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NOTES AND COMMENTS

LINKAGE STUDIES BETWEEN CHROMOSOME INVERSIONS AND ENZYME LOCI IN THE MOSQUITO *ANOPHELES STEPHENSI*

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SUMMARY

Preliminary linkage data in *Anopheles stephensi* show that in this species there exists apparent independent assortment between linked loci and/or inversions on different arms of the same chromosome.

CHROMOSOMAL polymorphisms for six different paracentric inversions have been demonstrated in *Anopheles stephensi* Liston (Coluzzi *et al.*, 1973) together with various electrophoretically detectable enzyme polymorphisms (Bullini *et al.*, 1971; Bullini and Coluzzi, 1973; Bullini *et al.*, in preparation).

The karyotype of *Anopheles stephensi* is similar to that of other species in the same genus, with two metacentric autosomal pairs and XY heterochromosomes.

Preliminary linkage data between chromosome 2 inversions 2Rb and 2Lc and the autosomal enzyme loci *phosphoglucomutase* (*Pgm*) and *isocitrate dehydrogenase-2* (*Idh-2*) are presented in this note.

The following two main findings emerge from the results summarised in table 1:

(a) the locus *Idh-2* and the inversion 2Rb are linked, the map distance being 15.6;
(b) in other combinations the loci/inversions assort independently.

The cytological evidence indicates that chromosomal arms 2R and 2L belong to the same chromosome with 2Rb involving the central third of one of the arms and 2Lc extending on the distal half of the other arm

TABLE 1

Recombination among the markers Pgm, Idh-2, *2Rb and 2Lc*

Loci or inversions	Parental genotypes	Recombinant genotypes	Total	% Recombinants	χ^2	P
Idh-2-Pgm	591	575	1166	49·91	0·219	> 0·60
Idh-2-2Rb	643	119	762	15·62	360·336	< 0·001
Idh-2-2Lc	378	403	781	51·60	0·800	> 0·40
Pgm-2Rb	381	367	748	49·06	0·262	> 0·60
Pgm-2Lc	383	385	768	50·13	0·005	> 0·90
2Rb-2Lc	459	459	918	50·00	0	= 1

(Coluzzi *et al.*, 1973). As already noted the genetic evidence points to independent assortment between these two inversions. The linkage experiments also show apparently complete independence between *Idh-2* and *Pgm* and between *Pgm* and 2Lc. Therefore the genetic evidence is inconsistent unless one accepts the existence of a crossing-over frequency between loci and/or chromosomal zones of the same chromosome, high enough to simulate complete genetic independence. The most likely explanation therefore is that *Idh-2* is linked to 2Rb on the right arm of chromosome 2 and that *Pgm* is on linkage group 3.

References

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