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Allele frequencies distribution at the Est-C locus in wine cellar populations of Drosophila melanogaster.

The Est-C locus perhaps is one of the polymorphic allozimic loci which isn't studied as much as others, because the results can be erratic, at least in natural samples taken from different places and times. Since Beckman and Johnson (1964) described two alleles (the fast and the slow one) and its three correspondent phenotypes, many other alleles have been described in different populations. In the two, Japanese and North American populations of Drosophila melanogaster studied by Kojima et al. (1970) the genic frequencies for the fast allele were almost fixed (0.844 and 0.920, respectively) and the other alleles oscillating with frequencies of 0.104 and 0.074, and furthermore a very-fast allele with 0.005 frequency has been found in the Japanese population. In the natural Greek population studied by Trianthaphillidis and Christodoulou (1973), the genic frequencies for the three alleles were: 0.017 for the slow allele, 0.977 for the fast one and 0.06 for the v-fast allele.

Johnson & Schaffer (1973) analyzed this locus in twelve natural populations, in different places of the U.S.A. An average allelic frequency was found for the slow allele equal to 0.047, 0.897 for the fast one and 0.056 for the v-fast. Furthermore a fourth allele was detected in a population of Florida, called highly-fast, the allelic frequency was 0.005. Up to this moment, None of the revised authors find the recessive-null alleles. Girard & Palabost (1976) were the first in detecting the existence of a recessive allele in four of the fifteen populations taken from a wine cellar in South France. The allelic frequencies on the average were: 0.057 (Est-C^S), 0.883 (Est-C^F), 0.006 (Est-C^{VF}) and 0.024 (Est-C^O). However, Anxolabehere et al. (1975) studying the same populations of the paper of Girard & Palabost (1976) during three years didn't find the recessive allele or the v-fast allele, and the allelic frequencies were 0.042 for the slow allele and 0.958 for the fast allele.

Recently Trianthaphillidis et al. (1980) when studying in a natural population of the island of Corfu, once more found the three alleles which they had found in 1973, with genic frequencies of 0.026 (Est-C^S), 0.967 (Est-C^F) and 0.007 (Est-C^{VF}). Voelker et al. (1980) studying North Carolina populations and Langley et al. (1981) in London populations, found null alleles in this locus with frequencies 0.005 and 0.0049, respectively. In the latest reference revised (Singh et al. 1982) the authors detested four alleles (none of them recessive) in two american populations and one in Africa, while only the slow allele (and whatsmore the fast) was found in four different populations originally from America, France, Vietnam and Taiwan, which the allelic frequencies were 0.049 (Est-C^S) and 0.951 (Est-C^F). And the fast allele was fixed in both Canada and Australian populations.

As we can see, of all the authors revised by us, Girard & Palabost (1976, 1977), are the only ones that find null allele with significant frequency, when studying this polymorphic locus in the wine cellar populations.

We have studied this polymorphic locus in ten wine cellar populations, in the South Iberian Peninsula, using the starch-gel electrophoresis technique (Poulik 1957) with the modifications put forward by Beckman & Johnson (1964).

The results obtained can be seen in Table 1. The allelic frequencies have been calculated by Bernstein's method (Cavalli-Sforza & Bodmer 1971).

Table 1. Frequencies for Est-C^S, Est-C^F, Est-C^V and Est-C^O alleles in ten wine cellar populations.

Population	sample size	S	F	V	O	HET. obs.	HET. est.
C1	100	0.005	0.808	0.035	0.151	-	0.321
C2	100	0	0.995	0.005	0	0.01	-
C3	100	0	1	0	0	-	-
C4	100	0	0.985	0.015	0	0.01	-
C5	100	0.026	0.726	0	0.246	-	0.408
C6	100	0.016	0.834	0.035	0.113	-	0.286
C7	100	0	0.859	0.059	0.084	-	0.256
C8	100	0	1	0	0	-	-
C9	100	0.021	0.762	0.015	0.201	-	0.376
C10	100	0.011	0.924	0.017	0.053	-	0.153
Σ=1000		0.008	0.890	0.018	0.085	0.010	0.300

As we can observe, the percentage of the populations which have a fixed locus in the Est-C^F is higher than that of the other authors, although the genic frequency on an average of the ten populations does not differ at all from the others, as a result our fixations can have some sampling error.

The same as Girard et al. (1976, 1977), Voelker et al. (1980) and Langley et al. (1981), a null recessive allele has been found by us with frequencies higher than those from the French populations. But on the whole these allelic frequencies for the Est-C^0, have an insignificant value. All the last ones with lower values detected for other alleles, make this locus practically monomorphic.

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Alonso, A., A.Rodero and A.Munoz. Universidad de Cordoba, ESPANA. Study of seven wing measurements and of esterase-6 locus in Drosophila melanogaster.

Since 1966 when Harris in Europe and Lewontin & Hubby in America first applied, almost simultaneously, electrophoretic techniques in the study of allelic variants attempts to relate this allozymic polymorphism to biometrical characters began in laboratory species as well as in domestic ones. Genetic markers were tested for their usefulness in Zootechnics.

Electrophoresis provides us with data on an individual gene. That is, for each protein and variable enzyme, there is a variation associated with different alleles in the loci, and vice versa, each invariable protein corresponds to a monomorphic locus. They attempted to associate the qualitative polymorphism with biometrical traits which are polygenic and whose genes could not be individualized. In this way, Aguade (1974), Cuello (1974), Serra (1977) and Porras (1978) oriented their studies which yielded unsatisfactory results. This occurred because the authors tried to establish a linear relationship between two variation levels of differing complexity, in which the more complex could depend on the simpler, but not in a linear function. On the other hand, the allozymic polymorphisms used

TABLE 1. Frequency distribution of the seventh measurement.

25°C	CLASSES SIZE			30°C	CLASSES SIZE		
GROUP	≤6.20	6.25-6.75	≥6.80	GROUP	≤5.25	5.30-6.00	≥6.05
Est-6^{FF} males	28	11	1	Est-6^{FF} males	30	21	1
Est-6^{FF} females	0	11	21	Est-6^{FF} females	0	12	11
Est-6^{FS} males	35	9	0	Est-6^{FS} males	16	25	0
Est-6^{FS} females	0	16	30	Est-6^{FS} females	1	31	25
Est-6^{SS} males	4	6	1	Est-6^{SS} males	4	6	0
Est-6^{SS} females	1	3	7	Est-6^{SS} females	0	6	7
TOTAL	68	56	60	TOTAL	41	101	44