Table 2. The χ^2 values at 1 degree of freedom for H_0 about 1:1 *y* and *sn* mosaic spots ratio on abdomen and on the head, notum, humeras, sternopleura in cases of spontaneous and induced mosaicism.

	Spontaneous mosaicism	Induced mosaicism
Imaginal disks derivatives	7.048 p< 0.01	9.666 p< 0.005
Abdomen	1.523 p> 0.10	0.416 p> 0.50

It was shown that:

1. The somatic mosaicism frequencies per 1 fly are significantly higher for abdomen than for other studied areas of the fly surface both in spontaneous and induced mosaicism cases (see Table 2). Therefore, observing of abdomen, which carries many more macrochaetes in comparison with other studied structures, considerably improves the test resolution. The increase in the number of bristles taken into account has the same effect as with increased number of flies examined.

2. The somatic mosaicism frequencies per 1 macrochaeta have no statistically significant differences for abdomen and imaginal disks derivatives both in case of induced and spontaneous mosaicism.

3. It's known that on the imaginal disks derivatives in $y + +/+ w\ sn^3$ heterozygotes the mosaic spot frequency *y* is higher than the mosaic spots frequency of *sn* (Stern, 1936). This regularity remains also for the imaginal disk derivatives in $y + +/+ w\ sn^3$ *vg/vg* heterozygotes both in the case of induced and spontaneous mosaicism. However, the *y* and *sn* mosaic spot frequencies obtained from the abdominal macrochaetes are related as 1:1 both in the case of induced and spontaneous mosaicism (see Table 2).

References: Ref. 1, 1982, Metodicheskie rekomendatsii po primeneniu somatichestogo mutagenesa u *Drosophila Melanogaster* v kachestve test-sistemi dlia uskorennogo opredelenia kanzerogenov, - M. MZ USSR, 1982; Stern, C., 1936, Genetics, 21: 625-730.

The behavior of *Drosophila pavani*, *Drosophila gaucha*, and their reciprocal hybrids in stressful environments.

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Drosophila pavani and *D. gaucha* are two sibling species that with another six constitute the *mesophragmatica* group; these species are endemic to South America (Val *et al.*, 1981). They are predominantly Andean in their distribution. In addition, *D. pavani* and *D. gaucha* may produce abundant interspecific hybrids under laboratory conditions; these hybrids are, however, sterile (Brncic and Koref-Santibañez, 1957). In the present study we compare the behavior of *D. pavani*, *D. gaucha* adult flies and their reciprocal hybrids in a reduced space in the presence and in the absence of food. The aim of this investigation is to inquire whether adults of these four types of genotypes exhibit a similar behavior in response to stress. It is important to investigate this type of problem because behavioral changes under stress conditions may reveal information on the role of behavior in determining patterns of geographical distribution (Hoffmann and Parsons, 1994). Under environmental stress the parental species may show a similar behavior, but the species hybrids may exhibit a different one. In this case we could infer that the species differ genetically in the control of the behaviors observed.

We used strains originated from adults collected in Chillán (*D. pavani*) and Buenos Aires (*D. gaucha*). Virgin flies of those strains were reciprocally crossed and the behavior of F_1 adults of the four types of genotypes (p × p, g × g, p × g, and g × p) was observed in vials of 18 and 36 cm^3 in volume. The flies used were grown individually in isolation vials filled with 4 cm^3 of culture medium. Once filled with the medium, the vials had 36 cm^3 of free space; they will henceforth be called "big space vials". In one experiment, adult flies of the Chillán and Buenos Aires strains were introduced individually in "virgin" big space vials and their behavior was observed for 2 min. In another experiment, the flies were introduced in vials with food where the available space was 18 cm^3 ("reduced space vials"), and their behavior recorded for 2 min. In a third experiment, flies of the mentioned strains were individually introduced in reduced space vials without food

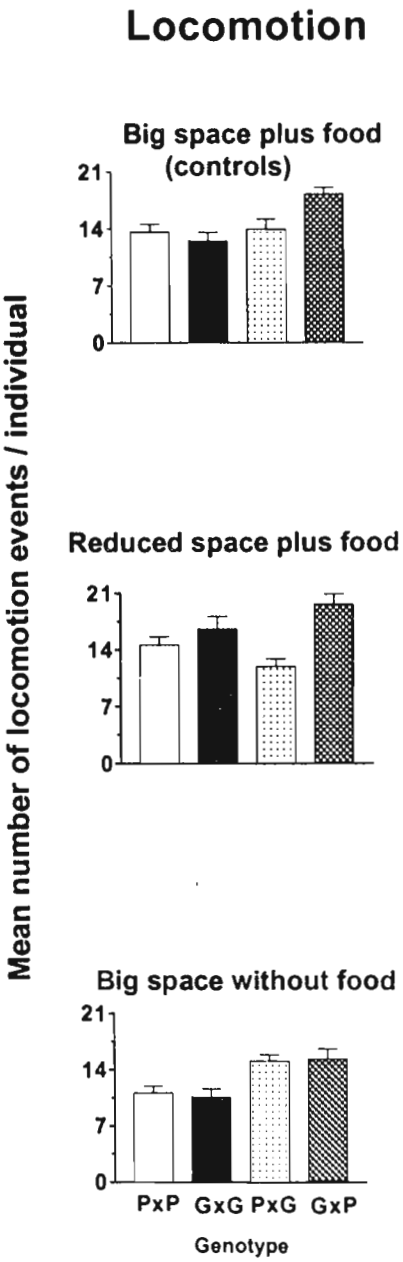

Figure 1. Locomotion rate of the p × p, g × g, p × g and g × p males in vials of 18 cm^3 (reduced space) and 36 cm^3 (big space) of free space, in the presence and in the absence of food.

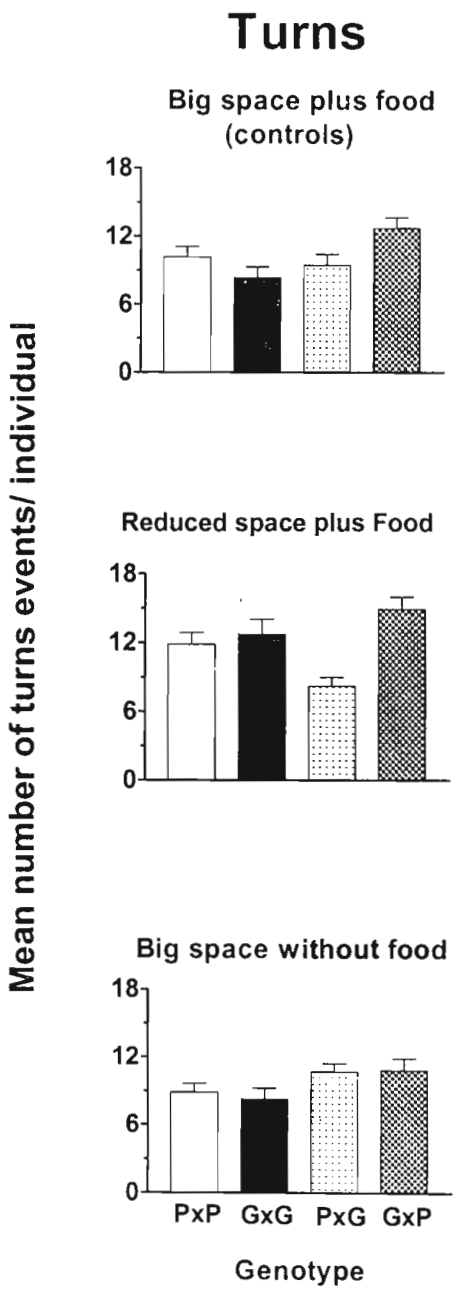

Figure 2. Turning behavior of the p × p, g × g, p × g and g × p males. Other details as in Figure 1.

and their behavior recorded for 2 min. In the three kinds of experiments we always used "virgin" vials for each fly. The behaviors recorded were: i) locomotion, ii) turning, iii) jumps and iv) grooming. Preening was exhibited while the flies remained without movement in the vials.

Figures 1 and 2 show the rates of locomotion and turning of males of the four types of genotypes in the environments. In big space vials the locomotion and turning rates of the g × p males statistically differ

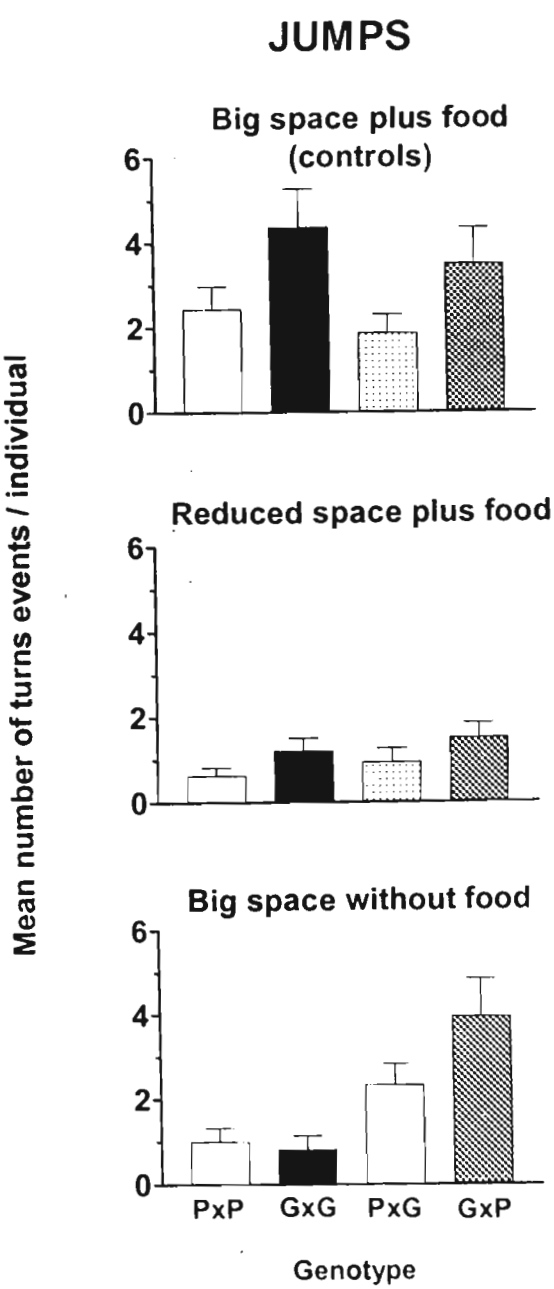

Figure 3. Jumping rate of the p × p, g × g, p × g and g × p males. Other details as in Figure 1.

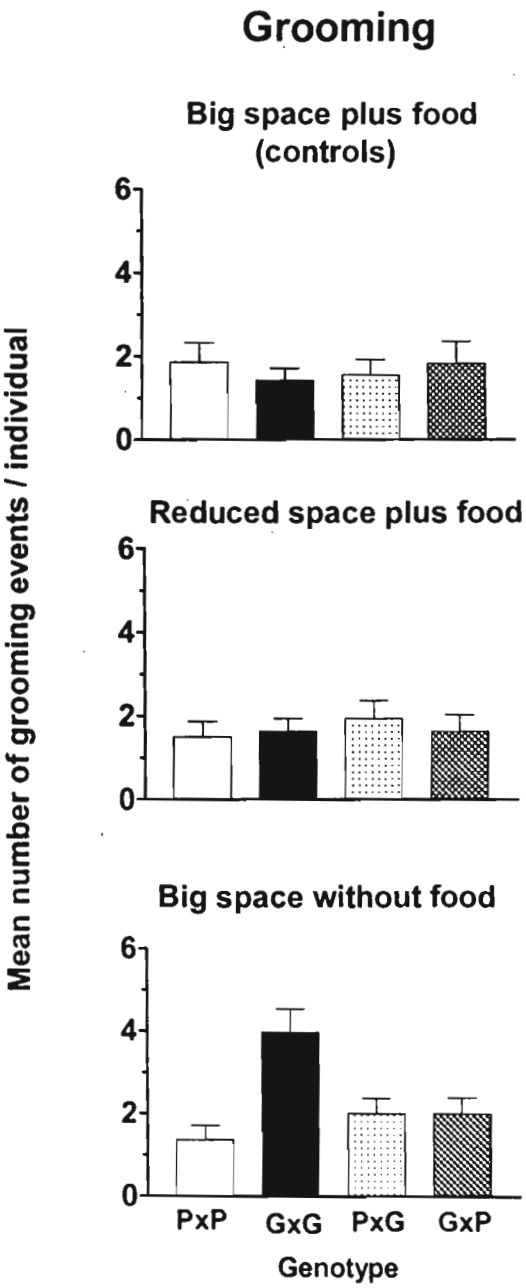

Figure 4. Grooming behavior of the p × p, g × g, p × g and g × p males. Other details as in Figure 1.

from the other three genotypes (p × p, g × g and p × g) (Figures 1 and 2) (ANOVA). However, in reduced space vials, the p × g hybrid males show a lower locomotion and number of changes in direction than p × p, g × g and g × p males (ANOVA). In big space vials without food, the p × p and g × g males reduced locomotion, but the turning rate is similar among the p × p, g × g, p × g and g × p males (ANOVA). Figure 3 shows the jumping rate of males of the four types of genotypes. In big space vials, the jumping rate of the g × g and p × g males is statistically different to that of the p × p and p × g males. In reduced space vials, the jumping rate decreased in the four types of males without statistical differences between them. By contrast, in

big space without food vials, the jumping rate of the species hybrids is greater than that of the parental species (ANOVA). Figure 4 shows the rate of grooming of the p × p, g × g, p × g and g × p genotypes. Statistically significant differences between the four genotypes were only found in big space vials without food, that is *D. gaucha* males substantially increase grooming in big space vials without food. On the other hand, in contrast with the males, females of the four types of genotypes show a similar behavior in the three environments where the male's behavior was studied (ANOVA) (data not shown).

Locomotion and turning are behavioral elements that configure patterns of movement in *Drosophila* adults and larvae (Godoy-Herrera *et al.*, 1997). Our results indicate that in the same environment, males of the four groups of genotypes may modify those behaviors in different ways. Thus, in big-space vials with food, p × p males decrease locomotion and turning rate while g × p males increase these behaviors, indicating there exists a genotype-environment interaction for their expression. These results seem to suggest that the g × p hybrid males could adjust in different ways to stressful environments. It is also interesting to note that the jumping rate decreases when the males are confined in reduced space. Jumping seems merely to represent aborted flight of the males in the vials. Given that in a relatively reduced space male jumping behavior equally decrease in the four groups of genotypes, we conclude that there is no genotype-environment interaction for the expression of such behavior. Grooming seems to increase in stressful circumstances (Hoffman and Parsons, 1994), and it is believed that it counteracts the effect of stress (Equibar and Moyaho, 1997). Our results show statistically significant differences for grooming rate between the four groups of genotypes when the males are confined in big vials without food and water. This kind of environment is probably very stressful for the flies. The results indicate that g × g males exhibit the greater rate of grooming, suggesting that this genotype could be more sensitive to the absence of food and water. In contrast with the males of the four groups of genotypes, the females did not show significant differences among them for the behaviors observed. We are planning further experiments to better understand these findings.

Acknowledgments: Supported by Fondecyt 1960727.

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Perturbation of sex determination in the strain *In(1)BM2(reinverted)*.

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The strain *In(1)BM2(reinverted)* of *Drosophila melanogaster*, shows a mutation in the structure of the polytene male X chromosome (Mazumdar *et al.*, 1978). In third instar male larvae reared at 18°C, about 25% of polytene nuclei reveal X chromosomes that appear twice as wide as the X chromosome of wild type larvae (Figure 1a). However, unlike polytene chromosome puffs, such puffy Xs do not manifest enhanced transcriptional activity (Kar and Pal, 1995). This characteristic thus classifies the puffy Xs as pompons (reviewed in Zhimulev, 1995). The absence of correlation between puffing and transcription suggests that the chromosomal rearrangement perturbs a pathway that controls the structure, but not the transcription, of the male X chromosome. The sex and chromosome specificity further suggests the possibility that the rearrangement affects the function of a regulator of the dosage compensation pathway.

The expression of the puffy Xs is controlled by the rearranged breakpoint at the 16A region of the polytene chromosome (Kar and Pal, 1995). In order to map the rearranged breakpoint, mutagenesis of segment 16A of *In(1)BM2(reinverted)* X chromosome has been initiated. Freshly eclosed *In(1)BM2(reinverted)* males were irradiated with 4000 rads of g-irradiation and mated to virgin *Df(1)B* females (*Df(1)15F9-16A1; 16A6-7*, Lindsley and Zimm, 1992). Flies emerging from such matings were scored for lethal or visible mutations, alteration in sex ratio and reversal of the puffy X phenotype.