Hegde, S.N. and N.B. Krishnamurthy. University of Mysore, Mysore, India. Studies on the Drosophila fauna from three localities of Maharastra State: India.

Sustained collections are essential in order to take census of the number and composition of Drosophilid fauna in several unexplored parts of India. The present report incorporates the results of the survey made by the authors in unexplored parts of Poona, Lonavala and Mahabaleswar, all of which belong to Maharastra state. Collections from 3 wild and 3 domestic localities made from the above places are presented in Table 1. The collections yielded a total of 21 different species in addition to a single species of the genus Phorticella. Out of the 21 species, 14 belong to the subgenus Sophophora, 3 to subgenus Drosophila, 3 to Scaptodrosophila, and one to Dorsilopha. The striking feature of the collection data is that in these areas only members of melanogaster and immigrans species groups dominated both in abundance and variety over others. This agrees with the suggestion made by Bock and Wheeler (1972) that "if collection made in any part of the southeast Asian or New Guinea area reveals that although many species may be collected at any particular locality, only two species groups comprise all or practically all of the catch, i.e., the melanogaster species group of the subgenus Sophophora and immigrans species group of the subgenus Drosophila".

Numerical variation in different localities under study are striking. The highest number of flies (1186) as well as species (17) has been collected in the wild localities of Mahabaleswar. In domestic localities, Lonavala has yielded a maximum number of flies (729) as well as species (4). D. jambulina, D. malerkotliana and D. nasuta are the 3 species which dominate numerically in these localities. It is interesting to note that D. bipectinata and D. malerkotliana which are essentially species that inhabit the wild localities have also been captured in the domestic localities of Lonavala. It is likely that these two wild species are attempting to invade and colonize the domestic locality as is evidenced by their presence in Lonavala.

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References: Bock, I.R. and M.R. Wheeler 1972, in: Studies in Genetics, VII, Univ. Texas Publ. 7213, pp. 1-102.

Henikoff, S. University of Washington, Seattle, Washington. A more conventional view of the "ebony" gene.

Two reports suggest that ebony has unusual properties. Unable to find position effects for the gene, Brosseau (1970) speculated that the locus might be immune to the effects of heterochromatin. More recently, Scalenghe and Ritossa (1977) reported that heat shock can induce cuticular glutamine synthetase I which is presumably the product of the ebony locus. Therefore, they proposed that the ebony gene, in addition to its role in normal development, is the site of the major heat shock puff at 93D. This communication describes ebony mutants that do not fit with the above suggestions: one mutation is a variegating position-effect, and another is a deficiency that does not remove the 93D heat shock puff locus.

Approximately 70,000 progeny of kar red e females mated to irradiated (3500r) red males were screened for mutant body and eye color. Of the 32 fertile mutant ebony chromosomes found, six carried aberrations involving the 93D region on the irradiated chromosome. Two translocations were broken in the 93D region and in the centromeric heterochromatin. One was a viable T(2;3) with a fully mutant phenotype even in the presence of an extra Y chromosome. The other was a homozygous lethal T(1;3) with a mottled phenotype that was much more strongly ebony in XX females than in the nearly wild-type XY males and XXY females. XO males were fully mutant.

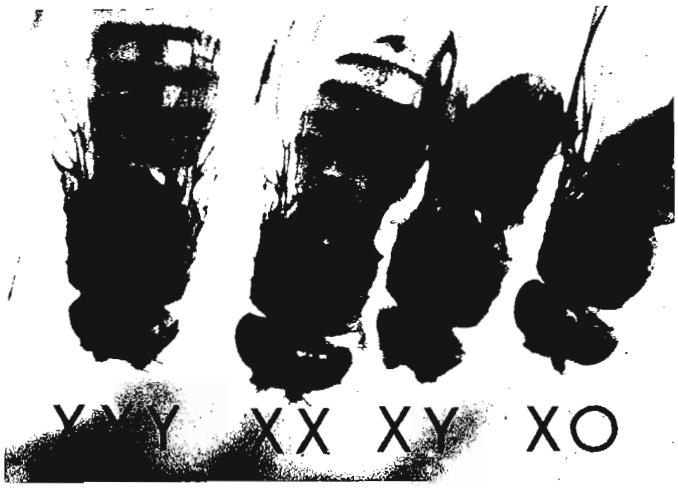

Fig. 1. Ebony-variegated flies from the same 18° culture: XXY=T(1;3)20;93D, red e^{H2}/+;In (3R)C, Sb e 1(3)e / $B^{s}Y$, XX=T(1;3)e^{H2}/+;In(3R)C, XY=T(1;3)e^{H2}/$B^{s}Y$;In(3R)C. An XO=T(1;3)e^{H2}/0; In(3R)C male is also shown.

Such Y-suppressibility accords with the interpretation that this mutation is a position effect that variegates for the ebony gene. Typical examples are shown in Fig. 1.

One inversion and three deficiencies, all fully ebony, were also found in this screen. Their cytological locations agree with the assignment of ebony to the 93D2-3 region from earlier reports (Scalenghe and Ritossa 1977; Korge 1972). In salivary squashes of heat-shocked larvae, it is clear that the 93D puff is outside of both the inversion, In(3R)84C;93D2-3, and one of the deletions, Df(3R)93B10-13; 93D2-3 (Fig. 2). The existence of a deficiency that uncovers ebony but has no apparent effect on the heat-shock puff argues against either the proposal that glutamine synthetase I is one of the heat-shock proteins, or the presumption that the enzyme is the product of the ebony locus (Scalenghe and Ritossa 1977).

Thus, no special hypotheses are needed to explain unusual aspects of ebony gene function.

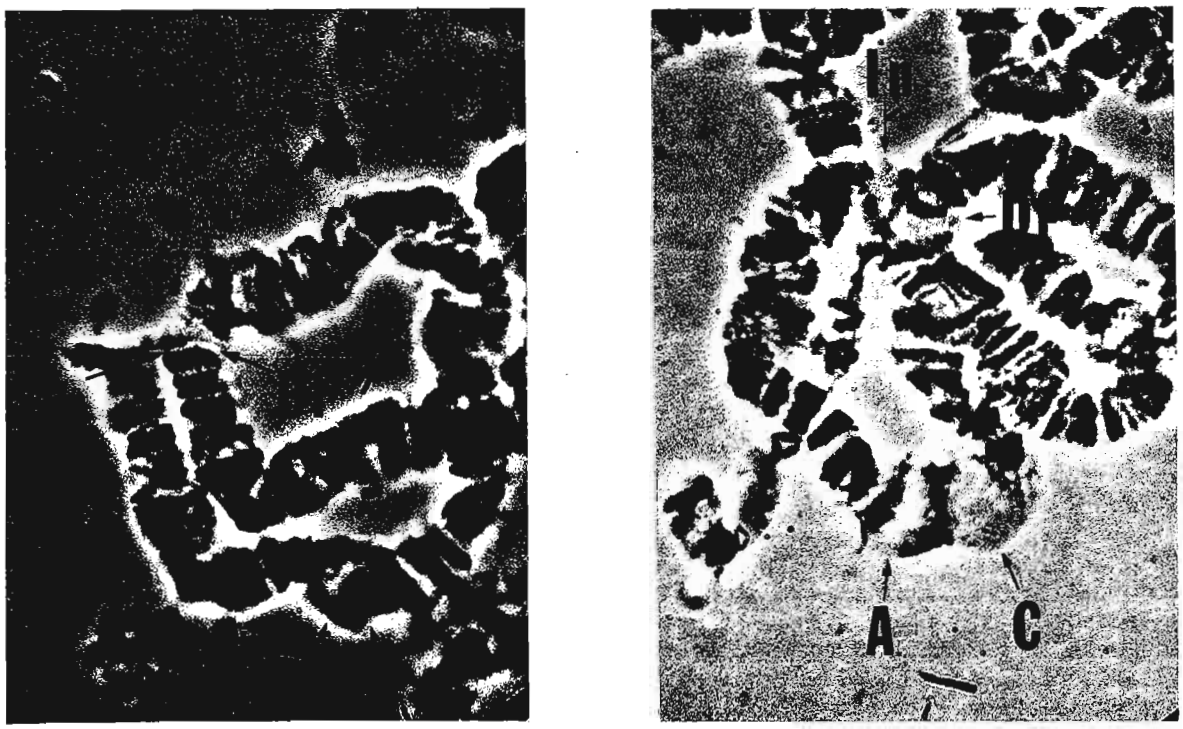

Fig. 2. a) Part of chromosome 3R from a larva of genotype In(3R)84C;93D2-3, red e^{H3}/Df(3R) 93B10-13;93D2-3, red e^{H5} squashed immediately after dissection. b) Example of 3R from the other salivary gland of the same larva held 15 min at 37° before squashing. Df and In indicate the 93D puff sites on deficiency and inversion chromosomes respectively. For references, A and C indicate the sites of the heat-shock puffs in 87A and 87C.

References: Brosseau, G.E. Jr. 1970, DIS 45:100; Scalenghe, F. and F. Ritossa 1977, Chromosoma (Berl.) 63:317; Korge, G. 1972, DIS 48:20.