Vidyodaya: J. Arts, Sci., Lett., Vol. 3 *No.* 1, *pp.* 82–84 *January* 1970.

RESEARCH NOTE

Inability to induce crossing over in Drosophila males with ovarian extract

by

WINSTON E. RATNAYAKE
Department of Biological Sciences, Vidyodaya University of Ceylon

Introduction

Crossing over is almost totally suppressed in the males of *Drosophila melanogaster* while it is normal in the females. Suppression of crossing over in the heterogametic sex of certain other organisms is also known. Reddi et al. (1965) in India have reported that extracts of ovaries can induce crossing over in Drosophila males implying that absence of crossing over in the male is presumably due to the lack of certain enzymes in the testes of these flies; enzymes which are thought to be required for mediating crossing over.

Considering the importance of such a finding similar experiments were started in other countries. Singer et al. (1967) in Canada and America on repeating the experiments under similar conditions obtained negative results. The present work was carried out in the Institute of Animal Genetics, University of Edinburgh, at about the same time that the experiments of Singer et al. were being done. Nagative results were also obtained, thus corroborating the observations of Singer et al.

Experimental Techniques

Ovaries of 300 Or K (Oregon K, a wild type stock of *D. melanogaster*) females were dissected out and masserated in 1.0 ml of 0.7% NaCl in a homogenizer. The masserated material was spun down twice in a centrifuge at 3000 r.p.m. for 20 minutes each. Approximately 0.3–0.5 ml of the supernatant was injected into the region of the testes on the dorsal side of the abdomen of males heterozygous for the second chromosome markers *dp b cn bw* (dumpy wings, black body, cinnabar and brown eyes). The markers were in coupling. A micropipette prepared in the laboratory as described by Clark (1963) was used for injecting the flies.

An extract prepared from the testes of 300 males, obtained in a similar manner to that from ovaries, was injected into males heterozygous for the same markers as described above. These flies were used as a control. In the experiments of other workers males injected with 0.7% NaCl were used as a control.

The injected 1-day old males, held for another day after the injection, were mated singly to 3, 1-day old homozygous *dp b cn bw* virgin females. Four 3-day broods were obtained. Crossovers were scored in the F_1 of the last three broods. Right through the experiment the temperature was maintained at 25 $\pm$ 1 °C.

Results and Conclusions

The results of the experiment were as follows:

Broods	Treatment			
	Ovarian Extract		Testes Extract (Control)	
	No. of Chromosomes tested	No. of Crossovers	No. of Chromosomes tested	No. of Crossovers
B (4-7 days)	12,106	0	11,689	0
C (8-11 days	10,031	3*	12,592	0
D (12-15 days)	9,396	0	—	—
Totals	31,533	3*	24,281	0

* cluster from one male: all *cn bw*.

Out of a total of 31,533 chromosomes which were tested in Broods B, C and D of the ovarian-extract treated males only 3 crossovers were obtained, and even these belonged to a single cluster from one treated male. This crossover could have been of spontaneous origin. There were no crossovers in 24,281 chromosomes in broods B and C of the control (testes extract injected) males. It does not appear possible that ovarian extract could induce crossing over in the male.

The results do not confirm the findings of Reddi et al. (1965). They agree with the observations of Singer et al. (1967) whose experiments were on a much larger scale. The reason why there is suppression of crossing over in the heterogametic sex still remains unexplained.

Acknowledgements

I wish to thank Professor C. Auerbach F. R. S. for her help and Professor C. H. Waddington F. R. S. for providing laboratory facilities. I am also grateful to the Association of Commonwealth Universities for a scholarship (1964—1967) during which period this work was carried out.

References

1. Clark, A. M. (1963). The brood pattern of sensitivity of the *Drosophila* testis to the mutagenic action of heliotrine. Z. Vererbung Lehre, *94*, 115–120.

2. Reddi, O. S., G. M. Reddy & M. S. Rao. (1965). Induction of crossing over in Drosophila males by means of ovarian extract. Nature, *208*, 203.

3. Singer, K. M., A. Chovnick, D. T. Suzuki, D. Baillie & D. Hoar. (1967). Attempts to induce crossing over in Drosophila males with ovarian extracts. Nature, *214*, 503.

සිංහල සාරාංශය.

ඩිම්බකෝෂ යුෂ පාවිච්චි කර පිරිමි ඩ්‍රොසොෆිලාගේ අවතරණය සිදු කිරීම නිෂ්ප්‍රභ වීම

ඩ්‍රොසොෆිලා ගැහැණු සතාගේ අවතරණ සාමාන්‍ය අයුරින් සිදුවුවත් පිරිමි සතාගේ අවතරණය කලාතුරකින් මිස සිදු නොවේ. ගැහැණු සතාගේ ඩිම්බකොෂයේ සෛලවල අවතරණ සිදු වන්නේ එන්සයිම මගින් බවත්, එම එන්සයිම වෘෂණයේ නැතැයි යන මතයක් රෙඩ්ඩි සහ තවත් අය (1965) දී පර්යේෂණ මගින් නිගමනය කර ඇත.

සිංගර් සහ තවත් අය (1967) දී එම පර්යේෂණ නැවත වරක් කිරීමෙන් පසු එහි සත්‍යතාවක් නැතැයි පැවසූහ. එවැනි පර්යේෂණයක් මා විසින් එඩිම්බරෝ විශ්ව විද්‍යාලයේ, සත්ව ප්‍රවේණි විද්‍යා ආයතනයේදී කළ විට සිංගර් සහ අනිකුත් අය පෙන්නුම් කළ අයුරුම ප්‍රතිඵල ලැබුණි. මෙම පත්‍රිකාව පිළියෙල කරන ලද්දේ එම පර්යේෂණයේ ප්‍රතිඵල පළ කිරීම සඳහාය.