

LETTERS TO THE EDITORS

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IN THE PRESENT CIRCUMSTANCES, PROOFS OF "LETTERS" WILL NOT BE SUBMITTED TO CORRESPONDENTS OUTSIDE GREAT BRITAIN.

Non-Lethality of the Mid Factor in *Lythrum Salicaria*

IN 1927 East¹ proposed a theory of the inheritance of style-length in tristylous *Lythrum Salicaria* which involved three factors. One of these, *S*, was epistatic to the others, and determined Short style as opposed to Mid and Long. The other two, each of which was supposed to give Mid style as opposed to Long, were lethal when homozygous and were linked. In 1932 East² seemed to abandon this theory in favour of a single non-lethal factor, having found for the first time a plant which, crossed with Long style, gave a large progeny nearly all Mid. In 1936, however, he explained³ that the 1927 theory was not abandoned, but applicable in his opinion only to the special type of plant with which first Barlow and later he himself had worked.

As Barlow⁴ was the pioneer in the genetics of *Lythrum*, it would be very strange if she had encountered a strain of plants in which the mechanism of the inheritance of style length not only presented unusual features, but also had been totally transformed by the substitution of two linked lethals for a single non-lethal factor in the determination of the Mid style-length, especially as all three factors have *ex hypothesi* no recognizable effects except on the form of flower. At the time of East's second paper², therefore, one of us planned a series of tests, involving no illegitimate matings, and using an open pollination technique. It was hoped in this way to avoid disturbances to the phenotype ratios, due possibly to illegitimate pollination, and it was soon found that large progenies with entirely reliable ratios could be obtained in this way.

The first step, aimed at settling the question of lethality, has now been completed. Four Short plants from seed of an open pollinated plot, grown at the Chelsea Physic Garden in 1936, were tested by open crossing with Long at Harpenden in the following year, and sufficiently large progenies were grown at Merton in 1938. The following classification was obtained:

Family	Long	Mid	Short	Total
A	123	0	135	258
B	130	0	130	260
C	141	0	127	268
D	63	64	139	266

The absence of Mid progeny out of 786 in the first three families is good evidence that stray pollen was effectively absent. The Short parent of family D evidently contained a single gene for Mid style-length. Two other such Short plants have since been found among eight more from open-pollinated seed tested in 1940.

The Short parent D was grown with a Mid daughter

from the family set out above, in isolation in Dr. F. Yates's garden at Harpenden, and two progenies from the reciprocally crossed seed were grown this year at Merton. Since both parents contain the same gene for Mid style-length, the test is critical for the lethality of this gene. If it were lethal we should expect 2 Mid : 1 Long, otherwise 3 Mid : 1 Long.

The two progenies obtained have now been scored as follows:

	Long	Mid	Short	Total
Mid X Short ..	28	103	117	248
Short X Mid ..	25	78	94	197
Total ..	53	181	211	445
Expected (non-lethal)	55.62	166.88	222.50	

The parallelism and homogeneity of the reciprocal progenies afford further confirmation of the absence of stray pollen. As regards the segregation for Mid and Long, the frequencies accord well with the expectations for 3:1 (χ^2 less than 0.7, from one degree of freedom); but are incompatible with a 2:1 ratio (χ^2 greater than 12.0). It is virtually certain, therefore, that the gene tested is not lethal.

The material from these progenies will be available for testing other possibilities not considered by East. Of these perhaps the most important is that of autopolyploid inheritance of the chromosome carrying the Mid gene. If adequate numbers can be tested, we may anticipate finding, both among the Mids and the Shorts, plants which have certainly received the same gene from both parents, and may in this case parallel the behaviour of those which East regarded as containing linked duplicate lethals.

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¹ East, E. M., *Genetics*, 12, 393-414 (1927).

² East, E. M., *Genetics*, 17, 327-334 (1932).

³ East, E. M., *Amer. Nat.*, 70, 5-12 (1936).

⁴ Barlow, N., *J. Genet.*, 3, 53-65 (1913); 13, 133-146 (1923).

Cardiac Metabolism and Rigor in Thyroidectomized Rats

IN order to elucidate the possible influence of the thyroid on heart metabolism, the effect of thyroidectomy on the course of cardiac rigor in rats has been studied.

Rigor was followed graphically according to the method of Chang, Patras and Templeton¹. The results obtained are summarized below and will be