

Gupta, A., W. Tadei, A. Monzato, E. Maciel, and E. Godoi. Univ. Fed. da Paraíba, CCEN/DBM, 58.059-900 Joao Pessoa - PB, Brazil. A genetic study on gene regulatory systems between sibling species of *Drosophila*.

It is well established that *D. pseudoobscura* and *D. persimilis* are two sibling species. However, the two may have genetic differences in their gene regulatory systems underlying morphological characters. In order to answer this question, we have analyzed the data collected by Gupta, for the following meristic characters: 1) bristle number on 4th and 5th

sternites in both sexes, 2) tooth number on proximal and distal sex combs on both legs, 3) genital arch tooth number on both sides (for details of materials and methods, see Gupta 1978, Evol. 32: 580-587). For each individual fly, average bristle number was computed using both sternites, both proximal as well as both distal sex combs, and genital arch tooth number on both sides. Such calculations were made for parental, F1 and backcross classes at two temperatures: 17.5° and 25.5°C. The results showed that the bristles on sternites are sex-linked. The transmission of such bristles from parental to F1's occurs in additive fashion and later segregate accordingly in their backcross classes. This holds true at both temperatures. A comparison (2x2) between the parental and backcross classes made by Tukey test showed that the backcross individuals, obtained from *D. pseudoobscura* Sc-h-11 x *D. persimilis* FC-46, gave higher number of significant classes than their parental classes at 17.5° than at 25.5°C, while the backcross classes obtained from *D. pseudoobscura* Sc-f-8 x *D. persimilis* FC-51B males gave the opposite results at these temperatures. In general, it clearly demonstrates that the temperature plays a significant role in the development of bristles analyzed in question (with the exception of bristles at distal sex combs where the backcross classes obtained from both the crosses were higher in number at 17.5° than at 25.5°C, when compared with the parental classes).

The ANOVA showed the existence of not only the effect of genotype and temperature but also a significant interaction effect, for each meristic character in question. This implies that the regulatory genes for the decrease or increase in bristle number are also influenced by such an interaction effect. That is to say, the increase or decrease in bristle number does depend upon the degree of an interaction that occurred during its development.

For each of the parental, F1's and backcross classes, the correlation analysis for the bristle number at two temperatures was made for the following: 1) sternites vs. proximal sex combs, 2) sternites vs. distal sex combs, 3) proximal vs. distal sex combs, 4) proximal vs. genital arch tooth number, and 5) distal vs. genital arch tooth number. The backcross individuals, in general, showed larger correlation values than their parental classes. It holds true at both the temperatures. Such observations indicate that there exists a common relationship among the gene regulatory systems for the development of the types of bristles studied. However, we do not know yet the degree of such relationship. It is interesting to note that specifically for bristle number on sternites vs. proximal sex combs, *D. pseudoobscura* Sc-h-11 males showed negative correlation at 17.5° but positive at 25.5°C. On the other hand, *D. persimilis* FC-46 males gave negative correlation value at both temperatures. The F1 classes showed positive or negative correlation value depending upon whether the parental males of the species had positive or negative correlation. However, the correlation values for each of the four backcross classes, obtained from *D. pseudoobscura* Sc-h-11 x *D. persimilis* FC-46, were found to be positive at 17.5° and negative at 25.5°C. Such results indicate that the developmental pathways for such bristles controlled by the gene regulatory systems are disturbed. That is to say that the gene regulatory systems of *D. pseudoobscura* are different from those of *D. persimilis* responsible for the development of bristles analyzed in question, and that such genes express their effects only in backcross individuals, and that clearly explains for the existence of very low viability in backcross classes. Thus, such a divergence in the structural as well as regulatory genes between the two species is the main cause for the occurrence of very low viability (specifically for males) in the backcross progeny. These results, therefore, imply that in addition to the reproductive characters such as spermatogenesis, the gene regulatory systems are also affected at the time of speciation. In other words, *D. pseudoobscura* and *D. persimilis* did diverge in their gene regulatory systems at the time of speciation (however, to what extent we do not know yet).

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Kekic, V. Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski trg 16, 11000 Belgrade, Yugoslavia. *Drosophila* community in barrels containing fermenting grapes.

It is common for fruit and wine growers in my country to distill homemade brandy, and it is still done in an old way: fruit is placed in barrels covered by cotton (or by plastic nowadays) cover, and stirred at