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MULTIPLE INTERCHANGE TRISOMY IN PEA

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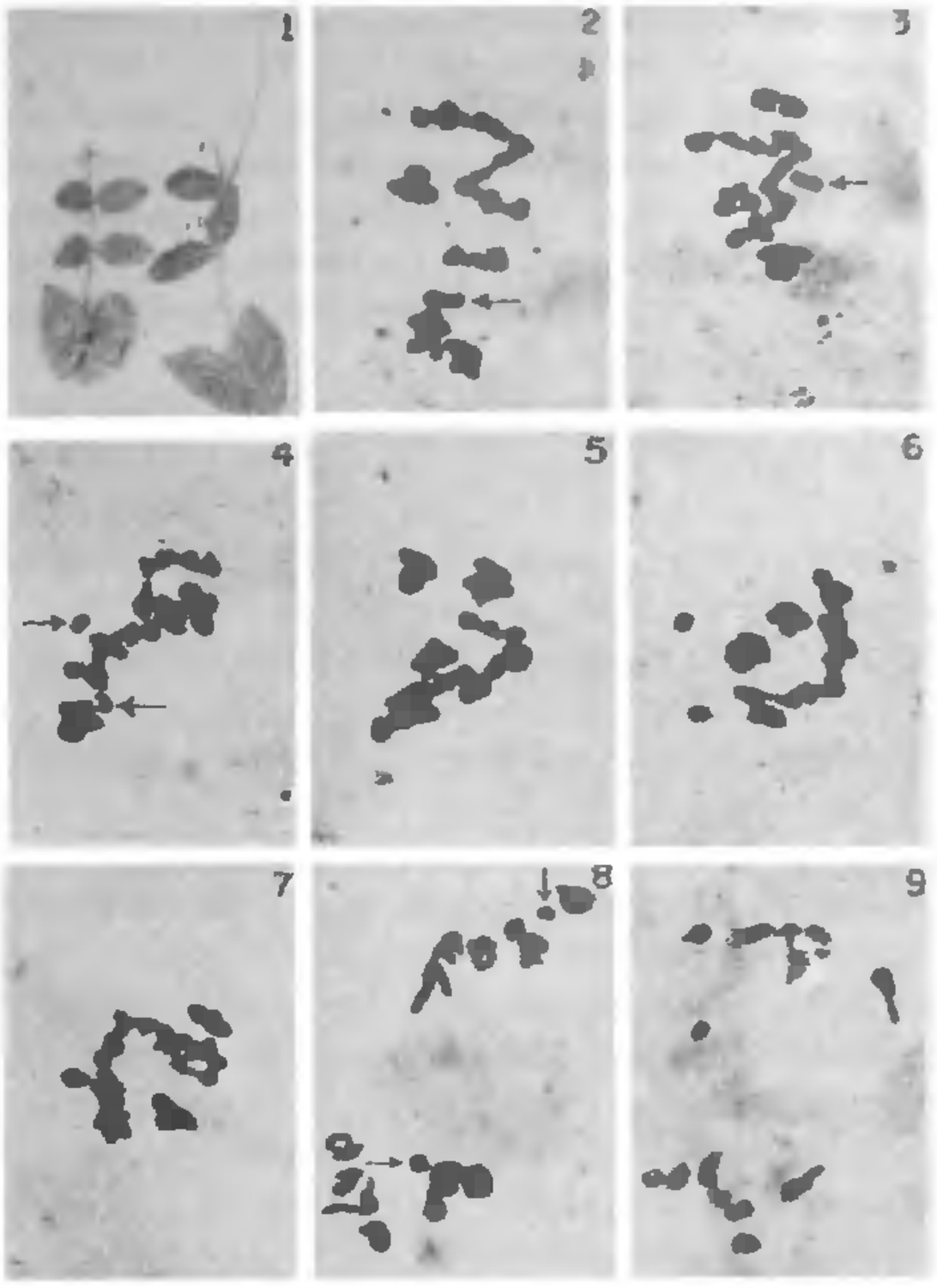
INTERCHANGES, particularly those involving highly unequal exchanges, are of great significance from evolutionary points of view. Multiple interchange trisomy involving highly unequal exchange, as described here, appears to be the first report in pea.

Two off-type plants were isolated in the M_3 generation of the selfed progeny of a highly sterile (80.0%) plant, which was induced through gamma-irradiation (10 Krad) of the F_1 seeds from a cross between T163 (indigenous) and 5806-S (a selection from 5806–*chlorina* mutant–Dr S. Blixt, Sweden). Both these plants were cytomorphologically alike and differed from the sister euploid in being vigorous with succulent stem having slightly reduced internode and leaf length (figure 1) and delayed flowering by 14 days. At MI, chromosome configuration involving 5 to 11 choromosomes were noted (figures 2–7). Mutants showed $4II + 1II' + 1C_5$ (20.0%), $3II + 1II' + 1C_7$ (25.0%), $3II + 1C_9$ (25.0%), $2II + 1II' + 1C_9$ (15.0%) and $2II + 1C_{11}$ (15.0%) chromosome configurations (II' stands for small bivalent). Mutants had one small bivalent (figures 2 & 3), which showed precocious chromosome separation at MI (figures 4 & 6). Normal disjunction of small bivalent at AI (figure 8) was noticed only in 15.0% cells, rest of the cells showed lagging of small chromosomes (figure 9). Chromosome count at AI indicated the presence of 15 chromosomes per cell. The trisomic condition was confirmed because of the presence of an extra chromosome over the normal complement ($2n = 14$). This extra chromosome was also involved in the multiple interchange and no separate trivalent was noted indicating the interchange nature of the extra chromosome. Pollen grains were of variable sizes (presence of micropollen grains) and had about 30% fertility. Only 2–6 seeds per plant were obtained.

Both the mutants appeared to have multiple interchange, as evident from the configurations involving 5 to 11 chromosomes at MI. Complex interchanges involving all the chromosomes of the complement



Figures 1–9. 1. Leaf (L334-4); mutant (left) and control (right) of pea. **2–9.** Meiotic stages in mutants L334-4,5. **2.** Metaphase I, 1 chain of 5 + 4II + 1II, small (arrowed). **3.** Metaphase I, 1 chain of 7 + 3II + 1II, small (arrowed). **4.** Metaphase I, 1 chain of 7 + 3II + 2, small chromosome (arrowed). **5.** Metaphase I, 1 chain of 9 + 3II. **6.** Metaphase I, 1 chain of 9 + 2II + 2, small chromosomes (arrowed). **7.** Metaphase I, 1 chain of 11 and 2II. **8.** Anaphase I, normal movement of small chromosomes (arrowed). **9.** Anaphase I, lagging of one small chromosome.

were reported in pearl millet[1-3], barley[4], *Triticum monococcum*[5] and also in pea[6].

The small size of chromosomes in the mutant was probably due to highly unequal exchange of segments. Moreover, bivalent with larger chromosomes (interchanged), the counterpart of the smaller ones, was not observed at MI as they were most likely involved with multiple interchange.

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PHOSPHOHEXOSE ISOMERASE AND ALDOLASE ACTIVITIES OF SERUM AND MUSCLE TISSUE IN *TRICHINELLA*-INFECTED ALBINO RATS AT DIFFERENT PERIODS OF POSTINFECTION

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TRICHINOSIS has been recognised as one of the important meat-borne helminthic zoonoses. A tentatively calculated 27 million cases of trichinosis in the world presents a serious challenge to meat hygienists and epidemiologists and parasitologists[1]. The present authors, while studying the effects of different chemotherapeutic agents in trichinella-infected rats[2], noted a mild to moderate alteration in the levels of some glycolytic enzymes of host tissues. This finding prompted us to study two key glycolytic enzymes, namely phosphohexose isomerase (PHI) and fructose 1,6-diphosphate aldolase (aldolase) in the serum and muscle tissue of host animals at different periods of this parasitic infection.

Forty eight male albino rats (inbred in our laboratory) weighing between 50 and 60 g were divided into two groups of 24 each, as control or non-infected (C) and infected (T). Animals of T group were infected with *Trichinella spiralis* larvae following the procedure

Table 1 *PHI and aldolase activities of serum and muscle tissue of trichinella-infected albino rats at different periods of postinfection.*

	PHI activities				Aldolase activities			
	Control (C)		Infected (T)		Control (C)		Infected (T)	
Days of postinfection	Serum (unit/ml)	Muscle (unit/mg protein)	Serum (unit/ml)	Muscle (unit/mg protein)	Serum (unit/ml)	Muscle (unit/mg protein)	Serum (unit/ml)	Muscle (unit/mg protein)
2	5.6 ± 0.4	3.5 ± 0.2	6.1 ± 0.7	4 0 ± 0.4	3.8 ± 0 2	6.2 ± 0.3	5 1 ± 0.4	6.5 ± 0 8
5	4 9 ± 0.4	3.9 ± 0.4	5.9 ± 0.8	5.1 ± 0.5	3.9 ± 0.2	6.2 ± 0.4	4.2 ± 0 3	7.6 ± 0.7
13	6.2 ± 0.8	3.5 ± 0.5	10.2 ± 0.9[a]	6.5 ± 0 4[b]	4.6 ± 0 3	5 4 ± 0 3	6 2 ± 0.2[a]	9.5 ± 0 4[d]
21	7.2 ± 0.4	4.1 ± 0.4	15.5 ± 1.2[b]	7.2 ± 0.4[b]	4.3 ± 0.3	6.1 ± 0.3	9.3 ± 0.7[b]	12 2 ± 0.6[d]
28	5.9 ± 0.7	3.5 ± 0.4	16.8 ± 1.0[d]	10.1 ± 0.5[d]	3.1 ± 0.4	6.5 ± 0.3	11.2 ± 1 0[d]	18 3 ± 1 2[d]
35	8.1 ± 0.3	3.7 ± 0.4	17.9 ± 1.2[d]	12.0 ± 0.9[d]	4 4 ± 0.2	5.9 ± 0.3	12 1 ± 0.8[d]	19 5 ± 1.4[d]
50	6.6 ± 0.4	3.9 ± 0.4	18.4 ± 1.3[d]	13.5 ± 1.2[d]	4.2 ± 0.3	5 2 ± 0.4	12 8 ± 1 2[d]	20.7 ± 1 2[d]
60	5.8 ± 0.4	4.0 ± 0.4	18.6 ± 1.5[d]	15.1 ± 1.1[d]	3.9 ± 0.3	6.3 ± 0.3	13 4 ± 1.0[d]	20.8 ± 1.3[d]

Values are mean ± S E. of three values. Values are significantly different from those for the corresponding controls (student's 't' test): [a] $P < 0.05$; [b] $P < 0.01$; [d] $P < 0.001$.