Mather, Wharton B. University of Queensland, Australia. Chromosomal polymorphism in D. rubida from Awala, New Guinea.

A sample of D. rubida from Awala in the Northern District of New Guinea was taken in September 1967. The flies were collected from heaps of fermenting banana placed in rain forest. The flies were cytologically analyzed by mating males to a standard inversion free laboratory strain and despermed females to males of the standard strain. In each case the giant chromosomes from seven larvae were scored (Mather 1961). The inversions recorded have been previously described: II LA, II RA, B and III D (Mather 1961) and II Rh, I (Mather 1966). The most notable feature of the collection is the very high frequency of II RH.

This inversion has been previously recorded from Bulolo in New Guinea but in much lower frequency (Mather 1967).

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References: Mather, W. B. 1961, Chromosomal polymorphism in Drosophila rubida, Mather Genetics, 46:799; Mather, W. B. 1966, New inversions in D. rubida, D.I.S., 41:125; Mather, W. B. 1967, Inter-yearly fluctuation of D. rubida inversion polymorphism, D.I.S., 42:85.

Chromosome		♂ %	♀ %
II	LA	5	6
	RA	7	4
	B	5	2
	RH	95	97
	I	5	4
III	D	2	6
Flies scored		89	50

Sharma, R. P. and M. S. Swaminathan. Indian Agricultural Research Institute, New Delhi, India. Effect of fluorodeoxyuridine alone and in combination with radiation on crossing-over in Drosophila melanogaster females.

Many chemicals, which inhibit DNA synthesis, have been shown to influence both meiotic (Davies & Lawrence, 1967) and mitotic (Holliday, 1961) crossing-over. The present report deals with the effect of 5-fluorodeoxyuridine (5-FudR), a potent inhibitor of DNA synthesis (Hartmann and Heidelberger, 1961) on meiotic crossing-over. One-day old females heterozygous for four second chromosome genes (dp b cn bw / + + + +), were injected with FudR (100µg/ml, prepared in saline). A group of treated females was later irradiated with 3Kr of gamma rays. Another group of virgin females, injected with saline only, was given 3Kr of gamma rays to serve as a check for combination treatment. All treated flies were allowed to recover for 12 hours. The surviving ones were crossed individually with three homozygous dp b cn bw / dp b cn bw males. Each female was allowed to lay eggs for six days in one tube and later transferred to another tube. Three broods in all were sampled. The recombination frequencies obtained in different regions in different broods are given in Table 1. The data show that FudR reduced the cross-over frequency in regions I and II of the first brood but had no effect on crossing-over in any other regions of the other broods. FudR treatment when followed by irradiation showed both a reduction (first brood - region I and II, second brood - region I) and an increase (first brood - region III, second and third brood - region II) over control but was not significantly different from the cross-overs produced by radiation alone. However, the mortality was more in the case of the combination treatment.

The possible interpretation for the non-recombinogenic property of FudR can be that the chromosome breaks produced by this chemical lack rejoining capacity (Taylor et al., 1962). Lack of rejoining will interfere with the formation of exchanges, responsible for increased crossing-over. The data presented in this study and that obtained with different alkylating agents and radiation (unpublished) suggest that any substance which induces chromosome breaks capable of rejoining, can enhance the recombination frequency. Conversely, radio-sensitizing chemicals which induce more breaks but few or no exchanges (Kihlman, 1962) cannot increase the recombination frequency even when given in conjunction with radiation.