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Inversion polymorphism in a natural population of *Drosophila willistoni* from Tabasco, Mexico.

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Among the most widely distributed species of *Drosophila* in America, we have *D. willistoni*. Geographically this species has been found from Southern Florida and Central Mexico down to Buenos Aires, Argentina (Townsend, 1952).

As many other natural populations of *Drosophila* it presents a broad polymorphism in respect to the gene arrangements on its chromosomes. According with Valente and Morales (1985), *D. willistoni* could be considered as the most polymorphic of all, with 70 different known inversions evenly distributed in the complete genome as shown in its polytene chromosomes. At this respect, in Mexico this species is poorly studied. For this reason a preliminary single collection of *D. willistoni* was done in May 1998 in a locality near Comalcalco in the State of Tabasco.

Flies were collected by baiting them with fermenting fruit, using several plastic buckets, distributed in an area about 1000 square meters, placed under the surrounding vegetation, and sweeping with a net. In this way, adult *D. willistoni* and a mixture of other species were obtained.

Captured flies were introduced in groups of 15-20 adults in a vial with fresh food until arrival to the laboratory in Mexico City. Once there they were transferred individually to a half-pint bottle with fresh food and incubated at 25°C initiating an isofemale line. Using the regular aceto-orcein staining technique a single larva of each isofemale line was dissected, a smear prepared, and its chromosomes analyzed through the light microscope. The different inversions present were recorded using as a guide the chromosome map of this species done by Dobzhansky (1950) and da Cunha *et al.* (1950), the results of our observations are presented in Table 1.

In total we were able to karyotype 38 chromosomes, corresponding to the progeny of 19 females captured. In our analysis we detected 27 different inversions. They correspond to 38.57% of the known gene sequences for the species.

All together the number of heterozygous inversions found were 70, since some of them were found more than once. This could be seen in Table 1, which shows the relative frequency of each inversion. Since these 70 heterozygous inversions were found in 19 individuals, it indicates that on average each female carries 3.68 heterozygous inversions. This value is consistent with other similar values found in populations studied elsewhere, such as Trinidad; Angra dos Reis, Rio de Janeiro; and Mogi, Sao Paulo (da Cunha and Dobzhansky, 1954); and Maranhao, Brazil (Ayala *et al.*, 1971).

As for the relative frequencies of the inversions found in this population, most of them were present in frequencies lower than 10% with the following exceptions: inversion A in the left arm of the X chromosome (XL) present in a frequency of 15.78%; inversion E of the right limb of the second chromosome (IIR) found 11 times, equivalent to 28.94%; and inversion B of the third chromosome found in 8 occasions, 21.05%.

Other relevant information that comes out of this study are the number of inversions found in each chromosome arm. They are 8 in XL, 10 in XR, 10 in IIL, 3 in IIR, and 5 in III.

Table 1. Relative frequencies (in per cent) of the different heterozygous inversions found in a natural population of *Drosophila willistoni*, from Comalcalco, Tabasco, Mexico.

XL	None	A	D	F	G				
	68.42	15.78	5.26	5.26	5.26				
XR	None	A	B	C	D	E			
	73.68	5.26	2.63	5.26	7.89	5.26			
IIL	None	A	B	C	F	G			
	68.42	7.89	5.26	5.26	7.89	5.26			
IIR	None	B	C	D	E	H			
	52.63	5.26	7.89	2.63	28.94	2.63			
III	None	A	B	D	E	F	I	J	M
	55.26	5.26	21.05	2.63	2.63	5.26	2.63	2.63	5.26

In all the cases the chromosome sample size is 38.

Similarly, taking the whole genome, two females had inversions in two chromosomes, 13 females in three chromosomes, 4 females in four chromosomes. Flies with no inversions or with inversions in the 5 chromosome arms were not registered. In our collection we also captured two females belonging to the same *Drosophila* group of species, *D. nebulosa*, of which similar cytological study yielded one inverted XL chromosome and the presence of the heterozygous inversions A, D, and E from the third chromosome. With such small sample size, it is hard to assign any relevant information.

In the case of *D. willistoni* also the small sample size might not be representative; but, of course if we take it with caution the information would represent a high polymorphic status of the population.

For the above results, it seems important to perform similar studies in this and other Mexican populations of the species either in spatial or temporal ways in order to form a better understanding of the populations of this species living in the country.

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