A NEW SPECIES OF *TINTINNABULARIA* (APOCYNACEAE, APOCYNOIDEAE) FROM HONDURAS, WITH TAXONOMIC NOTES

J. K. Williams
Department of Integrative Biology, University of Texas, Austin Texas 78712

Abstract: A new species from Honduras, *Tintinnabularia murallensis*, is described and illustrated. The new species broadens the current circumscription of the genus. An illustration of the new species is provided, as is a distribution map for all recognized species of the genus.

Keywords: *Tintinnabularia*, Apocynaceae, Honduras

Tintinnabularia Woodson is a neotropical genus of apocynaceous lianas with three species endemic to montane rain forests of southern Mexico, Guatemala and Honduras. The species are extremely rare and infrequently collected. To date the genus is known from only nine localities: eight cited in Morales (1996), one additional cited here.

Woodson (1936) established the monotypic *Tintinnabularia* with the description of *T. mortonii*. The genus is named for the bell-shaped flowers of the type species. The species epithet honors C.V. Morton (1905–1972), curator of ferns at the U.S. National Herbarium. The type species is known from only six sites, in Chiapas, Mexico and Guatemala. A second species, *Tintinnabularia gratissima*, was described by Morales (1996) based on two collections from Veracruz, Mexico. Morales was also the first to report and illustrate the fruit structure of *Tintinnabularia*, two moniliform follicles. The new species, described herein, broadens the current circumscription of *Tintinnabularia* and extends the range of the genus south into Honduras.

Tintinnabularia belongs to a distinctive group of Apocynoideae that includes the genera *Allomarkgrafia* Woodson, *Macrosiphonia* Müll.Arg., *Mandevilla* Lindl., *Mesechites* Müll.Arg., *Quiotania* Zarucchi and *Telosiphonia* (Woodson) Henr. *Quiotania* and *Telosiphonia* are controversial genera with some experts questioning their validity. Defense of these genera, however, is beyond the scope of the present paper and will not be covered here. It should be noted, however, that Zarucchi (1991) distinguished *Quiotania* from *Mandevilla* only in its lack of a distinct corolla tube. Unfortunately, Zarucchi was unaware of *Mandevilla holosericea* (Sessé & Moç.) J. K. Williams, a species from central Mexico (Morales, 1998 (as *M. syrinx* Woodson); Williams, 1998) that has a reduced basal corolla tube and is virtually identical to *Quiotania* in corolla size and shape.

This group of genera is distinguished from other Apocynoideae by the presence of 2–4 colleters located at the juncture of the petiole and the upper leaf, pentagonal-shaped style heads (vs. fusiform), anthers with obtuse or truncate auricles and its restriction to the New World. Woodson (1933, 1936) considered these features sufficiently distinctive to separate the complex from the remainder of the subfamily, however, he did not formally recognize the subgroup. Pichon (1950) formally recognized the bulk of this group as subtribe Mandevillinae of his tribe "Ichnocarpées". However, he did not include *Tintinnabularia* in his new subtribe; rather, he

included *Tintinnabularia* in subtribe Forsteroniinae next to *Forsteronia* (possibly due to their shared possession of domatia). Without explanation Leeuwenberg (1994) placed *Tintinnabularia* in his tribe Wrightieae, subtribe Wrightiinae near *Beaumontia*. It is assumed that Leeuwenberg made this placement based on Woodson's (1936) comment that *Beaumontia* and *Tintinnabularia* shared conspicuous sepals, well-developed filaments, and domatia. Sennblad et al. (1998) provided a cladistic analysis of the tribe Wrightieae. Although they did not include *Tintinnabularia* in their analysis, they did comment that the genus would most probably position near *Mandevilla* rather than to members of the tribe Wrightieae.

An unpublished morphological cladistic analysis of the Apocynoideae (Williams, 1999) positions *Tintinnabularia* with other members of the Mandevillinae, and distinct from members of the Wrightieae. Based on the analysis *Tintinnabularia* should be placed in the Mandevillinae because it possesses the three major characters of that subtribe (colleters on petiole apex, pentagonal stigmatic head, and restriction to the New World). Its possession of domatia may merely represent convergence with *Forsteronia* and *Beaumontia*.

Subsequent authors (Zarucchi, 1991; Henrickson, 1996) have provided detailed accounts of both the history and morphology of the subtribe Mandevillinae, which will not be repeated here.

When Woodson (1936) described *Tintinnabularia*, he distinguished the new genus from the other taxa within the complex by its dichasial or subumbellate inflorescences, infundibuliform corollas, foliaceous calyx lobes, filaments 3–5 times longer than the anthers, the domatia in the axils of the midrib of the undersurface of the leaves, and the anthers with convolute apical appendages. With the inclusion of *T. gratissima* and this new species, however, the genus can no longer be defined by these characters. *Tintinnabularia gratissima* has foliaceous sepals, domatia and an infundibular corolla, but it lacks long filaments (only 1–2 mm vs. 10–31 mm long) and the anthers do not have apical appendages. The new species has long filaments, apical appendages, and leaf domatia, but has smaller sepals (1 mm vs. 10–16 mm) and tubular-campanulate corollas. The only characters that remain from Woodson's (1936) original description of the genus are the presence of domatia and subumbellate inflorescences. This broadened circumscription of *Tintinnabularia* does not necessarily weaken its strength as a legitimate genus within subtribe Mandevillinae. Rather, it emphasizes the extreme variation seen in many genera of the Apocynaceae.

A key to the genera of subtribe Mandevillinae has not been provided since Woodson (1938). Given the recent redefinition of *Tintinnabularia* and the erection of the genera *Quiotania* and *Telosiphonia* since that time, an updated key to the subtribe is included here.

Key to the genera of subtribe Mandevillinae

[including data from Morales (1996, 1997), Henrickson, (1996), Williams (1996), Woodson (1936, 1938), and Zarucchi (1991)].

1. Leaves with domatia in axils of veins beneath; sepals foliaceous, ovate, or small and triangular; anthers with or without convolute, pubescent, apical filamentous appendages 2–3 mm long; staminal filaments well developed or reduced; inflorescence a di- or trichotomously branched dichasial cyme.

Tintinnabularia

1. Leaves without domatia in axils of veins beneath; sepals small, triangular to linear-lanceolate, occasionally foliaceous and ovate; anthers without convolute pubescent apical filamentous appendages; staminal filaments reduced, anthers essentially sessile; inflorescence various.
   2. Inflorescence compound, branched.
      3. Corollas infundibuliform; inflorescences of dichotomously branched dichasial cymes.

Allomarkgrafia

3. Corollas salverform; inflorescences of obscurely dichotomously branched corymbose cymes. *Mesechites*

2. Inflorescences simple and unbranched, or reduced to 1–3 flowers.
   4. Lianas or twining or erect suffrutescent herbs; inflorescences racemose, many-flowered, axillary; flowers diurnal, red, yellow, violet or white; evergreen or semi-deciduous tropical rain forests and occasionally found in savannas.
      5. Flowers with or without a distinct basal corolla tube; leaves with (subg. *Exothostemon*) or without (subg. *Mandevilla*) glands along midrib of the upper surface; throughout the neotropics *Mandevilla*
      5. Flowers without a distinct basal corolla tube; leaves without glands along the midrib of the upper surface; known only from Department of Antioquia, Colombia *Quiotania*
   4. Plants suffrutescent herbs, never twining; inflorescences reduced, of 1–3 flowers, terminal; flowers vespertine, white; arid regions.
      6. Peduncles to 4 cm long; pedicels 2–16 mm long, bracts not directly subtending calyx; hairs that extend into the throat from the inner surface of the filament to 0.3 mm long; pollen 53–78 μm in diameter; Mexico and southwestern United States *Telosiphonia*
      6. Peduncles 10–45 cm; pedicels absent, bracts directly subtending the calyx; hairs that extend into the throat from the inner surface of the filament to 1.5 mm long; pollen to 100–180 μm in diameter; South America *Macrosiphonia*

Tintinnabularia murallensis J. K. Williams sp. nov. (Fig. 1).

TYPE: HONDURAS. La Muralla National Park, dense hardwood forest located between guest house and "exploration" turn on nature trail (15°05′N, 86°44′W), 8 km NNW of La Unión, 6 Jun 1992, *T. Hawkins & D. Mejía 503* (HOLOTYPE: MO!).

Tintinnabularia mortonii Woodson similis sed differt corollis 1.5–1.8 cm longis (vs. 3.8–5.2 cm), sepalis viridibus triangularibus minutis 0.8–1 mm longisque (vs. marroninis lineari-lanceolatis foliaceis 11–16 mm longis), et antherarum appendicibus filamentosis apicalibus exsertis 2–3 mm ex orificio tubi corollae (vs. appendicibus inclusis).

LIANAS; stems terete, glabrous. LEAVES opposite, 6.1–9.4 cm long; petioles 6–10(–14) mm long, with axillary glands, the blades 5.5–8.5 cm long, 1.9–3.5 cm wide, oblong-elliptic, the apex obtusely caudate-acuminate, the base obtuse, glabrous, with 2 triangular colleters 1 mm long at the base of the midrib above, with domatia present in the vein axils beneath, membranous, the secondary venation visible beneath, the tertiary venation conspicuously reticulate. INFLORESCENCES axillary, trichotomously branched, subumbellate corymbs, with 5–9 pendant flowers; the peduncles 2–5.5 cm long; bracts scarious, linear, inconspicuous, 1–1.5 mm long, the pedicels 6–11 mm long, glabrous. Sepals 5-merous, free, minute, 0.8–1 mm long, triangular, green, glabrous, with 2–4 colleters interior to and alternate with each sepal. Corolla 5-merous, aestivation of corolla lobes in bud to the right, actinomorphic, basally tubular or cylindrical, abruptly flaring into a campanulate cup in the middle, yellow, 15–18 mm long, glabrous externally and moderately pubescent internally, the tube 8–11 mm long, 3–3.5 mm wide, the throat 5–7 mm long, 5–6 mm wide, the lobes 4–8 mm long, 2–3 mm wide, ovate, glabrous. Filaments 9–12 mm long, glabrous, inserted 3–4 mm above the corolla base; anthers 3.5–4 mm long, with convolute apical appendages 2–3 mm long, the apical appendages fully exserted past the orifice of the corolla tube. Pistils 14–16 mm long, the styles 12–14 mm long, glabrous; ovaries ovoid, apocarpous, ca. 1.5 mm long, glabrous; nectaries equal to slightly longer than the ovaries. FRUITS unknown.

Distribution (Fig. 2) and habitat: Known from only two collections from a single locality, La Muralla National Park,

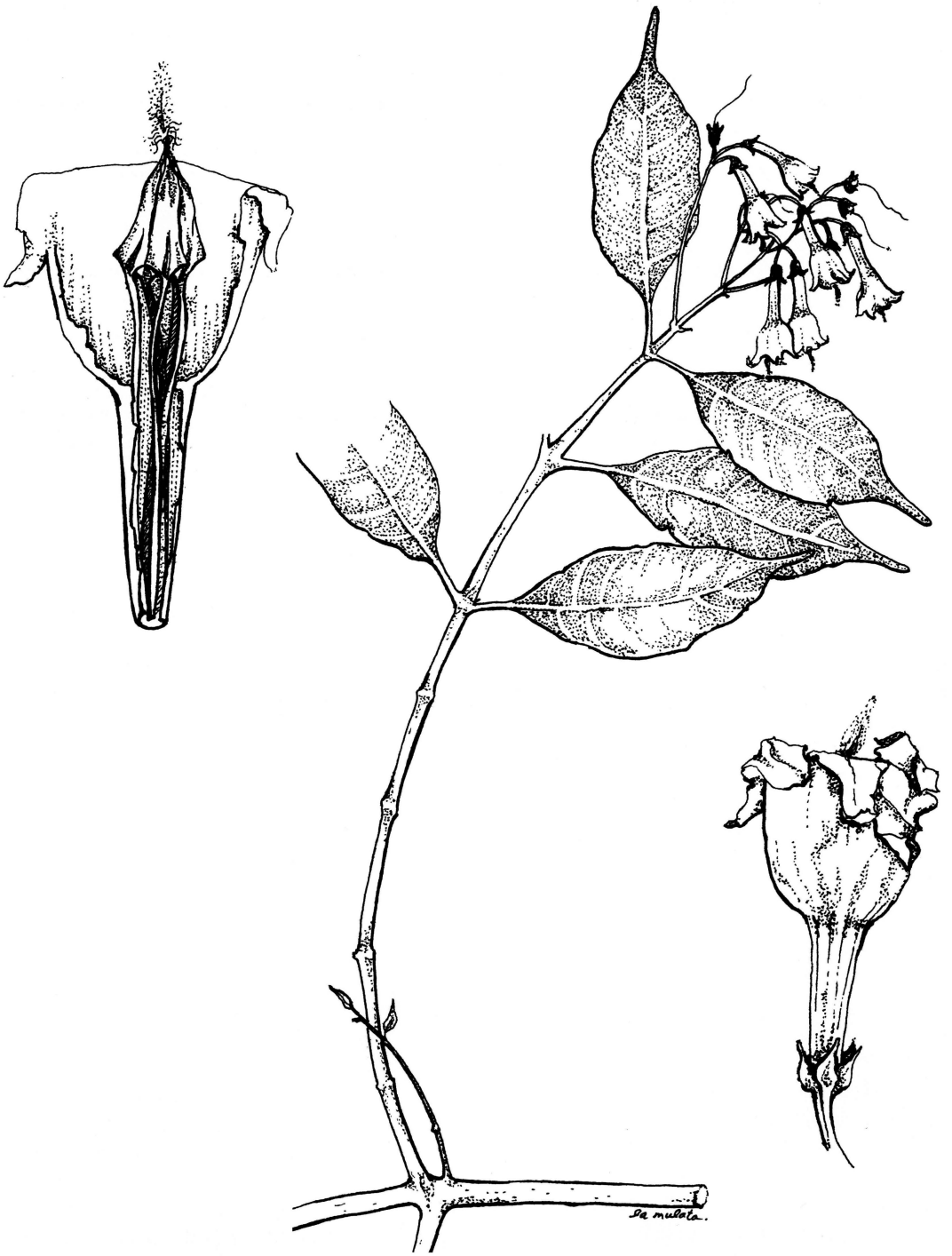

FIG. 1. Illustration of *Tintinnabularia murallensis*, from holotype. a. Habit, with pendant flowers. b. Cross section of mature flower, note the apical appendages of anthers and the developed filaments. c. Flower, note the minute sepals and exserted anther appendages.

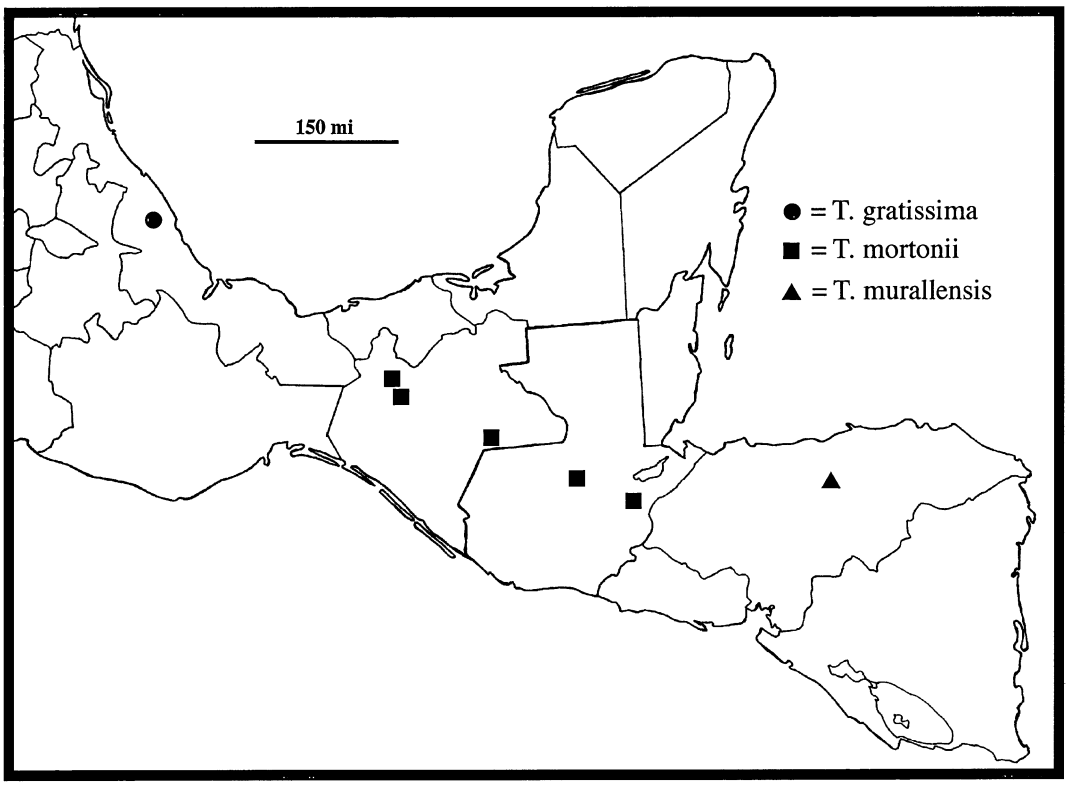

FIG. 2. Distribution map of *Tintinnabularia*.

Honduras, in montane rain forest at an elevation of 1415–1580 m.

ADDITIONAL SPECIMENS EXAMINED: HONDURAS. La Muralla National Park, Visitor Center and environs, 4 Jun 1992, *W. D'Arcy 18117* (MO).

Tintinnabularia murallensis is readily distinguished from the other two species of *Tintinnabularia* by its minute sepals and exserted anther appendages. Based on its distribution, filamentous anther appendages, and long filaments, it appears most closely related to *T. mortonii*.

Both *Tintinnabularia mortonii* and *T. murallensis* were reported as having yellow flowers; flower coloration is unknown in *T. gratissima* (Morales, 1996). The flowers are pendant in all three species.

The species epithet is in reference to the type locality, La Muralla National Park, Honduras.

Key to the species of *Tintinnabularia*

(data on *T. gratissima* taken from Morales (1996))

1. Filaments 1–2 mm long, pubescent; anthers without distinct apical appendages; corolla lobes 10–11 mm long, inconspicuously puberulent on both surfaces; Veracruz (Mexico). *T. gratissima* J. F. Morales
1. Filaments 10–31 mm long, glabrous; anthers with convolute apical appendages 2–3 mm long; corolla lobes 4–8 mm long, densely tomentose on both surfaces or glabrous abaxially and moderately pubescent adaxially.
   2. Corollas tubular-campanulate, 15–18 mm long; sepals minute, 0.8–1 mm long, triangular; filaments 9–12 mm long; apical appendages of anthers fully exserted; Honduras. *T. murallensis* J. K. Williams

2. Corollas infundibuliform, 38–52 mm long; sepals foliaceous, linear- lanceolate, 11–16 mm long; apical appendages of anthers included or only the tips exserted; Chiapas (Mexico), Guatemala.
T. mortonii Woodson

Acknowledgments

I thank Guy Nesom for the Latin diagnosis, Mary Endress, James Henrickson, Billie Turner, and Tom Wendt for reviewing the manuscript and Maria Thompson for the illustration. Appreciation is also extended to the staff of the Missouri Botanical Garden for allowing me the opportunity to examine their specimens.

Literature Cited

Henrickson, J. 1996. Studies in *Macrosiphonia* (Apocynaceae): Generic recognition of *Telosiphonia*. Aliso 14:179–195.

Leeuwenberg, A. J. M. 1994. Taxa of the Apocynaceae above the genus level. Agric. Univ. Wageningen Papers 94(3): 45–60.

Morales, J. F. 1996. Una nueva especie de *Tintinnabularia* (Apocynaceae). Novon 6: 392–394.

————-. 1997. A synopsis of the genus *Allomarkgrafia* (Apocynaceae). Brittonia 49: 337–345.

————-. 1998. A synopsis of the genus *Mandevilla* (Apocynaceae) in Mexico and Central America. Brittonia 50(2): 214–232.

Pichon, M. 1950. Classification des Apocynacées: XXV, Échitoïdees. Mém. Mus. Natl. Hist. Nat., Sér. B, Bot. 1: 1–143.

Sennblad, B., M. E. Endress, and B. Bremer. 1998. Morphology and molecular data in phylogenetic fraternity: the tribe Wrightieae (Apocynaceae) revisited. Amer. J. Bot. 85(8): 1143–1158.

Williams, J. K. 1996. The Mexican genera of the Apocynaceae (sensu A. DC.), with key and additional taxonomic notes. Sida 17:197–214.

————-. 1998. A new combination in Mexican *Mandevilla* (Apocynaceae). Sida 18(1): 237–239.

————-. 1999. A phylogenetic and taxonomic study of the Apocynaceae subfamily Apocynoideae of Mexico with synopsis of subfamily Plumerioideae. Ph.D. Dissertation. Austin: The University of Texas at Austin.

Woodson, R. E., Jr. 1933. Studies in the Apocynaceae IV. The American genera of Echitoideae. Ann. Missouri Bot. Gard. 20:605–790.

———————— 1936. Studies in the Apocynaceae IV. The American genera of Echitoideae. Ann. Missouri Bot. Gard. 23:169–438.

————- 1938. Apocynaceae. Pp. 103–192 in *North American Flora*, Vol. 29. Bronx, New York: The New York Botanical Garden.

Zarucchi, J. L. 1991. *Quiotania*: a new genus of Apocynaceae-Apocynoideae from northern Colombia. Novon 1: 33–36.