FLOWERING OF FASCIATED RECOMBINANTS UNDER SHORT DAY PHYTOTRON CONDITIONS

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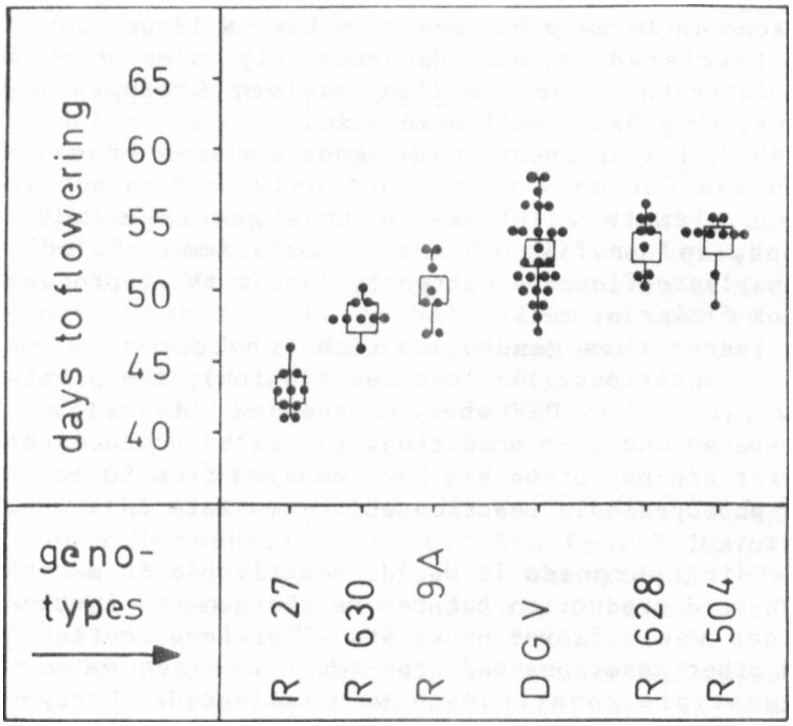
Some Pisum mutants with apical stem fasclation yield very well under field conditions in Germany because they have a large number of flowers and pods in the fasciated region. Unfortunately, some of these genotypes are too tall and later than their mother variety ('Dippes Gelbe Viktoria', DGV); moreover, they have small seed size.

Mutant 489C of this group, homozygous for more than 20 mutant genes, has been studied for many years, not only in Bonn but also in countries with different climates. Plants of this genotype failed to flower in Brazil, Egypt, and in five different locations of India. In Ghana and Uganda, a few plants flowered extremely late without producing seed. Most plants did not flower at all.

We have tested this genotype in the phytotron under long (LD) and short day (SD) conditions. In long day (18h/6h), the plants formed flowers considerably later than DGV whereas they did not flower at all in SD. Plants cultivated under SD conditions (12h/l2h) produced flower buds about two weeks after the phytotron had been changed from SD to LD. Thus, a gene controls the photoperiodic reaction of the mutants in a wav that flowering occurs only in LD.

For breeding purposes it would be desirable to maintain stem fasciation and high seed production but remove the gene(s) for photoperiodism so that the lines would flower under SD. Therefore, mutant 489C was used in crosses with other genotypes and from these crosses many recombinants of different genotypic constitution were selected. Forty-one of them were tested under SD phytotron conditions for flower behavior in order to make a pre-selection for further tests in India. Eighteen of them did not flower. A small group of fasciated recombinants, however, flowered as early or earlier than the non-fasciated mother variety DGV (Fig. 1). This was particularly true for recombinant R 27 selected in F5 from the cross 489C x R 46C (the early flowering recombinant). The plants of R 27 are tall and linearly fasciated. They flowered ten days prior to DGV and their seed production was essentially better than that of the mother variety. Recombinant R 630 was four days earlier than DGV. This genotype was selected In F^ from the cross 489C x mutant 122. The plants are tall, weakly fasciated with narrow leaflets.

These genotypes will be tested for yield in field trials in countries with short-day climate (India, Egypt). In the meantime, additional fasciated recombinants of our collection will be pre-selected in the phytotron for later use in field trials.



The flowering behavior of five fasciated recombinants and their mother variety 'Dippes Gelbe Viktoria' (DGV) under short day conditions in the phytotron. Each dot gives the value for one plant; the squares are the mean values for the respective genotypes.

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