

TABLE I

Effect of Planofix on the Nodule Number and Nodule weight (mg/plant) at harvest in *Arachis hypogaea* (Var. TMV 7)

Treatment—Planofix (ppm)	Nodule Number (per plant)	Nodule Weight (mg)
Control—No spray	57	79.60
Nil — Water spray	59	73.20
— 5	79	110.00
— 10	82	101.00
— 20	95	138.20
— 40	92	142.40
— 80	70	78.00
— 160	65	69.10

TABLE II

The effect of Planofix on the Total Nitrogen (mg/g) and the total carbohydrate (mg/g) content in *Arachis hypogaea* (Var. TMV 7)

Treatment—Planofix (ppm)	Total Nitrogen (mg/g)	Total carbohydrate (mg/g)	C/N ratio
Control—No spray	20.80	105.00	4.11
Nil — Water spray	23.00	110.00	4.78
— 5	25.80	120.00	4.65
— 10	26.20	129.00	4.92
— 20	26.30	132.00	5.01
— 40	27.20	140.00	5.15
— 80	26.20	125.00	4.77
— 160	25.80	80.00	3.10

its impact on nodulation and nitrogen turnover is an interesting complementary effect.

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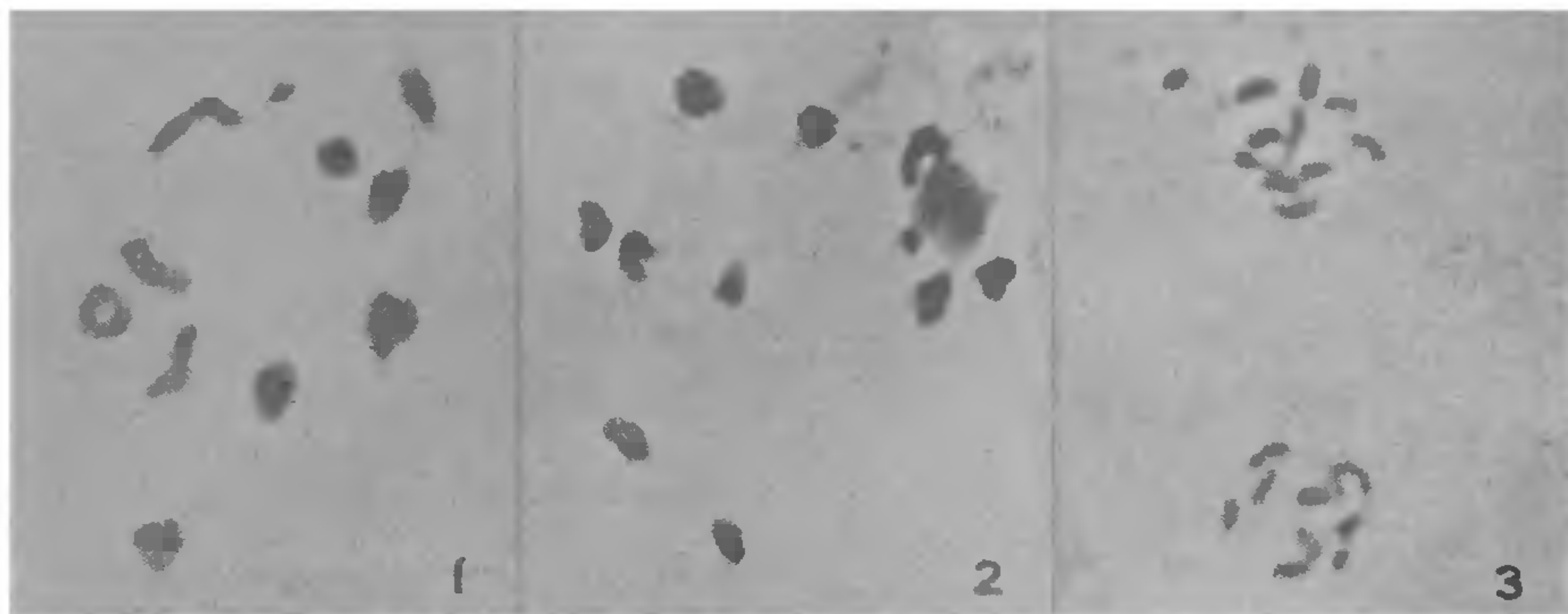
#### CYTOGENETIC BEHAVIOUR OF A FRAGMENT CHROMOSOME IN JOB'S TEARS, *COIX LACRYMA-JOBI* L.

NATURALLY occurring chromosomal abnormalities in Job's tears (*Coix lacryma-jobi* L.,  $2n = 20$ ) are scarce<sup>1</sup>. In 1966, in selfed progenies of one of the varieties, called *typica* Watt, a single plant having quite normal appearance showed an additional fragment chromosome in tapetal and pollen mother cells. A study of chromosome associations at diakinesis and metaphase I revealed one heteromorphic trivalent and 9 bivalents, as the chromosome fragment paired with two others, in 21 (43.8%) of the 48 cells studied. In all the cells at diakinesis, the trivalent was associated with the nucleolus (Fig. 1). In cells in which 10 bivalents and one univalent were formed, since the univalent-fragment was always found attached to the nucleolus at diakinesis (Fig. 2); it is conceivable that the fragment contained the nucleolus organizing region. Types of trivalents observed were chains and frying-pan, both kinds occurring in about equal proportions. Heteromorphic bivalents involving the fragment and one member of the pair of homologous chromosomes were, however, not observed. Average chiasma frequency per cell worked out to 19.61. At metaphase-I, the fragment either showed precocious movement to the poles or was oriented on the plate along with other bivalents. At anaphase-I and telophase-I, it lagged on the spindle in 23.1% of the 52 cells studied. In 33.3% of the 33 cells examined at telophase-I, it was found staying away at one pole from the rest of the group of normal chromosomes (Fig. 3) indicating that it is frequently eliminated from the daughter nuclei. This is evidenced further from the fact that in 62 (66.0%) of the 94 pollen quartets studied it was found as a micronucleus. Pollen fertility and seed set respectively were 72.4% and 48.7% compared to 84.8% and 62.5% in the normal sibs. The plant with the fragment was maintained through vegetative propagation for several years. In the florets of the new suckers also the fragment was present indicating that it is capable of successfully carrying through mitotic

cycles and, therefore, is centric. In 1968, in order to study the frequency of transmission of the fragment to the progenies, two of the suckers of this plant were selfed, three suckers were used as female

The origin of the fragment chromosome, however, is not known.

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FIGS. 1-3. Meiosis in Job's tears with  $2n=20 + 1$  fragment ( $\times 1,000$ ). Fig. 1. Diakinesis: 1 III and 9 II. Fig. 2. Diakinesis: 10 II and 1 I (fragment). Fig. 3. Telophase-I: 10:10 and the fragment at the upper pole.

and another three were used as male in crosses with the normal plants. The progenies were studied cytologically in 1969 and the results are shown in Table I.

TABLE I  
Transmission frequency of the fragment chromosome to the progenies under self-pollination and controlled cross-pollinations in Job's tears

Pollinations	Progeny		
	$2n=20 + 1f$	$2n=20$	Total
1. $2n=20 + 1f$ selfed	2	18	20
2. $2n=20 + 1f \times 2n=20$	2	20	22
3. $2n=20 \times 2n=20 + 1f$	..	24	24

$f$  = fragment.

Although the number of plants examined in each of the progenies of the selfed and controlled crosses was not high, it is quite apparent from the data that the fragment was transmitted through the female gametes in a low proportion of the cases (items 1 and 2, Table I), whereas its transmission via male gametes was not observed (item 3, Table I). Probably the male gametes carrying the fragment were either non-functional or incapable of competing with the normal male gametes in fertilization.

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#### CYTOLOGICAL STUDIES IN *FUIRENA* ROTTB. (CYPERACEAE)

THE earlier cytological information pertaining to the genus *Fuirena* concerns only the chromosome numbers of some Indian species<sup>1-8</sup>. The present contribution deals with the karyotype and meiosis in *F. uncinata* (Willd.) Kunth and *F. trilobites* C. B. Clarke.

*Fuirena uncinata* ( $2n=36$ ).—The length of chromosomes in the somatic complement ranges from  $0.7 \mu\text{m}$  to  $1.8 \mu\text{m}$ . The total length of diploid complement is  $40.3 \mu\text{m}$ . The karyotype consists of 10 pairs of chromosomes with median centromeres and 8 pairs with submedian centromeres, the longest pair of the latter type possesses satellites in the long arms (Figs. 1, 3).

*Fuirena trilobites* ( $2n=38$ ).—The chromosomes in the somatic complement range from  $0.7 \mu\text{m}$  to  $1.7 \mu\text{m}$  in length, the total length being  $40.9 \mu\text{m}$ . There are 17 pairs of chromosomes with median centromeres, and 2 pairs with submedian centromeres.