LOCUS IDENTITY TEST CROSSES FOR DIFFERENT FASCIATA LINES

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Spontaneous and induced fasciated mutants have been obtained independently by several investigators [for review see Blixt (1)]. The symbol Fa was proposed by White (7) after segregation ratio of 651 normal : 207 fasciated plants. Lamprecht got several 15:1 segregations after crossing his lines 490 x 794 (5,6) and proposed the symbol Fas for the second gene. He also records a 15:1 segregation after crossing two normal lines (Fa fas x fa Fas) (6). Several locus identity test crosses of different lines were performed by Gottschalk (2,3). The lines tested in the present study are given in Table 1.

Table 1. Lines used in the test crosses.

Line/mutant/variety	Initial line	Donor line
WL 6 (type line) (fa, fas, clariroseus)		Lamprecht/Blixt
WL 5038	1744 (Kloster)	Blixt
WL 5544	1263 (Weitor)	Blixt
WL 5853	2157 (Torsdag)	Sidorova
WL 6030	2100 (Ramonski 77)	Vasileva
WL 6032	2100 (Ramonski 77)	Vasileva
WL 6040	2100 (Ramonski 77)	Vasileva
Mut. I/74	Ramonski	Vasileva
Mut. II/87	Raman	Vasileva
Mut. VI/10	Urojaini	Vasileva
Mut. 489 C	Dippes Gelbe Viktoria	Gottschalk
Var. Gribowo Kronenerbse		Zentralinstitut fur Genetik, Gatersleben/DDR

The test crosses show that WL 6 and mutant 489 C have either identically mutated at their fasciated loci or (more probably) have multiple alleles (Table 2). The following hybrids:

WL 5038 x 489 C
WL 6 x WL 5038
489 C x WL 6040
WL 6 x WL 6040
Var. Gribowo Kronenerbse x 489 C40
Var. Gribowo Kronenerbse x WL 6

are all fasciated, leaving no doubt concerning the locus identity of WL 6 and mutant 489 6. WL 5544 (weakly fasciated and bifurcated with unstable penetrance) is non-allelic to 489 C and thus to the type-line WL 6 (fa, fas). The same was found for our mutant 1201 A (having the same features as WL 5544), i.e. the F1 was non-fasciated. We have not yet, however, crossed WL 5544 with 1201 A for locus identity.

Table 2. F_1 hybrids.

(1)	WL 6 x 489 C	Fasciated
(2)	WL 5038 x 489 C	Fasciated
(3)	WL 5544 x 489 C	Non-fasciated
(4)	WL 5853 x 489 C	Fasciated
(5)	Var. Gribowo Kronenerbse x 489 C	Fasciated
(6)	489 C x WL 6030	Fasciated
(7)	489 C x WL 6032	Fasciated
(8)	489 C x WL 6040	Fasciated
(9)	WL 6 x WL 5038	Fasciated
(10)	WL 6 x WL 6040	Fasciated
(11)	Var. Gribowo Kronenerbse x WL 6	Fasciated
(12)	489 C x Mut. I/74	Non-fasciated
(13)	489 C x Mut. II/87	Non-fasciated
(14)	Mut. I/74 x Mut. II/87	Fasciated
(15)	489 C x Mut. VI/10	Fasciated

In connection with the bifurcated lines we have found the following unusual phenomenon: F_1 489 C x Recombinant 177 (derived from 489 C x 1201 A, - small seeds and stable penetrance of bifurcation) was fasciated. The hybrids 489 C x 1201 A were definitely non-fasciated, but all the plants of F 101 A x R 177 were again weakly fasciated and bifurcated. The problem remains unsolved (4). Mt. 1/74 and Mut. 11/87 were "identical" with each other, but not identical with 489 C.

F2 segregation of (12) and (13) was:

(12) 113 normal:98 fasciated plants (1.15:1)

(13) 97 normal:76 fasciated plants (1.21:1).

According to 9:7 segregation (1.26:1), the mutants differ from the type line at one locus (gene fa-2).

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