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A NEW SOUTH AMERICAN SUBSECTION OF *SIDA* SECT. *NELAVAGA* (MALVACEAE) WITH TWO NEW SPECIES

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Abstract: *Sida* [sect. *Nelavaga*] subsect. **Conglomerata** is described as a new subsection of the genus, including eight species from South America. Two of the eight are newly described: ***Sida calva*** and ***S. florulenta***. The group is characterized by having flowers and fruits borne in axillary glomerules.

Resumen: Se describe como nueva *Sida* [secc. *Nelavaga*] subsecc. **Conglomerata**, incluyendo ocho especies sudamericanas. Dos de las ocho son descrito de nuevo: ***Sida calva*** y ***S. florulenta***. El grupo se caracteriza por tener flores y frutos portado en glomérulos axilares.

Keywords: Malvaceae, *Sida* sect. *Nelavaga*, South America.

A key to the South American species of the genus *Sida* L. was published by Kearney (1958), and the genus has been treated for different parts of South America by Schumann (1891), Rodrigo (1944), Monteiro (1936, 1949, 1969), Macbride (1956), Fryxell (1992, 2001), Burandt (1992), Fuertes (1995), and Krapovickas (2003, 2006, 2007). The global treatment by Baker (1892) treated only three of the species considered here (*S. tomentella* Miq., *S. urens* L., and *S. pseudo-urens* Baker f.) and did not place them together as a coherent group, other than noting that *S. urens* and *S. pseudo-urens* are allied. *Sida* was subdivided into sections by Schumann (1891), Monteiro (1936, 1949), Clement (1957), Kearney (1958), and Fryxell (1985). The last-named treatment, although based on Central and North American species, has been found to be applicable globally, with certain modifications (e.g., Sivadasan & Anil Kumar, 1996; Krapovickas, 2003). The history of this infrageneric subdivision was reviewed and summarized by Fryxell (1997, pp. 206, 255).

Borssum Waalkes (1966) established *Sida* sect. *Nelavaga* Borss. Waalk. for a portion of the genus that occurs in the tropics of both the Old World and the New World. Section *Nelavaga* was treated separately by Borssum Waalkes (1966) for

Malesia, by Fryxell (1985) for North and Central America, and by Krapovickas (2006) for Argentina “and nearby countries.” The group is characterized by a distinctive calyx morphology, often with dark-green margined, more or less trullate calyx lobes, 5-carpeled fruits that have a characteristic mericarp morphology (Krapovickas, 2006, fig. 2), and a base chromosome number (where known) of $x = 8$, in contrast to $x = 7$ in section *Sida* and most other sections of the genus (Fryxell, 1997). Within section *Nelavaga* a subgroup of species is characterized by having flowers and fruits that are sessile and congested in axillary glomerules. The best-known representative of this group is the widespread species, *Sida urens*, which occurs in the New World from Mexico and the West Indies to northern Argentina, and also in Africa and Madagascar and as a recent introduction in Hawaii (Starr et al., 2002). It and its near relative *Sida rufescens* A. St.-Hil. are weak-stemmed herbaceous plants that tend to be scandent on other vegetation. Bovini (2001) noted an affinity of *Sida rufescens* with his newly described *S. laciniata* Bovini, although the latter is characterized by having an erect habit.

In contrast, another subgroup of South American species in sect. *Nelavaga* shares the glomerulate inflorescences found in

Sida urens and *Sida rufescens*, but differs in presenting robust, shrubby plants with woody stems that are usually erect and reach heights of 1–2 meters as well as having larger calyces. *Sida urens* has been reported to have a chromosome complement of $2n = 32$, and *Sida melanocaulon* Hassl., representing the shrubby group, has $2n = 16$ (Krapovickas, 1957). These species with glomerulate, axillary inflorescences are here separated as a distinct subsection of sect. *Nelavaga* (subsect. *Conglomerata*), with the remaining species retained in subsect. *Nelavaga*. Subsection *Conglomerata* was recognized earlier as a group (“Grupo Urentae”) by Monteiro (1936), but he included three species (*S. savannarum* K. Schum., *S. guianensis* K. Schum., and *S. ulei* Ulbr.) that do not belong in sect. *Nelavaga* as now conceived, in addition to the following three species that are included here: *S. melanocaulon*, *S. urens*, and *S. tomentella*. Later, without explanation, Monteiro (1949) narrowed the group to three species (*S. savannarum*, *S. tomentella*, and *S. ulei*) and used another name (“Grupo Tomentellae”) for it, transferring *S. urens* out of the group. Neither “group” name was validly published (McNeill et al., 2006, Art. 36). The name *S. ulei* is now placed in *Sida* sect. *Muticae* C. Presl (Krapovickas, 2003); *S. savannarum* is a synonym of *Sida aggregata* C. Presl (Krapovickas, 2003), also in sect. *Muticae*; and *S. guianensis* is a synonym of *Sidastrum quinquenervium* (Duchass. ex Triana & Planch.) Baker f. (Fryxell, 1978).

Monteiro (1936, 1949), Kearney (1958), and Fryxell (1976) have associated the name *Sida ulei* with the group of species treated here, specifically with *S. nemorensis* Mart. ex Colla. In part this view followed the statement by Ulbrich in the protologue of *S. ulei* that it is allied to *S. tomentella*. However, Krapovickas (2003) has found that *S. ulei* is better placed in *Sida* sect. *Muticae* C. Presl, rather than in *Sida* sect. *Nelavaga*, based on the number and conformation of the mericarps in the fruit. Krapovickas made this disposi-

tion in part on the basis of a drawing that was attached to the holotype of *S. ulei* and which is preserved in the Field Museum photograph F-9399, the specimen being no longer extant. The drawing clearly shows ten styles and stigmas in the dissected flower. The type specimen lacked fruits. With this disposition of *S. ulei*, it becomes clear that the statement that *S. ulei* is a synonym of *S. nemorensis* (Fryxell, 1976) is incorrect. A better understanding of the latter species, based in part on the examination of additional specimens, makes its distinction evident.

Species of subsect. *Conglomerata* were treated by Schumann (1891), Monteiro (1936, 1949), Kearney (1958), and Krapovickas (2006). Several names have been published for these plants, but specimens have recently been examined that do not conform to known taxa, a finding that gave rise to the present investigation. There are six shrubby species in subsect. *Conglomerata*, each with more or less distinct geographical distributions. A key to the species of subsect. *Conglomerata* and their distributions and synonymy are presented below, including the description of two new species.

Sida L. [sect. *Nelavaga* Borss. Waalk.] subsect. **Conglomerata** Fryxell, subsect. nov. Type species: *Sida urens* L.

Subsect. *Conglomerata* a subsect. *Nelavaga* per florus et fructuum in glomerulis plurifloribus subsessilibus in axillis foliorum dignoscenda.

Subsect. *Conglomerata* is distinguished from subsect. *Nelavaga* by flowers and fruits crowded in subsessile axillary glomerules.

Characters that these species have in common include inflorescences of axillary glomerules often aggregated into terminal interrupted spikes, narrowly ovate to lanceolate leaves, 5-carpeled fruits with slender mericarps, and relatively large calyces that enclose and conceal the fruits. The axillary glomerules are sometimes subumbellate on a short (1–3 mm) peduncle, although this structure is usually obscured by the crowding of the flowers or fruits.

KEY TO THE SPECIES OF *SIDA* SECT. *NELEVAGA* SUBSECT. *CONGLOMERATA*

1. Plants herbaceous, the stems weak, decumbent or often scandent, reclining on and supported by other vegetation
 2. Calyx 5–7(–8) mm long
 3. Herbage sparsely pubescent, green 8. *Sida urens* L.
 3. Herbage densely pubescent, rufous or yellowish 6. *Sida rufescens* A. St.-Hil.
 2. Calyx 8–12 mm long
 4. Calyx lobes acuminate 4. *S. laciniata* Bovini
 4. Calyx lobes usually acute 7. *S. schumanniana* Krapov.
1. Plants shrubby, the stems woody, erect or recurving
 5. Stems and leaf blades (but not petioles) virtually lacking pubescence; calyx yellowish at base, the lobes 6–7 mm wide between the sinuses (Bolivia: Santa Cruz) 1. *Sida calva*, sp. nov.
 5. Stems and leaf blades manifestly pubescent; calyx green throughout, the lobes 4–5 mm wide between the sinuses
 6. Upper leaf surface with antrorsely oriented, recurved or appressed simple hairs 0.5–1.5 mm long; calyx ecostate
 7. Upper leaf surface with recurved or appressed hairs 1(–1.5) mm long; calyx 8–9 mm long, the lobes acute (Peru, Bolivia, Brazil) 3. *Sida florulenta*, sp. nov.
 7. Upper leaf surface with appressed hairs ca. 0.5 mm long; calyx 8–12 mm long, the lobes acute or sometimes acuminate 7. *Sida schumanniana* Krapov.
 6. Upper leaf surface variously pubescent with hairs less than 0.5 mm long, including stellate hairs; calyx 5- or 10-ribbed at base
 8. Stem hairs uniformly 0.2–0.3 mm long; axillary glomerules with fewer than five flowers (Brazil) 5. *Sida nemorensis* Mart. ex Colla
 8. Stem hairs coarser, variable, 0.5–2 mm long; axillary glomerules 6–8-flowered or more (Brazil, Argentina, Bolivia) 2. *Sida caudata* A. St.-Hil. & Naud.

1. *Sida calva* Fryxell, sp. nov. (Fig. 1).

TYPE: BOLIVIA. SANTA CRUZ: Prov. Santiesteban, 9 km ENE of Portachuelo on hwy. to Montero, 2 km E of Puente Eisenhower over Río Pirai, ca. 17°18'S, 63°19'E, alt. ca. 285 m, 2 m tall, 21 Jul 1991, *Nee & Vargas C. 41806* (HOLOTYPE: NY!; ISOTYPE: TEX!).

Frutices ad 2 m staturae, caulibus lignosis pubescentis carentibus; foliis glabris praeter faciem adaxialem petiolorum barbata; calycibus 8–10 mm longis ad basem lutescentibus ecostatis marginibus pubescentis.

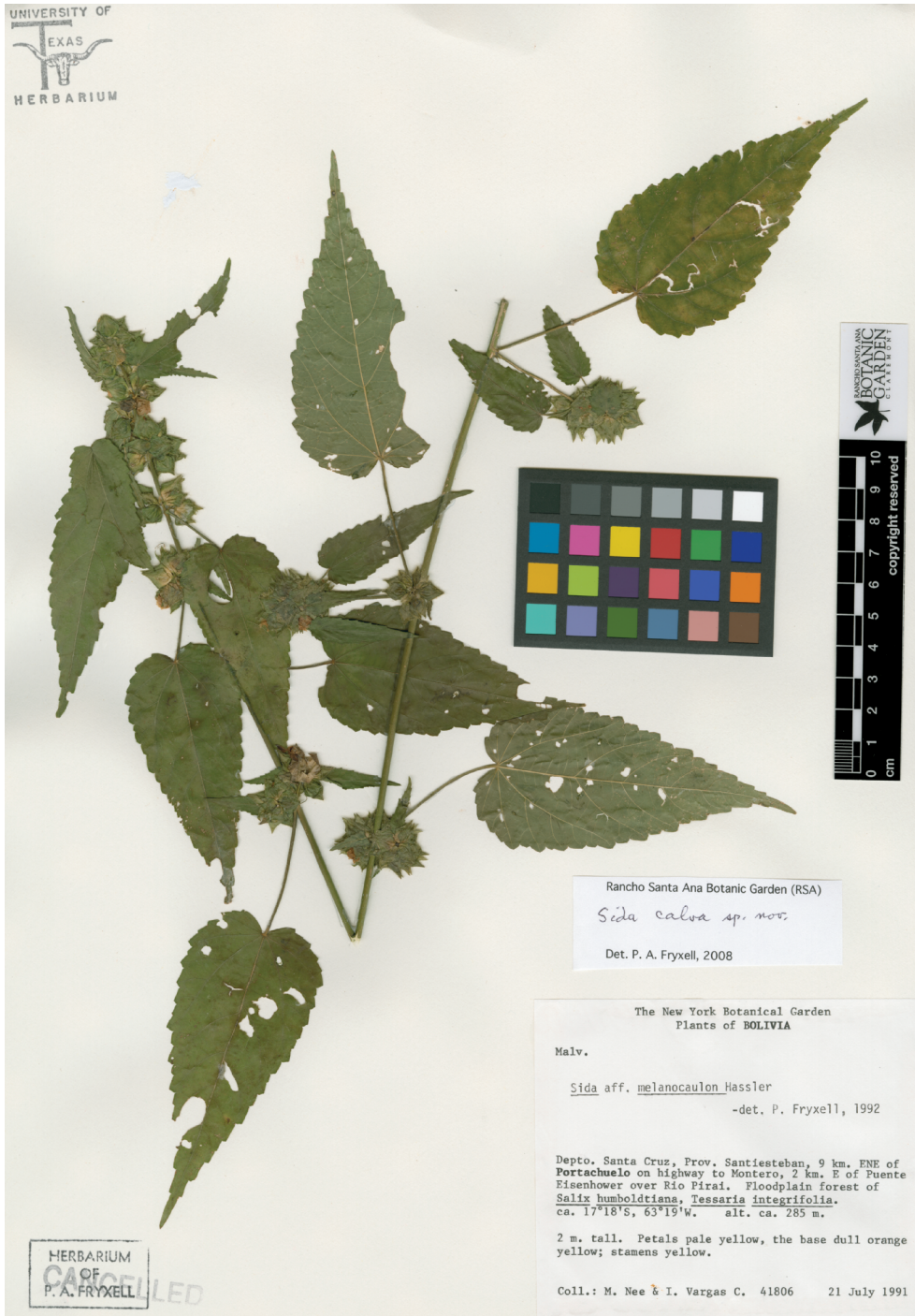
SHRUBS to 2 m tall, the stems essentially devoid of hairs of any size. LEAF BLADES ovate, 5–10 cm long, 2–5.5 cm wide, basally cordate, apex acuminate, margin coarsely crenate, palmately to pedately 7–9-nerved, glabrous above and beneath; petioles 1.5–4 cm long, with a narrow, dense line of hairs 0.3–0.4 mm long on adaxial side plus a few long hairs (1.5–2 mm) at distal end near juncture with lamina, otherwise glabrous; stipules linear, 4 mm long, 0.5 mm wide, 1-nerved, glabrous. FLOWERS borne in subsessile clusters of 4–8 (or more) in the axils of

the leaves, the clusters tending to be aggregated toward the apices of the branches. CALYX 8–10 mm long, yellowish basally, otherwise green, more than half-divided, the lobes triangular or trullate, up to 6–7 mm wide between the sinuses, acute or subacuminate, with stellate-pubescent margins and tips (hairs 0.5–1 mm long), the calyx 5-angled at the sinuses, sometimes with simple hairs to 2 mm in basal portion, the venation not prominent. PETALS pale yellow, the base dull orange-yellow; stamens yellow [fide collectors]. FRUITS not seen.

ADDITIONAL SPECIMENS EXAMINED: **BOLIVIA. SANTA CRUZ:** Prov. Ichilo. Parque Nacional Amoro, along Río Seguayo, 17°40'S, 63°43'W, 450 m, *Nee 38864* (RSA, NY). Huachi, head of Beni River, 3000 ft, Sep 1921, *Rusby 469* (NY).

A field note in the pocket of Rusby's 1921 specimen (# 469) states, "Wissadula (?). Fls. Light yellow. Large shrub with very long slender reclining branches."

2. *Sida caudata* A. St.-Hil. & Naudin, Ann. Sci. Nat. Bot. ser. 2, 18: 52. 1842. TYPE:

FIG. 1. *Sida calva* sp. nov. Isotype (TEX).

BRAZIL. MINAS GERAIS: *Claussen 29* (P as photo F-35534!).

Sida tomentella Miq., *Linnaea* 22: 553. 1849.

TYPE: **BRAZIL. MINAS GERAES:** Caldas, [no date,] *Regnell I-16* (HOLOTYPE: U-248898! [labeled as “isotype”]; ISOTYPES?: BR, LE!, P as photo F-35547!). [type locality at: 21°55’S, 46°10’W] See discussion of questionable isotypes below.

Sida tomentella Miq. var. *brevicalyx* K.

Schum. in *Fl. Bras.* 12(3): 309. 1891. TYPE: **BRAZIL. MINAS GERAIS:** Caldas, 18 Apr 1874, *Regnell I-16* (ex p.) (HOLOTYPE: P as photo F-35546!).

Sida melanocaulon Hassl., *Feddes Repert.* 8:

24. 1910. TYPE: **PARAGUAY.** Sierra de Amambay, ad ripas rio Estrella, *Rojas* [for Hassler] 10294 (HOLOTYPE: G as photo F-23778!; ISOTYPES: B as photo F-9386!, BAF, P).

Sida margaritensis Hassl., *Feddes Repert.* 12:

266. 1913. TYPE: **PARAGUAY.** Prope Cerro Margarita, *Hassler 11065* (HOLOTYPE: G; ISOTYPE: BM).

SHRUBS 0.6–2.5 m tall, the stems sometimes purplish pigmented, prominently hirsute with setae 1–2 mm long, with or without an understory of smaller (sometimes glandular) hairs, the setae simple or sometimes stellate with few arms. LEAF BLADES ovate, 3–8.5 × 1.5–3.5 cm, coarsely serrate-crenate, cordate, acute to slightly acuminate, sparsely stellate-pubescent on both surfaces, the hairs 3–5-armed beneath, ca. 1 mm diam., with fewer arms and slightly smaller above; petioles 1–2.5 cm with pubescence like stems; stipules linear, 3–8 mm long, pubescent. FLOWERS in axillary glomerules of 6 or more flowers. CALYX 6–9 mm long, 10-ribbed at base, hirsute with simple hairs 1–2 mm long and often with smaller hairs in addition, half or more divided, 5-angled at sinuses, the lobes acuminate, 3 mm wide at sinuses. MERICARPS 3.5 × 1–1.5 mm, apically 2-spined (spines 1 mm).

ICONOGRAPHY: None known.

ADDITIONAL SPECIMENS EXAMINED: **BRAZIL. BAHIA:** 6 km E de Poçoas, 14°36’40”S, 40°20’30”W, 10 Aug 2004, *Amorim et al. 4307* (CEPEC, NY). **MINAS GERAIS:** Serra do Ouro Branco, 20°28’S, 43°41’W, 1000 m, 12 May 1990, *Arbo et al. 3985* (CTES, K); 1845, *Widgren 478* (BR, S-2); Caldas, 10 May 1874, *Mosén 1788* (S-2). **MATTO GROSSO:** Santa Anna da Chapada, 20 May 1903, *Malme 3401* (S-2). **PARANÁ:** Mun. Palmeira, Rod. BR-277 descido rio Capivara, 8 Mar 1984, *Hatschbach 47582* (CTES, NY); Ponta Grossa, 24 Apr 1910, *Dusén 9905* (MO, S); Mun. Ponta Grossa, Parque Villa Velha, 24 Feb 1967, *Hatschbach 16052* (C, CTES); Villa Velha, 13 Mar 1904, *Dusén 4050* (S); Mun. Ivai, 15 May 1972, *Hatschbach 29309* (C, CTES, NY); Capão Grande, pr. Ponta Grossa, *Dusén 3936* (S); Capão Bonito, 16 May 1914, *Dusén 15046* (S); Jaguarihyva, 23 Apr 1911, *Dusén s.n.* (S), 15 May 1914, *Jönsson 354a* (S). **SANTA CATARINA:** Laguna, Morro N.S. da Gloria, 24 Jan 1984, *Krapovickas & Cristóbal 39388* (C, CTES). **ARGENTINA. MISIONES:** Dep. Iguazú, Isla San Martín, *Vanni et al. 2793* (CTES, NY); Dep. Candelaria, Loreto, 220 m, 21 Apr 1958, *Montes 27391* (NY); Dep. Candelaria, La Pastora, 220 m, 11 Jul 1946, *Montes 2413* (NY). **CORRIENTES:** Dept. San Martín, Yapeyú, costa del Río Uruguay, 12 Feb 1979, *Schinini et al. 17006* (CTES, NY). **BOLIVIA. SANTA CRUZ:** Prov. Ichilo, 2 km N of Buena Vista, 17°25’S, 63°40’W, 320 m, *Krapovickas & Fortunato 43923* (C, CTES, NY).

Kearney (1958, Note 40) suggested that *Sida tomentella* is “perhaps a synonym of *S. caudata* A. St.-Hil. & Naudin, an older name.” Monteiro (1977) concluded that *S. caudata* and *S. tomentella* are indistinguishable on the basis of an examination of a wide range of material including the type of *S. caudata*. Krapovickas (2006) also followed this view, and it is adopted here.

The typification of *Sida tomentella* is problematical. It is based on “Regnell I-16” according to the protologue. The holotype lacks a collection date but clearly it was collected prior to 1849, the date of publication of the name. Specimens with this designation (“I-16”) may be found in many herbaria, but with widely varying collection dates. As stated on the U.S. National Herbarium type register web site, the “dates are recondite.” For example, the Stockholm herbarium has one specimen dated 20 Apr 1860, two dated 21 May 1862, one dated 22 Apr 1873, and one lacking a date. The Copenhagen herbarium

has two specimens, both of which are dated 13 Jan 1866, as is the specimen at Kew, and the one at the Smithsonian is dated 23 Mar 1866. Since the species was described in 1849, none of these specimens with later dates can be considered as original material, and thus cannot be considered as isotypes. Those that are cited as isotypes above have not been checked for their dates of collection, and are thus cited with a “?”. This problem with Regnell collections has been noted before for *Pavonia guerkeana* R.E. Fr., based on Regnell I-15 (Fryxell, 1999, p. 116), which is the same collection number that is cited as the type of *Abutilon septemlobum* Miq. I have been unable to discover an explanation of the numbering system used by Regnell, or of the varying dates that are recorded on these herbarium sheets.

3. *Sida florulenta* Fryxell, sp. nov. (Fig. 2).

TYPE: PERU. UCAYALI: Provincia de Padre Abad, Distr. Padre Abad Pampa Yurac. Arbusto de 2–3 m. Flores de color amarillo, brácteos verde oscuro. Bosque secundario, 300 m, 9°3'S, 75°30'W, 9 Sep 2004, *Schunke Vigo & Graham 15875* (HOLOTYPE: F!; ISOTYPE: RSA!).

Frutices 2–3 m staturae, caulibus lignosis manifeste et dense pilosis; laminis foliorum in faciebus adaxialibus trichomatibus simplicibus antrorsis (1–1.5 mm longis) recurvatis vel adpressis; calycibus 8–9 mm longis ecostatis ad basem ciliatis, pilis 1–2 mm.

SHRUBS 2–3 m tall, the stems prominently pilose, the hairs simple, 2 mm long. LEAF BLADES ovate, 5–11 cm long, 2–5.5 cm wide, basally cordate, acuminate, coarsely crenate-serrate, palmately 7-nerved, the upper surface with recurved or appressed simple hairs 1(–1.5) mm long, antrorsely oriented, the lower surface with fewer and smaller hairs (especially on nerves) including some stellate hairs; petioles 1.5–4.5 cm long, pilose like stems, sometimes with an adaxial line of dense shorter hairs 0.1–0.6 mm long; stipules subulate, nearly glabrous, 4 mm long. FLOWERS crowded in axillary glomer-

ules of six or more flowers, evidently subsessile or on short pedicels 1–3 mm long, the glomerules forming interrupted spiciform inflorescences, often on axillary lateral branches. CALYX 8–9 mm long, slightly 5-angulate at sinuses, not ribbed, half or more divided, the lobes narrowly triangular-acute (4–5 mm wide between the sinuses), sparsely ciliate (especially basally), the hairs sometimes simple and 1–2 mm long, sometimes stellate and ca. 1 mm in diameter. PETALS 6 mm long (exceeding calyx), pale yellow with reddish base; androecium included. MERICARPS presumably 5 (but intact fruits not observed), glabrous except minutely pilose apically, 3 mm long, 1.5 mm wide, minutely bi-apiculate, the apicula 0.3 mm long, the dorsal wall smooth.

ADDITIONAL SPECIMENS EXAMINED. PERU. CUSCO: La Convención, Dist. Vilcabamba, Chiwanquiri, 12°45'16"S, 73°8'6"W, 881 m, 18 Jul 2004, *Galiano et al. 6645* (MO, TEX). BOLIVIA. GUANITIPUANI: 1892, *Bang 1446* (NY-2). BRAZIL. MINAS GERAIS: Viçosa, Upper Chacha Valley, [20°55'S, 43°W,] 670 m, 30 Jul 1930, *Mexia 4922* (NY, RSA).

The collection of *Mexia* from Minas Geraes cited above is widely separated from the other specimens from Peru and Bolivia, yet agrees well with these specimens in morphology. It is of interest that a second collection by *Mexia* (# 4773) of *Sida urens* (q.v.) from essentially the same locality, and when compared side-by-side with # 4922, shows all of the contrasting characters that distinguish *S. florulenta* and *S. urens*. Evidently the two species are sympatric, perhaps separated by ploidy level.

4. *Sida laciniata* Bovini, *Eugeniana* 25: 23, fig. 1. 2001. TYPE: BRAZIL. MINAS GERAIS: Januária, Vale do Rio Peruaçu, a caminho do cerrado do Judas, 21 Jul 1997, *Salino 3297 & Stehmann* (HOLOTYPE: BHCN-n.v.). [type locality at: 15°20'S. 42°20'W]

Erect SUBSHRUBS, the stems cylindrical, velutinous (hairs simple), the younger stems reddish. LEAF BLADES 1.5–7.5 × 1.2–4.5 cm, chartaceous, concolorous, cordiform, the



FIG. 2. *Sida florulenta* sp. nov. Isotype (RSA).

base cordate, the apex acute, the margins irregularly serrate, velutinous above and beneath, the hairs simple or rarely stellate, the younger ones reddish; petioles cylindrical, ca. 5 cm long, velutinous, reddish; stipules filiform, ca. 3 mm long, velutinous, reddish. INFLORESCENCES axillary, aggregate; flowers with a pedicel 3–4 cm long, velutinous, reddish; calyx pyramidal, membranous, yellowish-pallid, reddish on the margins of the lobes, very acuminate, velutinous; corolla yellow, ca. 1.2 cm in diameter; staminal tube ca. 2 mm tall, glabrous; ovary 5-locular, glabrescent; stigmas capitate, 5. MERICARPS 5, submuticous, ca. 2×2 mm, laterally reticulate. [Description translated from prologue.]

ICONOGRAPHY: Bovini (2001, page 25, Fig. 1).

5. *Sida nemorensis* Mart. ex Colla, Herb. Pedem. 1: 416. 1833. TYPE: **BRAZIL. MINAS GERAIS:** Rio Belmonte [Jequitinhonha, $16^{\circ}26'2''S$, $41^{\circ}0'10''W$]. *Martius s.n.* (holotype: TO!). Cf. Fryxell (1976).

Sida riedelii K. Schum. in Fl. Bras. 12 (3): 296. 189. 1891. *Sida spinosa* L. var. *riedelii* (K. Schum.) Monteiro, Monogr. Malv. Brasil. 41. 1936. TYPE: **BRAZIL. SÃO PAULO:** Prope Sorocaba, *Riedel 2021* (HOLOTYPE: B as photo F-9391! [reproduced by Rodrigo, 1944: *pl. 14*]; ISOTYPES: NY!, US!). [type locality at: $23^{\circ}45'S$, $47^{\circ}30'W$]

SHRUBS 0.5–2 m tall, slender; stems woody, densely short-pubescent, the hairs uniformly 0.2–0.3 mm long, stellate. LEAF BLADES narrowly ovate, 3–6 cm long, 1.5–2 cm wide (smaller upward), basally cordate (sinus shallow: 1–3 mm), the margin serrate, apically acuminate, both surfaces densely stellate-pubescent, the hairs ca. 0.5 mm long; petioles 8–12 mm long (shorter upward), with pubescence like stem, denser distally; stipules linear, 3–7 mm long, 0.5 mm wide, sparsely pubescent, the hairs to 0.5 mm. FLOWERS in axillary glomerules

of 2–4 flowers (sometimes solitary), the pedicels 1–2 mm long. CALYX 7–8 mm long, ca. half-divided, 5-angulate, stellate-pubescent, basally 10-ribbed, the lobes 4–5 mm long, 4–5 mm wide at sinus, acuminate. PETALS yellow, 7–8 mm long, slightly exceeding the calyx. [GENITALIA not seen; FRUITS not seen.]

ICONOGRAPHY: Rodrigo (1944, *plate 14* [holotype of *Sida riedelii*]).

ADDITIONAL SPECIMENS EXAMINED. **BRAZIL. GOIÁS:** Mun. Cristalina, Lajeado (Rod. BR-040), 12 Apr 1981, *Hatschbach 43835* (C, CTES) [$16^{\circ}40'S$, $47^{\circ}40'W$]. **PARANÁ:** Mun. Londrina, Lereville, Campo das Pedras, 29 Sep 1970, *Hatschbach 24861* (C, CTES). [$23^{\circ}S$, $51^{\circ}W$].

When Schumann originally described *Sida riedelii*, he suggested it was allied to *Sida spinosa* L. This suggestion was followed by Monteiro (1936), who reduced it to varietal rank within *S. spinosa*, which reduction in rank was followed by Rodrigo (1944) and Kearney (1958). Kearney, however, suggested (Kearney, 1958, Note 48) that this taxon “may be specifically distinct from *S. spinosa*.” None of these authors noted the similarity of *S. riedelii* to those species (*S. caudata*, *S. tomentella*, etc.) that form the basis for the group under study here, where it seems clearly to belong, although Rodrigo (1944, p. 129) noted that this plant has “flores numerosas aglomeradas en el ápice de las ramas formando conjuntos subglobosos densos,” unlike *S. spinosa*.

6. *Sida rufescens* A. St.-Hil., Fl. Bras. Merid. 1: 185. 1827. *Sida urens* var. *rufescens* (A. St.-Hil.) Baker f., J. Bot. 30: 294. 1892. TYPE: **BRAZIL. MINAS GERAIS:** Prope Formigas [Montes Claros], *St.-Hilaire s.n.* (HOLOTYPE: P as photo!).

Sida pseudo-urens Baker f., J. Bot. 30: 294. 1892. TYPE: **PERU.** Tarapoto, *Mathews 1552* (HOLOTYPE: BM).

Sida urens var. *aurea* Hassl., Repert. Spec. Nov. Regni Veg. 12: 267. 1913. TYPE: **PARAGUAY.** In regione calcarea cursus

superioris fluminis Apa, prope Cerro Margarita, Mar 1913, *Hassler 11037* (HOLOTYPE: G; ISOTYPES: NY!, P as photo!, UC!), non *Sida aurea* G. Don 1831 nec *Sida aurea* Lodd. 1842.

Sida urens f. *warmingiana* Monteiro, Monogr. Malv. Brasil. 38. 1936. TYPE: **BRAZIL**. **MINAS GERAIS**: Morro das pedras, Belo Horizonte, 30 May 1933, s. coll., s.n. (HOLOTYPE: Jard. Bot. de B. Hor. #7948-n.v.).

Weak-stemmed, trailing SUBSHRUBS, decumbent or often supported on other vegetation; stems freely branching, semi-woody, densely rufous-pubescent, the hairs mostly stellate, 1–1.5(–2) mm long, yellowish or ferruginous. LEAF BLADES ovate, 3–6 cm long, 2–3.5 cm wide, basally shallowly to deeply cordate, sharply serrate, prominently ciliate on marginal teeth, acute, palmately 7–9-nerved, stellate-pubescent beneath, with mixture of stellate, bifurcate, and simple hairs above; stipules linear, 6–7 mm long, setose; petioles 1–3.5 cm long, with pubescence like stem. FLOWERS in axillary glomerules of 6–8 flowers (or more), the glomerules subsessile or sometimes on lateral branches (peduncles) 1–3 cm long or more; pedicels 1–2 mm. CALYX 5–7 mm long, densely stellate-pubescent, the hairs setose, 1–2 mm long, yellowish or ferruginous, ca. 1/3-divided, the 5 lobes each 2.5 mm long, triangular and acute or acuminate, the calyx 5-angled and 4–5 mm wide at the sinuses. PETALS 4–5 mm long (subequal to calyx), yellow, apparently glabrous except pilose on margins of claw, the androecium ca. half length of petals. MERICARPS 2 mm long, mucous, glabrous.

ICONOGRAPHY: None known.

ADDITIONAL SPECIMENS EXAMINED. **GUYANA**. Rewa River, at Grant Falls, 3°10'N, 58°40'W, 20 Sep 1997, *Clarke et al. 6549* (NY). **SURINAM**. fluv. Corantyn, Apoera, 22 Oct 1916, *Stahel & Gonggrijp 2973* (NY). **VENEZUELA**. **CARABOBO**: Guaremales, road from Puerto Cabello to San Felipe, 10–100 m, 1921, *Pittier 9146* (NY). **BRAZIL**. **BAHIA**: Barreiras, 460 m, 12°9'S, 45°W, *Krapovickas et al. 38699* (CTES,

NY). **PARÁ**: Rio Tocantins, lungo l'Itgarapé Murú presso Aleobaça, 15 Aug 1899, *Buscalioni 1606* (NY). **GOIÁS**: 3 km S of São João da Aliança, 850 m, 15 Mar 1971, *Irwin et al. 31797* (COL, CTES, NY, UB). **MINAS GERAIS**: 5 km NE of Rio Manso and Coutode Magalhães, 960–1000 m, *Anderson et al. 8773* (COL, NY); 10 km N of Paracatú, road to Unai, 720 m, 7 Apr 1973, *Anderson et al. 8331* (NY). **BOLIVIA**. Without locality, *Bang 2807* (NY); Guanai, 2000 ft., May 1886 *Rusby 1454a* (NY). **SANTA CRUZ**: Prov. Florida, 3 km (by air) NE of Mairana, 18°6'S, 63°56'W, 1800 m, 9 May 1998, *Nee 49300* (NY, TEX); Prov. Sandoval, San Matias, 170 m, 16°21'S, 58°26'W, *Krapovickas & Schinini 36163* (CTES, NY); Prov. Ñuflo de Chávez, 480 m, *Steinbach 862* (NY); Prov. Ibáñez, near Bermejo, 18°7'S, 63°36'W, 1400 m, 23 Mar 2002, *Nee 51946* (NY); Prov. Ibáñez, between Santa Cruz and Abapó, 17°55'S, 63°15'W, 470 m, 28 Mar 1998, *Nee et al. 48794* (NY, TEX); Prov. Velasco, 5 km de San José de Campamento, 15°9'20"S, 60°59'29"W, .230 m, *Guillen & Lazo 4310* (MO, NY) **PARAGUAY**. **CONCEPCIÓN**: San Salvador, Mar 1917, *Rojas 2591* (NY). **ARGENTINA**. **MISIONES**: Dep. Candelaria, 5 Feb 1947, *Schwindt 92* (CTES, NY).

Bovini (2001) summarizes the various dispositions of *Sida rufescens* and concludes that it should be recognized in specific rank, as do Kearney (1958), Fryxell (1985), and Krapovickas (2006).

7. *Sida schumanniana* Krapov., Bonplandia (Corrientes) 15: 32. 2006. TYPE: **ARGENTINA**. **SALTA**: Dep. Orán, Orán, 15 Jul 1962, *Krapovickas & Legname 4509* (HOLOTYPE: CTES; ISOTYPE: LIL). [Type locality at: 22°50'S, 64°30'W]

Sida urens L. var. *grandiflora* K. Schum., in: Fl. Bras. 12(3): 307. 1891. TYPE: **PERU**. *Pavón* s.n. (MA? specimen not located), non *Sida grandiflora* Poir. 1810 nec *Sida grandiflora* (Paxton) Walp. 1848.

SHRUBS to 2 m tall, erect or sometimes sprawling, the stems woody, purplish, with sparse to dense long, simple hairs 1–1.5 mm. LEAF BLADES ovate-cordate, up to 12 × 7 cm (but progressively smaller upward), basally subcordate to cordate, coarsely crenate-dentate, palmately 5–7-nerved, the upper surface with appressed simple (occasionally bifurcate, rarely stellate) antrorsely-oriented

hairs 0.5–1 mm long, the lower surface with many fewer hairs widely scattered and randomly oriented, these sometimes stellate; petioles 1–6 cm long (smaller upward), densely pilose (especially distally) with simple hairs 1–2 mm long or more and with short recurved hairs (0.1–1 mm) in a narrow row on the adaxial side; stipules 3–7 mm long, subulate, hirsute to nearly glabrous. FLOWERS crowded in axillary glomerules or these sometimes on short lateral branches up to 1.5 cm long, the pedicels 1–3 mm long, the branch forming an interrupted raceme. CALYX 8–12 mm long, ca. half or more divided, 5-angled at the sinuses, the lobes trullate or somewhat acuminate, 4 mm wide between the sinuses, ciliate, the hairs simple, 1(–3) mm long and with some smaller stellate hairs. PETALS yellow, sometimes exceeding the calyx. FRUITS not seen.

ICONOGRAPHY: Krapovickas (2006, page 33, fig. 6 [in error]).

ADDITIONAL SPECIMENS EXAMINED. **COLOMBIA.**

SANTA MARTA: 2500 ft, 20 Dec 1898, *H.H. Smith 718* (A, BM, BR, COL, F, G, GH, NY, PH, S, UC, US); Santa Marta, 1000 ft, 5 Jan 1899, *H.H. Smith 719* (NY). **BOLIVIA. LA PAZ:** Prov. S. Yungas, San Bartolomé (near Calisaya), 750–900 m, Jul 1939, *Krukoff 10020* (NY), *Krukoff 10047* (NY); 3.8 km W of Huancaré, 2000 m, 16°23'S, 67°33'W, 29 Sep 1985, *Solomon & Nee 14297* (NY). **SANTA CRUZ:** Prov. Velasco, Estancia Flor del Oro, 13°33'S, 61°0'30"W, 190 m, 27 Jun 1991, *Nee 41483* (NY); Prov. Ichilo, Parque Nacional Amoro, 17°40'S, 63°43'30"W, 450 m, 22 Sep 1990, *Nee 38869* (NY). **PARAGUAY. AMAMBAY:** Cerro Corá, 17 Aug 1980, *Schinini & Bordas 20231* (NY); Sierra de Amambay, *Rojas* [for Hassler] *10540* (NY). **ARGENTINA. SALTA:** Sierra de Ramos, 20 Aug 1944, *Schulz & Varela 5472* (NY); Dept. Orán, Santa María, 17 Jul 1944, *Willink 194* (NY); Entre Agua Blanca y Angosto del Pescado, 19 Sep 1991, *Guaglianone et al. 2725* (NY); Dept. San Martín, La Porcelana, 3 Sep 1944, *Schulz 5514* (NY).

Krapovickas named this species in honor of K. Schumann and cited Schumann's varietal name as a synonym. He did not elevate var. *grandiflora* to specific rank, as this would have resulted in a later homonym, although he could have done so and provided a nomen novum. Rather, the

species *Sida schumanniana* is heterotypic with respect to *Sida urens* var. *grandiflora*. Therefore it must stand on the basis of Krapovickas' description and typification and not that of Schumann. Unfortunately, the illustration that was a part of the protologue was the result of a printing error, in which the caption for Figure 6, corresponding to *S. schumanniana*, was combined with the drawing from Figure 8, depicting *Sida waltoniana* Krapov., a rather different species. Thus, the figure and the description in the protologue are discordant, and the illustration must be ignored when interpreting the species. However, the specimen upon which the unpublished illustration was based (*Solomon & Nee 14297*, cited above) was examined in preparing the above description.

According to the original description, *Sida schumanniana* belongs in subsect. *Conglomerata* and recombines the weak-stemmed, scandent habit of *S. urens* and *S. rufescens* with the large calyces of the remaining species in the subsection. It is also notable for its wide distribution according to Krapovickas (2006), from Venezuela to Argentina. However, thirteen paratypes (cited above as "specimens examined") were seen in the present study and found to be quite variable, so that further study and evaluation of this variability is warranted.

8. *Sida urens* L., Syst. Nat., ed. 10. 1145. 1759. TYPE: [JAMAICA.] *Browne s.n.* (LECTOTYPE, designated by Rodrigo, 1944: LINN-866.20 [reproduced by Rodrigo, 1944, pl. 17]).

Sida verticillata Cav., Diss.1: 13. t. 1. f. 12. 1785. TYPE: BRAZIL. RIO DE JANEIRO: *Commerson s.n.* (HOLOTYPE: P-JU #12275!; ISOTYPES: P, MA-29796! (fide Garilleti, 1993).

Usually scandent HERBS OR SUBSHRUBS 1 (–2) m tall, the stems pilose with simple hairs 1.5–2 mm long and a few scattered stellate hairs, the epidermis not concealed. LEAF BLADES ovate, basally cordate, coarsely

serrate, acuminate, 6–7 cm long, 2.5–4.5 cm wide, progressively smaller upward, the upper surface with simple (0.5–1 mm), bifurcate, and stellate hairs, the lower surface similar but more often stellate-pubescent; petioles 1–3 cm long (smaller upward) with pubescence like stem; stipules 2–5 mm long, subulate. FLOWERS in subsessile, axillary glomerules of 3–8 (or more) flowers or these on short lateral branchlets up to 3 cm long. CALYX 5–7(–8) mm long, half or more divided, the lobes trullate, acute or acuminate, 3–4 mm wide at sinus, the margins prominently ciliate, the cilia 1–1.5 mm long. PETALS 6–7 mm long, yellowish or “salmon” with orange or purplish base, exceeding the calyx; staminal column 2 mm, the filaments 3 mm. MERICARPS 5, slender, 3×1.5 mm, smooth-walled, glabrous or nearly so, apically muticous.

ICONOGRAPHY: Schumann (1891, *plate 60*), Rodrigo (1944, *plate 17* [image of lectotype]), Fuertes (1995, page 32, *fig. 3*), Areces & Fryxell, (2007, page 168, *plate II-6* [mericarp]).

REPRESENTATIVE SPECIMENS EXAMINED. **BRITISH GUIANA.** Pomerone River, Jan 1923, *De La Cruz 2896* (NY); Kamahusa, Upper Mazaruni River (lat. ca. $59^{\circ}50'W$), Jul 1923, *De La Cruz 4190* (NY). **COLOMBIA.** SANTA MARTA: *H.H. Smith 717* (A, BM, BR, COL, F, G, GH, K, NY, P, PH, S, UC, US). TOLIMA: “La Trinidad,” Libano, 1000–1200 m, Dec 1917, *Pennell 3364* (NY). ANTIOQUIA: Medellín, Sep 1934, *Daniels 1178* (NY). EL VALLE: La Cumbre, 1500–1600 m, May 1922, *Pennell & Killip 5966* (NY). **VENEZUELA.** PORTUGUESA: Guanare, 26 Jan 1984, 400 m, *Fryxell et al. 4352* (NY); 5 km NW of Guanare, $9^{\circ}4'N$, $69^{\circ}49'W$, 200 m, 5 Nov 1990, *Dorr et al. 7647* (NY). MÉRIDA: Near Las Gonzales, $8^{\circ}25'N$, $71^{\circ}20'W$, 800–1600 m, 9 Nov 1990, *Dorr & Barnett 7663* (NY); Caracas, 3000 ft., 1854, *Fendler 72* (NY); Caracas, & vic., 3000–3500 ft., 15 Dec 1920, *Bailey & Bailey 45* (NY). **TRINIDAD.** 1877–1880, *Fendler 231* (NY); Pointe Gourde, 31 Mar 1921, *Britton & Broadway 2655* (NY). **ECUADOR.** LOJA: 12 km S of Vilcabamba, $4^{\circ}15'S$, $79^{\circ}15'W$, 1755 m, 8 Jul 1989, *Dorr & Valdespino 6530* (NY). **PERU.** HUÁNUCO: Near Río Huallaga, 750 m, 6 Jun 1981, *Young & Sullivan 808* (NY). UCAYALI: Prov. Coronel Portillo, $8^{\circ}40'S$, $75^{\circ}0'W$, 8 Aug 1980, *Gentry 29446* (NY). **BRAZIL.** AMAZONAS: Canumã, $4^{\circ}2'S$, $59^{\circ}4'W$, 28 Jun 1983, *Hill 12895* (NY); Maués, $3^{\circ}23'S$, $57^{\circ}44'W$, 29 Jul 1983, *Hill 13203* (NY); Manaus, 25 Jun 1974, *Lasseign P21184* (CTES, INPA, NY); Mun.

Manaus, $2^{\circ}19'S$, $60^{\circ}5'W$, 13 Feb 1992, *Nee 42561* (NY). GOIAS: Piranhas, 23 May 1966, *Irwin et al. 17683* (CTES, NY); Luziana, 15 km ao sul da cidade, 10 May 1982, *Heringer 18346* (NY); Serra Dourado, 6 km NE of Mossamedes, 700–780 m, 12 May 1973, *Anderson et al. 10199* (NY). MINAS GERAIS: Viçosa. Agricultural College lands. Disused hill road Chacha Valley, alt. 680 m, 2 Jun 1930, *Mexia 4773* (NY, RSA); Rio Pandeiros, 520 m, 18 Apr 1973, *Anderson et al. 9095* (COL, NY). PARÁ: Fordlandia, Sep 1931, *Krukoff 1234* (NY). PARANÁ: Mun. 2 Vezinhos, Foz do Chopim, 12 Dec 1968, *Hatschbach & Guimarães 20561* (NY); Mun. Laranjeiras, Salto Osorio, Rio Iguazú, 18 Apr 1970, *Hatschbach 24156* (CTES, NY). PERNAMBUCO: Tapera, 26 Jul 1931, *Pickel s.n.* (RSA). RIO GRANDE DO SUL: S. Leopoldo, 17 Mar 1950, *Rambo 46361* (NY). **BOLIVIA.** Reis, 1500 ft., Jun 1886, *Rusby 1454* (NY). BENI: Prov. Vaca Diez, Riberalta, $11^{\circ}0'S$, $66^{\circ}4'N$, 170 m, *Solomon 16724* (MO, NY). LA PAZ: Nor Yungas, Yoloso, 1280 m, 6 May 1980, *Luteyn & Dorr 13512* (CTES, NY); Yungas, *Bang 652* (NY); Coripata, 1700 m, 27 Jun 1930, *Buchtien 8129* (NY); Sud Yungas, Coroico, 9 May 1991, *Beck 19860* (CTES, NY); Polo-Polo bei Coroico, 1000 m, 1912, *Buchtien 4098* (NY). SANTA CRUZ: NE of Bermejo, $18^{\circ}7'S$, $63^{\circ}36'W$, 1425 m, *Nee 52393* (NY). TARIJA: Prov. O'Connor, Entre Ríos, 1450 m, 20 May 1971, *Krapovickas et al. 19025* (CTES, LPB, MO, TEX). **PARAGUAY.** In regione lacus Ypacaray, Cordillero de Altos, Mar 1913, *Hassler 12529* (NY); Pilcomayo River, *Morong 960* (NY). **ARGENTINA.** CORRIENTES: Dep. Concepción, 19 Feb. 1969, *Pedersen 9029* (C, CTES, NY); Carambola, 17 Feb 1983, *Pedersen 13502* (C, CTES, NY); Dep. Itazuíngó, San Carlos, 11 Apr 1974, *Krapovickas et al. 24938* (CTES, NY); Dep. Itazuíngó, $27^{\circ}36'S$, $56^{\circ}30'W$, *Tressens et al. 6590* (COL, CTES); Dep. San Martín, 12 km E de Colonia Pellegrini, $18^{\circ}31'S$, $57^{\circ}3'W$, 1 Mar 1989, *Tressens et al. 3747* (CTES, NY); Tres Cerros, 5 Feb 1982, *Schinini et al. 21863* (CTES, NY); Dep. Mburucuyá, Estancia Santa Teresa, 3 May 1964, *Krapovickas & Cristóbal 11416* (CTES, NY); Dep. Santo Tomé, Colonia Garabí, 19 Jul 1982, *Tressens et al. 2081* (CTES, NY). **FORMOSA:** Dep. Pilagá, Espinillo, 7 Mar 1949, *Morel 7322* (CTES, LIL, RSA). **JUJUY:** Los Lapachos, 3 Apr 1996, *Krapovickas & Cristóbal 46667* (CTES, F, GH, MEXU, NY). **MISIONES:** Dep. Candelaria, Santa Ana, 20 Mar 1930, *Rodriguez 56787* (NY); Dep. Leandro Alem, Paso Carreta, 9 Mar 1969, *Krapovickas et al. 15011* (CTES, NY). **SALTA:** Rio Pescado, 10 Jul 1956, *Borsini 570* (CTES, NY). Dep. San Ignacio, Teyucuaré, 12 May 1955, *Montes 14793* (CTES, NY), Colonia San Ignacio, 220 m, 21 Mar 1956, *Montes 14924* (CTES, NY). **PANAMÁ.** CANAL ZONE: Farfan beach, Bay of Panama, just N of canal, 27 Feb 1976, *Fosberg 56080* (POM). **PUERTO RICO.** Vieques Island, vicinity of Isabela Segunda, *Shafer 2510* (NY). **CUBA.** SANTA CLARA: Prov. Soledad, Cienfuegos, Belmonte Brook, 6 Nov 1928, *Jack 6612* (POM); Santiago de las Vegas, 5 Jan 1906, *Van Hermann 3499* (POM). **PINAR DEL RÍO:** Punta Brava, 15 Nov 1904, *Baker & O'Donovan*

4078 (POM). MEXICO. CHIAPAS: 18–20 km N of Ocozocoautla along road to Mal Paso, Municipio of Ocozocoautla de Espinosa, 800 m, 26 Jan 1972, *Breedlove 23843* (CAS, RSA). NAYARIT: Tepic, 12 Feb 1927, *Jones 22851* (POM).

Numerous additional specimens of *Sida urens* are cited by Krapovickas (2006) from Argentina, Bolivia, Brazil, and Paraguay. Starr et al. (2002) cite its recent introduction in Hawaii.

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