

Ipomoea purpurea (L.) Roth (Convolvulaceae), A Species of the *I. nil* Complex, Newly Naturalized in Taiwan

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ABSTRACT

Ipomoea nil complex (Convolvulaceae) includes four species. Three species were previously recorded in Taiwan. In this study, we document naturalization of *Ipomoea purpurea* (L.) Roth, a species of the natively growing in the North and South America, in the Central Range of Taiwan. This study provides a description and photographs to aid in identification.

Key words: Convolvulaceae, *Ipomoea nil* complex, *Ipomoea purpurea*, naturalized plant, Taiwan, Taxonomy

Introduction

Convolvulaceae, consisting of 58 genera and approximately 2,000 species (Staples and Yang, 1998), are cosmopolitan in distribution (Fang and Staples, 1995), and are best represented in Asia and the Americas (Wilson, 1960). Fourteen genera and 44 species of the family were recorded in Flora of Taiwan, 2nd edition (Staples and Yang, 1998). Taxonomy of the family in Taiwan has also been revised by Yeh and Tsai (2000), Liao *et al.* (2000), and Chen and Wu (2001).

The genus *Ipomoea* Linnaeus comprises 650 species all over the world (Mabberley, 1997), a large genus of the tropics and subtropics (Wilson, 1960). The majority of species occur in the Americas and Africa (Austin, 1980), over half of them are distributed in the Americas (Austin and Huaman, 1996). Twenty-one species were recorded in Flora of Taiwan, 2nd edition (Staples and Yang, 1998). More recently, Chen and Wu (2001) documented the naturalization of *Ipomoea hederifolia* L. on this island.

In this report, we document naturalization of *Ipomoea purpurea* (L.) Roth, a Neotropical species. This weedy plant was recently found at an open habitat of ca. 1,000 m altitudes in the Central Mountain Range of Taiwan. *Ipomoea purpurea*

belongs to the *Ipomoea nil* complex (Austin, 1986). In this study we provide a description and photographs to document its naturalization for Taiwan, as well as diagnostic keys to the taxa of the species complex.

Taxonomic Treatment

Key to species of *Ipomoea nil* complex

Sepals soft-pilose or pubescent on back with slender trichomes or glabrous ----- *I. indica*

Sepals hispid-pilose on back, the trichomes mostly with swollen bases.

Sepals broadly lanceolate, with slightly narrowed green tips shorter to slightly longer than body

----- *I. purpurea*

Sepals lanceolate, with narrowed elongate green tips much longer than body

Sepals gradually narrowed, the long acute tips suberect, straight, scarcely spreading -- *I. nil*

Sepals abruptly narrowed, the long subacute tips strongly spreading or curved

----- *I. hederacea*

Ipomoea purpurea (L.) Roth, Bot. Abh. 27. 1787; Austin, Taxon 35(2):357. 1986.

紫花牽牛 Figs. 1, 2-A, 3-A, B.

Convolvulus purpureus L., Sp. Pl. ed. 2. 1:219. 1762.

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Figure 1. Habit of *Ipomoea purpurea* (L.) Roth

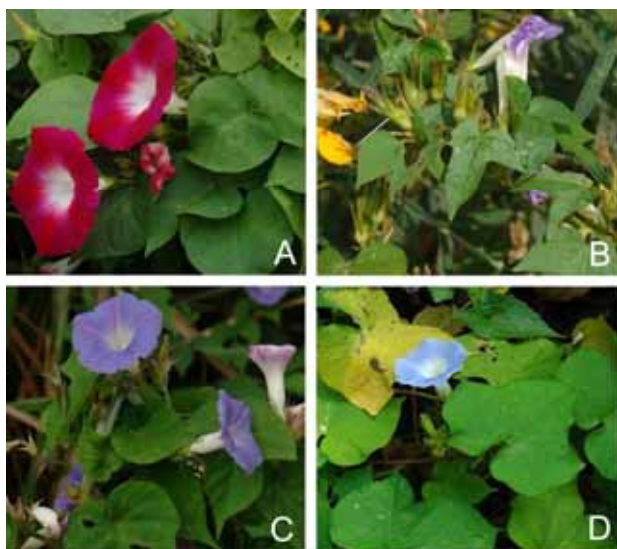


Figure 2. Habit of *Ipomoea nil* complex A: *Ipomoea purpurea* (L.) Roth; B: *Ipomoea nil* (L.) Roth; C: *Ipomoea indica* (Burm. f.) Merr.; D: *Ipomoea hederacea* (L.) Jacq.

Herbaceous vines; stems twining, long hirsute. Leaves cordate, 4-10 cm long, 4-10 cm wide, puberulent on both surfaces, apex acute, base cordate, margin entire, with 5-7 basal veinlets at base of blade, lateral veins 3-4 pairs; petioles 1-5 cm long, sparsely hairy. Inflorescences 1-3-flowered, cymes, axillary; peduncle 1-8 cm; bracts linear, 4-6 mm long, spreading hirsute; pedicel 1-1.3 cm long, hirsute, recurved; sepals subequal, 1-1.4 cm long, spreading long hairs abaxially in basal, outer 3 bigger, oblong, 5 mm wide, apex acute; inner 2 smaller, lanceolate, 3 mm wide, apex acuminate; Corolla red, with white center, funnellform, 4-6 cm in diameter, glabrous; Stamens 5, included, epipetalous at corolla base,



Figure 3. Sepals and Fruits of *Ipomoea nil* complex A, B: *Ipomoea purpurea* (L.) Roth; C, D: *Ipomoea nil* (L.) Roth; E, F: *Ipomoea indica* (Burm. f.) Merr.; G, H: *Ipomoea hederacea* (L.) Jacq.

filaments distinct, white, pubescent basally, unequal, 2 longer 1.2 cm long, 3 shorter 0.8 cm long, anthers dehiscing longitudinally; ovary superior, glabrous, 3-locular, style glabrous, 2.5 cm long, stigma 3-lobed. Capsule subglobose, glabrous, 8-10 mm in diameter, 3-valved; seeds 6, black, ovoid-trigonus, 4 mm long, sparsely strigillose.

Specimen examined: TAIWAN. Nantou County: Shinyi Hsiang, Dongpu, alt. 1,050 m, 13 Dec 2005, T. W. Hsu 12012, 12014, 12015, 12016, 12017 (TESRI).

Ipomoea nil complex includes *I. hederacea* (L.) Jacq., *I. indica* (Burm. f.) Merr., *I. nil* (L.) Roth., and *I. purpurea* (L.) Roth (Austin, 1986). The existence of intermediate morphs in the wild has caused difficulties in identification and

taxonomy ever since the genus was created (Austin, 1986). Typification and identity of these taxa have been thoroughly discussed (Verdcourt, 1957, 1958; Shinnars, 1965; Austin, 1986). Interestingly, all of the species are naturalized in Taiwan and other Asian countries. *Ipomoea hederacea* (L.) Jacq. (Figs. 2-D, 3-G, H) was found in west Taiwan at low elevations, from Taipei to Pingtung (Yen, 1994; Staples and Yang, 1998); *I. indica* (Burm. f.) Merr. (Figs. 2-C, 3-E, F) was found throughout in Taiwan at low to medium elevations (Yen, 1994; Staples and Yang, 1998); while *I. nil* (L.) Roth. (Figs. 2-B, 3-C, D) is a highly polymorphic American species, apparently introduced into Asia by the early Portuguese visitors in the first decades of the 16th century (Austin, 1986), and was naturalized in west Taiwan at low elevations (Lu, 1972; Staples and Yang, 1998).

Ipomoea purpurea (L.) Roth is native in the American tropics (Austin, 1980). In Taiwan, it occurs at ca. 1,000-1,100 m altitudes in the Central Mountain Range. It grows in wasteland and roadsides. In natural habitats, the species is associated with other weedy plants, e.g., *Amaranthus patulus* Betoloni, *Humulus scandens* (Lour.) Merr., *Sonchus oleraceus* L., *Bidens pilosa* L., *Bidens pilosa* L. var. *minor* (Blume) Sherff, *Bidens pilosa* L. var. *radiata* Sch. Bip., *Ipomoea indica* (Burm. f.) Merr., *Crassocephalum crepidioides* (Benth.) S. Moore. The finding of the species represents a new addition to the naturalization of the *I. nil* species complex in Taiwan. Sympatric distribution of *I. purpurea* and *Ipomoea indica* raises the risks of interspecific hybridization, which has been illustrated as one of the mechanisms for elevating invasiveness of the alien species (Gaskin and Schaal, 2002). This accidentally introduced species therefore has a potential of becoming a nasty weed and agricultural pest in Taiwan.

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台灣新歸化牽牛花複合種的植物 — 紫花牽牛 (旋花科)

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摘 要

牽牛花的複合種有四種，台灣植物誌第二版紀錄有三種，本研究提出第四種歸化於台灣中部中海拔地區，原產於美洲的植物--紫花牽牛(*Ipomoea purpurea* (L.) Roth)，本文提供其分類性狀描述與彩色照片。

關鍵詞：旋花科、牽牛花的複合種、紫花牽牛、歸化植物、台灣、分類

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