

Research paper

Anoda cristata (L.) Schltld. (Malvaceae), a newly naturalized plant in Taiwan

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【Abstract】 A newly naturalized plant, *Anoda cristata* (L.) Schltld. (Malvaceae), native to Mexico, has recently been found in low to medium elevations of central Taiwan. It is a newly recorded genus and species to the flora of this island. A detailed description, line-drawings, photographs and geographic distribution are provided for identification of this species.

【Key words】 *Anoda cristata*, Malvaceae, naturalized plant, Taiwan

研究報告

臺灣新歸化錦葵科植物—冠萼蔓錦葵

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【摘要】 本文記錄一種臺灣新歸化錦葵科植物冠萼蔓錦葵 (*Anoda cristata* (L.) Schltld.)，原產於墨西哥，最近被發現歸化於臺灣中部低至中海拔。本文描述其形態特徵、地理分佈及生育地環境，並提供彩色圖片與線畫圖以資辨識。

【關鍵詞】 錦葵科、冠萼蔓錦葵、歸化植物、臺灣

INTRODUCTION

The family Malvaceae consists of 100 genera and 1,000 species, distributed in tropical and temperate regions of N and S Hemisphere (Tang *et al.*, 2007). Based on Chang's study (1993), the species of Taiwan Malvaceae were classified into nine genera and twenty eight species. After “A Checklist of the Vascular Plants of Taiwan”

(Boufford *et al.*, 2003), and “A Synopsis of Taiwan Seed Plants” (Yang *et al.*, 2008) were published, three species within Malvaceae were reported for the flora of Taiwan (*Sida spinosa*: Lin *et al.* 2010; *Abutilon hulseanum*: Lin *et al.*, 2012, (in press); *Sida rhombifolia* var. *maderensis*: Lin and Tseng, 2011). In our recent botanical surveys, we found *Anoda cristata* (L.) Schltld. as

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a weed distributed in low to medium elevations of central Taiwan. The genus *Anoda* Cavanilles was established in 1785 based on *Anoda hastata* Cavanilles (Fryxell, 1988). The genus *Anoda* has its principal center and maximum diversity in Mexico. A few species occur in the southwestern United States, and *A. cristata* with weedy tendencies, is widespread and relatively common, occurring from the southern United States through Central America to many parts of South America. *Anoda cristata* occasionally occurs as a waif elsewhere, presumably by transport with agricultural planting seed. (Fryxell, 1988)

Anoda and *Sida* belong to the tribal Malveae St.-Hilaire. In outline, *A. cristata* is similar to *Sida* spp. in Taiwan, but differs in leaves and fruits. Leaves of *A. cristata* sometimes have an irregular purple blotch along the midvein while that of Taiwanese *Sida* spp. is absent. Lateral walls of mericarps of the former are evanescent, but persistent in the latter (Fryxell, 1988). *Anoda cristata* has white androecium, anthers and styles while those of Taiwanese *Sida* spp. are yellowish.

TAXONOMIC TREATMENT

Anoda cristata (L.) Schltdl., *Linnaea* 11: 210. 1837.

冠萼蔓錦葵 Fig. 1-3

An annual or perennial, suberect to sprawling herbs 10-75 cm tall, the stems and petioles usually hispid, the hairs patent or retrorse. Leaf blades mostly 5-8 cm long, 2-5 cm wide, variable (ovate, triangular, hastate, or rarely palmately lobed), crenate, rounded-acute, softly tomentulose above and beneath, leaves sometimes with an irregular purple blotch along the midvein, occasionally

also on margin; petioles 1-3 cm, hispid; stipules linear, 1-1.5 cm long, hispid, caducous. Flowers solitary in the leaf axils; pedicels up to 4 cm long, calyx 5-8 mm long in flower, accrescent to 12-20 mm long in fruit, hispid; corolla without a dark center, the petals 8-13 mm long, purplish or violet (rarely white); androecium shorter than the petals, glabrous to pubescent, white, the filaments 1-2 mm long, the anthers whitish; styles 10-16. Fruits 8-11 mm in diameter (excluding spines), a flattened disk, densely hispid; mericarps 10-16, indehiscent, with spine 1.5-4 mm long on dorsal angle, the lateral walls evanescent; seeds 3 mm long, brown-black to black, with warts.

Distribution : *Anoda cristata* is a common and widespread species, occurring throughout Mexico and flowering essentially throughout the year. It is highly variable and often occurs as a weed in disturbed areas. Its distribution extends northward into the southern parts of the United States, and southward through Central America to much of South America. In Taiwan, this species was found growing at open area such as roadsides, upland field, and open sunny soils in low to medium elevations.

Specimens examined : Taichung City: Chinshui Dist.: Tungshan, C. M. Wang 13613, 14172, 14387, 14587, 14598, 14860 (TNM). Nantou Co.: Jenai Township: Chingching, C. M. Wang 14579, 14584 (TNM).

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Fig. 1. *Anoda cristata* (L.) Schtdl. A. habit; B. section of flower; C. androecium; D. pistil with stamens removed; E. calyx; F. carpel and seed.

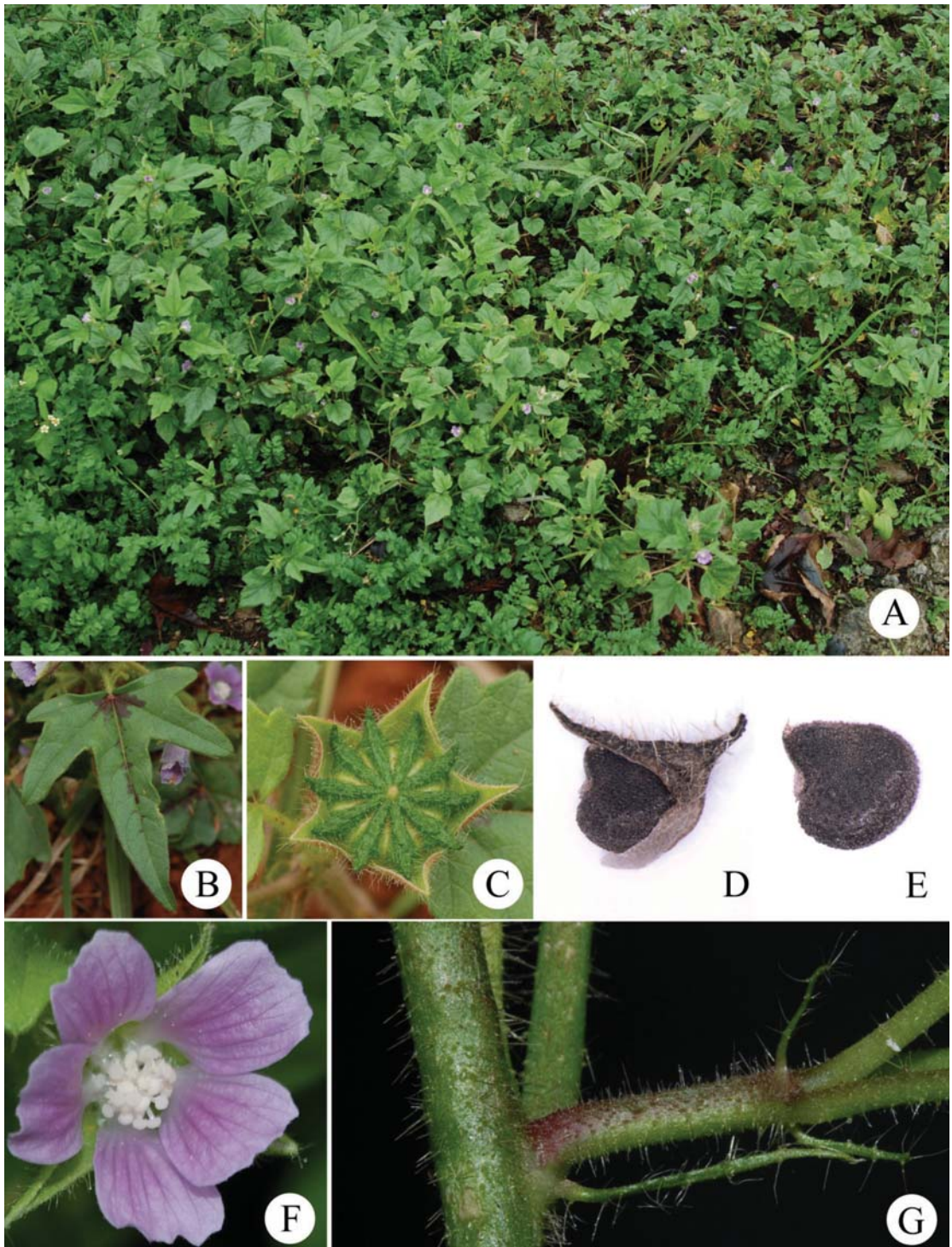


Fig. 2. *Anoda cristata* (L.) Schltdl. A. habitat; B. leaf; C. young fruit; D. carpel and seed; E. seed; F. flower; G. stem and stipule.

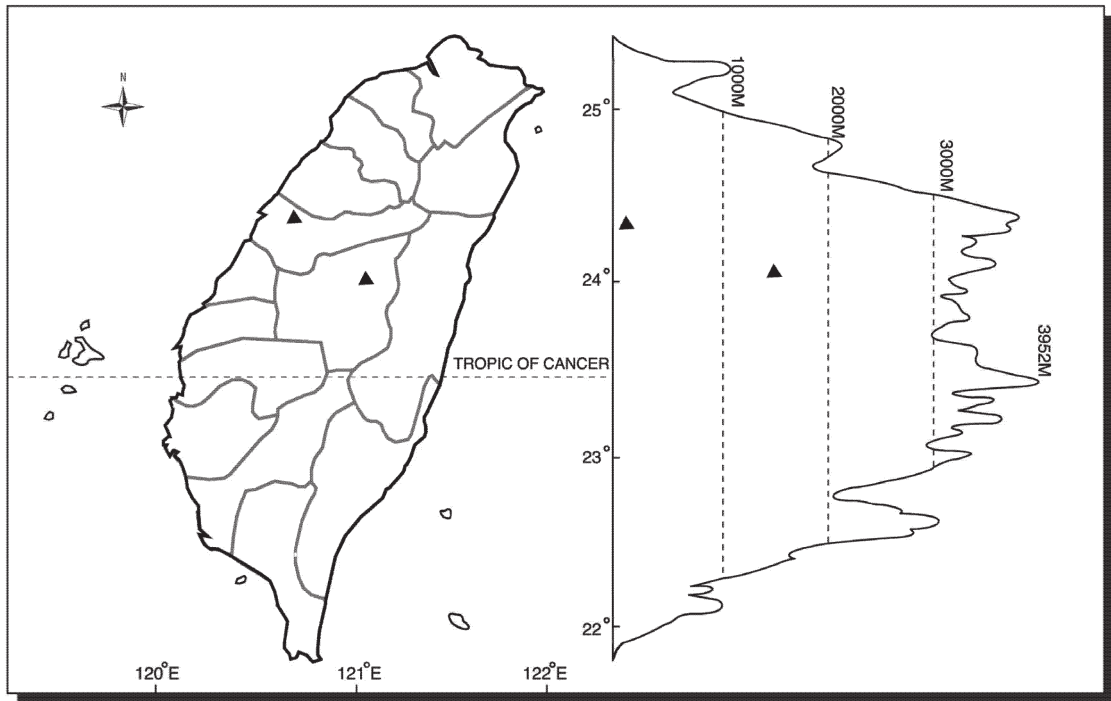


Fig. 3. Distribution of *Anoda cristata* (L.) Schltdl. in Taiwan.

LITERATURE CITED

- Boufford, D. E., H. Ohashi, T. C. Huang, C. F. Hsieh, J. L. Tsai, K. C. Yang, C. I Peng, C. S. Kuoh and A. Hsiao. (2003) A Checklist of the Vascular Plants of Taiwan. In: Huang, T.-C. *et al.* (eds.). *Flora of Taiwan*, 2nd ed., 6: 77. Editorial Committee, Dept. Bot., NTU, Taipei, Taiwan.
- Chang, C. E. (1993) Malvaceae. In: Huang, T. C. *et al.* (eds.) *Flora of Taiwan* 2nd ed. Vol. 3. Editorial Committee. Department of Botany, National Taiwan University. p. 739-741.
- Fryxell, P. A. (1988) Malvaceae of Mexico. In: *Systematic Botany Monographs*. 25: 82-105.
- Fryxell P. A. (1997) The American genera of Malvaceae-II. *Brittonia* 49:204-269.
- Lin, C. J., C. M. Wang, K. C. Yang and Y. H. Tseng (2012) *Abutilon hulseanum* (Torr. & A. Gray) Torr. ex A. Gray (Malvaceae), a Newly Naturalized Plant in Taiwan. *Q. J. For. Res.* (Accepted and in press)
- Lin, H. W., C. M. Wang and Y. H. Tseng (2010) *Sida spinosa* L. (Malvaceae), A Newly Naturalized Plant in Taiwan. *Q. J. For. Res.* 32(2):1-6.
- Lin, H. W. and Y. H. Tseng (2011) *Sida rhombifolia* L. var. *maderensis* (Lowe) Lowe (Malvaceae), A New Recorded Plant in Taiwan. *Q. J. For. Res.* 33(4):73-80.
- Tang, Y., G. G. Michael and J. D. Laurence (2007) Malvaceae. *Flora of China*. 12: 275-279.
- Yang, Y. P., C. K. Liao, M. Tang, and C. K. Yang (2008) *A Synopsis of Taiwan Seed Plants*. The Forestry Bureau, Council of Agriculture, Executive Yuan, Taipei, Taiwan. 278 pp.

