THE CAUSES OF MALE STERILITY IN *A. GAMBIAE* A-B GROUP CROSSES *

by

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The presence of a species complex in *A. gambiae* has been well established; however, the nature of the isolating mechanism has received very little attention. DAVIDSON and JACKSON (1962) originally believed the hybrid male sterility in A-B group crosses to be due to a single gene. Further investigation using induced copulation and marker genes showed that both of the autosomes were involved in the hybrid-sterility. This made the single gene hypothesis impracticable and indicated chromosal rearrangement as the most likely cause of male sterility.

In order for hybrid sterility in the male to be caused by chromosomal rearrangement, crossing over must occur in the male mosquito. That chiasmata with the resulting crossing over does occur in *Anopheles* males has been shown cytologically by a number of authors, and a cytological study of spermatogenesis in *A. gambiae* also revealed chiasmata during the diplotene stage.

The salivary chromosomes of strains in groups A and B, and hybrids between them were then studied. The group A strain from Lagos, Nigeria, was a sister strain to that used by FRIZZI and HOLSTEIN to produce a chromosome map for *A. gambiae*. The group B strain was from Kano, Nigeria. The FRIZZI and HOLSTEIN map was used as a standard and the Lagos and Kano banding patterns were compared to it. The banding sequence from the Lagos strain was compared in detail and appeared to have the same banding pattern as the map. A less extensive comparison was made between the map and the chromosome banding pattern in the Kano strain. Only the ends of the chromosome arms were compared and these appeared to be homologous. Each parental strain was also checked for its heterozygous inversion frequency. This frequency was found to be very low in comparison to that found by FRIZZI and HOLSTEIN (1956) and HOLSTEIN (1957).

The group A Lagos strain had a heterozygous inversion on the right arm of chromosome II extending over sections 10 and 11. The B group Kano strain had heterozygous inversions on two chromosome arms. One was located towards the distal end of chromosome IIR extending from the middle of section 7 to the distal half of section 9. The other inversion was on the left arm of chromosome III taking in half of section 38 and all of 39. Neither of the parental strains had an inversion frequency above 2 per cent.

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Hybrids from A-B group crosses differed from the parental stocks in that they presented a large number of aberrations. With the exception of the X-chromosome, which showed normal synapses throughout its length, all of the chromosome arms had some sort of rearrangement. Chromosome arm IIR had a large asynaptic region which extended from the middle of section 11. A short translocation shift has also been recorded in IIR and has been provisionally located in section 15. The left arm of chromosome II is homologous for sections 17 to half of 19, then there is a translocation involving chromosome arm IIIR. The right arm of chromosome III also shows a short asynaptic region extending from the middle of section 28 to the end of section 29. The left arm of chromosome III appears to be free of aberrations except for the occasional inversion near the tip.

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