

## A NEW FRUIT ROT DISEASE OF PAPAYA

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AN undescribed fruit rot of papaya (*Carica papaya* L.) at pre- and post-harvest stage was observed at Gwalior, during February and March, 1980. The isolations from the diseased fruits consistently yielded colonies of *Trichothecium roseum* (Pers.) Link ex Fries.

At pre-harvest stage the diseased area became wrinkled and pink in colour. The fungus was isolated in pure culture by single spore isolation method.

The pathogenicity of the fungus on papaya fruits was confirmed under laboratory as well as in field conditions. The disease appeared within 10 days on all inoculated fruits in both the conditions. The pathogen was found to attack through wounds. The pathogen was re-isolated from artificially infected fruits and found to resemble the original isolate. This fruit rot due to *T. roseum* had not been reported earlier from India.

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## IDENTIFICATION OF SOME TRANSLOCATION LINES IN PEA (*PISUM SATIVUM* L.)

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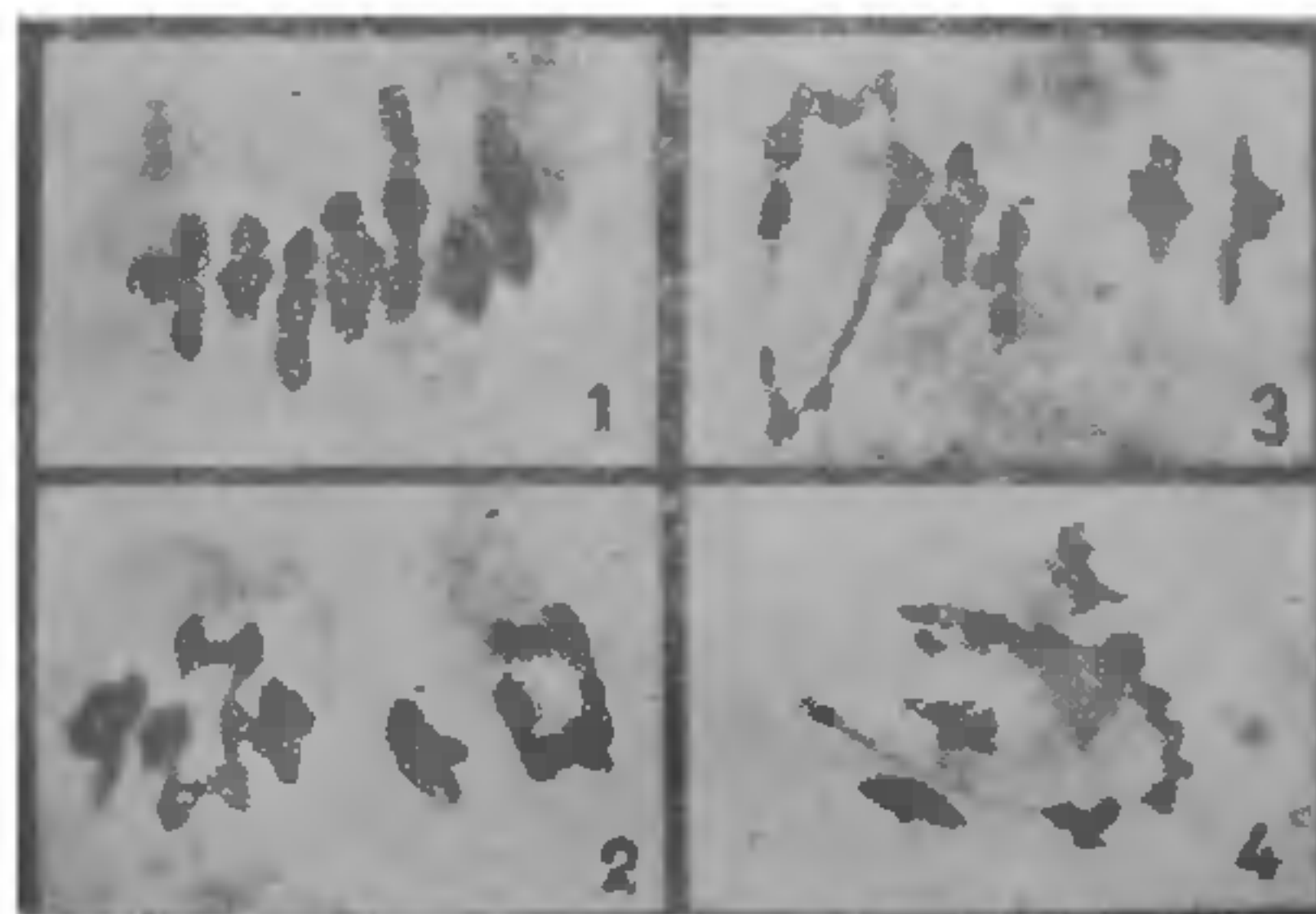
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IN an attempt to consolidate and augment the existing cytogenetic stocks of pea ( $2n = 14$ ) at this laboratory, large number of collections were made to locate translocations and the present report deals with the identification of interchange chromosomes in seven unknown lines. All these seven lines exhibiting translocations: four from Sweden (B-199, B-462, B-1466, B-1467), (Dr. S. Blixt), two from England (JI-152 and JI-147) (Dr. B. Snoad), and one from India (HUP-231-1-10) were crossed with different translocation testers in 1976-77. The twenty-six  $F_1$ 's obtained, along with the parental lines, were raised during 1977-78 in Rabi season at Banaras Hindu University Research Farm. The PMC's from the  $F_1$  plants, fixed in 1:3 (Acetic : Alcohol), were cytologically analysed and the different chromosome configurations at metaphase-I were recorded.

Based on the chromosome configurations at metaphase-I of  $F_1$  hybrids derived from crosses between the seven unknown translocations and the testers, specific chromosomes of the complement involved in translocation were identified. If the  $F_1$  shows  $7_{II}$  at metaphase-I, the two chromosomes involved in an unknown translocation and the tester will be the same as seen in Fig. 1. If the  $F_1$  shows an association of six chromosomes, it suggests that the unknown translocation has one chromosome in common with the tester (Figs. 3, 4). If the chromosomes involved in two translocations are different two quadrivalents will be seen in the  $F_1$  as seen in Fig. 2.

Although large number of translocations in pea have been reported, the study remained confined only to the identification of interchanges and that too in a few lines, most probably due to poor resolution of cytogenetic apparatus<sup>1-7</sup>.

The chromosomes, thus, identified on the basis of above observations in the unknown translocations, namely, B-199, B-462, B-1466, B-1467 and HUP-239-1-10 were 4-7, 1-2, 3-7, 4-5 and 3-7, respectively (Table I). In both the unknown lines JI-152 and JI-147, one of the interchange chromosomes (chromosome 3) was already known (personal communication from Dr. B. Snoad, England). Presence of two quadrivalents in the  $F_1$ 's of crosses of JI-152 with testers,  $T_{1-5}$  and  $T_{2-6}$ , suggested the non-involvement of chromosomes 1, 2, 5, and 6 in the unknown line JI-152 while its cross tester,  $T_{4-6}$ , showed an association of six chromosomes (Table I) indicating that one of the two chromosomes 4 or 6 was involved in the line JI-152. But as the chromosome 6 is already eliminated on the basis of cross JI-152  $\times$  tester,  $T_{2-6}$ , chromosome 4 appears to be involved. Thus, the line JI-152 was found to interchange for chromosomes 3 (already known) and 4.



FIGS. 1-4. Fig. 1.  $7_{II}$ , cross JI-147  $\times$  tester,  $T_{3-5}$ .  
Fig. 2.  $3_{II} + 2O_4$ , cross B-199  $\times$  tester,  $T_{1-5}$ .  
Fig. 3.  $4_{II} + 1O_6$ , cross JI-147  $\times$  tester,  $T_{1-5}$ .  
Fig. 4.  $4_{II} + 1C_6$ , cross B-199  $\times$  tester,  $B_{4-6}$ .

TABLE I  
Chromosome configurations at M-I in  $F_1$  progenies of unknown translations and translocation testers in pea

Culture number of unknown translocations	Chromosome configurations observed at M-I					Interchanged chromosomes
	Translocation testers					
	T <sub>1-5</sub>	T <sub>2-6</sub>	T <sub>3-5</sub>	T <sub>3-7</sub>	T <sub>4-6</sub>	
B-199	2 O <sub>4</sub>	2 O <sub>4</sub>	2 O <sub>4</sub>	1 O <sub>6</sub>	1 C <sub>6</sub>	T <sub>4-7</sub>
B-462	1 O <sub>6</sub>	1 O <sub>6</sub>	2 O <sub>4</sub>	—	2 O <sub>4</sub>	T <sub>1-2</sub>
B-1466	2 O <sub>4</sub>	2 O <sub>4</sub>	1 O <sub>6</sub>	—	2 O <sub>4</sub>	T <sub>3-7</sub>
B-1467	1 O <sub>6</sub>	2 O <sub>4</sub>	1 O <sub>6</sub>	—	1 O <sub>6</sub>	T <sub>4-5</sub>
JJ-152	2 O <sub>4</sub>	2 O <sub>4</sub>	—	—	1 O <sub>6</sub>	T <sub>3-4</sub>
JJ-147	1 O <sub>6</sub>	—	7 <sub>11</sub>	—	2 O <sub>4</sub>	T <sub>3-5</sub>
HUP-239-1-10	2 O <sub>4</sub>	2 O <sub>4</sub>	—	—	2 O <sub>4</sub>	T <sub>3-7</sub>

The crossing between the line JJ-147 and the tester, T<sub>4-6</sub>, showed two quadrivalents indicating that both chromosomes 4 and 6 were not involved in the line JJ-147. The latter, however, was found to interchange for the chromosomes 3 and 5 as the cross with the tester, T<sub>3-5</sub>, showed 7<sub>11</sub> (Table I). The chromosome 5 was further confirmed from the observation of a 1 O<sub>6</sub> configuration at metaphase I (Table I) in the  $F_1$  of cross with the tester, T<sub>1-5</sub>.

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## CYTOLOGY OF TRIPLOID HYBRID OF *AGERATUM*, LINN.

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THE genus *Ageratum* (Asteraceae) is comprised of about 30 herbaceous annual species, native to Tropical

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America<sup>1</sup>. Two species, *A. conyzoides* L. and *A. houstonianum* Mill., occur in India, the former being a weed found all over the country and the latter grown as a winter ornamental. During cytological analysis of these species, a natural triploid was located. This is the first report of triploidy in the genus, the meiotic behaviour of which is described.

Conventional techniques were adopted for fixing, staining and for the study of meiosis. Fifty PMCs analysed at metaphase I showed the presence of trivalents, bivalents and univalents (Fig. 1). The average number of associations and the range of distribution of trivalents, bivalents and univalents are 8.2 (6-10), 1.84 (0-5), and 1.72 (0-4) respectively. Out of 50 PMCs, 11.5% had a maximum of 10 trivalents (Fig. 2). The average chiasma frequency per cell was 21.7. Anaphase I segregation was highly irregular with unequal distribution of chromosomes, precocious separation of univalents, occurrence of laggards, etc. (Fig. 3). Subsequent stages of meiosis also showed irregularities leading to the formation of aneuploid gametes. Pollen stainability was 38.7% and there was 50% seed setting. The seed viability was found to be 40%.

The present triploid appears to be a natural hybrid between *A. houstonianum* and *A. conyzoides* which have been found to be tetraploid ( $2n = 40$ ) and diploid ( $2n = 20$ ) respectively (authors' unpublished data). The two species can be morphologically distinguished only on the basis of heart-shaped leaves and viscidly hairy lance-linear involucreal scales in *A. houstonianum*, while oblong leaves and acuminate, sparingly hairy involucreal scales in *A. conyzoides*<sup>1</sup>. The triploid form showed intermediate morphology with respect to leaf shape but profuse branching and flowering are characteristics of *A. houstonianum*. The high frequency of trivalents (6-10) found in the interspecific triploid