

Heliconia SCARLET: a mexican variety for cut flower and gardening

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ABSTRACT

Objective: To carry out the morphological characterization of *Heliconia uxpapanensis* × *Heliconia latispatha* var. Scarlet for varietal registration purposes.

Design, Methodology and Approximation: By means of rhizomes division of 71-1 plant from a plot of *H. uxpapanensis* × *H. latispatha* segregant plants (F2), twelve plants (tillers) were generated, planted, and cultivated in open field under 30% of natural shade. Morphological characterization was methodic conducted using the Technical Guide descriptors for Heliconias designed by the National Seed Inspection and Certification Service (SNICS, 2023).

Results: Morphological characters of the clones from the 71-1 segregant plant, tested with the SNICS Technical Guide descriptors, were constant so that a differentiation could be make between the Scarlet and Karely, a reference variety found in the Guide. Scarlet variety's primary distinctive characteristics are the red color, high brilliance, and the revolute-involute margins of their bracts. Their inflorescence morphological characteristic suggest they can be cultivated for cut flower and gardening.

Study limitations and implications: In order for Scarlet variety express, their characteristics of intense color and bracts brightness, they have to be cultivated under 30% of shade.

Findings and conclusions: Based on the Technical Guide descriptors for heliconias varietal description (SNICS, 2023), the Scarlet variety differentiates from the Karely (reference variety) as it presents a stability-distinction-homogeneity. For this reason, the varietal registration seems appropriate.

Keywords: bract brightness, cut flower, *Heliconia* Karely.

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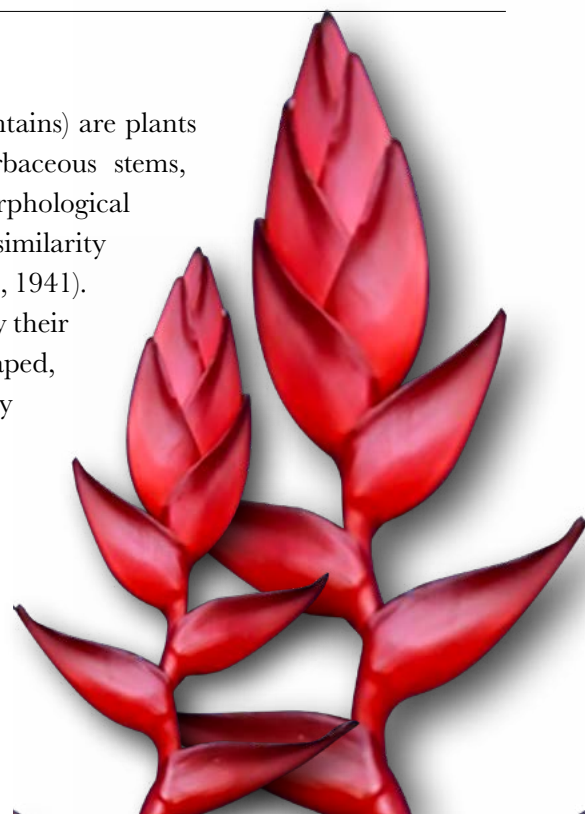
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INTRODUCTION

Species from the *Heliconia* genus (little plantains) are plants that characterize themselves for having herbaceous stems, broad and large leaves, and high degree of morphological similarity to plantains (Musaceae family); such similarity was taxonomically backed up until 1941 (Nakai, 1941). Species from the heliconias, be differentiated by their erect or pending inflorescences consisting of shaped, textured, tinged, and colored bracts; their rarity and beauty let them to be used in gardening, but their post-harvest durability makes them ideal for cut flower.

Around 220 species of heliconias which integrate the genus (Berry and Kress, 1991; Kress *et al.*, 1999) grow up naturally in the rainforests and subtropical forests of



the American continent between the Tropic of Cancer and Tropic of Capricorn parallels, geographically expanded from northern Argentina to northeast Mexico (Anderson, 1989). The greatest diversity is found in the territories of Colombia, Ecuador, and Venezuela; although it is worth mentioning that Colombia concentrates nearly 100 species (Kress *et al.*, 1999). These countries, apart from Costa Rica, have positioned themselves as the suppliers for most varieties existing in today's market and consolidated as worldwide producers and suppliers of tropical flowers (Diaz *et al.*, 2002).

Within the Mexican territory, there is a transition happening from tropical to cold climate that makes it possible to find at least twelve species of heliconias in the wild, along with their corresponding intraspecific diversity. Climate conditions, in addition to deep and fertile soils, favors the cultivation of commercial varieties, especially in Tabasco (Saldaña & Hernández, 2004), Chiapas and Veracruz. As previously cited, the varieties currently grown are coming from Central and South American countries.

Throughout INIFAP, Mexico generated its first heliconia variety called Karely in 2022, a variety registered in the National Catalogue for Plant Varieties.

To obtain the Breeder's Certificate for new heliconias varieties, a stability-distinction-homogeneity (SDH) test must be conducted using the SNICS Technical Guide, which works under the authority of the Department of Agriculture in Mexico. Therefore, the objective of the current work was to carry out a morphological characterization of the *Heliconia uxpanapensis* × *Heliconia latispatha* var. Scarlet for varietal registration purposes.

MATERIALS AND METHODS

From a segregant population (F2) of *Heliconia uxpanapensis* × *Heliconia latispatha* (cited by Ortiz-Curiel *et al.*, 2022), the 71-1 plant was selected due to its inflorescence deep red, brightness of its bracts and stem height; by means of rhizome division, such plant was asexually multiplied from which 12 plants were put directly into soil under 30% of shade. The site showed the following features: sandy franc soil (79.9% sand) where climate conditions are humid tropic with an average annual rainfall of 4,443 mm and average temperatures of 26.6 °C, reaching up to 35.5 °C from February to April.

Originally, the morphological characterization was methodically conducted using the descriptors suggested by Avendaño-Arrazate *et al.* (2017). Subsequently, such characterization for SDH purposes was carried out based on the Technical Guide descriptors for Heliconias (2023) created by the SNICS.

RESULTS AND DISCUSSION

Heliconia Var. Scarlet Varietal Description

Heliconia var. Scarlet, besides their deep red color and brightness of their bracts, have a tall-posture plant like. The red color growing in the midway, which included the apex in each bract, was slightly intensified—this did not imply the presence of a second color—the revolute margin orientation in this section associated to high brightness, generated a difference in the reflection of light; consequently, visual contrasts were intensified. These characteristics make *Heliconia* Scarlet different from their biological parents and from *Heliconia* Var. Karely, a reference variety (Figure 1).

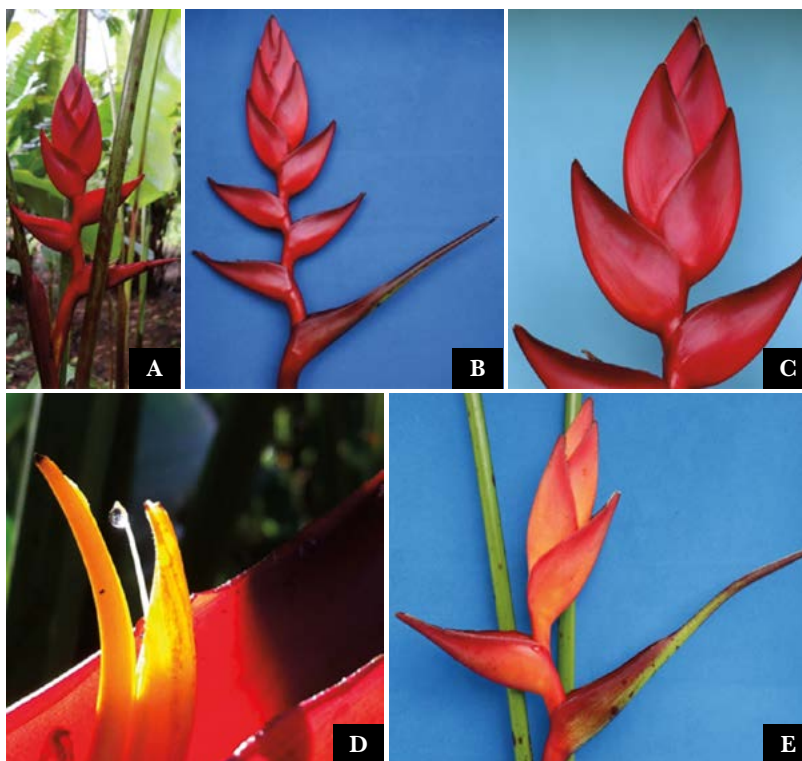


Figure 1. *Heliconia* Var. Scarlet and *Heliconia* Var. Karely. A) Inflorescence in a plot of Var. Scarlet, B) Inflorescence zooming, C) Involute-revolute margin orientation of the bracts, D) Color in flower, and E) *Heliconia* var. Karely (reference variety).

At maturity, *Heliconia* var. Scarlet presented up to 16 bracts in their inflorescence phyllotaxy distichous, which a rachis at zigzagging medium level. The plants' impressiveness, the contrast between the green in leaves and the deep red in the inflorescence, make them ideal for gardening. Generally, the first bract had a highly extension as the flag leaf; however, it did not present any foliar blades at the terminal end of this structure, as it happens with *Heliconia latispatha* varieties. The *Heliconia* var. Scarlet preserves similar trademarks to its female parent: *Heliconia uxpanapensis*.

Commercially speaking, their beauty and red color make the Scarlet variety suitable for cut flower. For instance, red heliconias are highly marketed preferable (Linares *et al.*, 2017; Diaz *et al.*, 2002). The length of Scarlet variety' stems, which exceed the 100 cm, are appropriate for the mainstream market since hotels, restaurants and hall's owners request tall flowering heliconias to have their ample spaces decorated (Baltazar-Bernal *et al.*, 2011).

The inflorescence formed by bracts in distichous position favors their packing and lessening any friction or bruising damages, a relevant feature for commercial varieties such as *Heliconia wagneriana*, *H. bihai*, *H. stricta*, *H. ortotricha*, *H. caribaea* and Karely (Ortiz-Curiel *et al.*, 2022).

For a suitable expression of color and characteristics inherent to Scarlet variety, they must be cultivated using an agroforestry system where shade conditions should be about 30% as Grajales-Solís and Montejo-Rodríguez (2008) have suggested not only for

Table 1. Morphological characterization of the *Heliconia uxpanapensis* Gutiérrez × *H. latispatha* var. Scarlet using the Technical Guide for Heliconias Varietal Description (SNICS, 2023).

Characteristics	Var. Scarlet	Note
Plant: degree of tillering	Medium	5
Plant: growth habit	Erect	1
Plant: height (144 cm)	Medium	5
Pseudostem: thickness (4.8 cm)	Medium	5
Pseudostem: antocianina pigmentation	Present	9
Pseudostem: intensity of antocianina pigmentation	Strong	4
Leaf: length (151.9 cm)	Long	7
Leaf: width (42.85 cm)	Broad	7
Leaf: length/width relation (3.5)	High	7
Petiole: length (136.9 cm)	Long	7
Rolled leaf: antocianina pigmentation in the underside margin	Present	9
Rolled leaf: intensity of antocianina pigmentation in the underside margin	Weak	3
Inflorescence: flag leaf	Present	9
Flag leaf: blade	Absent	1
Inflorescence: rotation	Absent	1
Inflorescence: degree of zigzagging in main axis	Medium	5
Inflorescence: number of bracts (14)	Plenty	7
Inflorescence: width (23.4 cm)	Medium	5
Inflorescence: bracts separation (3.3 cm)	Short	3
Bract: margin orientation	Medium	5
Bract: height (3.8 cm)	Medium	5
Bract: length (14.27 cm)	Medium	5
Bract: width (2.9 cm)	Medium	5
Bract: brilliance	Strong	7
Bract: number of colors	One	1
Bract: primary color	Red	3
Flower: length (joined tepals) (5.6 cm)	Medium	5
Flower: num. of colors in free tepal	One	1
Flower: free tepal primary color	Yellow	3
Flower: curvature of long axis in free tepal	Medium	5
Flower: curvature level in nectar storage	Weak	3
Flower: num. of color in joined tepals	One	1
Ovary: color	Yellow	2

diverse heliconia species and varieties but also for other tropical flowers growing within these agroforestry systems. Rhizomes and propagation material are kept at the INIFAP Rosario Izapa Experimental station. In line with the assessment results, we began the registration process of the Heliconia Scarlet in the National Catalogue for Domestic Varieties and the Breeder Certification before the National Service for Seed Inspection and Certification in Mexico.

CONCLUSIONS

SNICS morphological descriptors confirm there are two distinguishing morphological characterization for this variety: their deep red color and brilliance. Apart from meeting the SDH test, these two traits make *Heliconia* Scarlet ideal for cut flowers and gardening. With its register, the *Heliconia* var. Scarlet will be the second generated variety of heliconias in Mexico.

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