heterozygotes. The richness of culture medium and weak competition for space and food was considered the environmental factors favoring the heterozygotes.

Alahiotis *et al.* (1977) studying the selective effect of medium and humidity in cage populations reported that medium appears to influence allele and inversion frequencies while humidity does not. These authors speculate that *In(2L)t* is advantageous in environments with high population densities. According Lemeunier and Aulard (1992) this could explain the increase of frequency of *In(2L)t* observed by Roca et al. (1982) in cage population experiments. Also could explain the high frequency of heterokaryotypes for this inversion in some of our strains, since populations were maintained in bottles with high density.

At the present, it is not completely clear which could be the major balancing selection mechanism responsible for the maintenance of inversion polymorphism in *Drosophila*. Supergene selection can be potentially important mechanism of balancing selection (Alvarez and Zapata, 1997). When both supergene and karyotype selection is simultaneously operating on two gene arrangements, the recombination effect will lead to a protected polymorphism in many instances, even when the karyotype viability tends to produce the fixation of one of the two arrangements. These processes and the observation that *In(2l)t* heterozygotes exhibit heterosis with respect to certain components of fitness (Van Delden and Kamping, 1989,1991; Kamping and Van Delden, 1999a,b) could explain the persistence of *In(2L)22D;34A/ST* heterokaryotype in our stocks.

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A_{2+8+9}: a unique and new complex chromosomal gene arrangement in *Drosophila subobscura.*

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The species *Drosophila subobscura* displays a rich chromosomal inversion polymorphism on all of its five acrocentric chromosomes. Until 1993, 67 different inversions in 93 gene arrangements

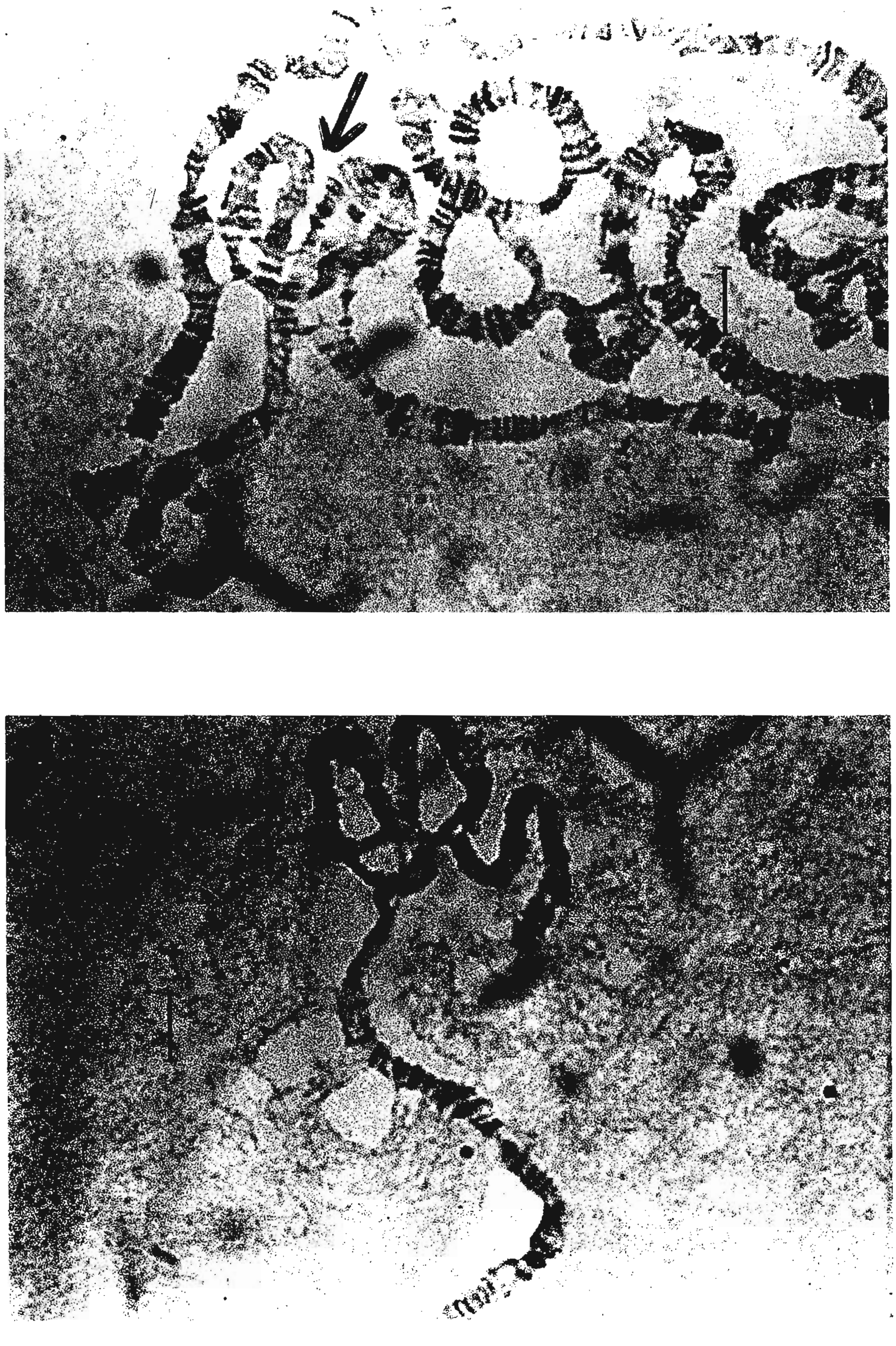
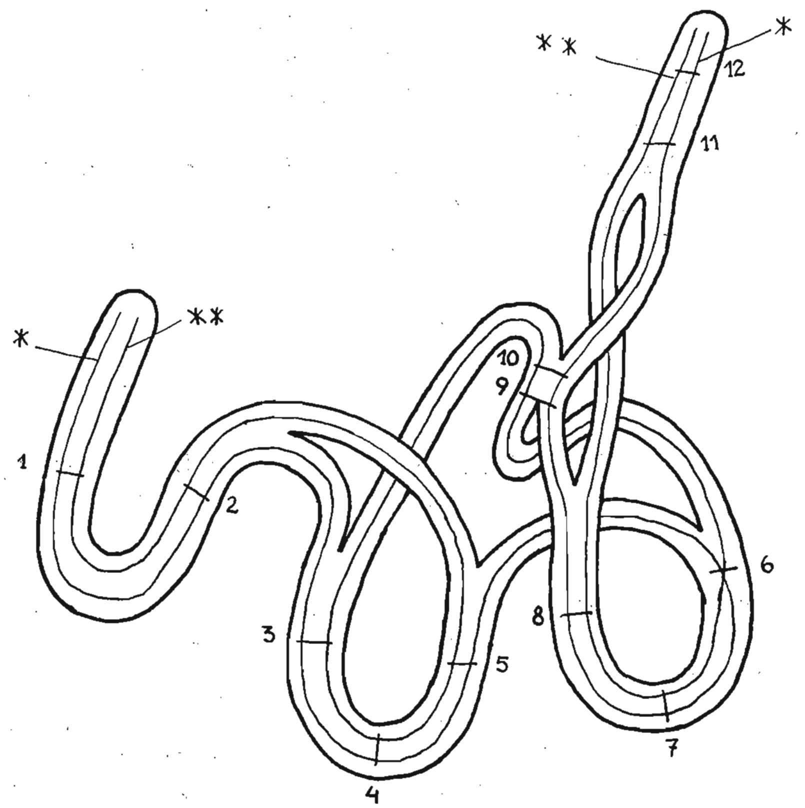


Figure 1. Gene arrangement A_{2+8+9}, in upper figure with U_{1+2}.



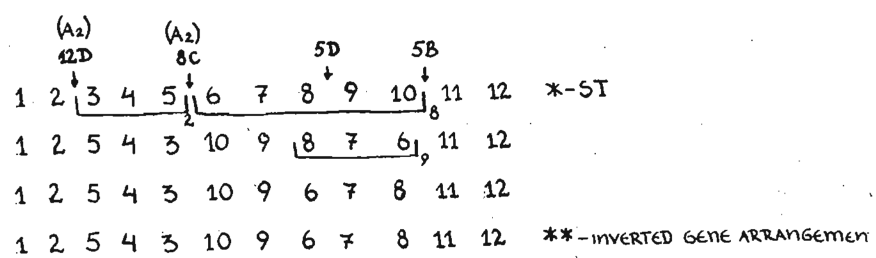


Figure 2. Possible origin of A_{2+8+9} gene arrangement..

have been reported (Krimbas, 1993). Eight inversions are located on A chromosome appearing in 11 different gene arrangements.

The arrangement A_{2+8+9} represents a unique and new inversion complex (Figure 1). It was detected in the progeny of one among 33 wild males from Zanjic (South Adriatic, Montenegro, Yugoslavia) that had been individually crossed to virgin females of the homokaryotypic standard strain "Kuesnacht" after collection in June of 1997.

The breakpoints of the inversions of the new gene arrangement are located in 12D of the map of Kunze-Muehl and Mueller (1958; Goetz 1965 has corrected the distal breakage point of A_2 later), 8C (common for A_2 and A_8), 5B (new), and 5D (common for A_5, A_7, A_8 and A_9). It comes out that only two inversions are needed to come from the rather frequent and widely distributed gene arrangement A_2 to the new arrangement. Inversion A_8 extents from 8C to 5B while the small inversion A_9 (5D-5B) is included in A_8 with a common breakpoint in 5B (Figure 2).

For European populations of *D. subobscura*, only A_{St}, A_1, A_2 and A_{2+6} gene arrangements have been reported (Krimbas, 1993). In Yugoslavia gene arrangements only A_{St}, A_1 and A_2 have been observed so far (Andjelkovic and Sperlich, 1973; Zivanovic, *et al.*, 1995, 1998).

This is the very first case that such a complex gene arrangement on A chromosome has been found in Europe. Complex gene arrangements on A chromosome were discovered until now only in the north-western part of Africa (Jungen, 1968), but A_{2+8+9} was never observed there. Most probably,

A_{2+8+9} is a gene arrangement that recently originated by transposon induced mutation or it is a rare and endemic arrangement for the south-eastern regions of Europe.

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This bibliography includes the papers published on the bipectinata complex which consists of four species: *D. bipectinata*, *D. malerkotliana*, *D. parabipectinata*, and *D. psudoananassae*. The *bipectinata* complex belongs to the *ananassae* subgroup of the *melanogaster* species group. However, the abstracts of symposia and conferences have not been included. In this bibliography we have tried to cover the literature of all four members of the *bipectinata* complex up to May 2000. We apologize to the readers for inadvertent omission of any paper. One (SS) of the authors thanks the CSIR, New Delhi for the award of Research Associateship (RA) to her.

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