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Note on Two New Additional Plants to Taiwan—*Gnaphalium polycaulon* Pers. (Asteraceae) and *Ipomoea eriocarpa* R. Br. (Convolvulaceae)

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ABSTRACT: The occurrence of *Gnaphalum indicum* L. in Taiwan has been questioned. In this paper we confirm the absence of this species and report the presence of *G. polycaulon* Pers., which had been previously misidentified as *G. indicum*. In addition, we report a newly naturalized plant, *Ipomoea eriocarpa* R. Br., in Taiwan. For each species, the taxonomic description, illustration, ecology and habitat information, and distribution map are provided.

KEY WORDS: Asteraceae, Convolvulaceae, *Gnaphalium polycaulon, Ipomoea eriocarpa*, Taiwan, Taxonomy, Weeds.

INTRODUCTION

Gnaphalium indicum L. was first recorded in Taiwan as early as 1896 by Henry. Later, this species was listed as present in Taiwan by many earlier botanists (Hayata, 1904; Matsumura and Hayata, 1906; Kawakami, 1910; Sasaki, 1928; Fukuyama, 1936). However, the species was not mentioned in Kitamura's *Enumeration* (1937), Masamune's *List* (1954) and in both the first (Li, 1978) and second (Peng et al., 1998) editions of the *Flora of Taiwan*.

Apparently the occurrence of this species in Taiwan was questioned. In 1971, *G. indicum* L. was transferred by Grierson to the genus *Helichrysum* as *H. indicum* (L.) Grierson. It is marked that *H. indicum* is easily distinguished from the other species of *Gnaphalium* by many characters. Based on extensive field observations as well as herbarium specimens, it is concluded that *H. indicum* does not occur in Taiwan, and the specimens misidentified by previous authors is actually *G. polycaulon*.

Ipomoea eriocarpa is from the tropics. In Taiwan it is usually found in fallows in association with *Crotalaria juncea* L., a green manure crop. Since the specimens of *I. eriocarpa* were collected from more than one locality of the crop fields, the species may have been introduced as a contaminant of *C. juncea* seed, and has now spread to the fields of Taiwan.

In this paper we report the presence of the species *G. polycaulon* Pers. in Taiwan and the recent naturalization of *I. eriocarpa* R. Br. in eastern and central Taiwan.

MATERIALS AND METHODS

For species morphological descriptions, fresh materials collected from fields were observed and measured, and vouchers were deposited in Herbarium, National Hualien University of Education (NHU). Information on species distributions was based on herbarium specimens from HAST, NHU and TAI.

TAXONOMIC TREATMENT

1. *Gnaphalium polycaulon* Pers., Syn. Pl. Persoon 2: 421. 1807; Chang & Tseng in Ling, Y. et al. (eds.), Fl. Reipubl. Popul. Sin. 75: 239. *pl. 38, 8-14*. 1979; Beentje, Fl. Trop. E. Africa, Compositae (Part 2) 398. 2002; Quaiser & Abid in Ali & Qaiser, Fl. Pak. 210: 117. 2003.

多莖鼠麴草 Figs. 1-3

Annual herbs, dwarf, erect to decumbent, densely white woolly-tomentose, especially in upper part; stems slender, simple or more commonly much branched, 8-25 cm tall, 0.5-1.5 mm across. Leaves grayish-green, spatulate or oblanceolate oblong, 1.5-4.5 cm long and 3-8 mm wide, obtuse and

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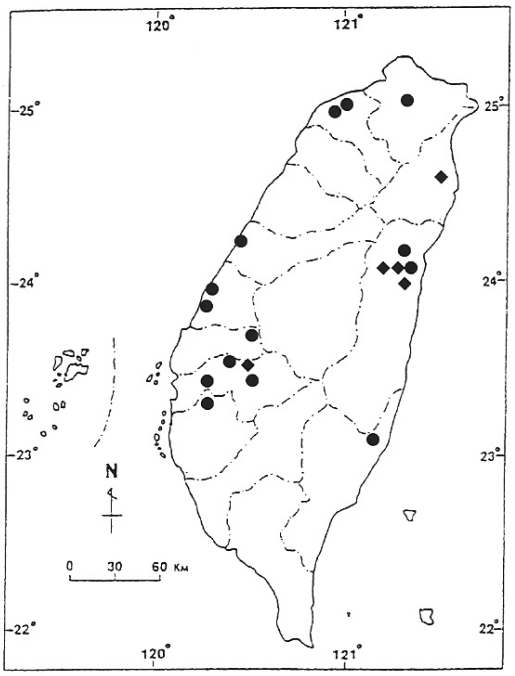


Fig. 1. Distribution map of *Gnaphalium polycaulon* Pers. (●) and *Ipomoea eriocarpa* R. Br. (◆) in Taiwan.

apiculate, narrowed to the sessile petioliform base, entire with wavy margins, the margins and the lower midribs sometimes flushed with purple, thinly appressed-tomentose on both surfaces. Heads campanulate, 2.5-3 mm high and 2-2.5 mm across, densely wooly to 2/3 from base, 2-5 in number, arranging in a spike to 2 cm long, at the tips of stems and branches; phallaries 3-seriate, loosely imbricated, graduated, elliptical ovate, elliptic to linear-oblong, acute, 1.6-2.2 mm long and 0.5-0.8 mm wide, scarious, with pale brown apex, red-purple middle and green base, these becoming brown when dry. Outer florets many, corolla filiform, 1.2 mm long, greenish yellow, the apex minutely 2-3 lobed, flushed with purple; central florets 5 or 6, tubular, greenish yellow, 1.5 mm long and 0.5 mm wide, 5-toothed at apex, the teeth flushed with purple; stamens yellow, 0.6 mm long; anthers sagittate at base, connate into a tube around the style; style white, 1.6 mm long, the style-branches linear, flushed with orange-yellow; ovary cylindrical, olivaceous, 0.5 mm long. Receptacle 1.3 mm across, pitted. Achenes oblong-rectangular, 0.5 mm long, pale brown, minutely punctuate. Pappus whitish, about 1.2 mm long, the bristles 5-8 in number, distinct, falling separately.

Specimen examined: TAIWAN. Hualien Co.: Hualien, along borders of paddy fields, 15 April 2000, *Chen, s. n* (NHU); Sing-cherng, along borders of paddy fields, 10 April 2001, *Chen s. n.* (NHU). Taitung Co.: Provincial Highway No. 11, 115.5K, along trail to mountain, 20 January 2003, *Yang & Liu s. n.* (NHU); Shan-wu, *Hsu 13361* (TAI). Tainan Co.: Tung-shan, along borders of paddy fields, 5 April 2003. *Ju s. n.* (NHU); Go-i Bridge, along borders of paddy fields, 5 April 2003, *Ju s. n.* (NHU). Chiayi Co.: Minsiung, nearby roadside, along borders of paddy fields, 15 February 2004, *Jeng s. n.* (NHU); Nan-tan Water Work, in dried swampy bogs, close to a grave, *Hsu & Kuo 6708* (TAI). Taichung Co.: Ching-shuei, weeds on ridges between plots of drained paddy field, *Peng 4488* (HAST). Taichung: Pei-tun Dist., Shui-pien-tou, alt. 145 m, on unplowing rice field, *Wang 4660* (HAST). Miaoli Co.: Yuan-li, on moist fallow paddy bank, expose, occasional, *Peng* et al. *17945* (HAST). Taoyuan Co.: Ping-jeng, along roadside, 15 February 2004, *Feng s. n.* (NHU); Yang-mei, along borders of paddy fields, 17 December 2005, *Deng s. n.* (NHU). Taipei: Mokusaku, 10 March 1929, *Sasaki s. n.* (TAI); Shui-uan-di, December 1934, *Shimizu s. n* (TAI). CHINA. GUANGDONG: Guangzhou City: suburbs, near Shi-pai, along paddy field, *Hosokawa 10241* (TAI). HAINAN: Ler-an to Van-zon Gun, 17 March 1942, *Yamamoto s. n.* (TAI).

Distribution and notes: *Gnaphalium polycaulon* Pers. is a pantropical weed (Beentje, 2002), widely distributed in tropical and subtropical Africa, Asia, China, Australia and tropical America (Grierson, 1971; Chang and Tseng, 1979; Qaiser and Abid, 2003). In Taiwan, *G. polycaulon* usually occurs as an annual weed in moist sunny places at roadsides, grasslands and also in and around cultivated fields. Since it frequently grows around rice fields, it is quite possible that this cudweed extended its range with the introduction of rice. Because the first report was made by Henry in 1896, it appears that the present species has been well established for over a century. In Hualien area it is usually associated with the following weeds: *Cardamine flexuosa* With., *Centipeda minima* (L.) A. Br. & Asch., *Chamaesyce prostrate* (Ait.) Small, *Hedyotis corymbosa* (L.) Lam, *Lindernia crustacea* (L.) F. Muell. and *Stellaria aquatica* (L.) Scop. The flowering season is restricted to the period between December and May.

This plant is often confused in herbarium specimens with *G. purpureum* L., however, the two are quite distinct from each other. Apart from the larger habit and the less branched stems, the latter has pappus bristles coherent at the base into a ring.

2. *Ipomoea eriocarpa* R. Br., Prodr. 484. 1810; van Ooststroom in van Steenis, Fl. Males., ser. 1, 4(4): 462, *fig. 35*. 1953; Verdcourt in Hubbard & Milne-Redhead, Fl. Trop. E. Africa, Convolvulaceae 91. 1963; Backer & Bakh. f., Fl. Java 2: 492. 1965; Fang & Staples in Wu, C. Y. (ed.), Fl. Reipubl. Popul. Sin. 64(1): 83. *pl. 18, 1-3*. 1979; Austin in Dassanayake & Fosberg, Rev. Handb. Fl. Ceylon 1: 325. 1980; Fang & Staples in Wu & Raven, Fl. China 16: 303. 1995; Wu & Raven, Fl. China Illustr. 16: 303. *fig. 1-3*. 1999.
毛果薯 Figs. 1, 4 & 5

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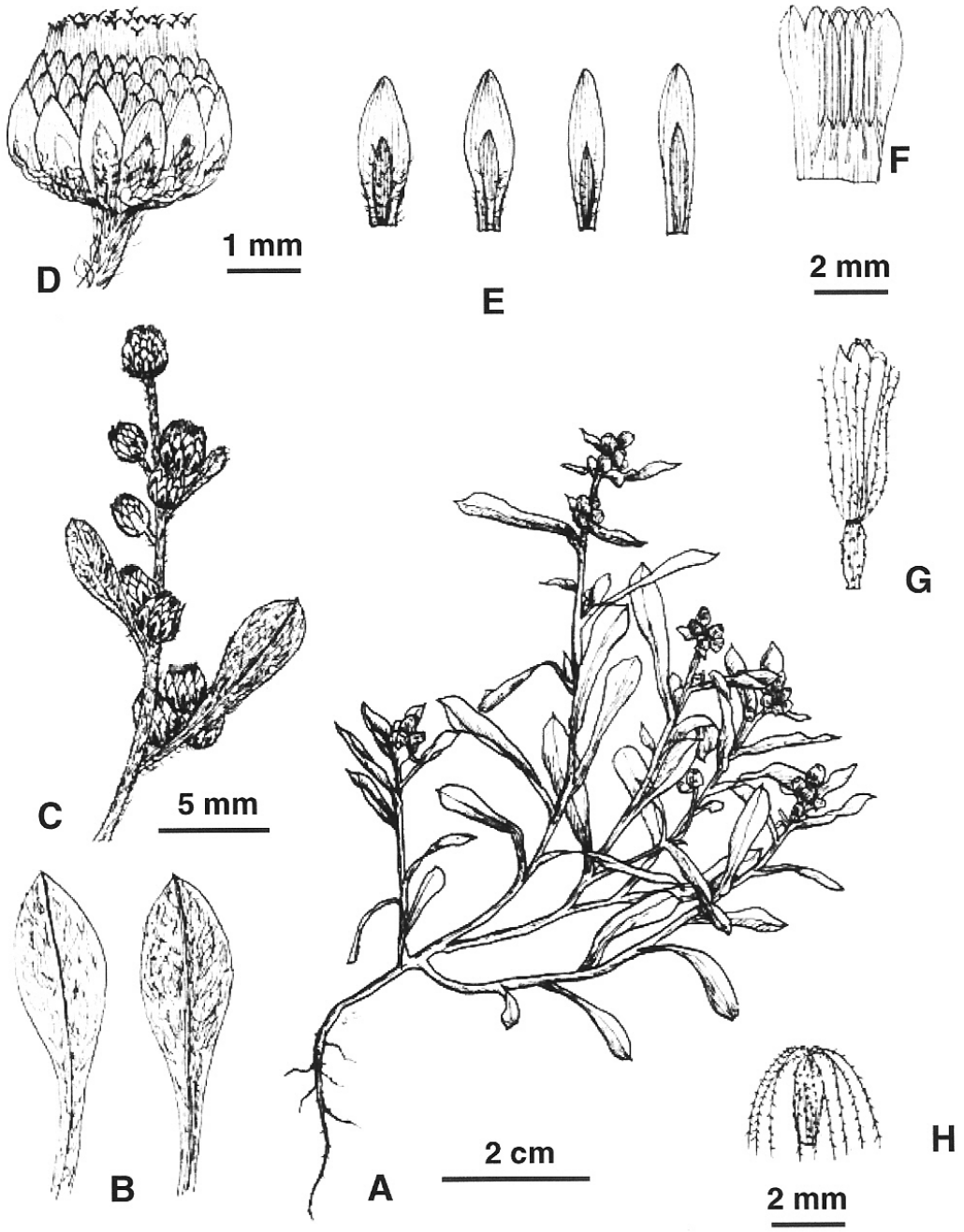


Fig. 2. *Gnaphalium polycaulon* Pers. A: Habit. B: Upper (left) and lower (right) leaf surfaces. C: Flowering branch. D: Head. E: Outer (left), middle, and inner (right) phallaries. F: Stamens at a dissected corolla tube. G: Floret. H: Achene.

Annual herbs, the stem twining, 1.5-2 mm across, green or somewhat flushed with purple, pubescent or hispid. Leaf-blades ovate-lanceolate, lanceolate to oblong-lanceolate, 5-12 cm long and 2-6 cm wide, entire, cordate at the base with rounded lobes, the apex attenuate to acuminate, with an mucronulate point, sparsely pilose on both surfaces or more densely beneath; petioles 1-6 cm long, green or somewhat flushed with purple, hispid-pilose. Flowers sessile, axillary, 3-7-flowered in cymes, the peduncle short, 3-5 mm long, bracts 2-4, linear to linear lanceolate, 3-6 mm long and 1 mm wide, abaxially hispid; sepals 5, somewhat reflexed, about equal in length, 6-9 mm long, 2-5 mm wide, ovate with an acuminate apex, the inner slightly narrower, all adaxially pilose and abaxially

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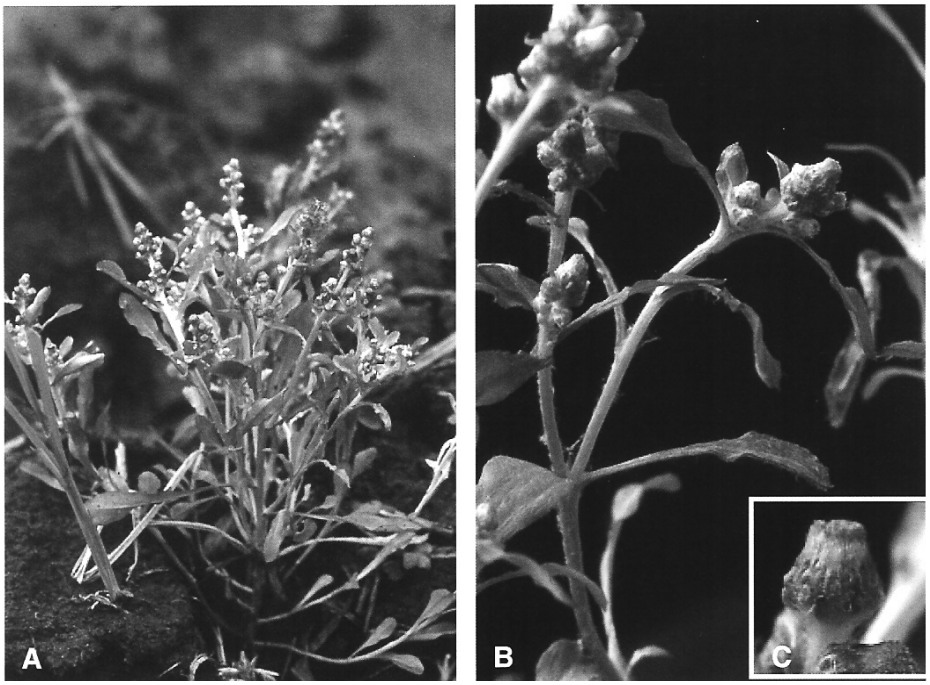


Fig. 3. *Gnaphalium polycaulon* Pers. A: Habitat. B: Flowering branches. C: Head.



Fig. 4. *Ipomoea eriocarpa* R. Br. A: Vines twisting around stems of *Crotalaria juncea* L. B: Inflorescence. C: Flower. D: Fruits.

hispid; corolla funnel form, light purple, darker inside, 1-1.3 cm long, midpetaline bands densely hispid outside, the limb 7 mm across, the tube 5-7 mm long and 3 mm wide; stamens 5, included, the filament inserted on the tube base, somewhat unequal, 4-4.5 mm long, white, the base swelled, minutely echinate, the anthers 1 mm long, white; ovary ovoid, 2.5 mm high and 2 mm wide, pilose, 4-locular, white, with a white cupuliform disk about 0.8 mm high at the base, the style white, 4 mm long, the stigma white, 2-globose, each 0.8 mm across. Capsule ovoid, 1 cm across, somewhat flushed with purple, when dry becoming to light brown, pilose; seeds 4, grayish brown to light brown, pyriform, 5 mm long and 2.3 mm wide, indistinctly reticulate on the surface.

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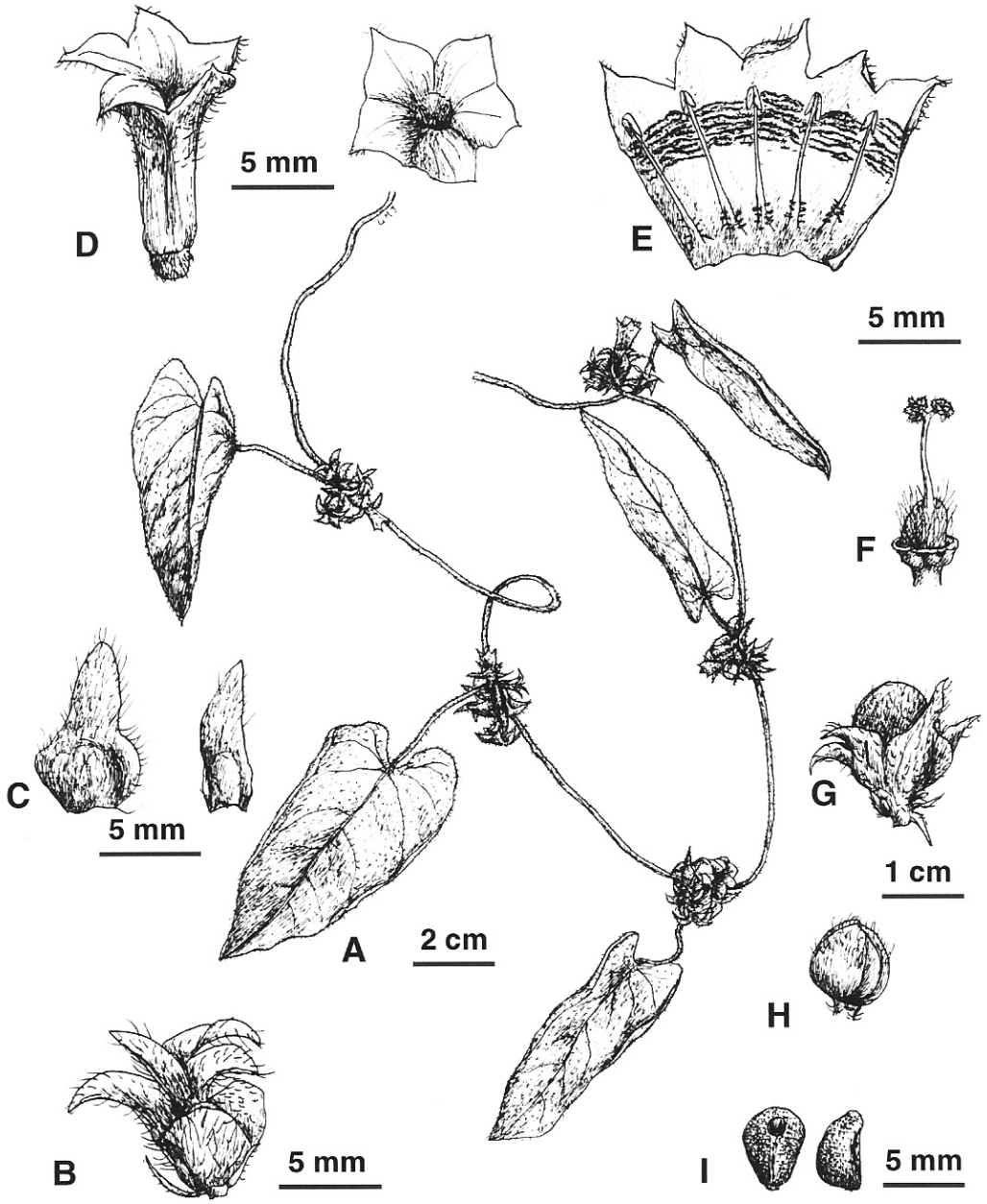


Fig. 5. *Ipomoea eriocarpa* R. Br. A: Habit. B: Calyx with bracts. C: Outer (left) and inner (right) sepals. D: Corolla tube from side and top views. E: Stamens on a dissected corolla tube. F: Pistil. G: Capsule with calyx persisting. H: Capsule. I: Seeds.

Specimens examined: TAIWAN. Ilan Co.: Nan-ao, roadsides, 2 January 2005, *J. S. Chen s. n.* (NHU). Hualien Co.: Hualien, in fallow paddy fields, 3 February 2005, *Chen s. n.* (NHU); Sing-cherng, in fallow fields, 20 January 2005, *Chen , s. n.* (NHU). Yunlin Co.: Ku-ken, climbing about the fence on a parking lot, 28 February 2005, *Cheng s. n.* (NHU).

Distribution and notes: *Ipomoea eriocarpa* widely distributed from tropical Africa to Madagascar, Egypt to tropical Asia, China and northern Australia is a pantropic weed (van Ooststroom, 1953; Verdcourt, 1963; Austin, 1980; Fang and Staples, 1995).

It is naturalized in disturbed areas such as fields, roadsides, waste ground and parking lots. In Hualien area it usually climbs over the plants of *Crotalaria juncea* L., and also associated with the following weeds: *Conyza sumatrensis* (Retz.) Walker, *Conyza canadensis (L.) Cronq., Ageratum houstonianum* Mill., *Crassocephalum crepidioides* (Benth.) S. Moore, *Solanum nigrum* L., *Ipomoea hederacea* (L.) Jacq. and *Setaria verticillata* (L.) P. Beauv. Flowering period is from late winter through early summer.

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Ipomea eriocarpa is easily separated from other species of the genus by its generally lanceolate leaves, hairy fruits, and by its small flowers congested in a cluster.

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記兩種臺灣植物之新見－多莖鼠麴草(菊科)及毛果薯(旋花科)

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摘　　要

本研究確認早期臺灣植物文獻所提菊科植物 *Gnaphalium indicum* L. 為多莖鼠麴草 (*Gnaphalium polycaulon* Pers.)，該種自生於臺灣潮濕耕地邊緣；同時報導新記錄旋花科歸化植物毛果薯 (*Ipomoea eriocarpa* R. Br.)。本文描述該二種植物外，並提供形態、解剖圖幅、分佈地與生態資訊。

關鍵詞：菊科、旋花科、多莖鼠麴草、毛果薯、臺灣、分類學、雜草。

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