HortScience 17(2):260. 1982.

P₁–**P**₈, Diploid and Tetraploid Salpiglossis Germplasm¹

Homer T. Erickson, James Steadman, Chi Won Lee², and Jules Janick

Department of Horticulture, Purdue University, West Lafayette, IN 47907

Additional index words. cleistogamy, tetraploid, Solanaceae, Salpiglossis sinuata, ornamentals breeding

A germplasm release representing 8 selections of *Salpiglossis sinuata* L. (velvet flower), all free of the cleistogamous character which inhibits corolla development, is being made by the Purdue University Agricultural Experiment Station. Five of the selections are diploid (2n = 44) and 3 are tetraploid (2n = 88).

Salpiglossis, an upright-growing annual with petunia-like flowers, is a long-day species which grows best in a cool climate. Thus, plants are primarily grown in the northern states and maritime regions of the United States, although they also can be grown successfully in most parts of the country. The extensive flower color range includes yellows, reds, and blues as well as shades of bronze. Flowers may be striped or self-colored, and with or without pigment dilution on the corolla margin. The genotypes herein released represent only a portion of the flower variability present in the species.

These selections are made available because the popularity of salpiglossis as a bedding plant has been limited by cleistogamy, which gives the impression of premature termination of flowering; the corolla of cleistogamous flowers fail to develop beyond the bud stage. This observation was made as early as the 19th century in Europe (5), but effective selection against cleistogamy has not been made, as the trait is still present in commercial cultivars.

Cleistogamy is controlled by a monogenic dominant (CC) (1). Plants containing the Cgene begin flowering normally, later shifting to totally cleistogamous flowers; reversion to normal flowers is sporatic and may not occur during the life of the plant. We anticipate that the 8 released selections of non-cleistogamous lines will encourage seed producers to introduce new cultivars representing a more extensive array of colors.

Origin

Homozygous non-cleistogamous lines of salpiglossis were derived from 'Emperor' and 'Bolero' cultivars (Geo. W. Park Seed Co., Greenwood, S. C.) during and subsequent to detailed studies on the inheritance and physiology of this trait (1, 2, 3).

Polyploids were obtained by colchicine treatment of seed. Tetraploids were identified cytologically as well as by morphological characters and breeding behavior (4).

Description

The 8 selections are described in Table 1. Representative diploid and tetraploid flowers are shown in Fig. 1. Tetraploids may be desirable in salpiglossis. Such plants have heavier petal texture, the corolla is more flared and open—often with a wavy edge, and the colors may be more vibrant than in diploids. Tetraploids bloom at the same time as diploids and appear to flower as freely. Thus, most of the disadvantages generally associated with tetraploidy are absent in salpiglossis. Seed proTable 1. Flower color, ploidy, and genotypes of salpiglossis germplasm.

Line	Flower color	Ploidy	Genotype
P-1	Solid red	2 <i>n</i>	ccRRDD
P-2	Dilute red	2 <i>n</i>	ccRRdd
P-3	Blue stripes	2 <i>n</i>	сс
P-4	Solid yellow	2 <i>n</i>	ccrrDD
P-5	Dilute yellow	2 <i>n</i>	ccrrdd
P-6	Solid red	4 <i>n</i>	ccccRRRRDDDD
P-7	Dilute red	4 <i>n</i>	ccccRRRRdddd
P-8	Solid yellow	4 <i>n</i>	ccccrrrrDDDD

C = cleistogamous; cc = chasmogamous (normal); R = red flower; rr = yellow flower; D = solid pattern; dd = dilute pattern.

duction is somewhat reduced but capsule yields of 100–200 seeds each, about half that of diploids, should be adequate.

Availability

Small samples of seed of the 8 releases are available to research personnel and commercial seed producers from the senior author.

Literature Cited

- Lee, C. W., H. T. Erickson, and J. Janick. 1976. Inheritance of cleistogamy in *Salpiglossis sinuata*. J. Hered. 67:267–270.
- Lee, C. W., H. T. Erickson, and J. Janick. 1978. Chasmogamous and cleistogamous pollination in *Salpiglossis sinuata*. Physiol. Plant. 43:225–230.
- Lee, C. W., H. T. Erickson, and J. Janick. 1979. Cleistogamy in *Salpiglossis sinuata*. Amer. J. Bot. 66:626–632.
- Steadman, J. 1981. Seed production and cytogenetics of induced polyploids of *Salpiglossis sinuata*. MS Thesis, Purdue Univ., West Lafayette, Ind.
- Vilmorin, M. D. de. 1894. Sur un Salpiglossis sinuata sans corolle. Soc. Bot. Fr. Bul. 41:216–217.



Fig. 1. Salpiglossis flowers: tetraploid P-8 (left) and diploid P-5 (right).

¹Received for publication December 1, 1981. Journal Paper Number 8818 of the Purdue University Agricultural Experiment Station.

The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked *advertisement* solely to indicate this fact.

²Plant Sciences Department, University of Arizona, Tucson, AZ 85721.