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NOTES AND COMMENTS

SELF-INCOMPATIBILITY IN *NEMESIA*

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SELF-INCOMPATIBILITY tests in five species and three interspecific hybrids showed three of these species and one hybrid to be self-incompatible. Each species and hybrid was tested for self-incompatibility by seed-setting and pollen-tube growth. The results obtained by the two different methods were in complete agreement (table 1).

TABLE 1

Results from self-pollinations in Nemesia *species and interspecific hybrids*

Species	Breeding system
N. capensis	Self-incompatible
N. strumosa (ST/74A)	Self-incompatible
N. strumosa (ST/74B)	Self-incompatible
N. versicolor	Self-incompatible
N. versicolor × *N. strumosa*	Self-incompatible
N. floribunda	Self-compatible
N. melissaefolia	Self-compatible
N. capensis × *N. floribunda*	Self-compatible
N. capensis × *N. melissaefolia*	Self-compatible

In each species and hybrid found to be self-incompatible, F_1 progeny were analysed in diallele crosses. The results obtained show that all progeny of self-incompatible plants were strictly self-incompatible. In each family the F_1 plants can be arranged either into two or four different breeding groups, each plant being reciprocally incompatible with plants in the same group and reciprocally compatible with plants in the other groups of the family (table 2).

With a maximum of four mating types in the F_1 families, a one-locus incompatibility system is postulated. The absence of reciprocal differences, the site of pollen-tube inhibition in the style and the differential behaviour of the pollen from the male parent in certain crosses are indications of gametophytic control of pollen specificity.

In the three species examined there are indications of a large number of alleles for the incompatibility gene. Four alleles are present in the two parent plants of *N. capensis* examined, and similarly four alleles in two plants of *N. strumosa*. In the latter species, Riley (1935) reported six and possibly seven alleles in four plants which he examined. In *N. versicolor*

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TABLE 2

Summary of the results from the diallele crosses showing the incompatibility relationships of plants in the F_1 families

Species	Reference of F_1 family	No. of plants	No. of groups*	No. of plants in the diff. groups
N. capensis	13/73	24	4	8, 6, 6, 4
N. strumosa	ST/74A×ST/74B	11	4	4, 4, 2, 1
N. versicolor	79/74 (a×c)	22	4	9, 6, 4, 3
N. versicolor	79/74 (b×d)	15	4	7, 4, 2, 2
N. versicolor	79/74 (d×b)	15	4	6, 5, 3, 1
N. versicolor	79/74 (c×d)	16	2	10, 6
N. versicolor	79/74 (d×c)	10	2	7, 3
N. versicolor ×*N. strumosa*	79/74×ST/74A	19	4	7, 5, 4, 3

* Groups are intra-incompatible and inter-compatible.

where crosses have been carried out between plants from different F_1 families the results show that there is a total of six different self-incompatibility alleles in four plants.

In the cross *N. versicolor*×*N. strumosa* the incompatibility system is not disturbed. This suggests that the incompatibility alleles in these species are homologous and that the genetic mechanism of self-incompatibility may have been present in a common ancestor from which these species evolved.

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REFERENCE

RILEY, H. P. 1935. Self-sterility and self-fertility in species of the genus *Nemesia*. *Amer. J. Bot.*, *22*, 889–894.