

radiation alters its interpretation. Thus the bicaudal embryos resulting from mutation and the UV-induced double abdomens found in other species of insects may well be produced by entirely different pathways at the molecular level.

References: Bownes, M. and K. Kalthoff 1974, *J. Embryol. Exp. Morph.* 31: 329-345; Bull, A.L. 1966, *J. Exp. Zool.* 161: 221-242; Kalthoff, K. 1971, *Wilhelm Roux Archiv* 168: 63-84; Nusslein-Volhard 1977, *Wilhelm Roux Archiv* 183: 249-268.

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Bregliano, J.C., A. Bucheton, J.M. Lavige, A. Pélisson and G. Picard, University of Clermont-Ferrand II, France. Hybrid dysgenesis in *Drosophila melanogaster*: the I-R system.

Since 1970 we have been working on a non-mendelian female sterility in *Drosophila melanogaster*. On the basis of the fertility of F_1 females, two main classes of strains, inducer and reactive, can be distinguished. Crosses between reactive females and inducer males give rise to daughters (SF females) showing a more

or less important reduction of fertility, while reciprocal crosses produce only normally fertile daughters (RSF females). SF sterility is characterized by several specific physiological features (Picard et al., 1977). A survey of more than 200 strains indicates that all wild populations are inducer, whatever may be their geographical origin, while both inducer and reactive are found among long established laboratory stocks.

We have demonstrated that SF sterility results from an interaction between a chromosomal factor (I factor) responsible for the inducer condition and a genetic state, called reactivity, responsible for the reactive condition. Both conditions show a great range of variations. According to the amount of reduction of fertility of SF females, reactive and inducer strains can be arranged from "strong" to "weak": the stronger the parental strains, the higher the reduction of SF female fertility (Bucheton et al., 1976). All wild populations tested so far are strong inducer.

Reactivity corresponds to a cytoplasmic state controlled by a polygenic system, with a long delayed effect (Bucheton and Picard, 1978). I factor is chromosomal and may be linked to any chromosome of inducer strains. Two kinds of chromosomes, inducer (i^+) and non-inducer (i^0) have been found in inducer strains according to their ability or not to carry I factor, respectively. Through heterozygous males bearing both i^+ and reactive originating (r) chromosomes, I factor is transmitted following a strict mendelian pattern. In contrast, in heterozygous females, even in those carrying only one i^+ chromosome, every r chromosome may acquire irreversibly I factor, often with a high frequency, by a process called chromosomal contamination (Picard, 1976, 1978). Several evidences indicate that I factor might be a transposable element (Pélisson, 1978). Chromosomal contamination occurs only in females in which the I-R interaction exists but not in inducer females. Indeed, although i^0 chromosomes can contaminate in SF females as well as r chromosomes, some inducer strains maintain a stable i^+/i^0 polymorphism. The lack of chromosomal contamination in i^+/i^0 inducer females allows the mapping of I factor. The first results support the idea that there are only a few sites on each chromosome but the data do not permit a decision as to whether or not these locations are the same on all homologous chromosomes of various strains (Pélisson and Picard, 1979).

We recently showed (Picard et al., 1978) that the I-R interaction leads not only to SF sterility and chromosomal contamination but also to high levels of several dysgenic traits in the female germ line (X non-disjunction, lethal and visible mutations). Some of the mutations observed are very unstable, suggesting they might result from insertions. It is of course tempting to hypothesize that they are insertions of I factor. The I-R interaction does not seem to have any effect on the male germ line.

The I-R interaction clearly enters in the field of hybrid dysgenesis. It is now firmly established (Kidwell, 1979) that there are at least two causally independent systems displaying many common features: the I-R and the P-M systems. The latter produces dysgenic traits in both female and male germ line, especially male recombination. These observations make it necessary to take a critical look at many studies done for 40 years on *Drosophila melanogaster*, mainly on mutator effects. In most cases, the experimental schemes do not exclude the possibility that the high mutability observed results from strain interactions rather than from widespread mutator genes acting in natural populations. Moreover, we claim that it is no longer possible for *Drosophila* geneticists to neglect the I-R and P-M classifications of the stocks they use.

References: Bucheton et al. 1976, *Heredity* 36:305-314; Bucheton and Picard 1978, *Heredity* 40:207-223; Kidwell 1979, *Genet. Res.* in press; Pelisson 1978, *Genet. Res.* 32:113-122; Pelisson and Picard 1979, *Genetics* in press; Picard 1976, *Genetics* 83:107-123; Picard 1978, *Molec. Gen. Genet.* 164:235-247; Picard et al. 1977, *Biol. Cell.* 29:89-98; Picard et al. 1978, *Genet. Res.* in press.

Brncic, D. and Budnik, M. Universidad de Chile, Santiago, Chile. Colonization of *Drosophila subobscura* Collin in Chile.

In February 1978, Mr. H. Fenner of our laboratory collected for the first time in Chile *Drosophila subobscura* Collin, in an orchard near Puerto Montt (S.41°30'). A laboratory stock was established and our determination was con-

firmed by crosses with stocks from Bilbao (Spain) provided by Prof. Antonio Prevosti (Barcelona), and from Norway (Stock TX 2361-01 provided by the Univ. of Kansas). F₁ and F₂ were fully fertile in both tests. Photomicrographs of the giant salivary gland chromosomes of the larvae from the Chilean stock were studied by Prof. A. Prevosti (Barcelona), who kindly informs us that the band sequences correspond most probably to those observed in the Western Mediterranean Europe region (Meridional Spain), and in the Mediterranean coast of North Africa (Marruecos and Tunis). This first observation of *D. subobscura* in Puerto Montt (Chile) is significant, because *Drosophila* have been collected there practically every summer for the last 25 years.

Eight months later (November and December 1978), we collected *D. subobscura* in large numbers in the following places in Chile, that correspond to a north-south gradient of about 1200 km: Santiago (S.33°30'), Lake Rapel (S.34°15'), Talca (S.35°26'), Chillan (S.36°36'), Salto del Laja (S.37°10'), Los Angeles (S.37°28'), Pucon (S.39°15'), Valdivia (S.39°50') and Puerto Montt (S.41°30'). Most collections were made utilizing fermenting banana traps placed in orchards or gardens, with the exception of the Salto del Laja and Pucon localities in which the baits were placed in small natural forests of *Notofagus*. In addition, a few flies were collected in a fruit-vegetable store in Chillan City by sweeping the net over the fruits. In none of the above mentioned places was *D. subobscura* recorded before, indicating that it represents a newly introduced species coming most probably from the Palearctic zone. We have no information of the existence of the species in other places of Neotropical zone or in the Nearctic.

The quantitative data of the collections seems to indicate that the rapid invasion of *subobscura* has displaced some "domestic" species, particularly *D. simulans*, which was a very abundant species all over the central and south-central parts of Chile, and has now become a relatively rare species.

Stocks of *D. subobscura*, originated from the above indicated places, were sent to Prof. A. Prevosti of Barcelona for further research. [The authors would like to thank Mrs. Hertha Fenner and Mr. Gonzalo Gajardo from our Department and Prof. Eduardo del Solar from the Univ. Austral (Valdivia - Chile), who collected the flies at Puerto Montt, Lake Rapel and Valdivia respectively, supported by grants from PNUD/UNESCO (Proyect RLA 76/006) and Univ. of Chile (Proyect B 027 - 784).]

Bryant, M. L. and M. R. Murnik. Western Illinois University. The mutagenicity of herbicides in *Drosophila melanogaster*.

Our laboratory is interested in the potential mutagenicity of herbicides. Trifluralin (Eli Lilly Company) is an herbicide commonly used for weed prevention in soybean crops. It is a yellow liquid, miscible with water. Accord-

ding to several investigators (Andersen, Leighty, and Takahashi 1972; Shirasu, 1975), trifluralin is not mutagenic in any of four different microorganisms. Since tests in microorganisms test only for point mutations, we decided to test this herbicide in *Drosophila*. Male, wild type Oregon-R flies, fed as larvae 0.01 trifluralin (w/w in modified Carpenter's medium) were mated with virgin Basc females. The concentration of trifluralin used was the highest dose not toxic to the developing flies. The treated group produced 0.09% sex-linked recessive lethals, while the control group had 0.12% of these mutations. Thus, the results of these tests indicate that trifluralin does not produce sex-linked recessive lethals in *Drosophila*.