EFFECT OF TEMPERATURE UPON THE EXPRESSION OF ADORSO-CENTRAL A BRISTLE REDUCING MUTUANT OF *DROSOPHILA MELANOGASTER*

WILBUR M. LUCE
University of Illinois, Urbana, Illinois

In February of 1932 while examining a forked (*f*) infra-Bar (B^i) stock of *Drosophila melanogaster* which were being kept at 27°C. it was noted that several of the flies among both the males and the females lacked either one or both of the anterior dorso-central bristles. The flies which showed the characteristic were mated together and their offspring examined for its presence. It was noticed that dorso-centrals were missing in only a certain percentage of the flies at 27°C., indicating that at this temperature penetrance was not complete. Inbreeding and selection were followed until it was certain that the stock was genetically pure. The new mutant was tentatively named adorso-central using the symbol *adc* for the gene or factor involved. This name seems appropriate since it describes the chief somatic effect, the loss of dorso-central bristles. Usually one or the other, frequently both, of the anterior dorso-centrals are missing. Rarely the posterior ones are gone, sometimes with, sometimes without, the accompanying loss of the anteriors. Usually when a bristle is lacking the basal ring is also missing but occasionally the ring will be present without the bristle.

The original stock in which the mutation occurred carried forked (*f*) a bristle affecting gene which causes gnarling and bending of the bristles and also results in forked ends on many. It also carried infra-Bar (B^i) which reduces the facet number in the eye. A normal eyed straight bristle stock carrying *adc* was established by crossing the *adc f* B^i to wild type. From these matings it appeared that the mutant is completely recessive to normal. There was also a suggestion from these matings, which were not completely recorded, that the mutant may be sex-linked. It may turn out to be another one of the many scute (*sc*) alleles. After the establishment of the adorso-central by itself, it has been kept as one of the stocks in our laboratory for examination and study. The position and linkage relationships of the mutant are being worked out and when established will be published.

The experiments dealt with in this report are concerned with the effects of temperature upon the expression of this mutant. The flies were raised at constant temperatures of 17°, 22° 24°, and 28° C. The temperature control for the 17°, 22°, and 28° incubators was accurate to plus or minus 0.3°. For the 24° incubator the control was accurate within plus or minus 0.5°. The flies used for the parents had been inbred for two years before the experiments were begun and should, therefore, have been as homozygous as is practicable. The same set of parents produced the flies raised at all of the temperatures. The same batch of food was also used for all tempera-

TABLE 1.—PERCENTAGE OF FLIES WITH ONE OR MORE ANTERIOR DORSO-CENTRAL BRISTLES LACKING WHEN RAISED AT DIFFERENT CONSTANT TEMPERATURES

	17°C.		22°C.		24°C.		28°C.	
	Females	Males	Females	Males	Females	Males	Females	Males
Number of individuals	100	100	100	100	100	100	100	100
Percent lacking anterior dorso-centrals.....	2	0	6	22	14	28	72	88

tures, and all other environmental factors were as accurately controlled as possible. The results obtained are summarized in table 1.

The table shows clearly that at 17° the penetrance of the *adc* factor is extremely low, only two females out of a hundred and no males out of the same number lacked bristles. At 22° the penetrance is still low and even at 24° it is not very high. At 28°, however, 72 percent of the females and 88 percent of the males lacked one or more bristles. The table also clearly brings out that at all temperatures except 17° the penetrance is higher in the males than it is in the females.

When the frequency of the loss of the right anterior dorso-central is compared with that of the left the data show no significant difference between the two sides of the fly in this respect. Thus there were in the whole series 174 flies in which the right anterior was missing and 160 flies with the left anterior missing. Assuming that these two events should occur with equal frequency there is a difference between observed and expected of 7 with a standard error of 8.97. This would clearly indicate that the departure from the assumed equal frequency is certainly not significant since a departure as great or greater would be expected 40 percent of the time due to chance alone.

The *adc* mutant appears to be promising material for the further study of both temperature and genetic effects. A more extended and critical analysis is now being attempted.