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Chromosomal polymorphism in D. ananassae.

Abundant evidence now exists to prove that differential gene arrangements have evolved in many species of Drosophila to meet the adaptive needs in a dynamic environment. Inasmuch as the adaptive values of different genomes differ considerably, the fitness of certain kinds of gene arrangements may, therefore, increase or decrease with fluctuation in environmental milieu. D. ananassae, a cosmopolitan domestic species, is known to exhibit nearly 50 different inversions in different natural populations. Of the several paracentric inversions, 3LA, 3RA and 2LA are common to all populations while the rest of the inversions are selectively restricted to these populations. From their studies on D. willistoni, da Cunha et al. (1950) postulate a close correlation of chromosomal polymorphism with environmental conditions. In an attempt to assess the correlation, if any, between the different inversions and the environmental temperature, the present study has been undertaken on the natural population of D. ananassae of Golabandha, situated at an altitude of 17.5 m and about 6 km to the south of the university campus, during the months of January through May, 1980. The temperature during these months was recorded as 24°C in January, 28°C in February and March, 32°C in April and 36°C in May.

Table 1. Inversion frequencies.

Type of inversion	Jan.	Feb.	Mar.	Apr.	May	Percentage
3LA	35	30	27	23	34	29.8
3RA	3	2	2	2	5	2.8
2LA	4	7	11	10	11	8.6
XLA	1	-	-	-	-	0.2

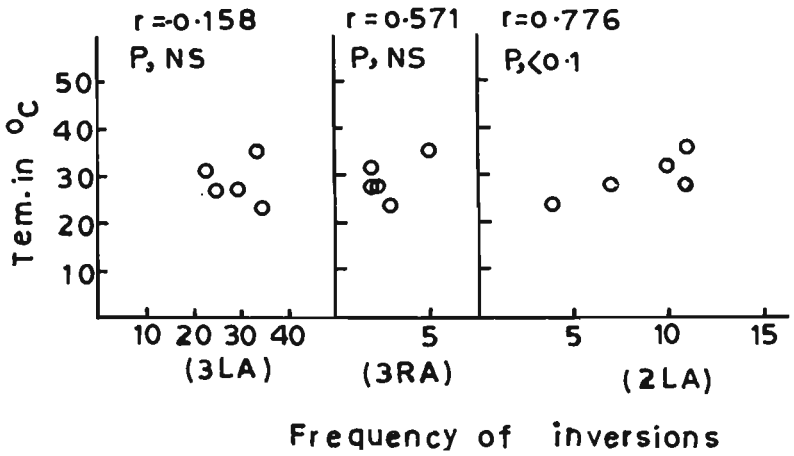

Fig. 1. Correlation between frequency of inversions (3LA, 3RA and 2LA) and environmental temperature in °C.

Collections were made in the first week of every month and the naturally inseminated gravid females were isolated. Individual flies were transferred to independent vials with wheat cream agar medium. 100 larvae were used in studying the inversions every month. Table 1 lists the inversion frequency data during the different months of study.

The correlation graphs of the frequency of inversions, coextensive with the species, and the temperature fluctuation during these months are represented in Fig. 1. As can be seen there is no significant correlation between the frequency of these inversions and the environmental temperature in the investigated population of D. ananassae.

Reference: da Cunha, A.B., H. Burla and Th. Dobzhansky 1950, Evolution 4:212.

Trippa, G., A. Loverre and M. Lepore. Università di Roma, Italy.

Segregation distortion of second chromosomes by a wild third chromosome in D. melanogaster: modifier or Sd gene?

Samples of wild populations of D. melanogaster from southern Italy have shown a frequency of 1 to 10% of second SD chromosomes (Trippa et al. 1972) and about 70% of third chromosomes carrying a dominant Sd modifier (Trippa and Loverre 1975). The characterization of Italian natural populations as regards frequency of meiotic drive systems utilizes a cross scheme which makes it possible to follow the segregation of both second and third chromosomes. F_1 +/bw-5; +/st-5 males from the cross between wild males and y; bw-5; st-5 females are backcrossed with y; bw-5; st-5 females to permit a first count of k_1 and k_2 at F_2 (k_1 for segregation of second chromosome = bw^+ individuals/