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The effect of temperature on mating  
activity in *D. gaucha* and *D. pavani*.

*D. gaucha* and *D. pavani*, two sibling  
species of the mesophragmatica group,  
are mostly allopatric in nature, overlap  
in one region of North Western Argentine  
and under laboratory conditions give  
abundant, but sterile hybrids. Their

courtship activity is very similar in pattern, although *D. gaucha* is more active under laboratory conditions, while copulation time is of around 60 min. in *D. pavani* and only about 30 min. in *D. gaucha* (1964, *Biológica* 36:17-26).

Several studies have been undertaken in order to analyze the biological and physiological differences between both species in nature. One of them bears relation to the effect of temperature on mating activity in them and in their reciprocal crosses. For this purpose the temperatures of 8°C, 12°C, 14°C, 16°C, 25°C, 29°C, 31°C were used. These could be indicative of the ranges at which the species may usually exist in nature.

Ten adult virgin females of either *D. pavani* or *D. gaucha* were placed together with an equal number of males of the same or the other species in separate vials at each of the temperatures mentioned, over a period of 6 hours. The spermathecae and ventral receptacles of the females were then examined for the presence of sperm. At least 100 pairs of each group were analyzed.

The results are summarized in Table 1. It may be observed that the optimal temperature for mating seems to be about the same for both species. Nevertheless, *D. pavani*, which

Table 1. Percentage of females inseminated

Crosses		Temperature													
♂	♀	8°C		12°C		14°C		16°C		25°C		29°C		31°C	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
gaucha	gaucha	200	5	100	24	125	39	100	31	200	79	200	36	100	0
pavani	pavani	200	31	200	37	100	23	100	34	100	48	200	37	100	0
pavani	gaucha	121	4.1	100	18	116	26.7	100	45	200	63.5	200	35	100	0
gaucha	pavani	200	0	100	0	100	1	200	13	200	24	200	15	100	0

is in general less active than its sibling species, seems to tolerate lower temperatures more. This may bear relation to their geographic distribution, as *D. gaucha* lives in general in regions with warmer climate than does *D. pavani*. On the other hand, the great differences between the reciprocal crosses may indicate that the receptivity of females is one of the determining factors in mating success.

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of Chile, Santiago, Chile. Density, fer-  
tility and gregarian tendency in *D. mel.*

The gregarian tendencies of some species,  
as *D. melanogaster*, may be revealed by  
the fact that females tend to lay their  
eggs in only some of the available breed-  
ing sites, or in areas which have pre-

viously been occupied by larval forms (1966, *Am. Nat.* 100:27-133).

In order to analyze the effect of density and fertility on this type of gregariousness, oviposition was studied in *D. melanogaster* inseminated females placed in population cages, in numbers ranging progressively from 6 to 768. Each cage had 6 numbered vials containing food medium added with carbon, equidistant from each other and in fixed positions. In each vial the number of eggs was counted every 24 hours, and replaced by a new one over a period of 10 days.

From the results, it can be concluded that the site of maximum oviposition is independent of the spatial position of the vial within the cage; nevertheless 72% to 92% of the eggs are found in 50% of the total number of available vials, although this percentage decreases with increasing density. The maximum fertility was found at lower density (for example for 6 females per cage, the mean oviposition per day was of 4.72 eggs, and for 768 females it decreased to 0.55 eggs per day). If maximum oviposition is considered when density is lowest, it is possible to construct a regression line whose slope falls regularly as density increases. The observed facts seem to indicate that the number of individuals is important for the aggregative tendencies of oviposition in *D. melanogaster*.