Angus, D.S. University of Queensland, Brisbane, Australia. The relationship of two sibling species within the quadrilineata species group of Drosophila.

In 1964 during a cytological analysis of D. tetrachaeta two flies (a male and a female) from Brown River, near Port Moresby were detected that, although morphologically identical with D. tetrachaeta, were very different as regards inversions present. In 1966 eight flies (three females and five males) were examined from Cairns which were cytologically similar to and would freely cross with the Brown River flies. Cultures established from Brown River and Cairns would not hybridise with D. tetrachaeta from Brown River beyond F_1 pupae. On this evidence a sibling species to D. tetrachaeta viz. D. pseudotetrachaeta was described (Angus 1967).

It is the purpose of this paper to describe as far as possible the specific inversions of D. pseudotetrachaeta and to record the degree of sexual isolation from D. tetrachaeta.

Sexual isolation tests between the two species were carried out by confining 10 sexually mature flies of one sex with 10 flies of the opposite sex and strain and examining the female tract for sperm after 10 days. Giant chromosome preparations were made by the acetic-lactic-orcein method (Strickberger 1962).

The very high sexual isolation between the two species is apparent from the table. Salivary chromosomes from hybrid larvae always show very poor pairing (Figure 1). However, five simple and one complex inversions have been detected in relation to the standard strain of D. tetrachaeta (Figure 2). The limits of the inversions in relation to the D. tetrachaeta map (Angus 1968) are IIA 9.0-11.3, IIIA 3.6-6.3, IIIB 11.0-chromocentre, IVA 3.5-4.9, IVB 14.6-chromocentre, VA 11.0-21.6. This last inversion is complex.

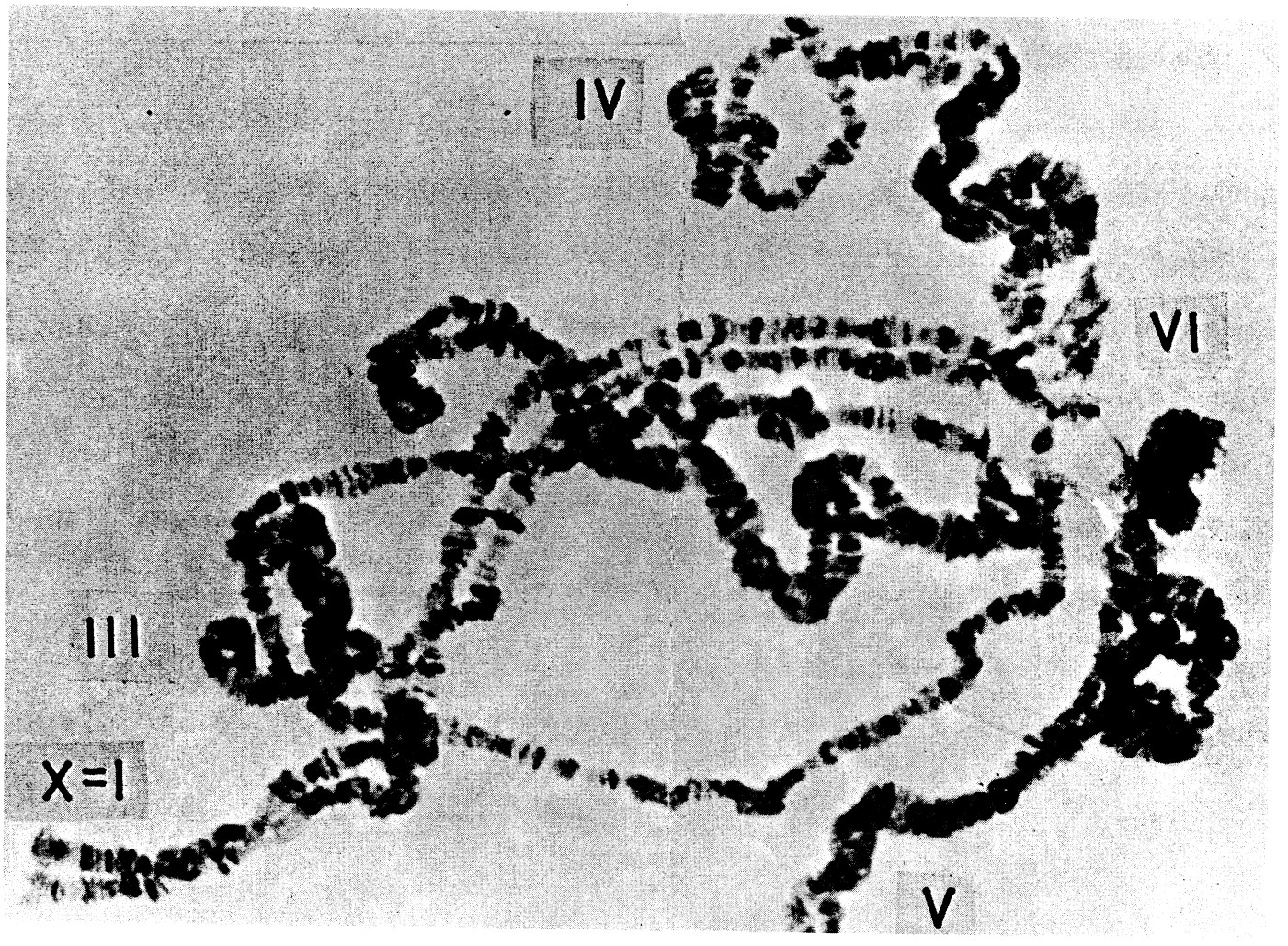

Figure 1

Figure 2

In the Australian region the situation found in the quadrilineata species group where these two cytologically differentiated sibling species have been detected contrasts with the situation in D. rubida where four geographical races have arisen by various isolating mechanisms and are characterised by different inversion patterns (Mather 1963, 1964, 1968 a and b).

SEXUAL ISOLATION TABLE

Females	Males	Females Tested	Number Insem.	% Insem.	Comment
D. pseudo.(Cairns)	D. tet.(Brown R.)	101	0	0	
D. tet.(Brown R.)	D. pseudo.(Cairns)	92	2	2	F_1 larvae
D. pseudo.(Brown R.)	D. tet.(Brown R.)	76	7	9	F_1 larvae
D. tet.(Brown R.)	D. pseudo.(Brown R.)	77	2	3	

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