CYTOLOGY AND ORIGIN OF A TETRAPLOID
TRICHOSANTHES PALMATA ROXB.

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Cytology of male plants of a tetraploid Trichosanthes palmata Roxb. has been studied. The plants showed 44 chromosomes in root tip cells. Chromosomal associations during diakinesis and early meiotic metaphase were studied. Chromosome number and morphology, high multivalent frequency, meiotic irregularities, general morphological characters and larger size of the stomata and epidermal cells compared to the diploid relative suggest that this collection is of possible autopolyploid origin.

Although the plants are dioecious, cytologically distinct sex chromosomes were not detected neither in the diploids reported earlier, nor in the tetraploids described in the present study.

Introduction

Trichosanthes palmata Roxb. is a dioecious climbing perennial belonging to the family Cucurbitaceae. Varghese (1971) reported male and female plants of T. palmata with 2n = 22 chromosomes. Rangaswami (1949) reported male and female plants of T. palmata with 2n = 44 chromosomes. A few male plants of T. palmata with 44 chromosomes in root tip cells were encountered during the course of investigations on S. Indian cucurbitaceous plants by the author. The present paper deals with morphological and cytological studies of these tetraploids in relation to the nature and origin of polyploidy in T. palmata.

Material and Methods

Male plants of T. palmata for the present study were collected from Trivandrum city, Kerala State (Material I) and Mettupalayam, Madras State (Material II). Root tips for somatic chromosome studies were obtained from stem cuttings planted in pots. They were fixed
between 11 a.m. and 1 p.m. in Carnoy’s fluid (1:3 acetic alcohol) for 2–4 hours. The cytological and photographic techniques used are similar to those reported earlier (VARGHESE, 1971).

Observations

The plants closely resembled the diploid \textit{T. palmata} plants reported earlier (VARGHESE, 1971), but had shorter internodes and more deeply lobed smaller leaves (Fig. 1). The large bracts of the male inflorescence, the sepals, the petals and the anthers were similar in all respects to that of the diploid plant (Fig. 2). The epidermal cells and stomata were larger in size compared to that of the diploids (Figs. 3, 4).

Mitotic preparations from root tip cells of the male plant showed forty four chromosomes which varied from 1.75 \mu m to 4.25 \mu m in length (Fig. 5). According to their comparative size, the twenty two pairs of chromosomes were grouped into 2 pairs of very long chromosomes, 4 pairs of long chromosomes, 4 pairs of medium chromosomes, 4 pairs of short chromosomes and 8 pairs of very short chromosomes (Textfig. 1b). Of the two longest pairs, one pair carries secondary constrictions, the members of this pair being slightly longer than the other pair in the first group. The rest of the chromosomes of the complement showed median or submedian constrictions. No observable irregu-

Textfig. 1. Approximate idiograms of the haploid set of somatic chromosomes of the diploid (a) and tetraploid (b) male plants of \textit{Trichosanthes palmata} Roxb.