

Recent Introduction of *Plumeria pudica* of the *Apocynaceae* Species in Cuba

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Received: June 30, 2017

Accepted: August 28, 2017

ABSTRACT

To reveal the identity of an allochthonous species recently introduced in Cuba and grown as ornamental plants, several botanical procedures (collections, catalogues and keys, description, and scientific illustrations) were performed. The presence of *Plumeria pudica* Jacq in Cuba was confirmed, and a dichotomous key was presented to contrast species of this genus now present on the island.


KEY WORDS/: *Plumeria pudica*, *Plumeria*, *Apocynaceae*, ornamental plants


INTRODUCTION

Genus *Plumeria* L. (*Apocynaceae*, *Rauvolfioideae*) includes 7-8 species, distributed in Mexico, Nicaragua, The Antilles, Guyana, Venezuela, Colombia, and Peru (Morales, 2006), some of them are cultivated in several other parts of the world (Chong, Tan & Corlett, 2009). The estimates about the number of species in the Cuban flora have varied depending on taxonomic and nomenclature criteria, with a maximum of 12 (Lippold, 1979), and a minimum of 3 (Greuter & Rankin, 2016); these reports were assumed for the present study. In recent years, another not previously observed species for over 30 years of work in Cuban fields and gardens has widespread.

At the herbarium of the University of Camaguey (HIPC) several requests from garden professionals and ornamental plant collectors were made to help with identification of the species. It was a complex task, since that particular genus was not registered in the most relevant catalogues of the national flora (Pichardo, 1862; Sauvalle, 1873; Gómez de la Maza, 1889 and 1897; Gómez de la Maza & Roig, 1914; Calvino, 1923; Agete, 1939; Alain, 1957; Anonymous, 1958; Roig, 1965; Alain, 1969; Boldo & Estévez, 1990; Esquivel, Knüpfner & Hammer, 1992 and Greuter & Rankin, 2016).

Accordingly, the aim of the study was to identify, name, describe, and illustrate the plant.

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MATERIALS AND METHODS

A collection of samples and pictures of the species was made in some Camaguey city gardens. The specimens were deposited at the herbarium of the Ignacio Agramonte Loynaz University of Camaguey (HIPC, according to permanently updated Thiers). Their identities were determined at the beginning, based on comparisons with descriptions and keys found in Zarucchi, (1987 [1988]), Woodson, Schery & Nowicke (1970), Allorge (w.s.). The preliminary results were contrasted with images available on the Internet (<http://www.tropicos.org/Image>, 100118595 to 98), and digital sources in the herbarium: GH, K and NY (The New York Botanical Garden, w.s.), whose access was made possible by JSTOR (<http://plants.jstor.org>). The description assumed the Font Quer (1975) terminology.

The search for documentary evidence of the existence of the species in Cuba included a review of materials already deposited in herbaria elsewhere: HAC, HAJB, HIPC and ULV (permanently update Thiers), as well as literature review.

RESULTS AND DISCUSSION

The species was identified as *Plumeria pudica* Jacq. The nomenclature, description, distribution, ethnobotany, and behavior data for Cuba are,

Plumeria pudica Jacq., Sel. Strip. Amer. Hist.: 37. 1763. Type: Jacquin s.n. [n.v.].

=*Plumeria caracasana* J. R. Johnson, Contrib. U. S. Nat. Herb. 12: 108. 1908. Holotype: [specimen] Venezuela, La Guaira, Robinson & Lyon s.n., 13-VII-1900 (US [photo!]).

=*Plumeria cochleata* Blake, Contrib. Gray Herb., n.s. 53: 47. 1918. Holotype: [especimen] Venezuela, between Coro and Alta Gracia, 1-V-1917, H.M. Curran & M. Haman 742 (NY [photo!]).

Common names: (Bridal Bouquet) *florón*, *lechoso*, *verano*, *amapola* (Colombia), according to Rodríguez, Banda, Reyes & Estupiñán, 2012; *doncella*, *doncella olorosa* (Curazao), *jazmín de copa*, *lirio*, *velo de novia* (Cuba).

It is a shrub or tree, 3-4 m high, with young round stems, slightly angular, with prominent foliar scars. Alternate leaves; 0.5-1 cm long glabrous to pubescent petioles; obovate, oblong-obovate to lyrate sheets, 12-30 × 5-14 cm, membranaceous or rarely sub-coriaceous; pubescent leaf surface; rarely pillous glabrous reverse; attenuated or acutely cuneate base; acuminate apex; entire frequently pandurate margin (especially at a young age). Thyrsoid inflorescence, 20-25 flowers, generally lax; glabrous axes; 7-14 cm long peduncles; 8-12 mm pedicels. Appealing hermaphrodite and actinomorphic flowers. Gamosepalous glabrous calyx, 1-5 lobulated; straight tube; 1.5-2 mm rounded, rarely truncate lobules with a dark upper end. White hypocrater-morph corolla, with yellow spots in the throat opening, without appendixes; 15-25 mm curved conduit, usually 25-35 × 20-30 mm, thoroughly obovate to obovate-oblong. Five-stamen androecium; free anthers detached from the stigma, no lengthening of the connective. Two-carpel apocarpic gynoecium; semi-inferous ovary, with abundant ova, and no nectaries; unique style; fusiform stigma underneath, and bi-apiculated on the top. Two-follicle, slightly compressed apocarpic fruit. Numerous dry seeds with concentric wings. It normally blossoms throughout the year. (Fig. 1.)



Fig.1a. View of the plant in urban home garden.



Fig.1b. Characteristics of the plant: (A) plant and flowers, (B) leaves, (C) detail of reverse, (D) flower, (E) calyx.

It is originally from South and Central America, and it has been cultivated in different parts of the world. Seemingly, its introduction in Cuba was made recently, but it has widespread very quickly to all provinces.

This species is not registered in the works of Pichardo (1862); Sauvalle (1873); Gómez de la Maza (1889 and 1897); Gómez de la Maza & Roig (1914); Calvino (1923); Agete (1939); Alain (1957); Anonymous (1958); Roig (1965); Alain (1969); Borhidi, 1981 [“1980”]; Boldo & Estévez (1990); Arias, Díaz, Leiva & Rodríguez (1992); Esquivel, Knüpfner & Hammer (1992); Fuentes *et al.* (2001); Alfonso & Bécquer (2016); Greuter & Rankin (2016), and Machado, Carracedo & Acosta (2016). Evidence of previous collection in Cuba was not either in the Cuban Data Network of Biodiversity, or in several herbaries (HAC, HAJB, HIPC and ULV).

Authors like Alfonso & Bécquer (2016), and Machado, Carracedo & Acosta (2016), referred to the existence of this species in Havana and Santiago de Cuba, respectively, but disregarded the discovery. Likely, these authors based their observations directly on the field, but did not collect any type of evidence. This article confirms the presence of *Plumeria pudica* in Cuban vegetation.

Specimens observed: Camaguey city, la Caridad area, home gardens. J Rifa, 12031, 4-IV-2017 (HIPC). Holguín, Carretera a Gibara Km 2, home gardens. I. E. Méndez, 12032, 30-IV-2017 (HIPC).

The plant is used for ornamental purposes in Cuba. It is thought to have toxic properties, due to the presence of alkaloids, agoniadine, plumerine, and plumeritanic acid (Sena, Duarte da Rocha, Oliveira, Ramos & Ramos, 2016). It is also used to treat digestive disorders and infections, for its anti-inflammatory, antipiretic, and antioxidant properties, thanks to tannin, alkaloid, flavonoid, iridoide, histamine, and serotonnin contents (Chanaka, Manuja, Roja, Jyothi, Swetha & Guru,

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2016; Fernandes *et al.*, 2015). Genus *plumeria* has antioxidant, antimicrobial, and analgesic actions (Ramproshad, Afroz, Mondal, Khan & Ahmed, 2012); its larvicide properties are highly toxic to two species of mosquitoes: *Aedes aegyti* and *A. stephensi* (Chandrashekhar, Patil, Borase, Slunke & Salunke, 2012), two important aspects to study further in *P. pudica*.

Alfonso & Bécquer (2016) considered it potentially dangerous (grade III) to children in day care centers, since the contact with latex can cause skin irritation.

The introduction of *P. pudica* is the fourth species of genus *Plumeria* found in Cuba, which may be differentiated by the dichotomous key below,

- 1 Linear to filiform leaves of up to 1 cm wide..... *P. filifolia*
- Oblong to elliptic, to elliptic-oblongate, obovate or linear lyra-shaped lanceolate leaves 2
- 2 Subsessile leaves (petioles smaller than 1 cm); frequently pandurated lyrate sheets (especially at a young age)..... *P. púdica*
- Clearly petiolate leaves (1 cm or more petioles); oblong to elliptic to elliptic-oblongate, obovate or linear-lanceolate sheets (never lyrate or pandurated)..... 3
- 3 Generally acute or acuminate leaves in the apex; 8-18 cm follicles; 2.6-3.2 cm seeds..... *P. obtuse*
- Slightly obtuse to round leaves; 19-38 cm follicles; 5.5-8 cm seeds..... *P. rubra*

ACKNOWLEDGMENTS

The authors wish to thank the collaboration of Orlando Abreu Girardo, who assisted us with providing the data that made this study possible.

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