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NOTE

Abelmoschus manihot var. *pungens* (Roxburgh) Hochreutiner (Malvaceae), A Newly Naturalized Plant in Taiwan

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ABSTRACT: *Abelmoschus manihot* var. *pungens* (Roxburgh) Hochreutiner is naturalized in abandoned land of central Taiwan. The distinguished characteristics of *A. manihot* var. *pungens* include the ovate-lanceolate epicalyx lobes, distinct prickly hairs all over the plant, and even over the margins of its epicalyx lobes. Descriptions, line drawings and photos of this species are provided.

KEY WORDS: *Abelmoschus manihot* var. *pungens*, Malvaceae, newly naturalized, Taiwan.

INTRODUCTION

The genus *Abelmoschus* Medikus comprises about 15 species distributed in tropical and subtropical regions in Eastern Hemisphere (Tang *et al*., 2007). One of the species, *A. manihot*, is a cultigen with a wide distribution. It is a traditional vegetable in Melanesia, but had also been introduced into other continents, either as a vegetable or as an ornamental (Preston, 1998). *A. manihot* was introduced from Janpan to Taiwan in 1911 (Chen and Hu, 1976). Ying (1992) mentioned it is native to China and was introduced to Taiwan during 1970–1980, generally cultivated at gardens, yet sometimes escaped. *A. manihot* can be recognized as two varieties: *A. manihot* var. *manihot* (L.) Medikus and *A. manihot* var. *pungens* (Roxburgh) Hochreutiner (Preston, 1998; Tang *et al*., 2007). *A. manihot* var. *manihot* can be recognized by having stems devoid of prickly hairs and some of pedicels with prickly hairs (Preston, 1998; Tang *et al*., 2007). By contrast, *A. manihot* var. *pungens* has conspicuous prickly hairs throughout the plant, including its margins of epicalyx lobes (Preston, 1998; Tang *et al*., 2007).

Recently, *A. manihot* var. *pungens* has been found in central Taiwan during our field research. We considered this species to be naturalized based on the fact that its population has survived in abandoned fields and reproduced without continued human efforts. As we know, there are at least three recorded localities of this species. The newly naturalized species to Taiwan is described and illustrated below.

TAXONOMIC TREATMENTS

Abelmoschus manihot var. ***pungens*** (Roxburgh) Hochreutiner, Candollea 2: 87. 1924; Tang *et al*. in Wu & Raven, Fl. China 12: 283–285 2007.
剛毛黃蜀葵 Figs. 1 & 3

Hibiscus pungens Roxburgh, Fl. Ind. 3: 213. 1832.

Annual or perennial erect herbs, up to 2 m tall. Stems long hispid, prickly hairs 1–4 mm long. Leaves chartaceous, orbicular in outline, leaf blade palmately 5–7-lobed, 15–25 cm in diameter, lobes linear or rarely linear-lanceolate, 8–18 cm long, 0.8–1.2 cm wide, sparsely hispid on both surfaces, entire or minutely toothed or wavy at margins; stipules 2 on each side of petiole, 8–13 mm long; petiole 8–18 cm long, nearly terete in cross section, very sparsely hispid. Flowers solitary axillary, subapical and forming terminal raceme, subtended leaf becoming bract-like toward distal apex; pedicel 2–3 cm long, densely hispid. Epicalyx lobes 4–5, rarely 6, ovate-lanceolate, 2.8–3 cm long, 1–1.6 cm wide, long hispid on surface and along margins, glabrous inside. Calyx spathe-like, minutely 5-toothed at apex, 3.5–4 cm long, puberulent, splitting deeply at one side, unsplitting or shallowly splitting at another side at flower opening, caduceus at fruiting. Corolla yellow with black-purple center, 10–11.5 cm in

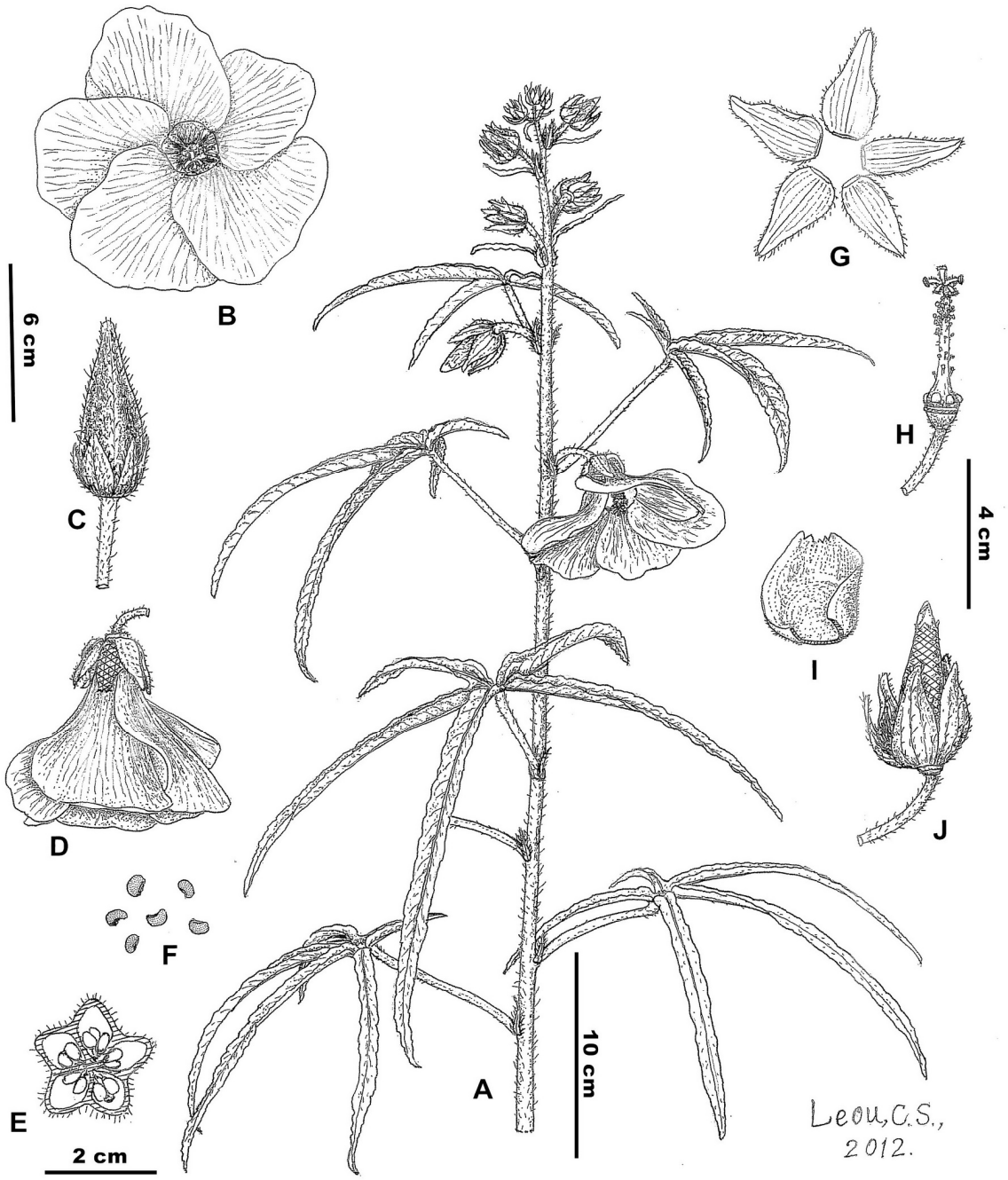

Fig. 1. *Abelmoschus manihot* var. *pungens* (Roxburgh) Hochreutiner. A: Flower branch. B: Flower, face view. C: Capsule. D: Flower in wilted side view, calyx being hatched. E: Capsule, cross-section. F: Seeds. G: Epicalyx, inside. H: Stamen, pistil and receptacle. I: Calyx, inside. J: Flower bud, side view, calyx being hatched.

diameter. Staminate tube 3 cm long, glabrous, 5-toothed at apex; anthers nearly sessile or shortly stalked, free part of filament 0.5–2 mm long. Pistil 3.5 cm long, 5-parted at apex, connate below, free part of style reflexed, 4–6 mm long, black-purple, more or less clavate, triangular in cross-section hirsute at lower surfaces; stigma flat; ovary conical, minutely pubescent, 7 mm in diameter, 10 mm tall, 5-celled. Capsule

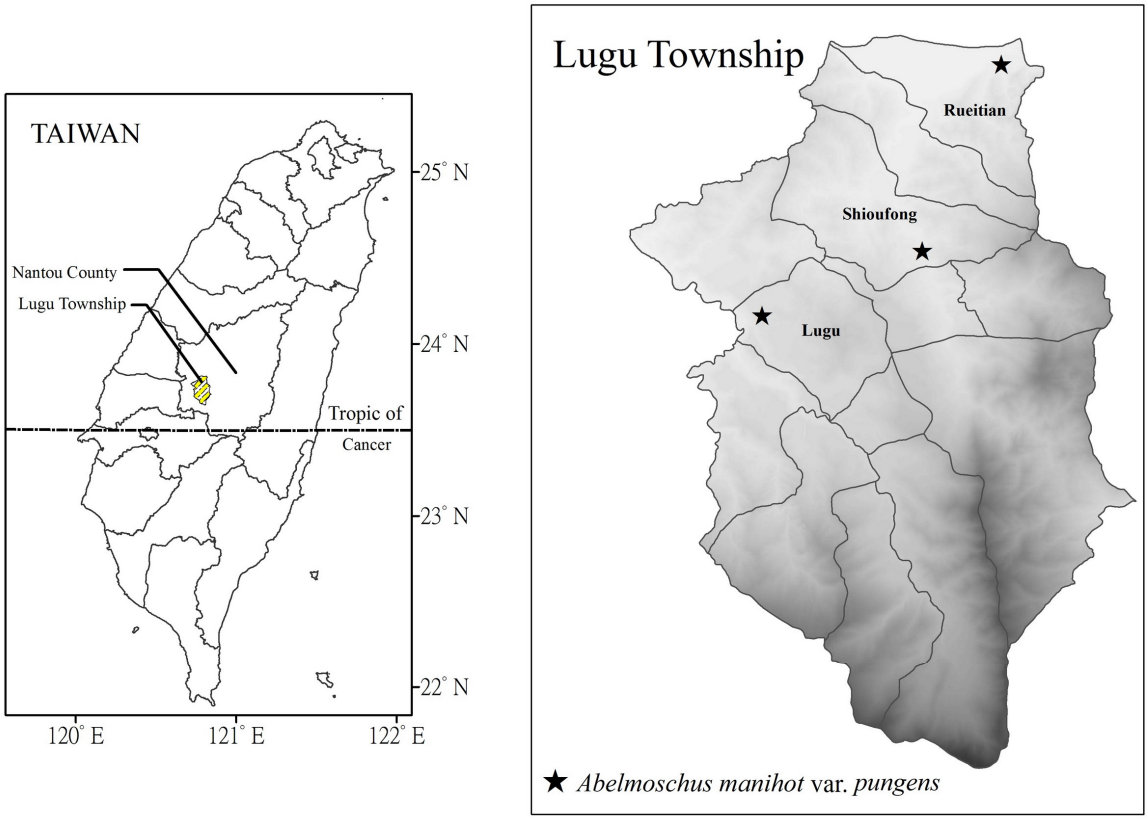

Fig. 2. Distribution of *Abelmoschus manihot* var. *pungens* (Roxburgh) Hochreutiner in Taiwan.

ovoid-ellipsoid, 5–7 cm long, 2.2–2.6 cm wide, hirsute. Seeds many, reniform, 3.3–3.6 mm long, black, with several concentric lines of hairs.

Specimens examined: TAIWAN, Nantou County, Lugu Township, Shioufong Village, 19 Jun. 2012, *C.T. Lee* 013 (PPI); Lugu Village, 21 Jun. 2012, *C.T. Lee* 014 (PPI); Rueitian Village,16 Jul. 2012, *C.T. Lee* 017 (PPI).

Distribution: *A. manihot* var. *pungens* occurs in China, India, Nepal, Philippines, and North Thailand (Preston, 1998; Tang *et al*., 2007). In Taiwan, *A. manihot* var. *pungens* occurs in Nantou County. It is found on streamsides and abandoned land.

Notes: Compared to the data recorded from *A. manihot* var. *pungens* found elsewhere, the species in central Taiwan has linear or rarely linear-lanceolate leave lobes and each kind of the lobes are entire or minutely toothed or wavy at margins. However, in our research, the leave lobes differ from those, recorded by Roxburgh in 1832, which are always deeply serrate-dentate.

Ying (1992) have described *A. manihot*. According to the Fig. 1128, it should be *A. manihot* var. *manihot*. Lu *et al*. (2006) have described *A. manihot*, too. Based on the photo of the species (p.174) with linear-lanceolate epicalyx lobes, the species should be *A. moschatus*. Both of the studies recognized *A. manihot* as a cultivated species in Taiwan.

To sum up, there are five species of *Abelmoschus*, including *A. manihot* var. *pungens*, have been recorded in Taiwan (Chang, 1993; Chao, 2005; Ying, 1992; Lu *et al*., 2006).

Key to *Abelmoschus* species in Taiwan

1. Epicalyx-segments 4–5, rarely 6, ovate-lanceolate……..……2
1. Epicalyx-segments 6–12, linear……..……3
2. Plant without long simple-hispid pubescent; branches glabrous; flowers in terminal head-like or shortly raceme..... ***A. lanyunatus***
2. Plant most parts with long simple-hispid and minutely simple- or few-rayed pubescent; flowers solitary axillary, subapical and forming terminal raceme……..……4
3. Capsule cylindric, 10–25 cm long ..... ***A. esculentus***
3. Capsule ovoid-ellipsoid, 4–6 cm long ……..…… ***A. moschatus***
4. Stems devoid of prickly hairs; pedicels sometimes with prickly hairs; leaf lobes oblong-lanceolate, margin robustly, obtusely serrate ..... ***A. manihot* var. *manihot***
4. Plants with distinct prickly hairs all round including margins of epicalyx-segments; leaf lobes linear or rarely linear-lanceolate, entire or minutely toothed or wavy at margins..... ***A. manihot* var. *pungens***

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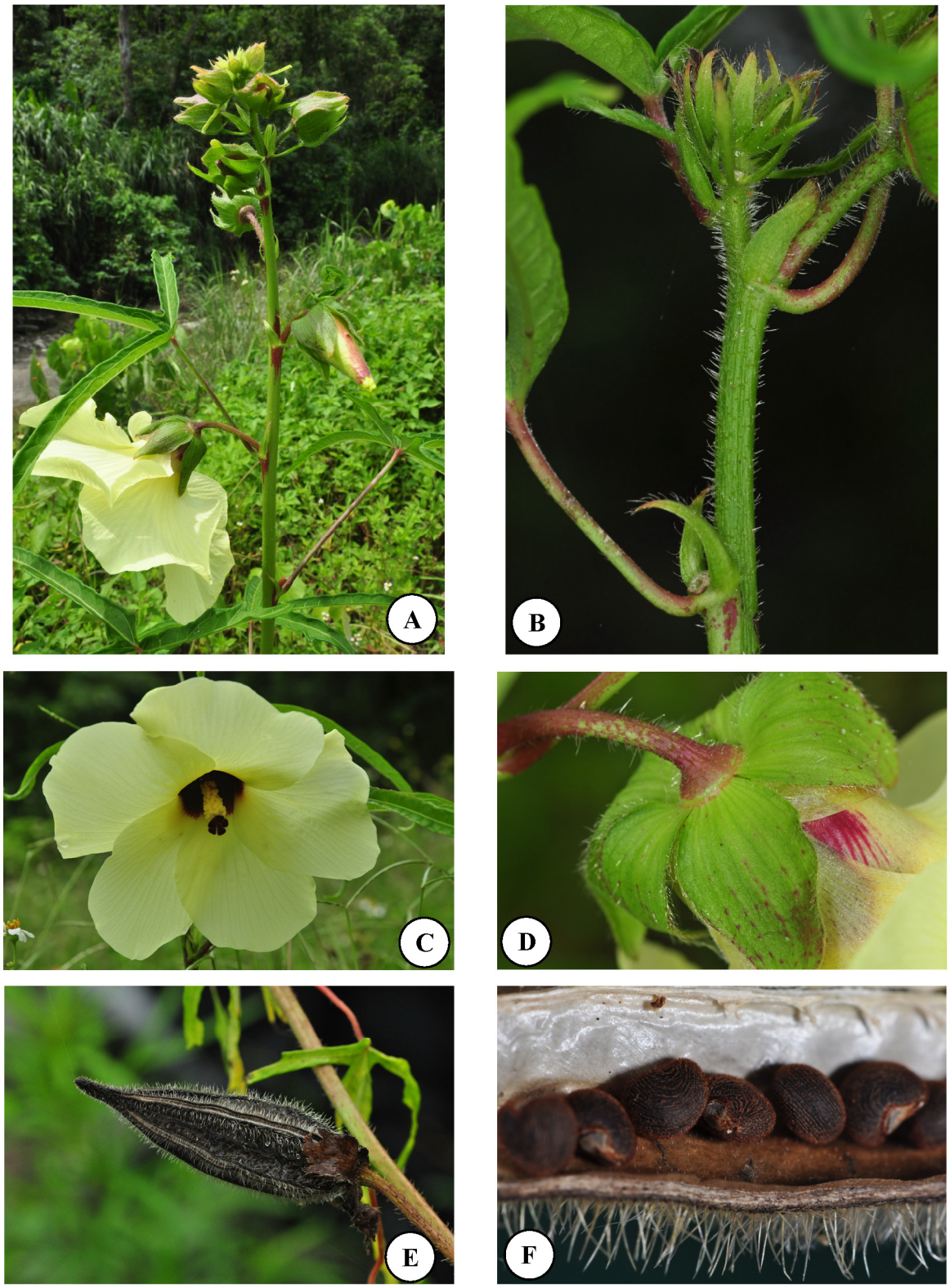

Fig. 3. Photographs of *Abelmoschus manihot* var. *pungens* (Roxburgh) Hochreutiner. A: Flowering plant. B: Stem and epicalyx have prickly hairs. C: Flower. D: Epicalyx lobes, oblong-lanceolate. E: Matured capsule. F: Seeds in the capsule.

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錦葵科新歸化植物－剛毛黃蜀葵

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摘要：剛毛黃蜀葵（錦葵科），近期於臺灣中部之野地被發現，為臺灣新歸化植物。本種辨識特徵為總苞片為卵狀披針形，全株及總苞片均密被剛毛。本文提供該種植物的形態描述、手繪圖及彩色照片供鑑定之用。

關鍵詞：剛毛黃蜀葵、錦葵科、新歸化、臺灣。