

Research paper

## *Hibiscus cannabinus* L. (Malvaceae), A Newly Naturalized Plant in Taiwan

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**【Abstract】** *Hibiscus cannabinus* L., native to Africa and India, has been cultivated as a fiber crop for many centuries. Recently, we found it has been naturalized to central, southern and eastern low altitudes in Taiwan. This alien species is very similar to *H. sabdariffa* L. but is distinguished from the latter by the corolla yellow with crimson center, and the lobe of calyx long caudate and white tomentose, each lobe with a gland at the base and epicalyx spiny. A taxonomic treatment, distributions, habitats, color photographs, line drawings, and voucher specimen were provided to aid identification.

**【Key words】** *Hibiscus cannabinus*, Malvaceae, Naturalized Plant, Taiwan

研究報告

## 臺灣新歸化錦葵科植物—大麻槿

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**【摘要】** 大麻槿 (*Hibiscus cannabinus* L.) 原產於非洲及印度，幾世紀以來常被栽培作為纖維作物。目前發現歸化於臺灣中、南部及東部低海拔地區路邊之荒廢農田及草地。其外觀與洛神葵 (*H. sabdariffa* L.) 相似，主要區別在於前者花冠黃色但中心深紅色；花萼裂片長尾狀、基部具腺並被白色棉毛及副萼被刺毛等。本文描述其形態特徵、地理分佈及生育地環境，並提供彩色圖片、引證標本與線繪圖以資辨識。

**【關鍵詞】** 大麻槿、錦葵科、歸化植物、臺灣

### INTRODUCTION

The family Malvaceae comprised 100 genera and 2,000 species throughout the world,

principally in tropical and subtropical regions but with a few genera in temperate regions (Fryxell, 1988). There are 8 genera and 23 species in

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Taiwan (Chang, 1993; Tang *et al.*, 2007). *Hibiscus* L. is the largest number of species in tropical and subtropical, about 200 species from the America, Africa, Asia, Australia, and elsewhere (Fryxell, 1988). *Hibiscus* is so heterogeneous that it is difficult to specify distinguishing features, but the 5-celled capsules and 5 capitate stigmas are essentially constant (Fryxell, 1997).

The taxa of *Hibiscus* are herbs, undershrubs, shrubs and trees, usually covered with stellate hairs. Leaves more or less palmately lobed. Flowers axillary and solitary; epicalyx-segments 5 or more, free or connate at base; calyx 5-toothed or 5-lobed; petals 5, connate at base with the staminal tube truncate, the staminal tube truncate or 5-toothed at summit. Ovary 5-celled, styles 5, connate below. Capsules loculocidally 5-valved (Chang, 1993).

Five species is previously recognized in Taiwan (Chang, 1993). *Hibiscus cannabinus* L., native to Africa and India, is now recorded as newly naturalized species to Taiwan. It is cultivated as a fiber crop and the seed oil is considered inedible but is used industrially and in oil-lamps (Tang *et al.*, 2007). The stem provided fiber materials (Lu *et al.*, 2006).

## TAXONOMIC TREATMENT

*Hibiscus cannabinus* L., Systema Naturae, ed. 10, 2: 1149. 1759.

大麻槿 Fig. 1, 2 and 3.

Annual or perennial herb, stem erect, robust, up to 3 m tall, glabrous, sparsely sharply spiny. Leaf blade dimorphic; blades on proximal part of stem cordate, those on distal part of stem palmately 3-7-lobed, lobes lanceolate, 2-12 × 0.6-2 cm long, base cordate or nearly rounded, margin serrate, glabrous on both surfaces, apex acuminate; basal veins 5-7, glandular near base

of midrib. Stipules silk like, 6-8 mm long; petiole 6-20 cm, sparsely spiny; Flowers solitary, axillary, subsessile. Epicalyx lobes 7-10, 6-8 mm long, sparsely spiny. Calyx subcampanulate, connate below the middle, ca. 3 cm long, the lobes 5, lanceolate and long caudate, 1-2 cm long, spiny and white tomentose, each with a gland at the base. Corolla yellow with crimson center; petals oblong-obovate, ca. 6 cm. Staminal column 1.5-2 cm long, glabrous. Styles 5, glabrous. Capsule globose, ca. 1.5 cm long in diameter, densely spiny, apex with shortly beaked. Seeds reniform, subglabrous, minutely scabrous on the back. Flower period in autumn (Hu, 1955; Tang *et al.*, 2007).

Specimens examined: Taiwan. Taichung City (台中市), Chingshui District (清水區), Tungshan (東山), elev. ca. 195 m, 28 Nov. 2011, Wnag 14698 (TNM); Taya District (大雅區), elev. ca. 146 m, 28 Nov. 2011, Wang 14699 (TNM); Changhua County (彰化縣). Fangyuan Township (芳苑鄉), Wangkung (王功), elev. ca. 13 m, 2 Jan. 2007, Wang, 11034 (TNM); Yunlin County (雲林縣). Dongshi Township (東勢鄉), elev. ca. 27 m, 13 Nov. 2005, Wang 8481 (TNM); Peikang Town (北港鎮), elev. ca. 9 m, 07 Nov. 2011, Wang 14552 (TNM); Mailiao Township (麥寮鄉), county road 156 (縣道156), elev. ca. 11 m, 25 Oct. 2011, Liu 189 (TCF); Maifeng village (麥豐村), elev. ca. 12 m, 20 Oct. 2011, Wang 14501 (TNM); Chiayi County (嘉義縣), Xingang Township (新港鄉), elev. ca. 21 m, 1 Jan. 2012, Liu 210 (TCF); Tainan City (台南市), Tsochen District (左鎮區), elev. ca. 50 m, 20 Jan. 2011, Wang 14198 (TNM); Shanhu District (善化區), Chlehpa (茄拔), elev. ca. 22 m, 15 Jan. 2011, Wang 14168 (TNM); Pingtung County (屏東縣), Manzhou Township (滿州鄉). Lanjenchi (攬仁溪). 8 Oct. 2011, Liu 217 (TCF); Taitung County (台東縣). Donghe

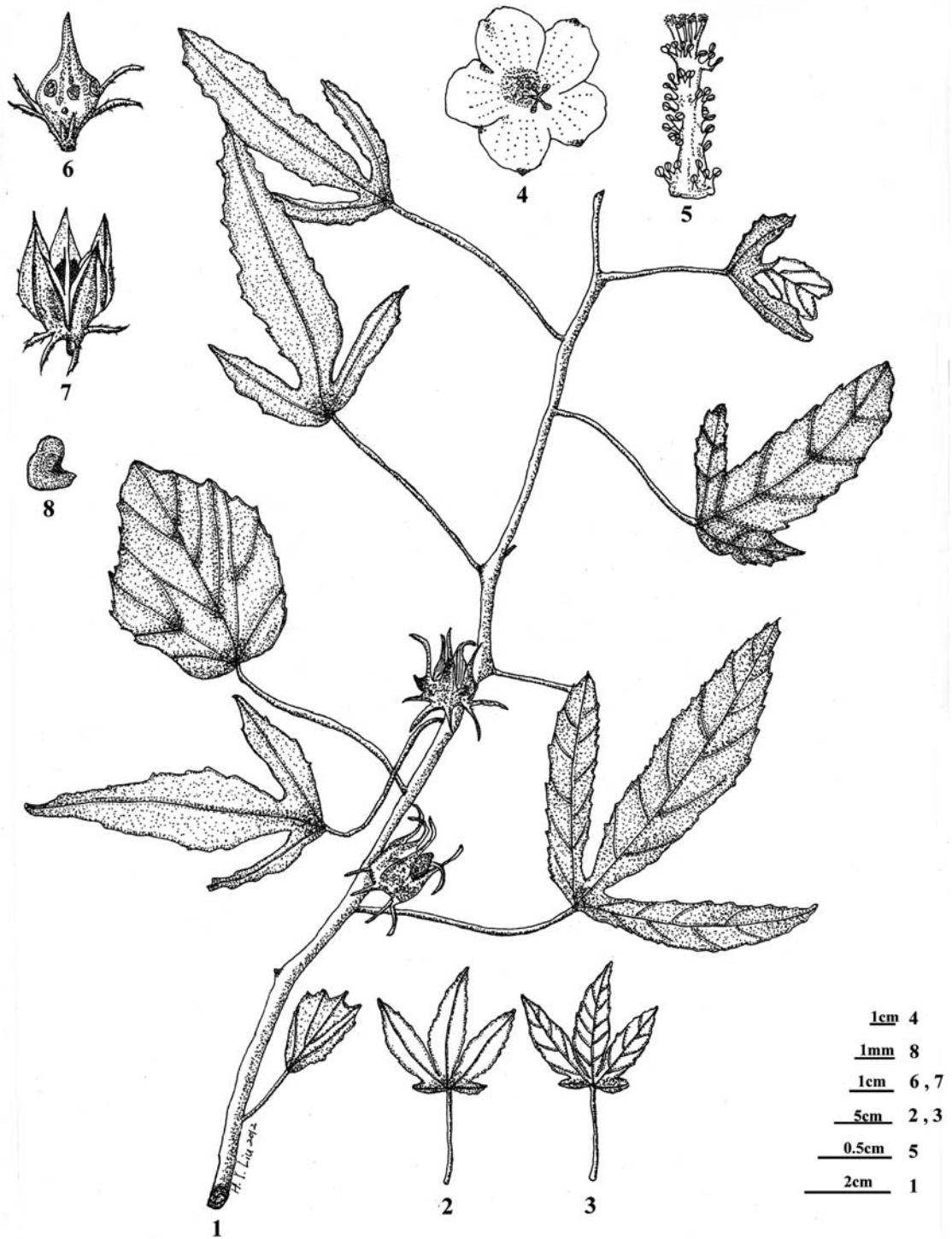


Fig. 1. *Hibiscus cannabinus* L. 1. Habit; 2. Leaf, adaxial surface; 3. Leaf, abaxial surface; 4. Flower; 5. Monadelphous tube; 6. Young fruit after flower; 7. Mature fruit; 8. Seed.

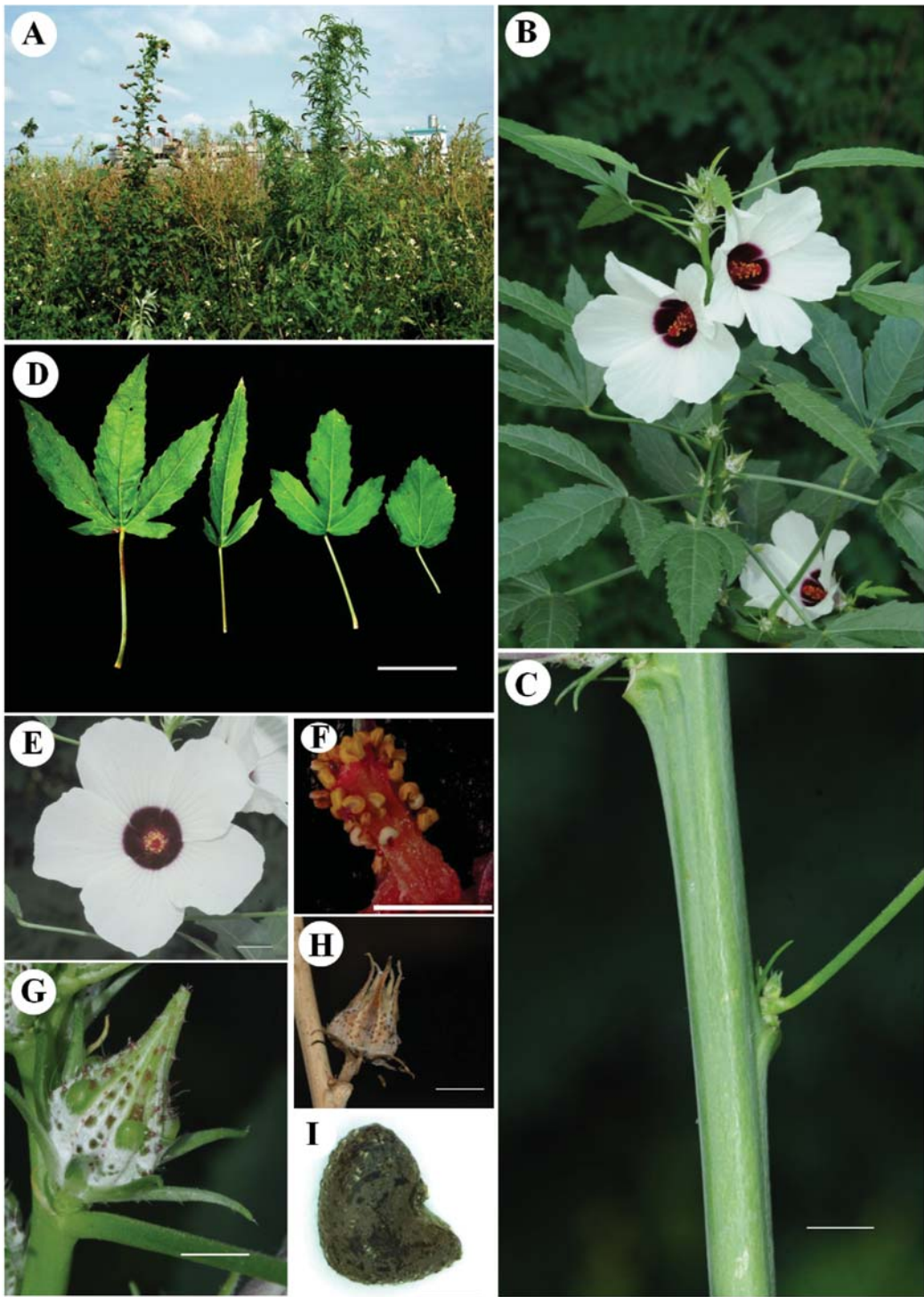


Fig. 2. *Hibiscus cannabinus* L. (Scale bar: C, E, G, H =1cm; D=5cm; F=0.5cm; I=1mm). A: Habitat. B: Habit. C: Petiole. D: Variation of leaves. E: Flower. F: Monadelphous tube. G: Young fruit after flower. H: Mature fruit. I: Seed.



Fig. 3. Voucher specimen of *Hibiscus cannabinus* L. (Liu 189, TCF).

Township (東河鄉), Chili Bridge (七里橋), 20 Jan. 2006, Wu 2397 (TNM); Donghe Township (東河鄉), Mt. Tulan (都蘭山), 09 Feb. 2012, Chao 2015 (TCF); Changbin Township (長濱鄉), Pengtsaitsun (彭仔村), 4 Feb. 2004, Wu 2070 (TNM); Taitung City (台東市), 11 Jan. 2012, Liu 214 (TCF).

**Notes:** *H. cannabinus* L. closely resembles

*H. sabdariffa* L., but it is distinct for having green stems, leaf 3-7 lobes; epicalyx 7-10 lobes, linear; calyx campanulate, green; calyx lobe lanceolate and long caudate (vs. red stems, leaf 3 lobes; epicalyx 8-12 lobes, lanceolate; calyx cup-shaped, red; calyx lobe triangular and long caudate.) (Table 1).

**Distribution:** *Hibiscus cannabinus* L. was

Table 1. Comparison of the *Hibiscus cannabinus* L. and *H. sabdariffa* L.

Morphology	<i>H. cannabinus</i> L.	<i>H. sabdariffa</i> L.
Stems	green	red
Leaves	3-7 lobes	3 lobes
Epicalyxes	7-10 lobes, linear	8-12 lobes, lanceolate
Calyxes	campanulate, green	cup-shaped, red
Calyx lobes	lanceolate and long caudate	triangular and long caudate

first planted in sub-Saharan Africa more than 1,000 years ago and has long been commercially grown in India, Africa, Asia, the Middle East, and more recently in Latin America (Fryxell, 1988; Lawton, 2004), and then cultivated in Heilongjiang, Liaoning, Hubei, Jiangsu, Zhejiang, Guangdong and Yunnan of China (Tang *et al.*, 2007). Recently this species has naturalized to central, southern and eastern of Taiwan. It was found at roadside, waste farms and grassland, at low altitudes of this island (Fig. 4).

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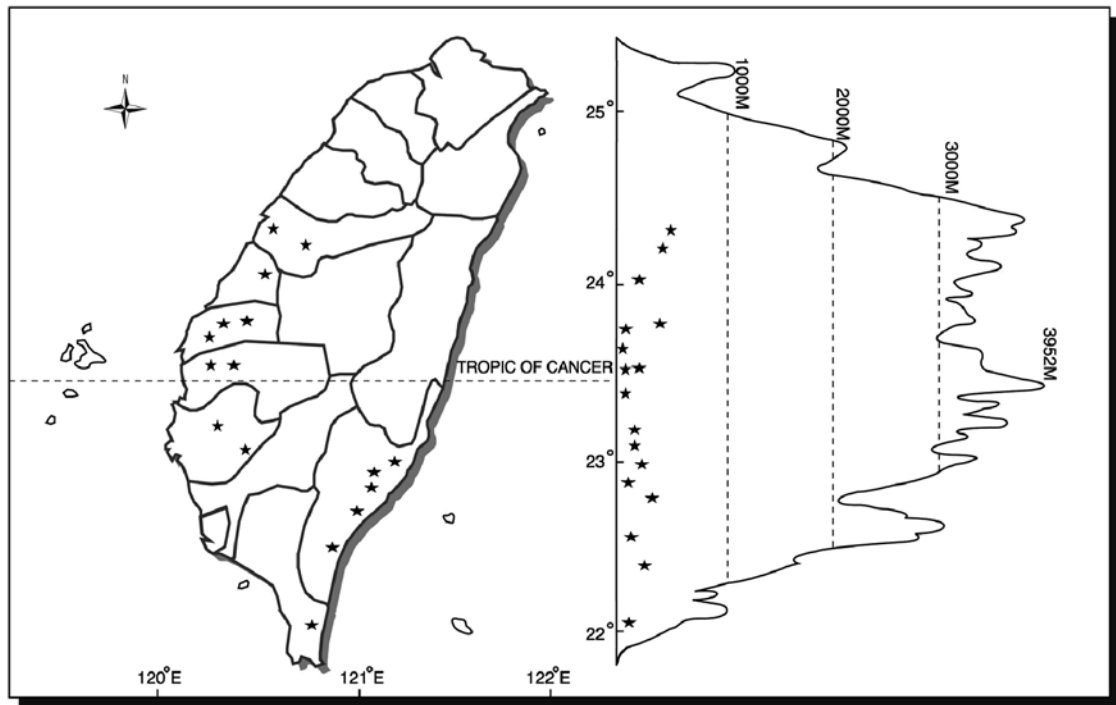


Fig. 4. Distribution of *Hibiscus cannabinus* L. in Taiwan.