Allozyme studies also have shown that the PGM gene is not sex-linked in another member of the *repleta* species group, *D. mojavensis* (G. Hocutt and T.A. Markow, unpublished). Our observations, together with the postulated phylogenetic history of chromosome rearrangements in the *nannoptera* and *repleta* species groups (Ward and Heed, 1970), are consistent with a sex-linked mode of inheritance of the *Pgm* locus in *D. pachea*.

Acknowledgments: This research was supported by grants from the Consejo Nacional de Ciencia y Tecnología (CONACYT; 500100-5-3614N) and the National Science Foundation (INT-8416427, INT-9402161 and DEB-9510645). We thank Dana Tamashiro for help with collecting and laboratory analyses, and the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Campus Guaymas, for providing laboratory facilities.

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Size-related-traits associated with courtship success and ecological parameters in a natural population of *Drosophila gaucha* (Diptera:Drosophilidae).

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Introduction

Sexual selection which arises from differential mating success involves a series of behavioral strategies that can be associated with size-related traits. In *Drosophila*, it has been shown that males do not discriminate during courtship, it being the females that choose their mates (but see Noor, 1996). Body size was often found to be positively correlated with male mating success but sexual selection would also occur on other size-related traits (Norry *et al*., 1995). Courtship behavior of the South American species *D. gaucha* is characterized by a large activity of the males, including a series of phases like the vibration of the wings, licking of the genitals, and the exchange of yeast drops (Koref-Santibañes, 1963). *D. gaucha* belongs to the Mesophragmatic group that includes at least 9 Andean species endemic to South America. *D. gaucha* is the most widely distributed member of the group, and it has been found in Bolivia, Uruguay, Argentina, and the south of Brazil (Brncic, 1987). In Mar del Plata (Argentina) it is the most abundant *Drosophila* species in winter, possibly associated with decaying fruits and other rotting vegetable material (Fernández Iriarte and López, 1995). However, no record exists about its breeding and feeding sites.

The aims of the present study were the characterization of some ecological parameters in a natural population of *D. gaucha* and to establish which size-related traits are involved in males in courtship success.

Materials and Methods

Sampling took place in a small cactus plantation of *Opuntia ficus-indica* located in the outskirts of the city of Mar del Plata. At this site, 23 rotting cladodes (rots) were collected. Each rot was taken to the laboratory and placed inside a plastic bag. All emerged flies were removed every 24 hours, sexed and placed in vials with culture media.

The following ecological parameters were estimated: colonization ability: number of rots with emerged flies/number of total rots; emergence window: mean number of days from the first to the last emergence in the rots; and density of flies: mean number of flies per cm^3 of the cactus rot.

In order to determine which size-related traits were related with courtship success, 10-15 days old virgin flies of each sex were used in the choice experiment, age at which they attained sexual maturity (Koref-Santibañes, 1963). The choice consisted in putting two males of the same age and one virgin female in vials, and they were observed until mating. Subsequently, mated and unmated males were removed from the vials and scored for several traits. Five morphometric traits were measured: thorax length, wing length, wing width, head width, and face width (see Norry *et al.*, 1995). Measurements were obtained using a 40× binocular microscope with a calibrated ocular. Data were logarithm transformed prior to the ANOVA testing for differences between mated and unmated males in size-related traits.

Results and Discussion

Ecological parameters: All emerged flies (146 females and 139 males) from the rots of *Opuntia fiscus-indica* were *D. gaucha*. The average number of flies per rot was 19±3.33 (9.37 females and 9.27 males). Sixty five percent of the rots examined were colonized; the emergence window was 5.93±2.25 days and the density was 0.042 individuals per cm^3 of cactus.

Size-related traits: Table 1 shows the mean and the standard deviation of the traits scored for mated and unmated males. For every measured trait, except for face width, mated males were greater than unmated. However, the ANOVA was significant only for wing width and marginally significant for head width (Table 2).

Table 1. Average values (standard deviation) in mm of the size-related traits in mated and unmated males.

Trait	Mated males		N	Unmated males		N
Thorax length	1.281	(0.038)	25	1.268	(0.036)	25
Wing length	1.791	(0.062)	25	1.777	(0.047)	24
Wing width	1.167	(0.044)	21	1.140	(0.037)	21
Head width	1.100	(0.035)	25	1.081	(0.033)	25
Face width	0.440	(0.026)	25	0.441	(0.019)	25

Table 2. ANOVA test for size-related traits between mated and unmated males.

Trait	df (effect)	MS (effect)	df (error)	MS (error)	F
Thorax length	1	0.0013	48	0.0008	1.59
Wing length	1	0.0007	47	0.0009	0.71
Wing width	1	0.0053	40	0.0012	4.39**
Head width	1	0.0038	48	0.0010	3.83*
Face width	1	0.0001	48	0.0027	0.04

*p = 0.056 and **p < 0.05

This study is the first records of ecological data of natural populations of *D. gaucha*. In fact, this is the first time that cactus are recognized as possible breeding sites for *D. gaucha*. The colonization ability is high in comparison to other cactophilic *Drosophila* species flies in Opuntias, that averaged 22% (Hasson *et al.*, 1992). However, the density of flies per rot was lower, which may suggest that the species is not a specialist in cactus.

The differences observed in wing width suggests the importance of this trait in the reproductive success of males. This fact could be associated with the important role of males wing vibration during courtship (Koref-Santibañez, 1963). The same trait was shown to be the target of sexual selection in *D. melanogaster* (Partridge *et al.*, 1987). Also, the differences in head width were marginally significant, in which case the results agree with those obtained in the cactophilic species *D. buzzatii* (Norry *et al.*, 1995). These authors propose that this trait is associated with the size of the probosis and in turn with the capacity to transfer drops of yeast during courtship.

Acknowledgments: We would like to thank Esteban Hasson for helpful comments on the manuscript.

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Polytenization rate of some heterochromatic sequences in different tissues of *D. melanogaster* otu^{11} mutants.

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Introduction

The bulk of *D. melanogaster* heterochromatin consists of satellite DNA sequences (Bonaccorsi and Lohe, 1991; Lohe *et al.*, 1993). Transposable elements are also a constant component of mitotic heterochromatin (Pimpinelli *et al.*, 1995). Other repeated sequences from telomeres such as the He-T (Traverse and Pardue, 1989) and the Telomere-Associated Sequence (TAS) (Karpen and Spradling, 1992; Zhang and Spradling, 1995) have been found in heterochromatin as well. Furthermore, there are a number of vital genes, similar to "typical" euchromatic ones, in heterochromatin of the second (Hilliker, 1976) and the third chromosomes (Marchant and Holm, 1988). In the salivary gland (SG) polytene chromosomes of *Drosophila* larvae, the pericentric heterochromatin is strongly underpolytenized (Mulder *et al.*, 1968; Glaser *et al.*, 1992), but some unique and some repeated sequences form polytenized "islands" (Devlin *et al.*, 1990b; Le *et al.*, 1995; Zhang and Spradling, 1995).

It has been shown that true polytene chromosomes can appear in pseudonurse cells (PNCs) of *D. melanogaster otu* mutants (King *et al.*, 1981). Some parts of pericentric heterochromatin which do not polytenize in SG chromosomes, do polytenize in PNC chromosomes developing a specific morphological pattern which can be identified in every individual chromosome arm (Mal'ceva and Zhimulev, 1993).

Here we determined the level of polytenization sequences from various regions of pericentric heterochromatin in SG and PNCs polytene tissues.