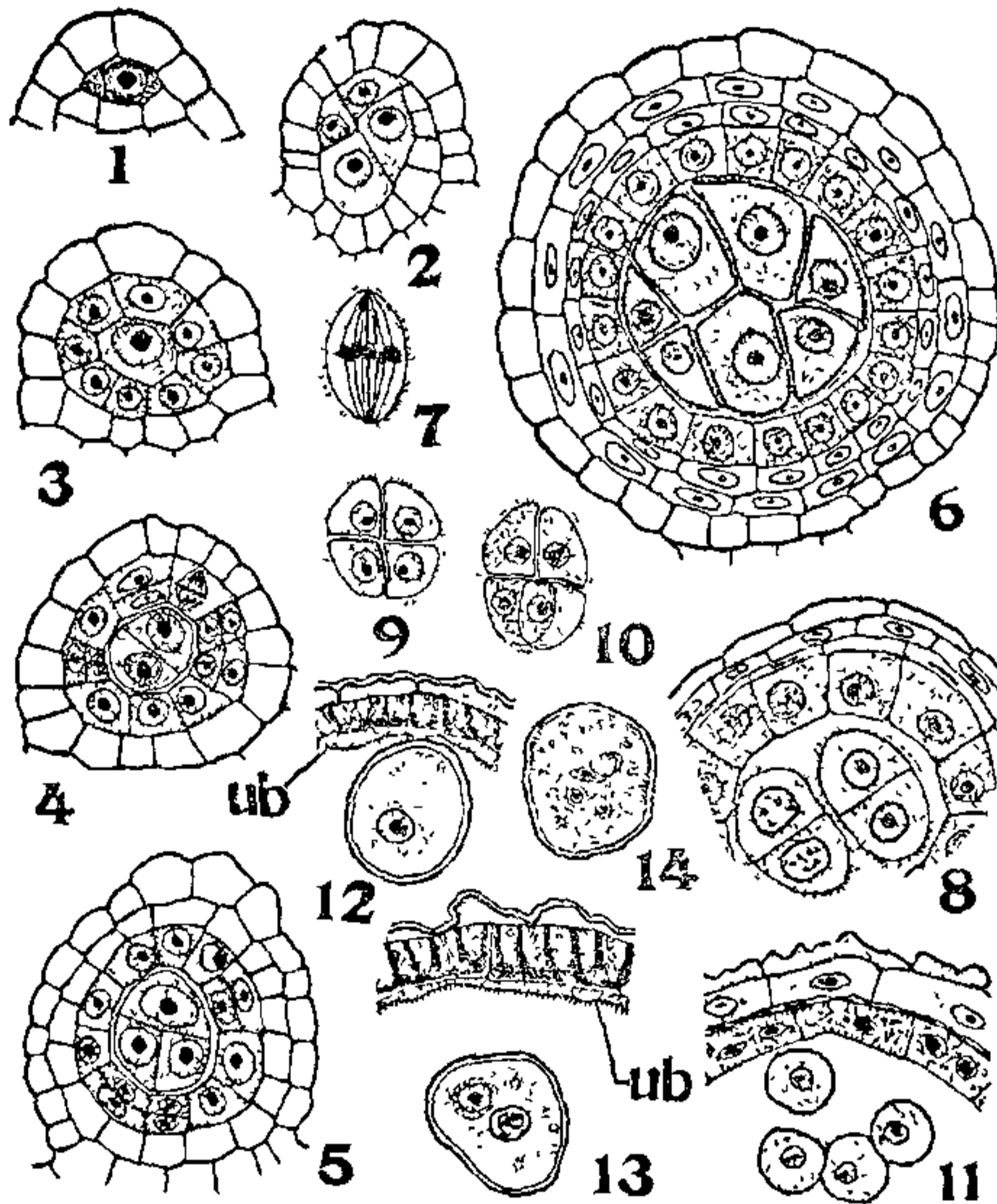


a vacuole (Fig. 12). As the pollen grain develops further the nucleus divides forming a large vegetative cell (Fig. 13). Later, the generative cell divides forming two small male cells which are round in shape (Fig. 14). Meanwhile, the vegetative nucleus loses its shape and takes dark stain showing signs of degeneration. The pollen grains are shed at 3-celled stage.



FIGS. 1-14. T.S. of anther. Fig. 1. An arche-sporial cell. Fig. 2. A plate of archesporial cells. Fig. 3. Sporogenous cell surrounded by primary parietal layer. Fig. 4. Periclinal division of primary parietal layer. Fig. 5. Periclinal division of inner secondary parietal layer. Fig. 6. Microspore mother cells surrounded by wall layers. Fig. 7. Microspore mother cell at metaphase. Fig. 8. Dyads; note prominent tapetum and the degenerating middle layer. Figs. 9, 10. Isobilateral and decussate tetrads. Fig. 11. Microspores with binucleate tapetal cells. Figs. 12, 13. One- and two-celled pollen grains; note lignaceous thickenings. Fig. 14. 3-celled pollen grain (All figures, $\times 320$).

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THANATEPHORUS CUCUMERIS, CAUSING DAMPING-OFF AND COLLAR ROT IN SUNFLOWER

DURING July-August 1977, large number of sunflower seedlings were observed to die due to root and collar rot, at G. K. V. K. Campus Farm of the University of Agricultural Sciences, Bangalore. In certain patches the germination was affected; a close observation of such patches revealed seed decay and pre-emergence damping-off. Where disease occurred on young seedlings a clear girdling and rotting of the basal portions of the stem at the collar region was noticed. Such plants collapsed and died. Isolations from the affected portions of the diseased seedlings yielded consistently a fungus with non-sporulating, septate, buff cottony mycelium. The fungus was pathogenic to sunflower and produced similar symptoms when inoculated artificially. Isolations from these inoculated plants yielded the same fungus. The pathogen was identified as *Rhizoctonia* state of *Thanatephorus cucumeris* (Frank) Donk and the culture is deposited in CMI (IMI 223515).

There are reports of *Rhizoctonia bataticola* infecting sunflower from India and abroad. However, there is no report of the occurrence of *R. solani* (Imperfect state of *Thanatephorus cucumeris*) on sunflower from India and this constitutes first record.

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OBSERVATIONS ON THE PACHYTENE CHROMOSOMES OF SOLANUM INDICUM VAR. MULTIFLORA

AMONG the spinous Solanums, many of which are of economic importance^{1,2}, only a few have been subjected to cytological analyses^{3,4}. Studies were therefore initiated in this direction and our observations

TABLE I
Morphological features of the pachytene chromosomes of *Solanum indicum* var. *multiflora*
(Lengths are given in microns)

Chromosome No.	Long arm			Short arm			Total length	Arm ratio LA/SA
	Total	ECS	HCS	HCS	ECS	Total		
1.	20.0	13.0	7.0	6.0	11.0	17.0	38.0	1.2
2.	21.0	14.0	7.0	5.0	5.0	10.0	33.0	2.1
3.	21.5	16.5	5.0	4.0	5.0	9.0	31.5	2.4
4.	16.0	12.0	4.0	4.0	9.0	13.0	31.0	1.2
5.	15.0	10.0	5.0	5.0	6.0	11.0	26.0	1.4
6.	12.6	8.6	4.0	5.0	6.0	11.0	23.6	1.1
7.*	16.0	11.0	5.0	6.0	..	6.0	23.0	2.7
8.	10.4	6.4	4.0	3.0	7.0	10.0	21.4	1.0
9.	12.0	8.0	4.0	3.0	5.0	8.0	21.0	1.5
10.	10.0	7.0	3.0	2.0	5.0	7.0	18.0	1.4
11.	11.0	9.0	2.0	2.0	4.0	6.0	17.0	1.8
12.	8.0	6.0	2.0	1.0	4.0	5.0	14.0	1.6

ECS—Euchromatic segment.

HCS—Heterochromatic segment.

LA—Long arm.

SA—Short arm.

* Denotes nucleolar organiser.

on the pachytene chromosomes of *Solanum indicum* Linn var. *multiflora* Wight⁷ are reported in this note.

The flower buds were fixed in 1:3 acetic-alcohol and stored; the anthers were smeared in acetocarmine and observations were made from temporary slides. At pachytene the chromosomes did not spread well and only a few chromosomes could be traced in each of the PMCs. On the basis of the relative lengths, arm ratios and the extent of differentiation into eu- and heterochromatic regions, all the twelve chromosomes of the haploid set could be recognised and numbered 1 to 12 in the descending order of their total lengths. The morphological features are summarised in Table I.

The chromosomes are linearly differentiated into eu- and heterochromatic segments of variable lengths, the latter consistently occupying the regions adjacent to the centromere. The total length of individual chromosomes varies from 38 μ m for chromosome 1 to 14 μ m for chromosome 12. The chromosome complement consists of 6 chromosomes with median centromeres, 4 with submedian centromeres, and 2 with subterminal centromeres. There is a single nucleolus organising chromosome pair, which occupies the seventh position in the complement, with the nucleolar organising body located in a nearly terminal position in its short arm.

In the morphological features of the pachytene chromosomes of *S. indicum* var. *multiflora*, described

now for the first time, this species shares certain cytological features with other spinous *Solanums* similarly investigated⁴⁻⁶. However its true affinities from the cytogenetic point of view needs to be established from studies on the F-1 heterozygotes and their derivatives between this and the other species. Attempts in this direction to elucidate the evolutionary trends within this group are in progress.

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