

Chamaesyce hypericifolia (L.) Millsp., A Newly Naturalized Spurge Species in Taiwan

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ABSTRACT: *Chamaesyce hypericifolia* (L.) Millsp., originally native to New World tropics and subtropics, was recently found naturalized in disturbed sites of eastern Taiwan. It represents a new record for the flora of Taiwan. The present study provides taxonomic description, line drawings and other relevant information. In addition, a comparison with *C. hyssopifolia* is given.

KEY WORDS: *Chamaesyce hypericifolia*, *Chamaesyce hyssopifolia*, Euphorbiaceae, Taxonomy, Taiwan.

INTRODUCTION

Chamaesyce is a genus of about 250 species, of cosmopolitan range but with the largest number of species in tropical and subtropical in the New World (Webster and Burch, 1967; Berry, 1999). In Taiwan the genus is represented by 14 species; four of them are endemic to the island, while the remainder widespread in temperate to tropical latitudes (Lin *et al.*, 1991). Recently an additional adventive species, *C. hypericifolia*, was found in eastern Taiwan. It is a widespread species in the New World tropics and subtropics, which resembles to a more common species viz., *C. hyssopifolia* but differs in several characters. The present study gives the species description and illustrations, based on live plant materials from Taiwan. Furthermore, a comparison of the diagnostic characters between this species and *C. hyssopifolia* is made.

TAXONOMIC TREATMENT

***Chamaesyce hypericifolia* (L.) Millsp.**, Field Columb. Mus. Bot. 2: 302. 1909; Webster & Burch, Ann. Missouri Bot. Gard. 54: 345. 1967; Croat, Fl. Barr. Color. Isl. 526. 1978; Acevedo-Rodríguez, Fl. St. John, U.S. Virgin Isl. (Memoirs) 206. 1996; Wunderlin, Guid. Vasc. Pl. Florida 399. 1998; Berry in Berry *et al.*, Fl. Venez. Guayana 5: 107. 1999; Koutnik & Huft in Wagner, Herbst & Sohmer, Man. Flowering Pl. Hawaii (Rev. ed.) 1: 609-610. pl. 81. 1999. Figs. 1, 2, 3A, 4A, 5A, 6A

Euphorbia hypericifolia L., Sp. Pl. 1: 454. 1753; Correll & Correll, Fl. Bah. Archip. 810. 1996.

Euphorbia glomerifera (Millsp.) L. C. Wheeler, Contr. Gray Herb. 127: 78. 1939; Haselwood & Motter, Handb. Hawaiian Weeds 232-233. 1983.

An annual or short-lived perennial herb, erect or ascending, mostly 20-100 cm tall, with milky sap. Stems much branched, deflexed at apex, purplish red, glabrous, 2-3 mm across, with somewhat swelled nodes; stipules spreading, triangular, 1-2 mm long and 1-1.5 mm wide,

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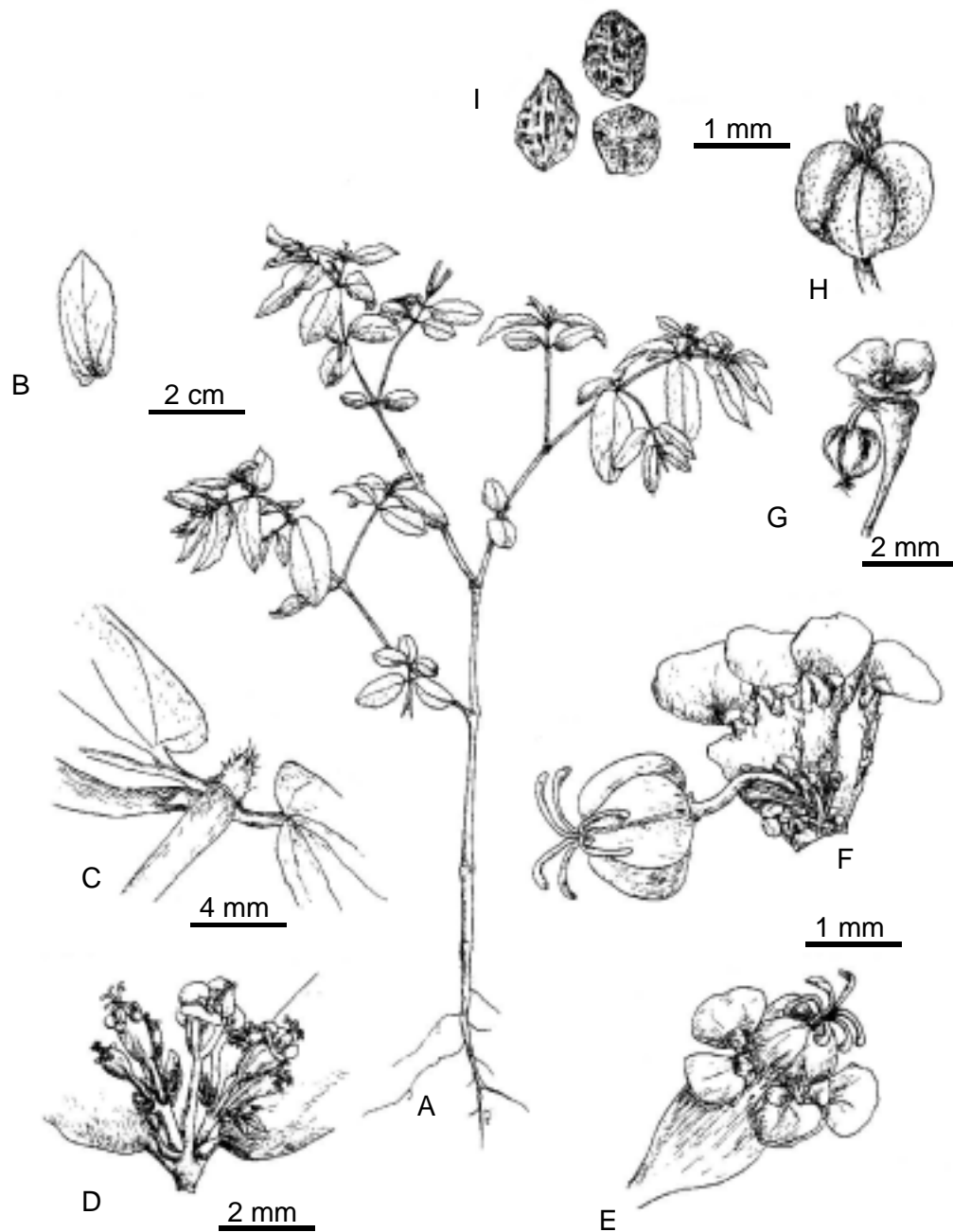


Fig. 1. *Chamaesyce hypericifolia* (L.) Millsp. A: Habit. B: Leaf blade. C: Stipule. D: Arrangement of cyathia. E: Cyathium. F: Dissected cyathium. G: Cyathium with fruiting pistil. H: Capsule. I: Seeds.

dentate and ciliate margined. Leaves opposite, distichous; petioles 1-2 mm long, purplish red; blades green flushed with purplish red, sometimes with small purple spots on the surface, oblong to elliptic or oblong-oblancheolate, 2.5-3 cm long and 8-15 mm wide, obliquely truncate to rounded at base, obtuse to subacute at apex, serrate especially above the middle. Cyathia in almost leafless lateral and terminal cyme; involucre turbinata, 1-1.3 mm long, appressed-hairy inside; stalks 0.5-4 mm long; glands 4, green to brownish-green, round, 0.2-0.3 mm across, the appendages conspicuous, obovate to reniform, 0.8-1 mm long and 1-1.2 mm wide, white or whitish pink; bracteoles 4, lanceolate, 0.3 mm long, lacerate and ciliate.



Fig. 2. *Chamaesyce hypericifolia* in its natural habitat.



Fig. 3. *Chamaesyce hypericifolia* (A) and *C. hyssopifolia* (B), showing the similar flowering branches.

Staminate flowers 10-15, tiny, filaments 0.5-1 mm long, anthers yellow flushed with purplish red, 0.4 mm long. Pistillate flower 1, exserted, style and stigma white, 0.5 mm long, styles 3, each 2-cleft, ovary green, ovoid, 0.8 mm across, with a long pedicel 0.5-1 mm long. Capsule glabrous, 3-lobed, globose, broader below the middle, 1.3 mm long and 1.5 mm wide, brownish when mature; seeds reddish brown, ovoid, 1.1 mm long and 0.7 mm wide, with 4 lateral ridges on each face, the surface with 2-4 depressions, mucilaginous when wet.

Specimens examined: TAIWAN. Hualien Co., Hualien, Tzu-tzi-ho-shan, Shiang-young Village, along pathside, in garden, January 5, 2004, S.-H. Chen *s. n.*; same loc., June 29, 2003, Y.-C. Liou *s. n.*; same loc.,

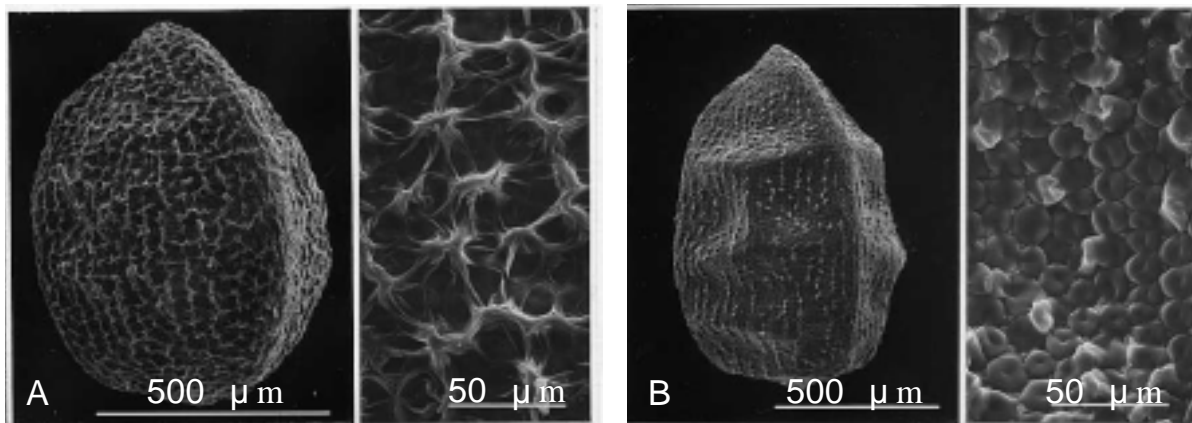


Fig. 4. Seeds of *Chamaesyce hypericifolia* (A) and *C. hyssopifolia* (B), showing side view and its enlargement under SEM.

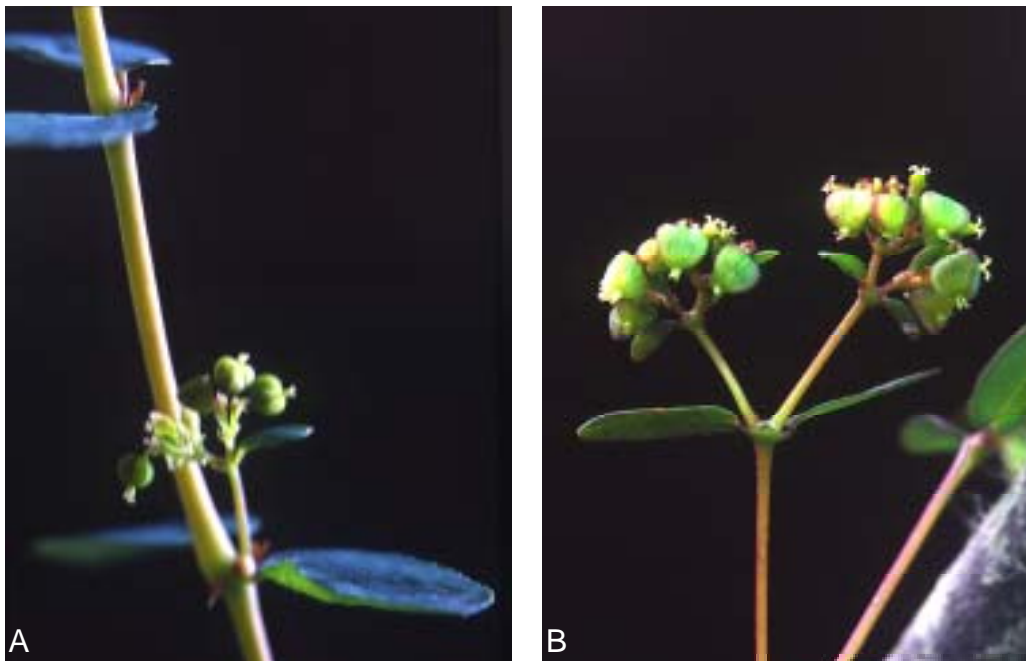


Fig. 5. Capsules of *Chamaesyce hypericifolia* (A) and *C. hyssopifolia* (B).

November 30, 2002, M.-Y. Ree & C.-W. Ho *s. n.*; same loc., November 19, 2002, C.-L. Tsai *s. n.* (all at HLTC); Quang-fu Hsiang, near Quang-fu Sugar Factory, under Quang-fu Bridge, July 22, 2003, Y.-H. Young *s. n.*; same loc., April 9, 2003, Y.-C. Chou *s. n.*; along Mataian Hsi (River), May 10, 2003, C.-L. Young *s. n.* (all at HLTC); Gi-an Hsiang, Nanhua, Lotus Village, in garden, along border of pond, May 12, 2003, S.-H. Chen *s. n.*, (HLTC). Taitung Co.: Da-zen Hsiang, along An-so Hsi (River), backyard of Heaven Temple, June 29, 2003, Y.-C. Liou & Y.-C. Su *s. n.* (HLTC); Bei-nan Hsiang, near Gymnastic Exp. High School, June 30, 2003, C.-F. Lin & L.-Y. Chen *s. n.* (HLTC).

Distribution: The species is distributed through the southern United States, Mexico, Central America to the West Indies and South America (Berry, 1999; Correll and Correll, 1996; Croat, 1978; Koutnik and Huft, 1999; Webster and Burch, 1967), and is introduced into Java (Backer and Bakhuizen, 1963) and Hawaii (Koutnik and Huft, 1999).



Fig. 6. Stipules of *Chamaesyce hypericifolia* (A) and *C. hyssopifolia* (B).

Habitat and Ecology: *C. hypericifolia* was first collected in Hualien in 2002 in garden at Shiang-young Village and is now a wide spread weed in the eastern part of the island. Locally it occurs in some places of the dry and wet lowlands, such as gardens, roadsides and waste ground; also along borders of ponds and marshes. The plant grows in association with other weedy plants commonly found in disturbed areas, such as *Aster subulatus* Michx., *Bidens pilosa* L. var. *radiata* Sch.-Bip., *Emilia sonchifolia* (L.) DC. var. *japonica* (Burm. f.) Mattfeld, *Chenopodium serotinum* L., *Veronica undulata* Wall., and *Mazus pumilus* (Burm. f.) Steenis. Flowering and fruiting are throughout the year.

Notes: In the course of studying the present species, we found another invasive species of tropical American origin, known as *C. hyssopifolia*, that at first sight might be mistaken for *C. hypericifolia*, widespread on this island. It was first collected in southern Taiwan in 1987 (Kao and Chaw, 1987, misidentified as *C. maculata*; Lin *et al.*, 1991) and apparently well established in this island during the past 18 years as another weed of roadsides, railroads, lawns and borders of field.

Although *C. hypericifolia* and *C. hyssopifolia* occur in similar habitats and are usually in a same habit (Figs. 2 & 3), there are several differences between these two species. In *C. hypericifolia* its seeds are orange brown and are ovate having a testa covered with an irregular, polygonal reticulum under SEM, while in *C. hyssopifolia* its seeds are blackish brown and are oblong having a testa covered with cuticular platelets (Fig. 4). The capsules in *C. hypericifolia* are ca. 1 mm across much smaller than those of *C. hyssopifolia*, which is usually distinguished by its larger, more ovoid capsules ca. 1.5-2 mm across (Fig. 5). In addition, the stipules of the former are conspicuous, outspreading and as much as 2 mm long, making a considerable difference from the inconspicuous ones in the latter, of which the stipules are attached to the nodes and hardly 1 mm in length (Fig. 6). In fact, in *C. hypericifolia* the usually purplish red coloration of fresh stipules is quite distinct.

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LITERATURE CITED

- Backer, C. A. and R. C. Bakhuizen Van Den Brink, Jr. 1963. Flora of Java Vol. I. Noordhoff, Groningen. 504 pp.
- Berry, P. E. 1999. *Chamaesyce*. In: Berry, P. E., K. Yatskievych, and B. K. Holst (eds.). Flora of Venezuelan Guayana Vol. 5. Missouri Botanical Garden press, St. Louis. pp. 105-107.
- Correll, D. S. and H. B. Correll. 1996. Flora of the Bahama Archipelago. A. R. G. Gantner Verlag K. G. (repr.). 810 pp.
- Croat, T. B. 1978. Flora of Barro Colorado Island. Stanford University press, Stanford, California. 526 pp.
- Kao, M.-T. and S.-M. Chaw. 1987 *Chamaesyce maculata* (L.) Small, a new addition to the Flora of Taiwan. J. Taiwan Mus. **40**: 41-44.
- Koutnik, D. L. and M. J. Huft. 1999. *Chamaesyce*. In: Wagner, W. L., D. R. Herbst, and S. H. Sohmer (eds.). Manual of the Flowering Plants of Hawaii Vol. I. Bishop Museum Press, Honolulu. pp. 609-610.
- Lin, S.-C., S.-M. Chaw, and C.-F. Hsieh. 1991. A taxonomic study of the genus *Chamaesyce* S. F. Gray (Euphorbiaceae) in Taiwan. Bot. Bull. Acad. Sin. **32**: 215-251.
- Webster, G. L. and D. Burch. 1967. Family 97 Euphorbiaceae. In: Woodson, R. E. Jr., R. W. Schery and Collaborators (eds.). Flora of Panama Part . Ann. Missouri Bot. Gard. **54**: 211-350.

台灣新歸化大戟科植物-假紫斑大戟

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摘 要

假紫斑大戟 (*Chamaesyce hypericifolia* (L.) Millsp.) (新擬中名) 為新歸化於台灣東部之大戟科植物。本文描述其分類特徵、分佈、生長環境並與相關種 - 紫斑大戟 (*Chamaesyce hyssopifolia*) 做比較。

關鍵詞：假紫斑大戟、紫斑大戟、大戟科、分類學、台灣。

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