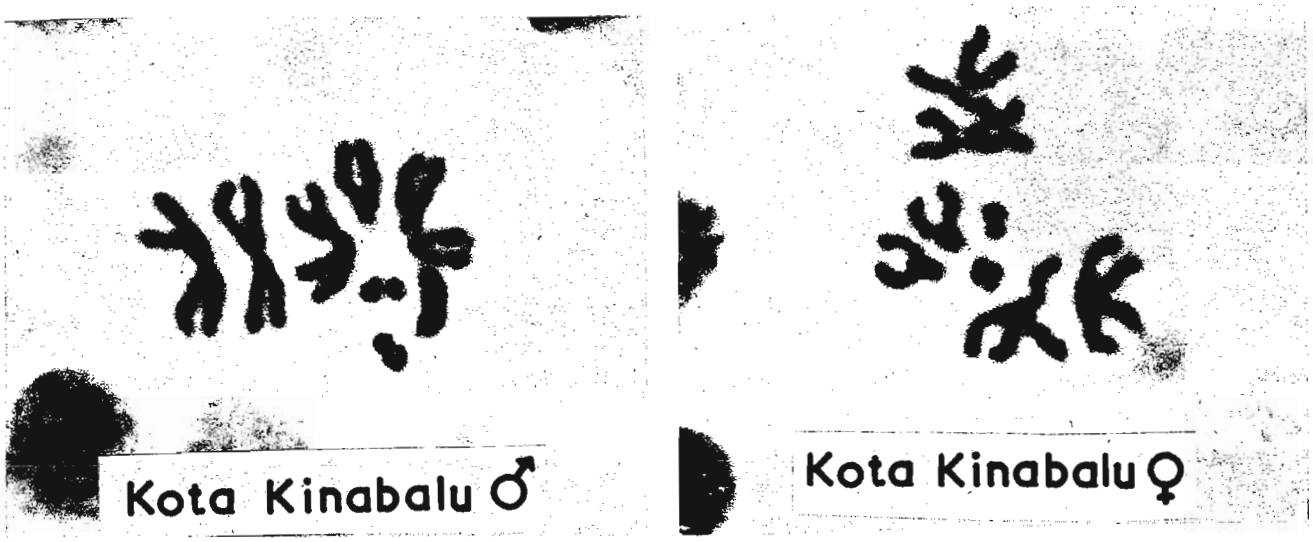
Baimai, Visut. University of Queensland, Australia. Karyotype variation in D. montium.

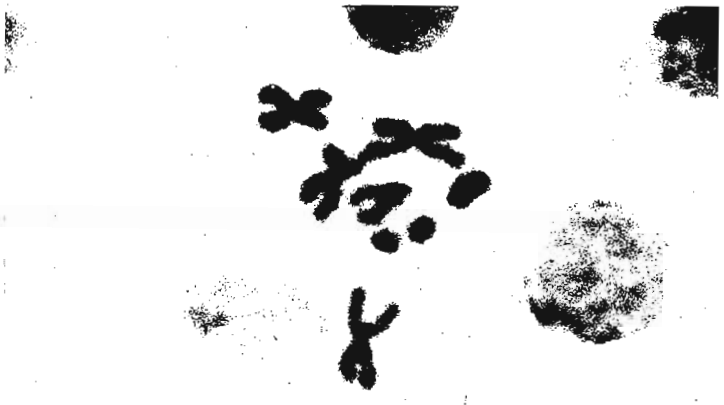
Kikkawa (1936) described two races of D. montium from localities in Japan, which differ in the morphology of one chromosome. Ward (1949) showed a third karyotype in the strain from China. Thus three categories, designated as type 1, 2, and 3, are recognized (Patterson and Stone 1952). Recently Drosophila collections from Madang, New Guinea and Sabah, Malaysia (Mather 1968) revealed an interesting karyotype variation in D. montium (designated serrata type I in Mather 1968 and unpublished Mather 1967). Type 3 has been verified in strains from Sandakan and Tawau (on the North East and South Coast of Sabah respectively). Strains from Kota Kinabalu (Jesselton) (North West Sabah) and Madang were found to differ from type I and 2 in the 4th chromosome. These two strains also have four pairs of chromosomes, but the rod-shaped 4th chromosome has been transformed into a small V-shape while the other chromosomes are similar to the corresponding ones of chromosome type I and 2. The Y chromosomes of the Madang and Kota Kinabalu strains have been identified as a rod-shaped and a V-shaped chromosome respectively. Further, comparative study of the F_1 hybrids shows that the V-shaped 4th chromosome of the Kota Kinabalu strain is considerably smaller than that of the Madang strain, which in turn is smaller than that of the Sandakan and Tawau strains.

Hence, these two strains from Kota Kinabalu and Madang could indicate new karyotypes within the species D. montium. If this is the case, the total number of karyotype variations in D. montium could be increased to five types, which is the most variable karyotype known in the genus Drosophila. However, the possibility of misinterpretation of the metaphase chromosome configuration should not be ruled out. The V-shaped 4th chromosome could have been misinterpreted as rod-shaped by Ward, as it has been occasionally observed by the author even using the more advanced colchicine treatment (Lewis and Riles 1960). However, this is not certain, as there is no photographic evidence of Ward's result available for comparison. At this stage it is quite obvious that there are at least four chromosome types in D. montium.

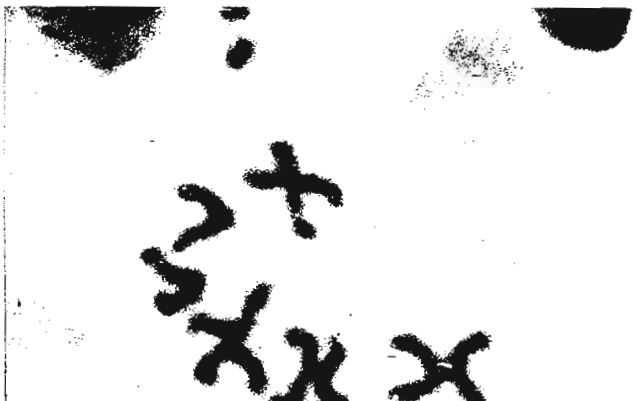
Furthermore, crosses between Madang and Kota Kinabalu, Madang and Sandakan, Madang and Tawau, and Sandakan and Tawau strains have yielded fertile hybrids. Interestingly enough, crosses between Kota Kinabalu and Sandakan and Kota Kinabalu and Tawau strains are cross-sterile. Thus the Kota Kinabalu strain is completely reproductively isolated from Sandakan and Tawau strains.

References; Kikkawa, H. 1936, Two races of Drosophila montium (a preliminary note) Jap. Jour. Genet., 12:137-142; Lewis, E. B. and L. S. Riles, 1960, A new method of preparing larval ganglion chromosomes, D.I.S. 34:118-119; Mather, W. B. 1968, The genus Drosophila in New Guinea and Sabah. Pap. Dept. Zool. Univ. Q'ld. 3(4):47-50; Patterson, J. T. and W. S. Stone, 1952, Evolution in the Genus Drosophila. New York: The MacMillan Co. Ltd.; Ward, C. L., 1949, Karyotype variation in Drosophila. Univ. Tex. Publ., 4920:70-79.



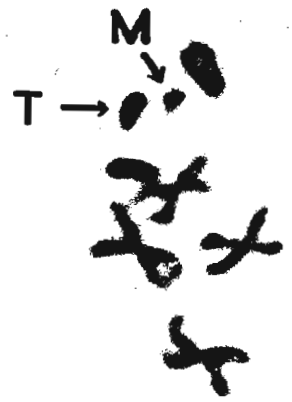


Madang ♂



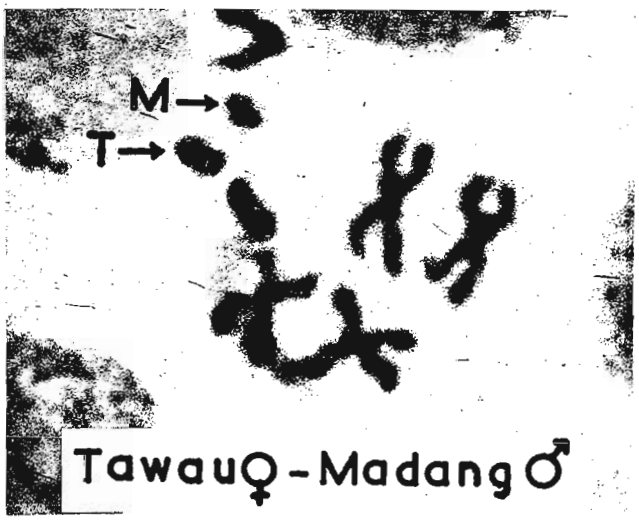
Madang ♀

Kota Kinabalu ♀ – Madang ♂

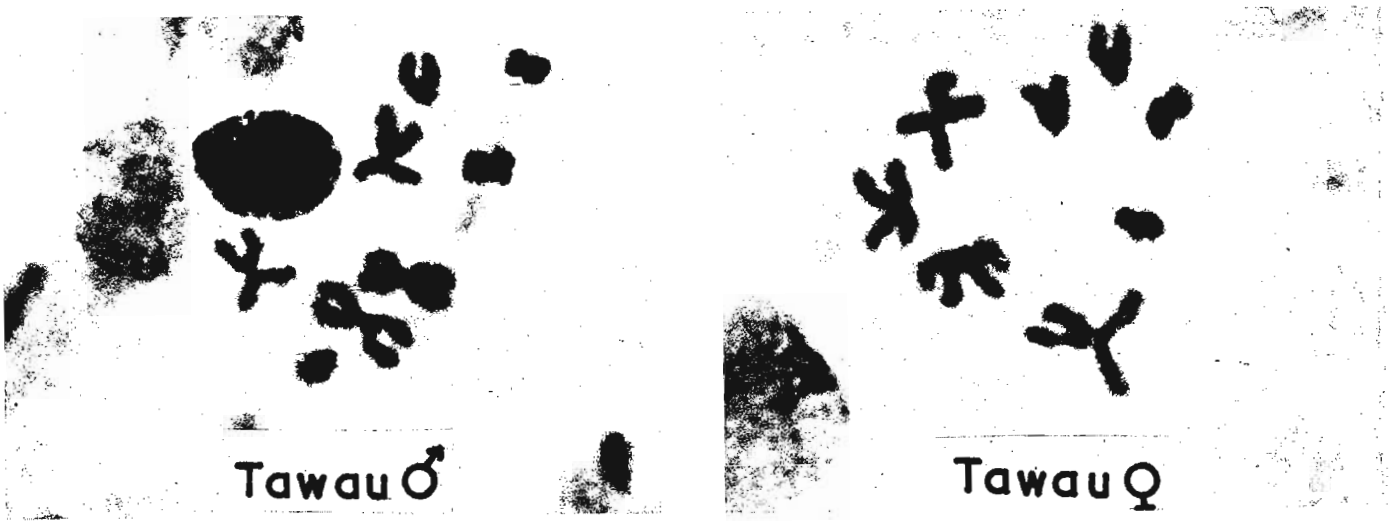


Madang ♀ – Tawau ♂

Madang ♀ – Kota Kinabalu ♂



Tawau ♀ – Madang ♂



Miloš, Ondřej.

Is crossing over in Drosophila males induced by heat?

Temperature affects very efficiently the frequency of crossing over in Drosophila melanogaster females. When considering the mechanism of crossing over in Drosophila melanogaster males, it is of primary importance to know whether crossing over in males can also be induced by heat treatment. Positive results were recorded in the older literature (Shull, Whittinghill 1934, Science 80: 103; Plough 1935, DIS 3: 50). Both the authors tested crossing over in the third chromosome. We replicated their experiments with second chromosome markers. In our experiments maternal stock was dp b cn bw and paternal one Oregon K.

Plough exposed 5-day-old larvae to 36.5°C for 16 hours. We repeated this treatment but obtained only negative results. Shull and Whittinghill submitted 0-6-day-old larvae to the action of temperature of 33-35°C for 1-8 days. When repeating their experiment we treated 6-day-old larvae by exposing them to the temperature of 32°C for four days. This kind of treatment again did not show any positive effect on the frequency of crossovers. All our experiments were sampled by ten 48-hour broods, starting from the second day after hatching. As there were no apparent differences between individual broods, only summarized results are given in the table.

The discrepancy between our results and summarized data can be explained in several ways:
1) Crossing over in D. melanogaster males can be induced by heat only in the third chromosome.
2) It can be induced only in some genome or plasmone backgrounds.
3) It can be induced by interaction of heat treatment with some food constituents - through the stress produced by heat.

The papers quoted above, however, do not give sufficient quantitative data to evaluate the statistical significance of results. It seems therefore that the possibility of induction of crossovers in Drosophila melanogaster males is rather doubtful unless it is proved by experiments which can be replicated.

Table

Treatment	n	crossovers	percentage
Control	57 993	12	0.021
36.5°C, 18 hrs	21 059	3	0.014
32°C, 4 days	13 457	3	0.022
Total	92 509	18	0.019

Kang, Y. S., C. C. Lee and K. W. Moon. Seoul National University, Seoul, Korea.
On the fecundity and fertility of D. melanogaster irradiated at third instar larval stage.

It has been reported that the effect of X-irradiation on the mutation rates differs depending on the different stages of germ cells. Paying attention to this point, we investigated the fecundity and fertility of D. melanogaster irradiated at third instar larval stage. Using the Seoul strain collected and established in 1954, male and female third instar larvae were irradiated with 1500 r of X-rays. The crossings were performed with the flies of 4-5 hour-old in four groups; (1) control-group A (2) irradiated female x normal male-group B (3) normal female x irradiated male-group C (4) irradiated female x irradiated male-group D.

F_1 flies whose parents were irradiated at third instar larval stage were treated at the same stage with the same dose. Also the crossings were made as described above. The results were shown briefly in Table 1. It was fully demonstrated that 1500 r of X-rays reduced fecundity, but there were no significant differences among the irradiated mating groups of parents. Observations on the rate of emergence, however, indicated that remarkable differences occurred among the X-irradiated mating groups of F_1 flies.

It is interesting to note that recovery from radiation damage in parent flies was not observed, but a certain tendency of repair processes in F_1 flies was apparent.

Table 1. The mean number of eggs laid, adults emerged and percentages of eggs to become adult per female for 30 days.

Generation	Parent (Treated)				F_1			F_1 (Treated)		
Group	A	B	C	D	B	C	D	B	C	D
Egg	951.49	192.12	187.00	190.60	347.34	404.96	314.16	195.08	191.98	202.77
Adult	741.97	116.86	93.70	84.07	207.64	191.94	153.30	86.28	74.82	78.92
Per cent	78.77	60.82	50.11	44.01	64.87	47.39	47.80	44.23	40.80	38.92

Chaudhuri, Anjana Rai. Department of Zoology, University of Calcutta, 35, Ballygunge Circular Road, Calcutta 19, India.
Lipo-protein nature of the so-called vacuole in salivary gland cells of the mutant "fat" in Drosophila melanogaster.

Slizynski (1964) reported the presence of a vacuole-like body in salivary gland cells of the mutant "fat abdomen" (ft, 2: 12.0) in Drosophila melanogaster. Appearance of this vacuole-like body is accompanied by an initiation and increase of puffing activity in various regions of the salivary chromosomes. Slizynski has further shown that the vacuoles appear more frequently in the distal than in the proximal cells of the gland and in salivary gland cells of larvae grown in low yeast medium than those grown in enriched medium. Both in squash preparations as well as in histological sections the vacuoles appear morphologically very much like the nucleolus, although of much larger size than the latter and like the nucleolus they are not at all or negligibly stained by aceto-carmine-acetic orcein. They appear more or less homogeneous and appear to be bound by a membrane-like structure.

Various standard staining methods have been applied in order to identify the cyto-chemical property of the vacuolar content in these mutant salivary glands. The reaction is negative to Feulgen and Methyl green - Pyronin Y and also to PAS, Alcian blue and Toluidine blue. On the other hand Mercury bromphenol blue technique for proteins shows definite positive reaction for these bodies, but Millon's technique for protein (Tyrosine containing) gives negligible reaction. Finally, while the Sudan Black reaction for bound lipid is reasonably positive, that for free lipids is also indicative of such lipids in these bodies. These results suggest that the so-called vacuoles in the ft salivary glands may be in fact "lipo-protein bodies" bound by a membrane-like structure.

Reference: Slizynski, B. M. 1964 Cytologia 29: 330-336.