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Notes on Four Alien Plants in Taiwan

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ABSTRACT: *Arthraxon lancifolius* (Trin.) Hochst., *Lamium hybridum* Vill., *Matricaria matricarioides* (Less.) Porter, and *Thlaspi arvense* L. were found recently in the mountains of central and southern Taiwan. *Thlaspi* is a new alien genus in the Taiwan flora. Descriptions, illustrations, and photos of these four alien plants are provided for identification.

KEY WORDS: ***Arthraxon lancifolius*, Asteraceae, Brassicaceae, Lamiaceae, *Lamium hybridum*, *Matricaria matricarioides*, Poaceae, Taxonomy, Taiwan, *Thlaspi arvense*.**

INTRODUCTION

Four new additions to the flora of Taiwan are reported here. They are *Arthraxon lancifolius* (Trin.) Hochst. (Poaceae) collected in southern Taiwan while *Lamium hybridum* Vill. (Lamiaceae), *Matricaria matricarioides* (Less.) Porter (Asteraceae), and *Thlaspi arvense* L. (Brassicaceae) were found in central Taiwan (Fig. 1).

The genus *Arthraxon* P. Beauv. (Poaceae) includes 7-20 species, and is distributed in tropical Africa, Madagascar, Mauritius, the Indo-Malesian region, and Japan (Watson and Dallwitz, 1992; Liu, 2000). Three species of *Arthraxon* were reported in Taiwan (Liu, 2000; Boufford et al., 2003). The genus *Lamium* L. (Lamiaceae) contains ca. 40 species in Eurasia and Africa, and was represented by two species in Taiwan (Huang et al., 1998; Boufford et al., 2003). *Matricaria* L. (Asteraceae) has ca. 7 species, widely distributed in the northern hemisphere, some of which were introduced into the southern hemisphere as weeds (Bremer and Humphries, 1993). *Matricaria chamomilla* L. was cultivated in Taiwan for its essential oil. The genus *Thlaspi* L. (Brassicaceae) contains about 75 species in the temperate region worldwide (Zhou et al., 2001), but was not reported in Taiwan (Zhou et al., 2001). In this study, we follow the idea of Clifford to choose the term "alien" to describe species not native to an area (Clifford, 2006), meanwhile we offer the descriptions, illustrations, and photographs for four alien plants to the flora of Taiwan.

TAXONOMIC TREATMENTS

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1. ***Arthraxon lancifolius*** (Trin.) Hochst., Flora 39: 188. 1856; van Welzen, P. C., Blumea 27: 255-300. 1981; Shukla U., Grasses of North-Eastern India., pp. 64-69. 1996.

小葉蓧草 Figs. 2 & 6A

Culms to 15 cm tall, ascending to erect, intrasheath branching; nodes articulate, pubescent, lower nodes rooting; internodes glabrous. Sheath shorter than internode, pubescent; ligule membranous; blade ovate, to 3.5 × 1 cm, base rounded. Inflorescence 1-3 spike-like racemes, 1-2 cm long, digitately arranged. Sessile spikelet with 2 florets, upper one fertile. Lower glume lanceolate, ca. 4.5 mm long, membranous, scabrous, 5-veined, apex acuminate or bifid; upper glume lanceolate, ca. 4.5 mm long, keeled, scabrous, veinless, apex acuminate. Rachilla ciliate; lower lemma lanceolate, ca. 2 mm long, hyaline; upper lemma lanceolate, ca. 1.5 mm long, hyaline, veinless, with one awn rising from sub-base of upper lemma, awn ca. 9 × as long as upper lemma, columnar; column ca. 3 × as long as upper lemma; apex of awn scabrous. Pedicel compressed, longer or shorter than pedicellate spikelet, margin ciliate. Pedicellate spikelet sterile, with one sterile floret. Lower glume lanceolate to ovate, boat-shaped, ca. 3 mm long , 5-veined, apex acuminate; upper glume lanceolate, boat-shaped, ca. 2.5 mm long, 3-veined, apex acuminate; lemma ovate, ca. 1.5 mm long, hyaline, 1-veined to veinless, apex acute or bifid.

Specimens examined: Chiayi Hsien, Alishan Hsiang, between Sher-Drow and Sher-Ze-Lu, along Taiwan Highway No. 18, Oct. 10, 2005, *M.-J. Jung x101002* (NCKU), 65 km marker on Taiwan Highway No. 18, Oct. 28, 2000, *W.-C. Leong 2116* (HAST).

Distribution and notes: *Arthraxon lancifolius* (Trin.) Hochst. is distributed in southern China, southeastern Asia, southern Asia, Arabia, and

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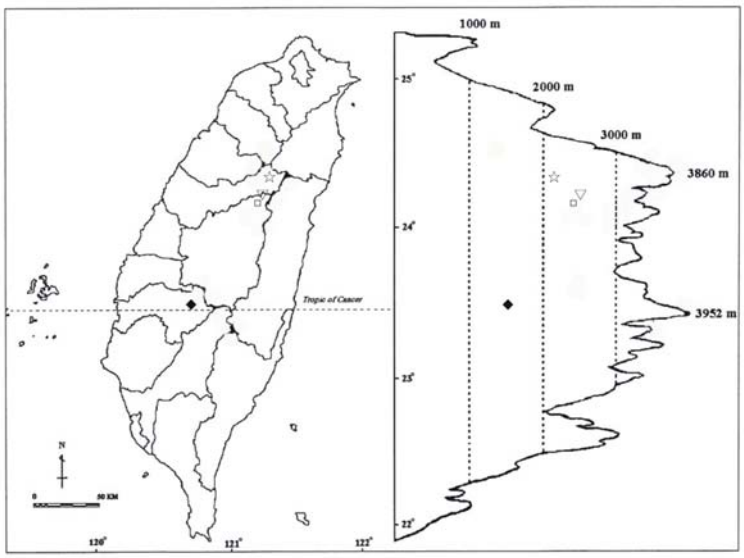


Fig. 1. Distribution map of *Arthraxon lancifolius* (Trin.) Hochst. (◆), *Lamium hybridum* Vill. (□), *Matricaria matricarioides* (Less.) Porter (▽), and *Thlaspi arvense* L. (☆).

eastern Africa (Welzen, 1981). One population was found naturalized along Taiwan Highway No. 18, between Sher-Drow and Sher-Ze-Lu. *Chloris divaricata* R. Br. var. *cynodontoides* (Bal.) Lazarides (Poaceae) was found at the same site. Leaf bases of *A. lancifolius* are rounded, while those of other *Arthraxon* grasses in Taiwan are amplexicaul. Tubercle hairs are absent on leaves of *A. lancifolius*, while these hairs are dominant in other *Arthraxon* species in Taiwan. *A. lancifolius* with well-developed rachilla hairs significantly differs from other native *Arthraxon* grasses in Taiwan.

2. ***Lamium hybridum*** Vill., Hist. Pl. Dauphine 1: 251. 1786; Stace, C. A., New Flora of the British Isles: 666-667, 1991.

雜種野芝麻 Figs. 3 & 6B

Herbs annual, ascending or erect, to ca. 25 cm tall. Stems square, slender, branched at base; phyllotaxis opposite. Leaves petiolate; petiole ca. 5 cm long; blade ovate, to 2 cm long, both surfaces hairy, base truncate, margin crenate, apex rounded. Inflorescences of dense verticillate cymes; foliaceous bracts 2, petiolate; petioles 0.5-2 cm long; bract enclosing the cymes, broadly ovate, 2-3.5 × 1.5-4.5 cm, base cuneate to attenuate, simple to lobed, apex acute; lobe 2-5 mm long. Flowers sessile. Calyx campanulate, 7-9 mm long, puberulent, 5-toothed; teeth narrowly triangular, equal. Corolla reddish purple, tubular, 1.5-2 cm long, bilabiate; upper lip galeate; lower lip 3-lobed; lateral lobes triangular, apex acute; central lobe fan-shaped, deeply divided. Stamens 4, didynamous, lower pair longer; anthers 2-celled, divergent, hairy at ends; stigma bifid. Nuts ca. 2.5 mm long, 3-keeled, scabrous.

Specimen examined: Nantou Hsien, Jenai Hsiang, Wha-Gang, Mar. 12, 2006, *M.-J. Jung y031204* (NCKU).

Distribution and notes: *Lamium hybridum* Vill. (cut-leaf dead nettle, or dead nettle hybrid) is distributed in Europe (Denise, 1937) and the British Isles (Stace, 1991). The plants occurred along the Li-shin Industrial Road, at 2300-2400 m elevation (Fig. 1). The shape of the lower corolla lobe is significantly different from that of *L. amplexicaule* L. and *L. tuberiferum* (Makino) Ohwi. Also, the petiolate character and lobed margin of bracts and hairy anthers could be used for identification.

3. ***Matricaria matricarioides*** (Less.) Porter, Mem. Torrey Bot. Club 5(22): 341. 1894; Stace C. A., New Flora of the British Isles: 867-868, 1991.

同花母菊 Figs. 4 & 6C

Herbs ascending to erect, to 10 cm tall. Phyllotaxis alternate; blade oblong, 1-1.8 cm × 5-8 mm, 2-pinnatisect; segments 5-7 pairs; basal segments linear, apex acuminate; distal lobes usually 3-lobed, apex acuminate. Peduncle 0.7-1.3 mm long. Heads discoid, 6-10 mm tall, 2.5-3.5 mm in diam.; receptacle 4-8 mm tall, 1.5-2 mm in diam., apex acute. Involucral bracts in 2 series, obovate to spatulate, margin hyaline; outer bracts 3-3.5 × 1.5-2 mm; inner bracts 2-2.5 × 1.2-1.5 mm. Disc florets tubular, 5-lobed; corolla pale yellow, ca. 1.5 mm long; anther ca. 0.3 mm long. Achenes obovate to oblanceolate, ca. 2 mm long, 5-ribbed.

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Specimen examined: Taichung Hsien, Hoping Hsiang, Lishan, Fushoushan Farm, Apr. 25, 2006, *M.-J. Jung y042510* (NCKU).

Distribution and notes: Common names of *Matricaria matricarioides* (Less.) Porter include: disc may weed, rayless dog fennel, rayless chamomile, rounded chamomile, pineapple weed, and pineapple may weed. This annual plant is native to Eurasia, and widespread as a cosmopolitan weed (Bremer and Humphries, 1993; Stace, 1991; Takematsu and Ichizen, 1987; USDA, NRCS. 2004). We have found *Matricaria matricarioides* first time on Dec. 4, 2005 in a waste area at Fushoushan Farm, ca. 2500 m elevation, and we then collected it on Apr. 25, 2006 at the same site (Fig. 1).

This species can easily be distinguished from *M. chamomilla* L., an introduced herb, because it lacks dominant ray florets.

Thlaspi L., Sp. 2: 645-647. 1753. 薺屬

Herbs, annual, biannual, or perennial. Roots cylindric, not fleshy. Glabrous to glaucous, trichomes absent or simple, branched trichomeswanted. Cauline leaves sessile, auriculate, sagittate, to amplexicaul, but not petiolate. Inflorescence a raceme. Silicle longer than wide or about as long as wide, apex often notched and winged apically, not spiny.

About 75 species in temperate Eurasia, mainly in south-western Asia and central and southern Europe.

4. ***Thlaspi arvense*** L., Sp. Pl. 2: 646. 1753; Zhou T.-Y., et al., Flora of China 8: 41. 2001; Stace C. A., New Flora of the British Isles: 326-329. 1991. 凹果薺 Figs. 5 & 6D

Herbs to 50 cm tall. Stem simple or branched, glabrous. Cauline leaves alternate; blade lanceolate to oblong, 2-4 × 0.7-1.5 cm, base truncate to auriculate, margin entire to dentate, apex acute. Inflorescence a raceme; pedicel ca. 0.8 cm long toca. 1.5 cm when fruiting. Sepals 4, ovate to oval, 1.5-2 × 1-1.3 mm, margin white. Petals 4, white, spatulate, ca. 2 × 1 mm, apex rounded. Anthers 6, 1.5-2 mm long. Pistil 1; ovary ca. 1 × 1 mm. Silicles suborbicular, ca. 1 cm long, apex emarginate to notched, to 5 mm deep; wings 1-1.5 mm wide at base, 2-5 mm wide at apex; seeds ovoid, ca. 1 mm long.

Specimen examined: Taichung Hsien, Hoping Hsiang, Wuling Farm, Trail head of Syueshan, Apr. 24, 2006, *M.-J. Jung y042401* (NCKU), May 10, 2006, *M.-J. Jung y051001* (NCKU).

Distribution and notes: *Thlaspi arvense* L. (field penny cress, tobołki polne) is native to temperate regions of Eurasia and Africa, and was introduced into Australia, and North and South America (USDA, NRCS. 2004). Specimens were collected along the roadside at Wuling Farm, near the trail head of Syueshan, and were accompanied by *Bromus catharticus* Vahl, *Capsella bursa-pastoris* (L.) Medik., and *Hypochaeris radicata* L. Dominant orbicular silicles with broad wings and notched apices can be used for identification.

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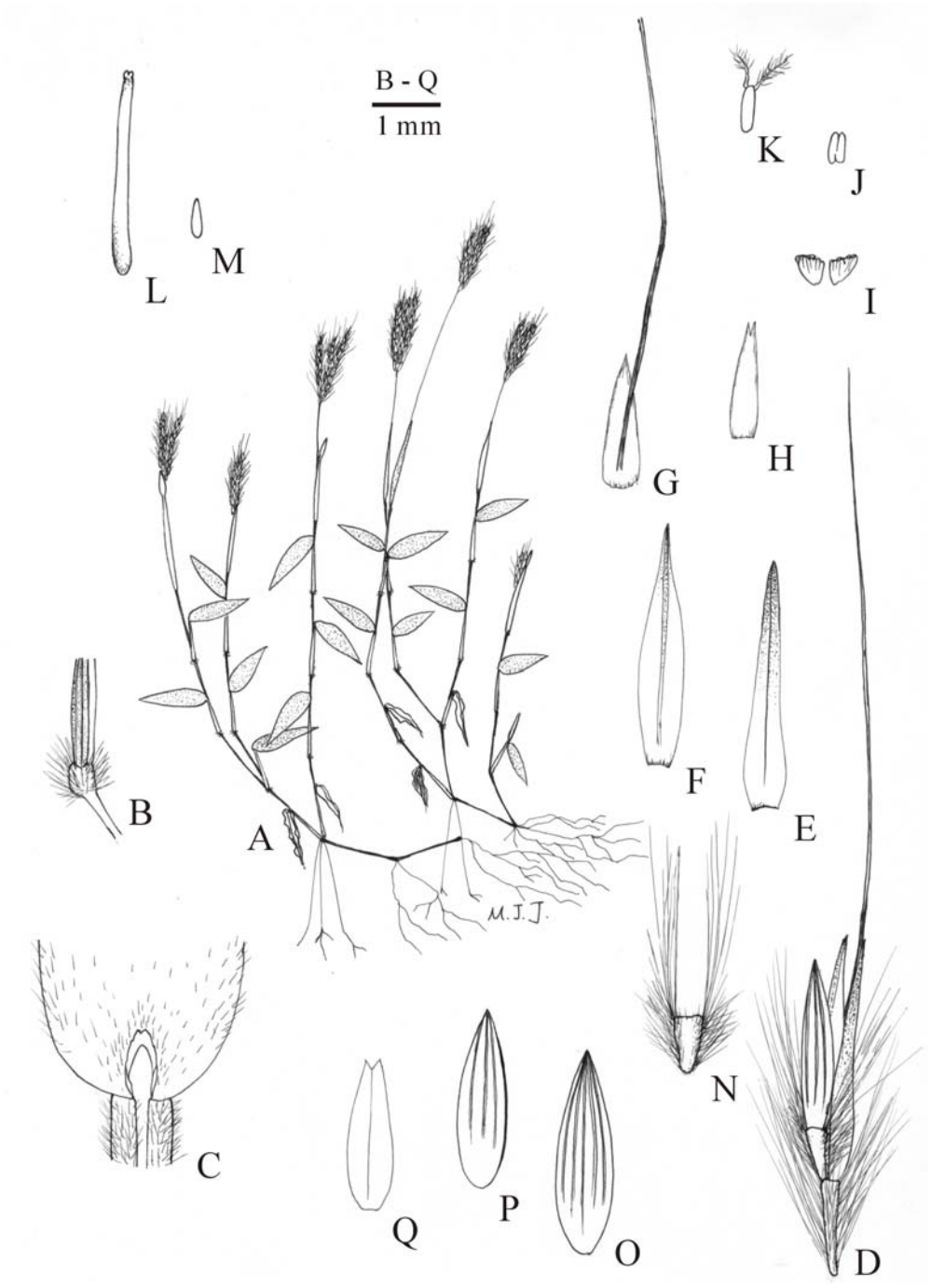


Fig. 2. *Arthraxon lancifolius* (Trin.) Hochst. A: Habit. B: Hairy node. C: Ligule. D: Spikelets. E-M: Components of sessile spikelet. E: Lower glume. F: Upper glume. G: Lemma. H: Palea. I: Lodicules. J: Anther. K: Pistil. L: Enlarged ovary. M: Embryo. N-Q: Components of pedicellate spikelet. N: Pedicel. O: Lower Glume. P: Upper Glume. Q: Lemma.

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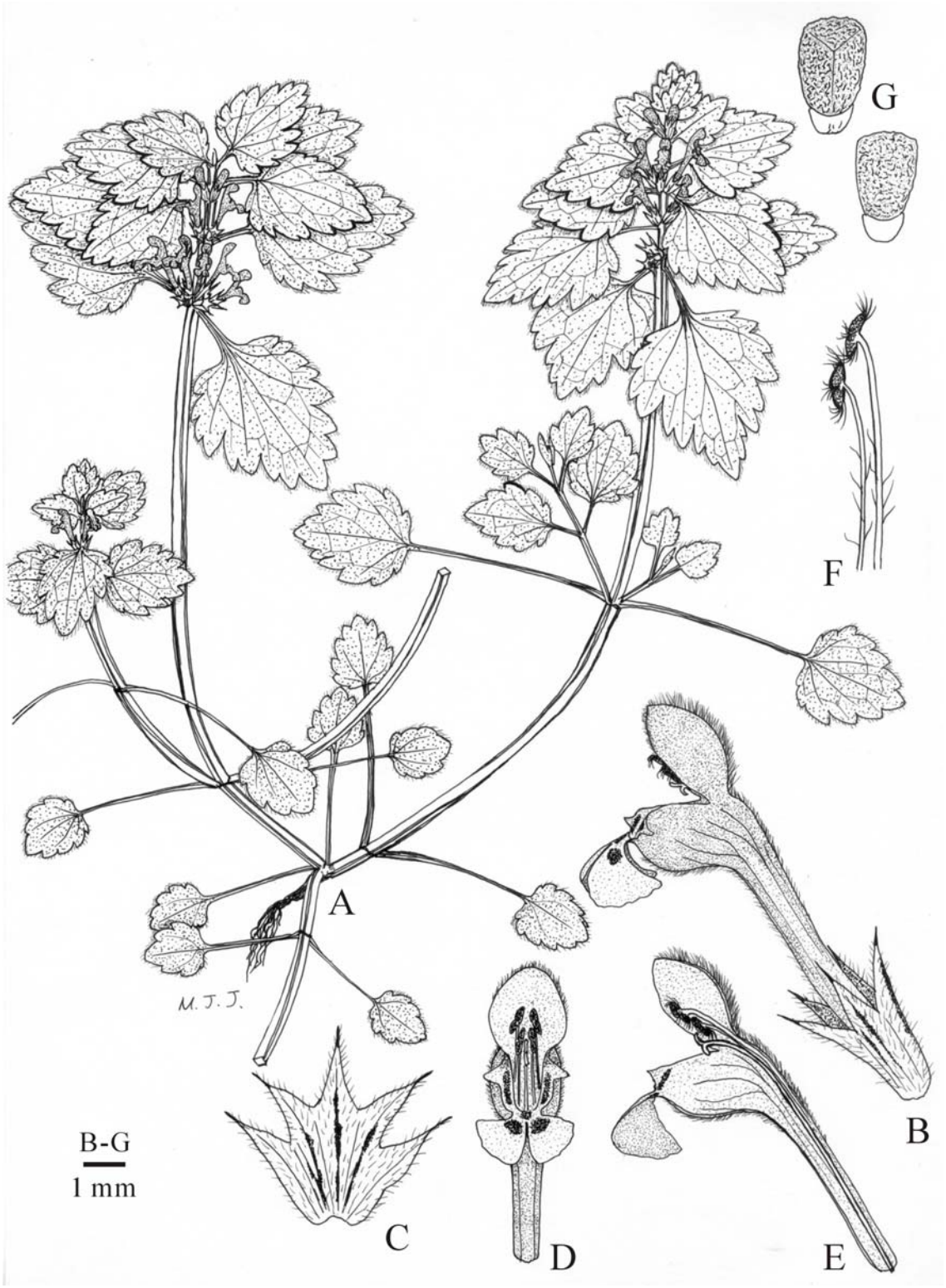


Fig. 3. *Lamium hybridum* Vill. A: Habit. B: Flower. C: Calyx. D and E: Corolla, front view and lateral view of dissected corolla. F: Anthers. G: Nutlets.

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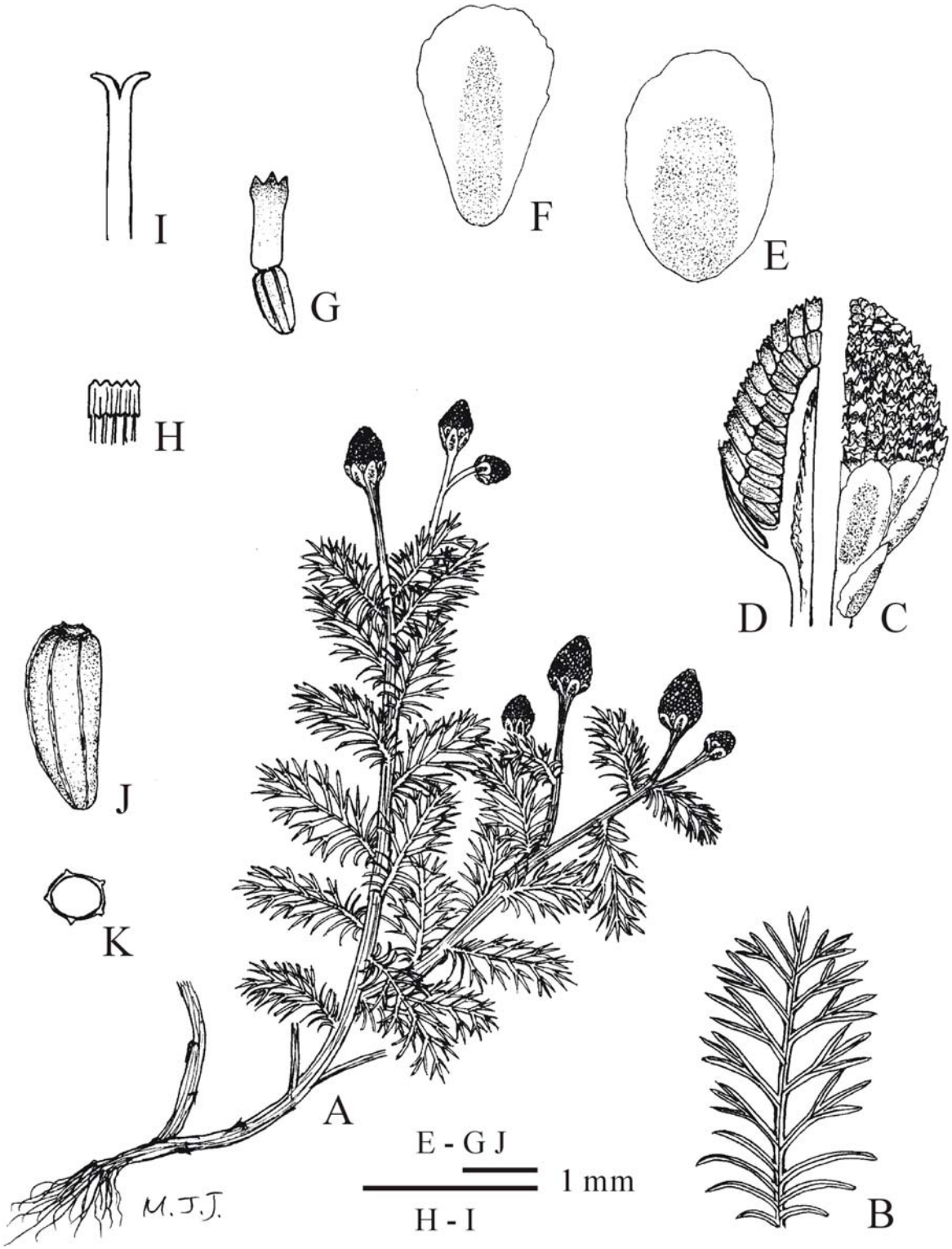


Fig. 4. *Matricaria matricarioides* (Less.) Porter. A: Habit. B: Blade. C and D: Head and dissected head. E and F: Outer and inner involucres. G: Floret. H: Anthers. I: Stigma. J: Achene.

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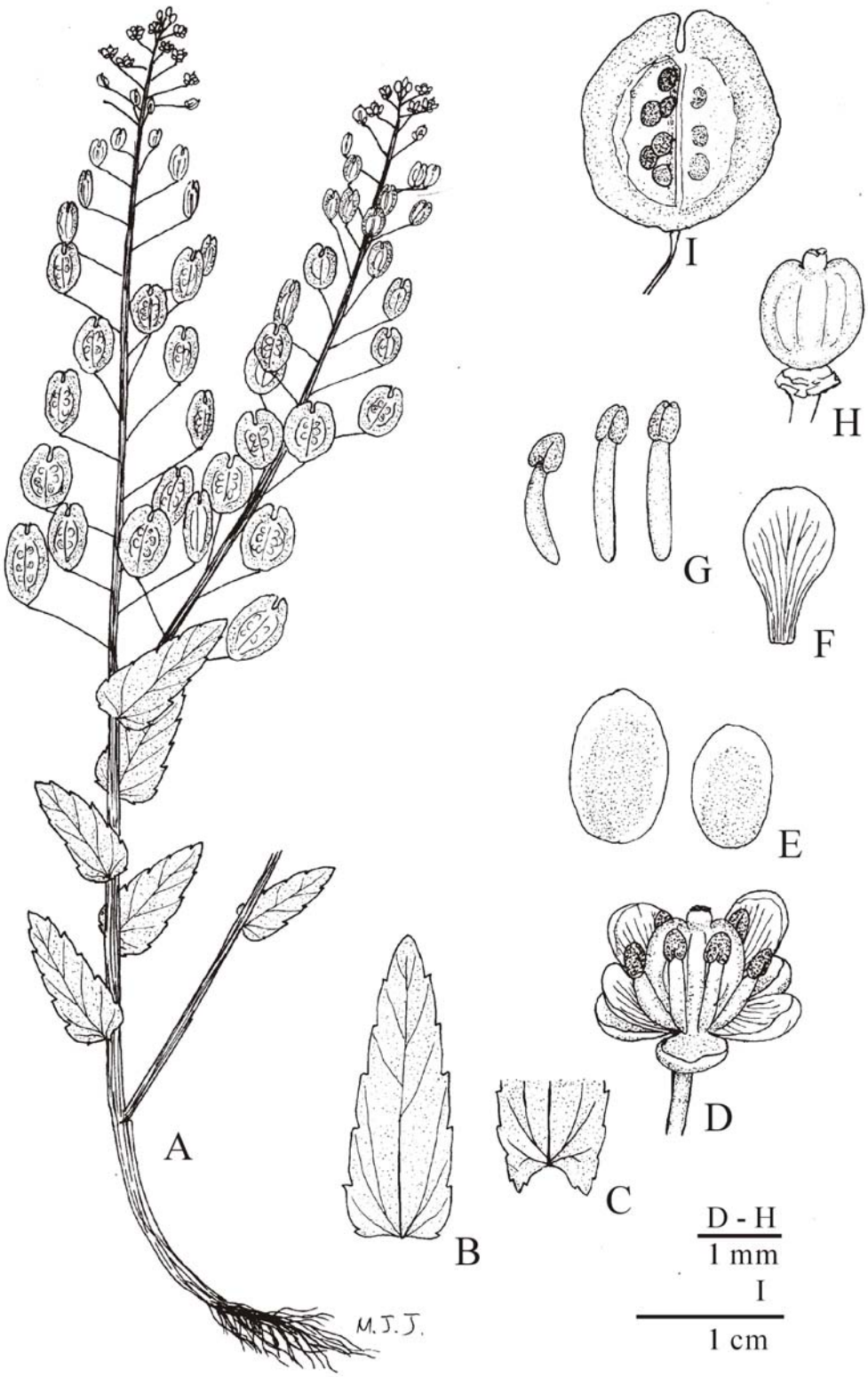


Fig. 5. *Thlaspi arvense* L. A: Habit. B: Blade with truncate base. C: Auriculate base of blade. D: Flower. E: Sepals. F: Petal. G: Anthers. H: Pistil. I: Silicle.

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Fig. 6. Photos of *Arthraxon lancifolius* (Trin.) Hochst (A), *Lamium hybridum* Vill (B), *Matricaria matricarioides* (Less.) Porter (C), *Thlaspi arvense* L (D).

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四種臺灣外來植物補註

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摘　　要

本文報導四種於中南部山區發現之外來植物：小葉蓋草 (*Arthraxon lancifolius* (Trin.) Hochst.)、雜種野芝麻 (*Lamium hybridum* Vill.)、同花母菊 (*Matricaria matricarioides* (Less.) Porter)，以及凹果薺菜(*Thlaspi arvense* L.)。其中薺菜屬 (*Thlaspi* L.) 為臺灣新紀錄屬。文中並提供描述、線繪圖及照片以供鑑定。

關鍵詞：小葉蓋草、菊科、十字花科、禾本科、唇形科、雜種野芝麻、同花母菊、分類學、臺灣、凹果薺菜。

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