Table 1. Mean survival in inner, outer and total populations, and mean developmental time in inner and outer subpopulations of the Drosophilid **Chymomyza costata.**

Strain	Overfeeding (days)	Survival			Developmental Time	
		Inner	Outer	Total	Inner	Outer
VKL	Uncrowded control	--	17.0±1.3	17.0±1.3	--	32.18±0.44
	13	0.0±0.0	8.2±2.1	8.2±2.1	--	40.84±0.98
	17	0.7±0.5	11.5±2.9	12.5±2.8	34.50±0.50	41.91±2.10
	21	1.5±0.9	5.5±3.0	7.0±2.9	36.83±0.17	47.93±1.65
	25	2.0±1.0	10.7±0.7	12.7±0.7	42.10±1.45	53.42±0.64
TODA	Uncrowded control	--	17.7±0.9	17.7±0.9	--	32.11±0.17
	17	0.0±0.0	11.5±3.5	11.5±3.5	--	46.39±1.87
	21	0.0±0.0	13.5±1.3	13.5±1.3	--	44.35±1.94
	25	0.5±0.5	13.7±2.8	14.2±2.6	38.50± *	47.57±1.07
	29	2.0±2.0	10.7±3.9	12.8±2.3	38.75± *	52.01±1.94
	33	3.0±2.4	14.5±2.5	17.5±4.6	40.50±2.51	61.29±1.20

* values obtained from a single vial.

The conclusion is that larvae are in diapause, but the mechanism which makes them enter diapause is different from that previously described in literature so far for this species (Basden 1954; Hackman et al. 1970). In relation to this view, it seems that larval stop might be regarded as a kind of diapause in non-diapausing species, such as **D.melanogaster**, but that is also present in diapausing species such as **Chymomyza costata**, promoted by crowding.

References: Basden, E.B. 1954, Proc. Royal Ent. Soc. London 29:7-9; Hackman, W., S. Lakovaara, A. Saura, M. Sorsa & K. Vepsalainen 1970, Ann. Ent. Fenn. 36:1-9; Lakovaara, S. 1969, DIS 44:128; Mensua, J.L. & A. Moya 1983, Heredity 51:347-352; Moya, A. & J.L. Mensua 1983, DIS 59:90-91.

Botella, L.M. and J.L. Ménsua. University of Valencia, Spain. A comparison of the urea and uric acid content between crowded and uncrowded cultures of **D.melanogaster** throughout development.

Uric acid, main biotic residue coming from the nitrogen catabolism in **Drosophila** (Botella et al. 1984a), plays an important role in competition phenomena for food, in such a way that it may account at least partially for the low survival and delayed development, as well as larval stop obtained in these conditions (Botella et al. 1984). On the other hand, urea, also present in small quantities in Drosophila cultures (Botella et al. 1984, 1985) is able to mimic the kinds of responses obtained in crowded cultures, for it decreases larva-adult survival and increases mean developmental time (Botella et al. 1983). An analysis of urea and uric acid has been carried out in the present work in order to compare uric acid and urea contents in crowded and uncrowded cultures throughout development. Crowded cultures consisted of 5 x 0.8 cm vials with 0.5 ml of Lewis medium seeded with 70 larvae. Uncrowded cultures consisted of 10 x 2.5 cm vials with 5 ml of Lewis medium seeded with 70 larvae. Both kinds of cultures were incubated at 19°C at 85% relative humidity and constant light. Analysis of urea and uric acid were carried out following the methods described elsewhere (Botella et al. 1984). The expression giving larval, pupal and adult content of both products is:

C(mg/100ml) = (Sample absorbance/Standard Absorbance) X (C Standard) X (1/dilution factor), where dilution factor (d.f.) is: d.f. = (Sample Volume)/(Sample Volume + Sodium Acetate Volume).

Sample volumes were estimated from larval, pupal and adult densities, as well as their respective body weights. These data appear in Table 1. The results of uric acid and urea determinations throughout the different stages of development are also shown in Table 1. As can be seen, when comparing the results between crowded and uncrowded cultures the following observations deserve to be pointed out: (i) uric acid concentrations in larvae from uncrowded cultures are higher than those of larvae bred in crowded conditions; (ii) uric acid concentrations in pupae rise as their development progress (as a consequence of a lack of external excretion), while urea concentration remains more or less the same, this being true for both crowded and uncrowded cultures. It is worth mentioning here that the level of both products is higher in crowded than in uncrowded conditions in pupal stage, but for the urea content in mature pupae where both kinds of cultures show approximately the same level; (iii) the main component of the newly born adults excretion is uric acid present in high levels, and close to that obtained in 33-day old pupae from crowded cultures. Recently emerged adults, when incubated at 25°C for 20 hr show a high uric acid content, similar in both kinds of cultures, and close to the uric acid concentration at the end of the pupal stage. Urea concentrations are slightly above this level.

Table 1. Urea and uric acid concentrations in larvae, pupae and adults from crowded and uncrowded cultures of **Drosophila melanogaster** throughout development.

Stage	Development (days) crowded	uncrowded	Body Density	Mean weight (mg) (20 individuals) crowded	uncrowded	Uric acid level (mg/100ml) crowded	uncrowded	Urea level (ml/100ml) crowded	uncrowded
Larvae	13	12	1.05±0.01	22.8±1.0	34.7±1.8	31.7±3.4	142.6±5.0	18.5±3.5	13.5±1.8
	25	--		22.1±3.0		22.1±4.1		27.0±2.7	
Pupae	24	14	0.85±0.04	17.0±0.8	28.6±1.0	121.4±8.8	80.4±5.5	25.9±2.9	3.5±1.5
	33	20		13.0±0.3	32.3±0.9	140.7±7.9	99.7±4.3	14.9±2.6	18.6±6.0
Adults	Excretion of newly emerged adults		--	--	--	169.7±30.4	173.3±21.0	20.8±4.7	11.9±7.0
	20 hr old adults		0.97±0.1	9.2±0.6	20.4±0.6	173.9±31.3	161.2±12.8	29.2±4.0	33.3±7.1

The differences found between larvae, pupae and adults from crowded and uncrowded cultures are explained as follows: (i) larvae from crowded cultures must be metabolically less active than those from uncrowded ones; (ii) when uncrowded larvae approach pupation they must eliminate a large amount of their uric acid content, while crowded larvae should activate their metabolism in order to pupate producing as a result a large amount of uric acid, similar to the level found in larvae from uncrowded cultures; (iii) all pupae that are able to attain adult stage must be included within a physiological optimal range which allows them to emerge as adults. These physiological limits would in turn explain the similarity in the uric acid content found in adults coming from crowded and uncrowded cultures.

References: Botella, L.M., A. Moya & J.L. Mensua 1983, DIS 59:23-24; Botella, L.M. & J.L. Mensua 1984, DIS 60:66; Botella, L.M., A. Moya, C. Gonzalez & J.L. Mensua 1985, J. Insect Physiol. 31:179-185.

Carracedo, M.C. and P.Casares. Universidad de Oviedo, Spain. Hybridization between **Drosophila melanogaster** and **D.simulans** in competition experiments.

Most of the papers dealing with interspecific competition between the pair of sibling species **D.melanogaster** and **D.simulans**, assumed that the possibility of interspecific hybridization is negligible. This assumption is based on the supposition that in these competition cultures, in which males and females are present, the frequency of hybridization must be very low or null, since each individual has a chance to elect (free-choice) a partner of its own species. This situation is different from the well-known methods of "no-choice" (one sex of each species), where the females are forced to accept a foreign male, and the frequency of hybridization reaches, in some instances, high values (Manning 1959; Watanabe et al. 1977; Carracedo & Casares 1985). We have carried out a study on interspecific competition between a "sparkling-poliert" laboratory mutant of **D.melanogaster** and a "white" strain of D.simulans derived from a natural population. All competition tests were made at an adult density of 10 pairs and with relative species frequencies of 0.1-0.2....0.9. A factorial 2 x 2 design was carried out by using two temperature regimes for the first factor, room variable temperature or fixed 21°C. As the second factor, two types of adults were utilized, based on that their larval development were in mono-specific or bi-specific cultures. For each combination of temperature-development-frequency, five replications were made. Ten pairs of virgin adult flies coming from mono- or bi-specific cultures were placed in culture bottles for 10 days. At the end, the females were placed into individual vials and their progenies examined. The appearance of wild phenotypes was taken as evidence of hybridization. We have only examined the females of **D.melanogaster** because in a simultaneous study with the same strains, the hybridization between **simulans** females and **melanogaster** males (no-choice method) was null (Carracedo & Casares 1984).

Table 1 shows the values of hybridization (i.e., hybridized females divided by total females), which represents the sum of all the relative frequencies for each of the four factorial combinations. These values, as percentages,were submitted to a weighted analysis of variance in the logit scale with the transformation for small size suggested by Snedecor & Cochran (1967), and the results are also shown in Table 1. The factorial effect of the conditioned adult development was not significant, which differs from the results of Eoff (1973), but the temperature showed a significant effect, being hybridization higher at room temperature than at 21°C. This result appears to be related with better general fitness showed by **D.simulans** in the former temperature regime (Carracedo 1984). It is of interest to ascertain whether the values