Research paper

*Sida spinosa* L. (Malvaceae), A Newly Naturalized Plant in Taiwan

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**ABSTRACT** *Sida spinosa* L. is native to Tropical America, now naturalized to central and southern Taiwan. A taxonomic treatment, line drawing, and color photographs of this species from wild are provided to aid in identification. The morphology of *S. spinosa* L. is very similar to *S. acuta* Burman f., and is distinguished from features of stems, leaves and mericarps.

**Key words** Malvaceae, *Sida spinosa* L., Taxonomy, Naturalized plant, Taiwan.

**INTRODUCTION**

The family Malvaceae comprise over 80 genera throughout the world, eight in Taiwan (Chang, 1977; Ying, 1992). The genus *Sida* L. with about 200 species distributed in tropical and subtropical areas, including America, Africa, Australia, Asia and the Pacific islands, is taxonomically one of the most difficult groups displaying wide ranging morphological variability (Sivarajan *et al.*, 1992; Tang *et al.*, 2007). A total of 6 taxa have been found in Taiwan (Chang, 1977, 1993), but the species of *Sida spinosa* L. was not recorded in the previously taxonomic study of Taiwan.

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The genus *Sida* is usually perennial subshrubs or herbs, often either stellate-pubescent or nearly glabrous. The leaves are simple or somewhat lobed, serrate. Flowers solitary or in inflorescence; calyx-lobes 5, corolla yellow, the petals 5, free above, connate at the base and adnate to the stamina tube; stamens numerous, free above. Ovary with 5 or more carpels, mericarps separate from the axis after ripening, pointed or usually 2-awned at the apex (Lu *et al.*, 2006; Chang, 1977; Li, 1963).

*Sida spinosa* L., native to tropical America, is now recorded as newly naturalized species to Taiwan, it probably has been accidentally introduced by the importation of crops from America and Australia (Hsu *et al.*, 2004), can flower and fruit in all years.

**TAXONOMIC TREATMENT**

*Sida spinosa* L., Species Plantarum 2:683. 1753.

刺金午時花 Fig. 1 & 2.

Perennial undershrubs, stems erect, up to 1 m high, much branch, minutely stellate-pubescent. Leaves alternate; blade narrowly oblong or elliptic-lanceolate, 1.5-3 cm long, 0.5-1 cm wide, obtuse at apex, rounded at base, serrate, basally 5-veined, minutely stellate-tomentose beneath, glabrescent above; petioles 1-2 cm long, occasionally spinose at base; stipules 0.3 cm long, subulate. Flowers solitary or in small groups in the leaf axils and crowded at the apices, pedicel 0.2-0.5 cm, joint; corolla yallow with red-veined, ca. 1 cm in diameter, 5 petals, subcordate; calyx campanulate, 0.3-0.5 cm across, minutely tomentose, the lobes triangular; 5 gynoecium, style red or pink; 10 filaments, stamen connate into column at base, glandular hair; pollen grains ca. 100 μm, spheroidal, porate, spines on the surface. Fruits schizocarpic, nearly globose, 0.3-0.4 cm across, mericarps 5, trigonous, apically 2-awned, the awns ca. 0.5 cm long, stellate-hairy; dorsally reticulate-veined. Chromosome numbers: 2n=14, 28 (Paul, 1988).

Specimens examined: Taiwan. Taichung County. Dali City (大里市), Dali Bridge (大里橋), 7 Jan. 2010, Lin 881; Taichung City, Beitun district (北屯區), Ree-Zhong Street (雷中街) 1 Nov. 2008, Lin 110; Nantou County, Ren-Ai Township (仁愛鄉), Nan-Phong Village (南豐村), 26 Dec. 2009, Li 856; Changhua County, Lugang township (鹿港鎮), Chang-Wnpb industrial estate (彰濱工業區), elev. ca. 5 m, 16 Nov. 1998, Yang *et al.*, 11588 (TNM); Huatan Township (花壩鄉), the crossing of 137 county road and Yong-Hing road (榮興路), 18 Nov. 2009, Lin 732~738; Pingtung County, Donggang town (東港鎮), elev. ca. 30 m, 30 Dec. 1999, Cheng 2887 (TNM); Fangshan Township (枋山鄉), elev. ca. 290 m, 20 Feb. 1995, Chen *et al.*, 5963 (TAIF); Nanjhou Township (南州鄉), Nanjou Sugar Refinery Plant (南州糖廠), 16 Mar. 2000, Ku 510 (PPI); Hengchun town (恆春鎮), Chu-Fire (出火), 10 Sep. 2009, Lin 568; Pingtung City, Neipu Township (內埔鄉), Lao-Pi (老埤), Jul. 16, 2001, Ku 1406 (PPI); Taitung County, Lanyu Township (蘭嶼鄉), Iraralai (朗島), 11 Aug. 1976, Chang 8912 (PPI).

Notes: The first record of *Sida spinosa* L. in Taiwan was in 1976 by C. E. Chang at Iraralai (朗島) of Lanyu island, which was treated as *S. acuta* Burman f.. After that, most Taiwan authors misidentified this species as *S. acuta* Burman f.. *S. spinosa* L. closely resembles *S. acuta* Burman f., and the distinctions are that the petioles 1-2 cm long, leaves densely stellate-hair beneath, stem with spines and each fruit with 5 mericarps, (vs. the petioles 0.3-0.5 cm long, leaves very sparsely stellate-hair, stem without spines and each fruit with 6 or 7 mericarps).
Fig. 3. Distribution of *Sida spinosa* L. in Taiwan.

<table>
<thead>
<tr>
<th>Species</th>
<th><em>Sida spinosa</em> L.</th>
<th><em>Sida acuta</em> Burman f.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>with spines</td>
<td>without spines</td>
</tr>
<tr>
<td>Petiole</td>
<td>1–2 cm</td>
<td>0.3–0.5 cm</td>
</tr>
<tr>
<td>Leaves</td>
<td>densely stellate-hair beneath</td>
<td>very sparsely stellate-hair</td>
</tr>
<tr>
<td>Stipule shape</td>
<td>subulate</td>
<td>lanceolate</td>
</tr>
<tr>
<td>Number of mericarps</td>
<td>5</td>
<td>6 or 7</td>
</tr>
<tr>
<td>Awns of mericarps</td>
<td>stellate-hairs</td>
<td>glabrous</td>
</tr>
</tbody>
</table>

Distribution: This species, *Sida spinosa* L. is native to tropical and subtropical America, Africa, Australia, Asia and the Pacific islands (Tang *et al.*, 2007) and previously naturalized to Ryukyus (Hatusima, 1971) and Japan (Nagada, 1972). Recently, it naturalized to central and southern Taiwan, was found in waste places and roadsides, at low and medium elevations up to 1,900 m.

**LITERATURE CITED**


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