Registration of a Mutant Lesquerella Genetic Stock with Cream Flower Color

A cream flower mutant of lesquerella [Lesquerella fendleri (A. Gray) S. Watson] genetic stock WCL-CF1 (Reg. no. GS-13, PI 642048) was released jointly by the USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ, and the Universidad Autonoma Agraria Antonio Narro at Buena-vista (UAAAN), Saltillo, Coahuila, Mexico. WCL-CF1 was derived from an accession collected in Coahuila, Mexico (A4005) during a germplasm exploration in 1999 (Salywon et al., 2005).

In their monograph of the genus Lesquerella, Rollins and Shaw (1973) describe the petals of this species as yellow but sometimes with orange guidelines. All plants located at the original collection sites had wild-type yellow flowers. Flower color for this species is extremely stable and to our knowledge variation for this trait has not been reported. Plants from more than 150 L. fendleri accessions in our working collection and those in the National Plant Germplasm System (NPGS), from throughout the species range, are all yellow flowered. Seeds from the Mexico sites were increased at Phoenix, AZ, in the fall of 1999 in a field at the USDA-ARS, U.S. Water Conservation Laboratory. Screened cages with house flies (Musa domestica G. E. Rumphius) as pollinators were used to isolate accessions for the regeneration. In the spring of 2000, a single plant in a cage of 72 individuals from accession number A4005 was observed having cream flowers, while all others had yellow flowers.

Controlled reciprocal crosses and self-pollinations were made between this plant and two random wild-type plants while in the field isolation cage. Flowers of all plants from the F1 generation had yellow flowers, regardless of which plant was used as the maternal parent, as were flowers of plants from self-pollinated, yellow flowered plants. Flowers of plants from the self-pollinated cream flowered plant were all cream colored, indicating that the parent plant was homozygous for this trait. F2 and selfed seeds were planted the following fall in the greenhouse. Flowers of these F2 plants fit a 3:1 ratio of yellow flowers to cream flowers indicating a recessive gene control-ling the trait. S2 seed of WCL-CF1 also produced all cream colored flowers.

When WCL-CF1 is planted in October it began flowering in early February and reached by mid-April. Plants require insect pollinators for seed-set. Oil concentration and fatty acid profile, seeds per silique, and 1000-seed weight were not significantly different between WCL-CF1 and wild types.

U.S. Plant Variety Protection will be sought for WCL-CF1. Limited quantities of seed of WCL-CF1 are available for distribution to qualified researchers on written request to the corresponding author for 5 yr. Recipients of seed are asked to make appropriate recognition of the germplasm in the development of a new cultivar, germplasm, parental line, or genetic stock. Requests from outside the U.S. should be accompanied by the appropriate customs controls.

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References


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