NOTE

Notes on Two Newly Naturalized Plants in Taiwan: *Evolvulus nummularius* (L.) L. (Convolvulaceae) and *Acalypha aristata* Kunth (Euphorbiaceae)

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ABSTRACT: *Evolvulus nummularius* (L.) L. and *Acalypha aristata* Kunth, originally native to tropical America, were recently found naturalized in disturbed sites of Taiwan. The present study gives the taxonomic description and line drawings of the two species. In addition, their distributions and notes on ecology are provided.

KEY WORDS: *Acalypha aristata*, Euphorbiaceae, *Evolvulus nummularius*, Convolvulaceae, Taiwan, Taxonomy, Weed.

INTRODUCTION

In this paper we report the recent finding of two naturalized species from Taiwan: *Evolvulus nummularius* (L.) L. and *Acalypha aristata* Kunth. Both of these are originally from the tropics of Central and South America. *Evolvulus* is a genus of about 100 species, almost all of which are found only in the Americas (Austin, 1980; Correll and Correll, 1996). Only a pantropical and subtropical species, *E. alsinoides* (L.) L., is presently known from Taiwan (Staples and Yang, 1998). The new record *E. nummularius* in southern Taiwan where it was found, is more weedy and in more disturbed ground than customary for *E. alsinoides*. These two species are easily distinguished by corollas, pubescence and habit.

Acalypha is a genus of 450 species (Radcliffe-Smith, 2001), of cosmopolitan range but with the largest number of species in tropical and subtropical regions (Correll and Correll, 1996; Levin, 1999; Radcliffe-Smith, 2001). In Taiwan the genus is represented by 10 species; five of them are endemic to the island, while the remainder are pantropical especially in South-East Asia (Hsieh et al., 1993). *Acalypha aristata* was found only in the dry areas of eastern Taiwan. It is a widespread species in the tropical America, which superficially resembles to a more common species viz., *A. australis* L. but differs in several characters.

The present study gives the two species description and illustrations, based on live plant materials from Taiwan.

TAXONOMIC TREATMENTS

1. ***Evolvulus nummularius*** (L.) L., Sp. Pl. ed. 2. 391. 1762; van Oostsroom in Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 14: 114. 1934 & in van Steenis, Fl. Males., Ser. 1, 4: 558. 1958; Verdcourt in Hubbard & Milne-Redhead, Fl. Trop. E. Africa, Convolvulaceae 16. *fig. 4*. 1963; Austin, Ann. Missouri Bot. Gard. 62: 177. *fig. 5*. 1975 & in Dassanayake, Rev. Handb. Fl. Ceylon 1: 311. 1980; Fang & Staples in Wu & Raven, Fl. China 16: 276. 1995; Matthew, Excurs. Fl. C. Tamilnadu, India 326. 1995; Correll & Correll, Fl. Bah. Archip. 1171. 1996; Acevedo-Rodríguez, Fl. St. John, U. S. Virgin Is1. (Memoirs) 181. *fig. 81 F-I*. 1996; Austin in Berry *et al*., Fl. Venez. Guayana 4: 388. *fig. 298*. 1998. 短梗土丁桂 Figs. 1 & 3

Evolvulus yunnanensis S. H. Huang, Acta Phytotax. Sin. 24(1): 17. *fig. 1*. 1986.

Perennial herbs, the stem prostrate, 1 mm across, somewhat woody, brown-pilose, rooting at nodes. Leaves alternate, distichous; blades oblong-ovate, oblong-orbicular to orbicular, 1-2 cm long and 8-18 mm wide, entire, cordate at the base with rounded lobes, the apex emarginate, sparsely pubescent on lower veins; petioles 2-5 mm long, brown-pilose. Flowers solitary, axillary; pedicels 2-2.5 mm long, up to 5 mm and reflexed when fruiting, sparsely brown-pilose, bracts 2, linear, 1.2 mm long and 0.5 mm wide, abaxially pubescent; sepals 5, erect, about equal in length, 2.5-3 mm long, 1.5-2 mm wide, oblong to elliptic with an mucronulate apex, the inner slightly narrower, all abaxially brown-pubescent and ciliate; corolla white, subrotate, 6-8 mm across, deeply 5-lobed, the lobes obovate, 2-2.5 mm long, 2.5-3 mm wide, emarginate at the apex, plicate, the midpetaline bands sparsely brown-pilose outside, the tube 2 mm long

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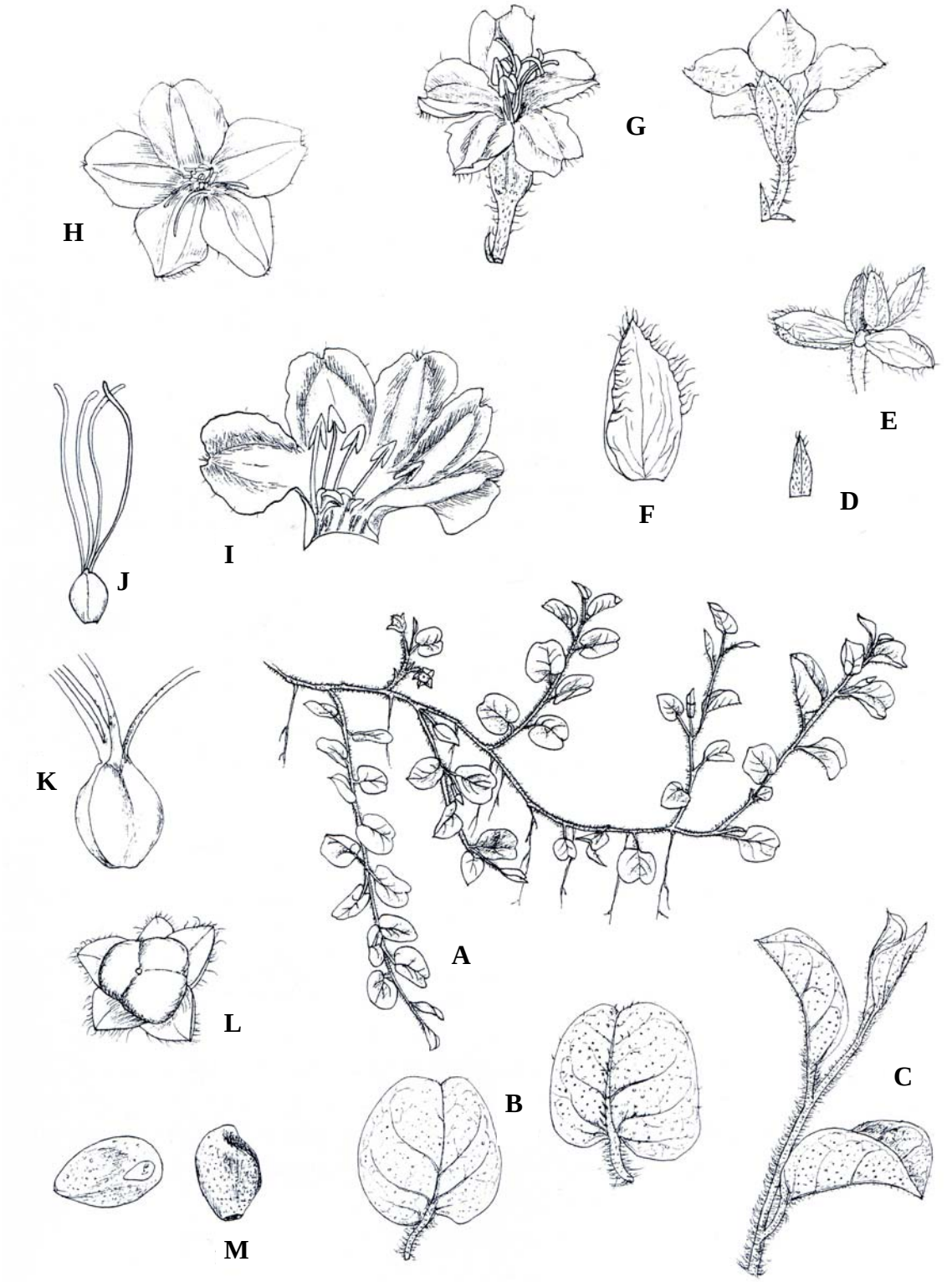


Fig. 1. *Evolvulus nummularius* (L.) L. A: Habit. B: Adaxial (left) and abaxial (right) surfaces of leaf. C: Young shoot. D: Bract. E: Flower with corolla removed. F: Sepal. G: Flower, bottom-side (right) and front-side (left) views. H: Corolla. I: Dissected corolla showing stamens, petal-like appendages and elevated ridges. J: Pistil. K: Ovary and branched style bases. L: Capsule. M: Seeds.

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and 1 mm wide, fleshy-ridged and occasionally with 2 to 4 petal-like appendages within the base; stamens 5, white, included, the filaments inserted on the tube, 1.5-2 mm long, the anthers oblong, 1 mm long; ovary ovoid, 1 mm across, yellow, glabrous, the styles 2, white, filiform, 4 mm long, each style deeply bifid nearly to the base, the stigmas white, subclavate. Capsules globose, 4 mm across, flushed with purple, when dry becoming to light brown. Seeds 2 to 4, pyriform, 2 mm long and 1mm wide, straw-colored with purplish spots, papillose on the surface.

Specimen examined: TAIWAN: Kaohsiung City: Siaogang, along roadsides and on traffic islands, near Kaohsiung International Airport, 17 October 2008, *Chen s. n.* (NHU). Tainan City : on lawns of Tainan Airport, *Su 360* (NHU)

Distribution and notes: *Evolvulus nummularius* is an almost pantropic weed, originally from Mexico through the West Indies and Central America to South America, introduced and naturalized in several Old World regions including Africa, Madagascar, Malaysia, and Ceylon (Austin, 1980; Correll and Correll, 1996). It also occurs in India and Nepal (Matthew, 1995), and southern China (Fang and Staples, 1995).

In Taiwan, *E. nummularius* occurs in the southern coastal counties, found on lawns, at disturbed places such as roadsides, traffic islands, parking lots and other waste ground, and in open sunny sandy soils, often associate with other common weeds such as *Eragrostis amabilis* (L.) Wight & Arn. *ex* Nees, *Desmodium triflorum* (L.) DC., *Oxalis corniculata* L., *Chamaesyce prostrata* (Aiton) Small, and *Vernonia cinerea* (L.) Less. var. *cinerea*. Flowering is all year round. The plants with prostrate stems and distichously arranged leaves, some resembling *Dichondra micrantha* Urb., which is a common weed in moist places in the lowlands of Taiwan (Chen, 1990), however the two are quite distinct. Apart from the stems lacking conspicuous brown hairs and the erect, long-stalked leaves, the latter has flowers less than 2 mm broad, as well as quite large calyx lobes.

2. ***Acalypha aristata*** Kunth in von Humboldt et al., Nov. Gen. Sp. 2: 93. 1817; Govaerts, Frodin & Radcliffe-Smith, World Checklist Bibliogr. Euphorbiaceae 1: 50. 2000. 南美鐵莧 Figs. 2 & 4

Acalypha arvensis Poepp. in Poepp. & Endl., Nov. Gen. Sp. Pl. 3: 21. 1841; Webster & Burch, Ann. Missouri Bot. Gard. 54: 307. 1967; Croat, Fl. Barro Colorado Is1. 521. 1978; Levin in Berry *et al.*, Fl. Venez. Guayana 5: 82. 1999.

Annual herbs, 30-50 cm tall, the stem erect, 2-3 mm wide, green flushed with purplish red, densely hispid with appressed, incurved hairs, somewhat woody at base. Leaves alternate; blades rhomboid, ovate to broadly ovate, 4-7 cm long and 3-4 cm wide, acute to obtuse at apex, rounded to slightly cordate at base, pubescent above and below, hispid on veins, palmately 5-veined, the margins crenate-serrate; petioles 2-3 cm long, densely hispid with appressed, incurved hairs; stipules lanceolate, 1.5-3 mm long, hispid. Inflorescence spicate, axillary. Staminate spikes with peduncles up to 1 cm long, ellipsoidal, 5 mm long and 2 mm wide. Staminate flowers densely clustered, 5-8 at a node and subtended by a bract, the bract oblong, 0.5-0.8 mm long, hispid, with a long apical bristle up to 8 mm long and smaller bristles on margins, pedicels up to 0.6 mm long, hispidulous; petals lacking; calyx lobes 4, ovate, 0.3 mm long and wide, purplish red, hispidulous and tuberculate outside; stamens 8 in clusters, white, anthers elongated, 0.3 mm long, pendent, filaments 0.2 mm long. Pistillate spikes ellipsoidal to short cylindrical, 1-2.5 cm long, 1-1.3 cm wide, with a terminal bristlelike projection 5-15 mm long, the projection purplish red, hispidulous, bearing 3-5 nodes of staminate flowers at base and a terminal T-shaped abnomal pistllate flower. Pistillate flowers solitary, sessile, subtended by a foliaceous bract and usually 2-4 extra bractlets, the bracts ovate, 4-7 mm long, 2-3 mm wide, hispid with 5 bristlelike lobes 1.5-2 mm long, the bractlets linear, 1 mm long, hispid; petals lacking; calyx lobes 3, lanceolate, hispidulous, styles 3, elongated, 4-5 mm long, stigma red, divided into filiform segments 2 mm long. Capsules ovoid, 3-lobed, 3 mm across, hispidulous, with persistent styles. Seeds 3, ellipsoidal, carunculate, 1.5mm long, 1 mm wide, gray with blackish brown spots, punctate on the surface.

Specimen examined: TAIWAN: Hualien Co. : Hualien City, Meilun, 10 December 2000, *Chen s. n.*; same loc., 30 December 2000, *Su s. n.* (All at NHU)

Distribution and notes: *Acalypha aristata* is a widespread neotropical weed, native from Mexico, the West Indies south to Panama, Venezuela, Peru and Brazil (Webster and Burch, 1967; Levin, 1995)

In Taiwan, *Acalypha aristata* occurs in Hualien County as a weed of similar situations to *A. indica* L. It is found on dry, sandy soils, along orchards, shrub borders, unmanaged meadows, and in waste areas, associated with the following weedy plants: *Phyllanthus amarus* Schum. & Thonn. *Oxalis corniculata* L., *Alysicarpus vaginalis* (L.) DC., *Crotalaria pallida* Aiton var. *obovata* (G. Don) Polhill, *Conyza sumatrensis* (Retz.) Walker, *Chloris barbata* Sw., *Dactyloctenium aegyptium* (L.) P. Beauv. and *Digitaria radicosa* (J. Presl) Miq.

This annual herb can be distinguished from other *Acalypha* species of the region by its densely hispid habit, axillary inflorescences, and female bracts with bristlelike bract-lobes.

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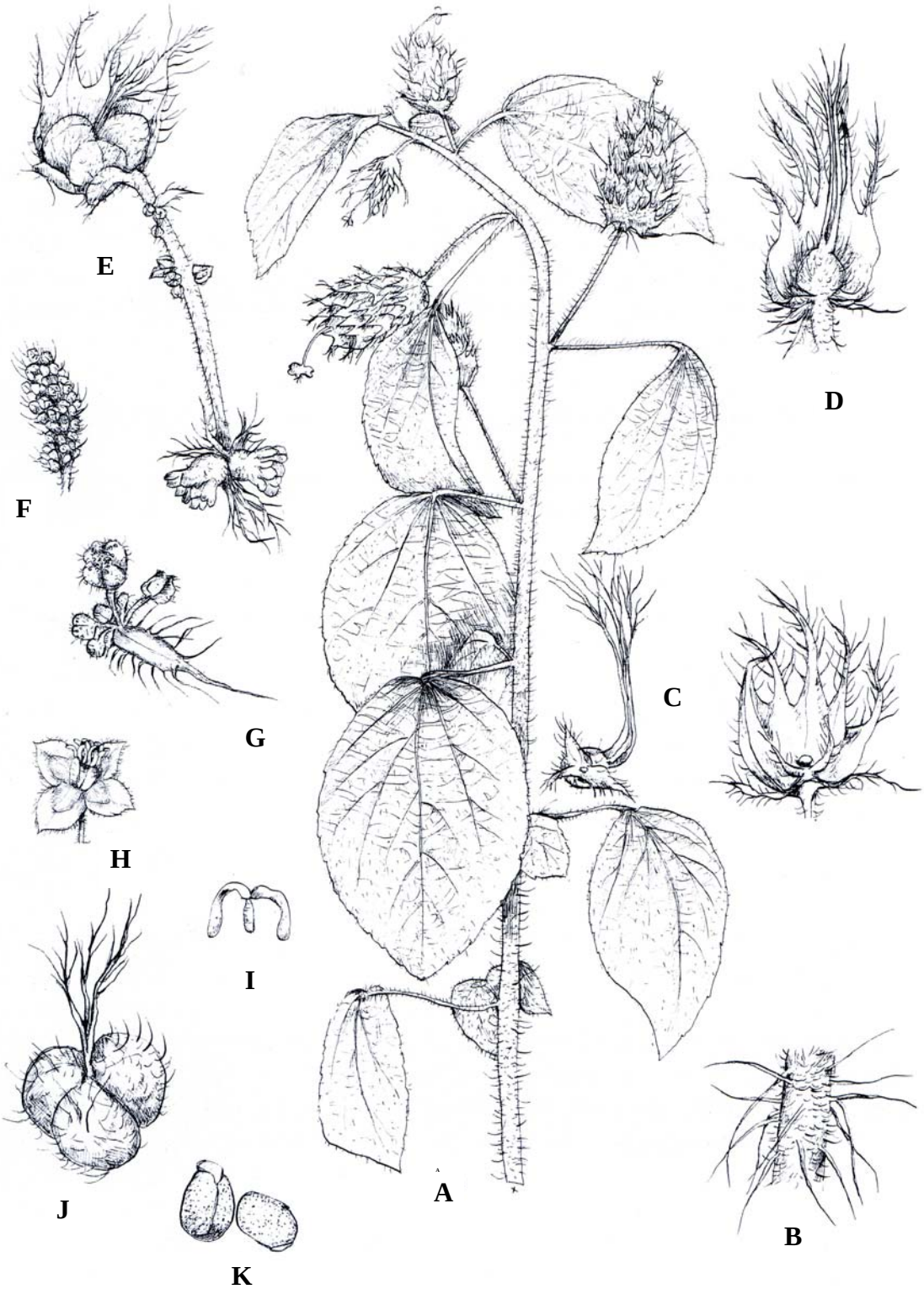


Fig. 2. *Acalypha aristata* Kunth. A: Habit. B: Detail of stem showing indument. C: Dissected pistillate flower, foliaceous bract and pistil with adnate calyx lobes. D: Pistillate flower. E: Upper portion of pistillate spike. F: Staminate spike. G: Staminate flowers with subtending bract. H: Staminate flower. I: Stamen. J: Capsule with persistent styles. K: Seeds.

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Fig. 3. *Evolvulus nummularius* (L.) L. A: Habit. B:Flower. C: Capsule. D: Seeds. Bar = I mm.



Fig. 4. *Acalypha aristata* Kunth. A: Habitat. B: Flowering branch showing pistillate spikes. C: Seeds. Bar = I mm.

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記臺灣兩種新歸化植物－短梗土丁桂 (旋花科) 與南美鐵莧 (大戟科)

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摘要：短梗土丁桂 (*Evolvulus nummularius* (L.) L.) 及南美鐵莧 (*Acalypha aristata* Kunth) (新擬中名) 為新歸化於臺灣之旋花科與大戟科植物。本文描述這兩種植物，除提供形態、解剖圖幅外，並報告其分佈、生態及與相近種之差異。

關鍵詞：南美鐵莧、大戟科、旋花科、短梗土丁桂、臺灣、分類學、雜草。

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