Varma, M.B. and M. Sanjeeva Rao. Osmania University, Hyderabad, India. Studies on the genetic effects induced in Drosophila melanogaster cultured on irradiated glucose medium.

The treatment of food with ionizing radiation is known to be an effective means of prolonging the storage life of food. This fact led to the extreme view of the possibility that irradiated food may be mutagenic and thus hazardous to animals including human beings. Stone, Wyss and Hass (1947) studied the effect of UV rays on irradiated medium in Staphylococcus aureus and reported an increase in mutation frequency. Henderson et al. (1957) cultured Drosophila melanogaster on food made from a yeast-water suspension irradiated with 10^6 gamma radiation and found no significant differences. Swaminathan et al. (1963) found an increase in dominant lethality as well as an increase in frequency of visible mutations in Drosophila melanogaster cultured on food given 150 kr of X rays. Prakash (1965, 1967) reported a high incidence of sex-linked recessive lethals in Drosophila following the addition of DNA irradiated with 100 kr of X rays to media. Rinehart and Ratty (1965, 1967) also reported an increase in sex-linked recessive lethal frequency in D. melanogaster cultured on food given 150 kr, 500 kr, and 3,000 kr of X rays or gamma rays. Reddy et al. (1965) cultured D. melanogaster on a food medium irradiated with 150 kr and 300 kr from a gamma source and observed no induction of mutation. Chopra (1965) tested Drosophila for the production of mutation by feeding the larvae on irradiated medium or irradiated DNA. The experiments did not provide any evidence for a mutagenic effect.

Since the results reported above on irradiation of media are conflicting, experiments were undertaken to assess the effect of irradiated glucose. The present investigation reports the work done on feeding Drosophila on medium containing irradiated glucose and also to assess the damage, if any, of feeding on the same medium for 4 generations.

Glucose was irradiated with a dose of 200 kr of X rays delivered at an exposure of approximately 4000 r per minute. The Oregon strain was allowed to feed on a normal medium containing 50 gms of irradiated glucose dissolved in 100cc of medium. Half of the males developed on this medium were crossed to y sc^{S1} In49 sc^{8};bw st virgin females to screen the incidence of sex-linked recessive lethals and translocations. A brood pattern of three day intervals was used and 6 broods were studied. Each male was allowed to mate with three virgin

Table 1. Comparison of frequencies of sex-linked recessive lethals in a control (1) and induced in four generations (2, 3, 4 and 5) of Drosophila cultured on medium containing 50% irradiated glucose.

	BROOD PATTERN																	
SL	A			B			C			D			E			F			TOTAL		
No	T	l	%	T	l	%	T	l	%	T	l	%	T	l	%	T	l	%	T	l	%
1	861	2	0.23	827	4	0.48	874	2	0.23	89[illegible]	4	0.45	764	0	-	783	2	0.25	5005	14	0.27
2	777	6	0.77	758	5	0.66	620	3	0.48	478	4	0.83	595	3	0.50	435	7	1.60	3663	28	0.77
3	810	7	0.87	452	5	1.10	811	6	0.98	572	5	0.87	438	3	0.68	187	2	1.07	3070	28	0.90
4	902	9	0.99	547	5	0.91	428	4	0.93	390	4	1.02	311	3	0.80	285	3	1.05	2923	28	0.96
5	673	7	1.04	555	5	0.90	439	4	0.91	180	2	1.1	-	-	-	-	-	-	1847	18	0.97

T = Total number of X-chromosomes scored l = lethals recorded

Table 2. Comparison of frequencies of translocations in a control (1) and induced in four generations (2, 3, 4 and 5) of Drosophila cultured on a medium containing 50% irradiated glucose.

	BROOD PATTERN																	
SL	A			B			C			D			E			F			TOTAL		
No	T	t	%	T	t	%	T	t	%	T	t	%	T	t	%	T	t	%	T	t	%
1	849	0	-	846	-	-	832	0	-	862	0	-	737	0	-	731	0	-	4902	0	-
2	546	1	0.18	575	0	-	613	1	0.16	425	0	-	290	1	0.34	200	0	-	2469	3	0.12
3	762	1	0.13	217	2	0.92	383	1	0.26	418	1	0.23	259	1	0.38	172	1	0.58	2211	7	0.31
4	694	2	0.28	310	1	0.32	320	1	0.31	380	2	0.53	282	1	0.35	270	2	0.73	2256	9	0.39
5	333	2	0.62	235	1	0.42	371	3	0.80	200	0	-	-	-	-	-	-	-	1139	6	0.53

T = Total number of F_1 sons tested t = Translocations recorded

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Gupta, J.P. Banaras Hindu University, Varanasi, India. A preliminary report on Drosophilids of Manipur, India.

During recent years a considerable amount of attention has been paid in this country to the field observation of Drosophila, especially in connection with the taxonomy, ecology and geographical distribution. As a result of this several new and newly recorded species have been added to the list of Indian Drosophilids. Still now a vast area of great ecological interest remains virgin or very poorly exploited.

Recently collections were made twice, once in the month of October and once in February 1972 at Khongnangpheidekpi (Manipur) and its adjoining vicinity by using various fermenting fruits as bait. A total of 527 specimens were collected; they comprised ten species belonging to the three subgenera of the genus Drosophila, viz., Sophophora, Drosophila and Dorsilopha.

Drosophila species collected at Khongnangpheidekpi (Manipur, India)

Species	Subgenus	Number
1. D. immigrans	Drosophila	207
2. D. nasuta	"	165
3. D. takahashii	Sophophora	15
4. D. eugracilis	"	42
5. D. malerkotliana	"	27
6. D. bipectinata	"	32
7. D. melanogaster	"	5
8. D. kikkawai	"	7
9 D. nepalensis	"	8
10. D. busckii	Dorsilopha	19
TOTAL		527

Among the species lured to fermenting fruits, D. immigrans and D. nasuta were seen in large numbers. Another interesting feature noticed during these collections was that D. nasuta and D. eugracilis were only seen in October whereas D. immigrans and D. nepalensis in February only. This very clearly indicates that the natural populations of these four species observe seasonal activity.

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Table 3. X^2 values for the differences of sex-linked recessive lethals in controls compared with different broods of 4 generations.

Sl No	Generation	BROODS A	B	C	D	E	F	TOTAL
1	control vs F_1	2.15	0.68	0.14	0.27	1.72	5.26	11.96
2	control vs F_2	2.04	2.58	2.53	0.45	1.66	0.81	16.00
3	control vs F_3	3.02	1.75	1.70	0.67	1.64	1.36	17.46
4	control vs F_4	2.95	1.70	1.68	0.19	-	-	10.72

females. F_1 females were mated individually with y sc^{S1} In49 sc^8 males while the F_1 males were mated individually with bw;st females to score for sex-linked recessive lethals and translocations, respectively.

The other half of the males were allowed to feed again on a medium containing 50 gms of irradiated glucose in 100 cc of medium along with fresh females of ORK. The experiment was repeated in the above manner for four generations. The results are presented in Table 1 and 2.

A X^2 test has been done to compare the following groups: 1) Control vs F_1, 2) Control vs F_2, 3) Control vs F_3, and 4) Control vs F_4. The results of the statistical analyses are presented in Table 3.

The present investigation revealed that irradiated glucose when mixed in medium could induce mutations in Drosophila melanogaster.