

Two Newly Naturalized Plants of the Leguminosae in Taiwan: *Macroptilium bracteatum* (Nees & Mart.) Maréchal & Baudet and *Cyamopsis tetragonoloba* (L.) Toubert

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Abstract. *Macroptilium bracteatum* (Nees & Mart.) Maréchal & Baudet, an herb native to South America, was recently found in west-central Taiwan. *Cyamopsis tetragonoloba* (L.) Toubert, an herb native to India, is a newly recorded genus in Taiwan. Both species are considered to be naturalized plants. This report gives taxonomic descriptions, illustrations, and distribution maps. Photographs are also provided for help with identification.

Key words: *Cyamopsis tetragonoloba*, *Macroptilium bracteatum*, Leguminosae, naturalized plant, Taiwan.

INTRODUCTION

The Leguminosae is the third largest family of angiosperms, with three subfamilies comprising ca. 650 genera and more than 18,000 species (Doyle *et al.*, 1997). In the *Flora of Taiwan* 2nd edition, there are ca. 60 genera and 170 native or naturalized species recorded (Huang and Ohashi, 1993). Fifty-four naturalized species represent 34 genera and three subfamilies, and most of these taxa belong to the subfamily Papilionoideae (Wu *et al.*, 2003). As for the updated naturalized flora of Taiwan, ca. 80 naturalized species of the Leguminosae were recorded (Wu *et al.*, 2010). Recently, in our botanical exploration, two species were found in central Taiwan and are now considered to be naturalized plants: *Macroptilium bracteatum* (Nees & Mart.) Maréchal & Baudet and *Cyamopsis tetragonoloba* (L.) Toubert. The latter represents a new record of the genus in Taiwan. Both of these are considered common weeds of orchards, roadsides, and agronomic crops. This paper provides descriptions, illustrations, distribution maps, and color photos.

All specimens were deposited in the herbarium of Department of Botany, National Museum of Natural Science, Taichung city, Taiwan (TNM).

SYSTEMATIC TREATMENT

Macroptilium bracteatum (Nees & Mart.) Maréchal & Baudet, Bull. Jard. Bot. Natl. Belg. 44: 443. 1974. 芭葉賽芎豆 (Figs. 1, 3)

Phaseolus bracteatus Nees & Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 12: 27. 1824. (basionym)

Erect and somewhat trailing perennial herb. Stem pubescent, up to 100 cm tall. Leaves trifoliolate, stipules about 5 mm long, petiole 1~4 cm long; leaflets 3.5~6 cm long, 3~4 cm wide, pubescent on both sides; usually with 3 lobes, apex obtuse. Peduncle 10~15 cm long, with a whorl of bracts close to base; flowers on upper part of raceme, purplish-red with small bracts at base; calyx tube pubescent, ca. 5 mm long, with 5 unequal teeth. Fruit linear, 4.5~9 cm long with 10~18 seeds. Seeds brown to black, almost cylindrical, 2.5~4

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mm long and 3~4 mm in diameter, almost always mottled.

Specimens examined: Changhua Co.: Huatan Township: Kukualiao *C. M. Wang 14922* (TNM).

Distribution and Notes

This species is native to South America, including Argentina, Bolivia, Brazil, Paraguay, Peru, and Venezuela. Because this species was selected for use as a short-term pasture plant on heavy textured alkaline soils in the subtropics (Jones and Rees, 1997), it might have been introduced to other countries via the soil. So far, *M. bracteatum* has only been found in west-central Taiwan (Fig. 4). There are two species of the genus recorded in the *Flora of Taiwan*: *M. atropurpureus* (DC.) Urban and *M. lathyroides* (DC.) Urban (Huang and Ohashi, 1993). *Macroptilium bracteatum* is somewhat similar to *M. atropurpureus*, but differs from the latter by having a whorl of bracts at the base of the peduncle.

Key to species of Taiwanese *Macroptilium*

1. Leaves glabrous or hairy on vein above, leaflets narrowly elliptic to ovate-lanceolate; peduncles with appressed hairs *M. lathyroides*
1. Leaves hairy above, leaflets ovate to rhombic; peduncles with spreading hairs.
 2. With a whorl of bracts at base of peduncle.....
..... *M. atropurpureus*
 2. Without a whorl of bracts at base of peduncle
..... *M. bracteatum*

Cyamopsis Candolle, Prod. 2: 215. 1825 瓜兒豆屬

Herbs, annual, with appressed T-shaped trichomes. Stipules subulate or linear. Leaves 3-foliolate or simple; leaflet blades on both surfaces or only abaxially with appressed white T-shaped trichomes, margin serrate, entire, or parted. Inflorescence axillary, racemose. Calyx 5-toothed, abaxial, one much longer than the others. Corolla yellow to pink; keel not curled. Stamens 10, monadelphous. Ovary sessile. Legume angular, apex tapering to a beak. Surface of seeds slightly tubercular and bulging.

Four species, in tropical Africa and South Asia. One species is naturalized in Taiwan.

Cyamopsis tetragonoloba (L.) Toubert, in Engler & Prantl, Nat. Pflanzenfam. 3(3): 259. 1894. 瓜兒豆 (Figs. 2, 3)

Psoralea tetragonoloba L., Mant. Pl. 1:104. 1767. (basionym)

An erect or decumbent annual herb. Stem branched, up to 70 cm tall, with small white appressed hairs. Leaves trifoliolate, with appressed hairs and brown dots, stipules linear, 6~8 mm long, petiole 3~6 cm long; leaflets 5~8 cm long, 3.5~6 cm wide; usually obovate, base cuneate, apex acute, margins with 8~12 pairs of remote acute serrations. Peduncle 2~5 cm long, with appressed hairs, bracts linear, close to base. Flowers on upper part of raceme, pink, bracteoles linear, 4~6-mm-long, at base of each flower; calyx tube pubescent, 1~2 mm long, with 5 unequal teeth. Fruit linear, brown to dark-brown and somewhat curved when mature, ridged, 4~5 cm long with ca. 7~9 seeds. Seeds brown to black, usually broadly ovoid, 3.5~4.5 mm in diameter.

Specimens examined: Taichung City: Chinshui Dist.: Tungshan, *C. M. Wang 14388* (TNM). Changhua Co.: Chutang Township: Chutang Village, *C. M. Wang 14505* (TNM); Hsiushui Township: Nanshialun, *C. M. Wang 14561*(TNM). Yunlin Co.: Tungshih Township: Hsinkun Village, *C. M. Wang 14492* (TNM); Mailiao Township: Maifeng Village, *C. M. Wang 14503, 14504* (TNM); Mailiao Township: Chunliao, *C. M. Wang 14610* (TNM); Mailiao Township, *C. M. Wang 14621, 14625* (TNM); Mailiao Township: Niutso Village, *C. M. Wang 14630* (TNM).

Distribution and Notes

Cyamopsis tetragonoloba is a moderately sized annual herb found throughout India, that is cultivated for its pods which are used as a vegetable and for traditional medicines (Sharma et al., 2011). It is a leguminous crop with a good capability to fix atmospheric nitrogen. Many cultivars of this species are grown for seed production; the seeds are generally rich in proteins which are used for poultry and animal nutrition (Elsheikh and Ibrahim, 1999). In China, this crop was introduced to western Yunnan Province for the gum (Xu et al., 2010). We consider that this species was likely introduced to Taiwan by agricultural activities. Several populations were found in different counties in central Taiwan (Fig. 4), and it is considered an invasive plant.

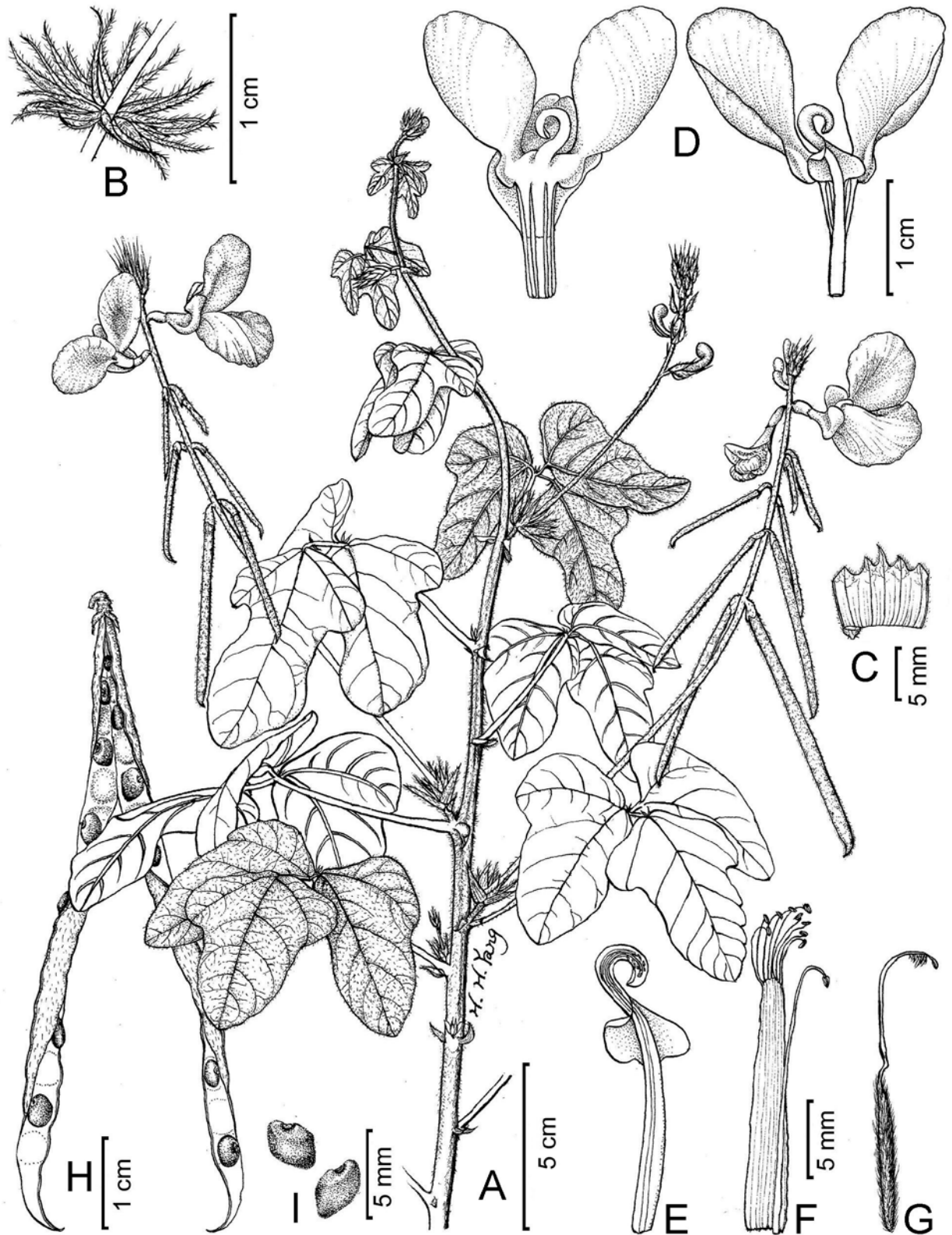


Fig. 1. *Macroptilium bracteatum*. A, Habit; B, bract; C, calyx; D, corolla; E, keel with stamens; F, stamens; G, pistil; H, pod; I, seeds.

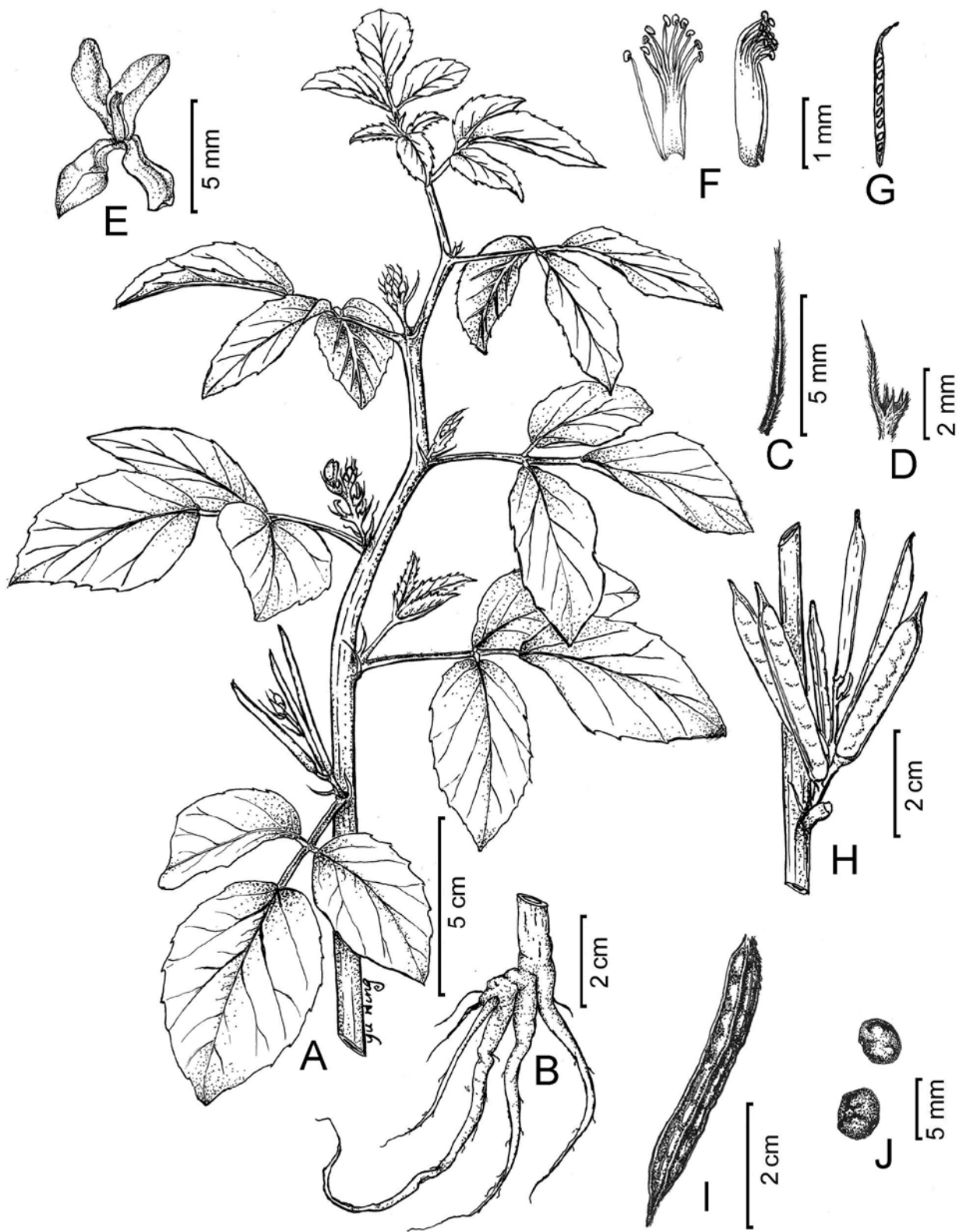


Fig. 2. *Cyamopsis tetragonoloba*. A, Habit; B, root; C, bract; D, calyx; E, corolla; F, stamens; G, pistil; H, immature pods; I, pod; J, seeds.

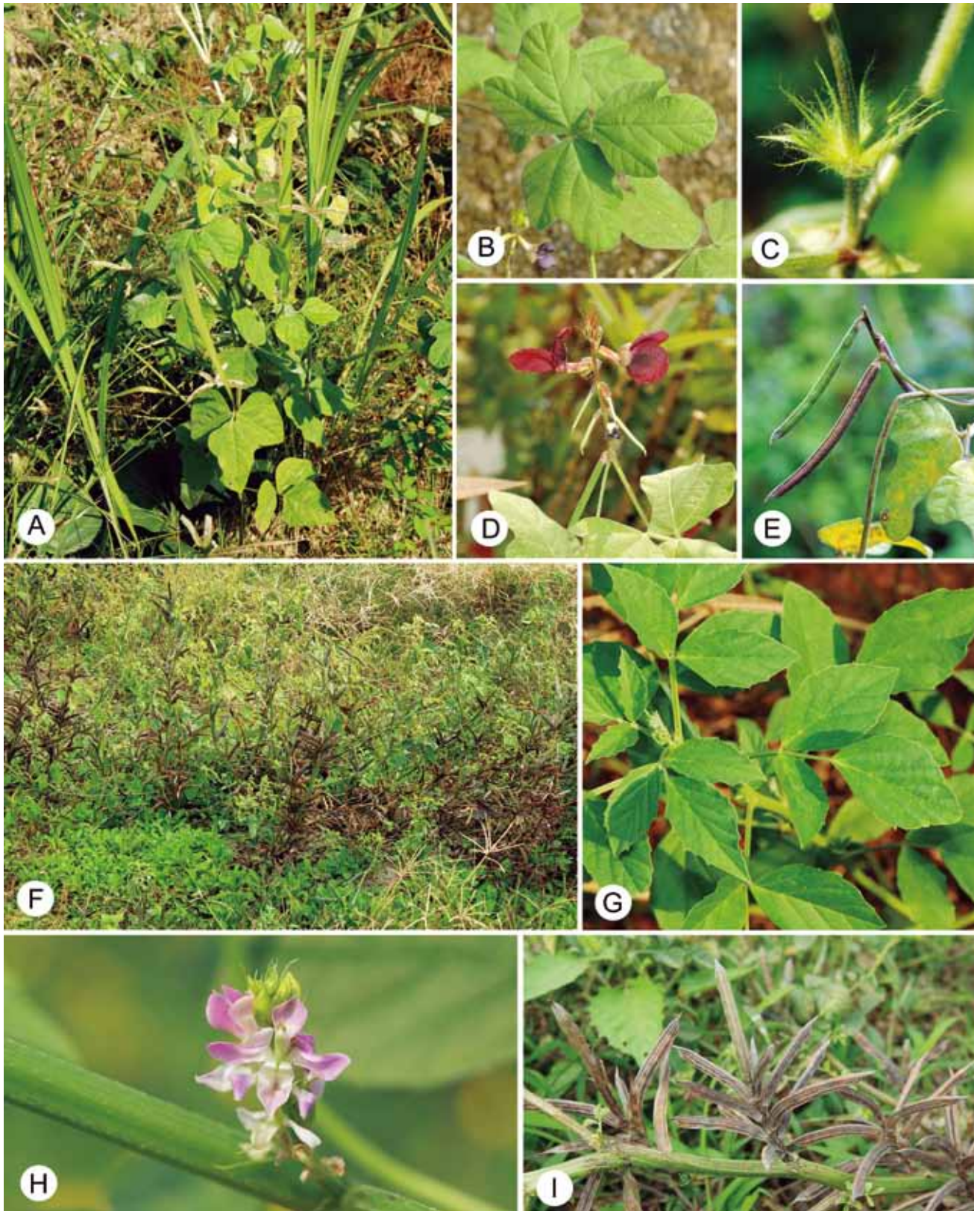


Fig. 3. *Macropodium bracteatum*. A, Habit; B, leaves; C, bract; D, inflorescence; E, pods. *Cyamopsis tetragonoloba*. F, Habit; G, leaves; H, inflorescence; I, pods.

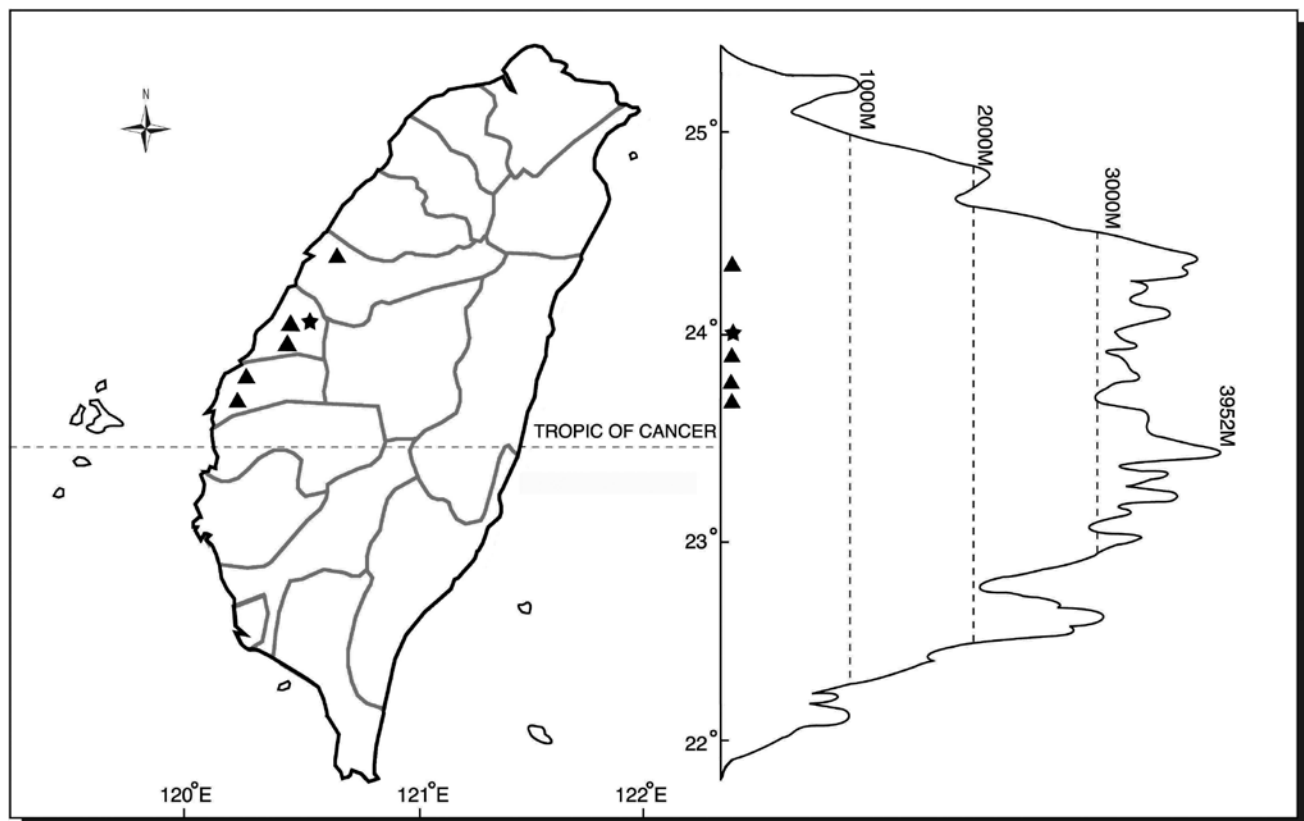


Fig. 4. Distribution map of *Macropodium bracteatum* (star) and *Cyamopsis tetragonoloba* (triangles) in Taiwan.

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兩種新歸化的豆科植物

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原產於南美洲的苞葉賽芣豆（新擬），最近發現於中臺灣；而原產於印度的瓜兒豆，則為臺灣的新紀錄屬植物。這兩種豆科植物，推測均為新近才歸化於臺灣的外來物種。本文提供分類特徵描述，手繪圖，以及在臺灣的分佈點以供區分鑑定。

關鍵詞：瓜兒豆，苞葉賽芣豆，豆科，歸化植物，臺灣。