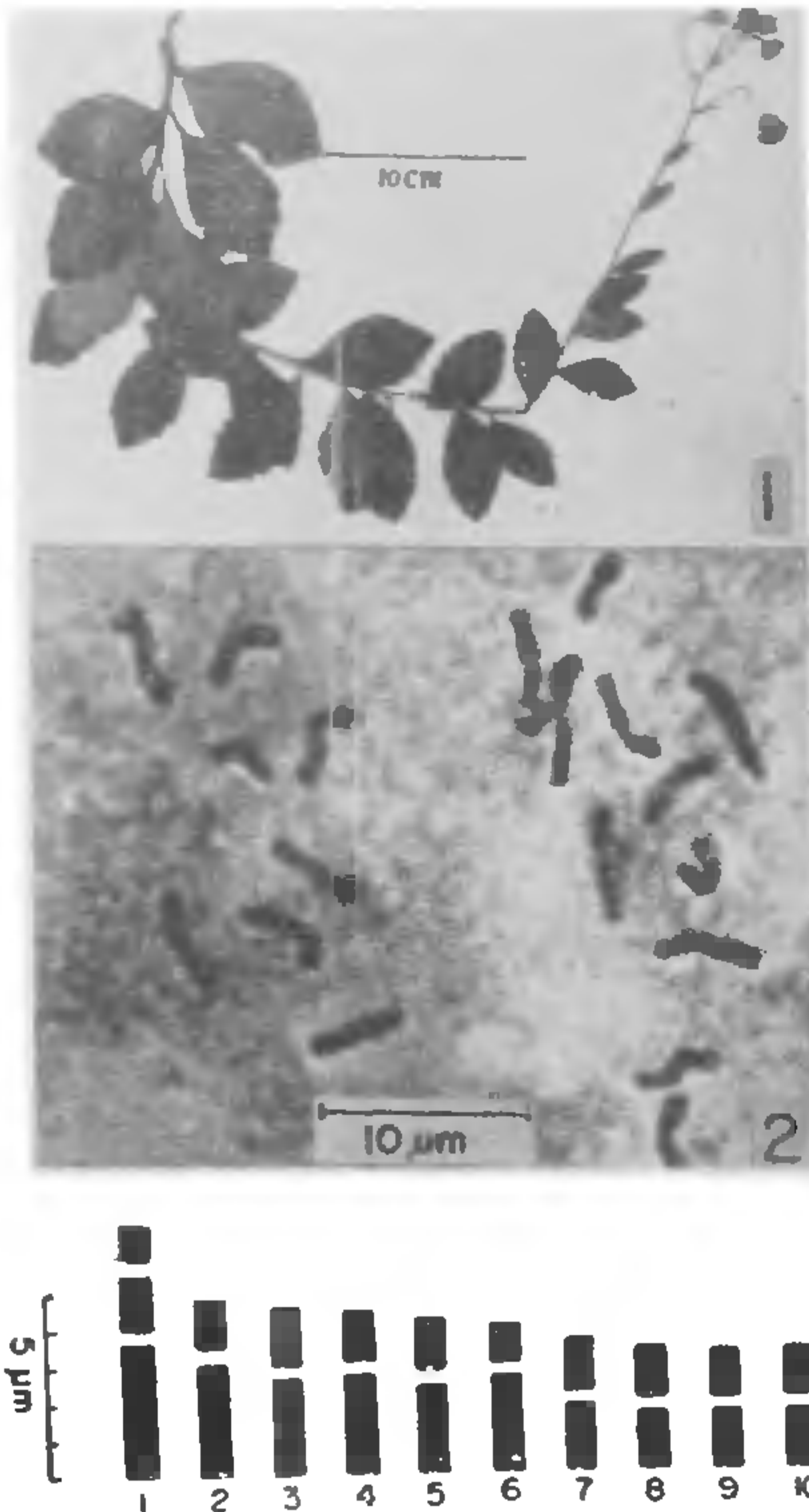
Species	Source with collection number	Present report		Previous report
		2n	n	
<i>Adenoon indicum</i> Dalz.	Mahabaleswar (BMN 241)	20	..	..
<i>Centratherum courtallense</i> Benth.	Thirukuraingudi (BMN 265)	18	9	Mathew 1975 n = 9
<i>C. mayurii</i> Fischer	Sakaleshpur (BMN 82)	18	..	..
<i>C. sp.</i> (<i>C. phyllolaenum</i> auct. non Benth.)	Sengaltheri (BMN 285)	18	9	..
<i>C. molle</i> Benth.	Manipal (BMN 214)	18	..	..
<i>C. rangacharii</i> Gamble	Munnar (BMN 152)	18	..	..
<i>C. ritchiei</i> Hook. f.	Castle Rock (BMN 251)	18	..	..
<i>C. tenue</i> Clarke	Agumbe (BMN 62)	18	..	..
<i>Lamprachaenium microcephalum</i> Benth.	Mahabaleswar (BMN 236)	18	..	..
<i>Vernonia albicans</i> DC.	Hassan (BMN 35)	18	9	Mathew, A. and Mathew, P. M., 1976 n = 9
<i>V. comorinensis</i> W. W. Smith	Kakachi (BMN 192)	20	..	..
<i>V. gossypina</i> Gamble	Sengaltheri (BMN 178)	20	10	..
<i>V. ramaswamii</i> Hutch.	Sengaltheri (BMN 182)	..	10	..
<i>V. shevaroyensis</i> Gamble	Yercaud (BMN 277)	..	30	..
<i>V. travancorica</i> Hook. f.	Kakachi (BMN 129)	..	30	..

Note : Voucher specimens of the above investigated species are preserved in the Herbarium of the Post-Graduate Department of Botany, University of Mysore.

Adenoon indicum Dalz. (Fig. 1) grows wild in western ghats and on Mahabaleswar Hill. It is an annual, erect, rigid, scabrous herb with alternate, ovate leaves and characterised by hairs with bulbous base. The heads of homogamous, regular, purple flowers are in corymbose panicles. The achenes are obovoid, cylindrical with 10 ribs. The plant is distia-

The diploid chromosome number of *Adenoon indicum* Dalz. is found to be 2n = 20 (Fig. 2) and is the first report for the species. Somatic chromosomes and their idiogram are represented in Figs. 2 and 3. The idiogram shows that chromosomes fall in a series of close gradations. Karyotype made according to Levan⁵ reveals that the 1st, 2nd, 4th, 5th and 6th

pairs of chromosomes are with submedian constrictions and all the remaining chromosomes are with either median or near median constrictions. The first pair is distinguishable because of its secondary constrictions on the short arm. The chromosome length ranges from 2.8 to 5.7 μm with an absolute length of 37.1 μm . The Karyotype is not advanced as it represents only m and sm types⁵ of chromosomes with close gradations.



FIGS. 1-3. Fig. 1. Photograph of the plant. Fig. 2. Photomicrograph of the somatic metaphase plate showing $2n = 20$. Fig. 3. Idiogram.

The author is highly thankful to Dr. D. A. Govindappa, Professor and Head of the Department of Botany, University of Mysore, for encouragement and facilities. He is indebted to Dr. M. Anantawamy Rau for his guidance. Grateful acknowledgement is made to the University Grants Commission for the award of a Teacher Fellowship, and to the Director, Royal Botanic Garden, Kew, for the determination of some of the investigated species.

Department of Botany,
University of Mysore,
Manasagangotri,
Mysore 570 006, India,
August 17, 1978.

B. M. NARAYANA.

1. Gamble, J. S., *Flora of the Presidency of Madras*, 1956, Vol. II, Rep. ed. Calcutta.
2. Mathew, A. and Mathew, P. M., *Cytologia*, 1976, 41, 401.
3. Tjio, J. H. and Levan, A., *Ann. Extac. Exp. Aule. Die.*, 1950, 2, 21.
4. Wittmann, W., *Stain Tech.*, 1962, 37, 27.
5. Levan, A., Fredga, K. and Sandberg, A. A., *Hereditas*, 1962, 52, 201.

CANNABIS SATIVA LINN., A NEW HOST FOR PHOMA SP.

ON July 19, 1979, several lower green leaves of *Cannabis sativa* plants growing wild at Srinagar (Garhwal) were seen suffering from severe yellow spotting. The disease first appeared on the surface of the lamina as small light, yellowish brown coloured spots with a sharp outline. These were usually circular to begin with but as their area increased, they acquired an irregular outline (Fig. 1). The mature lesions had light yellow colour and were bounded by a well defined, narrow marginal ring of metal-brown tinge. At this stage pycnidia showed up as small, black dots throughout the spotted parts of the leaves. The reverse colour of the mature spots is also light brown. They occupied any position on the leaves, freely traversing the veins (Fig. 2).

At first pycnidia were seen covered by epidermis of the host. Later these erupted in the form of membranous, globose, or subglobose, single or gregarious masses generally in groups of two or three, each measuring 110-140 μ in diameter with a distinct papillate ostiole. The texture of the pycnidial wall is thin, paranchymatous and sub-translucent, being made up of a single layer of brown, polyhedral cells. Phialides are short, ampuliform, hyaline, indistinguishable from the inner wall of pycnidium. Conidia are aseptate oval, being 2.4-3.1 $\mu \times$ 1.4-1.6 μ in size. The mycelium is septate, thin-walled and presents a light brown hue (Figs. 3, 4).

The present pathogen differed much from other species of *Phoma*, already reported on other hosts, mostly in the size and nature of the pycnidia. Hence, *Cannabis sativa* Linn. is reported as a new host for *Phoma* sp. from Srinagar (Garhwal).