

Scharloo, W., and W. Vreezen. Universities of Groningen and Leiden, Netherlands. Selection for 5th vein interruption in a Hairless mutant.

Selection for a larger 5th vein interruption was practised on the mutant H^{57c} introduced in the Kaduna cage population. Progress was steady until no 5th vein material was left posterior to the 2nd crossvein. Then progress was almost halted (generations 8-

12) and the variability very small. After the appearance of some individuals with a break proximal to the 2nd crossvein, advance was resumed and the variability increased again. In generation 7 the first individuals appeared which showed a 5th vein interruption without the presence of H^{57c}. The penetrance and expression of these assimilants increased steadily, even when progress in H^{57c} expression on which selection was practised, was apparently halted in generations 8-12.

It can be concluded that the lack of progress and the small variability in these generations is the reflection of a zone of canalization in 5th vein formation around its junction with the 2nd crossvein. This is supported by the result of introduction of chromosomes with dominant markers in stocks obtained from the selection line by relaxation at different stages. The effect of the modifiers introduced in this way seems to depend on the expression range and is very small when they act in the neighbourhood of the 2nd crossvein.

Beardmore, J. A. and W. Kramer. University of Groningen, Netherlands. Selection responses in different environments.

The choice of environment in selection experiments is of considerable theoretical and applied interest. Falconer (Genet. Res. 1, 1960) on the basis of experiments with mice, suggested that for good overall expression of the selected character, selection should

be practised in an environment unfavourable to the expression of this character.

In order to test this thesis and in an effort to establish in how far the genes involved in determining the same character in different environments are the same, an experiment involving selection for number of abdominal chaetae on the 5th sternite of *D. melanogaster* has been started. High, low and unselected control (H, L and C) lines are grown at 22°C and 28°C, giving in all six lines.

The mean values for the character at S 16 are as follows:

H 28	<u>26.54</u>	C 28	<u>19.91</u>	L 28	<u>16.42</u>
H 22	<u>25.36</u>	C 22	<u>20.84</u>	L 22	<u>15.34</u>

1. Selection is clearly effective in both environments.
2. Selection response is greatest in the environment whose effect acts against that of selection (28° for H, 22° for L).

Cross tests in the other temperature were made at S 16 and the values for the six lines are:

	22°	28°		22°	28°		22°	28°
L 22	15.65	14.99	H 22	24.48	24.14	C 22	20.84	20.40
L 28	17.51	15.97	H 28	24.79	25.51	C 28	21.94	19.91

1. Selection response is largely maintained in the new environment using, as a basis of comparison, deviation from control in both environments. This might indicate that the genes selected in the two conditions are broadly similar.

2. The effect of shifting from one environment to the other is not reciprocally equal in any of the three comparisons, 28° lines being more sensitive than 22° lines in all

cases. The H 28 line has fewer bristles at 22°C than at 28°C, suggesting that some of the genes effective at the latter temperature have a diminished effect at 22°C. The magnitude of this diminution in effect is probably of the order of three bristles. Provisionally we may conclude that the genes selected for in H 28 differ appreciably from those selected for in H 22.

The experiment is being continued.

Mettler, L. E. and J. J. Nagle. North Carolina State University, Raleigh, N.C. Corroboratory evidence for the concept of the sympatric origin of isolating mechanisms.

Drosophila arizonensis and *D. mojavensis* are two species found in the southwestern part of the United States and in northwestern Mexico. The central range of *arizonensis* includes the Central Gulf Coast, Foothills of Sonora, Plains of Sonora, and southern parts of the Arizona

Upland and Lower Colorado Valley regions of the Sonoran Desert. *Drosophila mojavensis* consists of two morphologically and cytologically distinct races. Race A is limited to the Mojave Desert and Race B is found in the Central Gulf Coast, Arizona Upland, and Lower Colorado Valley regions of the Sonoran Desert. Race A of *mojavensis* is allopatric to *arizonensis*, while Race B is sympatric with *arizonensis* over a large portion of its range. Both species are members of the Mulleri subgroup of the Repleta group and they are known to hybridize and produce some fertile offspring (Patterson and Stone, 1952). *Drosophila arizonensis* is morphologically and cytologically distinguishable from either race of *mojavensis* (species-specific paracentric inversion differences occur in three of the haploid set of six chromosomes).

Four cage populations were initiated for the purpose of studying inter-specific competition and possible secondary intergradation. Cages I and II were initiated with equal proportions of males and females of *arizonensis* and Race A of *mojavensis*, and Cages III and IV were initiated in the same manner using *arizonensis* and Race B of *mojavensis*. The composition of each population was determined by a cytological examination (salivary-gland chromosomes) of larvae developing from egg samples taken every thirty days (approximating generations). Parental, F₁ hybrid, and post-F₁ recombinant karyotypic combinations could be ascertained for the three chromosomes having species-specific arrangements.

The data obtained from these populations conform to the hypothesis that reproductive isolation is stronger in areas where two species are sympatric, as compared to the degree of isolation between allopatric forms of the same species, which is expected under the concept that isolating mechanisms are intensified through natural selection, as originally proposed by A. R. Wallace (Dobzhansky, 1940).

It is evident from Table 1 that the degree of reproductive isolation is much stronger between the naturally sympatric forms than between the allopatric forms (the relative degree of reproductive isolation being inversely proportional to the incidence of interspecific recombinant types). Reproductive isolation between *arizonensis* and Race B of *mojavensis* is apparently complete in nature; no hybrids have been found among individuals sampled from several areas of Sonora, Mexico where the two species are known to be sympatric (samples collected by Dr. W. B. Heed). Although the above data suggest that introgression or intergradation might occur between *arizonensis* and Race A of *mojavensis*, there is ample reason to suspect that these forms are truly allopatric.

Table 1. Percentages of interspecific recombinant types from hybridization between allopatric and sympatric populations of the same two species.

Sample Number	Percentage of Recombinant Types			
	Cage No. I	II	III	IV
1	30.0	85.0	0.0	0.0
2	51.0	91.0	0.0	0.0
3	72.0	89.0	1.7	1.7
4	85.0	92.0	0.0	0.8
5	88.0	88.0	0.8	0.0
6	86.0	82.0	5.0	2.5
7	-	-	2.5	3.3