Nirmala Sajjan, S. and N.B. Krishnamurthy. University of Mysore, Manasagangothri, Mysore, India. Competition studies between D. ananassae and D. melanogaster.

D. ananassae and D. melanogaster, the two cosmopolitan, sympatric and domestic species of the melanogaster species group, were subjected to competition both at the preadult and adult stages of the life cycle. Monomorphic and polymorphic strains of D. ananassae and highly inbred strains of D. melanogaster were employed in these experiments. By adapting the procedure of Ayala (1965) the relative and competitive fitnesses of the above strains have been estimated. Preadult competition was analysed at 4 different densities - 100, 200, 400 and 1,000 eggs per 250 ml milk bottle containing equal amounts of media. The complete dynamics of these species in inter- and intraspecific competition will be discussed elsewhere.

Some of the observations of the above experiment are presented here. The relative fitness, as measured by the productivity and the total population size, is more for D. melanogaster than D. ananassae. The fitnesses of monomorphic strain of D. ananassae and highly inbred strain of D. melanogaster were found to be superior to the corresponding polymorphic and less inbred strains. In interspecific competition, irrespective of the strains in the process, D. ananassae was eliminated by D. melanogaster. The preadult competition has revealed that as the density increases, the mean developmental time of the species also increased while the viability was lowered. D. ananassae manifests a faster rate of development while D. melanogaster exhibits a higher grade of viability. The mean developmental time of the pure cultures of both the species is significantly less than the corresponding mixed cultures. This indicates that some sort of interference occurs when they compete for food resulting in lengthening of the developmental period.

Thus, D. melanogaster is a better competitor because of its higher degree of egg to adult viability and more relative fitness than D. ananassae. In view of this, it is felt that the sympatric coexistence of these species in nature may be mediated by their yet unknown non-overlapping microhabitats.

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Reference: Ayala, F.J. 1965, Genetics 51:527-544.

Mulley, J.C. University of Sydney, Australia. Electrophoretic detection of pyranosidase in Drosophila buzzatii.

In D. buzzatii the detection of β-glucosidase and β-galactosidase on duplicate electrophoretograms gave identical banding patterns. This indicated that the one enzyme was involved and a problem of nomenclature therefore exists. The difficulty was overcome by referring to the enzyme as pyranosidase since synthetic pyranosides were employed as substrates.

Electrophoresis was done on density gradient acrylamide gels. Gels were run at 300 V for 2 hours in a tris-borate buffer (0.1 M, pH 8.9). Enzyme detection was extremely simple. The pH of the gel was lowered in phosphate buffer (0.1 M, pH 6.0) for 15-30 minutes. To this was added 10 mg 4-methylumbellicalfenyl-2-acetoamido-2-deoxy-β-D-glucopyranoside or the corresponding galactopyranoside (obtained from Koch Light). After 15-30 minutes the fluorescent bands were scored under ultraviolet light (3,500 Å).

Variation was detectable in Australian populations. Banding patterns were found to be inherited in a simple Mendelian fashion.

$$S \times F \longrightarrow \text{all } S/F$$
$$S/F \times S/F \longrightarrow 11F : 21\ S/F : 8\ S$$

Gene frequency was highly stable (between .83 and .95) in 10 populations sampled from 8 localities where the greatest distance between localities was over 500 miles. This stability in gene frequency may well be a reflection of the uniform habitat of D. buzzatii which colonise only the rotting stems and fruit of certain cacti of the genus Opuntia.

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