A taxonomic revision of the genus *Tamonea* (Verbenaceae)

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A taxonomic revision of the genus *Tamonea* is provided. *Tamonea* is a small genus of Verbenaceae, placed in the tribe *Casselieae*. It is represented by six species, distributed in tropical and temperate America, from Mexico and the Caribbean in the north, to Brazil, Paraguay and Bolivia in the south. Four new combinations are introduced: *Tamonea curassavica* var. *australis*, *T. curassavica* var. *cardenasii*, *T. curassavica* var. *parvifolia* and *T. curassavica* var. *yucatanensis*; a new synonym is proposed for *T. curassavica* var. *curassavica*. The species *Tamonea juncea* is lectotypified. Detailed morphological descriptions are given for each taxon, in addition to a key for their identification, illustrations, actualized synonymy, distribution and specimens lists, as well as discussion about the relationship between closely related taxa. © 2008 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2008, 157, 357–371.

ADDITIONAL KEYWORDS: *Casselia* *Ghinia* – taxonomy – tropical and temperate America.

INTRODUCTION

The name *Tamonea* Aubl. was founded twice: once referring to species of Verbenaceae (Aublet, 1775: 659) and, without realizing it, in the same work (Aublet, 1775: 440), also referring to a species of Melastomataceae. When Aublet (1775) realized this error, he replaced the name *Tamonea* for Melastomataceae by *Fothergilla* Aubl., leaving the name *Tamonea* for the species of Verbenaceae. *Tamonea* for Melastomataceae is not accepted (Rehder *et al*., 1935: 508; Lanjouw, 1952: 124; Gibson, 1970: 228). Schreber (1789) founded *Ghinia* to replace *Tamonea*, considering this last an invalid name. Several authors followed Schreber in the use of the *Ghinia* name (Gmelin, 1791; Willdenow, 1797; Swartz, 1800; Standley, 1924; Britton & Wilson, 1925; Moldenke, 1941, 1942, León & Liogier, 1957; Moldenke, 1981a, b, c; Correl & Correl, 1982), even though *Tamonea* is the accepted and valid name for the Verbenaceae genus. Many other authors, such as Swartz (1788), Jussieu (1789), Persoon (1807), Schlechtendal & Chamisso (1830, 1831), Walmers (1845), Schauer (1847), Urban (1911), Gibson (1970), Troncoso (1974), Howard (1983), Zaruchi (1984), Martinez & Múlgura (2003) and Atkins (2004), used the correct name *Tamonea* for Verbenaceae.

The taxonomic position of *Tamonea* within the Verbenaceae family has been controversial. Schauer (1847) placed *Tamonea* in the tribe Verbeneae Schauer, subtribe Casselieae Schauer, along with the genus *Casselia* Nees et Mart. Briquet (1895) placed *Tamonea* in the subfamily Verbenoideae Briq., tribe Euverbeneae Briq., along with *Verbena* L. & Hierobotana Briq. Junell (1934: 196), on the basis of the ovary morphology, agreed with Schauer’s classification. Troncoso (1974) placed *Tamonea* in the tribe Verbeneae Schauer, but withdrew subtribe Casselieae Schauer from it and treated this last as tribe Casse- 

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follow the criteria of Martínez & Múlgura (2003), also accepted by Atkins (2004), who suggest that Tamonea, along with Casselia and Parodianthus Tronc., should be grouped together under the tribe Casselieae, because of the ovary with false partitions being fused only at the top and bottom and the inflorescences indeterminate and with axillary partial inflorescences in the form of racemes (Martínez, Botta & Múlgura, 1996) (Fig. 1). These three genera differ in fruit characters: in Tamonea, the fruit is entire, subdrupaceous and four seeded; in Parodianthus it is a drupaceous schizocarp, with two two-seeded mericarps; while in Casselia it is also a drupaceous schizocarp, but with two one-seeded mericarps by abortion of the adaxial carpel.

MATERIAL AND METHODS

This taxonomical revision is based on herbarium collections from the following herbaria: G, HAL, K, LIL, MO, NY, P, RB, S, SI, U and UPRPP. Flower measurements were taken from material rehydrated by boiling. Fruit measurements were taken from dried specimens. The descriptive terminology of the inflorescences used here is in accordance with Martínez et al. (1996); the morphological terms used follow Hickey (1974). Vein formations are defined as: pinnatifid, with one major vein and secondary veins originating from the major vein; actinodromous, with three or more major veins diverging from one point; and hyphodromous, with only one major vein present, secondary veins absent or hidden within the mesophyll. For the description of pubescence, the terms strigose, hispid, hirsute, puberulous, scabrous or pilose are used, following Lawrence (1951).

The distribution and habitat of taxa were taken from the herbarium specimen labels.

TAXONOMIC TREATMENT


Perennial HERBS and SUBSHRUBS, stems erect, tetragonal. LEAVES opposite, sessile or petiolated, venation pinnatifid, actinodromous or hyphodromous. INFLORESCENCES bracteose, arranged in a homotetic pleiobotryum, inflorescences consisting of 1 or 2 pairs of paracladia, the basal paracladia longer than the distal ones. Flowers arranged in spiciform rachimose inflorescences, with 1–15 briefly pedicelated flowers, alternated along the rachis. FLOWERS five-merous, calyx campanulated, persistent in fruit, with 5 sharp-pointed, equal-length teeth; corolla violet, blue or white coloured, funnelform or hypocrateriform, 2-labiated, unequally 5-lobed; stamens 4 inserted near middle of the corolla tube, posterior pair with glandular thickening of connective, style deciduous or persistent in fruit, included, stigma oblique; ovary 2-carpellated, 2-locular carpels, 4 ovules. FRUIT drupaceous, dry at maturity, obovate, 0.4–0.6 × 0.3–0.5 cm, woody exocarp, with 4 spine-like horns or without horns.

Distribution and habitat: Tamonea is a genus of six species, distributed in Tropical America, from Mexico and the Caribbean to southern Brazil, Paraguay and Bolivia. Species of Tamonea are not abundant, many species have a very restricted area of distribution and
there are many endemisms. That is the reason why it has been a poorly collected genus.

**Notes:** In horned fruits there are generally four horns, two of them longer than the other two. Nevertheless, there are specimens [e.g. Duarte 7541 (SI), *Tamonea curassavica*] where two of the horns are fused together, looking like a three-horned fruit.

### 1. TAMONEA BOXIANA (MOLDENKE) R. A. HOWARD (Fig. 2)


**Subshrubs,** to 50–60 cm high, puberulous or scabrous pubescence. LEAVES sessile or briefly petiolated, hyphodromous venation, dimorphic, the basal leaves 0.7–1 × 0.2–0.5 cm, oblong, cuneate base, obtuse apex, lobed margins, the apical leaves 1 × 0.1 cm, linear, acute apex, entire margins. INFLORESCENCES with long pair of basal paracladia and short solitary distal paracladia. Florescences 3–6 cm long., with 5–8 flowers briefly pedicelled c. 0.5 cm long.; floral bracts 0.2 cm long, linear. Calyx 0.25 cm long, teeth 0.5 mm long; hypocotyliform corolla, violet coloured, tube 0.4 cm long. FRUIT 4 horned, longer pair of horns 4 mm long, shorter pair 2 mm long.

**Iconography:** Britton, 1932: 5, figure 547; Howard, 1989: 241, figure 98.

**Common name:** 'cardero' (Moldenke, 1981b: 417).

**Phenology:** Flowering and fruiting in spring and summer.

**Distribution and habitat:** This species grows in Puerto Rico and the Lesser Antilles. It is found in dry forests.

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<table>
<thead>
<tr>
<th>KEY TO THE SPECIES OF <em>Tamonea</em></th>
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<tr>
<td>1a. Fruit without horns..................</td>
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<tr>
<td>2a. Leaves with actinodromous venation</td>
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<tr>
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<tr>
<td>3b. Fruit with long horns, 2–3 mm long.; plants with strigose pubescence, calyx with few, short, adpressed, non-glandular trichomes</td>
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<td>4a. Dimorphic leaves, hyphodromous venation, the basal leaves oblong, 0.2–0.5 cm lat., lobed margins, the apical leaves linear, 0.1 cm lat., entire margins</td>
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<td>5b. Florescences of 3–15 flowers.........</td>
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<tr>
<td>6a. Fruiting calyx reaches the base of the fruit horns; horns brief 0.5–1 mm long; leaves shorter than 1.5 cm long., with puberulous pubescence</td>
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<tr>
<td>7a. Leaves with pilose pubescence, with non-white translucent trichomes, 0.5–0.6 mm long.</td>
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<tr>
<td>8a. Leaves with truncate base, obtuse apex, pubescence puberulous, trichomes 0.1–0.25 mm long. Endemic of Yucatán, in Mexico</td>
</tr>
<tr>
<td>8b. Leaves with cuneate base, acute apex, pubescence hispid or strigose, with trichomes 0.25–0.5 mm long. Native from Bahamas, Bolivia, Cuba, Guatemala, Mexico and Paraguay</td>
</tr>
<tr>
<td>9a. Floral bracts 0.15–0.2 cm long.; leaves hispid on abaxial surface, glandular trichomes on both surfaces</td>
</tr>
<tr>
<td>9b. Floral bracts 0.2–0.5 cm long.; leaves strigose on main veins of abaxial surface, hispid on secondary veins</td>
</tr>
</tbody>
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Notes: *Ghinia spinosa* Britton & P. Wilson (1925) is an illegitimate name because it is a homonym to the previous name by Willdenow (1797). Besides, this last one is also an illegitimate name, because it is based on a superfluous name: *Tamonea spinosa* Sw. (see notes under *T. curassavica*). So Moldenke (1942) replaces this illegitimate name by *G. boxiana*, without mentioning any type specimen. Later on, Moldenke (1981a: 417), refers to some specimens sent from herb. BM by Dr Box ‘Antigua: Box 1091’, but never explained where the holotype was deposited. Howard (1988: 288) combines *Tamonea boxiana* (Moldenke) Howard and later (Howard, 1989: 241) he typifies this taxon with the specimen mentioned by Moldenke (1981a: 417), but does not chose an holotype. As original material from Swartz could not be found, the Box specimen chosen by Moldenke (1981a: 417) and Howard (Howard, 1989: 241) is the suitable neotype.


2. **Tamonea curassavica** (L.) Pers


*Tamonea spinosa* Sw., Prodr. 94 (1788), nom. illeg. superfl. *Ghinia spinosa* (Sw.) Wild., Sp. pl. 1: 114 (1797). comb. illeg. Type: Curacao 1782, s/legit. (Lectotype: here designated, S, photograph SI!)


*Tamonea scabra* Schltdl. & Cham., Linnaea 5: 99 (1830). Type: Mexico: Tierra caliente, Puente del Rey, Hacienda de la Laguna, October 1828/29, F. Deppe & C. J. W. Schiede s.n. (Holotype: HAL 98486, photograph SI!)


*Herbs or Subshrubs*, from 35 to 100 cm high, stems woody at the base, subglabrous or pubescent. *Leaves* with a brief petiole 0.3–1 cm long., pinnatifid stems woody at the base, subglabrous or pubescent. INFLORESCENCES with long pair of basal paracladia truncate base, obtuse or acute apex, serrate margins. INFLORES- CENCES with long pair of basal paracladia and short solitaire distal paracladia. Florescences 10–25 cm long, with 3–15 flowers briefly pedicelated 0.1–0.3 cm long.; floral bracts 0.15–0.5 cm long., linear. Calyx 0.3–0.55 cm long, teeth 0.5–1.5 mm long; hypocotyliform corolla, violet or blue coloured, tube 0.5–0.7 cm long. FRUIT 4 horned, horns 0.5–4 mm long., generally a pair of horns longer than the other.

*Notes:* Varieties were considered when a group of organisms with characters of gradual variation was observed, which would indicate an incomplete segregation of the incipient species, sharing the same geographical area. We followed the Suttill & Allen (1992) concept of variety used when the taxon is poorly differentiated and the variation is mostly ecotypical, not geographical. In this species, five varieties are recognized, principally distinguished because of the type of pubescence, length and morphology of the leaves and floral bracts. Trichomes can be glandular or non-glandular, in the latter group trichomes are usually white opaque, sometimes non-white and translucid trichomes are found.

*Tamonea spinosa* Sw., *T. verbenacea* Sw. and *Ghinia verbenacea* Sw. are all illegitimate superfluous names, because in all cases the author is referring to *Verbena curassavica* L. (a valid name), so following the Vienna code (Art. 52, McNeill et al., 2006) this last one should be the name of the taxon. The combinations by Walpers (1845: 115) and Schauer (1847: 528) are illegitimate because they are based upon illegitimate names.


BRANCHES with short patent glandular and non-glandular with white opaque trichomes. LEAF blade 1.5–2.5 × 0.3–1.3 cm, ovate, cuneate base, acute apex, adaxially subglabrous or strigose, abaxially strigose on the main veins, secondary veins with hispid, with white opaque trichomes, 0.25–0.5 mm long. FLORAL BRACTS 0.2–0.5 cm long., calyx 0.3–0.35 cm long., glabrous or strigose, fruiting calyx never reaches the base of the fruit horns. FRUIT 4 horned, horns 1.5–3.5 mm long., generally a pair of horns longer than the other.


*Phenology:* Flowering and fruiting from March to December.

*Distribution and habitat:* Cuba, Guatemala, Mexico and Paraguay. According to Moldenke (1981a: 454) also in Bahamas (New Providence). It grows in limestone hills. Berazaín Iturralde et al. (2005: 48) consider this species endangered in Cuba, referring to its state as ‘vulnerable’ following the listings of the International Union for the Conservation of Nature and Natural Resources (IUCN; 2001).

*Specimens examined:* MEXICO. Chiapas: La Hoya 1841–43, Liebman 11307 (SI, U); Ocozocoautla de Espinosa, 1 km N of Ocozocoautla, 830 m, 25 Set 1971, Breedlove 19784 (MO). Tamaulipas: Aldama, sierras de Tamaulipas, region of Rancho Las Yucas, c. 40 km, NNW of Aldama, 23°14′N, 98°10′W, 10 October 1957, Dressler 2337 (MO); N of Limon, 15...

**2B. TAMONEA CURASSAVICA VAR. AUSTRALIS** (Moldenke) O’Leary, P. Peralta & Múlgura, comb. nov. (Fig. 3)


Branches and leaves with pilose pubescence, translucid trichomes 0.5–0.6 mm long, translucid and abundant glandular trichomes. Leaf blade 1.5–2 × 0.8–1 cm, ovate, truncate base, acute or obtuse apex. Floral bracts 0.25–0.3 cm long, hispid, calyx 0.5–0.55 cm long., hispid, with some glandular trichomes, fruiting calyx never reaches the base of the fruit horns. FRUIT 4 horned, horns 2–4 mm long., generally a pair of horns longer than the other.

**Phenology:** Flowering and fruiting in March.

**Distribution and habitat:** Bolivia & Paraguay. Moldenke (1981a) mentioned specimens from Brazil, in the states of Bahia and Mina Gerais. It is found in sandy soils and pastures, also in xerophytic forest.


**2C. TAMONEA CURASSAVICA VAR. CARDENASII** (Moldenke) O’Leary, P. Peralta & Múlgura, comb. nov.


Branches hispid, with glandular trichomes and non-glandular short, white opaque trichomes. Leaf blade 1.5–6 × 0.8–2 cm, ovate, cuneate base, acute apex, scarcely pubescent on adaxial surface, hispid on abaxial surface, non-glandular short, white opaque trichomes, 0.25–0.5 mm long. and glandular trichomes on both surfaces. Floral bracts 0.15–0.2 cm long., calyx 0.4–0.45 cm long., with glandular and non-glandular trichomes, fruiting calyx never reaches the bases of the fruit horns. FRUIT 4 horned, horns 4 mm long., generally a pair of horns longer than the other.

**Iconography:** Troncoso, 1974: 322, figure 5.

**Phenology:** Flowering and fruiting in March.

**Distribution and habitat:** Bolivia & Paraguay. Moldenke (1981a) mentioned specimens from Brazil, in the states of Bahia and Mina Gerais. It is found in sandy soils and pastures, also in xerophytic forest.


**2D. TAMONEA CURASSAVICA VAR. PARVIFOLIA** (Moldenke) O’Leary, P. Peralta & Múlgura, comb. nov. (Fig. 4)

valles, 3 August 1937, G. L. Fisher s.n. (Holotype: NY, photograph SI!).

Branches with adpressed white opaque, non-glandular trichomes. Leaf blade 1–1.5 × 0.8–1 cm, ovate, cuneate base, acute or obtuse apex, both surfaces puberulous with short and white opaque, non-glandular trichomes 0.1–0.25 mm long. Floral bracts 0.15–0.20 cm long, calyx 0.3–0.35 cm long, fruiting calyx reaches the base of the fruit horns. Fruit 4 horned, horns 0.5–1 mm long, generally a pair of horns longer than the other.

Phenology: Flowering from April to October.

Distribution and habitat: México. It is found in limestone soils and rocky forests, 10–2050 m.

Specimens examined: MEXICO. San Luis Potosi: Minas de San Rafael, May 1911, Purpus 5291 (MO); San Dieguito, 13–16 June 1904, Palmer 125 (K, MO, SI); Palmer 133 (K, MO, NY, SI); Rascon, August 1911, Purpus 5290 (MO). Sinaloa: San Antonio, Tanjas, 7 November 1978, Alcorn 1581 (NY, SI). Tamaulipas: 1931, von Rozynski 378 (G, SI); 14 October 1932, von Rozynski 521 (P, SI); Nogales, von Rozynski 483 (SI); 27 km SE of Miquihuana on road to Palmilla, 23°37′N, 99°39′W,
Figure 4. *Tamonea curassavica* var. *parvifolia*. A, plant general aspect. B, leaf, adaxial face. C, fruiting calyx. D, fruit. [From Palmer 133 (K).]
2025 m, 13 August 1941, L.R. Stanford et al. 886 (MO).

2E. TAMONEA CURASSAVICA VAR. YUCATANENSIS (MOLDENKE) O’LEARY, P. PERALTA & M. E. MÜLGURA, COMB. NOV. (Fig. 5)


Branches glabrous or scarcely puberulous. Leaf blade 1.5–2.5 × 0.6–2 cm, ovate, truncate base, obtuse apex, adaxially glabrous or subglabrous, abaxially surface glabrous or puberulous, with white opaque, non-glandular trichomes 0.1–0.25 mm long. Floral bracts 0.2 cm long., calyx 0.3–0.35 cm long, puberulous, fruiting calyx never reaches the base of the fruit horns. Fruit 4 horned, horns 1–3 mm long., generally a pair of horns longer than the other.

Phenology: Flowering and fruiting from June to November.


Distribution and habitat: This variety is endemic from Yucatán, in Mexico. It is found in wetlands.


Figure 5. Tamonea curassavica var. yucatanensis. A, branch detail. B, leaf, abaxial face. C, fruit. D, detail of stem pubescence [A, B, from Gaumer 834 (K); C, D, from Gaumer 834b (SI isotype)].
Specimens examined: MEXICO. Yucatán: Izamal 1917–1921, Gaumer 24097 (G, K, SI); Gaumer 24228 (G); Gaumer et al. 23384 (SI); Lundell 8176 (NY, SI); 18 Set 1925, Gaumer 834 (G, K, P, SI); San Anselmo, Gaumer 1988 (K, SI); Valladolid, camino rumbo a San Lorenzo, 20°42′53″N, 88°15′45″W, 22 m, 4 July 1988, Remmers, G. & H. de Voeyer 16 (MO); a 5 km al S de Telchac Puerto, sobre la carretera a Telchac Pueblo, 24 December 1985, E. Cabrera 10312 (MO).

3. TAMONEA EUPHRASIIFOLIA B. L. ROB. (Fig. 6)


Subshrubs, to 30–60 cm high, stems woody at the base, strigose pubescence, hispid at the ribs. Leaves with a brief petiole 0.1–0.2 cm long., actinodromous venation, blades 0.5–1 × 0.4–1 cm, ovate, truncate base, obtuse apex, serrate margins, adaxialy subglaucous, adpressed trichomes on abaxial face. Inflorescences with solitaire paracladia. Florescences 5–10 cm long., with 3–5 flowers briefly pedicelated 0.2 cm long.; floral bracts 0.2 cm long., sublinear. Calyx 0.45–0.6 cm long. with teeth 1–2 mm long., with adpressed, short, non-glandular trichomes; fun-
nelform corolla, violet coloured, tube c. 1.5 cm long. 
FRUIT 4 horned, horns 2–3 mm long, generally a pair of 
horns longer than the other.

**Phenology:** Flowering in May.

**Distribution and habitat:** This species is endemic from eastern Mexico. It is found in sandy and lime soils.

**Notes:** Robinson mentioned the type material of *Tamonea euphrasiifolia* B. L. Rob., which was deposited at GH and US, not mentioning which one was the holotype. Moldenke (1981b: 459) says the specimen from GH is the holotype, so the US specimen is an isotype.

*Tamonea euphrasiifolia* shares with *T. juncea* Schauer the same kind of actinodromous venation. Nevertheless, they differ because *T. juncea* has dense hispid pubescence, with glandular hairs and the fruit horns are very brief, while *T. euphrasiifolia* has scare strigose pubescence, without glandular hairs and the fruit horns are longer, c. 0.3 cm long. Apart from that *T. euphrasiifolia* grows in Mexico and *T. juncea* grows in the state of Bahia, in Brazil.

**Specimens examined:** MEXICO. Tamaulipas: Tampico, 4 V 1921, Rutten et al 529 (SI). Veracruz: Near Pueblo Viejo, 9 km S Tampico 1910, Palmer 538 (K, NY, SI).

4. **Tamonea juncea** Schauer (Fig. 7) 

**Subshrubs,** to 50 cm high, rigid, erect, woody branches; hispid or hirsute glandular pubescence. **Leaves** rigid and adpressed to the stem, subsessile or sessile, blades 0.8 × 0.6 cm, actinodromous venation, subtriangular, truncate base, obtuse apex, serrate margins, hispid pubescence, mainly on abaxial surface veins. **Inflorescences** with solitary parapodium. *Florescence* 5 cm long, with 1–2 flowers, briefly pedicelated 0.2 cm long.; floral bracts 0.25 cm
long., sublinear. Calyx 0.4–0.5 cm long. with teeth 1–2 mm long., dense hispid or hirsute pubescence with glandular trichomes; funnelform corolla, violet coloured, tube 1 cm long. FRUITS 4 horned, horns 1 mm long.

**Phenology:** Flowering and fruiting in March.

**Distribution and habitat:** Tamonea juncea grows in Brazil, in the state of Bahia. It is found in rocky, sandy lands and in the ‘cerrados’.

**Notes:** Schauer (1847) in the protologue of this species mentions two specimens: Blanchet 2566 and Blanchet 3397 (sintypes). The specimen Blanchet 3397 was here chosen as the lectotype because it is a good specimen, with many isotypes distributed in several herbaria; the material from BM was selected as lectotype because Schauer worked there.

**Specimens examined:** BRAZIL. Bahia: Serra do Curral Feio, 16 km NW Lagoinha, 4 March 1974, Harley 16667 (K, P, RB, SI); s. loc., Paganucci de Queirolo 850 (K); s. loc., Blanchet 2566 (G).


**Iconography:** Aublet, 1775: 660. figure 268; Gibson, 1970: 229, figure 45; Lopez-Palacios, 1977: 315, figure 75; Jansen-Jacobs, 1988: 74, figure 21; Aymard, 2005: 439, figure 369.

**Phenology:** Flowering and fruiting in spring and summer.

**Distribution and habitat:** It grows from Mexico in the north to tropical Brazil in the south. It grows in sandy, rocky grounds.

**Notes:** Tamonea spicata distinguishes from the rest of the species of Tamonea because of the absence of horns on the fruits.

Stevens et al. (2001) mentions it is employed as a medicinal plant for menstrual and stomach pain. Aymard (2005) says it is a poisonous for the cattle.

Link (1820) refers to a specimen number ‘389’ from herb. Wildenow (B), named in herb. as Leptocarpus chamaedrifolius, but that corresponds to Tamonea spicata, so the Leptocarpus chamaedrifolius name is not a validly published name (Art. 32, McNeill et al., 2006).

**Specimens examined:** MEXICO. Chiapas: Ococingo, Cofolasa, 24 km SE cruero Corozal, 25 February 1985, Martinez 11257 (MO); Ococingo, 16 km NW Boca Lacantum, 20 January 1986, Martinez 16454 (MO); Ococingo, 16 km NW Boca Lacantum, 31 October 1985, Martinez 14514 (MO).


**Distribution and habitat:** It grows from Mexico in the north to tropical Brazil in the south. It grows in sandy, rocky grounds.

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Figure 8. Tamonea subbiflora. A, plant general aspect. B, leaf, adaxial face. C, fruiting calyx. [From Ekman 4500 (K.).]

17560 (K, MO, RB, U); 5 km SE Marau, 30 March 1974, Harley 17497 (K, MO, U); 2 February 1977, Harley et al. 18491 (K; MO), Coastal Zone, 16 May 1980. Harley et al. 22138 (K, U); Feira de Santana, campus da UEFS, Queiroz & Crepaldi 1510 (K); Ilheus, fazenda Porto Seguro, 26 August 1961, Duarte 6102 (RB); region Cacaueria da Bahia, area do Pousio, 22 April 1982, Cavalho et al. 1288 (K); Serra do Sincorá, 4 February 1974, Harley 15881 (K, MO, P, U); Serra Grande, Itacaré, 26 August 1992, Amorim 674 (NY, SI); Theobroma, August 1988, Sobral & Mattos Silva 6047 (ICN, SI); Vittoria, Selow s.n. (K).

FRENCH GUIANA. Cayenne: 1835, Leprieur s.n. (K); Cayenne: Layon forestier, 10 v 1990. Cremer & Hoff 11378 (U); km 23, crique Anguille, W of R du Tour de l’Ile Savanna, Leeuweuberger 11685 (U); bord de la route de l’Est, Prévost 1581 (U); Upper Takutu-Upper Essequibo, Karanambo, Savanna near airstrip, 4 Set 1988, Maas et al. 7245 (K, NY, U). GUYANA. Ebini Exp. Intermediate Savanna, Berbice river, 6 Set 1958, Harrison & Persand 1042 (K).

SURINAME. Lobim, savanna nter Zanderij, 26 Set 1958, Donselaar 124 (U); Republick, 23 April 1960, Hekking 80 (U); Republick, 4 Set 1948, Lanjouw & Lindeman 135 (U); Pará, 12 April 1974, Vreden 14529 (U); Lindeman 27 (NY, SI); Tibiti savanne, 10 January 1949, Lanjouw & Lindeman 1764 (NY, U). VENEZUELA. Bolivar: cerro Pichacho, N of Las Nieves, February 1961, Steyermark 89285 (G); Páez, La Grulla, 6 km SE Upata, July 1978, Delascio et al. 6811 (MO); 61 km SE Upata, 2 December 1973, Davidse 4633 (MO); Reserva Forestal Imataca, January 1983, Stergios et al. 4919 (MO).

6. TAMONEA SUBBIFLORA URB. & EKMAN (Fig. 8)

HERBS or SUBSHRUBS, 20–60 cm high, stems woody at the base, puberulous pubescence. LEAVES with a brief petiole 0.25–0.3(1) cm long., puberulous, with or without glandular trichomes, blade 0.6–1.6 (2.5) × 0.3–0.6 (1.3) cm, pinnatifid venation, ovate, truncate base, obtuse apex, serrate margin, adaxially puberulous or glabrous, abaxially puberulous, over venation. INFLORESCENCES with solitary paracladia or in pairs. Florescences to 2 cm long., with 1 or 2 flowers; briefly pedicelated 0.1 cm long.; floral bracts 0.1–0.2 (0.3) cm long, linear, with glandular trichomes or not. Calyx 0.2–0.25 cm long., teeth c. 1 mm long. FRUIT 4 horned, horns 3–4 mm long., generally a pair of horns longer than the other.

Phenology: Flowering and fruiting in July and August.

Distribution and habitat: Haití and eastern Cuba. It grows in wet places and along the routes, at 400 m.

Notes: According to Berazaín Iturralde et al. (2005: 48), this species is endangered in Cuba and its state is ’critical’ following IUCN (2001). No collected specimens from Cuba could be found.

Specimens examined: HAITI. Hispaniola: Civ., Department Nord-Quest, plateau of Bombarte moist place on the road near Vallière, 8 July 1925, Ekman 4500 (K, S).

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REFERENCES


León H, Liogier H. 1957. Verbenaceae. Contribuciones Oca-
sionales del Museo de Historia Natural del Colegio de La Salle 4: 279–323.


Martínez S, Botta S, Múlgura ME. 1996. Morfología de las inflorescencias en Verbenaceae–Verbenoideae I: Tribu Ver-


Moldenke HN. 1942. The known geographic distribution of the members of the Verbenaceae and Avicenniaceae. New York: Privately published.


