‘Lufkin Red’ and ‘Lufkin White’ Winter-hardy Hibiscus (*Hibiscus* × *laevis* All.)

Cecil T. Pounders¹

USDA-ARS Thad Cochran Southern Horticultural Laboratory, P.O. Box 287,
810 Highway 26 West, Poplarville, MS 39470

Additional index words. leaf spot resistance, Malvaceae, perennials, ornamentals

Winter-hardy hibiscuses are herbaceous perennials that regenerate from root buds each spring in USDA hardiness zones 5 through 9. Colloquially known as Rose Mallows, the most recent taxonomic revision (Blanchard, 1976) recognizes five species (*Hibiscus coccineus* Walter, *Hibiscus dasycalyx* Blake & Shiller, *Hibiscus grandiflorus* Michaux, *Hibiscus laevis* Allioni, and *Hibiscus moscheutos* L.) that comprise the North American taxon *Hibiscus* L. sect. *Muenchusia* (Heister ex Fabricium) O. Blanchard (Malvaceae) (Small, 2004). A number of additional taxa associated with *H. moscheutos* have been variously recognized historically as varieties, subspecies, or distinct species. Primary among these are *Hibiscus moscheutos* subsp. *palustris* L., native to the northeastern United States, and *Hibiscus moscheutos* subsp. *incanus* Wendl., indigenous to the southeastern coastal plain (Blanchard, 1976).

Native populations prefer wetland habitats such as flood plains but are tolerant to wide fluctuations in soil moisture. Rose mallows are long-day plants (Warner and Erwin, 2001) that flower from late spring through fall. Flowers last for a single day with color varying from scarlet rose in *H. coccineus* to white, lavender, and pink shades in the other four species. Studies of pollination in *H. moscheutos* indicate that the species is generally self-compatible but that the trait is variable with some lines rapidly develop inbreeding depression in progeny (Snow and Spira, 1993). The five species have a shared chromosome number of $N=19$, but artificial hybridization studies resulted in grouping the species into two groups based on seed set (Wise and Menzel, 1971). *Hibiscus grandiflorus* and *H. moscheutos* (Group I) were entirely interfertile, and *H. coccineus* and *H. laevis* (Group II) were also interfertile, but crosses between groups produced few viable seed. Although Wise and Menzel (1971) did not include *H. dasycalyx* in their studies, subsequent work has shown that *H. dasycalyx* is closely related to *H. laevis* (Klips, 1995; Small, 2004) and clearly belongs in Group II.

Although breeding of rose mallows has focused on developing new clones with improved horticultural traits (Malinowski et al., 2012) such as branching and flower color, there is a need for clones with improved disease resistance, particularly in the southeastern United States. Both ‘Lufkin Red’ and ‘Lufkin White’ have desirable horticultural traits in combination with demonstrated high levels of field resistance to the leaf spot complex (Pirone, 1970) that is problematic on winter-hardy hibiscus clones in areas with warm nights and high humidity.

Origin

In 2005, a collection of winter-hardy hibiscus germplasm comprised of commercial clones and species seedlings grown from various provenances across the South were planted in the field at McNeill, MS. Previous observations indicated that hibiscus fungal leaf spot was prevalent on rose mallows in the area and that screening the germplasm for resistance by natural infestation would be possible. Laboratory evaluation of pathogens on hibiscus leaves collected from the area revealed that *Colletotricum* sp. was the dominant species, but *Alternaria* sp. and *Cercospora* sp. were also present. Clones and species were interplanted to facilitate natural cross-pollination at the same time germplasm was being evaluated for leaf spot resistance. None of the named clones proved resistant to the leaf spot complex but several seedlings of *H. moscheutos* subsp. *incanus*,

H. dasycalyx, and *H. laevis* from various provenances showed no symptoms of leaf spot. Open-pollinated seeds were collected from the elite plants, and then seedlings were produced in the greenhouse and outplanted for evaluation in the spring of 2006.

‘Lufkin Red’ and ‘Lufkin White’ were selected in 2007 from open-pollinated seedlings grown from a leaf spot-resistant east Texas *H. laevis* provenance seedling. Both selections retain the leaf texture and field leaf spot resistance of the maternal parent. Flower quality and numbers as well as growth habit are much improved over the species.

Description

Plants of ‘Lufkin Red’ are semicompact, upright-spreading with abundant production of red (red–purple 58A) (Royal Horticultural Society Flower Council of Holland, 2001) flowers of moderate size (10 to 15 cm) with a small white, then red swath of color at the base of each petal, which is not visible from a distance (Fig. 1). Flowers often are cupped on cool mornings but open flat by noon. This cultivar is very fertile with abundant seed pods produced from insect pollination. Flowering is stimulated by removal of the seed pods. Leaves are slightly smaller than typical *H. laevis* but retain the war club three-lobed shape. Ultimate plant size is dependent on container size and environmental conditions with plants in a #3 nursery pot growing to 0.7 m high × 0.4 m wide within three months after spring planting under optimum conditions. Under landscape conditions, plants should mature to 1.6 m high × 1.3 m wide. Plants die to ground level each winter and build a large multistemmed clump after several seasons of growth, which may result in slightly larger plants as the root system matures.

Plants of ‘Lufkin White’ are semicompact, upright-spreading with prolific production of near-white pink-blushed (red–purple 69D) flowers of moderate size (8 to 10 cm) with a small white, then red swath of color at the base of each petal, which is perceived as a small red eye in the flower (Fig. 2). Flowers often are cupped on cool mornings but open flat by noon. Insect pollination results in copious ornamental brown lantern-shaped seed

Fig. 1. Flowers and foliage of ‘Lufkin Red’ winter-hardy hibiscus.

Received for publication 26 Sept. 2012. Accepted for publication 25 Oct. 2012.

¹To whom reprint requests should be addressed; e-mail Cecil.Pounders@ars.usda.gov.

Fig. 2. Flowers and foliage of 'Lufkin White' winter-hardy hibiscus.

pod if pods are not removed to stimulate additional flowering. Plants in a #3 nursery pot grow to 0.6 m high $\times$ 0.3 m wide within three months when properly nurtured. Under landscape conditions, plants should mature to $\approx$ 1.2 m high $\times$ 1.5 m wide. Plants die to ground level each winter and build a large multistemmed clump after several seasons.

Plants of both clones have been evaluated for five years at Poplarville, MS (USDA hardiness zone 8B) and have proven cold-hardy to -9°C in Jan. 2011. The climate of the testing site is characterized by humid summers with temperatures reaching 34 to 37 $^{\circ}\text{C}$. Considering winter-hardiness of its parentage components, it is anticipated both cultivars will be adapted to USDA hardiness zones 4 through 8. Plants of 'Lufkin Red' and 'Lufkin White' have not been observed under all possible environmental conditions. The phenotypes may vary slightly as a result of environmental changes such as light intensity and temperature with no alteration of genotype.

Culture

Both clones display great similarity to *H. laevis* in a slightly miniaturized form with

improved floral traits. The form and scale of both clones are ideally proportioned for inclusion as a component of perennial borders and gardens. Both clones should be planted in full sun to promote maximal plant development and blooming. No diseases or pests have been observed at the trial location in Poplarville, MS. However, 'Lufkin Red' and 'Lufkin White' may be susceptible to diseases common to species in the mallow family other than fungal leaf spots. Pests such as Japanese beetles (*Popillia japonica*), sawflies (suborder Symphyta), spider mites (family Tetranychidae), and aphids (family Aphidoidea) may cause damage in regions where these pests are endemic.

Propagation

'Lufkin Red' and 'Lufkin White' are easily propagated by softwood stem or branched-shoot cuttings treated with 1500 ppm indole-3-butyric acid under intermittent misting systems. The best rooting material should be taken from actively growing stock plants. The response of the clones to growth regulators or propagation by tissue culture techniques (West and Preece, 2004) has not been evaluated.

Availability

Additional information or a list of nurseries propagating 'Lufkin Red' and 'Lufkin White' is available on written request to Cecil Pounders, USDA-ARS (e-mail: Cecil.Pounders@ars.usda.gov). The USDA-ARS does not have plants for sale. In addition, specimens of the releases have been deposited in the National Plant Germplasm System where they will be available for research purposes. It is requested that appropriate recognition be made if this germplasm contributes to the development of a new breeding lines or cultivars.

Literature Cited

- Blanchard, O.J. 1976. A revision of species segregated from *Hibiscus* sect. *Trionum* (Medicus) de Candolle *sensu lato* (Malvaceae). Cornell University, Ithaca, NY.
- Klips, R.A. 1995. Genetic affinity of the rare eastern Texas endemic *Hibiscus dasycalyx* (Malvaceae). *Amer. J. Bot.* 82:1463–1472.
- Malinowski, D.P., R.S. Brown, and W.E. Pinchak. 2012. 'Robert Brown' winter-hardy hibiscus (*Hibiscus* $\times$ *moscheutos* L.). *HortScience* 47: 291–292.
- Pirone, P.P. 1970. Diseases and pests of ornamental plants. 4th Ed. Ronald Press, New York, NY.
- Royal Horticultural Society Flower Council of Holland. 2001. RHS colour chart. 4th Ed. London, UK.
- Small, R. 2004. Phylogeny of *Hibiscus* sect. *Muenchhusia* (Malvaceae) based on chloroplast *rpL16* and *ndhF*, and nuclear ITS and GBSSI sequences. *Syst. Bot.* 29:385–392.
- Snow, A.A. and T.P. Spira. 1993. Individual variation in the vigor of self pollen and selfed progeny in *Hibiscus moscheutos* (Malvaceae). *Amer. J. Bot.* 80:160–164.
- Warner, R.M. and J.E. Erwin. 2001. Variation in floral induction requirements of *Hibiscus* sp. *J. Amer. Soc. Hort. Sci.* 126:262–268.
- West, T.P. and J.E. Preece. 2004. Effects of thidiazuron and nutrient salt formulations on micropropagation of hardy hibiscus (*Hibiscus moscheutos* L.). *Acta Hort.* 630:293–297.
- Wise, D.A. and M.Y. Menzel. 1971. Genetic affinities of the North American species of *Hibiscus* sect. *Trionum*. *Brittonia* 23:425–437.