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A new spontaneous inversion in chromosome O of *Drosophila subobscura*.

Drosophila subobscura displays a very rich chromosomal polymorphism in its five acrocentric chromosomes. Until 1980 a total of 56 inversions and 2 duplications had been recorded in nature (Krimbas and Loukas, 1980). Since then, seven new spontaneous inversions have been described: E_{16} (Sperlich et al., 1981), J_5 (Malogolowkin-Cohen and Sperlich, 1981), E_{17} (Brncic et al., 1982), E_{18} (Pegueroles et al., 1988), E_{19}, E_{20} and U_{12} (Gosteli and Hauschteck-Jungen, 1989).

We have found a male carrying a new arrangement of chromosome O in a sample captured near Barcelona. Heterokaryotypic larvae for this arrangement and O_{3+4} showed two overlapped inversion loops (Figure 1). The proximal loop was small and the distal very long, with only a few bands left free at the end of the chromosome. Half the larvae from some crosses between the male offspring of this male and females from a homokaryotypic strain for the arrangement O_{3+4+1} showed a single long inversion loop (Figure 2). This indicates that the new arrangement included inversion O_1 besides complex O_{3+4} and the new inversion O_{25}.

Inversion O_{25} is very long and spreads over the two segments (I and II) of the chromosome O. This underlines the artificiality of dividing chromosome O into two segments, since this was based on the fact that the inversions on one segment did not overlap the other. This inversion includes complex O_{3+4} and overlaps inversion O_1. The study of the pattern of bands revealed that the breakage sites are 83C/84A and 99A/99B of the Kunze-Muhl and Muller (1958) map. The former breakpoint is common to inversions O_9, O_{15} and O_{22} whereas the latter is common to inversions O_{19} and O_{23}. Therefore, both breakage sites are "hot" points. This confirms that inversions do not arise randomly on the chromosome and that certain points may have a characteristic that make their appearance more probable.

Figure 1. $O_{3+4+1+25}/O_{3+4}$ heterokayotype.

A series of crosses with the balanced strain VaBa revealed that the chromosome with the new arrangement was lethal in homozygous condition. In addition, the heterozygous flies for the arrangement $O_{3+4+1+25}$ and the chromosome O_{Va} did not have offspring. This kind of heterozygous male showed protuberant twisted genitalia which must make mating difficult. On the other hand although females appeared normal, they did not give any offspring either. The stable heterokaryotypic strain $O_{Ba}/O_{3+4+1+25}$ whose flies show the phenotype Ba, grew well at 18 and 13°C and did not show any other anomaly.

References: Brncic, D., M. Budnik and A. Prevosti 1982, Ambientes Terrestres 6:23-32; Gosteli, M. and E. Hauschteck-Jungen 1989, Genetica 79:115-120; Krimbas, C.B. and M. Loukas 1980, Evolutionary Biology 12:163-234; Kunze-Muhl, E. and E. Muller 1958, Chromosoma 9:559-570; Malogolowkin-Cohen, Ch. and D. Sperlich 1981, Rev. Brasil. Genet. IV, 2:213-230; Pegueroles, G., C. Segarra and A. Prevosti 1988, D.I.S. 67:64-65; Sperlich, D., W. Pinsker and V.G. Mitrofanov 1981, Genetica 54:329-334.

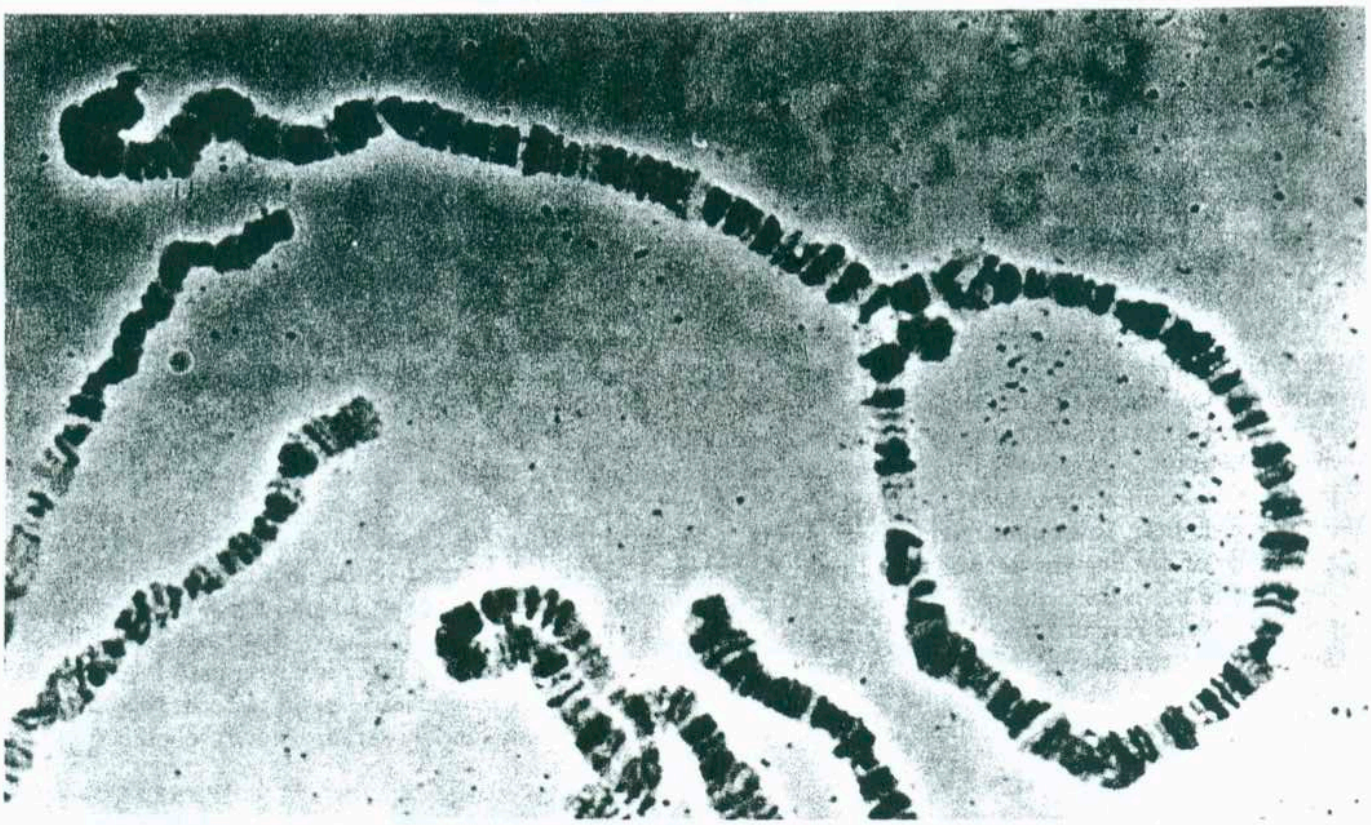

Figure 2. $O_{3+4+1+25}/O_{3+4+1}$ heterokaryotype.

Hegde, S.N. and M. Jayashankar. Department of Studies in Zoology, University of Mysore, Manasagangothre, Mysore-570 006, India. A new gene arrangement in *Drosophila ananassae* from Rewa, India.

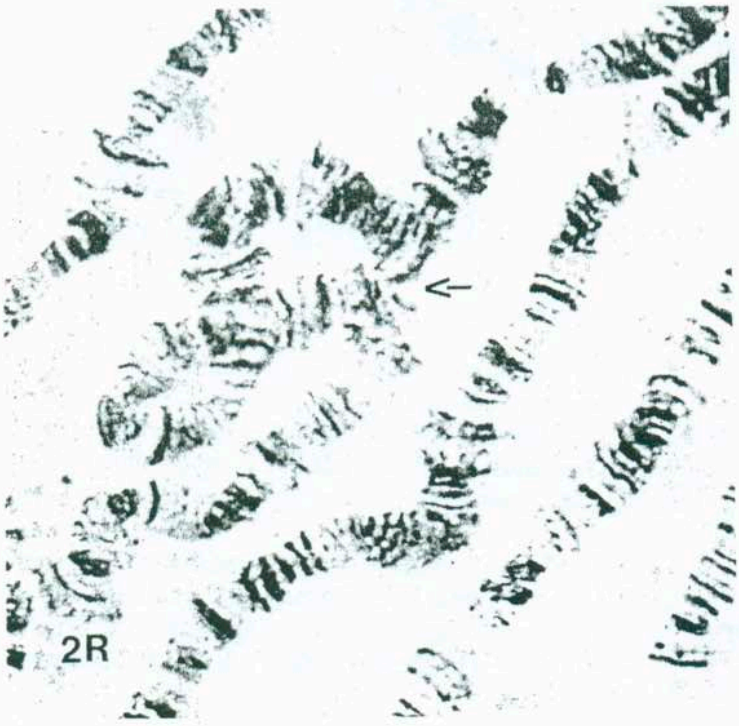

Figure 1. Micrograph of 2Rd inversion heterozygote.

Drosophila ananassae, a domestic and cosmopolitan species of the *melanogaster* species group harbours many inversions and translocations. Chromosomal polymorphism in *Drosophila ananassae* has been studied extensively by many investigators (Futch, 1966; Singh, 1970; Sajjan and Krishnamurthy, 1970; Singh et al., 1972; Reddy and Krishnamurthy, 1972, 1973). Because of peculiarities in its cytological and genetical behaviour *Drosophila ananassae* emerged as 'unique' among *Drosophila* species.

In this report we describe a new paracentric inversion heterozygote in *Drosophila ananassae* population collected from Rewa, Madhya Pradesh in the month of December, 1991. Comparison with the reference map of salivary chromosomes of *D. ananassae* constructed by Ray

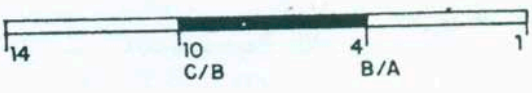

Figure 2. Shows location of 2Rd inversion.