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301

Taxonomic Revision of *Dolichandra* (Bignoniaceae, Bignoniaceae)

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Abstract

Dolichandra Cham. emend. L.G.Lohmann is a genus of Neotropical lianas in tribe Bignonieae (Bignoniaceae) that comprises nine species. It is centered in Paraguay, southern Brazil and northeastern Argentina, where six species occur and three are endemic. Species of *Dolichandra* are generally climbers of dry and wet lowland forests, also growing in swamps and gallery forest formations. The genus is characterized by four main synapomorphies: (i) stems with multiple dissected phloem wedges in cross-section, (ii) trifid and uncatate tendrils, (iii) psilate and 3-colpate pollen, and (iv) capsules with four lines of dehiscence. Other features of the genus are the large and membranaceous calyces, dimorphic growth with the juvenile form attaching by its uncinata tendrils, lanceolate prophylls of the axillary buds, congested-cymose inflorescences, and a lobed nectary disk. In this taxonomic revision, we present detailed descriptions for all species recognized, taxonomic and nomenclatural comments, distribution maps and information on the habitat and distribution of each species, as well as information on their conservation status (i.e., IUCN categories), and illustrations of diagnostic characters. Thirty-five names are treated as synonyms, six of which are newly proposed. More specifically, *Tecoma maximiliani* Mart. ex DC. is synonymized under *Dolichandra unguiculata* (Vell.) L.G. Lohmann, *Bignonia pseudounguis* Desf., *Bignonia unguis-cati* var. *radicans* DC., and *Macfadyena hassleri* Sprague are synonymized under *Dolichandra uncatata* (Andrews) L.G. Lohmann, while *Bignonia tweediana* Lindley and *Dolichandra kohautiana* Presl are synonymized under *Dolichandra ungui-cati* (L.) L.G. Lohmann. Lectotypes are proposed for 13 species names, namely *Bignonia californica* Brandegee, *Bignonia gracilis* G. Lodd., *Bignonia inflata* Griseb. *Bignonia tweediana* Lindley, *Bignonia unguis-cati* var. *guatemalensis* K. Schum. & Loes., *Bignonia unguis-cati* var. *serrata* Bureau & K. Schum., *Dolichandra cynanchoides* Cham., *Dolichandra fenzliana* Miq. *Macfadyena hassleri* Sprague, *Parabignonia steyermarkii* Sandwith, *Paradolichandra chodatii* var. *brachycalyx*, *Spathodea mollis* and *Tecoma maximiliani* Mart. ex DC.

Key words: IUCN categories, lianas, lectotypes, Neotropical Flora, taxonomy

Introduction

Systematics and taxonomy

The generic classification of tribe Bignonieae has changed drastically over the years (Lohmann 2006, Lohmann & Taylor 2014). The first comprehensive generic classifications of tribe Bignonieae date back to the 19th Century (Bentham & Hooker 1876, Schumann 1894). When these classifications were proposed, genera were supported by few morphological traits, many were small and difficult to recognize (Lohmann 2006). Alwyn Gentry was the first to combine data from morphology, anatomy, palinology, and ecology to merge and re-circumscribe generic limits and recognize broader and more meaningful units (see Gentry 1973a, 1973b, 1979a, Gentry & Tomb 1980). Generic realignments of Bignonieae species based on newly proposed morphological features led to a re-evaluation of the importance of fruit and seed characters to diagnose genera in the tribe (Gentry 1972, 1973b). Gentry (1972, 1973b) also used the morphology of phloem wedges found on stems, the growth form of young individuals, flowering phenology, corolla shape and texture as generic markers.

Based on these characters, Gentry (1972, 1973b) merged several genera and proposed new generic affinities. Among those, he placed *Macfadyena* De Candolle (1845: 179–180), including *Doxantha* Miers (1863: 189–190), and *Melloa* Bureau (1868: 379–380), within the same “very natural” group that he characterized by glabrous and yellow corollas, large and membranaceous calyces, trifid and uncatate tendrils, and similar stem vascularization. This species group was further supported, enlarged, and redefined by palynological evidence (Gentry & Tomb 1980). More specifically, Gentry & Tomb (1980) conducted a comprehensive survey of pollen types within Bignonieae and found that most species in the tribe have three-colpate, more or less psilate (or smooth) pollen. Based on pollen traits, Gentry & Tomb (1980) recognized three natural groups, one of which was characterized by uncinata tendrils, large calyces, and glabrous (or nearly glabrous) corolla tubes. This group included all members of *Dolichandra* Chamisso (1832: 657), *Macfadyena*, *Melloa*, *Parabignonia* Bureau ex Schumann (1894: 229) and *Paradolichandra* Hassler (1907: 718) (= *Parabignonia*; Gentry 1979a). The inclusion of *Melloa*, *Parabignonia*, and *Paradolichandra* in this unnamed group of Bignonieae represented a major taxonomic change, as these genera had been traditionally placed in tribe Tecomeae (Schumann 1894–1895, Bureau & Schumann 1896–1897, Sandwith 1966), due to their fruit dehiscence.

The alliance of *Dolichandra*, *Macfadyena*, *Parabignonia*, and *Melloa* identified by Gentry was also supported by anatomical data. Dos Santos (1995) studied the wood anatomy of 31 genera of Bignoniaceae and divided these genera into four groups based on the type of cambial variation. Her “Group 3” was characterized by multiple dissected phloem wedges (Dos Santos 1995, figs. 46, 62, 74), and included all members of *Macfadyena*, *Melloa* and *Parabignonia*; *Dolichandra* was not treated in her study.

A molecular phylogeny of Bignoniaceae sampled 46 of the 47 genera recognized in the tribe and found that *Dolichandra*, *Macfadyena*, *Melloa*, and *Parabignonia* form a strongly supported monophyletic group (Lohmann 2006). Monophyly of the four genera inferred from molecular data in combination with the morphological features outlined above led to a broader circumscription of *Dolichandra*, which now also includes *Macfadyena*, *Melloa*, and *Parabignonia* (Lohmann & Taylor 2014). As circumscribed by Lohmann & Taylor (2014), the genus is characterized by four morphological synapomorphies: (i) stems with multiple dissected phloem wedges in cross-section, (ii) trifold and uncinately tendrils, (iii) psilate and 3-colpate pollen, and (iv) capsules with four lines of dehiscence (Fig. 1). Other features that characterize the genus are the large and membranaceous calyces, dimorphic growth with the juvenile form attaching on tree trunks by uncinately tendrils, lanceolate prophylls of the axillary buds, congested-cymose inflorescences, and a lobed nectary disk (Fig. 1) (Lohmann & Taylor 2014).

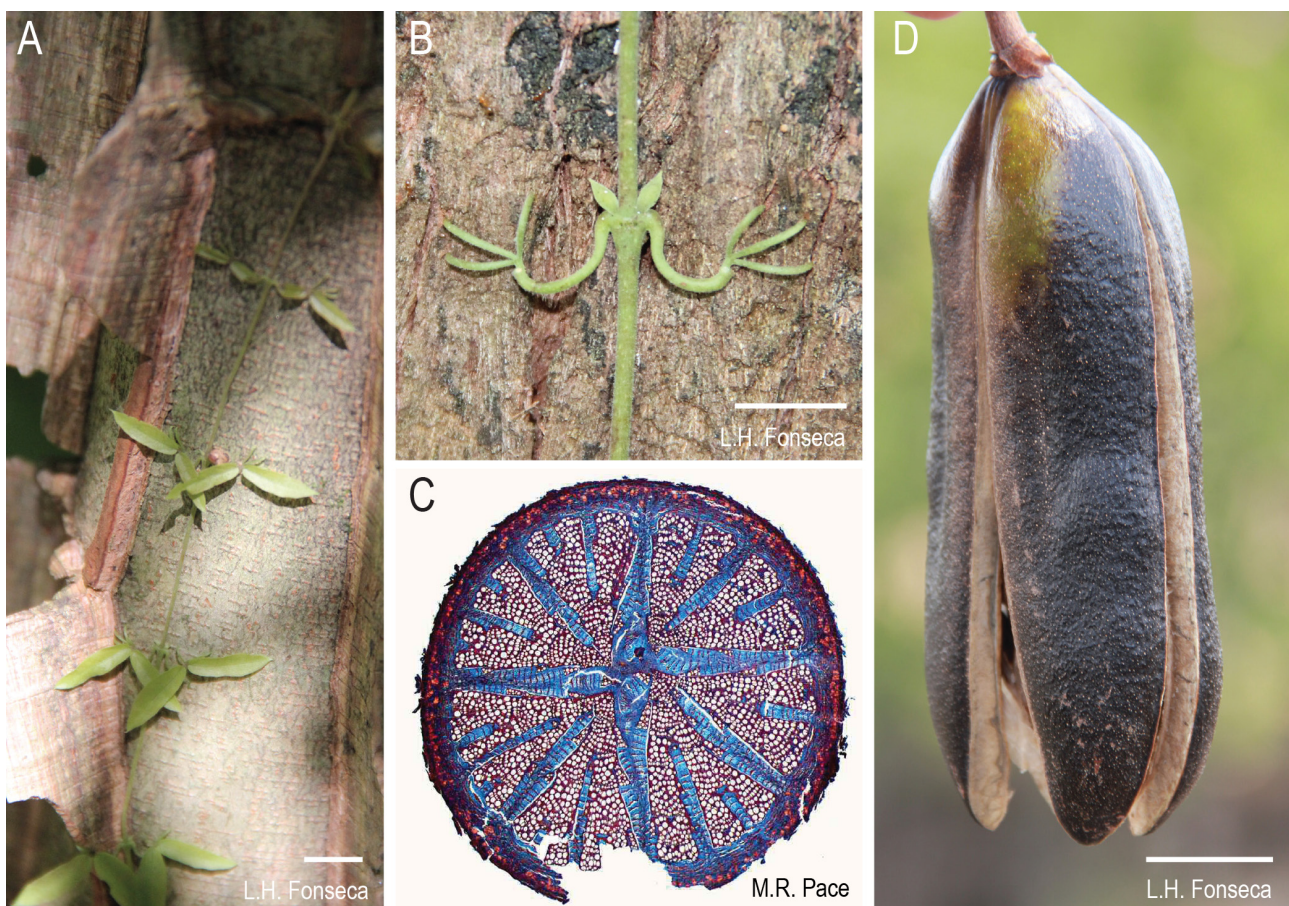


FIGURE 1. Morphological synapomorphies of *Dolichandra*. **A.** Juvenile form of *D. unguis-cati* growing appressed to the tree trunk. **B.** Trifold and uncinately tendril of *D. unguis-cati* with leaflets removed. **C.** Cross-section of *D. unguis-cati* stem showing the multiple dissected phloem. **D.** Fruit of *D. quadrivalvis* showing the two lines of dehiscence. White bars = 1 cm.

Dolichandra was first described as monotypic based on *D. cynanchoides* Chamisso (1832: 658). Two additional species were subsequently described in the genus: *D. kohautiana* Presl (1845: 522) [= *Dolichandra unguis-cati* (Linnaeus 1753: 623) Lohmann (2008: 273)] and *D. fenzliana* Miquel (1845: 251) [= *Dolichandra uncata* (Andrews 1808: t. 530) Lohmann (2008: 273)]. *Tecoma maximilianii* Mart. ex De Candolle (1845: 222) was transferred to *Dolichandra* as *D. maximilianii* (Mart. ex DC.) Kuntze (1898: 243). Gentry (1975) subsequently treated *D. maximilianii* as a synonym of *Parabignonia unguiculata* (Vellozo 1829: 248) Gentry (1975: 343) [= *D. unguiculata* (Vell.) L.G.Lohmann in Lohmann & Taylor (2014: 431)].

The expanded circumscription of *Dolichandra* proposed by Lohmann & Taylor (2014) includes eight species: *D. cynanchoides*, three species traditionally included in *Macfadyena*, three species traditionally included in *Parabignonia*, and one species traditionally included in *Melloa*. More specifically, *Macfadyena dentata* Schumann (1894: 227) is treated as *D. dentata* (K.Schum.) L.G.Lohmann in Lohmann & Taylor (2014: 430), *M. uncata* (Andrews) Sprague & Sandwith (1937: 215) as *D. uncata*, *M. unguis-cati* (L.) Gentry (1973b: 236–237) as *D. unguis-cati*, *Parabignonia chodatii* (Hassler 1907: 720) Gentry (1979a: 785) as *D. chodatii* (Hassl.) L.G.Lohmann in Lohmann & Taylor (2014: 429–430), *P. steyermarkii* Sandwith (1966: 446–452) as *D. steyermarkii* (Sandwith) Lohmann (2008: 273), *P. unguiculata* as *D. unguiculata*, and *Melloa quadrivalvis* (Jacquin 1809: 37) Gentry (1973b: 237) as *D. quadrivalvis* (Jacq.) Lohmann (2008: 273). More recently, *Macfadyena hispida* (De Candolle 1845: 205) Seemann (1863: 227) was recognized as separate from *D. uncata* and treated as *D. hispida* (DC.) L.H.Fonseca & L.G.Lohmann in Fonseca *et al.* (2015: 35–43).

Here, we follow the broader circumscription of Lohmann & Taylor (2014) and accept the taxonomic changes proposed by Fonseca *et al.* (2015), thus recognizing nine species in *Dolichandra*. All species of *Dolichandra* recognized are monophyletic (Fonseca & Lohmann 2015), clearly diagnosed and easily separated by reproductive and vegetative characters. The flowers are showy and vary in shape, color, scent, and amount of reward for pollinators (Alcantara & Lohmann 2010). Fruits and seeds are also variable, with fruit sizes ranging from 13 cm (*D. cynanchoides*) to 136 cm (*D. unguis-cati*) long. Seed wings are generally hyaline, except from *D. dentata* and *D. uncata* where the hyaline wings are reduced or totally inexistent.

Reproductive biology

D. cynanchoides has odorless flowers, with a bright orange-red or deep red-violet color and abundant nectar. The calyx is usually large, thin, and loosely enclosing the base of a rather thick corolla, with a long and narrow tube that is usually glabrous externally, and exerted anthers and stigma (Gentry 1974, 1980b). This set of characters is associated with hummingbird pollination (Gentry 1974, 1980b, 1990) and has been referred to as “*Martinella*-type” flower (Gentry 1974) or “*Pyrostegia*-type” flower (Gentry 1980b). Hummingbird pollination was reported by Fabris (1979) and García (1992) and also indicated in labels of herbarium material. *D. chodatii* has narrow tubular deep-magenta corollas that are completely glabrous externally, and membranaceous calyces. This species has a mixed morphology and is likely pollinated by both large to medium size bees and hummingbirds (Alcantara & Lohmann 2010).

D. dentata, *D. hispida*, *D. quadrivalvis*, *D. uncata*, and *D. unguis-cati* share yellow and fragrant flowers that produce abundant nectar, and have conspicuous membranous, tubular-campanulate corollas with an open mouth, and included anthers. This floral morphology has been referred to as the “*Anemopaegma*-type” (Gentry 1974, 1980b) or “open-mouth bee” flowers (Gentry 1980b), and are mostly pollinated by large to medium sized bees (Gentry 1974, 1990). *D. steyermarkii* and *D. unguiculata* have tubular-campanulate corollas that are often light red-purple and pubescent externally, and yellow or white internally. These flowers are also thought to be bee pollinated although they were not included in Gentry’s (1974, 1980b) “*Anemopaegma*-type” flowers, nor in his “open-mouth bee” flowers (Gentry 1990).

Five different basic patterns of flowering phenology are recognized in the Bignoniaceae (Gentry 1972, 1974): (i) Type 1 flowers are associated with bat pollination; (ii) Type 2 or “modified steady state” include individuals that flower irregularly and open few flowers at a time, but produce flowers over a long period of time. There is little correlation between season and flowering and little synchronization of flowering between individuals of a single species. Species following this phenology pattern are usually pollinated by bees, which are long-lived and follow regular foraging routes; (iii) Type 3 or “cornucopia” includes individuals that produce numerous flowers in a period of several weeks, each of which generally lasts a single day. Individuals within a species are synchronized only by season (dry versus wet) and can flower at anytime in that season. This is the most widespread and generalized pattern of phenology in the Bignoniaceae, attracting a wide range of potential pollinators, including hummingbirds, hawkmoths, butterflies, and bees; (iv) Type 4 or “big-bang” includes individuals that bloom in a highly synchronized fashion, with most of the individuals in a community flowering at the same time. Massive numbers of flowers are produced, but each flowering cycle lasts only a few days. Mass blooming always occurs during the dry season, although occasional individuals may bloom in the wet season. The “big bang” phenology seems to attract a generalized spectrum of pollinators, but is associated with bee-pollinated species; and (v) Type 5 or “multiple bang” is related to multiple short-time massive flowering and high synchronization among individuals in a population.

Three of these five phenologies are represented in *Dolichandra*. Most species (i.e., *D. cynanchoides*, *D. dentata*, *D. quadrivalvis*, *D. steyermarkii* and *D. unguiculata*) follow Gentry's (1974) Type 3 or "cornucopia" phenology. The flowering peak of *D. cynanchoides*, *D. quadrivalvis* and *D. unguiculata* ranges between September and December. *D. dentata* flowers from September through December, with a marked peak in November. On the other hand, *D. uncata* flowers irregularly throughout the year following Gentry's (1974) Type 2 or "modified steady state" phenology pattern. Fruit set is high in *D. uncata*, contrasting to most other Bignoniaceae species. *D. chodatii*, *D. hispida* and *D. unguis-cati* have massive bloomings following Gentry's (1974) Type 4 or "big-bang" phenology pattern. *D. unguis-cati* is in bloom from March to June in Panama (Gentry 1973a) and mainly from September to November in the Brazilian Atlantic Forest (Fonseca pers. obs.), *D. chodatii* flowers from March to early June (Fonseca pers. obs.), and *D. hispida* from September to January (Fonseca *et al.* 2015). *D. steyermarkii* is poorly collected and the flowering pattern is not clear.

Cytology

Goldblatt & Gentry (1979) documented a base number of $n = 20$ for all but three of the 21 genera of tribe Bignonieae that have been studied cytologically. Within *Dolichandra*, chromosome counts were $2n = 40$ for *D. chodatii*, *D. dentata*, *D. uncata*, and *D. unguis-cati*, although $2n = 80$ was also found in *D. unguis-cati* (Jullier 1989, Piazzano 1998). These results corroborate the base number $n = 20$ observed for species of tribe Bignonieae in general. The chromosome counts available for *D. unguis-cati* suggest that this species includes at least two ploidy levels (Jullier 1989).

Geographic distribution

Species of *Dolichandra* are found from sea level to 1950 m alt., with a single report of *D. unguis-cati* occurring in altitudes that range between 3000 and 4000 m alt. (Folsom J.P. 2085 at MO). Members of *Dolichandra* are distributed from humid and dry forests of Mexico all the way to northern Argentina, Uruguay and Southern Brazil (Fig. 2) (Lohmann & Taylor 2014). Four species of *Dolichandra* (*D. chodatii*, *D. cynanchoides*, *D. dentata*, and *D. hispida*) occur in seasonally dry tropical forests (Lohmann & Taylor 2014) and are distributed from northeast Argentina, southern and midwestern Brazil, Paraguay, and Uruguay (Lohmann & Taylor 2014). While *D. quadrivalvis*, *D. uncata*, and *D. unguis-cati* are broadly distributed from Mexico to northern Argentina and southern Brazil, *D. steyermarkii* and *D. unguiculata* have more restricted distributions, with the former occurring in Costa Rica, Colombia, Ecuador, and Venezuela, and the latter being restricted to the Ombrophilous Atlantic rainforest of Brazil (Gentry 1974, Lohmann & Taylor 2014).

Economic and ethnobotanic uses

D. dentata is cultivated in Argentina (Fabris 1979, García 1992). *D. cynanchoides*, and *D. unguis-cati* are cultivated as ornamentals in warm tropical regions worldwide (Lohmann & Taylor 2014), and are also invasives in several countries such as Australia (Sparks 1999), China (Li *et al.* 2015), South Africa (Csurhes & Edwards 1998), and USA (FLEPPC 2016, Texas Invasives 2016). Attempts to reduce population size of *D. unguis-cati* are underway in Australia and South Africa mainly using Coleoptera, Hemiptera, and Lepidoptera as biological controls (Willians 2002; Dhileepan *et al.* 2005, Dhileepan *et al.* 2007, Dhileepan *et al.* 2013).

A number of medicinal uses have been reported in the literature. *D. cynanchoides* has been used as an antidiarrhetic and an antiemetic (Schulz 1940). *D. uncata* has been reported as an aphrodisiac, permanent contraceptive, treatment to conjunctivitis and behavioral disorders (Gentry 1992). *D. unguis-cati* has anti-inflammatory, antitumoral, and antitypanosomol activities (Duarte *et al.* 2000, Aboutabl *et al.* 2008) and is used in folk medicine to treat anuria, bloating, malaria, dysentery, rheumatism, and snakebite (Houghton & Osibogon 1993, Milliken 1997, Hilgert 2001).

In addition to the medicinal properties and use as ornamentals, a variety of other uses have been reported to several members of *Dolichandra*. For instance, the stems of *D. chodatii* are used in Paraguay as lashing material for construction (J. William & R. Orosco 214 in sched. at MO). The stems of *D. quadrivalvis* are known to have poisonous properties and are used to capture crabs by fishermen in Colombia. According to Gentry (1992), the bait is prepared from the shavings of stems of *D. quadrivalvis*, which are mixed with banana and left overnight outside crab holes. The next morning the crabs are found immobilized outside their holes, where they can be easily picked up. The effect is temporary, the crabs recover before they reach market and are not perceptibly toxic to humans.

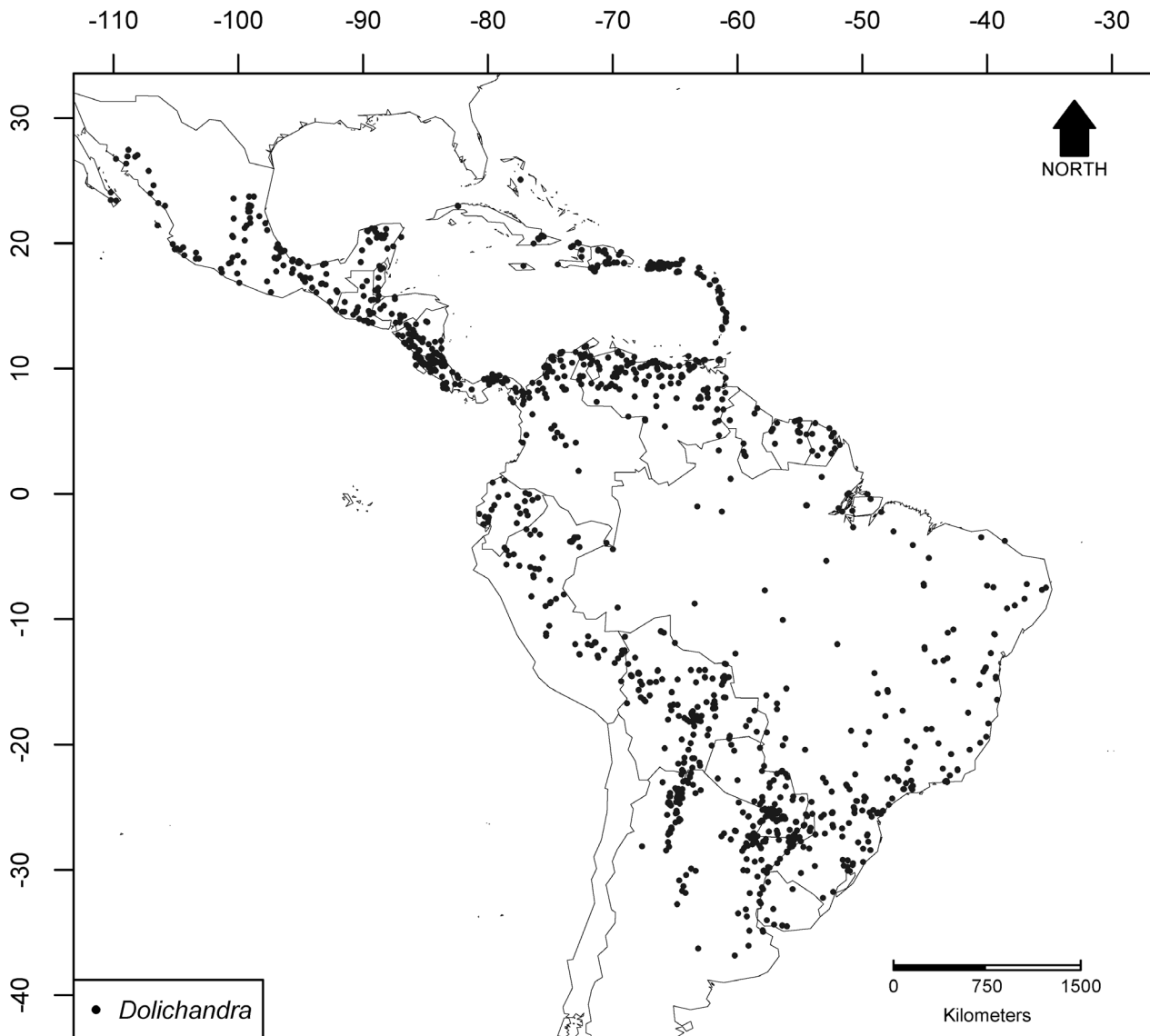


FIGURE 2. Geographic distribution of *Dolichandra* in Central and South America.

Material and Methods

The taxonomic revision of *Dolichandra* is based on morphological observations made during field expeditions and the analysis of herbarium specimens deposited at AAU, B, BHCB, BM, BR, C, CAS, CAY, CM, ESA, F, FI, FUEL, FTG, G, GH, GOET, HUEFS, INPA, L, M, MBM, MICH, MO, NY, S, SP, SPF, TEX, U, UB, UPCB, UPS, US and W (acronyms follow Thiers, continuously updated). Physical specimens were examined during herbarium visits and as loans. Barcodes for specimens examined physically are included in square brackets. Specimen images were examined at JSTOR Global Plants (<http://plants.jstor.org/>) and at FI online type images (<http://parlatore.msn.unifi.it/types/>) and are cited with the corresponding barcode. All vouchers listed in this work were examined by at least one of the authors. In particular, MO represents the most important collection for *Dolichandra* as it includes the collections compiled by the late A.H. Gentry during his investigations of the Bignoniaceae. Observations of these materials contributed substantially for the present study. When available, barcodes of specimens examined are cited within brackets.

All accepted names are listed alphabetically, with nomenclatural discussions and citations following McNeill *et al.* (2012). Morphological descriptions follow the general terminology adopted by Lohmann & Taylor (2014) for tribe Bignonieae. New phylogenetic hypothesis (Fonseca & Lohmann 2015) provided important information for

the circumscription of species. While monophyly is not a pre-requisite for species delimitation, it is an evidence of such. Species are evolutionary lineages that acquire properties through time and reciprocal-monophyly criterion provides complementary evidence for species hypotheses proposed exclusively based on morphological similarity (Funk & Omland 2003; de Queiroz 2007). All species treated here are monophyletic (Fonseca & Lohmann 2015).

Examined material is based on a rigorous compilation of collections for all species, yet the list shown here is not exhaustive. Following Lohmann & Taylor (2014), countries with relatively small surface areas are listed individually; for countries with larger areas, the main political units (states, provinces, or departments) in which the species are documented are also detailed. Distribution maps were based on a dataset with ca. 2000 geo-referenced localities compiled for all species of *Dolichandra*. Dots on the maps depict specimens with geographic coordinates provided on collection labels or localities for which we were able to estimate the geographic coordinates of the municipality using the Global Administrative Areas data (available at <http://www.gadm.org/>) and R (R Development core team, 2012) package GISTools (Brusdon & Chen unpubl.). Maps were prepared using maptools (Bivand et al. unpubl., available at <http://cran.r-project.org/web/packages/maptools/index.html>). Conservation status was assessed using distribution data and the GeoCAT Tool (Bachman *et al.* 2011). Extent of occurrence (EOO) was used to categorize species.

Taxonomic Treatment

- Dolichandra* Chamisso (1832: 657), emend. L.G. Lohmann in Lohmann & Taylor (2014: 428). Type:—*Dolichandra cynanchoides* Chamisso (1832: 658).
- Macfadyena* Candolle (1845: 179–180). Type:—*Macfadyena uncinata* (Meyer 1818: 210) Candolle (1845: 180) [= *Dolichandra uncata* (Andrews 1808: t. 530) Lohmann (2008: 273)]
- Doxantha* Miers (1863: 189–190). Type:—*Doxantha unguis-cati* (Linnaeus 1753: 623) Miers (1863: 190) [= *Dolichandra unguis-cati* (Linnaeus 1753: 623) Lohmann (2008: 273)]
- Melloa* Bureau (1868: 379–380). Lectotype (designated by Baillon 1888: 26):—*Melloa populifolia* (Candolle 1845: 159–160) Bureau in Bureau & Schumann (1897: 295–296) [= *Dolichandra quadrivalvis* (Jacquin 1809: 37) Lohmann (2008: 273)]
- Parabignonia* Bureau ex Schumann (1894: 229). Type:—*Parabignonia maximillianii* (Mart. ex Candolle 1845: 222) Bureau ex Schumann (1894: 229) [= *Dolichandra unguiculata* (Vellozo 1829: 248) L.G.Lohmann in Lohmann & Taylor (2014: 431)]
- Paradolichandra* Hassler (1907: 718). Type:—*Paradolichandra chodatii* Hassler (1907: 720) [= *Dolichandra chodatii* (Hassl.) L.G.Lohmann in Lohmann & Taylor (2014: 429–430)]
- Batocydia* Mart. ex Britton in Britton & Wilson (1925: 194) nom. illeg. Type:—*Batocydia unguis-cati* (Linnaeus 1753: 623) Mart. ex Britton in Britton & Wilson (1925: 194), as “*Batocydia unguis*” [= *Dolichandra unguis-cati* (Linnaeus 1753: 623) Lohmann (2008: 273)]

Lianas, with or without dimorphic juvenile growth; stems terete, grey, brown, dark brown, glabrous, puberulent, pubescent or hispid, flaky bark present or absent, striate, with lenticels, lenticels elliptic; branchlets terete, green to purplish, glabrous to pubescent; interpetiolar regions with ridges, with or without glandular fields in young stems; prophylls of the axillary buds lanceolate, deltoid or ovate, smooth or striate, glabrous to pubescent, without glands. **Leaves** bifoliolate with a terminal tendril; petioles subterete to slightly sulcate, glabrous, puberulent, pubescent or hispid, petiolules subterete or sulcate, glabrous, puberulent, pubescent or hispid; tendrils trifid, uncinata, sometimes becoming woody, subterete, glabrous to pubescent; leaflets membranaceous or chartaceous, with margin entire or serrate. **Inflorescences** a leafy raceme, leafy thyrse, or reduced to lateral raceme with up to three flowers; floral bracts deciduous or persistent, membranaceous, green or green to purplish, bracteoles deciduous or persistent, membranaceous, green or green to purplish. **Calyces** campanulate, spathaceous or truncate, single apiculate, three-lobed or five-lobed, apex rounded or apiculate, non-inflated to inflated, green or green to purplish, membranaceous, sometimes with pateliform glands. **Corollas** purple, red, purplish or yellow, with or without nectar guides, tubular or infundibuliform, membranaceous, glabrous or puberulent externally, with or without glands at apex. **Androecia** attached at the same position, filaments terete, glabrous, anthers included or exerted. **Gynoecia** with ovary linear or elliptic-oblong, generally sessile, rarely stipitate, smooth or ribbed, glabrous or lepidote, ovules in one to multiple series on each placenta. **Fruits** linear or oblong, woody, with two valves that are incompletely divided longitudinally or completely divided in four, glabrous, smooth or rugous, with lenticels, without glands, with calyx persistent or caducous. **Seeds** numerous, winged, oblong; seed wing membranaceous and translucent or woody.

Key to all species of *Dolichandra*

- 1a Branchlets with flaky bark; calyx five-lobed 2
 1b Branchlets without flaky bark or flaky exclusively on old stems; calyx three-lobed 3
 2a Tendril never woody; calyx with lobes lanceolate and glabrous (except at margin), without glandular trichomes; Brazilian Atlantic Forest *D. unguiculata*
 2b Tendril woody; calyx with lobes rounded and shortly mucronate, puberulent, with glandular trichomes; Amazon forest and wet forests of Central America *D. steyermarkii*
 3a Prophylls of the axillary buds ovate and striate; calyx campanulate, truncate to sinuous, not apiculated *D. unguis-cati*
 3b Prophylls of the axillary buds lanceolate (sometimes deltoid) and smooth; calyx two-lobed, three-lobed or spathaceous, generally apiculated 4
 4a Leaflet margins serrate; seed wings woody, with a narrow hyaline margin *D. dentata*
 4b Leaflet margins entire; seed wings hyaline, rarely woody but then without an hyaline margin 5
 5a Anthers and stigma exserted; corolla bilabiate with the upper 2 lobes forward and the lower 3 lobes reflexed, red; fruit oblong *D. cynanchoides*
 5b Anthers and stigma included; corolla bilabiate with the upper 2 lobes reflexed and the lower 3 lobes forward, yellow or purple; fruit linear, rarely oblong but then woody 6
 6a Calyx campanulate and three-lobed, covering approximately 1/3 of the corolla; corolla purple at the tube and pink at the lobes *D. chodatii*
 6b Calyx truncate and not lobed or spathaceous and two-lobed, covering approximately 1/4 or 1/5 of the corolla; corolla yellow throughout 7
 7a Calyx with a recurved apicule; fruit oblong, terete and woody *D. quadrivalvis*
 7b Calyx with an incurved apicule; fruit linear, flattened and slightly woody 8
 8a Stems hispid; ovary vinaceous; fruits 77–125.8 cm long; seeds with hyaline wings; deciduous forests of northern Argentina, southern, southwestern and central Brazil, Paraguay and Bolivia *D. hispida*
 8b Stems glabrous to puberulous; ovary green; fruits 9.2–38.5 cm long; seeds woody, opaque, without hyaline wings; mangroves and swamps from Mexico to Argentina and Trinidad *D. uncatata*

1. *Dolichandra chodatii* (Hassler 1907: 720) L.G. Lohmann in Lohmann & Taylor (2014: 429–430)

≡ *Paradolichandra chodatii* Hassl. *Parabignonia chodatii* (Hassl.) Gentry (1980: 785)

Holotype:—PARAGUAY. Sierra de Amambay, Picada Esperanza, 1907–1908, *Hassler E. 10281* (G! [G00094032], G as photo F neg. 26200 at MO-1693014!; isotype, A00549372!, NY! [NY-328894], S image!).

= *Paradolichandra chodatii* var. *brachycalyx* Hassler (1910: 59).

Lectotype (designated here):—PARAGUAY. Villa Sana, Rio Apa, 3 March 1909, *Fiebrig K. 5071* (K000449798!).

Residual syntype:—PARAGUAY. Villa Sana, Rio Apa, 3 March 1909, *Fiebrig K. 5150* (syntype, K not seen).

Lianas, without dimorphic juvenile growth; stems terete, brown, glabrous, bark not flaky, striate; branchlets terete, purplish to green, glabrous; interpetiolar regions without glandular fields; prophylls of the axillary buds lanceolate, 1–5 mm long, smooth, glabrous. **Leaves** bifoliolate with a terminal tendril; petioles subterete, 14–45 mm long, glabrous to puberulent, trichomes simple; petiolules subterete, 5–35 mm long, glabrous to puberulent; tendrils sometimes woody, subterete, 21–50 mm long, glabrous, tendril arms 10–25 mm long; leaflets elliptic to oblong-elliptic, apex cuspidate to acuminate, base rounded, truncate or cordate, symmetric or slightly asymmetric, 45–200 × 30–100 mm, chartaceous, adaxial surface lepidote with peltate trichomes, abaxial surface lepidote with peltate trichomes, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescences** thyrsoid, glabrous; floral pedicels 20–56 mm long; floral bracts deciduous, obovate to orbiculate, 12–26 mm long, membranaceous, purplish; bracteoles deciduous, rarely present, obovate. **Calyces** campanulate, inflated, three-lobed, lobes rounded, 36–56 × 22–34 mm, membranaceous, green to purplish, lepidote, trichomes peltate. **Corollas** purple with pink lobes, tubular-infundibuliform, upper two and lower three diverging from axis at almost 90°, coriaceous, glabrous throughout, only lepidote at the region of stamen attachment, trichomes stipitate, nectar guides present, 60–90 × 10–18 mm, tube 50–80 mm long, lobes 10–15 × 10–20 mm, orbicular. **Androecia** attached at the same position; filaments terete, glabrous, short filaments 19–21 mm long, long filaments 27–30 mm long; staminodes 7–12 mm long; anthers included, 5–6 mm long. **Gynoecea** with ovaries linear, 6–8 × 1.5–2.5 mm, green, lepidote, trichomes peltate, ovules in multiple series on each placenta; styles 36–42 mm long, glabrous; stigmas included, 5.2 mm long. **Fruits** terete and linear, narrowed at both ends, 20–45 × 1.5–2.5 cm, slightly woody, rugose, dark brown to black, glabrous. **Seeds** numerous, winged, oblong, 27–42 × 7–15 × 1 mm; seed bodies 10–13 × 4–8 mm; seed wings membranaceous and opaque.

Illustration:—Figure 3A–I.

Nomenclatural notes:—Hassler (1910) cited two gatherings at K (*Fiebrig 5071* and *Fiebrig 5150*) in the protologue of *Paradolichandra chodatii* var. *brachycalyx*. Here, we selected the fertile collection (*Fiebrig 5071*), for which an image is available online, as lectotype. The sterile collection *Fiebrig 5150* was not located.

Taxonomic notes:—*Dolichandra chodatii* is characterized by a campanulate calyx, a three-lobed and purple corolla with pink lobes, and a terete and linear capsule ranging from 20–45 cm in length (Table 1). *Dolichandra chodatii* is also characterized by woody tendrils, although this feature is shared with *D. quadrivalvis* and *D. steyermarkii*. The presence of a ring of tissue outside the corolla is also distinctive of *D. chodatii* but uncommon in other *Dolichandra*, shared only with *D. quadrivalvis* (Rivera 2000). This ring of tissue may be a vestigial calyx, in which case, the structure generally called calyx in *D. chodatii* would represent a pseudocalyx, composed of fused bracteoles or a second external calyx whorl. A pseudocalyx composed by fused bracteoles has been reported in *Thunbergia* Retzius (1780: 163) and *Pseudocalyx* Radlkofer (1883: 416), members of the Lamiales (Schönenberger & Endress 1998).

Phenology:—Flowers during the late wet season and dry season, from March to early June. Fruits were recorded in May.

Habitat and distribution:—*Dolichandra chodatii* is known from Argentina (Jujuy, Salta), Bolivia, Brazil (Minas Gerais, Paraná) and Paraguay (Fig. 4). It is generally found between 100–450 m alt., where it is found in dense clusters in moist to dry tropical forest remnants.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 1,296,055.637 km² and the estimated area of occupancy is 112.000 km² (cell width of 2 km). No population level data is available for this taxon.

Specimens examined:—ARGENTINA. **Jujuy:** Calilegua, 21 March 1994, *Múlgura M. 1444* (MO). *Ferraro 7464* (ESA). Ledesma, 17 March 1973, *Cabrera A. 23307* (MO); 20 March 1963, *Legname P.R. 3058* (MCNS, MO, NY). Parque Nacional Calilegua, 6 March 1983, *Hunziker J.H. 10634* (MO). Valle Grande, 24 February 1965, *Fabris H. s.n.* (MO). **Salta:** El Bananal, 4 April 1945, *Meyer T. 8486* (MO). Oran, 28 April 1975, *Cabrera A. 26538* (MO). Rio Pescado, 20 February 1943, *Meyer T. 4798* (MO, NY); 2 March 1943, *Meyer T. 5078* (MO). San Ignacio, 11 April 1945, *Pierotti S.A. 1191* (MO, NY). Urundel, 1 June 1951, *Sleumer H.O. 1996* (MO). BOLIVIA. **Beni:** Trinidad, 26 March 1992, *Saavedra R. 260* (MO). **Chuquisaca:** Muyupampa, 1 August 1986, *William J. 214* (MO). **Santa Cruz:** Estancia San Miguelito, 6 July 1995, *Fuentes A. 944* (MO). Jardín Botánico de Santa Cruz, 9 May 1991, *Gentry A.H. 73602* (MO); 9 May 1991, *Gentry A.H. 73628* (MO). La Angostura, 6 May 2001, *Arbeláez A. 697* (MO). Perseverancia, 11 May 1991, *Gentry A.H. 73686* (MO); 14 May 1991, *Gentry A.H. 73813* (F, MO). Santiago, 16 May 1991, *Gentry A.H. 73967* (F, MO). **Tarija:** Yacuiba, 7 April 1977, *Krapovickas A. 31000* (MO). BRAZIL. **Minas Gerais:** Iguatama, *Melo P.H.A. 538* (SPF). **Paraná:** Cambé, 29 May 1985, *Pizzaia N.L. 1109* (MO). Londrina, 5 May 2010, *Fonseca L.H.M. 136* (MO, SPF). Rio Capivari, 5 April 1961, *Hatschbach G. 6966* (MBM, MO). **São Paulo:** Dracena, *Bernacci L.C. 2064* (SP). PARAGUAY. **Amambay:** Rio Apa, *Hassler E. 11085* (C, G, NY, RB, MO). Sierra de Amambay, *Hassler E. 10281* (MO). **Presidente Hayes:** Primavera, 19 March 1955, *Woolston A.L. 481* (K, MO, NY). **San Pedro:** Chore, 12 March 1987, *Davalos J. 24* (MO).

2. *Dolichandra cynanchoides* Chamisso (1832: 658). *Macfadyena cynanchoides* (Cham.) Morong (1893: 187)

Lectotype (designated here):—BRAZIL. Unknown state, s.d., *Sellow F. s.n.* (HAL0016196!).

= *Dolichandra cynanchoides* var. *latifolia* Hassler (1910: 59).

Holotype:—PARAGUAY. Guairá: Villa Rica, January, *Hassler E. 8725* (G! [G00077799]).

= *Doxantha cuspidata* Miers (1863: 190), *nom. nud.*

Based on: Country? Parana, s.d., *Gibert E.J. 59* (BM? not seen; P not seen) [= Uruguay. Montevideo, (P), det. A. Gentry]

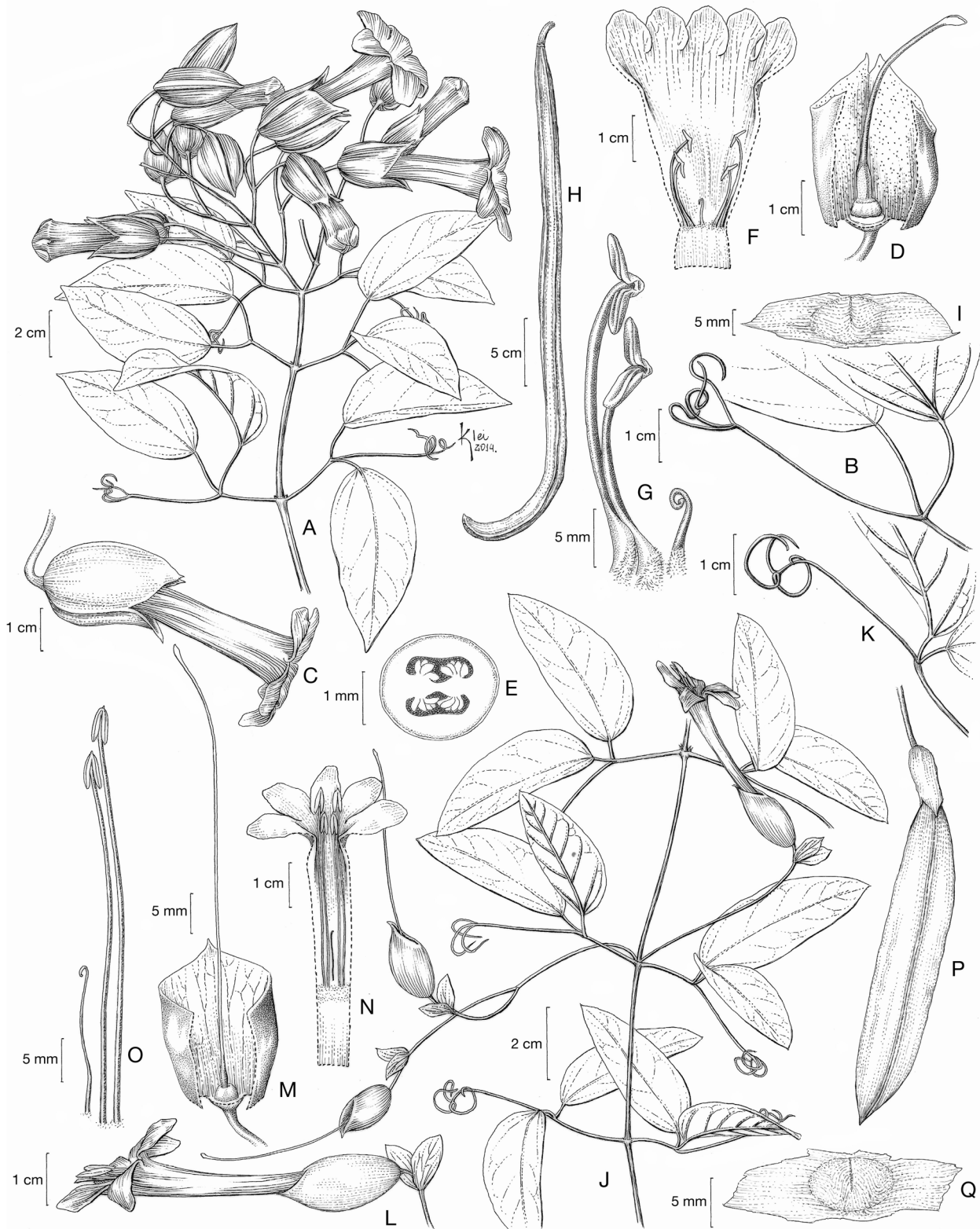


FIGURE 3. *Dolichandra chodatii*. **A.** Habit. **B.** Leaflets and tendril. **C.** Flower overview. **D.** Open calyx showing ovary and nectary. **E.** Ovary cross-section. **F.** Open corolla showing stamens and staminode. **G.** Detail of stamens and staminode. **H.** Fruit. **I.** Seed. *Dolichandra cynanchoides*. **J.** Habit. **K.** Detail of leaflets and tendril. **L.** Flower overview. **M.** Open calyx showing ovary and nectary. **N.** Open corolla showing stamens and staminode. **O.** Detail of stamens and staminode. **P.** Fruit. **Q.** Seed.

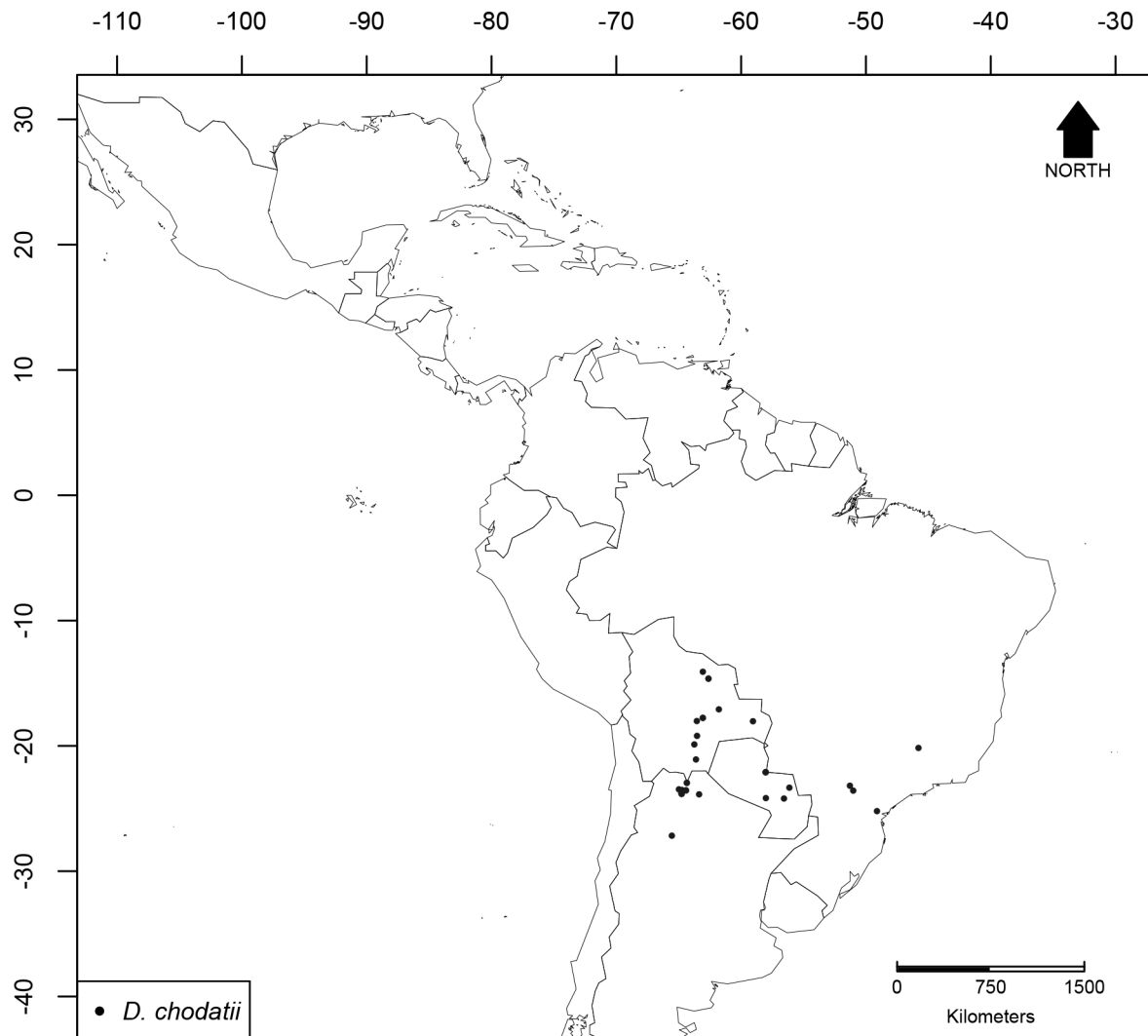


FIGURE 4. Geographic distribution of *Dolichandra chodatii* in South America.

Lianas, without dimorphic juvenile growth. **Stems** terete, dark brown, glabrous, bark not flaky, striate. **Branchlets** terete, purplish and shining, glabrous interpetiolar region without glandular fields; prophylls of the axillary buds lanceolate, 1–4 mm long, smooth, glabrous. **Leaves** bifoliolate with a terminal tendril; petioles subterete; 12–35 mm long, glabrous; petiolules subterete, 3–15 mm long, glabrous; tendrils not woody, subterete, 15–62 mm long, glabrous, tendril arms 7–22 mm long; leaflets ovate, elliptical to oblong, apex acute to cuspidate, base rounded to cordate, symmetric to slightly asymmetric, (25–) 42–94 × (15–) 21–45 mm, chartaceous, adaxial surface glabrous to scattered lepidote with peltate trichomes, abaxial surface glabrous to scattered lepidote with peltate trichomes, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescences** a leafy thyrse, glabrous; floral pedicels 8–34 mm long; floral bracts persistent, rarely deciduous, elliptic mucronate, 6–20 mm long, membranaceous, purplish; bracteoles persistent, rarely deciduous, elliptic mucronate. **Calyces** spathaceous, inflated, single apiculated, 20–27 × 10–15.5 mm, membranaceous, green to purplish, lepidote at the base with peltate trichomes. **Corollas** red (yellow in buds), tubular, with upper 2 lobes forward projected and the lower 3 lobes reflexed, coriaceous, glabrous, except ciliate at the margin of the lobes and lepidote at the level of stamen attachment, eglandular trichomes simple, glandular trichomes stipitate, without nectar guides, corollas 55–72 × 8–17 mm, tubes 43–52 mm long, lobes 7–8 × 6.7–10 mm, obovate to orbicular. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 33–57 mm long, long filaments 40–68 mm long; staminodes 22–23 mm long; anthers exerted, 4–5.5 mm long. **Gynoeceia** with ovaries stipitate and elliptic-oblong, 4 × 3 mm, green, lepidote, trichomes peltate, ovules in multiple series on each placenta; styles 47–68 mm long,

glabrous; stigmas exerted, 2–3 mm long. **Fruits** flattened and oblong, narrowed at both ends, 5–13 × 1.8–2.5 mm, slightly woody, smooth, dark brown to black, glabrous. **Seeds** numerous, winged, oblong, 20–35 × 7–10 × 1.8 mm, seed bodies 6–10 × 5–7 mm, seed wings membranaceous and opaque.

Illustration:—Figure 3J–Q.

Nomenclatural notes:—Chamisso (1832) described *Dolichandra cynanchoides* based on a Sellow collection without mentioning a number. According to Stafleu & Cowan (1976: 482) Chamisso's types should be deposited at LE, but no corresponding specimen was located during two visits to the LE herbarium (M.C. Medeiros and A. Nogueira, pers. comm.). An image of an unnumbered collection of *D. cynanchoides* by Sellow matching the protologue is available at JSTOR (HAL0016196). Since part of the Sellow collections examined by Chamisso (and Schlechtendahl) are known to be kept at HAL (Braun & Wittig 2003), this specimen unambiguously represents original material and is here selected as the lectotype.

Taxonomic notes:—*Dolichandra cynanchoides* can be distinguished from other species of the genus by a series of flower features associated with hummingbird pollination (Gentry 1974, 1990), namely: the purplish calyx and red corolla, exerted anthers and stigma, reflexed lobes of the corolla (Table 1), and large anthers (4–5.5 mm long). Other distinctive features of this species are the stipitate ovary, and flattened and oblong fruit.

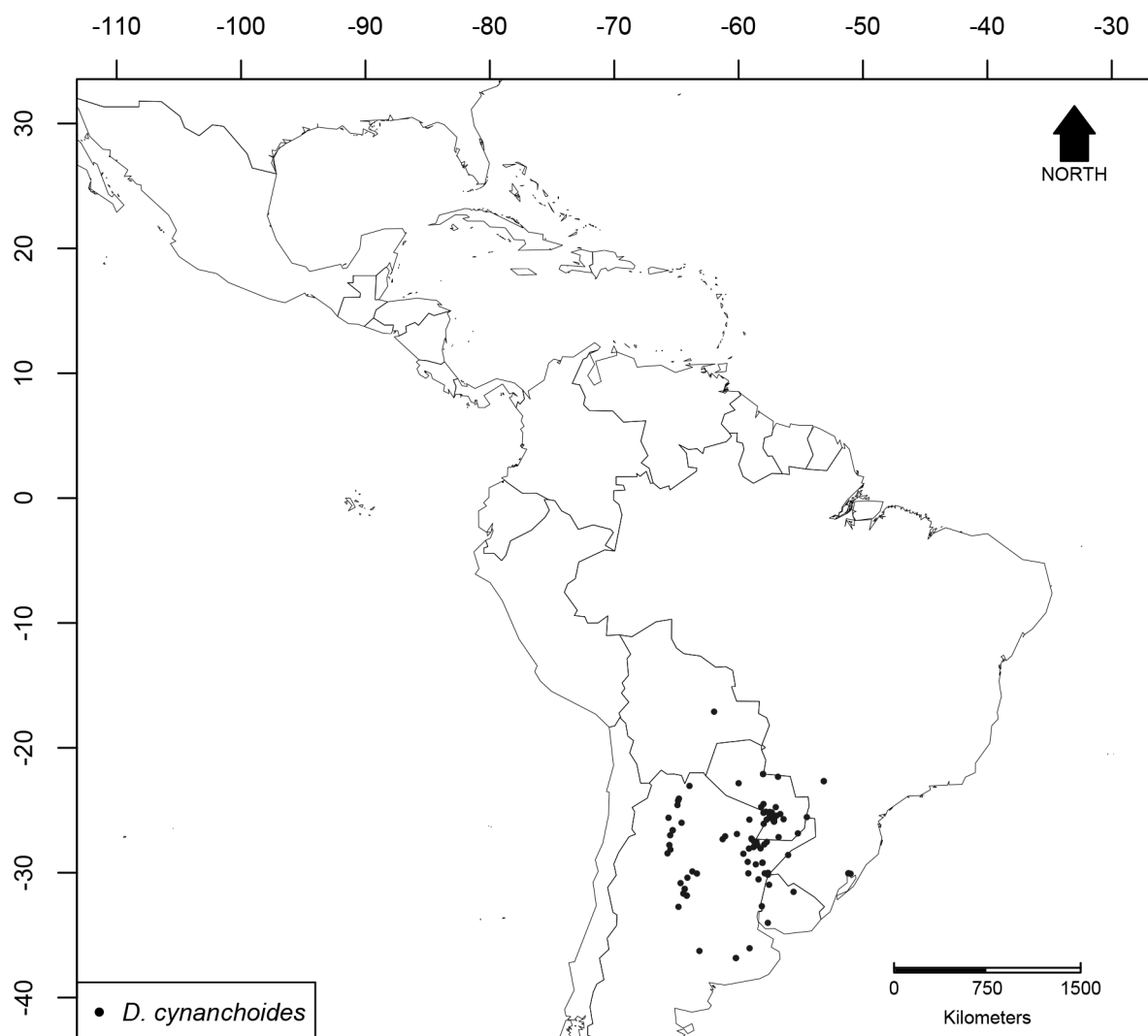


FIGURE 5. Geographic distribution of *Dolichandra cynanchoides* in South America.

Phenology:—Flowers from October to April (dry season) and fruits from November to July.

Habitat and distribution:—*Dolichandra cynanchoides* is distributed from southern Argentina (Buenos Aires, Catamarca, Chaco, Cordoba, Corrientes, Entre Rios, Formosa, Jujuy, Salta, Santa Fé, Tucumán), Bolivia, Brazil

(Paraná, Rio Grande do Sul), Paraguay and Uruguay (Fig. 5), occurring mainly in “chaco” or riparian vegetation in open areas. It is generally found between 500 and 800 m alt.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 2,143,892.775 km² and the estimated area of occupancy is 376.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—Brazil: “Pata-de-galo”, “Clarim” (Sandwith & Hunt 1974). Argentina: “Teyú-igsipó” (= enredadera del lagarto, García 1992), “Sacha-huasca” (Fabris 1965).

Specimens examined:—ARGENTINA. **Buenos Aires:** Buenos Aires, *Galleto L. 1019* (MO). Las Flores, 10 February 1974, *Schulz A.G. 18144* (MO, BM). **Catamarca:** Alijilan, 4 January 1942, *Pierotti S.A. 11534* (MO). Santa Rosa, 9 May 1944, *Varela 80* (MO). **Chaco:** Colonia Benitez, *Schulz A.G. 2394* (F). General Pinedo, 15 March 1955, *Schulz A.G. 8914* (MO). Las Breñas, 26 October 1959, *Schulz A.G. 10664* (MO). Margarita Belen, 5 December 1945, *Aguilar R.T. 537* (MO). Napalpi, 28 December 1946, *Buratovich F. 137* (MO, S, W). Rio Tapenagá, 25 December 1945, *Schulz C. 826* (FI, MO). **Cordoba:** Alta Gracia, *Pierotti S.A. s.n.* (MO); 5 November 1948, *Sota E.R. de la 626* (MO). Canada, 15 January 1948, *Terribile M. 863* (MO). Canteras Quilpo, 24 December 1950, *Sota A.V. de la 3372* (MO, S). Cerro La Cocha, 20 April 1946, *Pierotti S.A. 5058* (BR, MO, U). Colon, 30 December 1950, *Sota A.V. de la 3337* (L, MO). La Calera, 9 December 1978, *James 4035* (MO); 10 December 1979, *James 4064* (MO). Sierra Chica, 8 December 1878, *Hieronymus G. s.n.* (MO); *Meebold A. s.n.* (MO). Tulumba, 26 December 1947, *Balegno B. 1590* (MO). Villa de Maria, 20 December 1947, *Balegno B. 1453* (C, MO). **Corrientes:** Arroyo Pollo, 29 August 1945, *Ibarrola C. 3193*(F, MO). Arroyo San Juan, 19 November 1976, *Seigler D. DS10145* (MO). Cabred, *Farrola 2258* (FI); 26 January 1945, *Ibarrola C. 2268* (A, MO, NY). Corrientes, *Gentry A.H. 59465* (MO); 30 September 1987, *Gentry A.H. 59465* (MO). Empedrado, 19 December 1976, *Irigoyen J. 352* (C, F, G, MO). Estancia Santa Maria, 26 November 1950, *Pedersen T.M. 879* (MO). Goya, 2 January 1979, *Arbo M.M.2243* (MO). Isla Ibate, 29 April 1945, *Huidobro A.M.R. 2042* (MO, NY, W). Lomas de Vallejos, 10 October 1945, *Ibarrola T.S. 3489* (BM, F, MO). Mburucuya, 26 November 1950, *Lourteig A. 879* (MO). Mercedes, 7 January 1947, *Huidobro A.M.R. 4051* (MO); *Schinini A. 11633* (MO); 17 September 1979, *Schinini A. 18668* (MO). Pellegrini, 30 October 1971, *Krapovickas A. 20092* (MO). Perugorria, *Tressens S.G.598* (MO, P). Rio Mirinay, 16 February 1979, *Schinini A. 17322* (MO). Saldan, 30 December 1950, *Hassler E. s.n.* (MO). San Luis del Palmar, 29 January 1972, *Quarín C. 355* (GH, MO). Timbo Cora, 11 December 1945, *Ibarrola 3878* (MO, S, W). **Entre Rios:** Estancia Buena Esperanza, *Pedersen T.M. 8121* (C, MO). **Formosa:** Colonia Casco Cué, 7 February 1946, *Morel J. 857* (MO). El Paraiso, 4 October 1981, *Valla J.J. 102 (BAA17662)* (MO). Parque Nacional Pilcomayo, 2 December 1946, *Morel I. 1716* (MO). Riacho Pilagá, 27 December 1945, *Morel J. 745* (BM, F, MO, NY). **Jujuy:** Chalican, *Cabrera A. 31507* (MBM, MO). San Pedro, 19 November 1978, *Renvoize S.A. 3529* (MO, NY). **Salta:** Agua Caliente, 8 November 1927, *Venturi S. 5458* (MO). Alemania, 17 December 1929, *Venturi S. 9908* (BM, GH, MO, S, US). Senda Hachada, 1 October 1983, *Novara L.J. 3796* (MO). **Santa Fe:** Villa Ana, 29 October 1971, *Quarín C. 27* (F, MO). **Tucuman:** La Cocha, 23 February 1941, *Meyer T. 3899* (MO, NY). Tapia, 27 December 1935, *Mexia Y. 4339* (GH, MO); 15 December 1948, *Pedersen T.M. s.n.* (MO). Tucuman, *Haas J. de 947* (MO). BOLIVIA. **Santa Cruz:** Estancia San Miguelito, 3 January 1996, *Fuentes A. 1554* (MO). BRAZIL. **Paraná:** Foz do Iguaçu, 12 August 1966, *Lindeman J.C. 3478* (MO). Rio Paranapanema, 23 June 1966, *Hatschbach G. 14451* (F, MBM, NY, US); 23 June 1966, *Hatschbach G. 14457* (MBM, MO). **Rio Grande do Sul:** Porto Alegre, *Rambo B. 40522* (MO); *Rambo B. 44933* (MO); *Vianna E. s.n.* (MO). São Borja, 2 December 1952, *Lindeman J.C. s.n.* (MO). Viamão, *Porto M.L. 576* (L, MO). PARAGUAY. **Amambay:** Rio Apa, 1908, *Hassler E. s.n.* (MO). **Boqueron:** Pozo Arias, 29 October 1985, *Mereles F. 529* (MO). **Central:** Estero del Ypoal, 8 December 1990, *Zardini E. 25238* (MO); 18 March 1992, *Zardini E. 31221* (MO). Jardín Botánico Y Zoológico, *Pérez B. 396* (AS, MO). Rio Hermoso, 28 September 1893, *Malme G.O.A. 1002* (L, MO, UPS). San Bernardino, 8 September 1916, *Osten C. 8994* (MO). Tavarory, 16 December 1991, *Zardini E. 29557* (AS, MO). Ypacaray, *Hassler E. 12548* (C, BM, G, A, GH, L, NY, MO, S); 1913, *Hassler E. 12548a* (MO); 1897, *Hassler E. 3144* (MO). **Cordillera:** Nueva Colombia, 27 August 1988, *Zardini E. 6868* (G, MO). Rio Salado, 13 September 1978, *Arbo M.M. 1629* (MO); 18 November 1989, *Zardini E. 16595* (AS, MO, TEX); 4 August 1990, *Zardini E. 22688* (MO). **Guaira:** Cordillera de Ybytyruzu, 2 October 1985, *Gentry A.H. 51985* (MO). Mbocayaity-Melgarejo, 6 July 1992, *Zardini E. 32322* (MO). **Misiones:** Rio Bermejo, 14 December 1950, *Schulz A.G. 7845* (MO). Rio Pirayu, 11 October 1893, *Lindmann C.A.M. 2335* (L, MO, S, UPS). Santiago, 26 April 1961, *Pedersen T.M. 5986* (L, MO). **Paraguari:** Acahay Massif, 1 November 1985, *Brunner D.R. 1264* (MO); 4 December 1988, *Zardini E. 8289* (MO); 5 January

1989, *Zardini E. 9180* (MO). Paraguari, 12 September 1980, *Casas J.F. FC3508* (MO); 12 September 1980, *Casas J.F. FC3508* (MO); 12 September 1980, *Fernandez-Casas J. 3508* (G, MO); 30 May 1989, *Gentry A.H. 66203* (MO). **Presidente Hayes:** Estancia Fortuna, 15 July 1993, *Mereles F. 5257* (MO). Rio Apa, 1908, *Fiebrig K.A.G. 4533* (MO). Pozo Arias, *Silva N.T. da 2160* (SPF). Rio Pilcomayo, 11 November 1985, *Brunner D.R. 1335* (MO). Trans-Chaco Highway, 30 May 1989, *Gentry A.H. 66210* (MO); 2 October 1985, *Gentry A.H. MO*, (MO). **San Pedro:** Pirayu, *Lindman C. A-2335* (MO). URUGUAY. **Colonia:** Miguelete, 5 February 1928, *Herter W.G. 1016A* (MO). **Rio Negro:** San Javier, 27 November 1928, *Herter W.G. 1016* (B, HB, M, MBM, MO, S, US). **Rivera:** Cunapiru, 1928, *Wright D. s.n.* (MO). **Salto:** Arapey, April 1949, *Herter 1016d* (MO).

3. *Dolichandra dentata* (Schumann 1894: 227) L.G.Lohmann in Lohmann & Taylor (2014: 430)

≡ *Macfadyena dentata* K.Schum.

Lectotype (designated by Lohmann & Taylor 2014):—URUGUAY. Concepción del Uruguay, November 1877, *Lorentz P.G. s.n.* (K! [K000449794]).

Lianas, without dimorphic juvenile growth. **Stems** terete, brown, puberulent-pubescent, bark not flaky, striate. **Branchlets** terete, green, puberulent-pubescent, trichomes simple; interpetiolar regions with glandular fields; prophylls of the axillary buds lanceolate, 1–2 mm long, smooth, puberulent-pubescent, trichomes simple. **Leaves** bifoliolate with a terminal tendril; petioles subterete, 13–35 mm long, puberulent-pubescent, trichomes simple; petiolules subterete, 6–18 mm long, puberulent-pubescent; tendrils not woody, subterete, 18–30 mm long, puberulent-pubescent, trichomes simple, tendril arms 6–10 mm long; leaflets ovate to ovate-elliptic, apex cuspidate, base obtuse to rounded, symmetric or slightly asymmetric, 25–86 × 21–53 mm, membranaceous, adaxial surface puberulent-pubescent, trichomes simple more concentrated at main vein, abaxial surface puberulent-pubescent with scattered glandular trichomes, eglandular trichomes simple, glandular trichomes peltate and patelliform, first venation pinnate, second venation brochidodromous, third venation reticulate, margin serrate. **Inflorescences** reduced to a lateral raceme with up to three flowers, puberulent-pubescent, trichomes simple; floral pedicels 10–25 mm long; floral bracts deciduous, rarely present, elliptic to obovate mucronate, 5–9 mm long, membranaceous, green; bracteoles persistent, rarely deciduous, elliptic to obovate mucronate. **Calyces** spathaceous, non-inflated, with incurved single apicule, 10–30 × 7–20 mm, membranaceous, green, glabrous. **Corollas** yellow, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, lobes orbicular, membranaceous, lepidote with scarce simple trichomes outside, ciliate at the margin of the lobes and lepidote at stamen attachment, eglandular trichomes simple, glandular trichomes stipitate, nectar guides present, corollas 55–76 × 10–15 mm, tubes 42–58 mm long, lobes 13–15 × 15–17 mm, orbicular. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 13–15 mm long, long filaments 20–23 mm long; staminodes 5–7 mm long; anthers included, 3–4 mm long. **Gynoecia** with ovaries linear, 6–7 mm long, green, lepidote, trichomes peltate, ovules in one series on each placenta; styles 30–37 mm long, glabrous, stigmas included, 3–4 mm long. **Fruits** terete and linear, narrowed at both ends, 10–31 × 1–1.5 cm, slightly woody, smooth, dark brown to black, glabrous. **Seeds** numerous, winged, oblong, 21–26 × 9–12 × 4.4 mm, seed bodies 19–23 × 10 mm, seed wings woody with membranaceous translucent margin.

Illustration:—Figure 6A–H.

Taxonomic notes:—*Dolichandra dentata* shares a green spathaceous calyx, and a yellow corolla with *D. hispida*, *D. quadrivalvis* and *D. uncata*. *Dolichandra dentata* is morphologically most similar to *D. uncata*, differing by its serrate leaves (vs. entire leaves in *D. uncata*) and winged seeds (vs. corky seeds in *D. uncata*). *Dolichandra dentata* is also morphologically similar to *D. unguis-cati*, with which it shares yellow flowers and toothed leaflet margins, the most distinctive features of *D. dentata*; however, the toothed margins are found in all individuals of *D. dentata* and only occasionally in *D. unguis-cati*. *Dolichandra dentata* differs from *D. unguis-cati* by the subspathaceous calyx (vs. truncate calyx in *D. unguis-cati*), lanceolate, smooth prophylls of the axillary buds (vs. ovate and longitudinally striate prophylls of the axillary buds in *D. unguis-cati*), and seeds with narrow wings (vs. seeds with wide wings in *D. unguis-cati*) (Table 1). As such, *D. dentata* does not have an exclusive synapomorphy but is recognized based on a unique combination of characters following the species recognition criterion proposed by Cracraft (1983). The seeds with reduced wings are associated with water dispersal (Gentry 1974), which is consistent with its distribution along river basins.

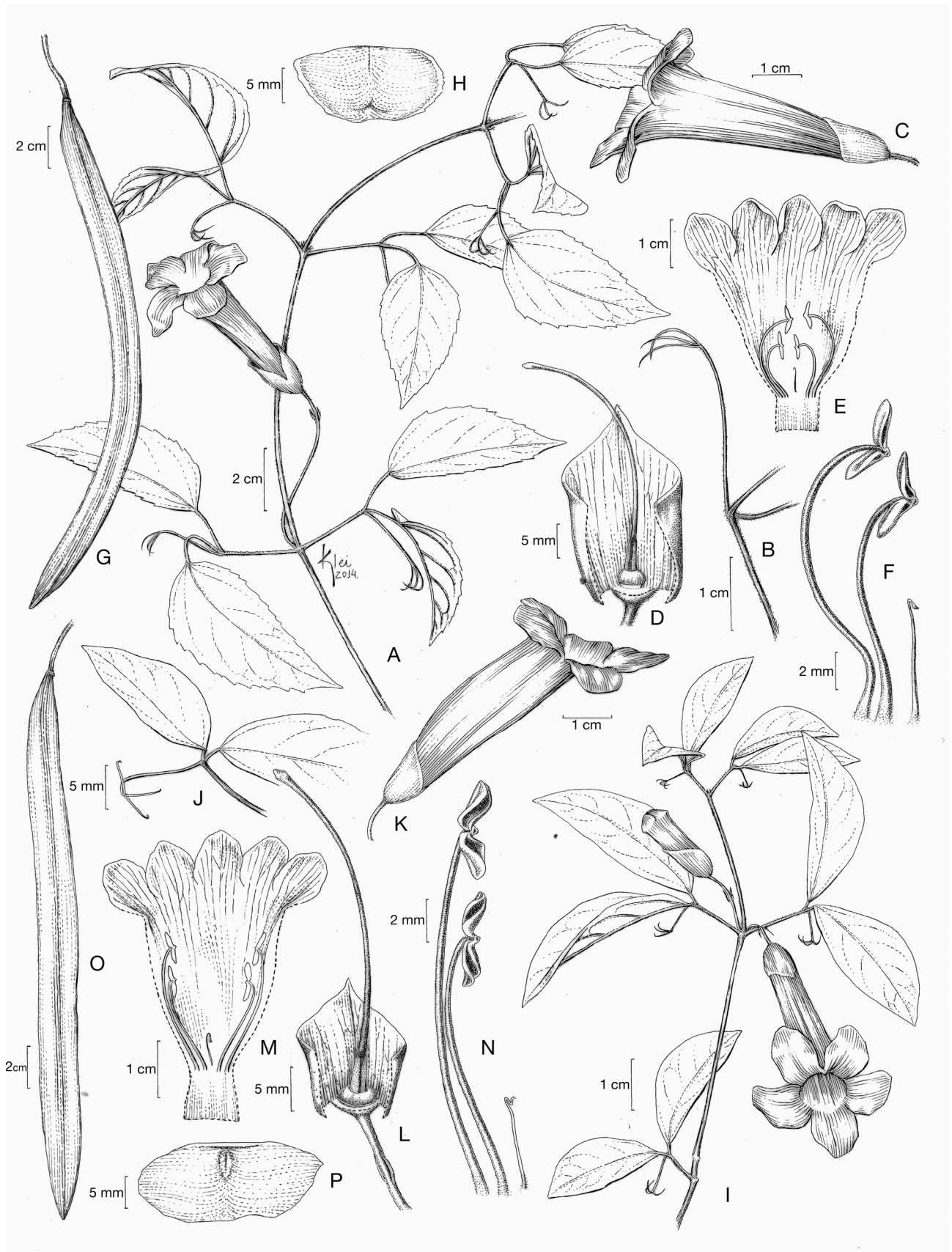


FIGURE 6. *Dolichandra dentata*. **A.** Habit. **B.** Tendril. **C.** Flower overview. **D.** Open calyx showing ovary and nectary. **E.** Open corolla showing stamens and staminode. **F.** Detail of stamens and staminode. **G.** Fruit. **H.** Seed. *Dolichandra uncata*. **I.** Habit. **J.** Detail of leaflets and tendril. **K.** Flower overview. **L.** Open calyx showing ovary and nectary. **M.** Open corolla showing stamens and staminode. **N.** Detail of stamens and staminode. **O.** Fruit. **P.** Seed.

Phenology:—Flowers from September to April, with a flowering peak in November. Fruits from November to April.

Habitat and distribution:—*Dolichandra dentata* occurs in Argentina (Corrientes, Entre Rios, Misiones), Brazil (Mato Grosso do Sul, Paraná, Santa Catarina), Paraguay and Uruguay (Fig. 7), where it is found mainly along the basins of Rivers Uruguay and Paraná, in riverbanks and riparian forest. It is occasionally found in dense forest.

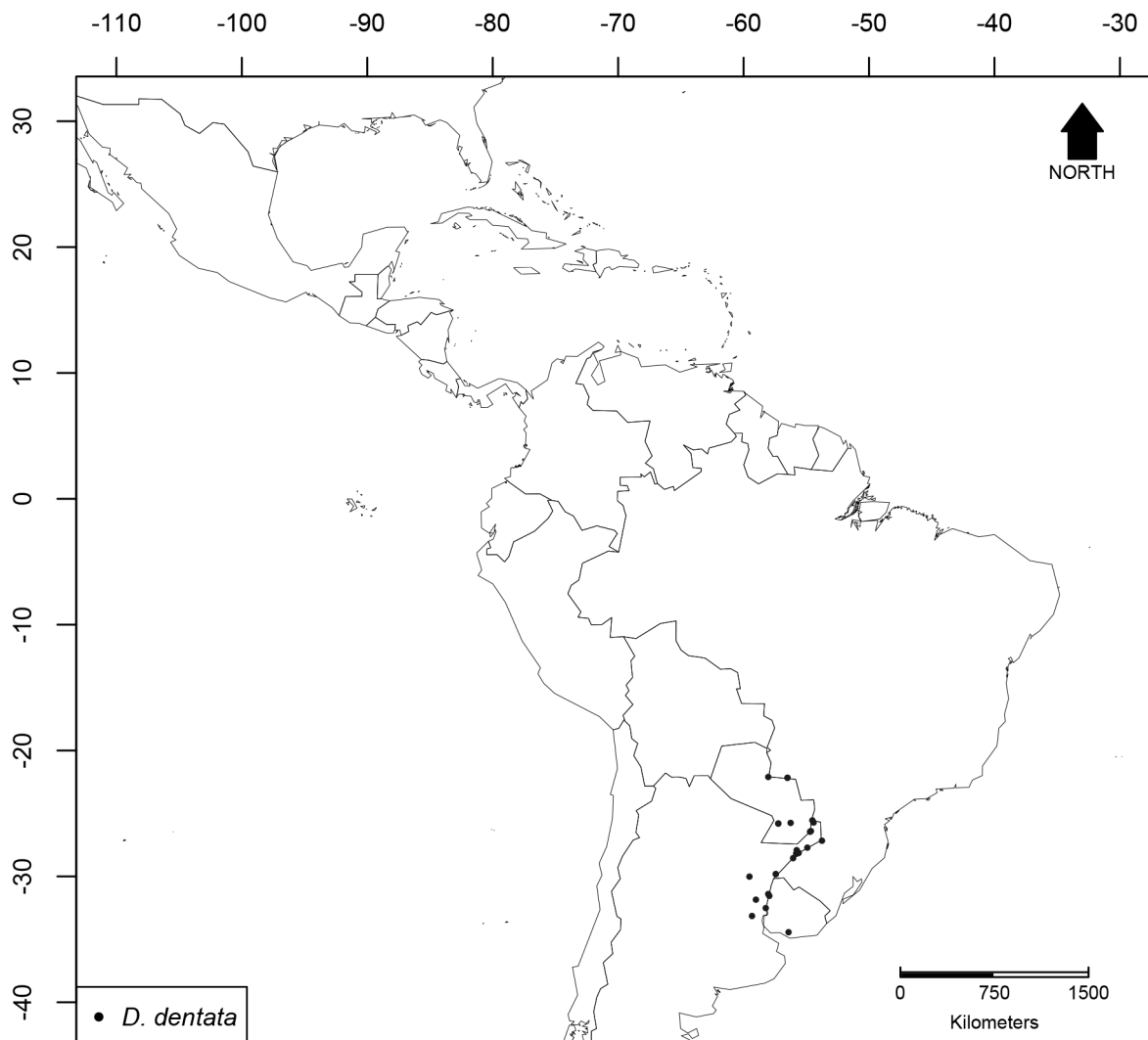


FIGURE 7. Geographic distribution of *Dolichandra dentata* in South America.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for this species is 355,482.362 km² and the estimated area of occupancy is 84.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—Brazil: “Cipó-de-canoa” (Sandwith & Hunt 1974). Argentina: “Uña de gato” (Fabris 1979).

Specimens examined:—**ARGENTINA. Corrientes:** Arroyo Chimiray, 3 December 1981, *Tressens S.G. 1487* (MO). Colonia Garabi, 3 December 1970, *Krapovickas A. 17047* (MO). Guarruchos, 12 April 1974, *Krapovickas A. 25055* (MO). Santo Tome, 5 February 1979, *Schinini A. 16723* (MO). **Entre Rios:** Arroyo La China, 24 December 1941, *Nicora E.G. 3317* (MO). Concordia, 24 January 1946, *Marcano-Berti L. 268* (MO). Gualeguay, 5 January 1932, *Burkart A. 4284* (MO). Villaguay, 10 November 1973, *Burkart A. 30160* (MO). **Misiones:** Apostoles, 18 September 1961, *Fabris H. 7351* (MO). Arroyo Piray Guazu, 7 January 1972, *Quarín C. 262* (MO).

Eldorado, 7 June 1972, *Quarín C.* 264 (MO). Panambi, 25 December 1971, *Mroginski L.* 551 (MO). Parque Nacional Iguazu, 19 December 1980, *Cusato L.* 461 (MO). BRAZIL. **Mato Grosso do Sul:** Bela Vista, *Hatschbach G.* 76512 (MBM). **Paraná:** Foz do Iguazú, *Lindeman J.C.* 3497 (MO). **Santa Catarina:** Iporanga, *Fonseca L.H.M.* 124 (SPF). Itapiranga, 1 February 1964, *Reitz R. s.n.* (MO). PARAGUAY. **Amambay:** Bellavista, 13 February 1982, *Casas J.F. FC6288* (MO); 13 February 1982, *Fernandez-Casas J.* 6288 (MO, NY). Rio Apa, *Hassler E.* 8238 (C, G, K, MICH, MO). **Guaira:** Cordillera de Ybytyruzu, 22 December 1986, *Schinini A.* 25117 (MO). **Paraguari:** Carapegua, 12 September 1980, *Casas J.F.* 8694 (G, MO); *Rojas T.* 3360 (MO). URUGUAY. **Canelones:** Santa Lucia, *Gibert 1152* (F, MO, MICH, NY). **Salto:** Dayman, 17 December 1905, *Berro M.* 3489 (G).

4. *Dolichandra hispida* (Candolle 1845: 205) L.H.Fonseca & L.G.Lohmann in Fonseca *et al.* (2015: 35–43)

≡ *Spathodea hispida* DC.

≡ *Macfadyena hispida* (DC.) Seemann (1863: 227).

Holotype:—BRAZIL. Mato Grosso: Cuiabá, 1832, *Silva Manso A.* 105A (G-DC! [G00133604], photo F neg. 7375!).

= *Macfadyena pubescens* Moore (1895: 418).

Holotype:—PARAGUAY. “inter Villa Maria et Corumbá”, December 1891–92, *Moore 1021* (BM! [BM000578432], isotype NY!).

= *Spathodea mollis* Sonder (1849: 561).

≡ *Macfadyena mollis* (Sond.) Seemann (1863: 227).

Lectotype (designated here):—BRAZIL. Minas Gerais, s.d., *Regnell 292* (BM000578577!); replaces the lectotype incorrectly designated by Fonseca *et al.* (2015).

Lianas, without dimorphic juvenile growth. **Stems** terete, brown, hispid, bark not flaky, striate. **Branchlets** terete, green, hispid with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate; interpetiolar regions with glandular fields; prophylls of the axillary buds lanceolate, 1.6–3 mm long, smooth, hispid with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate. **Leaves** bifoliolate with a terminal tendril; petioles subterete, 9.5–44.9 mm long, hispid with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate; petiolules subterete, 3–29 mm long, hispid with scarcely glandular trichomes; tendrils not woody, subterete, 15.8–21 mm long, hispid with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate, tendril arms 6–11.5 mm long, leaflets ovate, obovate or elliptic, apex acute to short acuminate with a drop tip, base rounded, symmetric or slightly asymmetric, 32–86 × 12–71 mm, membranaceous, adaxial surface hispid, trichomes simple, abaxial surface hispid with trichomes more concentrated at the main vein, trichomes simple, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescence** reduced to a lateral raceme with up to three flowers, rarely reduced to one flower, hispid with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate and pateliform; floral pedicels 5–43 mm long; floral bracts deciduous, rarely present, elliptic to obovate mucronate, 0.7–5.5 mm long, membranaceous, green; bracteoles deciduous, rarely present, elliptic to obovate mucronate. **Calyces** spathaceous, non-inflated, with an incurved single apicule, 14–32 × 7–16 mm, membranaceous, green, glabrate to hispidulous throughout and lepidote, eglandular trichomes simple, glandular trichomes peltate and pateliform. **Corollas** yellow, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, glabrate to hispidulous and lepidote at stamen attachment, eglandular trichomes simple, glandular trichomes stipitate, nectar guides present, corollas 51–91 × 13–22 mm, tubes 46–59 mm long, lobes 12–20 × 12–21 mm, obcordate to orbicular. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 11.5–17 mm long, long filaments 17.4–24 mm long; staminodes 8–9 mm long; anthers included, 3–3.9 mm long. **Gynoecium** with ovaries linear, 7–9 × 1.4 mm, purplish, glabrous; styles 26–30 mm long, glabrous, ovules in one series on each placenta; stigmas included, 3.3–5.4 mm. **Fruits** flattened and linear, narrowed at both ends, 77–125.8 × 1.17–2.2 cm, slightly woody, smooth, dark brown, glabrous. **Seeds** numerous, winged, oblong, 22–38 × 14–18 × 2 mm, seed bodies 8–15 × 6–9 mm, seed wings membranaceous and translucent.

Illustration:—Figure 8A–J.

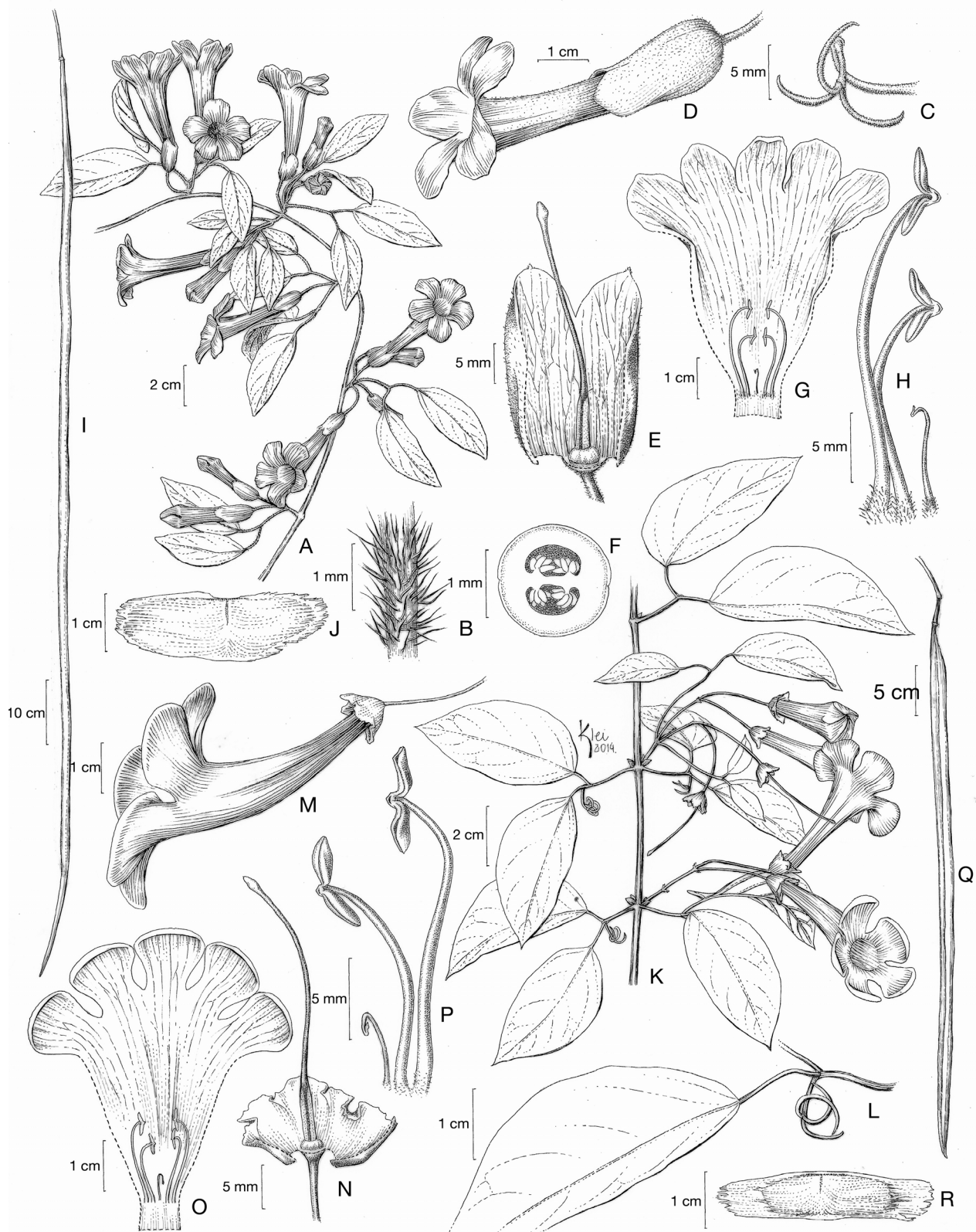


FIGURE 8. *Dolichandra hispida*. **A.** Habit. **B.** Detail of trichomes. **C.** Tendril. **D.** Flower overview. **E.** Open calyx showing ovary and nectary. **F.** Ovary cross-section. **G.** Open corolla showing stamens and staminode. **H.** Detail of stamens and staminode. **I.** Fruit. **J.** Seed. *Dolichandra unguis-cati*. **K.** Habit. **L.** Detail of leaflets and tendril. **M.** Flower overview. **N.** Open calyx showing ovary and nectary. **O.** Open corolla showing stamens and staminode. **P.** Detail of stamens and staminode. **Q.** Fruit. **R.** Seed.

TABLE 1. Key morphological features of all species of *Dolichandra*.

Morphological characters	<i>D. chodatii</i>	<i>D. cynanchoides</i>	<i>D. dentata</i>	<i>D. hispida</i>	<i>D. quadrivalvis</i>	<i>D. steyermarkii</i>	<i>D. uncata</i>	<i>D. unguiculata</i>	<i>D. unguis-cati</i>
Flaky bark	Absent	Absent	Absent	Absent	Absent	Present	Absent	Present	Absent
Prophyll form	Lanceolate	Lanceolate	Lanceolate	Lanceolate	Lanceolate or deltoid	Lanceolate	Lanceolate	Lanceolate	Ovate
Prophyll texture	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Longitudinally striate
Leaf margin	Entire	Entire	Serrate	Entire	Entire	Entire	Entire	Entire	Serrate or entire
Tendrils	Persistent and woody	Caducous	Caducous	Caducous	Persistent and woody	Persistent and woody	Caducous	Caducous	Caducous
Calyx color	Green to purplish	Green to purplish	Green	Green	Green	Green to purplish	Green	Green to purplish	Green
Calyx shape	Campanulate	Spathaceous	Spathaceous	Spathaceous	Spathaceous	Campanulate	Spathaceous	Campanulate	Campanulate
Calyx apex	Three-lobed	Single apiculate	Single apiculate	Single apiculate	Single apiculate	Five-lobed	Single apiculate	Five-lobed	Truncated to sinuous
Corolla color	Tube purple and lobes pink	Red	Yellow	Yellow	Yellow	Purplish	Yellow	Purplish	Yellow
Corolla form	Tubular-infundibuliform	Tubular	Infundibuliform	Infundibuliform	Infundibuliform	Infundibuliform	Infundibuliform	Infundibuliform	Infundibuliform
EFNs at the corolla	Present	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent
Position of sexual whorls	Included	Exserted	Included	Included	Included	Included	Included	Included	Included
Fruit shape	terete and linear	Flattened and oblong	Flattened and linear	Flattened and linear	terete and oblong	Flattened and linear	Flattened and linear	Flattened and linear	Flattened and linear
Fruit dimensions	20–45 x 1.5–2.5 cm	5–13 x 1.5–2.5 cm	10–31 x 1–1.5 cm	77–125.8 x 1.17–2.2 cm	11–17.5 x 3.5–6 cm	26–32 x 1.4–2.8 cm	16–30 x 1.1–2.2 cm	20–50 x 1–1.5 cm	18–136 x 1–2 cm
Seed wings texture	Membranaceous	Membranaceous	Woody	Membranaceous	Membranaceous	Membranaceous	Woody	Membranaceous	Membranaceous

Nomenclatural notes:—Fonseca *et al.* (2015) propose the lectotypification of *Macfadyena mollis* (Sonder 1849: 561) Seemann (1863: 227) using the gathering *Regnell I-292* (MO-2229711). This gathering was made in 1855, after the name *Spathodea mollis* Sonder (1849: 561) was published and could not be selected as a lectotype according to Art. 9.3 of the International Code of Nomenclature (McNeill *et al.* 2012). Therefore, we here reject the lectotypification proposed by Fonseca *et al.* (2015) and select the specimen *Regnell 292* (BM000578577) as the lectotype. The label of the specimen *Regnell 292* does not include any information on the date of collection, but it is possible to recognize the handwriting of Otto Wilhelm Sonder (using as reference: <http://linnaeus.nrm.se/botany/fbo/hand/sonder.html.en>) on an additional label identifying the material as “*Spathodea mollis* Sonder n. spec.,” thus indicating that this gathering indeed represents original material analyzed by Sonder.

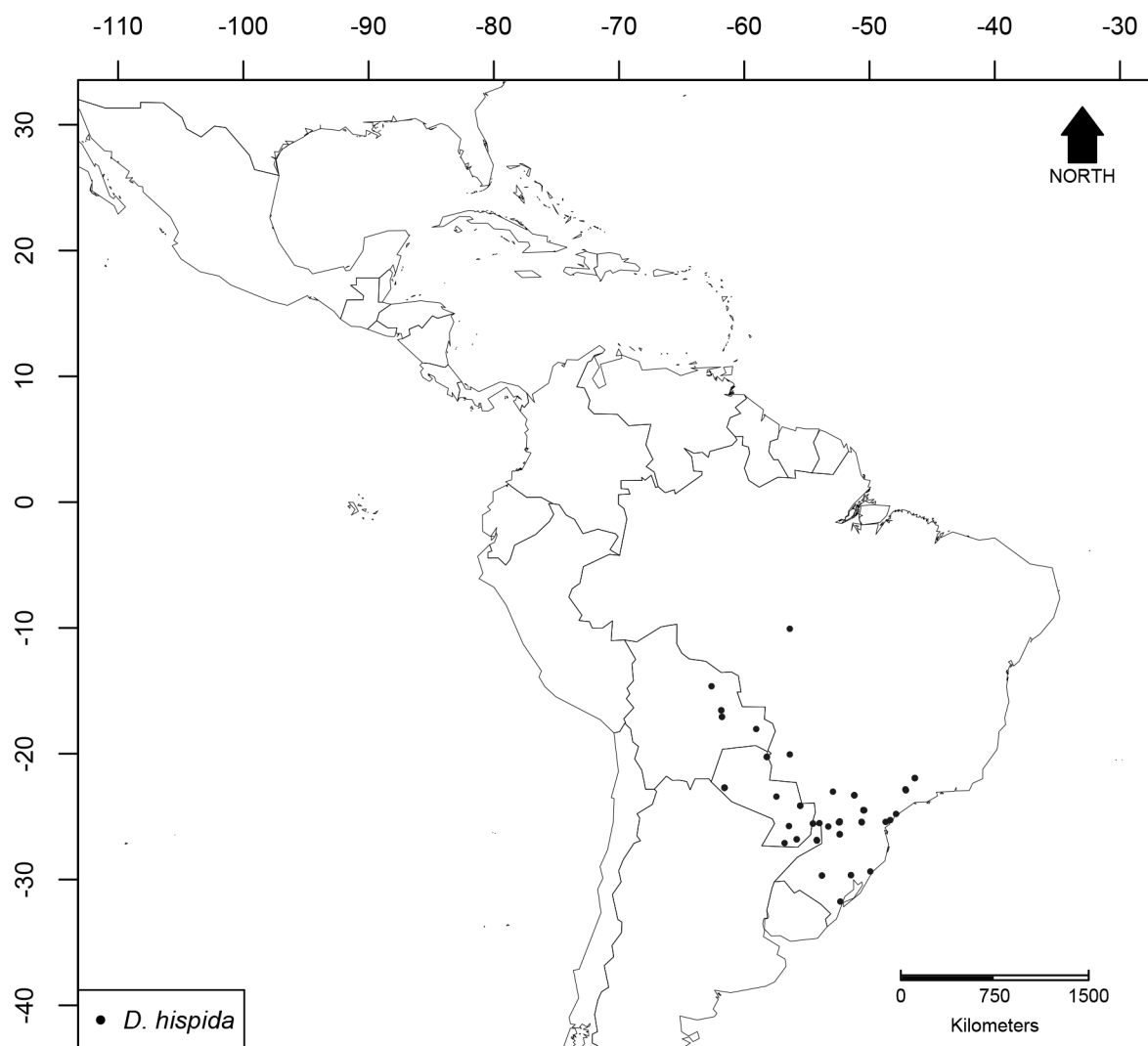


FIGURE 9. Geographic distribution of *Dolichandra hispida* in South America.

Taxonomic notes:—*Dolichandra hispida* shares a green spathaceous calyx and a yellow corolla with *D. dentata*, *D. quadrivalvis*, and *D. uncata*. *Dolichandra hispida* is morphologically most similar to *D. dentata* and *D. uncata*, however it differs by the hispid indument (vs. glabrous to pubescent indument in *D. dentata* and *D. uncata*) and a purplish ovary (vs. green ovary in all other species of *Dolichandra*). *Dolichandra hispida* is also morphologically similar to *D. unguis-cati* with which it shares a green calyx, a yellow corolla, long capsules (that reach 125.8 cm in *D. hispida* and 136 cm in *D. unguis-cati*), and seeds with conspicuous hyaline wings that are thought to be associated with wind dispersal (Table 1).

Phenology:—Flowers from September to January and fruits from September to February.

Distribution:—*Dolichandra hispida* occurs in moist to dry tropical forest remnants of Argentina (Misiones, Santa Cruz), Bolivia, Brazil (Mato Grosso, Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo),

and Paraguay (Fig. 9).

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 2,209,625.833 km² and the estimated area of occupancy is 140.000 km² (cell width of 2 km). No population level data is available for this taxon.

Specimens examined:—ARGENTINA. **Misiones:** Guarani, 03 March 2000, *Deginani N. 1630* (MO). BOLIVIA. **Santa Cruz:** Estancia San Miguelito, 02 December 1996, *Fuentes A. 1342* (MO); Las Trancas, 16 November 1994, *Jardim A. 1204* (MO). BRAZIL. **Mato Grosso:** Alta Floresta, 18 Sep. 1991, *Macedo 3009* (INPA). **Paraná:** Antonina, 31 October 1973, *Hatschbach G. 29172* (MBM); Foz do Iguaçu, *Fonseca L.H.M. 111* (SPF); Foz do Iguaçu, 14 October 1962, *Hatschbach G. 9378* (MBM); Guaraqueçaba, 20 November 2003, *Hatschbach G. 76720* (MBM); Irati, 01 October 1982, *G. Hatschbach 45518* (MBM); Laranjeiras do Sul, 07 March 1991, *Silva 955* (UPCB, SP); 31 October 1985, *Dias s.n.* (FUEL, MO); Morretes, 12 March 2008, *Fonseca L.H.M. 27* (SPF, MBM); Pinhão, 22 February 1996, *Hatschbach G. 64429* (MBM); Rio Bonito do Iguaçu, 23 June 1995, *Poliquesi 328* (MBM, SPF); Tibagi, 12 October 1959, *Hatschbach G. 6373* (MBM). **Rio Grande do Sul:** Morrinhos do Sul, 19 October 1997, *Jarenkow 3204* (PEL, MBM). **Santa Catarina:** Apiúna, 11 October 2009, *Kniess K. 561* (SPF). **São Paulo:** Iporanga, 23 October 2010, *Fonseca L.H.M. 157* (SPF, SP, MBM, MO); Iporanga, 23 October 2010, *Fonseca L.H.M. 162* (SPF, SP, MBM, MO). PARAGUAY. **Chaco:** Bahia Negra, 13 November 1946, *Rojas T. 13743* (MO); Itapua, 10 October 1984, *Brunner D.R. 853* (MO). **Alto Parana:** Puerto Stroessner, 27 May 1989, *Gentry A.H. 66144* (MO).

5. *Dolichandra quadrivalvis* (Jacquin 1809: 37) Lohmann (2008: 273)

≡ *Bignonia quadrivalvis* Jacq.

≡ *Melloa quadrivalvis* (Jacq.) Gentry (1973b: 237) as “*quadrivalva*”.

Lectotype (designated by Lohmann & Taylor 2014):—Jacq., *Fragm. Bot.* 37, tab. 40, fig. 3. 1800 [1809] (illustration!).

≡ *Spathodea fraxinifolia* Kunth in Humboldt *et al.* (1819: 147).

≡ *Melloa fraxinifolia* (Kunth) K.Schum. ex Schnee in Pittier (1947: 407).

Lectotype (designated by Gentry 1973a):—VENEZUELA. Río Guárico, s.d., *von Humboldt F.W.H.A. & Bonpland A.J.A. 780* (P! [P00670824]).

≡ *Bignonia populifolia* Candolle (1845: 159–160).

≡ *Melloa populifolia* (DC.) Bureau in Bureau & Schumann (1897: 295–296).

Holotype:—BRAZIL. Cuiabá, s.d., *Silva Manso A. 101B* (G-DC! [G00133269]).

≡ *Spathodea pisoniana* Candolle (1845: 209).

≡ *Tabebuia pisoniana* (DC.) Miers (1863: 199).

Holotype:—BRAZIL. Bahia, November 1818, *von Martius C.F.P. s.n.* (M! [M-0086465]).

≡ *Phryganocydia pisoniana* Mart. ex Candolle (1845: 209), *nom. invalid.*

Based on: Unknown country. Without locality, s.d., *Marcgrave s.n.* (C? not seen) [published in the synonymy of *Spathodea pisoniana* DC.]

≡ *Macfadyena terniflora* Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Ceará, Crato, s.d., *Gardner G.* (BM not seen; P!) [Gentry 1982b]

Lianas, without dimorphic juvenile growth. **Stems** terete, grey to brown, glabrous to puberulent, bark not flaky, striate. **Branchlets** terete, green, glabrous to puberulent, trichomes simple; interpetiolar regions with inconspicuous glandular fields; prophylls of the axillary buds lanceolate or deltoid and apiculate, 2.5–4 mm long, smooth, glabrous to puberulent, trichomes simple. **Leaves** bifoliolate with terminal tendril; petioles subterete, 7–50 mm long, glabrous to puberulent, trichomes simple; petiolules subterete, 5–35 mm long, glabrous to puberulent; tendrils sometimes woody, subterete, 32–85 mm long, glabrous to scarcely puberulent, trichomes simple, tendril arms 7–25 mm long; leaflets ovate, ovate-elliptic, elliptic, lanceolate, ovate-lanceolate, or oblong-elliptic, apex acute to rounded, emarginate to cuspidate, base cuneate to cordate, symmetric or slightly asymmetric, 38–150 × 11–111 mm, chartaceous, adaxial surface glabrous to scattered lepidote, trichomes pateliform, abaxial surface glabrous to scattered lepidote, trichomes pateliform, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescences** a leafy thyrse, glabrous to puberulent, trichomes simple; floral pedicels 12–45 mm long; floral bracts persistent, rarely deciduous, lanceolate

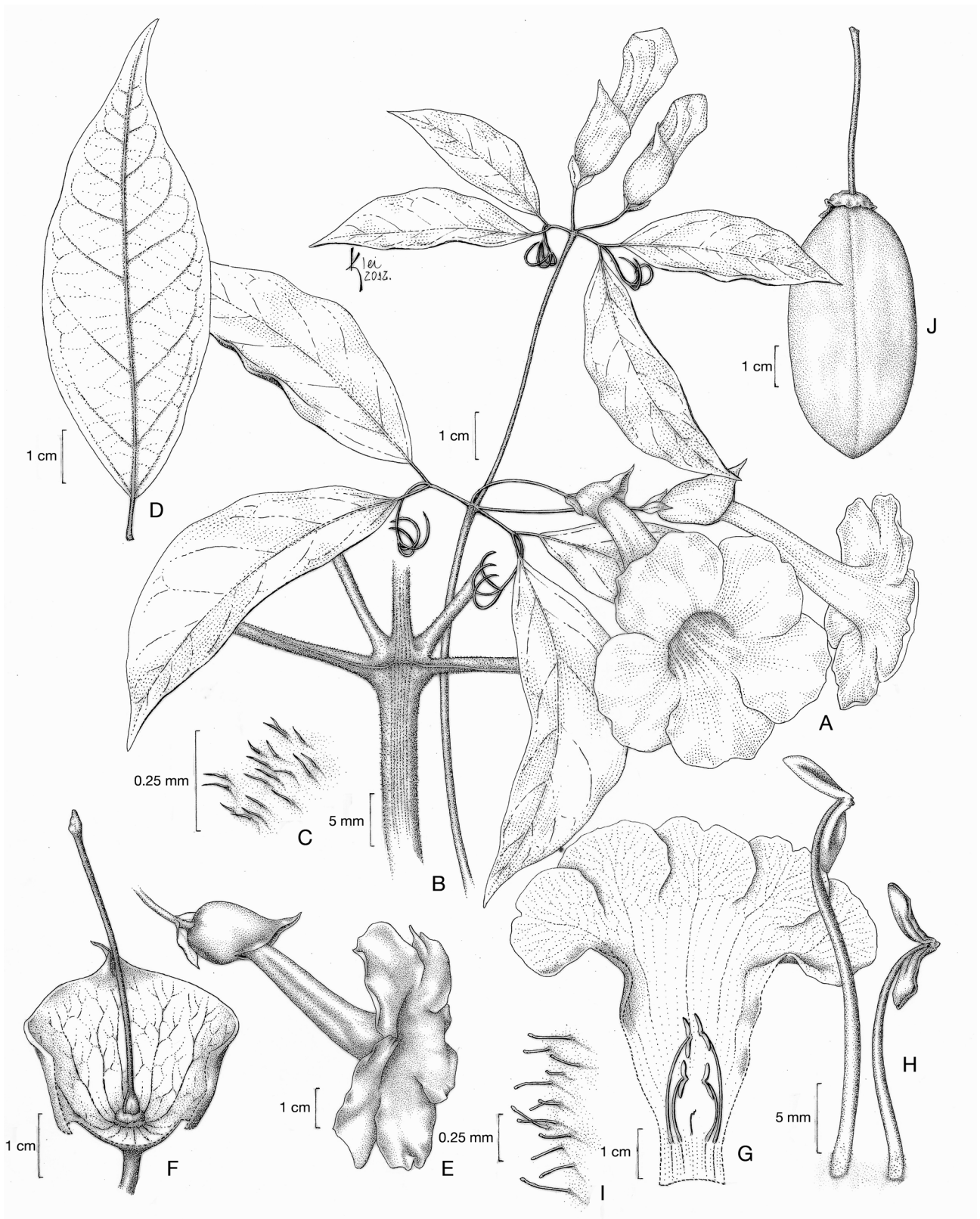


FIGURE 10. *Dolichandra quadrivalvis*. **A.** Habit. **B.** Detail of stem. **C.** Detail of trichomes. **D.** Leaflet. **E.** Flower overview. **F.** Open calyx showing ovary and nectary. **G.** Open corolla showing stamens and staminode. **H.** Detail of stamens and staminode. **I.** Detail of trichomes at stamens insertion. **J.** Fruit.

to elliptic, 7–30 mm long, membranaceous, green; bracteoles persistent, rarely deciduous, lanceolate to elliptic. **Calyces** spathaceous, inflated, with a recurved single apicule, 10–26 × 8–15 mm, membranaceous, green, glabrous to scarcely puberulent with glandular trichomes, eglandular trichomes simple, glandular trichomes peltate. **Corollas** yellow, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, glabrous outside and lepidote at stamen attachment, trichomes stipitate, nectar guides present, corollas 42–82 × 8–15 mm, tubes 30–65 mm long, lobes 8–25 × 12–30 mm, orbicular. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 10–15 mm long, long filaments 20–23 mm long; staminodes 5–7 mm long; anthers included, 4–5 mm long. **Gynoecia** with ovaries elliptic-oblong and ribbed, 5–7 × 2–3 mm, green, glabrous, ovules in multiple series on each placenta; styles 27–38 mm long, glabrous; stigmas included, 1.5–3 mm long. **Fruits** terete and oblong, narrowed at both ends, 11–17.5 × 3.5–6 cm, woody with valves very thick (5–10 mm), rugose with many lenticels, dark brown, glabrous. **Seeds** numerous, winged, oblong, 32–60 × 10–22 × 2–3 mm, seed bodies 9–15 × 8–12 mm, seed wings membranaceous and translucent.

Illustration:—Figure 10.

Taxonomic notes:—*Dolichandra quadrivalvis* shares a green spathaceous calyx and yellow corolla with *D. dentata*, *D. hispida*, and *D. uncata*, and shares woody tendrils with *D. chodatii* and *D. steyermarkii*. *Dolichandra quadrivalvis* is characterized by a thick, woody, oblong, and clearly four-parted fruit (Table 1). A ring of tissue outside the corolla is also distinctive of *D. quadrivalvis*, but uncommon in other *Dolichandra*; this feature is also found in *D. chodatii* (Rivera 2000). This ring of tissue may be a vestigial calyx, with the structure generally called calyx actually representing a pseudocalyx, composed of fused bracteoles or a second external calyx whorl. A pseudocalyx composed of fused bracteoles has been reported in *Thunbergia* and *Pseudocalyx*, other members of the Lamiales (Schönenberger & Endress 1998).

Phenology:—Flowers from September to December. Fruits from November to January.

Distribution and ecology:—*Dolichandra quadrivalvis* is known from Argentina (Chaco, Corrientes, Entre Ríos, Formosa, Jujuy, Misiones, Salta), Bolivia, Brazil (Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraíba, Paraná, Pará, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo, and Tocantins), Colombia (Atlántico, Bolívar, Cesar, Cundinamarca, Magdalena, Tolima), Costa Rica, El Salvador, Guatemala, Guyana, Honduras, Mexico (Chiapas, Guerrero, Hidalgo, Jalisco, Michoacan, Oaxaca, Queretaro, San Luis Potosí, Tamaulipas, Veracruz, Yucatan), Nicaragua, Panama, Paraguay, Peru (Madre de Dios, Ucayali), and Venezuela (Anzoátegui, Aragua, Barinas, Bolívar, Cojedes, Distrito Federal, Guarico, Lara, Monaguas, Portuguesa, Zulia) (Fig. 11). It is mainly found 10–1300 (1800) m alt. in different types of tropical forest types, mainly in deciduous and dry forests in Costa Rica, Brazil and Bolivia, gallery forests within savanna vegetation in Venezuela and subtropical forests in Argentina. In Brazil this species occurs in the Atlantic Rainforest (wet), “Cerrado” vegetation (dry), and “Caatingas” (semi-arid), where it grows on a wide variety of substrates, from rich to sandy soils and granitic outcrops.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 22,229,222.545 km² and the estimated area of occupancy is 1,024.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—Mexico: “Chacanicab” (*Gaumer G.F. 575*), “Chacxnetoloc” (*Gaumer G.F. 725p.p.*). Colombia: “Mata-cangrejo” (*Gentry A.H. et al. 55583, 78482*). Venezuela: “Ké ñeté” (*Boom B.M. 6576*). Brazil: “Cipó-de-cruz” (*Eiten G. & Eiten L.T. 10434*), “Cipó-de-cesta” (*Sandwith & Hunt 1974*).

Specimens examined:—ARGENTINA. **Chaco:** Colonia Benitez, *Schulz A.G. 34* (MO); *Schulz A.G. 461* (MO); *Schulz A.G. s.n.* (MO); 9 February 1982, *Schulz A.G. s.n.* (MO). **Corrientes:** Arroyo Chimiray, *Krapovickas A. 29126* (AAU, MO!). Garruchos, 0 0, *Krapovickas A. 21062* (MO). Paso de la Patria, 17 June 1980, *Tressens S.G. 1052* (MO). **Formosa:** Mojon de Fierro, 24 September 1970, *Schulz A.G. 17569* (MO). **Jujuy:** Higuertitas, 23 November 1980, *Cabrera A.L. 32236* (MO). Ledesma, *Cabrera A. 10190* (UPS); 11 November 1961, *Fabris H.3021* (MO). Serrania de Calilegua, 12 October 1927, *Venturi S. 5378* (MO). Sierra Calilegua, 12 October 1927, *Venturi S. 279* (MO). **Misiones:** Eldorado, 26 September 1972, *Schinini A. 5435* (MO). Parque Nacional Iguazu, 18 September 1961, *Fabris H. 7450* (MO). Puerto Piray, 20 October 1978, *Renvoize S.A. 3185* (MO). San Pedro, 30 October 1958, *Torres M. 13* (MO). **Salta:** Aguaray, 7 January 1940, *Schreiter 10890* (MO). Oran, 28 October 1913, *Rodriguez D. 1063* (MO); *Steinbach J. 1625* (MO). Tartagal, *Meyer T. 12679* (FI, MO); 21 October 1924, *Schreiter 3363* (MO). Vespucio, *Schreiter 11401* (MO, U). BOLIVIA. **Beni:** Trinidad, 1 September 1926, *Wedermann E. 2575*

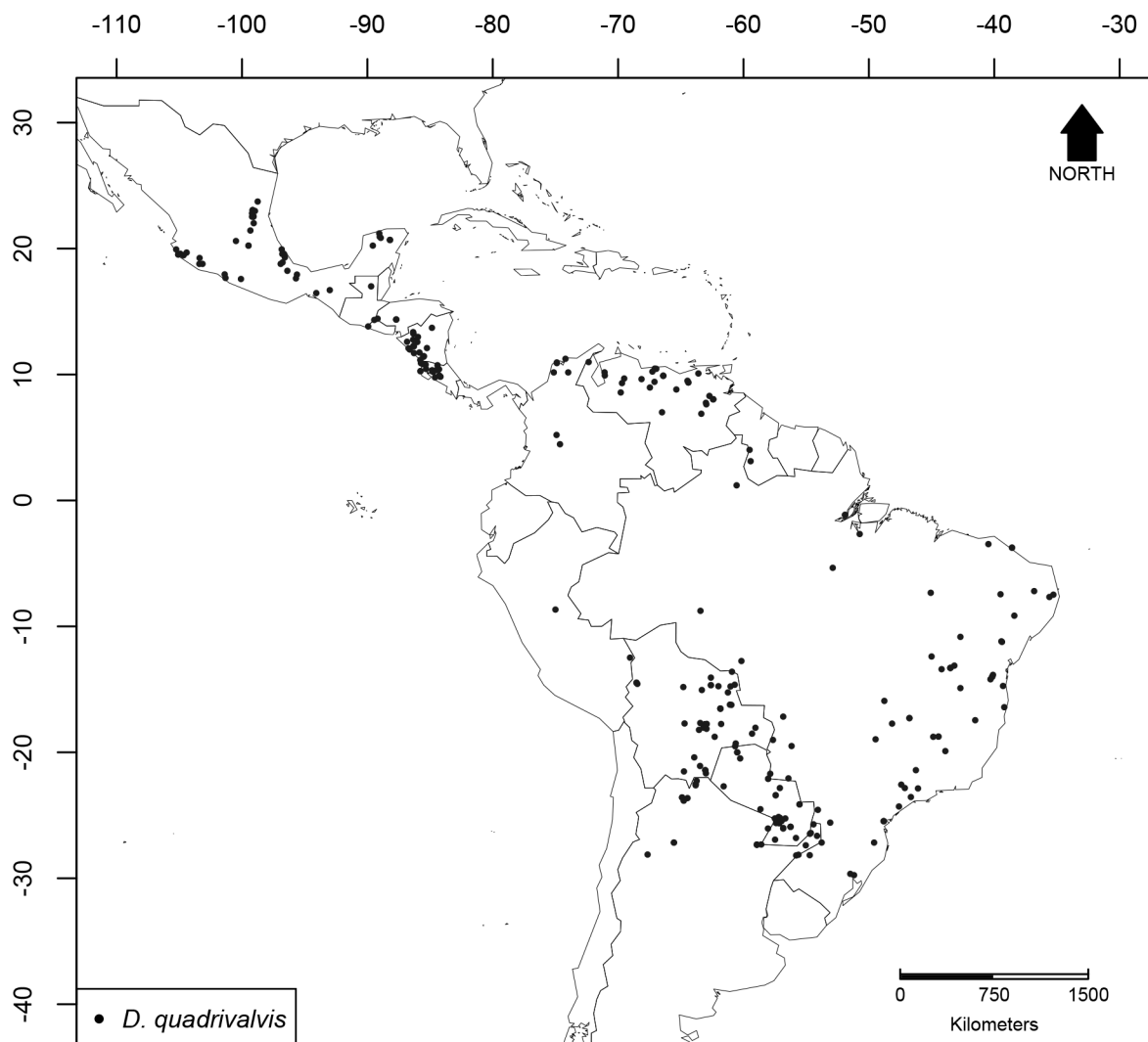


FIGURE 11. Geographic distribution of *Dolichandra quadrivalvis* in Central and South America.

(MO). **Chuquisaca:** Hacienda Sipoperanda, 8 December 1999, *Caballero J.* 87 (MO). Tarairi, 6 April 1993, *Toledo C.S.* 11378 (MO). **Cochabamba:** Rio San Mateo, 5 April 1996, *Jardim A.* 2736 (MO). **La Paz:** Arroyo Pintata, 3 March 2003, *Cayola L.* 247 (MO). Chaquimayo, 10 June 1990, *Gentry A.H.* 71052 (MO). Madidi, 3 January 2003, *Canqui F.* 222 (MO). **Santa Cruz:** Aguascalientes, 2 February 1995, *Mostacedo B.* 2814 (MO). Bolfor, 14 June 1995, *Mamani M.F.* 799 (MO). Curuyuqui, 26 October 1991, *Gentry A.H.* 75278 (MO). El Encanto, 4 November 1991, *Gentry A.H.* 75545 (MO). El Refugio, 25 January 1995, *Guillén R.* 3046 (MO). Embozú, 30 September 1990, *Nee M.H.* 38949 (MO). Estancia San Miguelito, 15 March 1995, *Fuentes A.* 480 (MO). Hacienda Acuario, 7 April 1996, *Guillén J.* 91 (MO). Jardín Botánico de Santa Cruz, 18 May 1991, *Gentry A.H.* 74068 (F, MO); 19 July 1987, *Nee M.H.* 35263 (MO). Las Trancas, 15 April 1995, *Mamani M.F.* 860 (MO). Lomerio, 21 August 1998, *Toledo M.* 786 (MO). Noel Kempff Mercado, 19 April 1997, *Wallace R.* 146 (MO). Oquiriquia, 27 September 1995, *Sánchez L.* 95 (MO). Parque Nacional Kaa Iya del Gran Chaco, 6 February 1998, *Fuentes A.* 2161A (MO). Perseverancia, 3 July 1992, *Vargas I.G.* 1585 (MO); 5 July 1992, *Vargas I.G.* 1659 (MO); 5 July 1992, *Vargas I.G.* 1674 (MO). Reserva de vida Silvestre Ríos Blanco y Negro, 28 September 1993, *Vargas I.G.* 2887 (MO). Rio Grande, 23 January 1994, *Nee M.H.* 44665 (MO). San Juancito, 4 May 1986, *Beck S.* 12408 (MO). San Ramon, 11 January 1999, *Agreda P.* 81 (MO). Santa Cruz, 24 August 1987, *Nee M.H.* 35732 (MO); *Nee M.H.* 48893 (MO, NY). Terevinto, 15 February 1994, *Nee M.H.* 45014 (MO). **Tarija:** Bermejo, 20 October 1983, *Beck S.* 9604 (MO). Gran Chaco, 26 October 1983, *Beck S.* 9762 (MO). Villa Montes, 1 November 1993, *Billiet F.* 6012 (MO); 1 November 1993, *Billiet F.* 6016 (MO). BRAZIL. **Bahia:** Bom Jesus da Lapa, 17 April 1980, *Harley R.M.* 21453

(MO); 5 April 1992, *Hatschbach G. 56623* (MO); *Santos R.S. 24340* (MO). Glória, 31 January 1982, *Rocha E. de S.F. da 783* (MO). Ilhéus, 4 November 1981, *Hage J.L. 1508* (MO). Jequié, 19 November 1978, *Mori S.A. 11194* (MO). Manoel Vitorino, 29 September 1979, *Mori S.A. 12830* (MO). Santa Luz, 1 December 1992, *Arbo M.M. 5498* (MO); 16 November 1986, *Queiroz L.P. de 1126* (MO). Santa Maria da Vitória, 19 June 1986, *Hatschbach G. 50473* (MO). Santo Antônio, *Blanchet J.S. 3138* (MO). Sítio do Mato, 27 October 1965, *Duarte A.P. 9522* (MO, RB). São Desidério, 14 October 1989, *Nogueira Silva P.E. 84* (MO). Urandi, 3 November 1988, *Kral R. 75478* (MO). Vitória da Conquista, 18 October 1967, *Duarte A.P. 10514* (MO); 9 February 1985, *Gentry A.H. 49992* (MO). Xique-Xique, 15 November 1984, *Noblick L.R. 3471* (MO). **Ceará:** Chapada do Araripe, 15 February 1985, *Gentry A.H. 50106* (MO). Fortaleza, *Ducke W.A. 2503* (MO); 25 April 1909, *Silva J.D. da s.n.* (MO). Meruoca, *Fernandez A. s.n.* (MO). **Goiás:** Ipameri, 5 October 1976, *Hatschbach G. 38956* (MO). **Maranhão:** Loreto, 2 February 1970, *Eiten G. 10434* (MO). **Mato Grosso:** Poconé, 14 June 1979, *Prance G.T. 26229* (MO). **Mato Grosso do Sul:** Bela Vista, 23 October 1987, *Hatschbach G. s.n.* (MO). Corumbá, 10 May 1953, *Pereira E. 182* (MO). Pantanal do Rio Negro, 29 September 1987, *Dubs B. 482* (MO). Porto Murtinho, 23 October 1980, *Pires J.M. 17311* (MO). **Minas Gerais:** Belo Horizonte, 20 October 1956, *Heringer E.P. 5391* (IAN, UB). Curvelo, 18 September 1965, *Duarte A.P. 8915* (MO); 18 September 1965, *Pereira E. 9928* (MO). Felixlândia, 27 September 1959, *Heringer E.P. 7212* (MO). Itaobim, 20 November 1985, *Hatschbach G. 49989* (MBM, MO). Ituiutaba, 14 November 1949, *Macedo A. 2024* (IAN, MO). Monte Belo, 6 September 1987, *Gentry A.H. 59094* (MO). Rio Pardo, 1 November 1922, *Jurgens C. 4* (MO). Unai, 30 August 1961, *Duarte A.P. 5711* (MO); *Duarte A.P. 5713* (MO). **Paraíba:** Curral de Cima, *Lohmann L.G. 686* (SPF). Taperoá, 29 November 1971, *Lima D.A. 1072* (IPA). **Paraná:** Marechal Cândido Rondon, 18 September 1981, *Hatschbach G. 43999* (MBM, MO). Morretes, 4 January 1914, *Dusen P. 14275* (MO); 11 November 1977, *Hatschbach G. 40492* (MBM, TEX-LL, MO); 13 January 1975, *Kummrow R. 997* (MO). Rio Chopim, 9 October 1974, *Hatschbach G. 35103* (MO). **Pará:** Rio Jari, 5 November 1969, *Cavalcante P.B. 2300* (MO); 8 November 1969, *Silva N.T. da 2644* (MO); *Silva N.T. da 2853* (MO). Rio Xingú, *Balée W.L. 2606* (MO). **Pernambuco:** Timbaúba, 20 November 1957, *Andrade-Lima A.D. de s.n.* (MO). **Rio Grande do Sul:** Cerro Largo, *Rambo B. 53182* (MO). Montenegro, *Rambo B. 49222* (MO). São Leopoldo, *Padre E.J. s.n.* (MO). **Rondônia:** Corumbá de Goiás, 24 January 1968, *Irwin H.S. 19137* (MO). Porto Velho, 24 September 1963, *Maguire B. 56784* (MO). Vilhena, 6 September 1963, *Maguire B. s.n.* (MO). **Roraima:** Rio Branco, *Fróes R.L. 23201* (MO). **Santa Catarina:** Ibirama, *Smith L.B. 7622* (MO). Itapiranga, *Smith L.B. 12716* (MO). **São Paulo:** Campinas, 4 January 1985, *Gentry A.H. 49171* (MO). Juquiá, *Kuhlman J.G. 3103* (G). Limeira, 25 September 1951, *Hoehne W. 3652* (MO, SPF). Represa Atabainha Lake, 26 August 1987, *Gentry A.H. 58691* (MO). Iporanga, *Fonseca L.H.M. 161* (SPF). São Paulo, 15 September 1974, *Handro O. 2262* (MO). COLOMBIA. **Atlantico:** Galapa, 21 May 1959, *Dugand A. 5120* (COL, MO). Juan Mina, 5 May 1959, *Dugand A. 5111* (MO). **Bolívar:** Cartagena, 25 August 1986, *Gentry A.H. 55583* (MO). **Cesar:** Bosconia, 12 March 1993, *Gentry A.H. 79229* (MO). **Cundinamarca:** Tacoima, *Triana J.J. 4124* (BM, COL, MO). **Magdalena:** Santa Marta, 1898, *Smith H.H. 1133* (MO). **Tolima:** Mariquita, *Triana J.J. s.n.* (MO). COSTA RICA. **Alajuela:** San Carlos, 3 June 1986, *Hammel B. 15307* (MO). San Miguel Oeste Naranjo, 5 January 1987, *Herrera G.C. 387* (MO). **Guanacaste:** Parque Nacional Rincon, 20 November 1992, *Espinoza 684* (MO). Parque Nacional Santa Rosa, 21 June 1982, *Janzen D.H. 12183* (MO); 20 August 1994, *Quesada 139* (MO); 15 June 1977, *Stevens G. 69* (MO). Reserva Biológica Lomas Barbudal, 2 May 1993, *Chavarria U. 795* (MO). **Puntarenas:** Cordillera de Tilarón, 13 April 1994, *Fuentes Z. 719* (CR, MO). Los Negritos, 13 February 1987, *Poveda A.L.J. 4194* (MO). Península de Nicoya, 2 March 1985, *Gomez L.D. 23359* (MO). Reserva Biológica Monteverde, 10 December 1985, *Bello C.E. 3620* (MO); 9 March 1994, *Morales J.F. 2474* (MO). San Luis, 15 November 1985, *Haber W.A. 3620* (MO). San Martín, 7 May 1988, *Erick Bello 206* (MO). **San Jose:** Acosta, 25 February 1995, *Morales J.F. 3514* (MO). Agua Blanca, 12 February 1994, *Morales J.F. 2371* (MO). Península de Nicoya, March 1900, *Tonduz A. 13866* (MO). Reserva Biológica Cara, 23 January 1991, *Záiga R. 425* (MO). Río Quebrada, 4 August 1992, *Fernandez A. 322* (MO). EL SALVADOR. **Ahuachapán:** El Imposible, 10 June 1997, *Sandoval E. ES-01567* (MO). **Santa Ana:** Metapan, 19 March 1959, *Montalvo E.A. 3211* (MO). GUATEMALA. **Peten:** Remate, 9 April 1960, *Contreras E. 808* (MO). GUYANA. **Essequibo:** Kanuku Mts., 4 March 1938, *Smith A.C. 3278* (MO). Karasabai, 9 March 1989, *McDowell T. 2198* (MO). HONDURAS. **Comayagua:** Comayagua, 28 May 1956, *Molina R.A. 7306* (F, MO, TEX-LL). Lejamani, 18 March 1983, *Holst B.K. 960* (MO). **La Paz:** Comayagua, 7 January 1982, *Holst B.K. 697* (MO). **Ocotepeque:** Nueva Ocotepeque, 19 April 1984, *Morales R.L. 176* (NY). MEXICO. **Chiapas:** Chiapa de Corzo, 10 April 1965, *Breedlove D.E. 9626* (F, MICH, MO). Rizo de Oro, 18 April 1972, *Breedlove D.E. 24641* (MICH,

MO). **Guerrero**: Campo Morado, 5 October 1939, *Hinton G.B.* 14257 (MO). Murga, 14 June 1937, *Hinton G.B.* 10319 (F, TEX-LL, MO). Vallecitos, 27 May 1937, *Hinton G.B.* 10234 (F, MO). **Hidalgo**: San Bartolo, 1 March 1973, *Gimate L.J.* 940 (MO); 1 March 1973, *Rzedowski J.* 940 (MO). **Jalisco**: Casimiro Castillo, 7 January 1985, *Judzewicz E.J.* 5176 (MO). Chamela, 28 June 1984, *Arturo J.* 4223 (MO); 2 July 1978, *Magallanes J.A.S.* 1108 (MO); 28 June 1984, *Magallanes J.A.S.* 4223 (MO). La Huerta, 26 June 1985, *Lott E.J.* 2589 (TEX); 12 May 1991, *Lott E.J.* 3463 (MO); 4 November 1991, *Lott E.J.* 4122 (MO). Nacastilla, 22 May 1979, *Magallanes J.A.S.* 1576 (MO). Pihuamo, 4 December 1959, *McVaugh R.* 1404 (MO). Tomatlan, 22 July 1981, *Magallanes J.A.S.* 2976 (MO). **Michoacan**: Coalcoman de Matamoros, 6 November 1939, *Hinton G.B.* 13792 (MO). Villa Victoria, 5 October 1939, *Hinton G.B.* 13765 (MO). **Oaxaca**: Tuxtepec, 21 May 1986, *Gereau R.E.* 2241 (MO). **Queretaro**: Las Adjuntas, 12 April 1968, *Rzedowski J.* 25627 (MICH, MO). Tancoyol, 28 April 1987, *Rzedowski J.* 43169 (MO). **San Luis Potosi**: Valles, 25 April 1942, *Nelson A.* 5175 (CAS, MO, TEX). **Tamaulipas**: Antiguo Morelos, 5 April 1976, *Harriman N.A.* 12132 (MO); 1 May 1959, *Rzedowski J.* 10342 (MO); 30 May 1971, *Ward D.B.* 7785 (MICH, MO, NY). Casas, 27 September 1959, *Johnston M.C.* 4104 (MO). Chamal, 30 April 1985, *Martinez M.* 643 (MO). Gomez Farias, 31 March 1975, *Harriman N.A.* 10688 (F, MO); 29 April 1985, *Martinez A.M.* 582 (MO); 19 July 1968, *Richardson A.* 653 (MO, TEX). Nuevo Morelos, 12 April 1946, *Davis E.W. s.n.* (MO). Rio Sabinas, 4 April 1960, *Duke J.A.* M3629 (MO). **Veracruz**: Actopan, 29 October 1972, *Dorantes L.J.* 1837 (MO). Atoyac, 30 April 1976, *Velazquez L.C.* 294 (F, MO). Cerro Gordo, 21 August 1975, *Dorantes L.J.* 4249 (MO). Coapa, 23 June 1983, *Ventura A.F.* 20339 (MO). Coetzala, 25 May 1983, *Robles L.* 172 (MO). Emiliano Zapata, 2 June 1971, *Dorantes L.J.* 148 (MO). Misantla, 5 February 1965, *Gomez-Pompa A.* 195 (MO). Potrerillos, 1 April 1975, *Ventura A.F.* 11157 (MO). San Antonio Paso del Toro, 14 January 1984, *Nee M.H.* 28814 (MO). **Yucatan**: Izamal, *Gaumer G.F.* 575 (F, G-DC, MO). Kancabdzonot., May 1917, *Gaumer G.F.* 23902 (MO). Suitun, May 1916, *Gaumer G.F.* 23304 (MO). Unknown municipality, *Puch A.* 498 (MO). Valladolid, 21 July 1986, *Cabrera C.E.* 11554 (MO); 19 December 1985, *Cabrera E.* 10021 (MO); 24 September 1985, *Cabrera E.* 9322 (MO). NICARAGUA. **Atlántico Norte**: Las Mercedes, 10 May 1978, *Vincelli P.C.* 336-A (MO). **Carazo**: La Trinidad, 13 June 1983, *Grijalva A.* 2652 (MO). **Chontales**: Juigalpa, 2 June 1976, *Neill D.A.* 435 (MO). **Esteli**: Chayote, 31 July 1983, *Moreno P.P.* 21780 (MO); 11 March 1984, *Moreno P.P.* 23531 (MO). Condega, 10 March 1984, *Moreno P.P.* 23486 (MO). El Chayote, 1 April 1983, *Moreno P.P.* 21247 (MO). Esteli, 19 December 1984, *Moreno P.P.* 25150 (MO). **Granada**: Isla Zapatera, 19 January 1982, *Sandino J.C.* 1828 (MO). **Leon**: Cerro El Nancital, 22 June 1983, *Moreno P.P.* 21563 (MO). Quebrada Las Ruedas, 13 May 1981, *Stevens W.D.* 20153 (MO). Volcan Telica, 6 October 1991, *Iltis H.H.* 30828 (MO). **Managua**: Peninsula de Chiltepe, 23 July 1982, *Moreno P.P.* 16951 (MO); 4 November 1980, *Moreno P.P.* 4264 (MO); 29 May 1980, *Moreno P.P.* 671 (MO). Salamina, 11 May 1980, *Stevens W.D.* 17153 (MO). **Matagalpa**: Jinotega, 1 February 1984, *Moreno P.P.* 22918 (MO). Puertas Viejas, 10 May 1982, *Moreno P.P.* 16230 (MO). **Rivas**: Isla Ometepe, 5 June 1985, *Robleto W.* 2107 (MO); 27 April 1984, *Robleto W.* 398 (MO); 28 April 1984, *Robleto W.* 422 (MO); 18 June 1984, *Robleto W.* 932 (MO). San Juan del Sur, 1865, *Torrey J.* 2 (MO). PARAGUAY. **Alto Paraguay**: Palmar de las Islas, 18 October 1977, *Evrard C.* 8173 (MO). **Amambay**: Rio Apa, *Fiebrig K.* 5120 (G, M, MO); *Hassler E.* 8445 (G, MO). **Caazapa**: Asunción, *Balansa B.* 510 (MO). **Canendiyu**: Villa Ygatimi, *Gentry A.H.* 59330 (MO); 25 September 1987, *Gentry A.H.* 59398 (MO). **Central**: Estero del Ypoal, 18 March 1992, *Zardini E.* 31177 (MO). Paraguay River, 13 January 1990, *Zardini E.* 18215 (AS, MO). San Bernardino, 15 January 1974, *Conrad J.* 2225 (MO); *Hassler E.* 1530 (G, MO); *Hassler E.* 3353 (G, MO, P). **Chaco**: Agua Dulce, 20 October 1980, *Casas J.F.* FC4353 (MO). Cerro Leon, 28 October 1987, *Spichiger R.* 2396 (MO). Cordillera de Ybytyruzu, 13 November 1988, *Ortiz M.* 813 (MO); 13 November 1988, *Soria N.* 2650 (MO). Parque Nacional Defensores del Chaco, 20 October 1980, *Fernandez-Casas J.* 4353 (MO, G). Puerto Stroessner, *Stutz L.C.* 1414 (K, MO, U). **Concepción**: Concepción, *Hassler E.* 7442 (G, MO); *Hassler E.* 7450 (MO). **Cordillera**: Cerro Tobati, 18 November 1987, *Zardini E.* 3787 (MO). Compania Rio Negro, 7 July 1990, *Zardini E.* 21740 (MO). **Guaira**: Cordillera de Ybytyruzu, 17 February 1989, *Zardini E.* 10864 (MO). **Itapua**: Pirapo, 10 October 1984, *Brunner D.R.* 856 (MO). **Misiones**: Santa Elisa, *Hassler E.* 2726 (G, MO). **Paraguari**: Cerro Mbatovi, 19 July 1989, *Soria N.* 3966 (MO); 24 June 1989, *Zardini E.* 13240 (MO); 3 August 1988, *Zardini E.* 6371 (MO); 8 September 1988, *Zardini E.* 7138 (MO); 1 December 1988, *Zardini E.* 8104 (MO). Cerro Palacios, 23 May 1987, *Zardini E.* 2539 (MO); 23 September 1987, *Zardini E.* 3072 (MO); 23 September 1987, *Zardini E.* 3106 (MO). Paraguari, *Balansa B.* 510b (MO). Parque Nacional Ybycul, 1 October 1985, *Gentry A.H.* 51943 (MO); 21 October 1988, *Zardini E.* 7470 (MO). Villa Sana, *Fiebrig K.* 5249 (G, MO). **Presidente Hayes**: Fortin Martinez, 11 November 1985, *Brunner D.R.* 1359 (MO). PERU. **Madre de Dios**: Tambopata, 7

October 1991, *Timaná M.* 2446 (MO). **Ucayali:** Tingo Maria, 9 February 1981, *Gentry A.H.* 31140 (MO). VENEZUELA. **Anzoategui:** Anaco, 13 February 1970, *Holmquist J.D. s.n.* (MO). Cantaura, 12 May 1950, *Smith F.D.* 171 (MO, US); 17 June 1952, *Smith F.D.* 250 (MO, US). **Aragua:** El Consejo, 4 April 1925, *Pittier H.* 11678 (MO). **Barinas:** San Rafael de Mijagual, *Aristeguieta L.* 1694 (MO). **Bolívar:** Cedo, 26 April 1986, *Boom B.M.* 6576 (MO). La Paragua, 7 July 1975, *Gentry A.H.* 15067 (MO). Puerto Ordaz, 1964, *Aristeguieta L.* 5353 (MO). Represa Guri, 1 April 1981, *Liesner R.* 11073 (MO); 2 April 1981, *Liesner R.* 11124 (MO); 15 March 1974, *Gentry A.H.* 10429 (MO); 15 March 1974, *Gentry A.H.* 10437 (MO); 19 March 1974, *Gentry A.H.* 10756 (MO). **Cojedes:** El Pao, 30 April 1959, *Trujillo B.* 4140 (MO). **Distrito Federal:** El Junquito, *Fernandez F.* 455 (MO). Montalban, 13 September 1975, *Berry P.E.* 1321 (MO). **Guarico:** Altigracia de Orituco, *Aristeguieta L.* 6081 (VEN); 20 March 1974, *Gentry A.H.* 10821 (MO); 8 July 1975, *Gentry A.H.* 15119 (MO). Calabozo, 7 March 1974, *Gentry A.H.* 10244 (MO). El Sombrero, *Humboldt A.* 780 (MO). La Aguadita, 25 August 1955, *Tamayo F.* 4129 (MO). **Lara:** Yacambu, 28 July 1973, *Steyermark J.A.* 107647 (MO). **Portuguesa:** Rio Maria, 3 November 1982, *Steyermark J.A.* 127206 (MO). **Zulia:** Burro Negro, 5 August 1980, *Bunting G.S.* 9539 (MO). Machango, 8 May 1980, *Aristeguieta L.* 12602 (MO). Mara, 29 May 1980, *Steyermark J.A.* 122832 (MO).

6. *Dolichandra steyermarkii* (Sandwith 1966: 446–452) Lohmann (2008: 273)

≡ *Parabignonia steyermarkii* Sandwith.

Lectotype (designated here):—VENEZUELA. Bolívar: Km 119 south of El Dorado, 1030 m, 12 January 1964, *Steyermark J.A. et al.* 93003 (K! [K000449804]; isolectotypes, K! [K000449802], K! [K000449803], F-1653425!, S image!, US! [US00588660], US! [US00796013], VEN image!).

Lianas, with dimorphic juvenile growth. **Stems** terete, grey to brown, glabrous, bark flaky, striate. **Branchlets** terete, purplish to green, glabrous to puberulent, trichomes simple; interpetiolar regions with inconspicuously glandular fields; prophylls of the axillary buds lanceolate, 1.1–2.4 mm long, smooth, glabrous to puberulent, trichomes simple. **Leaves** bifoliolate with terminal tendril; petioles subterete, 10–35 mm long, glabrous to puberulent, trichomes simple; petiolules sulcate, 4–15 mm long, glabrous to puberulent; tendrils woody, 22–65 mm long, glabrous, tendril arms 7–12 mm long; leaflets elliptic to lanceolate, apex acute to cuspidate, base acute, obtuse, rounded or subcordate, symmetric to slightly asymmetric, 45–100 × 21–54 mm, chartaceous, adaxial surface glabrous, abaxial surface lepidote with glandular trichomes more concentrated at the base, trichomes pateliform, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire or slightly serrulate in the apical third. **Inflorescences** a leafy raceme, puberulent, trichomes simple; floral pedicels 10–32 mm long; floral bracts deciduous, rarely present, linear to lanceolate, 8–25 mm long, membranaceous, green; bracteoles persistent, rarely deciduous, linear to lanceolate. **Calyces** campanulate, inflated, five-lobed, lobe rounded with apex mucronate, 9–15 × 6–11 mm, membranaceous, green to purplish, puberulent with scarcely glandular trichomes, eglandular trichomes simple, glandular trichomes peltate. **Corollas** purplish, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, pubescent and lepidote, eglandular trichomes simple, glandular trichomes peltate throughout, pateliform at apex of the tube, stipitate at stamen attachment, nectar guides present, corollas 46–75 × 12–24 mm, tubes 33–60 mm long, lobes 8.5–16.4 × 8.6–18.5 mm, orbicular to obovate. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 12–16 mm long, long filaments 20–25 mm long; staminodes 6–10 mm long; anthers included, 2.7–3.5 mm long. **Gynoecia** with ovaries linear, 3–6 × 1.5–1.7 mm, green, glabrous, ovules in one series on each placenta; styles 25–32 mm long, glabrous; stigmas included, 1.5–3 mm long. **Fruits** flattened and linear, narrowed at both ends, 26–32 × 1.4–2.8 cm, slightly woody, smooth with many lenticels, brown to dark brown, glabrous. **Seeds** unknown.

Illustration:—Figure 12A–F.

Nomenclatural notes:—Sandwith (1966) cited a K specimen in the protologue of this name. Three duplicates of the type collection were located at K and the best sheet is here selected as the lectotype.

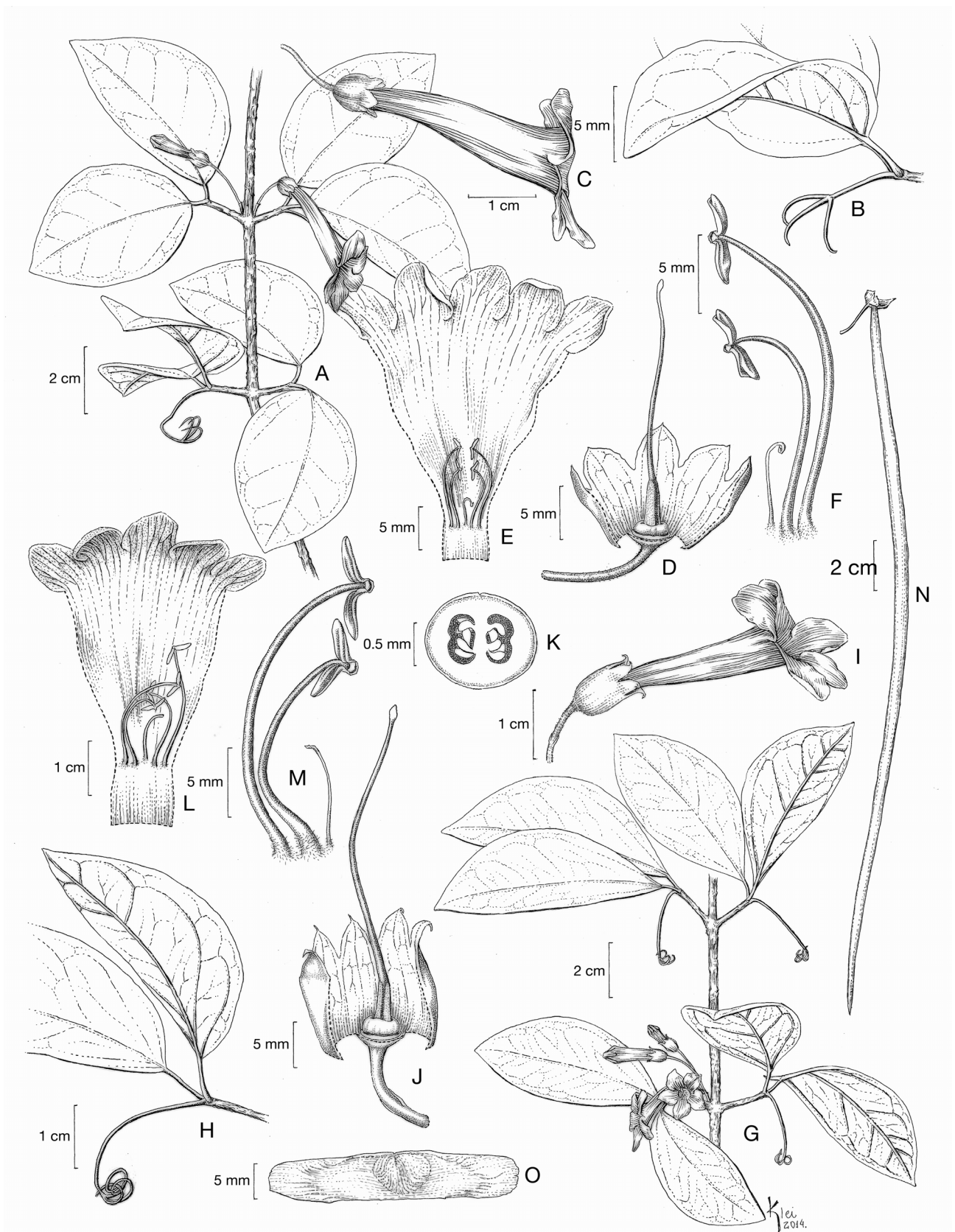


FIGURE 12. *Dolichandra steyermarkii*. **A.** Habit. **B.** Detail of leaflets and tendril. **C.** Overview. **D.** Open calyx showing ovary and nectary. **E.** Open corolla showing stamens and staminode. **F.** Detail of stamens and staminode. *Dolichandra unguiculata*. **G.** Habit. **H.** Detail of leaflets and tendril. **I.** Flower overview. **J.** Open calyx showing ovary and nectary. **K.** Ovary cross-section. **L.** Open corolla showing stamens and staminode. **M.** Detail of stamens and staminode. **N.** Fruit. **O.** Seed.

Taxonomic notes:—*Dolichandra steyermarkii* is very similar morphologically to *D. unguiculata*, with which it shares branchlets with flaky bark, chartaceous leaflets, large tendrils (up to 6.5 cm) and campanulate calyces with five apicules (Table 1). *Dolichandra steyermarkii* can be differentiated from *D. unguiculata* by the rounded to shortly mucronate calyx (vs. long mucronate calyx in *D. unguiculata*) and puberulent calyx with scarcely glandular trichomes (vs. glabrous calyx with puberulent margin in *D. steyermarkii*).

Phenology:—Flowers from January to March. A single fruit specimen was collected in April.

Distribution and ecology:—*Dolichandra steyermarkii* is known from Brazil (Acre, Pará), Costa Rica, Ecuador, French Guiana, Guyana, Peru, Surinam and Venezuela (Bolivar, Delta Amacuro, Sucre) (Fig. 13). It grows between 100–1000 m alt. in wet tropical forests.

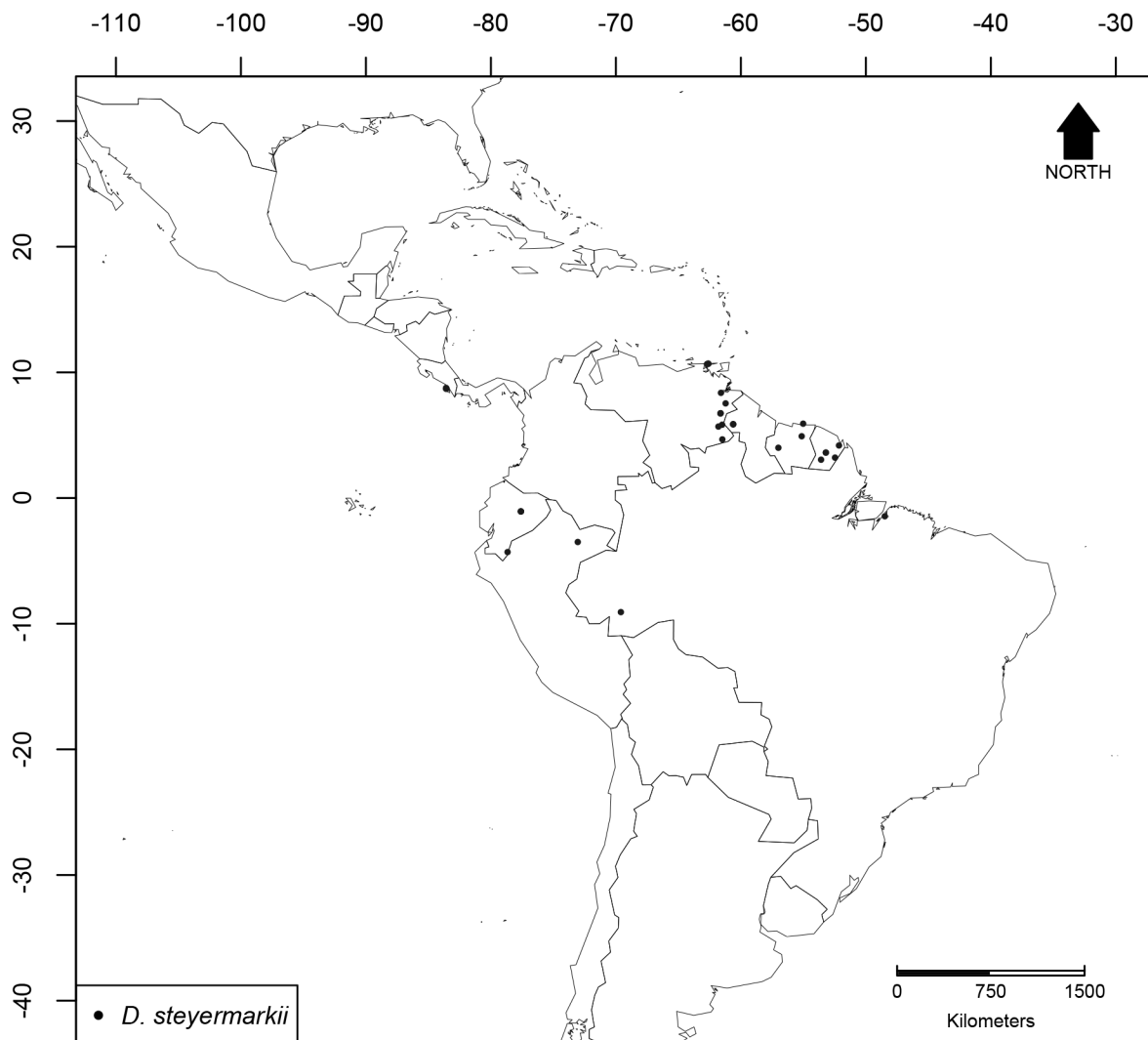


FIGURE 13. Geographic distribution of *Dolichandra steyermarkii* in Central and South America.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 5,586,045.848 km² and the estimated area of occupancy is 116.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—Brazil: “Cipó-morceguinho” (Silveira M. *et al.* 1595).

Specimens examined:—BRAZIL. **Acre:** Manoel Urbano, 26 November 1996, *Silveira M. 1595* (MO). **Pará:** Belém, 3 November 1977, *D'Arc J. 8* (MO). COSTA RICA. **Puntarenas:** Chocuaco, 28 August 1995, *Aguilar R. 4266* (MO). Golfo Dulce, 12 January 1992, *Aguilar R. 817* (CR, MO). Peninsula de Osa, 5 June 1995, *Rodriguez J.V. 758* (MO). Rincon de Osa, 11 January 1993, *Gentry A.H. 78682* (MO). ECUADOR. **Napo:** Jatun Sacha, 21

May 1987, *Cerón C.E. 1478* (MO, QAME); 24 August 1988, *Cerón C.E. 4512* (MO); 17 January 1987, *Cerón C.E. 746* (MO); 30 December 1987, *Gentry A.H. 60206* (MO). **Zamora-Chinchipe**: Rio Nangaritzza, 31 July 1993, *Gentry A.H. 80912* (MO). FRENCH GUIANA. **Cayenne**: Approuague River, 21 January 1970, *Oldeman R.A.A. B-2820* (MO). Camopi River, 6 December 1983, *Feuillet C. 1197* (MO). Montagne Bellevue de l'Inini, 22 August 1985, *Granville J.J. de 7740* (CAY, MO, U). Saul, 10 February 1993, *Mori S.A. 22908* (MO); 12 February 1993, *Mori S.A. 22960* (MO). GUYANA. **Rupununi**: Unknown municipality, 16 August 1960, *Tillet S.S. 45149* (MO, NY). PERU. **Loreto**: Maynas, 13 February 1989, *Gentry A.H. 65709* (MO). SURINAM. **Brokopondo**: Kabelstation, 21 July 1953, *Lindeman J.C. 440* (MO, U). **Nickerie**: Kabalebo Dam, 18 November 1976, *Heyde N.M. 165* (MO). **Unknown province**: Unknown municipality, 31 July 1977, *Heyde N.M. 720* (MO). VENEZUELA. **Bolivar**: El Dorado, 17 March 1974, *Gentry A.H. 10592* (MO); 17 March 1974, *Gentry A.H. 10605* (MO); 2 April 1985, *Holst B.K. 2083* (MO); 12 January 1964, *Steyermark J.A. 93003* (F, K, MO). Las Chicharras, 5 February 1961, *Steyermark J.A. 89166* (MO). Rio Caruay (Ptari-tepui), 27 November 1944, *Steyermark J.A. 60643* (F, MO). Rio Surukun, 1 April 1987, *Marcano V. 894* (MO). **Delta Amacuro**: Rio Grande, 7 February 1964, *Steyermark J.A. 93071* (MO). **Sucre**: Manacal, 30 November 1979, *Steyermark J.A. 120739* (MO). Paria, 1 December 1979, *Steyermark J.A. 120855* (MO); 21 February 1980, *Steyermark J.A. 121443* (MO); 23 February 1980, *Steyermark J.A. 121688* (MO).

7. *Dolichandra uncata* (Andrews 1808: t. 530) Lohmann (2008: 273)

≡ *Bignonia uncata* Andrews.

≡ *Spathodea uncata* (Andrews) Sprengel (1825: 835).

≡ *Doxantha uncata* (Andrews) Miers (1863: 190).

≡ *Macfadyena uncata* (Andrews) Sprague & Sandwith (1937: 215).

Lectotype (designated by Howard 1989):—Bot. Reposit. 8: tab. 530, 1808, illustration based on a cultivated specimen from Cayenne, French Guiana, brought to England by Lord Seaforth (illustration!).

= *Bignonia uncinata* Meyer (1818: 210).

≡ *Spathodea uncinata* (G.Mey.) Sprengel (1825: 835).

≡ *Macfadyena uncinata* (G. Mey.) Candolle (1845: 180).

Holotype:—SURINAM. Essequibo, in sylvis insulae Arowabisch, s.d., *Meyer G. 221* (GOET000342!).

= *Bignonia pseudounguis* Desfontaines (1829: 397), as “*pseudo-unguis*”.

Holotype:—Unknown country. Without locality, s.d., collector and number not indicated (FI011845!).

= *Dolichandra fenzliana* Miquel (1845: 251).

≡ *Spathodea fenzliana* (Miq.) Walpers (1847: 513).

≡ *Macfadyena fenzliana* (Miq.) Miquel (1850: 125).

Lectotype (designated here):—SURINAM. Ad saepes Gardeniae ad plantat Adriche, Matappica, s.d., *Focke H.C. 661* (U0000747!; isolectotype, U0000748!).

= *Bignonia unguis-cati* var. *radicans* Candolle (1845: 146), as “*unguis*”.

≡ *Doxantha radicans* (DC.) Miers (1863: 190).

Holotype:—BRAZIL. Maranhao: “in ditione Japurensi”, s.d., *von Martius C.F.P. s.n.* (M!).

= *Pachyptera puberula* Candolle (1845: 175).

Holotype:—BRAZIL. Mato Grosso: “circa Cujabam”, *Silva Manso A. 10* (G-DC! [G00133299]).

= *Macfadyena hassleri* Sprague (1905: 85), *syn. nov.*

Lectotype (designated here):—PARAGUAY. Propre Concepcion, September, *Hassler E. 7538* (K! [K000449790]); isolectotype, G!, photo F neg. 26197).

Residual syntypes:—PARAGUAY. Propre Concepcion, September 1901, *Hassler E. 7539* (syntype, K not seen, G not seen, NY not seen); *ibid.*, in arenosis propre Bellavista, December, *Hassler E. 8239* (syntype, K not seen, NY! [NY-00278051], S image!).

= *Macfadyena guatemalensis* Blake (1922: 24–25).

Holotype:—GUATEMALA. Izabal: along the bank of Rio Izabal, 1 June 1919, *Blake S.F. 7845* (US! [US00125850]).

Lianas, with dimorphic juvenile growth. **Stems** terete, brown, glabrous to puberulent, bark not flaky, striate. **Branchlets** terete, green, glabrous to puberulent, trichomes simple; interpetiolar regions with glandular field usually present on young twigs; prophylls of the axillary buds lanceolate, 2–4 mm long, smooth, puberulent, trichomes simple. **Leaves** bifoliolate with a terminal tendril; petioles subterete to slightly sulcate, 5–52 mm long, glabrous to puberulent, trichomes simple; petiolules subterete to sulcate, 1–32 mm long, glabrous to puberulent; tendrils not woody, subterete, 8–20 mm long, glabrous to puberulent, trichomes simple, tendril arms 5–11 mm long; leaflets ovate to elliptic, apex acute to long acuminate, base cuneate to rounded, symmetric to slightly

asymmetric, 20–260 × 9–130 mm, membranaceous to chartaceous, adaxial surface lepidote, trichomes peltate, abaxial surface lepidote and sometimes puberulent at the main veins, egladular trichomes simple, glandular trichomes peltate and pateliform, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescences** reduced to a lateral raceme with up to three flowers, glabrous to puberulent, trichomes simple; floral pedicels 4–15 mm long; floral bracts deciduous, rarely present, elliptic to obovate mucronate, 2.5–4 mm long, membranaceous, green; bracteoles persistent, rarely deciduous, linear to elliptic mucronate. **Calyces** spathaceous, non-inflated, with a reduced incurved single apicule, 12–31 × 6–15 mm, membranaceous, green, glabrous to lepidote at the base, trichomes pateliform. **Corollas** yellow, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, lepidote, trichomes peltate throughout, trichomes stipitate at the stamen attachment, nectar guides present, corollas 42–103 × 8–20 mm, tubes 35–90 mm long, lobes 7–22 × 8–20 mm, orbicular. **Androecia** attachment at the same position, 15–21 mm; filaments terete, glabrous, short filaments 16–20 mm long, long filaments 21–24 mm long; staminodes 7–11 mm long; anthers included, 2.5 mm long. **Gynoecia** with ovaries linear, 2.5–5 × 1.5–2.5 mm, green, glabrous; styles 30–37 mm long, glabrous, ovules in one series on each placenta; stigmas included, 2–3 mm long. **Fruits** flattened and linear, narrowed at both ends, 16–30 × 1.1–2.2 cm, slightly woody, smooth, brown to dark brown, glabrous. **Seeds** numerous, winged, oblong, 10–58 × 7–17 × 4–6 mm, seed bodies 8–15 × 7–12 mm, seed wings woody.

Illustration:—Figure 6I–P.

Nomenclatural notes:—Sprague (1905) cited three gatherings (*Hassler E. 7538*, *Hassler E. 7539* and *Hassler E. 8239*) in the protologue of *Macfadyena hassleri*. The collection best preserved is here chosen as the lectotype. Two images of *Dolichandra fenzliana* were located at U. The best material is here selected as lectotype.

Taxonomic notes:—*Dolichandra uncata* shares a green spathaceous calyx and yellow corolla with *D. dentata*, *D. hispida*, and *D. quadrivalvis*. *Dolichandra uncata* is morphologically most similar to *D. dentata*, differing by its entire leaves (vs. serrate leaves in *D. dentata*) and corky seeds (vs. winged seeds in *D. dentata*). *Dolichandra uncata* is also morphologically similar to *D. unguis-cati*, with which it shares a green calyx and yellow corolla, differing by the spathaceous calyx (vs. campanulate calyx in *D. unguis-cati*), lanceolate and smooth prophylls of the axillary buds (vs. ovate and striate prophylls of the axillary buds in *D. unguis-cati*), and corky seeds (vs. winged seeds in *D. unguis-cati*) (Table 1).

Phenology:—Flowers and fruits irregularly throughout the year.

Distribution and ecology:—*Dolichandra uncata* is known from Argentina (Chaco, Corrientes, Formosa, Jujuy, Misiones), Belize, Bolivia, Brazil (Amapá, Amazonas, Mato Grosso, Pará), Colômbia (Antioquia, Atlântico, Bolívar, Boyaca, Chocó, Córdoba, La Guajira, Magdalena, Meta, Valle del Cauca), Costa Rica, Cuba, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico (Quintana Roo, Tabasco, Veracruz), Nicaragua, Panama, Paraguay, Peru (Amazonas, Huanuco, Loreto, Madre de Dios, San Martín, Ucayali), Surinam, and Venezuela (Amazonas, Apure, Barinas, Bolívar, Delta Amacuro, Falcon, Guarico, Miranda, Monaguas, Sucre, Yaracuy, Zulia) (Fig. 14), where it occurs between sea level and 500 m alt. Individuals of *D. uncata* often grow near the coast in swampy habitats in fresh water sub-mangrove associations inland from the *Rhizophora-Avicennia-Laguncularia* associations, or in seasonally inundated tahuampa or varzea habitats (Gentry 1979b).

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 16,870,030.730 km² and the estimated area of occupancy is 1,036.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—Brazil: “Cipó-morcego” (Rabelo B.V. *et al.* 1846). Honduras: “Uña de gato,” “Chinacla,” “Coral,” “Bejuco verde,” “Bejuco blanco,” “Uña de iguana” (Standley & Williams 1974).

Specimens examined:—ARGENTINA. **Chaco:** Arroyo Iné, *Schulz A.G. 1624* (MO). Barranqueras, *Schulz A.G. 1612* (MO). Colonia Benitez, *Schulz A.G. 2398* (MO); *Schulz A.G. 35* (CAY, MO); *Schulz A.G. 8109* (MO); 23 December 1951, *Schulz A.G. 8132* (MO); 26 January 1953, *Schulz A.G. 8400* (MO); *Schulz A.G. 8646* (MO). Enrique Urein, *Schulz A.G. 2411* (MO). Isla Antequera, 21 April 1942, *Schulz A.G. 3430* (MO); *Schulz A.G. 462* (MO); *Schulz A.G. 64* (MO). Las Palmas, 28 January 1952, *Schulz A.G. 8007* (MO). Riacho Iné, *Schulz A.G. 3043* (MO). **Corrientes:** Corrientes, 30 September 1987, *Gentry A.H. 59475* (MO). Goya, 8 November 1980, *Ahumada O. 3854* (MO). Paso de la Patria, 5 November 1978, *Cristobal C.L. 1817* (MO); 8 December 1950, *Schulz A.G. 7657*

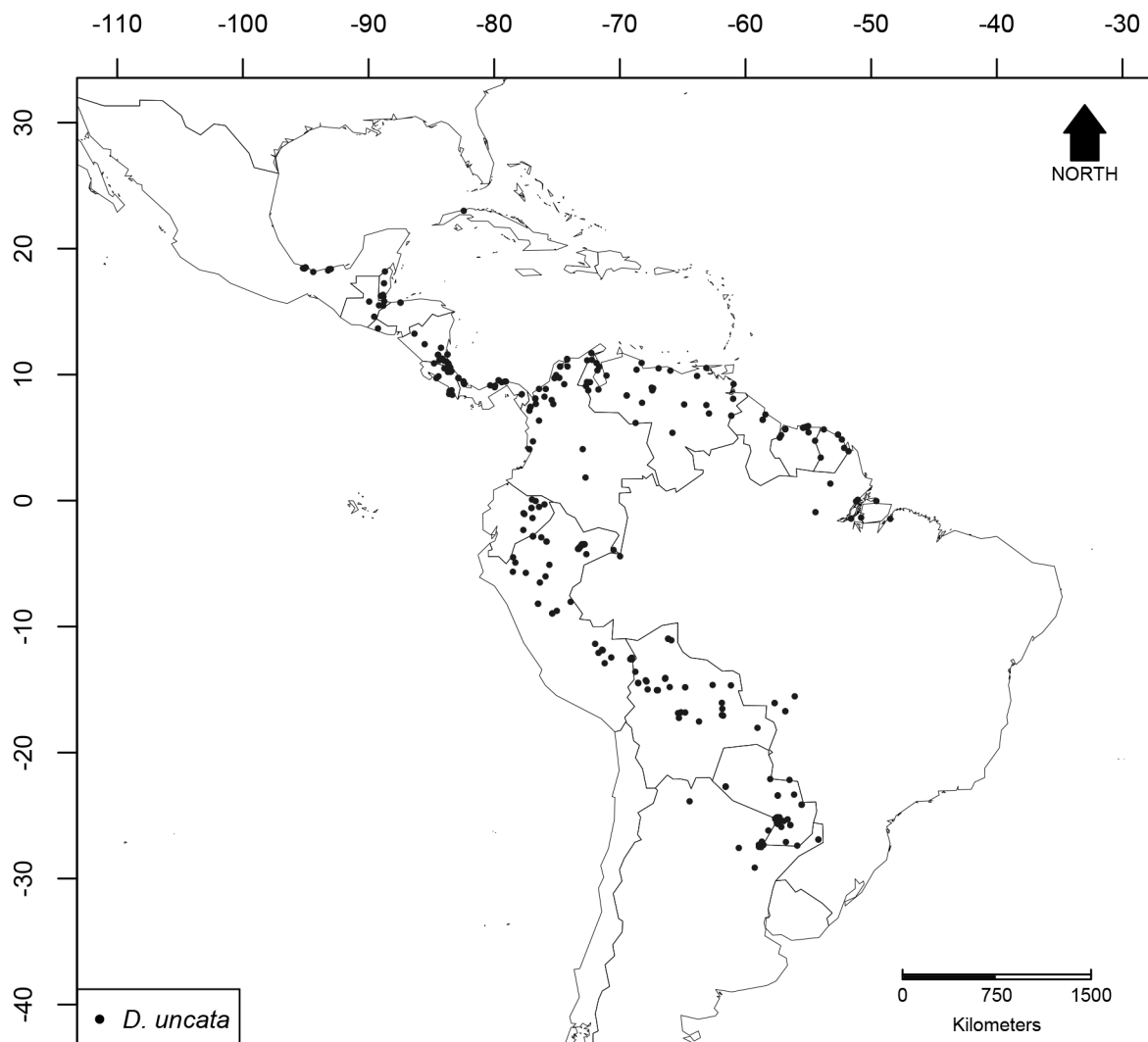


FIGURE 14. Geographic distribution of *Dolichandra uncata* in Central and South America.

(MO); 13 November 1981, *Tressens S.G. 1359* (MO). **Formosa:** Formosa, 1918, *Jorgensen P. 1966* (MO). **Jujuy:** Laguna de la Brea, 24 July 1901, *Fries R.E. 398* (MO, S). **Misiones:** Posadas, *Schinini A. 4892* (G, MO). Prédio Guarani, 7 September 1994, *Schinini A. 28716* (MO); 21 September 1995, *Tressens S.G. 5466* (MO, S, U). **BELIZE.** **Cayo:** Belmopan, 30 May 1974, *Dwyer J.D. 12556A* (MO). **Toledo:** Jacinto Creek, 24 October 1944, *Gentle P.H. 4913* (F, TEX-LL, MO, NY, S); 15 May 1933, *Schipp W.A. 8-562* (MO); 15 May 1933, *Schipp W.A. S-562* (MO). Monkey River, 23 August 1941, *Gentle P.H. 3589* (MO). San Antonio, 10 April 1945, *Gentle P.H. 5323* (MO, TEX-LL). **BOLIVIA.** **Beni:** Estación Biológica Beni, 3 October 1995, *Paz P. 160* (MO); 16 October 1995, *Paz R.C. 294* (MO). Estancia El Porvenir, 29 September 1984, *Solomon J.C. 12382* (MO). Riberalta, 25 September 1981, *Solomon J.C. 6437* (MO). Rio Beni - Madre de Dios, August 1886, *Rusby H.H. 1137* (MO); August 1886, *Rusby H.H. 1786pp* (MO); August 1886, *Rusby H.H. s.n.* (MO). Rio Yacuma, 10 March 1979, *Beck S. 2651* (MO); 18 April 1980, *Beck S. 3293* (MO). Trinidad, 1 September 1926, *Wedermann E. 2407* (MO); 1 September 1926, *Wedermann E. 2534* (MO). **Cochabamba:** Puerto Villarroel, 8 June 2000, *Villavicencio X. 1767* (MO). Senda Bayer, 5 April 2000, *Villavicencio X. 1391* (MO). Todos Santos, 13 October 1966, *Steinbach R. 380* (F, MO, NY, U, US). **La Paz:** Alto Madidi, 19 May 1990, *Gentry A.H. 70196* (MO). Antahuacana, 1 June 1909, *Buchtien O. 2206* (MO). Cooperativa Sapecho, 28 December 1994, *Seidel R. 4149* (MO). Covendo, 30 January 1994, *Quintana G. 1048* (MO); 30 January 1994, *Quintana G. 1225* (MO). Madidi, 3 March 2003, *Canqui F. 232* (MO); 19 February 2003, *Cayola L. 7* (MO); 18 May 2001, *Macía M.J. 4488* (MO); 4 March 2003, *Paniagua N. 5649* (MO); *Seidel R. 8563* (MO); 28 January 2002, *Seidel R. 8563* (MO). Yolosa, 10 September 1989, *Beck S. 18785* (MO). **Santa**

Cruz: Bolfor, 12 December 1994, *Mamani M.F.* 398 (MO). El Carmen, 4 October 1996, *Jiménez S.* 946 (MO). El Divisorio, 20 September 1995, *Foster P.F.* 194 (MO). Estancia San Miguelito, 2 December 1996, *Fuentes A.* 1342 (MO); 9 December 1996, *Fuentes A.* 1392 (MO); 9 December 1996, *Fuentes A.* 1392A (MO). Lomerio, 20 February 1995, *Abbott J.R.* 16251 (MO). Perseverancia, 12 May 1991, *Gentry A.H.* 73710 (F, MO). Rio Beni-Madre de Dios, August 1886, *Rusby H.H.* 2569 (MO). Santiago, 16 May 1991, *Gentry A.H.* 73956 (MO). BRAZIL. **Acre:** Unknown municipality, *Lohmann L.* 477 (MO, NY, SPF). **Amapá:** Macapá, *Rabelo A.M.* 1425 (MO); 8 April 1983, *Rabelo B.V.* 2073 (MO). Matapi, 4 March 1983, *Rabelo B.V.* 1846 (MO). **Amazonas:** Benjamin Constant, 7 September 1962, *Duarte A.P.* 6860 (MO). **Mato Grosso:** Cuiabá, 6 January 1909, *Manso S.* 1645 (MO). Cáceres, 10 January 1982, *Saddi N.* 2038 (MO); 10 January 1982, *Saddi N.* 2038 (MO). Poconé, *Saddi N.* 7183 (MO); *Thomas W.W.* 4635 (MO). **Pará:** Antônio Lemos, *Black G.A.* s.n. (MO). Belém, 7 December 1974, *Gentry A.H.* 13107 (MO). Gurupá, *Santos G. dos* 231 (MO); 12 August 1991, *Santos G. dos* 315 (MO); 12 August 1991, *Santos G. dos* 318 (MO). Ilha Mexiana, *Guedes M.* 2305 (MO). Lageira, *Strudwick J.J.* 3112 (MO). COLOMBIA. **Antioquia:** Arboletes, 1 October 1986, *Roldan F.J.* 557 (MO). Chigorodo, 11 January 1986, *Renteria E.* 4569 (MO). Puerto Belgica, 8 April 1951, *Romero-Castaneda R.* 2326 (MO). Turbo, 28 January 1984, *Brand J.* 825 (MO); 21 January 1974, *Gentry A.H.* 9446 (GH, MO); *Haught O.* 4813 (US). **Atlantico:** Ponedera, 1939, *Dugand A.* 1239 (MO); *Dugand A.* 1240 (MO). **Bolívar:** Corozal, *Romero-Castaneda R.* 10037 (MO); *Romero-Castaneda R.* 9619 (MO). Mompos, 10 March 1981, *Espina J.* 990 (MO). San Juan Nepomuceno, 31 December 1992, *Gentry A.H.* 78451 (MO). Zambrano, 11 May 1986, *Cuadros H.V.* 2587 (MO). **Boyaca:** Orocué, 18 March 1939, *Haught O.* 2685 (MO, US). **Choco:** Bahia Solano, 18 April 1989, *Espina J.* 2682 (MO). Noanama, 6 April 1979, *Forero E.* 4686 (MO). Riosucio, 17 April 1988, *Cardenas D.L.* 1698 (MO); 17 January 1974, *Gentry A.H.* 9300 (MO). Truando, Rio, *Bernal P.* 38 (MO); 18 January 1974, *Gentry A.H.* 9317 (MO). **Cordoba:** Montelibano, 23 May 1949, *Romero-Castaneda R.* 1731 (MO). Palotal, 5 July 1948, *Romero-Castaneda R.* 1136 (MO). Tierralta, 30 July 1988, *Gentry A.H.* 63959 (MO). **La Guajira:** Maicao, 1 May 1988, *Roldan F.J.* 961 (MO). Uribia, 19 May 1981, *Bunch P.* 712 (MO). **Magdalena:** Bureche, 30 May 1943, *Romero-Castaneda R.* 93 (MO). Santa Marta, *Smith H.H.* 751 (MO). Tucurínca, 27 July 1944, *Romero-Castaneda R.* 123 (MO). **Meta:** Puerto Lopez, 14 October 1938, *Cuatrecasas J.* 3554 (F, MO, US). **Valle del Cauca:** San Isidro, 29 March 1986, *Gentry A.H.* 53767 (MO). COSTA RICA. **Alajuela:** Llanura de Guatuso, 23 June 1993, *Flores L.* 108 (MO). **Heredia:** Puerto Viejo, 12 July 1971, *Gentry A.H.* 1157 (MO). **Limon:** Cahuita, 21 July 1971, *Gentry A.H.* 1278 (MO); 21 July 1971, *Gentry A.H.* 1281 (F, MO); March 1983, *Gómez L.D.* 20133 (MO). El Carmen, 17 March 1973, *Lent R.W.* 3271 (F). Guacimo, August 1901, *Tonduz A.* 14891 (MO). Limón, 4 October 1895, *Tonduz A.* 9797 (MO). Parque Nacional Tortuguero, 12 April 1990, *Chacón I.A.* 832A (MO); 2 December 1987, *Robles R.* 1434 (MO); 23 December 1987, *Robles R.* 1492 (F, MO); 29 May 1988, *Robles R.* 1849 (MO); 7 June 1988, *Robles R.* 1895 (MO); 25 October 1990, *Solano J.* 212 (MO). Rio San Juan, 21 September 1986, *Davidse G.* 31486 (MO). Rio Tortuguero, 22 January 1997, *Hammel B.* 20749 (INB, MO). **Puntarenas:** Golfo Dulce, 8 April 1995, *Morales J.F.* 3854 (MO); 25 February 1933, *Valerio M.* 411 (BR, CR, F). Parque Nacional Corcovado, 4 February 1988, *Kernan C.* 67 (MO). Puerto Jimenez, 22 July 1971, *Gentry A.H.* 1308 (MO). Rincon de Osa, 17 July 1971, *Gentry A.H.* 1236 (MO). Rio Agujas, 5 April 1997, *Hammel B.* 20695 (MO). CUBA: **Habana:** Finca El Chia, Guajay, 24 November 1946, *Acuna J.* 24881 (MO). ECUADOR. **Morona-Santiago:** Rio Kankaim, 21 September 1985, *Shiki D.* RBAE156 (MO). **Napo:** Coca, 5 November 1974, *Gentry A.H.* 12494 (MO); 5 November 1974, *Gentry A.H.* 12521 (MO). Jatun Sacha, 19 March 1987, *Cerón C.E.* 982 (MO). Lago Agrio, 11 February 1974, *Gentry A.H.* 9841 (MO). Rio Aguatico, *Harling G.* 7390 (F, MO). Rio Blanco, 21 May 1990, *Kohn E.* 1229 (MO). Rio Napo, *Harling G.* 7374 (MO). Santa Cecilia, 27 November 1966, *Sparre B.* 13228 (S). **Pastaza:** Rio Villano, 24 March 1980, *Harling G.* 17728 (AAU, MO). EL SALVADOR. **La Libertad:** Antiguo Cuscatlan, 19 March 1990, *Villacorta R.* 557 (MO). FRENCH GUIANA. **Cayenne:** Akarouany River, *Sagot P.* 399 (MO). Approuague River, 16 January 1970, *Oldeman R.A.A.* B-2780 (MO). Cayenne, 20 February 1985, *Gentry A.H.* 50228 (MO). Gabaret-Bassin de l'Oyapock, 12 April 1988, *Cremers G.* 9874 (CAY, MO, P). Iles du Salut, 21 February 1985, *Cremers G.* 8449 (MO); 21 February 1985, *Cremers G.* 8491 (MO). Kiiki Tabiki, 19 June 1984, *Sauvain M.* 150 (MO). Matoury, 25 April 1986, *Kodjoed J.F.* 113 (MO). GUATEMALA. **Alta Verapaz:** Sebol, 18 April 1943, *Steyermark J.A.* 45751A (MO). **Izabal:** Bananera, 6 April 1940, *Steyermark J.A.* 38971 (MO). Escobas, 13 April 1940, *Steyermark J.A.* 39217 (F, MO). Rio Dulce, 16 April 1940, *Steyermark J.A.* 39528 (F, MO). Rio Izabal, 1 June 1919, *Blake S.F.* 7845 (MO). GUYANA. **Essequibo:** Naamrye Canal, 24 April 1987, *Pipoly J.J.* 11734 (MO, NY, US). **West Demerara:** Mazaruni River, 29 December 1944, *Fanshawe D.B.* F2198 (MO); 1937, *Sandwith N.Y.* 1549 (MO).

HONDURAS. **Atlántida**: Tela, 14 December 1928, *Standley P.C.* 53566 (MO); 14 December 1928, *Standley P.C.* 54754 (MO). MEXICO. **Quintana Roo**: Between Chetumal and La Union, 8 May 1982, *Davidse G.* 20224 (MO). **Tabasco**: Comalcalco, 18 July 1983, *Ventura A.F.* 20458 (MO). Laguna Mecoacan, 16 May 1963, *Barlow F.D.* 28/3 (MO). Rio Gonzalez, 2 July 1963, *Barlow F.D.* 36/3 (MO). **Veracruz**: Catemaco, 15 July 1972, *Beaman J.H.* 6377 (F, MO). Rio Coatzacoalcos, March 1937, *Williams L.O.* 8624 (MO). San Andres Tuxtla, 4 March 1975, *Sousa M.* 4517 (MO). Sontecomapan, 23 May 1981, *Gentry A.H.* 32276 (F, MO); 30 June 1984, *Ibarra-Manriquez G.I.* 1831 (MO); 26 August 1974, *Sousa M.* 4432 (MO); 20 July 1984, *Trigos R.C.* 2773 (MO). NICARAGUA. **Atlántico Sur**: Rio Maiz, 8 January 1995, *Rueda R.* 2656 (MO). **Esteli**: Cuesta de Kukamonga, 11 May 1985, *Moreno P.P.* 25693 (MO). **Rio San Juan**: La Lupe, 28 June 1997, *Salick J.* 8278 (MO). San Juan del Norte, 29 July 1996, *Rueda R.* 4621B (MO); 31 July 1996, *Rueda R.* 4773 (MO); 19 September 1998, *Rueda R.* 8804 (MO). **Zelaya**: La Barra de Punta Gorda, 17 November 1981, *Moreno P.P.* 13311 (MO). Monkey Point, 25 October 1981, *Moreno P.P.* 12447 (MO); 7 April 1981, *Stevens W.D.* 20019 (MO). Rio Grande, 22 April 1949, *Molina R.A.* 2299 (F, MO). Rio Punta Gorda, 16 February 1994, *Rueda R.* 3082 (MO); 16 February 1994, *Rueda R.* 3097 (MO). Santa Julia, 24 May 1984, *Robledo W.* 657 (C, MO). PANAMA. **Bocas del Toro**: Almirante, January 1928, *Cooper G.P.* 191 (MO); January 1928, *Cooper G.P.* 191 (MO); 28 November 1971, *Gentry A.H.* 2696 (MO); 29 November 1971, *Gentry A.H.* 2757 (MO). Rio Changuinola, 9 March 1924, *Dunlap V.C.* 513 (MO). Valle de Agua, 9 September 1940, *Wedel H. von* 654 (MO). **Canal Area**: Lagarto Keys, February 1839, *Barclay H.G.* 2776 (MO). Rio Trinidad, 19 July 1911, *Pittier H.* 4003 (BM, MO, NY, US). **Colon**: Miguel de la Borda, 21 April 1970, *Croat T.B.* 9899 (MO, SCZ). Portobelo, 7 September 1971, *Gentry A.H.* 1745 (MO); 7 April 1971, *Gentry A.H.* 724 (MO, NY). **Darien**: Rio Ucurganti, 7 July 1967, *Bristan N.* 1132 (MO). **San Blas**: Cangandi, 13 December 1985, *Nevers G. de* 6485 (MO). Mandinga, 7 October 1966, *Duke J.A.* 8883 (MO). Rio Cangandi, 25 January 1985, *Nevers G. de* 4624 (MO); 30 January 1985, *Nevers G. de* 4762 (MO). PARAGUAY. **Amambay**: Rio Apa, *Fiebrig K.* 4302 (G, MO). Sierra de Amambay, *Hassler E.* 11147 (MO). **Canendiyu**: Villa Ygatimi, *Gentry A.H.* 59386A (MO); *Gentry A.H.* 59404 (MO); *Gentry A.H.* 59406 (MO, TEX). **Central**: Estero del Ypoal, 14 December 1989, *Zardini E.* 16957 (AS, MO); 7 January 1990, *Zardini E.* 17794 (MO); 13 January 1990, *Zardini E.* 18027 (AS, MO); 23 June 1990, *Zardini E.* 21585 (AS, MO, NY, SPF); 23 June 1990, *Zardini E.* 21665 (AS, MO); 8 December 1990, *Zardini E.* 25236 (MO); 8 December 1990, *Zardini E.* 25255 (MO); 3 August 1991, *Zardini E.* 28222 (MO); 11 November 1991, *Zardini E.* 28634 (MO); 18 March 1992, *Zardini E.* 31247 (MO); 18 March 1992, *Zardini E.* 31258 (MO). Nueva Italia, *Perez L.* 460 (MO). Rio Bermejo, *Schulz A.G.* 7854 (MO). Tavarory, 16 December 1991, *Zardini E.* 29423 (MO); 16 December 1991, *Zardini E.* 29483 (MO). **Chaco**: Bellavista, *Hassler E.* 8239 (BM, MO). Puerto Stroessner, *Stutz L.C.* 1141 (MO); *Stutz L.C.* 1717 (G, MO); *Stutz L.C.* 1718 (G, MO); 28 May 1982, *Stutz L.C.* 340 (G, MO). Villarrica, *Balansa B.* 505a (MO). **Concepción**: Concepción, *Hassler E.* 7529 (MO); *Hassler E.* 7539 (MO). **Cordillera**: Nueva Colombia, 27 August 1988, *Zardini E.* 6862 (MO). Rio Piribebuy, 3 March 1990, *Zardini E.* 19812 (MO). Rio Salado, 13 November 1978, *Arbo M.M.* 1644 (C, F, MO); 3 March 1990, *Zardini E.* 19950 (MO); 21 July 1990, *Zardini E.* 22325 (AS, MO); 4 August 1990, *Zardini E.* 22758 (MO). **Guaira**: Villarrica, *Balansa B.* 505b (MO). **Misiones**: Caaguazu, *Balansa B.* 509 (MO). **Paraguari**: Estero del Ypoal, 7 January 1990, *Zardini E.* 17491 (MO). **Presidente Hayes**: Chaco, *Fiebrig K.* 1435 (MO); 29 July 1910, *Flebrig K.* 1435 (K, MO); *Rojas T.* 2900C (MO). PERU. **Amazonas**: Bagua, 8 November 1996, *Diaz C.* 8320 (MO); 14 October 1995, *Vásquez R.* 20275 (MO). Condorcanqui, 12 August 1978, *Kujikat A.* 261 (MO). **Huanuco**: Carretera Marginal, 31 May 1983, *Gentry A.H.* 41338 (MO). **Loreto**: Alto Amazonas, 11 October 1985, *Gentry A.H.* 52236 (F, MO); 30 March 1987, *Lewis W.H.* 13460 (MO). Boca del Huallaga, October 1929, *Williams L.* 4208 (MO). Indiana, 22 May 1978, *Gentry A.H.* 22236 (MO); 5 November 1979, *Gentry A.H.* 27446 (MO). Loreto, 3 December 1985, *Lewis W.H.* 10207 (MO); 3 December 1985, *Lewis W.H.* 10247 (MO); 29 December 1986, *Lewis W.H.* 10529 (MO). Mariscal Ramon Castilla, 13 August 1987, *Vásquez R.* 9324 (AAU, F, MO, NY). Maynas, 28 July 1980, *Gentry A.H.* 29181 (MO); 4 July 1983, *Gentry A.H.* 42553 (MO); 29 August 1983, *Gentry A.H.* 43794 (MO); 15 February 1989, *Gentry A.H.* 65861 (MO, NY, TEX); 5 January 1991, *Gentry A.H.* 72164 (MO); 6 April 1985, *Vásquez R.* 6293 (MO); 23 February 1986, *Vásquez R.* 7229 (MO, NY). Padre Isla, 22 May 1978, *Gentry A.H.* 22236 (MO). Punchana, 1 October 1964, *Dodson C.H.* 2839 (MO). Quisto Cocha, 15 November 1974, *Gentry A.H.* 12701 (GH, MO). Rio Sinchiyacu, 21 November 1986, *Lewis W.H.* 11905 (MO); 21 November 1986, *Lewis W.H.* 12037 (MO); 21 November 1986, *Lewis W.H.* 12078 (MO). **Madre de Dios**: Manu, 20 July 1984, *Foster R.B.* 9662 (MO); 20 August 1983, *Gentry A.H.* 43706 (AAU, MO); 14 September 1991, *Nuñez P.* 14248 (MO); July 1988, *Shepherd G.J.* 2128 (MO). Parque Nacional Manu, 19 September 1986, *Foster R.B.* 11425 (F, MO); 19

October 1979, *Gentry A.H. 26934* (MO). Salvacion, 5 December 1991, *Nuñez P. 14630* (MO). Tambopata, 20 February 1989, *Gentry A.H. 66012* (MO); 14 December 1989, *Gentry A.H. 68760* (MO); 14 June 1989, *Nuñez P. 10796* (MO); 13 May 1990, *Nuñez P. 12144* (MO); 26 June 1991, *Timaná M. 1846* (MO); 26 June 1991, *Timaná M. 1846A* (MO); 30 August 1991, *Timaná M. 2128* (MO); 7 October 1991, *Timaná M. 2449* (MO); 18 November 1991, *Timaná M. 3278* (MO). **San Martín:** Rio Cachiyacu, 9 May 1975, *Schunke-Vigo J. 8455* (MO). Tarapoto, 5 December 1987, *Montes F. 1* (MO). Tocache Nuevo, 14 March 1979, *Gentry A.H. 25743* (F, MO); 28 July 1974, *Schunke-Vigo J. 7852* (MO, US). **Ucayali:** Aguaytia, 29 June 1960, *Mathias M.E. 5045* (MO); August 1946, *Woytkowski F. 34465* (MO). Coronel Portillo, 18 June 1987, *Gentry A.H. 58405* (AAU, F, MO, NY). SURINAM. **Commenwijnje:** Jaglust, 24 December 1837, *Splitgerber F.L. 422* (K, L). **Nickerie:** Nickerie, 25 September 1916, *Boschwezen3511pp* (MO); 24 February 1915, *Gonggrijp J.W. 1025* (MO, U); 11 September 1920, *Pulle A.A. 548* (MO, U, US). **Para:** Jodensavanne, 2 November 1921, *Boschwezen 5518* (MO). **Paramaribo:** Kwattaweg, 11 June 1913, *Soeprato 46B* (MO). Paramaribo, April 1979, *Heyde N.M. 579* (MO). **Saramacca:** La Poule, 23 April 1916, *Samuels J.A. 152* (GH, NY); 23 April 1916, *Samuels J.A. 395* (GH). **Sipaliwini:** Apoera, 2 September 1911, *Gonggrijp J.W. 17* (MO). Matappi, *Focke 661* (U). **Unknown province:** Unknown municipality, 4 October 1954, *Mennega A. 194* (MO). VENEZUELA. **Amazonas:** Caño Majagua, 17 April 1974, *Jangoux I.J. 10135* (MO). **Apure:** Achaguas, 19 June 1973, *Ramia M. 5317* (MO, VEN). Rio Meta, 15 February 1978, *Davidse G. 14119* (MO). **Barinas:** Cachicamo, 9 April 1968, *Steyermark J.A. 102031* (MO); 11 April 1968, *Steyermark J.A. 102096* (MO, VEN). **Bolívar:** Anacoco, 18 March 1974, *Gentry A.H. 10705* (MO); 18 March 1974, *Gentry A.H. 10719* (MO). Caura, Rio, 19 April 1939, *Williams L. 11878* (F, MO, US). Represa Guri, 4 April 1981, *Liesner R. 11239* (MO). San Pedro de las Bocas, 7 July 1975, *Gentry A.H. 15079* (MO). **Delta Amacuro:** Antonio Diaz, 16 October 1977, *Steyermark J.A. 114697* (MO). La Margarita, 26 November 1960, *Steyermark J.A. 87778* (GH, NY, U, UB, US). **Falcon:** Chichiriviche, 26 June 1970, *Smith R.F. V6331* (MO). **Guarico:** Calabozo, 7 March 1974, *Gentry A.H. 10262* (MO). Calabozo-Cazarola, 27 July 1974, *Morillo G. 4239* (MO). Miranda, 13 July 1975, *Castillo A. 121* (MO). **Miranda:** Caracas, *Aristeguieta L. 4855* (MO, VEN). Rio Chico, 3 May 1923, *Jahn A. 1240* (MO). **Monagas:** San Juan, *Marcano-Berti L. 55-1-76* (MO). **Sucre:** Guaraunos, 18 February 1980, *Steyermark J.A. 121226* (MO, NY). **Yaracuy:** Marin, 9 April 1925, *Pittier H. 11767* (MO). **Zulia:** Bachaquero, 4 May 1968, *Ferrari G. 363* (MO). Casigua El Cubo, 14 December 1979, *Bunting G.S. 8467* (MO). El Laberinto, 16 April 1977, *Aristeguieta L. 12326* (MO). Guana, 5 June 1977, *Bunting G.S. 5121* (MO). Machango, 8 May 1980, *Aristeguieta L. 12609* (MO). Maracaibo, 11 May 1983, *Gentry A.H. 41252* (MO, NY). Perija, 19 June 1980, *Davidse G. 18206* (MO). Potrerito, 12 June 1977, *Bunting G.S. 5158* (MO, NY). Rio Catatumbo, 27 March 1982, *Liesner R. 13267* (MO). Rio Lora (Boca del Rio), 14 December 1922, *Pittier H. 10960* (MO).

8. *Dolichandra unguiculata* (Vellozo 1829: 248) L.G.Lohmann in Lohmann & Taylor (2014: 431)

≡ *Bignonia unguiculata* Vell.

≡ *Doxantha unguiculata* (Vell.) Miers (1863: 190).

≡ *Parabignonia unguiculata* (Vell.) Gentry (1975: 343).

Lectotype (designated by Lohmann & Taylor 2014):—Vellozo, Fl. Flumin. Icones 6: Tab. 33, 1831 (illustration!).

= *Tecoma maximiliani* Mart. ex Candolle (1845: 222) as “*maximiliani*”.

≡ *Gelsemium maximiliani* (Mart. ex DC.) Kuntze (1891: 480) as “*maximiliani*”.

≡ *Parabignonia maximiliani* (Mart. ex DC.) Bureau ex Schumann (1894: 229).

≡ *Dolichandra maximiliani* (Mart. ex DC.) Kuntze (1898: 243) as “*maximiliani*,” *syn. nov.*

Lectotype (designated here):—BRAZIL. Bahia, s.d., *Blanchet J.S. 2304* (G-DC! [G0133909]).

Residual syntype:—BRAZIL. Without locality, s.d., *von Martius C.F.P. s.n.* (M not seen).

Liana, with dimorphic juvenile growth. **Stems** terete, grey to brown, glabrous, bark flaky, striate. **Branchlets** terete, purplish to green, glabrous to puberulent, trichomes simple; interpetiolar regions with inconspicuously glandular fields; prophylls of the axillary buds lanceolate, 0.9–1.3 mm long, smooth, puberulent, trichomes simple. **Leaves** bifoliate with a terminal tendril; petioles subterete to slightly sulcate, 10–25 mm long, glabrous to puberulent, trichomes simple; petiolules sulcate, 4–13 mm long, glabrous to puberulent; tendrils not woody, subterete, 22–40 mm long, glabrous, tendril arms 7–17 mm long; leaflets elliptic to oblong, apex apiculate to cuspidate, base acute, obtuse or rounded, symmetric or slight asymmetric, 46–120 × 35–72 mm, chartaceous, adaxial surface glabrous, abaxial surface lepidote, trichomes peltate and pateliform, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire. **Inflorescences** a leafy raceme, puberulent,

trichomes simple; floral pedicels 10–15 mm long; floral bracts deciduous, rarely present, lanceolate to elliptic, 7–10 mm, membranaceous, green; bracteoles persistent, rarely deciduous, linear to lanceolate. **Calyces** campanulate, inflated, with five lobes, lobe lanceolate with mucronate apex, 12–15 × 6–10 mm, membranaceous, green to purplish, mostly glabrous and puberulent at the margin, trichomes simple. **Corollas** purplish externally and yellow inside the tube, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, puberulent and with glandular trichomes at the apex eglandular trichomes simple, glandular trichomes pateliform and stipitate, nectar guide present, corollas 45–62 × 9–15 mm, tubes 39–50 mm long, lobes 6–15 × 7–14 mm, orbicular to obovate. **Androecia** attachment at the same position; filaments terete, glabrous, short filaments 13–16 mm long, long filaments 24–25 mm long; staminodes 8–10 mm long; anthers included, 4–4.4 mm long. **Gynoecia** with ovaries linear, 5–6.5 × 1–2 mm, green, glabrous, ovules in one series on each placenta; styles 25–32 mm long, glabrous; stigmas included, 1.5–2 mm long. **Fruits** flattened and linear, narrowed at both ends, 21–50 × 1–1.5 cm, slightly woody, smooth, brown to dark brown, glabrous **Seeds** numerous, winged, oblong, 30–35 × 8–10 × 0.7–1 mm, seed bodies 7–9 × 5–7 mm, seed wings membranaceous and opaque.

Illustration:—Figure 12G–O.

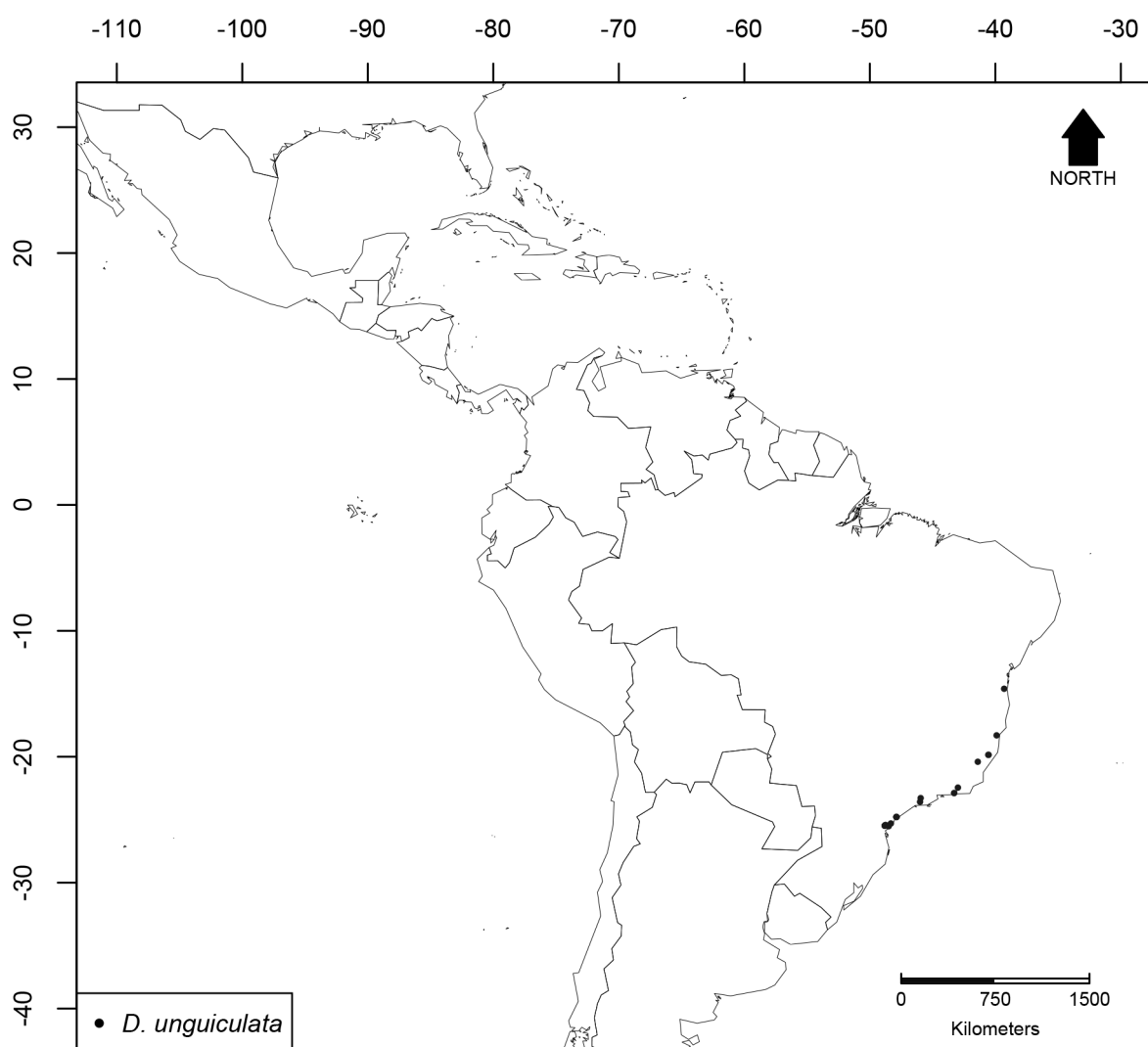


FIGURE 15. Geographic distribution of *Dolichandra unguiculata* in Central and South America.

Nomenclatural notes:—Candolle (1845) cited two gatherings (*Blanchet J.S. 2304* and *von Martius C.F.P. s.n.*) in the protologue of *Tecoma maximilianii*. We were only able to locate the collection *Blanchet J.S. 2304*, which is here selected as the lectotype.

Taxonomic notes:—*Dolichandra unguiculata* is very similar morphologically to *D. steyermarkii*, with which it shares branchlets with flaky bark, chartaceous leaflets, large tendrils (up to 6.5 cm) and five lobed campanulate calyces (Table 1). *Dolichandra unguiculata* can be differentiated from *D. steyermarkii* by the glabrous and long mucronate calyx (vs. puberulent and rounded to shortly mucronate calyx of *D. steyermarkii*).

Phenology:—Flowers throughout the year, with a flowering peak from October to December.

Distribution and ecology:—*Dolichandra unguiculata* is known from Brazil (Bahia, Espírito Santo, Paraná, Rio de Janeiro, São Paulo), restricted to the Atlantic Forest of Brazil (Fig. 15). It is found primarily in tropical wet and coastal forests, mainly near riverbanks or at “restinga” vegetation, below 100 m alt.

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 318,181.275 km² and the estimated area of occupancy is 96.000 km² (cell width of 2 km). No population level data is available for this taxon.

Specimens examined:—BRAZIL. **Bahia:** Urucuca, 11 April 1978, *Mori S.A. 11055* (MO). **Espirito Santo:** Conceição do Castelo, 6 November 1986, *Hatschbach G. 50688* (MBM, MO). Pedro Canário, *Viellard C.J. s.n.* (MO). Santa Teresa, *Boone W. 310* (MBML, MO); 4 February 1985, *Gentry A.H. 3457* (MO); 19 June 1984, *Hoffmann W.A. 151* (MO). **Paraná:** Guaraqueçaba, 8 December 1970, *Hatschbach G. 25767* (MBM, MO). Morretes, 24 January 1985, *Gentry A.H. 49774* (MO); 25 January 1985, *Gentry A.H. 49854* (MO); 28 October 1976, *Hatschbach G. 39143* (MBM, MO). Paranaguá, 1 October 1962, *Hatschbach G. 9256* (MBM, MO). Rio Nunes, 24 January 1985, *Gentry A.H. 49820* (MO). **Rio de Janeiro:** Rio de Janeiro, *Ducke W.A. s.n.* (MO); 1 November 1934, *Mello B. s.n.* (MO). Teresópolis, *Glaziou A.F.M. 4742* (MO). **São Paulo:** Apiaí, *Fonseca L.H.M. 159* (SPF); Bertioga, *Fonseca L.H.M. 166* (SPF); Cananéia, 4 November 1991, *Barros F. de 2298* (MO); 17 August 1982, *Fiuza de Melo M.M.R. 434* (MO); 1 November 1987, *Gentry A.H. s.n.* (MO); 19 August 1982, *Maruffa A.C. 45* (MO); *Marutla A.C. 45* (MO). Jacareí, *Dusen P. 15609* (MICH). São Paulo, 4 September 1987, *Gentry A.H. 59058* (MO).

9. *Dolichandra unguis-cati* (Linneaus 1753: 623) Lohmann (2008: 273)

≡ *Bignonia unguis-cati* L.

≡ *Doxantha unguis-cati* (L.) Miers (1863: 190), as “*unguis*”.

≡ *Doxantha unguis-cati* (L.) Miers ex Rehder (1913: 262), nom. superfl.

≡ *Batocydia unguis-cati* (L.) Mart. ex Britton in Britton & Wilson (1925: 194).

≡ *Macfadyena unguis-cati* (L.) Gentry (1973b: 236).

Lectotype (designated by Nasir 1979: 18):—Plumier, *Descr. Pl. Amer.*, tab. 94, 1693 (illustration!).

= *Bignonia unguis* Vellozo (1829: 246).

Lectotype (designated by Gentry 1975):—t. 20 in Vell., *Fl. Flumin. Icones 6. 1827 “1831”* (illustration!).

= *Bignonia exoleta* Vellozo (1829: 248).

≡ *Batocydia exoleta* (Vell.) Mart. ex. Cadolle (1845: 148).

≡ *Doxantha exoleta* (Vell.) Miers (1863: 190).

≡ *Bignonia unguis-cati* var. *exoleta* (Vell.) Sprague (1905: 84).

≡ *Doxantha unguis-cati* var. *exoleta* (Vell.) Fabris (1965: 394).

Lectotype (designated by Gentry 1975):—t. 30 in Vell., *Fl. Flumin. Icones 6. 1827.* (illustration!).

= *Bignonia gracilis* Loddiges (1831: 1705).

≡ *Bignonia unguis* var. *gracilis* (G. Lodd.) Candolle (1845: 146).

Lectotype (designated here):—pl. 1705 in Loddiges, *Bot. Cab. 18* (1831; illustration!).

= *Bignonia tweediana* Lindley (1840: t. 40).

≡ *Doxantha tweediana* (Lindl.) Miers (1863: 190), *syn. nov.*

Lectotype (designated here):—pl. 45 in Edwards’s *Botanical Register 26: 1840*, from cultivated material in England, the original plant collected by *W.F. Strangways* in Buenos Aires. (illustration!).

= *Dolichandra kohautiana* Presl (1845: 522).

≡ *Spathodea kohautiana* (C. Presl) Walpers (1847: 513), *syn. nov.*

Holotype:—MARTINIQUE. Without locality, s.d., *Kohaut F. s.n.* [labeled: *Sieber, Fl. Martin. 164*] (PRC not seen; isotypes, MO-1998968!, JE-00001054!).

= *Bignonia inflata* Grisebach (1879: 256).

Lectotype (designated here):—ARGENTINA. Salta: San Andrés, cerca de Orán, 17 September 1873, *Lorentz P.G. & Hieronymus G. 271* (GOET000349!; isolectotype, GOET000350!, CORD00006167!).

= *Bignonia lanuginosa* Hemsley (1882: 491).

Holotype:—MEXICO. Sierra San Pedro Nolasco, Talea, 1843–1844, *C. Jurgensen 578* (K! [K000449788]; isotype, BM!

[BM000578403], FI011844!).

= *Bignonia unguis-cati* var. *guatemalensis* Schumann & Loesener (1896: 130–131) as “*unguis cati*.”

Lectotype (designated here):—GUATEMALA. Retalulëu, May 1867, *Bernoulli C.G. & Cario R. 2057* (K! [K000449789]; isolectotype, S not seen).

= *Bignonia unguis-cati* var. *serrata* Bureau & Schumann (1896: 283).

Lectotype (designated here):—PARAGUAY. Villa Rica, October 1874, *Balansa B. 506* (K! [K000449793]; isolectotype, P! [P01817745]).

= *Bignonia californica* Brandegees (1903: 170).

Lectotype (designated here):—MEXICO. Baja California: Cape Region, vicinity of Miraflores, *Purpus C.A. 249* (US! [US00125820]; isolectotype, MO!).

Residual syntype:—MEXICO. Baja California, Cape Region, vicinity of Miraflores, s.d., *Brandegee T.S. 716* (syntype, UC172616!, UC102883!).

= *Bignonia dasyonyx* Blake (1917: 93–94).

≡ *Doxantha dasyonyx* (S.F.Blake) Blake (1923: 192).

≡ *Doxantha unguis-cati* var. *dasyonyx* (S.F.Blake) Seibert (1940: 422).

Holotype: BELIZE. Toledo, 27 May 1907, *Peck M.E. 919* (GH! [GH 00075897]; isotype, K! [K000449787]).

= *Doxantha elongata* Miers (1863: 190), *nom. nud.*

Based on: BRAZIL. Rio Grande, s.d., *Fox H.S. 9* (BM? not seen) [?= MO!, *H.S. Fox s.n.*]

= *Doxantha inoleta* Miers (1863: 190), *nom. nud.*

Based on: URUGUAY. Montevideo, s.d., *King D.O. 170* (BM000578406!)

= *Doxantha mexicana* Miers (1863: 190), *nom. nud.*

Based on: MEXICO. Without locality, s.d., *Coulter T. 1004* (BM? not seen) [Gentry 1973a]

= *Doxantha praesignis* Miers (1863: 190), *nom. nud.*

Based on: SAN DOMINGO. Without locality, s.d., *Imray J. s.n.* (BM? not seen) [Gentry 1973a]

= *Doxantha scitiflora* Miers (1863: 190), *nom. nud.*

Based on: COLOMBIA. Antigua, s.d., *Nicholson T. s.n.* (BM? not seen) [Gentry, unpubl. notes]

= *Doxantha serratula* Miers (1863: 190), *nom. nud.*

Based on: GUADALUPE. Without locality, s.d., *Duchassing E.P. s.n.* (BM? not seen) [Gentry 1973a]

= *Doxantha tenuicula* Miers (1863: 190), *nom. nud.*

Based on: Hispaniola. Without locality, s.d., *Swartz O. s.n.* (BM? not seen) [Gentry, 1973a]

Lianas, with dimorphic juvenile growth. **Stems** terete, brown, glabrous to puberulent, bark not flaky. **Branchlets** terete, green, glabrous to pubescent, trichomes simple; interpetiolar regions with glandular fields; prophylls of the axillary buds ovate, 2–8 mm long, striate, glabrous to pubescent, trichomes simple. **Leaves** bifoliolate with a terminal tendril; petioles subterete to slightly sulcate, 22–70 mm long, glabrous to pubescent; petiolules sulcate, 1–35 mm long, glabrous to pubescent, rarely lepidote, eglandular trichomes simple, glandular trichomes lepidote; tendrils not woody, subterete, 12–40 mm long, glabrous to pubescent, trichomes simple, tendril arms 3–20 mm long; leaflets ovate to elliptic, apex acute to acuminate, base cuneate to truncate, symmetric or slight asymmetric, 32–260 × 10–135 mm, membranaceous or chartaceous, adaxial surface glabrous to scarcely lepidote, glandular trichomes pateliform, abaxial surface puberulent along main veins, eglandular trichomes simple, glandular trichomes peltate throughout, pateliform concentrated at the base, first venation pinnate, second venation brochidodromous, third venation reticulate, margin entire or serrate. **Inflorescences** a thyrse or leafy thyrse, glabrous to pubescent, trichomes simple; floral pedicels 7–42 mm long; floral bracts deciduous, rarely present, lanceolate to elliptic, 1–10 mm long, membranaceous, green; bracteoles deciduous, rarely present, linear to lanceolate. **Calycs** campanulate, inflated, with truncate to sinuous margin, 6–30 × 7–22 mm, membranaceous, green, glabrous to scarcely lepidote, trichomes peltate and pateliform. **Corollas** yellow, with lobes dark yellow, infundibuliform, with upper two lobes diverging from axis at almost 90° and the lower three lobes spreading, membranaceous, glabrous, except ciliate at the margin of the lobes and pubescent at nectar guides and at stamens attachment, eglandular trichomes simple, glandular trichomes stipitate, nectar guides present, corollas 37–100 × 12–25 mm, tubes 29–71 mm long, lobes 10–29 × 12–25 mm, orbicular to obovate. **Androecia** attachment at the same position, 4–8 mm; filaments terete, glabrous, short filaments 12–28 mm long, long filaments 19–25 mm long; staminodes 5–15 mm long; anthers included, 3–8 mm long. **Gynoeceia** with ovaries linear, 5–10 × 1–2 mm, green, glabrous; styles 13–28 mm, glabrous, ovules in one series on each placenta; stigmas included, 2–3 mm long. **Fruits** flattened and linear, narrowed at both ends, 18–136 × 1–2.2 cm, slightly woody, smooth, brown, glabrous. **Seeds** numerous, winged, oblong, 27–68 × 10–20 × 0.6–1.2 mm, seed bodies 14–40 × 5–9 mm, seed wings membranaceous and translucent.

Illustration:—Figures 8K–R.

Nomenclatural notes:—Loddiges (1831) described *Bignonia gracilis* without citing any material. No original collections were located and the illustration provided by the author is here selected as lectotype.

Lindley (1840) described *Bignonia tweediana* without citing any material. No original collections were located and the illustration provided by the author is here selected as lectotype.

Grisebach (1879) described *Bignonia inflata* based on the collection *Lorentz P.G. & Hieronymus G. 271*. Two duplicates of this collection are deposited at GOET and the best quality material is here chosen as the lectotype.

Bureau & Schumann (1896), and Schumann & Loesener (1896) described, respectively, *Bignonia unguis-cati* var. *serrata* based on a collection of *Bernoulli B. 2057*, and *Bignonia unguis-cati* var. *guatemalensis* based on a collection of *Balansa B. 506*. Both holotypes were deposited at B and destroyed during the World War II (Hiepko 1987). Duplicates of both collections were located in other herbaria and the best quality materials were here selected as the lectotypes.

Brandgee (1903) cited two gatherings, *Purpus C.A. 249* and *Brandege T.S. 716*, in the protologue of *Bignonia californica*. We here selected the best quality materials as the lectotypes.

Taxonomic notes:—*Dolichandra unguis-cati* shares a green calyx and yellow corolla with *D. dentata*, *D. hispida*, *D. quadrivalvis* and *D. uncata*. *Dolichandra unguis-cati* is morphologically most similar to *D. hispida*, with which it shares the longest capsules in the family (reaching 136 cm in the former and 125.8 cm in the latter). *Dolichandra unguis-cati* can be differentiated from other species of *Dolichandra* by the brownish, obovate, and longitudinally striate prophylls of the axillary buds and a truncate calyx, with straight to sinuous margin (Table 1). We did not observe any morphological discontinuity or geographical structure and thus, a broad circumscription of *Dolichandra unguis-cati* is adopted here. Morphological variation is prominent in leaflet shape (narrowly ovate to obovate, elliptic, entire or dentate) and size (30–260 × 10–135 mm), as well as in calyx size (6–30 × 7–20 mm), and corolla size (29–71 mm).

Phenology:—Flowers during the dry season and early wet season, from March to June (in Panama, Gentry 1973a) and September to January in southeastern Brazil. Fruits were collected throughout the year.

Distribution and ecology:—*Dolichandra unguis-cati* is known from Antigua, Argentina (Buenos Aires, Chaco, Corrientes, Entre Rios, Formosa, Jujuy, Misiones, Salta, Santa Fe, Tucuman), Bahamas Archipelago, Barbados, Belize, Bolivia, Brazil (Amazonas, Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Pará, Pernambuco, Rio Grande do Sul, Rio de Janeiro, Rondônia, Roraima, Santa Catarina, São Paulo), Colômbia (Atlântico, Bolivar, Caldas, Cesar, Choco, Cordoba, Cundinamarca, Guajira, La Guajira, Magdalena, Meta), Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadalupe, Guatemala, Honduras, Mexico (Baja California, Campeche, Chiapas, Colima, Estado de Nueva Leon, Guerrero, Mexico, Michoacan, Nayarit, Oaxaca, Queretaro, Quintana Roo, San Luis Potosi, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, Yucatan), Nicaragua, Panama, Paraguay, Peru (Amazonas, Cuzco, Junin, Loreto, Madre de Dios, Pasco, Puno, San Martin), Surinam, Puerto Rico, Saint Martin, Saint Thomas, Uruguay, Venezuela (Amazonas, Anzoategui, Apure, Aragua, Barinas, Bolivar, Carabobo, Cojedes, Delta Amacuro, Distrito Federal, Falcon, Guarico, Lara, Merida, Miranda, Monaguas, Nueva Esparta, Portuguesa, Sucre, Uaracuy, Zulia) and the Windward Islands (Grenada, Martinique, Saint Lucia, Saint Vincent) (Fig. 16). It occurs between sea level and 2100 m elev. and is common in dry forests and becomes progressively less common in premontane moist forest and rare in premontane wet forest and tropical wet forest (Gentry 1973a). It is also an invasive in Australia, China, South Africa, and USA (Florida, Texas).

Conservation status:—This species is categorized as Least Concern [LC] following the IUCN criteria (IUCN 2012, IUCN Standards and Petitions Subcommittee 2016). The extent of occurrence estimated for the species is 29,900,950.163 km² and the estimated area of occupancy is 3,072.000 km² (cell width of 2 km). No population level data is available for this taxon.

Vernacular names:—ARGENTINA: “Uña de gato,” “Mbaracaya-piapé,” “Teyu-igsipó” (Fabris 1979). BRAZIL: “Unha-de-gato”. GUATEMALA: “Uña de gato”, “Bejuco azucena”, and “Uña de guana” (Standley & Williams 1974). USA: “Cat’s claw”, and “Yellow trumpet vine” (Gentry 1982a).

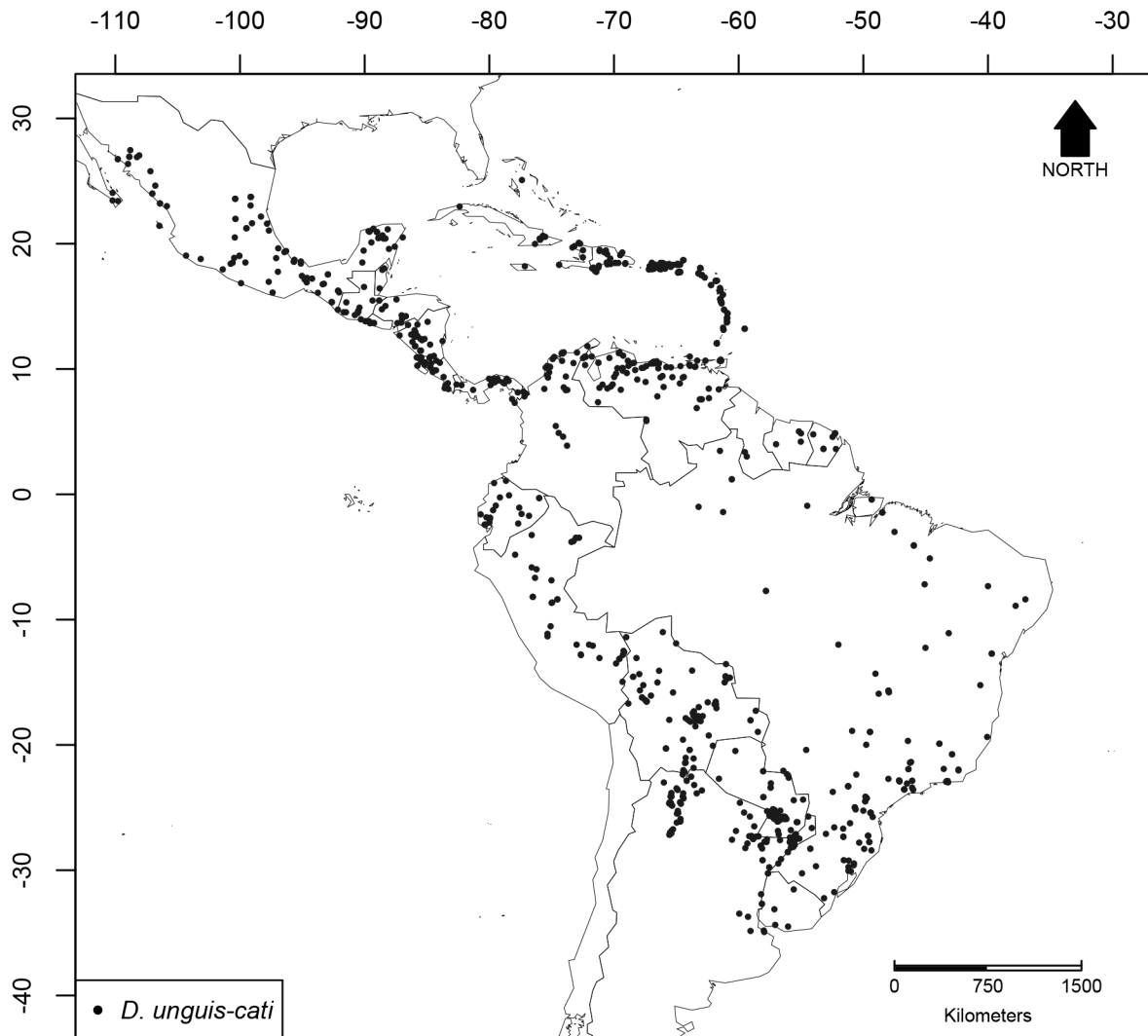


FIGURE 16. Geographic distribution of *Dolichandra unguis-cati* in Central and South America.

Specimens examined:—ANTIGUA. Lyons, 10 December 1937, *Box H.E. 1306* (A, BM, MICH, MO, US). ARGENTINA. **Buenos Aires:** La Plata, 23 December 1984, *Gentry A.H. 49139* (MO). Punta Lara, 18 October 1939, *Cabrera A. 5379* (NY, MO). **Chaco:** Basail, 19 April 1983, *Pires E. 1382* (MO). Colonia Benitez, *Schulz A.G. 2388* (MO); 2 November 1943, *Schulz A.G. 3453* (MO); *Schulz A.G. 37* (COL, MO); *Schulz A.G. 463* (MO). Colonia Popular, 25 September 1938, *Schulz A.G. 1616* (MO). Enrique Urein, *Schulz A.G. 1633* (MO). Margarita Belen, 7 November 1947, *Aguilar R. 1072* (MO). Quitilipi, *Schulz A.G. 1631* (MO). **Corrientes:** Arroyo Chimiray, 6 February 1972, *Krapovickas A. 21077* (MO); *Tressens D. 1877* (MO). Corrientes, 1978, *Arbo M.M. 1558* (MO); *Gentry A.H. 59463* (MO); 6 November 1965, *Krapovickas A. 11735* (MO); 14 October 1969, *Marunak V. 77* (MO, TEX-LL); 27 December 1974, *Schinini A. 10754* (MO). Ensenada Grande, 6 October 1971, *Krapovickas A. 20012* (MO). Garruchos, 7 February 1972, *Krapovickas A. 21340* (MO); 12 April 1974, *Krapovickas A. 25086* (MO); 20 October 1974, *Krapovickas A. 25770* (MO). Ituazingo, 26 April 1975, *Schinini A. 11393* (MO). Las Tres Marias, 2 August 1954, *Pedersen T.M. 2750* (MO). Lomas de Vallejos, *Schinini A. 17761* (MO). Mburucuya, 6 October 1950, *Pedersen T.M. 1212* (MO); 6 July 1954, *Pedersen T.M. 1212A* (MO). Mercedes, 2 February 1974, *Quarín C. 2030* (MO); 15 November 1977, *Schinini A. 14362* (MO). Monte Caseros, 22 February 1945, *Ibarrola C. 2483* (MO); 10 September 1979, *Schinini A. 18272* (MO). Paso Florentin, *Ibarrola C. 3721* (MO). Paso de la Patria, 7 February 1972, *Carnevali R. 2786* (MO). Rio Aguapey, 24 September 1974, *Krapovickas A. 26403* (MO). Rio Parana, 11 October 1984, *Schinini A. 25014* (MO). San Antonio, 11 December 1973, *Krapovickas A. 24232* (MO, G). San Carlos, *Krapovickas A. 17984* (MO); 1 March 1985, *Tressens S.G. 3103* (MO). Santo Tome, 9 December

1976, *Quarín C.* 3430 (MO); 4 December 1981, *Tressens D.* 1556 (MO). Timbo Cora, 16 November 1980, *Gentry A.H.* 4119 (MO). Yapeyu, 17 November 1961, *Fabris H.* 7308 (MO). **Entre Ríos:** Arroyo Palmar, 10 January 1984, *Cusato L. s.n.* (MO). Isla Martín García, *Palacios M.A.* 40 (MO). **Formosa:** Arroyo Salado, 2 September 1971, *Krapovickas A.* 19612 (MO). Bartolome de las Casas, 9 June 1971, *Lustran P.* 479 (MO). Clorinda, 30 September 1946, *Morel I.* 1405 (MO, S). Laishi, 2 February 1971, *Boelcke O.* 14520 (MO). Pirane, 17 November 1945, *Morel I.* 309 (F, MO, S, W). **Jujuy:** El Fuerte, 22 November 1970, *Cabrera A.* 21077 (MO). Jujuy, 26 September 1938, *Eyerdam W.J.* 22215 (MO). Laguna de La Brea, 26 July 1901, *Fries R.E.* 405 (S). Laguna de Yala, 8 April 1945, *O'Donell C.A.* 2896 (MO). Lozano, 3 November 1974, *Schinini A.* 10262 (MO). Sierra Calilegua, 6 October 1927, *Venturi S.* 5388 (MO); 11 October 1927, *Venturi S.* 5398 (A, BM, F, MO, US). Sierra de Sta. Barbara, 9 October 1929, *Venturi S.* 9581 (MO); 15 October 1929, *Venturi S.* 9662 (BM, MO). Tiraxi, 17 September 1981, *Rotman A.* 545 (MO); 7 September 1989, *Urtubey E.* 9 (MO). Valle Grande, 18 October 1964, *Cabrera A.L.* 16146 (MO, TEX). Yala, 22 October 1963, *Fabris H.* 4672 (M, MO). **Misiones:** Apostoles, *Crovetto R.* 11492 (MO). Arroyo Grande Pindapoy, 28 December 1944, *Sesmeros* 254 (MO, NY). Candelaria, 18 April 1945, *Montes J.E.* 751 (MO, NY, S); 24 July 1944, *Montes J.M.* 129 (BM, MO); 14 January 1945, *Schwarz G.J.* 508 (MO, U, US). Cerro Azul, 13 September 1970, *Krapovickas A.* 15938 (C, MO). Concepcion de la Sierra, 2 February 1948, *Schulz A.G.* 6956 (MO); *Schwarz G.J.* 36021 (MO). Garupá, 18 April 1979, *Royo O.* 679 (MO). Martires, 5 January 1947, *Bertoni J.E.A.* 3379 (MO). Obera, 26 December 1973, *Pires S.* 175 (MO). Parque Nacional Iguazu, 17 November 1971, *Krapovickas A.* 18362 (MO). Posadas, 14 December 1907, *Ekman E.L.* 1006 (MO, NY). San Ignacio, 13 July 1939, *Schulz A.G.* 2419 (MO). San Pedro, 7 July 1949, *Montes J.* 4299 (MO). Santo Pipo, 4 October 1947, *Schwarz G.J.* 4879 (MO); 4 October 1947, *Schwarz G.J.* 4879 (MO). **Salta:** Arroyo Castellanos, 16 September 1988, *Novara L.J.* 8097 (M, MO, S). Cerro La Pedrera, *Varela* 2127 (MO). Cordón de Lesser, 5 September 1989, *Novara L.J.* 9009 (MO); 15 October 1941, *Zabala S.* 249 (MO, U). Esteco, 10 March 1964, *Vaca A. s.n.* (MO). Hickmann, 20 November 1978, *Renvoize S.A.* 3532 (B, MO, NY, S, U, US). Metan, 8 December 1946, *Malvárez M.R.* 115 (MO). Oran, 3 November 1938, *Eyerdam W.J.* 22826 (MO); 27 October 1924, *Venturi S.* 3549 (MO, S, US). Parque Nacional El Rey, *Gentry A.H.* 51750 (MO); *Gentry A.H.* 51765 (MO, NY, TEX); *Gentry A.H.* 51819 (MO); 28 October 1983, *Malmierca L. s.n.* (MO). Rio Blanco, 16 March 1945, *Abbiati D.* 933 (F, MO). Rio Seco, 17 November 1986, *Charpin A.* AC20488 (MO). Rio Yacones, 22 September 1980, *Zardini E.* 1188 (MO); 22 September 1980, *Zardini E.* 1194 (MO). Salta, 25 September 1985, *Gentry A.H.* 51833 (MO, NY); 30 January 1983, *Novara L.J.* 3098 (MO). San Ignacio, 11 April 1945, *Pierotti S.A.* 1207 (MO, NY). San Lorenzo, 3 October 1901, *Fries R.E.* 601 (MO); 23 May 1982, *Novara L.J.* 2691 (MO); 19 September 1985, *Vanni R.* 465 (C, MO). Sierra de la Candelaria, 13 September 1929, *Venturi S.* 9513 (A, MO, S). Tartagal, 15 February 1940, *Schreiter* 10889 (F, MO); 24 October 1924, *Schreiter* 3473 (GH, MO, NY). Universidad Católica, *Gentry A.H.* 51698 (MO, NY). Vaqueros, 16 May 1982, *Novara L.J.* 2675 (MO). **Santa Fe:** Villa Guillermina, *Schulz A.G.* 2410 (MO). **Tucuman:** Famailla, 1 October 1920, *Venturi S.* 39356 (MO); 1 October 1920, *Venturi S.* 961 (MO). Tafi Viejo, 4 November 1978, *Renvoize S.A.* 3361 (MO). Tucuman, *Hjerting J.P.* 417 (C, MO). Villa Nougues, 25 February 1917, *Schreiter* 157 (GH, MO, NY, US). BAHAMA ARCHIPELAGO. 27 June 1979, *Correll D.S.* 50769 (MO, NY). BARBADOS. *Gooding E.G.B.* 353 (BM, MO); *Pontin s.n.* (MO); *Vahl s.n.* (MO). BELIZE. **Corozal:** Maya Ruins, 29 March 1983, *Crane C.J.* 452 (MO). **Orange Walk:** Honey Camp, November 1929, *Lundell C.L.* 674 (MO). **Toledo:** Pine Ridge, 16 September 1946, *Gentle P.H.* 6049 (F, MO, TEX-LL). BOLIVIA. **Beni:** Estación Biológica Beni, 10 October 1995, *Paz P.* 251 (MO). Riberalta, 7 June 1982, *Solomon J.C.* 7965 (MO). San José de Patrocinio, 21 May 1996, *Gutiérrez E.* 1960 (MO). Tacuaral del Matos, 4 October 1997, *Ticona J.P.* 66 (MO). **Chuquisaca:** Hacienda Sipoperanda, 8 December 1999, *Caballero J.* 15 (MO). Luis Calvo, 11 October 1987, *Murguía O.* 524 (MO). Puesto Nuevo, 13 April 1993, *Toledo C.S.* 11790 (GH, MO). Sopachuy, 25 September 1991, *Kessler M.* 3255 (MO); Tomina, *Gutiérrez* 990 (SPF). **Cochabamba:** Taroma, 7 October 1928, *Steinbach J.* 8135 (MO). **La Paz:** Asunta, 31 March 1993, *Beck S.* 23323 (MO). Chaquimayo, 11 June 1990, *Gentry A.H.* 71092 (MO); 12 June 1990, *Gentry A.H.* 71134 (MO). Charopampa, November 1907, *Buchtien O. s.n.* (MO). Chulumani, 29 June 1985, *Beck S.* 12157 (MO). Cieneguilla, 23 March 1990, *Beck S.* 23145 (MO). La Plazuela, 15 December 1997, *Beck S.* 23216 (MO); 15 December 1997, *Beck S.* 23217 (MO); 14 September 1993, *Beck S.* 23224 (MO); 15 December 1998, *Beck S.* 23267 (MO). Lakachaka, 19 September 1991, *Lewis M.* 40356 (MO). Madidi, 6 October 2002, *Fuentes A.* 5421 (MO). Muchanes, 5 September 1994, *Vargas L.* 1241 (MO). Santa Fé, 9 August 1995, *Walt S. de* 795 (MO). Yolosa, 24 September 1987, *Beck S.* 13587 (MO). **Pando:** Estación Biológica Callimico, 14 November 2001, *Urrelo J.* 267 (MO). **Santa Cruz:** Andrez Ibanez, 24 February 1987, *Nee M.H.* 34243 (MO, NY). Brecha, 14 January 1998, *Nee M.H.* 47970 (MO, NY). Buena Vista, 1 August 1915, *Steinbach J.* 1583 (MO).

Coroico, October 1912, *Buchtien O.* 3901 (MO). Cotoca, 28 January 1989, *Nee M.H.* 37766 (MO, NY). El Carmen, 2 May 1997, *Gutiérrez E.* 2113 (MO). Estancia Flor de Oro, 29 June 1991, *Nee M.H.* 41530 (MO, NY, TEX). Estancia San Miguelito, 26 June 1995, *Fuentes A.* 757 (MO). Estancia San Rafael, 29 July 1987, *Centurión T.* 361 (MO). Estancia San Rafael de Amboró, 29 July 1987, *Nee M.H.* 35434 (MO, NY). Florida, 5 November 1991, *Gentry A.H.* 75558 (MO). Hacienda San Roque, 19 August 1996, *Guillén R.* 4508 (G, MO). Jardín Botánico de Santa Cruz, 19 July 1987, *Nee M.H.* 35265 (F, MO, NY, TEX. US). Jardín Botánico de Santa Cruz, 15 December 1995, *Uslar Y.* 380 (MO). Las Lomas, 10 April 1927, *Troll C.* 360 (MO). Las Trancas, 8 March 1995, *Jardim A.* 1644 (MO). Lomerio, 18 May 1993, *Toledo M.* 163 (MO); 8 December 1999, *Toledo M.* 513 (MO); 28 November 1994, *Toledo M.* 513 (MO). Mineros, 28 August 1996, *Nee M.H.* 47111 (MO, NY). Noel Kempff Mercado, 29 March 1994, *Jardim A.* 520 (MO); 29 March 1904, *Jardim J.G.* 520 (MO); 28 June 1993, *Saldías M.* 2779 (MO); 31 March 1994, *Saldías M.* 3751 (MO). Pedro Lorenzo, 22 December 1994, *Nee M.H.* 46074 (MO, NY, TEX); 2 December 1997, *Nee M.H.* 47508 (MO). Quebrada Salada, 24 May 1991, *Nee M.H.* 40545 (MO). Rio Palometilla, 26 September 1924, *Steinbach J.* 6466 (A, F, G, MO, S). Rio Pitasama, 20 September 1987, *Centurión T.* 426 (MO). Rio Salado, 22 January 1998, *Nee M.H.* 48073 (MO). Samaipata, 14 October 2001, *Vargas I.G.* 6277 (MO). San Fernando, 5 May 1997, *Saldías M.* 5118 (MO). San Ramón, 7 June 1991, *Nee M.H.* 41583 (MO). Santa Cruz, 18 August 1987, *Nee M.H.* 35662 (MO, NY, TEX). Santa Rosa de Lima, 3 July 1996, *Saldías M.* 4357 (MO). Santiago, 16 May 1991, *Gentry A.H.* 73963 (MO); 16 May 1991, *Gentry A.H.* 73970 (MO). Sara, *Steinbach J.* 7195 (MO, NY); 29 August 1925, *Steinbach J.* 7196 (A, GH, MO, NY, S); 29 August 1925, *Steinbach J.* 7359 (A, F, MO, S). Toledo, 19 October 1993, *Killeen T.* 5706 (MO). Yaguanao, 10 April 1927, *Troll C.* 361 (MO). Yerba Buena, 23 December 1989, *Nee M.H.* 38294 (MO, NY, TEX). **Tarija:** Arce, 21 November 1986, *Ehrich R.* 267 (MO). Entre Rios, 27 February 1989, *Aronson J.* 7819 (MO). Naranjo Agrio, 21 April 1983, *Solomon J.C.* 9952 (MO, NY). Narvaez, 1 May 1983, *Solomon J.C.* 10334 (MO); 2 October 1983, *Solomon J.C.* 11000 (MO). Rio Cambarí, 13 October 1983, *Solomon J.C.* 11198 (MO). Tatarenda, 3 April 1902, *Fries R.E.* 1510 (MO). Valley of the Río Chillaguatas, 14 October 1983, *Solomon J.C.* 11241 (MO). Villa Montes, 4 September 1987, *Killeen T.* 2702 (MO). Yacuiba, 23 September 1985, *Beck S.* 11450 (MO). BRAZIL. **Amazonas:** Rio Branco, 24 March 1909, *Moers* 7967 (MO). **Bahia:** Barreiras, *Black G.A.* s.n. (MO). Itambe, *Mori S.A.* 11524 (MO). Itatim, 28 January 1996, *Franca F.* 1535 (HUEFS, MO); 31 August 1996, *Franca F.* 1782 (HUEFS, MO); 16 December 1995, *Melo E. de* 1384 (MO). Rio Grande, *Fox M.* 294 (MO). **Ceará:** Chapada do Araripe, 2 December 1958, *Guedes T.N.* 526 (MO). **Espirito Santo:** Linhares, *Benson W.W.* 40 (MO). **Goiás:** Brasília, 9 August 1961, *Heringer E.P.* 8783 (MO); *Ratter J.A.* s.n. (MO); *Sellow F.* 1633 (MO); 7 January 1909, *Sellow F.* s.n. (MO). Cachoeira Alta, *Anderson W.R.* 12404 (MO). Campinorte, 23 June 1998, *Aparecida da Silva M.* 3828 (MO). Corumbá de Goiás, 25 January 1968, *Irwin H.S.* 19174 (C, MO, NY, TEX-LL, UB, US). Reserva Ecologica do IBGE, 29 September 1983, *Pereira B.A.S.* 799 (MO). Rio São Bartolomeu, 24 April 1980, *Heringer E.P.* 4499 (MO, US). **Maranhão:** Barra do Corda, *Fernandez A.* s.n. (MO). Loreto, *Eiten G.* 10806 (MO). Santa Luzia, 11 August 1991, *Santos G. dos* 63 (MO); 11 August 1991, *Santos G. dos* 65 (MO); 11 August 1991, *Santos G. dos* 67 (MO). **Mato Grosso:** Serra do Roncador, 10 October 1964, *Prance G.T.* 59358 (F, GH, M, MO, NY, UB, S). **Mato Grosso do Sul:** Bela Vista, 23 October 1987, *Hatschbach G.* s.n. (MO). Campo Grande, 2 July 1969, *Hatschbach G.* 21808 (MO). **Minas Gerais:** Belo Horizonte, *Duarte A.P.* 6387 (MO); 10 February 1942, *Oliveira E.* 1149 (MO). Caldas, 18 November 1961, *Regnell A.F.* s.n. (MO); 18 September 1966, *Regnelli* 40 (MO). Ituiutaba, 31 October 1949, *Macedo A.* 1985 (BM, MO, NY, S); 31 October 1949, *Macedo A.* 1991 (BM, C, MO); 10 October 1948, *Macedo A.* 281 (MO, US). Marliéria, *Lombardi J.* 2432 (BHCB, MO). Monte Belo, 6 September 1987, *Gentry A.H.* 59100 (MO); 6 September 1987, *Gentry A.H.* 59112 (MO); 7 September 1987, *Gentry A.H.* 59155 (MO). Monte Verde, 29 January 1978, *Gentry A.H.* 21498 (MO). Pratinha, 2 March 1989, *Walter B.M.T.* 4 (MO). Viçosa, 15 November 1958, *Irwin H.S.* 2100 (MO); 1 October 1930, *Mexia Y.* 5132 (MO). **Paraná:** Arapoti, 9 September 1960, *Hatschbach G.* 7218 (MO). Castro, 26 January 1985, *Gentry A.H.* 49877 (MO). Cerro Azul, 24 October 1959, *Hatschbach G.* 6389 (L, MO); *Lindeman J.C.* 932 (MO, NY, US). Curitiba, *Dusen P.* 13391 (MO); 23 November 1970, *Hatschbach G.* 25630 (C, MO, US, S); 31 October 1975, *Hatschbach G.* 37389 (MBM, MO); 9 November 1983, *Hatschbach G.* 47102 (MBM, MO); 13 October 1976, *Kummrow R.* 1169 (MO); 16 October 1979, *Oliveira P.I.* 106 (MO, NY); *Oliveira P.I.* 757 (MO). Imbituva, 6 May 1967, *Lindeman J.C.* 5251 (MO). Ipiranga, 8 October 1969, *Hatschbach G.* 22394 (MBM, MO); 1 October 1966, *Lindeman J.C.* 2783 (MO). Jaguariáiva, 30 September 1911, *Dusen P.* 13072 (MO, S); 10 October 1908, *Dusen P.* 6838 (MO, S); 6 March 1914, *Dusen P.* s.n. (MO); 3 June 1914, *Fansson G.* s.n. (MO). Londrina, *Fonseca L.H.M.* 104 (SPF); 28 February 1985, *Goncalves R.C.* s.n. (MO); 13 March 1986, *Moura L.* 1918 (MO); 19 September 1985, *Pizzaia L.N.* 1301 (MO); 5 October 1983, *Vieira A.O.S.* 167 (MO).

Mandirituba, 11 May 1972, *Kuniyoshi Y.S.* 3300 (MO). Pirai do Sul, 25 October 1977, *Hatschbach G.* 40405 (C, MO, NY); 15 October 1966, *Lindeman J.C.* 3021 (MO, U, US). Terra Boa, 1 March 1966, *Lindeman J.C.* 595 (MO). **Pará:** Belém, 15 December 1958, *Cavalcante P.B.* 1377 (MO); *Ducke W.A.* 2044 (MO); *Pires J.M.* 4424 (MO). Marabá, *Santos G. dos* 125 (MO); *Santos G. dos* 79 (MO). Monte Alegre, *Soels* 23 (GOET, MO). **Pernambuco:** Arcoverde, 22 July 1971, *Lima D.A.* s.n. (MO). Inajá, 21 July 1995, *Laurêncio A.* 97 (MO). **Rio Grande do Sul:** Arroio Grande, 11 February 1961, *Pabst G.* 6547 (MO). Bento Gonçalves, 10 July 1971, *Santos E. dos* 2647 (MO). Canela, 11 November 1962, *Richter E.* s.n. (MO). Caxias do Sul, 12 March 1949, *Rambo B.* 44658 (MO). Pelotas, 23 February 1955, *Sacco J.C. da* 268 (G, MO). Porto Alegre, 28 January 1973, *Krapovickas A.* 22957 (MO); 29 December 1966, *Lindeman J.C.* 3889 (MO, U); *Lindmann C.A.M.* 1629 (MO, S); *Lindmann C.A.M.* 577 (MO); *Lindmann C.A.M.* s.n. (MO); *Lindmann C.A.M.* s.n. (MO); *Pabst G.* 5731 (MO, US); *Rambo B.* 41508 (MO); *Rambo B.* 44004 (MO). Rosário do Sul, 20 January 1973, *Krapovickas A.* 22816 (MO). Santa Maria, *Lindmann C.A.M.* s.n. (MO). Santo Angelo, *Lindmann C.A.M.* s.n. (MO); *Schubarzer M.* s.n. (MO). São Leopoldo, *Padre E.J.* 283 (MO); *Sehnm P.A.* 7541 (MO). São Borja, *Fonseca L.H.M.* 131 (SPF); Taquara, 15 October 1985, *Wasun R.* 1577 (L, MO, US). Viamão, 4 October 1950, *Rambo B.* 46719 (MO). **Rio de Janeiro:** Baía de Guanabara, *Sucre B.* 3506 (MO). Cantagalo, 18 October 1986, *Hatschbach G.* 50657 (MO, S). Corcovado, *Gomes E.* 36 (MO). Cordeiro, *Santos E. dos* 2038 (MO). Ipanema, *von Martius C.F.P.* s.n. (MO). Piedade, *Kuhlman J.G.* s.n. (MO). Rio de Janeiro, *Glaziou A.F.M.* s.n. (MO). São Cristovão, *Glaziou A.F.M.* 4694 (MO). Tijuca, 6 March 1981, *Lima D.C. de* 1628 (MO). **Rondônia:** Rio Guaporé, *Black G.A.* s.n. (MO). **Roraima:** Caracará, *Fonseca L.H.M.* 140 (SPF); Ilha de Maracá, *Ratter J.A.* s.n. (MO). Rio Branco, *Ule U.* 7846 (MG, MO); *Ule U.* 7967 (C, MO). **Santa Catarina:** Abelardo Luz, *Smith L.B.* 12868 (MO). Agua Doce, 12 April 1964, *Smith L.B.* 13551 (MO). Bom Retiro, *Reitz R.* 2774 (MO); *Smith L.B.* 7633 (MO). Capinzal, 21 December 1962, *Reitz R.* 14 (MO); *Reitz R.* 14371 (MO); *Reitz R.* 16211 (MO). Lajes, *Pabst G.* 6193 (MO). Lauro Muller, *Reitz R.* 7403 (MO). Pôrto União, *Reitz R.* 13657 (MO). Rio do Sul, 19 October 1958, *Reitz R.* 23 (MO, S); 19 October 1958, *Reitz R.* 7 (L, MO); *Reitz R.* 7360 (MO). São Carlos, 16 October 1964, *Smith L.B.* 12572 (MO, NY, US). São Joaquim, 24 November 1980, *Krapovickas A.* 36893 (MO). **São Paulo:** Atibaia, 29 January 1978, *Gentry A.H.* 21478 (MO). Boracéia, 2 March 1987, *Custodio Filho A.* s.n. (MO). Campinas, 4 January 1985, *Gentry A.H.* 49186 (MO); 4 January 1985, *Gentry A.H.* 49192 (MO); *Grotta A.S.* s.n. (MO); 9 September 1904, *Heiner A.* 189 (MO); 18 September 1968, *Mello H.* s.n. (MO); *Silva W.R.* s.n. (MO). Paraguaçu Paulista, 2 June 1955, *Eiten G.* 5843 (MO). Piracicaba, 25 February 1988, *Zandoval J.A.* s.n. (MO). Represa Atabainha Lake, 5 January 1985, *Gentry A.H.* 49232 (MO); 26 August 1987, *Gentry A.H.* 58685 (MO). Riolândia, 11 October 1994, *Souza A.A.* 35 (MO). São Paulo, 13 October 1931, *Handro O.* 28351 (MO, S); 16 October 1917, *Hoehne F.C.* 725 (BM, MO, S, US); 13 October 1952, *Hoehne W.* 3842 (MO); 16 October 1917, *Hoehne W.* s.n. (MO); 10 October 1970, *Panizza S.* s.n. (MO); 6 October 1984, *Pompeia S.* 162 (MO). **COLOMBIA. Atlantico:** Baranoa, *Dugand A.* 1067 (F, MO). Barranquilla, *Elias B.* 665 (MO). **Bolivar:** Arjona, 13 August 1985, *Zarucchi J.L.* 4132 (MO, NY). Cartagena, 4 September 1989, *Cuadros H.V.* 4334 (MO); 25 August 1986, *Gentry A.H.* 55584 (MO). Corozal, 15 April 1963, *Romero-Castaneda R.* 9609 (MO, NY). Morales, 22 April 1966, *Forero E.* 495 (F, US, MO, NY). Norosi, 9 April 1985, *Cuadros H.V.* 2155 (MO). Puerto Badel, 27 April 1984, *Forero E.* 9894 (MO). **Caldas:** La Dorada, 7 March 1977, *Gentry A.H.* 18142 (MO). **Cesar:** El Palmar, *Cuadros H.V.* 1740 (MO). Gamarra, 2 April 1956, *Uribe-Uribe* 2736 (MO). Valledupar, *Cuadros H.V.* 1736 (MO). **Choco:** Parque Nacional Los Katios, 28 May 1976, *Forero E.* 1585 (MO). Ungia, 17 July 1976, *Gentry A.H.* 16727 (MO). **Cordoba:** Planeta Rica, 23 March 1981, *García-Barriga H.* 21280 (US). **Cundinamarca:** Bogota, 9 August 1932, *Lawrence A.E.* 428 (MO). Sasaima, 10 January 1946, *García-Barriga H.* 11888 (US). **Guajira:** Barranca, 6 March 1980, *Fonnegra G.R.* 1511 (MO). **La Guajira:** Pueblo Viejo, 2 July 1984, *Gentry A.H.* 47542 (MO). **Magdalena:** Bonda, 6 May 1945, *Romero-Castaneda R.* 345 (MO). Parque Nacional Tayrona, 23 August 1986, *Gentry A.H.* 55478 (MO); 9 September 1968, *Lozano C.G.* 2779 (MO). Santa Marta, 1898, *Smith H.H.* 1134 (MO). Tucurínca, 24 April 1948, *Romero-Castaneda R.* 1071 (COL, MO). **Meta:** Guamal, 3 March 1960, *Patino V.* 228 (MO). **COSTA RICA. Alajuela:** Finca La Pacifica, 26 July 1971, *Gentry A.H.* 1335 (MO). Llanura de Guatuso, 16 March 1993, *Flores K.* 59 (CR, MO); 17 March 1993, *Flores K.* 78 (MO); 4 April 1995, *Villalobos* 113 (MO). San Pedro de San Ramón, 2 February 1929, *Brenes A.M.* 6620 (MO). Tircoles, 2 April 1924, *Standley P.C.* 40203 (MO). **Guanacaste:** Bagaces, 7 June 1971, *Gentry A.H.* 840 (MO). Cordillera de Guanacaste, 13 May 1995, *Morales J.F.* 4170 (MO). Finca La Pacifica, 9 March 1970, *Daubenmire R.* 630 (MO); 7 July 1971, *Gentry A.H.* 1114 (MO); 8 June 1971, *Gentry A.H.* 852 (MO); 8 June 1971, *Gentry A.H.* 864 (MO); 14 June 1971, *Gentry A.H.* 925 (MO); 16 June 1971, *Gentry A.H.* 935 (MO); 17 June 1971, *Gentry A.H.* 942 (MO); 18 September 1970, *Janzen D.H.* 10093 (MO); 21 September 1975, *Janzen D.H.* 10149

(MO); 6 May 1973, *Opler P.A.* 1753 (MO); 8 April 1972, *Opler P.A.* 682 (MO). Liberia, April 1966, *Jimenez M.A. s.n.* (MO); April 1966, *Jiménez L. O. s.n.* (MO). Parque Nacional Guanacaste, 24 October 1990, *Chávez C.* 555 (MO); 6 June 1990, *Varela G.* 49 (MO). Parque Nacional Santa Rosa, 12 May 1995, *Morales J.F.* 4124 (MO); 12 May 1995, *Morales J.F.* 4157 (MO). Peninsula de Nicoya, 23 March 1963, *Jimenez M.A.* 527pp (MO); April 1933, *Valerio M.* 477 (MO). Rio Corobici, 8 June 1971, *Gentry A.H.* 875 (MO). Salinas, 29 April 1995, *Zamora V.N.* 2265 (MO). Taboga, 10 June 1971, *Gentry A.H.* 894 (MO). Valle del Tempisque, 13 January 1996, *Chavarria* 1387 (MO). **Heredia:** Puerto Viejo, 27 April 1973, *Burger W.C.* 9093 (F, MO). **Puntarenas:** Cantón de Osa, 1 April 1950, *Allen P.H.* 5521 (MO). Miramar, 2 June 1971, *Gentry A.H.* 772 (MO). Parque Nacional Corcovado, 6 May 1989, *Kernan C.* 1080 (MO). Puerto Jiménez, 28 March 1995, *Aguilar R.* 3811 (MO). **San Jose:** El Rodeo, 1 March 1995, *Jiménez A.J.* 2081 (MO). General Viejo, April 1940, *Skutch A.F.* 4872 (MO). Reserva Biologica Carara, 1 April 1993, *Gentry A.H.* 79260 (MO). Villa Colón, 7 October 1934, *Valerio M.* 959 (MO). **Unknown province:** Unknown municipality, 23 April 1973, *Hartshorn G.S.* 1158 (MO). CUBA. **Habana:** Santiago de Las Vegas, 30 March 1923, *Calvino M.* 7769 (MO). **Holguin:** Sierra Cristal, 18 February 1948, *Ferrás J.* 15011 (MO, US). **Santiago de Cuba:** Loma del Piedra Blanca, *Clemente B.* 206 (MO). Unknown municipality, 10 July 1915, *Ekman E.L.* 6222 (B, MO, S). **Unknown province:** Unknown municipality, 18 April 1940, *Carabia J.P.* 3632 (MO, NY); 10 April 1918, *Ekman E.L.* 9170 (MO, S); 28 April 1909, *Shafer J.A.* 1591 (F, MO, NY, US); *Wright C.* 1340 (MO). DOMINICA. St. Paul Parish, 17 April 1962, *Cooley G.R.* 8783 (GH, MO). St. John, 29 January 1986, *Whiteford C.* 5288 (BM, MO). DOMINICAN REPUBLIC. **Azua:** El numero, 5 March 1980, *Mejia M.* 129 (MO, NY). Unknown municipality, 22 July 1982, *Zanoni T.* 21934 (MO, NY). **Barahona:** Montaña Nova, 21 August 1946, *Howard R.A.* 8583 (GH, MICH, MO, NY, S, US); Pedernales, 8 August 1946, *Howard R.A.* 8254 (BM, GH, MO, NY, S, US); 23 March 1983, *Zanoni T.* 38607 (MO, NY). **La Romana:** Unknown municipality, 24 November 1980, *Mejia M.* 9398 (GH, MO, NY). **La Vega:** Unknown municipality, 31 December 1947, *Allard H.A. s.n.* (US); **Santiago:** Guazumal, 10 September 1950, *Jiménez J.* 2100 (MO, US). **Valverde:** Unknown municipality, 9 June 1987, *García R.* 2209 (MO, NY, S). ECUADOR. **Esmeraldas:** Lita, 11 June 1978, *Madison M.T.* 5223 (MO). Reserva Florestal de Jardín Tropical, 2 February 1991, *Gentry A.H.* 73008 (MO). **Guayas:** Capeira, 23 September 1981, *Dodson C.H.* 11484 (MO). Cerro Azul, 17 January 1991, *Gentry A.H.* 72353 (MO). Daule, 30 September 1952, *Fagerlind F.* 434 (MO, S). Guayaquil-Salinas, 18 March 1980, *Dodson C.H.* 9641 (MO). Pedro Carbo, 2 January 1942, *Haight O.* 3122 (MO). **Los Rios:** Buena Fé, 25 January 1981, *Gentry A.H.* 30794 (MO). Hacienda Santa Lucia, 18 October 1934, *Mexia Y.* 6572 (MO, NY, US). Janueche Forest, 4 February 1979, *Dodson C.H.* 7491 (MO). **Manabi:** Cuchilla Seca, 22 January 1991, *Gentry A.H.* 72622 (MO). **Morona-Santiago:** Guayaquil, 0 0, *Jameson W.* 515 (MO). Taisha, 11 September 1985, *Baker M.A.* 6356 (MO, NY). **Napo:** Jatun Sacha, 29 December 1987, *Gentry A.H.* 60052 (MO). Rio Aguarico, 9 February 1974, *Gentry A.H.* 9725 (MO); 10 February 1974, *Gentry A.H.* 9818 (MO). **Pastaza:** Pozo Petrolero, 1 September 1990, *Gudiño E.* 772 (MO); 4 October 1990, *Gudiño E.* 881 (MO). **Pichincha:** Santo Domingo de los Colorados, 27 October 1974, *Gentry A.H.* 12168 (MO). EL SALVADOR. **Ahuachapan:** El Imposible, 28 April 1990, *Sermeno A.* 182 (MO). San Benito, 14 April 1993, *Sandoval E.* 1176 (F, MO); 18 April 1995, *Sandoval M.* ISB00892 (MO). **La Libertad:** Antiguo Cuscatlan, 11 April 1989, *Cruz R.* 186 (MO); 10 May 1989, *Cruz R.* 191 (B, F, MO). Santa Tecla, *Carlson M.C.* 100 (MO, US); 10 April 1922, *Standley P.C.* 23045 (MO). **Sonsonate:** Izalco, 25 February 1907, *Pittier H.* 1973 (MO, US); 19 March 1922, *Standley P.C.* 21839 (GH, MO, NY, US). Rio Acachapa, May 1940, *Tucker J.M.* 1341 (MO). FRENCH GUIANA. **Cayenne:** Cacao, *Oldeman R.A.A.* 1047 (MO, P). Mahury Mountatin, *Oldeman R.A.A.* 1023 (CAY, MO); *Oldeman R.A.A.* 1133 (MO); *Sagot P.* 1370 (MO). Paul Isnard, 11 February 1983, *Cremers G.* 7959 (MO). Saul, 5 August 1987, *Allorge L.* 371 (MO); *Granville J.J. de* 2001 (MO); 6 August 1987, *Mori S.A.* 18641 (MO). GUADALUPE. La Rosette, 24 June 1937, *Stehle* 1817 (MO, US). GUATEMALA. **Alta Verapaz:** Rio Polochic, 10 April 1941, *Standley P.C.* 91854 (MO). **Escuintla:** Escuintla, 12 March 1941, *Standley P.C.* 89057 (F, MO). **Guatemala:** Guatemala, April 1970, *Harmon W.E.* 2207 (MO). La Aurora, *Aguilar J.I.* 36 (MO). Santa Catarina, *Artamott G. s.n.* (MO). **Huehuetenango:** Huehuetenango, 2 April 1978, *German* 811 (MO). **Izabal:** Bananera, 28 March 1940, *Steyermark J.A.* 38043 (F, MO); *Steyermark J.A.* 39111 (F, MO). **Peten:** Cerro Ceibal, 30 April 1942, *Steyermark J.A.* 46091 (A, F, MO). **Retalhuleu:** Retalhuleu, 17 February 1941, *Standley P.C.* 87383 (F, MO). **San Marcos:** Rio Cabus, 12 March 1940, *Steyermark J.A.* 37597 (F, MO). **Santa Rosa:** Los Cerritos, 7 December 1940, *Standley P.C.* 79627 (MO). **Suchitepequez:** Mazatenango, March 1928, *Ruano J.M.* 1048 (MO). **Unknown department:** Unknown municipality, 19 April 1905, *Pittier H.* 124 (MO, US). GUYANA. **Essequibo:** Kanaku Mountains, 23 November 1987, *Jansen-Jacobs M.J.* 1179 (B, MO, US). Kanuku Mts., 5 November 1991, *Harris E.M.* 1166 (MO). HONDURAS. **Comayagua:** Villa San Antonio, 20 May 1964, *Molina R.A.* 13825 (F, G,

MO, NY, US). **El Paraiso:** Rio Teupasenti, *Molina R.A. 11912* (F, MO, NY). Teupasenti Mt., 26 April 1963, *Molina R.A. 11887* (F, MO, NY, TEX-LL.). **Francisco Morazan:** Cantarranas, 24 March 1957, *Molina R.A. 7806* (F, MO). Las Pilas, 27 December 1951, *Standley P.C. 29440* (F, MO). Rio de la Orilla, 8 June 1948, *Molina R.A. 946* (MO). Suyapa, 11 December 1948, *Molina R.A. 1829* (MO). Tegucigalpa, 29 December 1947, *Williams L.O. 13603* (MO). **Yoro:** Las Lomas, 16 May 1991, *Davidse G. 34461* (MO). MEXICO. **Baja California, Sur de:** Agua Caliente, 6 May 1931, *Wiggins I.L. 5666* (MO). La Huerta, 13 December 1994, *Daniel T.F. 6841* (MO). Todos Santos, 21 October 1977, *Breedlove D.E. 43196* (CAS). **Campeche:** Conhuas, 7 June 1983, *Cabrera E. 4834* (MO). Tuxpena, 20 October 1931, *Lundell C.L. 847* (F, MICH, MO, US). **Chiapas:** Acacoyagua, 15 March 1949, *Matuda E. 18634* (F, MO). Berriozobal, 30 April 1952, *Moore H.E. Jr. 6326* (MO, TEX). Comitán de Domínguez, 2 June 1945, *Matuda E. 15679* (MO); 2 June 1945, *Matuda E. 5679* (MO). Escuintla, 3 April 1948, *Matuda E. 17568* (MO); 5 September 1948, *Matuda E. 18373* (MO). La Trinitaria, 25 March 1981, *Breedlove D.E. 50335* (C, MO, NY). Ocozocoautla de Espinosa, 1 June 1973, *Breedlove D.E. 35452* (MO). Tonalá, 16 August 1949, *Matuda E. 18767* (F, MO). **Colima:** Manzanillo, 30 November 1925, *Ferris R.S. 6826* (MO). **Estado de Nuevo Leon:** San Pedro Nolasco, 1843, *Jurgensen C. 548* (MO); 1844, *Jurgensen C. 572* (MO); 1844, *Jurgensen C. 578* (MO). **Guerrero:** Acapulaco de Juárez, October 1895, *Palmer E. 367* (MO). Cutzamala de Pinzón, 15 May 1935, *Hinton G.B. 7769* (GH, MICH, MO, NY, US). Tario, 5 April 1935, *Hinton G.B. 7586* (MO). Taxco el Viejo, 28 April 1936, *Abbott N.J. 127* (GH). Vallecitos, 27 May 1937, *Hinton G.B. 10236* (F, GH, MICH, MO, NY, U). **México:** Nanchititla, 6 October 1934, *Hinton G.B. 6138* (MO). Temascaltepec de Gonzales, 7 May 1933, *Hinton G.B. 4285* (MO). Temascaltepec de Gonzalez, 17 June 1935, *Hinton G.B. 7883* (GH, MICH, MO, NY, US). **Michoacan:** Coalcoman de Matamoros, 22 June 1939, *Hinton G.B. 13830* (BM, F, MICH, MO, NY, US, U). **Nayarit:** Las Tres Islas Marias, 24 July 1932, *Howell J.T. 10444A* (MO). **Oaxaca:** Esmeralda, 16 April 1981, *Wendt T. s.n.* (MO). San Miguel Chimalapa, 25 March 1985, *Hernández G.H. 1033* (F, MO, TEX). Santa María Chimalapa, 7 May 1985, *Hernández G.H. 1162* (MO). Tomellin, 17 May 1894, *Pringle C.G. 5788* (GH, MO). Uxpanapa, 16 April 1981, *Wendt T. 31992* (MO). **Queretaro:** El Batán, 24 July 1979, *Arguelles E. 1278* (MO). Jalpan, 22 May 1989, *Carranza E. 1727* (MICH, MO); *González E. 1457* (MO); 18 April 1992, *López C.L. 291* (MO). **Quintana Roo:** Felipe Carrillo Puerto, 12 June 1983, *Cabrera E. 4983* (MO). San Miguel de Cozumel, 3 June 1986, *Cabrera E. 11396* (MO). Vigía Chico, 23 May 1984, *Duran R. 966* (MO, NY). **San Luis Potosí:** Canoas, 30 November 1890, *Pringle C.G. 3656* (GH, MO); 28 June 1891, *Pringle C.G. 5123* (A, GH, MO). Tampote, 6 April 1926, *Runyon R. 901* (MO). **Sinaloa:** Comedero, 27 January 1940, *Gentry H.S. 5393* (GH, MICH, MO, NY). Culiacán, 21 September 1944, *Gentry H.S. 7083* (F, MICH, NY, US); November 1919, *Partida J.A. 2005* (MO). Las Palmas, 19 1922, *Ortega J. 4545* (MO). Mazatlán, July 1934, *Ortega J.G. 7237* (MO); 18 March 1955, *Wiggins I.L. 13160A* (MO). Rosario, 7 July 1897, *Rose J.N. 1561* (MO). Sinaloa de Leyva, 11 October 1976, *Pérez S. 48* (CAS, MO). **Sonora:** Cuchujaqui, 29 December 1991, *Martin P.S. s.n.* (MO). Rio Cuchujaqui, 15 July 1993, *Meyer S.A. s.n.* (MO). Rio Mayo, 8 July 1935, *Gentry H.S. 1471* (MO); 2 October 1936, *Gentry H.S. 2917* (MO). Rio del Fuerte, 1 July 1936, *Gentry H.S. 2268* (MO). San Bernardo, 10 July 1959, *Arguelles J. 100* (US). Sierra de Alamos, 16 March 1910, *Rose J.N. 12917* (MO, US). **Tabasco:** Teapa, 12 August 1974, *Conrad J. 2860* (MO); 26 April 1983, *Ventura A.F. 20169* (MO, NY). **Tamaulipas:** Calle, 29 January 1970, *Gonzalez-Medrano F. 3445* (MO). Ciudad Victoria, 7 April 1961, *King R.M. 4531* (MO); 1907, *Palmer E. 242* (MO); 1 May 1907, *Palmer E. 365* (MO). Gomez Farias, 25 March 1986, *Hernández L. 1692* (MO). **Veracruz:** Catemaco, 30 October 1984, *Cedillo Trigos R. 2855* (CAS, MO). Coacoatzintla, 12 April 1971, *Ventura A.F. 3420* (MO). Conejos, 11 June 1973, *Ventura A.F. 8350* (MO). El Poblado, 6 May 1982, *Vazquez T.M. 2508* (MO). Jesus Carranza, 9 May 1974, *Marquez R.W. 210* (MO); 19 October 1974, *Marquez R.W. M-277* (MO). La Ceiba, 10 May 1976, *Ventura A.F. 12755* (MO). Laguna Encantada, 4 December 1989, *Sinaca C.S. 1555* (MO). Los Tuxtlas, 30 July 1989, *Ibarra M.G. 3440* (MO); 28 December 1985, *Sinaca C.S. 380* (MO). Minatitlán, 9 April 1982, *Wendt T. 3832* (MO). Orizaba, *Botteri M. 535* (MO, US). Paso de la Milpa, 19 April 1976, *Ventura A.F. 12673* (MO). Potrero del Llano, 10 June 1973, *Hansen B. 1772* (MICH, MO, US). Puente Nacional, 1 April 1976, *Ventura A.F. 12604* (MO). San Andrés Tuxtla, 3 January 1990, *Sinaca C. S. 1505* (MO). Tamaulipas, 7 March 1983, *Nee M.H. 25804* (MO). **Yucatan:** Anicabil, 31 May 1869, *Schott A. 399* (BM). Chichén-Itza, 22 June 1932, *Steere W.C. 1473* (F, MICH, MO). Dzempl, 29 March 1995, *Simá P. 1800* (F, MO). Izamal, *Gaumer G.F. 507pp* (MO); 22 February 1906, *Greenman J.M. 414* (F, MO); 22 February 1906, *Greenman J.M. 428* (F, GH, MO, NY); 22 February 1906, *Greenman J.M. 435* (F, MO). Mérida, 18 April 1866, *Schott A. 776* (BM, F, MO); 18 April 1866, *Schott H.W. 399a* (MO); *Schott H.W. 776a* (MO). Tizimin, 22 March 1988, *Cabrera E. 15720* (MO). Unknown municipality, *Flores J. 9104* (MO); 29 September 1981, *Ucan E. 1516* (MO). Xuilub, 4 July 1989, *Mogensen B. 1010* (MO); 5

November 1989, *Mogensen B. 1198* (MO); 28 April 1984, *Sanabria A. 382* (F, MO). NICARAGUA. **Atlántico Norte:** Cerro Saslaya, 5 May 1978, *Neill D.A. 3871* (MO). **Boaco:** Cerro Mombachito, 8 October 1979, *Stevens W.D. 14750* (MO). Rio Grande, 10 May 1980, *Moreno P.P. 356* (MO). **Chinandega:** El Viejo, 1848, *Oersted s.n.* (MO). **Chontales:** Cerro Oluma, 4 January 1984, *Gentry A.H. 43952A* (MO). La Gateada, 17 July 1977, *Stevens W.D. 2849* (MO). **Granada:** Volcán Mombacho, 7 August 1983, *Gentry A.H. 2920* (MO); 11 May 1981, *Moreno P.P. 8434* (MO). **Jinotega:** Jinotega, June 1947, *Standley P.C. 10171* (MO); 27 June 1947, *Standley P.C. 10275* (F, MO). Rio Coco, 9 September 1997, *Rueda R. 7386* (MO). **Leon:** Cerro Nancital, 11 September 1980, *Moreno P.P. 2472* (MO). **Madriz:** Cerro Quisuca, 31 May 1980, *Stevens W.D. 17355* (BM, MO). **Managua:** Managua, 8 February 1983, *Gentry A.H. 3078* (MO). Puertas Viejas, 8 June 1983, *Araquistain M. 3564* (MO). **Matagalpa:** El Eden, 1 February 1984, *Moreno P.P. 22903* (MO). Esquipulas, 25 January 1985, *Moreno P.P. 25364* (MO). Matagalpa, 23 May 1985, *Davidse G. 30279* (MO). Puertas Viejas, 10 May 1982, *Moreno P.P. 16273* (MO). **Rio San Juan:** Bocas de Sabalo, 14 March 1987, *Moreno P.P. 26739* (MO). **Rivas:** Isla Ometepe, 21 September 1984, *Robleto W. 1190* (GH, MO); 19 January 1985, *Robleto W. 1741* (MO); 1 June 1985, *Robleto W. 1968* (MO); 16 June 1984, *Robleto W. 880* (MO). **Zelaya:** Cukra, 16 June 1948, *Long L.E. 185* (F, MO). PANAMA. **Canal Area:** Canal Area (Isla Barro Colorado), 26 March 1971, *Croat T. 14062* (F, MO, NY); 30 April 1970, *Croat T.B. 10110* (MO); 16 May 1970, *Croat T.B. 10224* (MO); 2 October 1970, *Croat T.B. 12498* (MO); 13 November 1970, *Croat T.B. 12588* (MO); 1 April 1971, *Croat T.B. 14081* (MO); 19 May 1971, *Croat T.B. 14645* (MO); 28 March 1970, *Croat T.B. 9141* (MO); 18 April 1970, *Croat T.B. 9783* (MO); 28 January 1988, *Garwood N.C. 2232A* (MO); 6 April 1971, *Gentry A.H. 715* (MO); 6 April 1971, *Gentry A.H. 715* (MO); 6 April 1971, *Gentry A.H. 715A* (MO); 6 April 1971, *Gentry A.H. 715A* (MO); 6 April 1971, *Gentry A.H. 715B* (MO); 8 November 1958, *Shattuck 944* (MO); 24 October 1931, *Shattuck O.E. 264* (F, MO); 31 July 1929, *Wetmore R.H. 75* (F, MO). Cerro Ancon, 23 April 1972, *Gentry A.H. 5125* (MO). Cerro Galera, 17 December 1972, *Gentry A.H. 6645* (MO). Chilibre, 5 August 1940, *Seibert R.J. 1500* (MO). Fort Sherman, 27 March 1972, *Gentry A.H. 4837* (MO). Gamboa, 16 October 1971, *Gentry A.H. 2094* (MO). Madden Represa, 10 April 1972, *Gentry A.H. 5059* (MO); 12 April 1972, *Gentry A.H. 5066* (MO). Pedro Miguel, 1 April 1972, *Gentry A.H. 4865* (MO). Quebrada Mendoza, 16 April 1974, *Nee M.H. 11359* (MO). Summit, 4 January 1924, *Standley P.C. 29683* (MO). **Chiriqui:** Fortuna Dam Camp, 26 February 1985, *Hampshire R.J. 114* (BM, MO). Volcan, 16 March 1977, *Folsom J.P. 2085* (MO). **Darien:** Cerro Tacarcuna, 16 January 1975, *Gentry A.H. 13603* (MO). El Real de Santa Maria, 3 March 1972, *Gentry A.H. 4532* (BM, MO). Jaque, 7 February 1972, *Gentry A.H. 4145* (MO). Rio Cocalito, 10 January 1975, *Gentry A.H. 13503* (MO). **Panama:** Ancon, 28 February 1923, *Piper C.V. 6023* (MO, US). Campana, 15 July 1938, *Woodson R.E. 1308* (MO, NY). Cerro Jefe, 18 October 1971, *Gentry A.H. 2148* (MO). Isla Taboga, 23 July 1938, *Woodson R.E. 1450* (A, MO). Pacora, 19 June 1938, *Woodson R.E. 736b* (MO). Rio Bayano, 25 January 1972, *Gentry A.H. 3807* (MO). Rio La Maestra, 31 October 1971, *Gentry A.H. 2328* (MO). Rio Pasiga, 29 October 1971, *Gentry A.H. 2286* (MO); 1 November 1971, *Gentry A.H. 2366* (MO). Rio Piragua, 17 November 1971, *Gentry A.H. 2558* (MO). **Veraguas:** Santiago, 4 May 1985, *Hammel B. 13767* (MO). PARAGUAY. **Alto Parana:** Puerto Stroessner, 27 May 1989, *Gentry A.H. 66145* (MO, NY, TEX). **Amambay:** Cerro Cora, 22 August 1980, *Schinini A. 20349* (MO). Esperanza, 1907, *Hassler E. 10597* (MO). Rio Apa, 1908, *Fiebrig K. 4823* (MO); 1908, *Fiebrig K.A.G. 4823* (MO). **Caazapa:** Asunción, *Balansa B. 487* (MO); 1943, *Teague G.W. 401* (MO); 2 September 1945, *Teague G.W. 48* (MO). Tavaí, 17 March 1989, *Basualdo I. 2311* (MO); 18 May 1989, *Ortiz M. 1275* (MO); 19 May 1989, *Soria N. 3906* (MO). **Canendiyu:** Curuguaty, *Gentry A.H. 59416* (MO); *Gentry A.H. 59429* (MO). **Central:** Estero del Ypoal, 23 June 1990, *Zardini E. 21543* (NY, MO); 27 June 1991, *Zardini E. 27986* (MO); 27 June 1991, *Zardini E. 28156* (MO); 3 August 1991, *Zardini E. 28345* (MO); 4 November 1991, *Zardini E. 28524* (MO); 18 March 1992, *Zardini E. 31194* (MO); 18 March 1992, *Zardini E. 31201* (MO); 18 March 1992, *Zardini E. 31205* (MO); 17 June 1992, *Zardini E. 31990* (MO); 17 June 1992, *Zardini E. 32090* (MO). Jardín Botánico y Zoológico, 20 June 1990, *Pérez B. 199* (MO); 1991, *Pérez B. 698* (MO); 1991, *Pérez B. 803* (MO). San Bernardino, 15 January 1979, *Bernardi A.L. 19617* (AAU, G, MO, NY); 10 October 1893, *Lindmann C.A.M. 2333* (MO, S); 13 September 1916, *Osten C. 8995* (MO, S); 14 October 1973, *Quarín C. 1547* (MO); 9 December 1945, *Teague G.W. 643* (MO). Tavarory, 7 July 1990, *Zardini E. 21906* (MO); 4 March 1992, *Zardini E. 30925* (MO). Ypacaray, *Hassler E. 12237* (BM, C, G, GH, L, MO); 1897, *Hassler E. 2128* (MO); *Hassler E. 3148* (MO); 1897, *Hassler E. 3217* (MO); 1897, *Hassler E. 3802* (MO). **Chaco:** Cerro Leon, 23 October 1987, *Spichiger R. 2402* (MO). **Concepcion:** Rio Aquidaban, 14 November 1985, *Brunner D.R. 1400* (G, MO). **Concepción:** Concepción, *Hassler E. 7282* (G, MO, NY, S); *Hassler E. 7376* (MO). **Cordillera:** Cerrito San Bernardino, *Rojas T. 1513* (MO). Cerro Ybytu Silla, 6 April 1988, *Degen R. 728* (MO). Cerro Zanja Jhu, 25 June 1988, *Zardini E. 5085* (MO). Compania Rio Negro, 7 July 1990, *Zardini E. 21750*

(MO). Emboscada, 3 March 1990, *Zardini E. 19657* (MO); 9 June 1990, *Zardini E. 21072* (MO). Nueva Colombia, 26 May 1990, *Zardini E. 20442* (MO). **Guaira**: Cordillera de Ybytyruzu, 17 February 1989, *Zardini E. 10990* (MO); 5 March 1989, *Zardini E. 11272* (MO); 23 July 1989, *Zardini E. 13767* (MO); 20 September 1989, *Zardini E. 14294* (MO); 27 September 1989, *Zardini E. 14652* (MO); 27 September 1989, *Zardini E. 14723* (MO); 10 July 1992, *Zardini E. 32537* (MO); 13 January 1989, *Zardini E. 9512* (MO). Mbocayaity-Melgarejo, 6 July 1992, *Zardini E. 32336* (MO). Villarrica, *Balansa B. 506* (K, MO, US); 16 November 1928, *Jorgensen P. 3454* (MO, NY, S, US). **Itapua**: Pirapo, 10 October 1984, *Brunner D.R. 857* (MO). **Misiones**: Santa Rosa, 16 November 1978, *Arbo M.M. 1957* (C, MO). Santiago, 23 September 1962, *Pedersen T.M. 6539* (C, L, MO, NY). **Paraguari**: Acahay Massif, 1 November 1985, *Brunner D.R. 1261* (MO); 13 January 1992, *Zardini E. 29712* (MO); 20 January 1992, *Zardini E. 29926* (MO); 26 February 1992, *Zardini E. 30679* (MO); 26 February 1992, *Zardini E. 30768* (MO). Carapegua, 12 September 1980, *Fernandez-Casas J. 3514* (MO). Cerro Mbatovi, 28 November 1987, *Soria N. 1886* (MO); 26 January 1988, *Soria N. 2077* (MO); 24 June 1989, *Zardini E. 13070* (MO); 24 June 1989, *Zardini E. 13231* (MO). Cerro Palacios, 30 October 1987, *Basualdo I. 1492* (MO); 30 October 1987, *Zardini E. 3735* (MO). Cordillera de Altos, 21 September 1902, *Fiebrig K. 149* (BM, GH, L, MO, W); *Hassler E. 3302* (G, MO, NY, S, W). Estero del Ypoal, 7 January 1990, *Zardini E. 17500* (MO); 13 January 1990, *Zardini E. 17970* (MO). Parque Nacional Ybycul, 14 May 1989, *Aguayo A. 148* (MO); 1 October 1985, *Gentry A.H. 51891* (MO); 1 October 1985, *Gentry A.H. 51891A* (MO); 1 October 1985, *Gentry A.H. 51898* (MO); 27 January 1989, *Zardini E. 10336* (MO); 18 March 1989, *Zardini E. 12075* (MO); 9 February 1991, *Zardini E. 26399* (MO); 22 June 1991, *Zardini E. 27714* (MO); 31 May 1987, *Zardini E. 2894* (MO); 3 February 1992, *Zardini E. 30255* (MO); 12 March 1992, *Zardini E. 31078* (MO); 12 March 1992, *Zardini E. 31148* (MO); 23 June 1988, *Zardini E. 4953* (MO); 21 October 1988, *Zardini E. 7515* (MO); 14 December 1988, *Zardini E. 8772* (MO); 21 December 1988, *Zardini E. 9084* (MO). **Presidente Hayes**: Primavera, 20 September 1954, *Woolston A.L. 325* (MO, NY); 5 June 1958, *Woolston A.L. 964* (MO). PERU. **Amazonas**: Condorcanqui, 12 October *Albán J. 11004* (MO). **Cuzco**: Echarate, 9 September 1969, *Alfaro R.C. 555* (MO). La Convencion, 2 February 1991, *Nuñez P. 12803* (MO); 24 September 1964, *Vargas C.C. 13675* (MO); 25 July 1980, *Vargas C.C. 23405* (MO); Pilcopata, 1 July 1978, *Gentry A.H. 23654* (AAU, F, MO, NY). **Junin**: Puente-Paucartambo, 30 January 1983, *Gentry A.H. 39779* (MO). San Ramon, 27 June 1976, *Gentry A.H. 16423* (MO). **Loreto**: Alto Amazonas, 10 October 1985, *Gentry A.H. 52196* (MO). Balsapuerto, 26 August 1929, *Killip E.P. 28162* (MO, NY, US). Boca del Rio Mazan, 24 February 1935, *Schunke J.M. 317* (F, MO, NY, US). Campamento Neshuya, 10 February 1965, *Schunke-Vigo J. 902* (MO). Coronel Portillo, 20 January 1976, *Gentry A.H. 16103* (MO). Maynas, 14 February 1989, *Gentry A.H. 65775* (MO); 28 April 1989, *Vásquez R. 12065* (MO). Morona Cocha, 6 January 1979, *Ayala F. 1610* (MO). Paca, 21 December 1989, *Huber J.E. s.n.* (MO). Quistacocha, 9 September 1992, *Ayala F. 6446* (MO). Yanamono, 24 June 1982, *Gentry A.H. 37103* (MO). **Madre de Dios**: Parque Nacional Manu, 19 October 1979, *Gentry A.H. 26972* (MO). Puerto Maldonado, 24 January 1976, *Gentry A.H. 16279* (F, MO). Tambopata, 24 April 1980, *Barbour P.J. 4931* (MO); 5 March 1981, *Gentry A.H. 32011* (MO); 20 December 1992, *Gentry A.H. 78361* (MO); 13 August 1988, *Nuñez P. 9774* (MO). **Pasco**: Cacazu, 4 July 1988, *Gentry A.H. 63250* (MO). **Puno**: Rio Candamo - Rio Guacamayo, 29 May 1992, *Gentry A.H. 77346* (MO). **San Martin**: Rio Huallaga, 6 February 1984, *Gentry A.H. 45024* (MO). Tocache Nuevo, 14 March 1979, *Gentry A.H. 25686* (F, MO); 22 September 1970, *Schunke-Vigo J. 4431* (MO); 22 May 1975, *Schunke-Vigo J. 8538* (AAU, MO, NY, U). **Ucayali**: Pucallpa, 27 March 1977, *Gentry A.H. 18754* (MO); 30 December 1964, *Schunke-Vigo J. 6682* (F, MO, US). SURINAM. **Brokopondo**: Brownsveg, 21 September 1967, *Lindeman J.C. 12092a* (MO). **Nickerie**: Kabalebo Dam, 15 November 1976, *Heyde N.M. 93* (MO, U). **Sipaliwini**: Abontjeman, *Donseler J. van 1020* (MO). **Unknown province**: Unknown municipality, *Daniels A.G.H. 1011* (MO). PUERTO RICO. Buena Vista, 18 February 1914, *Johnston J.R. 1380* (NY). Culebra, 3 March 1906, *Britton N.L. 66* (MO, NY, US). Papayo, 9 December 1982, *Liogier A. 33731* (MO, NY). Saint Thomas, 11 February 1971, *Woodbury s.n.* (MO). Tortola, 23 July 1986, *Proctor G.R. 42001* (MO). SAINT MARTIN. Cul de Sac, 28 August 1906, *Boldingh I. 2037* (U). SAINT THOMAS. Cowell Point, 31 January 1913, *Britton N.L. 52* (MO, NY, US). URUGUAY. **Canelones**: Sta. Rosa Cuareim, *Herter W.G. 972* (G, MO, W). **Colonia**: Ecilda Paullier, 25 March 1983, *Solomon J.C. 9841* (MO). **Florida**: Rio Yi, 2 November 1946, *Rosengurt B. 5710* (MO). **Rio Negro**: San Javier, *Herter W.G. 82827* (MO); 27 November 1927, *Herter W.G. 972A* (MO). **Rivera**: Cunapiru, *Wright D. s.n.* (MO). VENEZUELA. **Amazonas**: Cachama, *Davidse G. 15296* (MO). **Anzoategui**: Boca de Uchire, 3 July 1975, *Gentry A.H. 14817* (MO). Cantaura, 12 June 1941, *Pittier H. 14802* (MO, US). Pariaguan, *Aristeguieta L. 4685* (MO). San Joaquin, *Lasser T. 4236* (MO). **Apure**: San Camilo, 29 March 1968, *Steyermark J.A. 101517* (F, MO, NY, U). **Aragua**: Macapo, 29 April 1971, *Bunting G.S. 4422* (MO). **Barinas**: Barinas, 13 April 1968, *Steyermark*

J.A. 102284 (MO). Barrancas, 30 March 1977, *Marcano-Berti L. 36-3-77* (MO). Cachicamo, 11 April 1968, *Steyermark J.A. 102128* (MO, NY). **Bolivar:** Curbati/El Algarrobo, 15 April 1988, *Dorr L.J. 4708* (MO, NY). El Manteco, 1978, *Delascio C.F. 6934* (MO). La Paragua, *Williams L. 12793* (MO). Represa Guri, 24 February 1992, *Aymard G. 10180* (MO, NY); 26 February 1992, *Aymard G. 10221* (MO); 4 April 1981, *Liesner R. 11283* (MO). Rio Parhueña, 30 June 1975, *Gentry A.H. 14708* (MO). **Carabobo:** Guigue, 16 March 1966, *Steyermark J.A. 95144* (MO, US). **Cojedes:** El Mogote, 28 November 1981, *Aymard G. 754* (MO). Tinaquillo, *Aristeguieta L. 4856* (MO). **Delta Amacuro:** Rio Grande, 6 July 1975, *Gentry A.H. 14966* (MO). Tucupita, 1 April 1979, *Davidse G. 16436* (MO). **Distrito Federal:** Caracas, 20 May 1974, *Morillo G. 4225* (MO). El Avila, Parque Nacional, 21 May 1977, *Manara B.J. s.n.* (MO); *Manara B.J. s.n.* (MO). El Pinar, 17 May 1943, *Delgado E. 327* (MO, US). Los Caracas, 11 February 1973, *Croat T.B. 21623* (MO). Macarao, 10 June 1970, *Montes R.A. 256* (MO, VEN). **Falcon:** Cerro Monte Arriba, 3 March 1972, *Agostini G. 1107* (MO). La Chapa, 19 July 1967, *Steyermark J.A. 99162* (F, MO, NY). Puerto Cumarebo, 13 February 1977, *Steyermark J.A. 113797* (MO). Zambrano, 20 March 1979, *Wingfield R. 5722* (MO, U). **Guarico:** Calabozo, 15 February 1979, *Gentry A.H. 24773* (MO). Chaguaramas, 13 February 1964, *Ramia M. 2861* (MO). Espino, 21 March 1991, *Martino G. de 338* (MO). Garcitas, 1 April 1949, *Lasser T. 2697* (MO). Maracay, 29 March 1974, *Gentry A.H. 10979* (MO). Tamanaco (viejo), 11 June 1966, *Aristeguieta L. 6150* (MO, NY). Zaraza, 20 March 1974, *Gentry A.H. 10809* (MO). **Lara:** Barquisimeto, 16 April 1946, *Burkart A. 16559* (MO); *Saer J. 145* (MO, NY, US); *Saer J. 182* (MO); *Saer J. 212* (G, MO, NY). El Limon, *Pittier H. 13481* (F, MO, US). Guarico, 2 April 1988, *Rivero R. 1699* (MO). Iribarren, 24 March 1975, *Steyermark J.A. 111552* (F, MO, NY). Los Yabos, *Tamayo F. 274* (MO). **Merida:** Edo. Merida., 3 May 1966, *Lopez-Palacios S. 1222* (MO). Mucuchies, 19 April 1967, *Lopez-Palacios S. 1640* (MO). **Miranda:** Caracas, 10 August 1975, *Steyermark J.A. 111996* (MO); 26 October 1975, *Berry P.E. 1645* (MO); 17 August 1975, *Steyermark J.A. 112042* (MO). Carrizal, 20 May 1974, *Morillo G. 4227* (MO). Cerros del Bachiller, 18 March 1978, *Steyermark J.A. 116414* (MO). El Cafetal (Urbanizacion), 16 August 1975, *Berry P.E. 1053* (MO). Guarenas, 3 July 1975, *Gentry A.H. 14792* (MO). Guatire, *Aristeguieta L. 3050* (MO). Guatopo Arriba, 22 November 1956, *Bernardi A.L. 5810* (MO, NY). Urbanizacion Santa Fé, 3 August 1975, *Steyermark J.A. 111830* (MO). **Monagas:** Caripe, 6 April 1969, *Trujillo B. 9482* (MO). Teresen, 5 April 1969, *Trujillo B. 9285* (MO). **Nueva Esparta:** Copey, Cerro, *Gines H. 3410* (MO, US). **Portuguesa:** Biscucuy, 2 May 1971, *Nee M.H. 4105* (MO). San Rafael De Onoto, 1 April 1974, *Gentry A.H. 11175* (MO). **Sucre:** Cogollal, 28 April 1945, *Steyermark J.A. 62408* (F, MO, NY). Cumanacoa, 26 November 1982, *Cumana C.L.J. 1019* (MO). Guiria, 16 December 1965, *Ruiz Teran L.E. 2891* (MO). Manacal, 30 November 1979, *Steyermark J.A. 120761* (MO). **Yaracuy:** El Chino, 3 May 1964, *Trujillo B. 6331* (MO). La Llanada, 2 March 1973, *Romero B.T. 395* (MO). San Pablo, 1 May 1940, *Pittier H. 14398* (MO). **Zulia:** El Guanabano, 5 July 1981, *Alfonzo G.L. 15* (MO); 6 April 1979, *Bunting G.S. 7210* (MO). Mara, 29 May 1980, *Steyermark J.A. 122847* (MO, MY); 30 May 1980, *Steyermark J.A. 122917* (F, MO, NY); 2 June 1980, *Steyermark J.A. 123178* (MO). Puerto Mara, 18 October 1982, *Bunting G.S. 11801* (MO). Rio Guasare, 9 May 1983, *Gentry A.H. 41183* (MO). Villa del Rosario, 22 April 1982, *Bunting G.S. 11406* (MO, NY). WINDWARD ISLANDS. **Grenada:** Unknown municipality, 27 September 1905, *Broadway W.E. s.n.* (BR, F, MO, NY, US); 1 June 1906, *Broadway W.E. s.n.* (MO, NY, US); *Broadway W.E. s.n.* (MO); *Broadway W.E. s.n.* (MO); 9 February 1932, *Fairchild D. s.n.* (MICH, MO, US); 1 November 1957, *Proctor G.R. 16816* (BM, MO). **Martinique:** Unknown municipality, *Duss P. 1914* (CAS, MO); 26 July 1939, *Egler F.E. s.n.* (MO, NY); *Hahn M. 252* (BM, US); Unknown municipality, *Hahn M. 1434* (BR, G, GH, MO, US, W). **St. Lucia:** Unknown municipality, 22 April 1950, *Howard R.A. 11456* (A, MO); 3 April 1986, *Pierre L.L. 320* (A); 4 April 1958, *Proctor G.R. 17821* (A, MO); 4 April 1958, *Proctor G.R. 17924* (A, BM, MO); *Schwaegrichen s.n.* (MO); *Sturrock 368* (A, MO). **St. Vincent:** Unknown municipality, 26 May 1947, *Morton C.V. 6283* (MO, US); *Smith H.H. 822* (GH, MO, NY); Unknown municipality, 4 April 1947, *Morton C. 4715* (GH, MO, US).

Incertae Sedis

Bignonia acutistipula Schlechtendal (1854: 375)

≡ *Doxantha acutistipula* (Schltdl.) Miers (1863: 190).

Type:—MEXICO. Not located.

=? *Dolichandra unguis-cati* [based on diagnosis and description]

Doxantha adunca Miers (1863: 188)

Type:—BRAZIL. Sao Paulo, Paraty, s.d., *Weir J. 9* (BM? not seen)

=? *Dolichandra unguis-cati* [based on diagnosis]

Doxantha unguis var. *microphylla* Chodat (1917: 243)

Type:—PARAGUAY. Cordillière de Altos, s.d., collector and number not indicated. (G? not seen)

=? *Dolichandra unguis-cati* [based on diagnosis]

Macfadyena undulata Schumann (1894: 227)

Type:—BOLIVIA. Without locality, s.d., collector and number not indicated. Not located.

=? *Dolichandra unguis-cati* [based on diagnosis]

Microbignonia auristellae Kraenzlin (1915: 380)

Type:—PERU. Alto Acre, in Seringal Auristella, s.d., *Ule E. 101b* (probably at B and destroyed)

=? *Dolichandra unguis-cati* [based on diagnosis]

Melloa duseniana Kraenzlin (1921: 121)

Type:—BRAZIL. Paraná: Capão Grande, s.d., *Dusén P. 9166* (probably at B and destroyed)

[It is not certain what this is, but probably nothing in *Dolichandra* based on description]

Doxantha cuspidata Miers (1863: 190), *nom. nud.*

Doxantha elongata Miers (1863: 190), *nom. nud.*

Doxantha exilis Miers (1863: 190), *nom. nud.*

Based on: BRAZIL?. Parana, s.d., *Tweedie J. s.n.* (BM? not seen)

Doxantha ferruginea Miers (1863: 190), *nom. nud.*

Based on: URUGUAY. Without locality, s.d., *Tweedie J. s.n.* (BM? not seen)

Doxantha inoleta Miers (1863: 190), *nom. nud.*

Doxantha lanuginosa Miers (1863: 190), *nom. nud.*

Based on: MEXICO. Sierra San Pedro Nolasco, Talea &c., 1843–1844, *Jurgensen C. s.n. (578?)* (BM? not seen)

Doxantha limbata Miers (1863: 190), *nom. nud.*

Based on: BRAZIL. Rio de Janeiro, s.d., *Miers J. s.n.* (BM? not seen)

Doxantha mexicana Miers (1863: 190), *nom. nud.*

Doxantha praesignis Miers (1863: 190), *nom. nud.*

Doxantha scitiflora Miers (1863: 190), *nom. nud.*

Doxantha serratula Miers (1863: 190), *nom. nud.*

Doxantha speciosa Miers (1863: 190), *nom. nud.*

Based on: BRAZIL. Rio Grande do Sul, Porto Alegre, s.d., *Fox H.S. 294* (BM? not seen; P? not seen).

Doxantha taeniamorpha Miers (1863: 190), *nom. nud.*

Based on: Country? Parana, s.d., *Gibert E.J. s.n.* (BM? not seen)

Doxantha tenuicula Miers (1863: 190), *nom. nud.*

Doxantha torquata Miers (1863: 190), *nom. nud.*

Based on: ARGENTINA. Buenos Aires, s.d., *Tweedie J. s.n.* (BM? not seen)

Macfadyena amanda Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Rio Grande do Sul, s.d., *J. Tweedie s.n.* (BM? not seen)

Macfadyena diffusa Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Rio de Janeiro, s.d., *Miers J. s.n.* (BM? not seen)

Macfadyena guttiflora Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Rio de Janeiro, s.d., *Miers J. s.n.* (BM? not seen)

Macfadyena stipuloidea Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Bahia, Ilheos, s.d., *Moricand M.E. s.n.* (BM? not seen)

Macfadyena terniflora Miers (1863: 200), *nom. nud.*

Excluded names in *Dolichandra* and genera synonymized

Doxantha capreolata (Linneaus 1753: 624) Miers (1863: 190)

Lectotype (designated by Reveal in Jarvis *et al.* 1993: 24):—Herb. Clifford: 317, Bignonia no. 2 excluding open flower (illustration!).

= *Bignonia capreolata* Linneaus (1753: 624).

Doxantha hamigera Miers (1863: 190), *nom. nud.*

Based on: BRAZIL. Rio de Janeiro, s.d., *Gardner G. 78* (BM? not seen; K image!)

= *Tanaecium pyramidatum* (Richard 1792: 110) Lohmann (2008: 274), [Gentry]

Doxantha lanceolata (Candolle 1845: 163) Miers (1863: 190)

≡ *Bignonia lanceolata* DC.

Holotype:—BRAZIL. Bahia: Rio São Francisco, s.d., *Blanchet J.S. 2904* (G-DC! [G00133157], isotype, P! [P00608075], P! [P00608076]).

= *Anemopaegma velutinum* Mart. ex Candolle (1845: 189).

Doxantha longisiliqua (Bertol. ex Sprengel 1825: 830) Miers (1863: 190)

≡ *Bignonia longisiliqua* Bertol. ex Spreng.

Holotype:—COLOMBIA. Río Magdalena, s.d., *Bertero C.L.G. s.n.* (G-DC! [G00133287]).

= *Martinella obovata* (Kunth in Humboldt *et al.* 1819: 147) Bureau & Schumann (1896: 161).

Macfadyena amazonica Miers (1863: 200), *nom. nud.*

Based on: BRAZIL. Santarem, s.d., *Spruce R. s.n.* (? K not seen; P!)

= *Bignonia corymbosa* (Ventenat 1807: 19) Lohmann (2008: 272) [Gentry 1982b]

Macfadyena bangii Rusby (1900: 72)

Holotype:—BOLIVIA. Junction of Rivers Beni and Madre de Dios, August 1886, *Rusby H.H. 1139* (NY not seen; isotypes, US! [US00125849], MICH1210238!, PH00016419!).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann

Macfadyena bifolia Miers (1863: 200)

Type:—FRENCH GUYANA. Cayenne?, t. 55, f. 1, Plum. in Burm., Pl. Amer. 1756; “Catesb. Hort. Am. f. 43”. (illustration, not seen) [Burman cites “Linn. Spec. Pl. p. 623. no. 4.” which is *Bignonia aequinoctialis* Linneaus (1753: 623)]

= *Bignonia aequinoctialis* L.

Macfadyena bipinnata Moore (1895: 418)

Holotype:—BRAZIL. Mato Grosso, near Santa Cruz, September, *Moore S. 290* (BM! [BM000573951]).

≡ *Adenocalymma bipinnatum* (S.Moore) L.G.Lohmann in Lohmann & Taylor (2014: 388).

Macfadyena bracteosa (Candolle 1845: 208) Benth. in Bentham & Hooker (1876: 1035)

≡ *Spathodea bracteosa* DC.

Holotype:—FRENCH GUYANA. Cayenne, s.d., *Patris s.n.* (G-DC! [G00133620]).

= *Adenocalymma bracteosum* (DC.) Lohmann (2008: 270).

Macfadyena citrifolia (Candolle 1838: 131) Miers (1863: 200)

≡ *Tabebuia citrifolia* DC.

Holotype:—BRAZIL. Near Bahia, 1836, *Blanchet J.S. 2351* (G-DC not seen; isotype, K! [K000449373], P! [P00608058], P! [P00608059], P! [P00608060]).

= *Anemopaegma chamberlaynii* (Sims 1820: t. 2148) Bureau & Schumann (1896: 128).

Macfadyena coito (Vellozo 1829: 245) Miers (1863: 200)

≡ *Bignonia coito* Vell.

Type:—t. 19 in Vellozo, Fl. Flumin. Icones 1827. (illustration!).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann

Macfadyena corymbosa (Vent.) Grisebach (1858: 10)

≡ *Spathodea corymbosa* Vent.

Holotype:—TRINIDAD. Without locality, s.d., *Riedlé A. s.n.* (P! [P00481551]).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann

Macfadyena fallax (Chamisso 1832: 717) Moore (1895: 418)

≡ *Bignonia fallax* Cham.

Holotype:—BRAZIL. Without locality, s.d., *Sellow F. s.n.* (presumed at B and destroyed; isotype, K! [K000449759]).

= *Adenocalymma pubescens* (Sprengel 1825: 836) L.G.Lohmann in Lohmann & Taylor (2014: 395).

Macfadyena fockeana (Miquel 1845: 609) Miers (1863: 200)

≡ *Bignonia fockeana* Miq.

Holotype:—SURINAM. Paramaribo, s.d., *Focke H.C. 924* (U! [U0000750]).

= *Martinella obovata* (Kunth.) Bureau & Schumann (1896: t. 84) [Gentry 1982b]

Macfadyena japurensis (Candolle 1845: 214) Miers (1863: 200)

≡ *Tabebuia japurensis* DC.

Type:—BRAZIL. Amazonas: Rio Negro, Japurá, December 1819, *von Martius C.F.P. 182* (M! [M-0086354], M as photo F neg. 20439 at K! and at MO-1692789!).

= *Fridericia japurensis* (DC.) L.G.Lohmann in Lohmann & Taylor (2014: 439).

Macfadyena laurifolia (Kunth in Humboldt *et al.* 1819: 146) Miers (1863: 200)

≡ *Spathodea laurifolia* Kunth.

Holotype:—VENEZUELA. Sucre “Novae Andalusiae, prope Bordones et Cumana”, September, *von Humboldt F.W.H.A. & Bonpland A.J.A. s.n.* (P not seen).

= *Bignonia* [Gentry 1982b]

Macfadyena lepidota Seem. ex Miers (1863: 200), *nom. nud.*

Based on: Antilles. Without locality, s.d., *Shakespear s.n.* (drawing by Miers at P!)

= *Bignonia corymbosa* (Vent.) L.G.Lohmann [Gentry 1973a]

Macfadyena obovata (Kunth in Humboldt *et al.* 1819: 147) Miers (1863: 200)

≡ *Spathodea obovata* Kunth.

Holotype:—COLOMBIA. Turbaco, March, *von Humboldt F.W.H.A. & Bonpland A.J.A. 1391* (P-Bonpl!).

= *Martinella obovata* (Kunth) Bureau & Schumann [Gentry 1982b]

Macfadyena orinocensis (Kunth in Humboldt *et al.* 1819: 147) Miers (1863: 200)

≡ *Spathodea orinocensis* Kunth

Holotype:—VENEZUELA. Orinoco, near Carichana, s.d., *von Humboldt F.W.H.A. & Bonpland A.J.A. s.n.* (P not seen; isotype, HAL0116239!).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann [Lohmann 2008]

Macfadyena ovata Miers (1863: 200), *nom. nud.*

Based on: COLOMBIA. Without locality, s.d., *Cuming H. 1118* (BM? not seen; P!)

= *Bignonia corymbosa* (Vent.) L.G.Lohmann [Gentry 1982b]

Macfadyena phellosperma Hemsley (1882: 492)

Holotype:—PANAMA. Río Grande, swamps, s.d., *Hayes S. 81* (K! [K000449734]; isotype K! [K000449735], BM! [BM000630059]).

= *Bignonia phellosperma* (Hemsl.) L.G.Lohmann in Lohmann & Taylor (2014: 421).

Macfadyena platypoda (Candolle 1845: 204) Miers (1863: 200)

≡ *Spathodea platypoda* DC.

Holotype:—BRAZIL. Bahia, s.d., *Blanchet J. 1511* (G-DC [G00133644]; isotype P, not seen).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann [Lohmann 2008]

Macfadyena podopogon (Candolle 1845: 205) Grisebach (1866: 195)

≡ *Spathodea podopogon* DC.

Holotype:—CUBA. Havana, s.d., *de la Sagra R. 293* (G-DC! [G00133616]).

= *Fridericia podopogon* (DC.) L.G.Lohmann in Lohmann & Taylor (2014: 443).

Macfadyena riparia Moore (1895: 417)

Holotype:—BRAZIL. Matto Grosso, fl. Paraguay, between Santa Cruz and Villa Maria, s.d., *Moore S. 837* (BM! [BM000992372]).

= *Bignonia corymbosa* (Vent.) L.G.Lohmann [Lohmann 2008]

Macfadyena simplicifolia Donnell (1891: 198)

Holotype:—GUATEMALA. Alta Verapaz, Pansamá, s.d., *von Tuerckheim H. 1030* (US! [US01095010]; isotypes, GH! [GH00052094], K! [K000529428], M not seen, US not seen).

= *Spathacanthus hahnianus* Baillon (1888: 444) [Daniel 1995]

Macfadyena violacea Rusby (1927: 356)

Holotype:—BOLIVIA. Beni, Rurrenabaque, 1000 ft., 7 October 1921, *Rusby H.H. 774* (NY-278049!).

= *Bignonia uleana* (Kraenzlin 1915: 374) L.G.Lohmann in Lohmann & Taylor (2014: 422–423).

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 Harris E.M. 1166 (*D. unguis-cati*).
 Hartshorn G.S. 1158 (*D. unguis-cati*).
 Hassler E. 10281, 11085 (*D. chodatii*), 3144, 12548, s.n., s.n., s.n. (*D. cynanchoides*), 8238 (*D. dentata*), 1530, 2726, 3353, 7442, 7450, 8445 (*D. quadrivalvis*), 7529, 7539, 8239, 11147 (*D. uncata*), 2128, 3148, 3217, 3302, 3802, 7282, 7376, 10597, 12237 (*D. unguis-cati*).
 Hatschbach G. 6966 (*D. chodatii*), 14451, 14457 (*D. cynanchoides*), 6373, 9378, 29172, 45518, 64429, 76720 (*D. hispida*), 35103, 38956, 40492, 43999, 49989, 50473, 56623, s.n. (*D. quadrivalvis*), 9256, 25767, 39143, 50688 (*D. unguiculata*), 6389, 7218, 21808, 22394, 25630, 37389, 40405, 47102, 50657, s.n. (*D. unguis-cati*).
 Haught O. 2685, 4813 (*D. uncata*), 3122 (*D. unguis-cati*).
 Heiner A. 189 (*D. unguis-cati*).
 Heringer E.P. 5391, 7212 (*D. quadrivalvis*), 4499, 8783 (*D. unguis-cati*).
 Hernández G.H. 1033, 1162 (*D. unguis-cati*).
 Hernández L. 1692 (*D. unguis-cati*).
 Herrera G.C. 387 (*D. quadrivalvis*).
 Herter W.G. 1016, s.n. (*D. cynanchoides*), 972, 82827, s.n. (*D. unguis-cati*).
 Heyde N.M. 165, 720 (*D. steyermarkii*), 579 (*D. uncata*), 93 (*D. unguis-cati*).
 Hieronymus G. s.n. (*D. cynanchoides*).
 Hinton G.B. 10234, 10319, 13765, 13792, 14257 (*D. quadrivalvis*), 4285, 6138, 7586, 7769, 7883, 10236, 13830 (*D. unguis-cati*).
 Hjerting J.P. 417 (*D. unguis-cati*).
 Hoehne F.C. 725 (*D. unguis-cati*).
 Hoehne W. 3652 (*D. quadrivalvis*), 3842, s.n. (*D. unguis-cati*).
 Hoffmann W.A. 151 (*D. unguiculata*).
 Holmquist J.D. s.n. (*D. quadrivalvis*).
 Holst B.K. 697, 960 (*D. quadrivalvis*), 2083 (*D. steyermarkii*).
 Howard R.A. 8254, 8583, 11456 (*D. unguis-cati*).
 Howell J.T. s.n. (*D. unguis-cati*).
 Huber J.E. s.n. (*D. unguis-cati*).
 Huidobro A.M.R. 2042, 4051 (*D. cynanchoides*).
 Humboldt A. 780 (*D. quadrivalvis*).

Hunziker J.H. 10634 (*D. chodatii*).
 Ibarra M.G. 3440 (*D. unguis-cati*).
 Ibarra-Manriquez G.I. 1831 (*D. uncata*).
 Ibarrola C. 2268, 3193, 3489 3878 (*D. cynanchoides*), 2483, 3721 (*D. unguis-cati*).
 Iltis H.H. 30828 (*D. quadrivalvis*).
 Irigoyen J. 352 (*D. cynanchoides*).
 Irwin H.S. 19137 (*D. quadrivalvis*), 2100, 19174 (*D. unguis-cati*).
 Jahn A. 1240 (*D. uncata*).
 James 4035, 4064 (*D. cynanchoides*).
 Jameson W. 515 (*D. unguis-cati*).
 Jangoux I.J. 10135 (*D. uncata*).
 Jansen-Jacobs M.J. 1179 (*D. unguis-cati*).
 Janzen D.H. 12183 (*D. quadrivalvis*), 10093, 10149 (*D. unguis-cati*).
 Jardim A. 1204 (*D. hispida*) 1178, 2736 (*D. quadrivalvis*), 520, 1644 (*D. unguis-cati*).
 Jardim J.G. 520 (*D. unguis-cati*).
 Jarenkow 3204 (*D. hispida*).
 Jimenez M.A. s.n., s.n. (*D. unguis-cati*).
 Jiménez A.J. 2081 (*D. unguis-cati*).
 Jiménez L. O. s.n., s.n. (*D. unguis-cati*).
 Jiménez S. 946 (*D. uncata*).
 Johnston M.C. 4104 (*D. quadrivalvis*).
 Jorgensen P. 1966 (*D. uncata*), 3454 (*D. unguis-cati*).
 Judziewicz E.J. 5176 (*D. quadrivalvis*).
 Jurgens C. 4 (*D. quadrivalvis*).
 Jurgensen C. 548, 572, 578 (*D. unguis-cati*).
 Kernan C. 67 (*D. uncata*), 1080 (*D. unguis-cati*).
 Kessler M. 3255 (*D. unguis-cati*).
 Killeen T. 2702, 5706 (*D. unguis-cati*).
 Killip E.P. 28162 (*D. unguis-cati*).
 King R.M. 4531 (*D. unguis-cati*).
 Kniess K. 561 (*D. hispida*).
 Kodjoed J.F. 113 (*D. uncata*).
 Kohn E. 1229 (*D. uncata*).
 Kral R. 75478 (*D. quadrivalvis*).
 Krapovickas A. 31000, 31463 (*D. chodatii*), 20092 (*D. cynanchoides*), 17047, 25055, 26835 (*D. dentata*), 19201, 21062, 29126 (*D. quadrivalvis*), 11735, 15938, 17984, 18362, 19612, 20012, 21077, 21340, 22816, 22957, 24232, 25086, 25770, 26403, 36893 (*D. unguis-cati*).
 Kuhlman J.G. 3103 (*D. quadrivalvis*), s.n. (*D. unguis-cati*).
 Kujikat A. 261 (*D. uncata*).
 Kummrow R. 997 (*D. quadrivalvis*), 1169 (*D. unguis-cati*).
 Kuniyoshi Y.S. 3300 (*D. unguis-cati*).
 Lasser T. 2697, 4236 (*D. unguis-cati*).
 Laurêncio A. 97 (*D. unguis-cati*).
 Lawrence A.E. 428 (*D. unguis-cati*).
 Legname P.R. 3058 (*D. chodatii*).
 Lent R.W. 3271 (*D. uncata*).
 Lewis M. 40356 (*D. unguis-cati*).
 Lewis W.H. 10207, 10247, 10529, 11905, 12037, 12078, 13460 (*D. uncata*).
 Liesner R. 11073, 11124 (*D. quadrivalvis*), 11239, 13267 (*D. uncata*), 11283 (*D. unguis-cati*).
 Lima D.A. 1028, 1072 (*D. quadrivalvis*), 1628, s.n. (*D. unguis-cati*).
 Lindeman J.C. 3478, s.n. (*D. cynanchoides*), 3497 (*D. dentata*), 440 (*D. steyermarkii*), 595, 932, 2783, 3021, 3889, 5251, s.n. (*D. unguis-cati*).

Lindmann C.A.M. 2335, s.n. (*D. cynanchoides*), 577, 1629, 2333, s.n., s.n., s.n., s.n. (*D. unguis-cati*).
Liogier A. 33731 (*D. unguis-cati*).
Lohmann L.G. 477 (*D. uncata*), 686 (*D. quadrivalvis*).
Lombardi J. 2432 (*D. unguis-cati*).
Long L.E. 185 (*D. unguis-cati*).
Lopez-Palacios S. 1222, 1640 (*D. unguis-cati*).
Lorentz P.G. 271 (*D. unguis-cati*).
Lott E.J. 2589, 3463, 4122 (*D. quadrivalvis*).
Lourteig A. 879 (*D. cynanchoides*), 2776 (*D. dentata*).
Lozano C.G. 2779 (*D. unguis-cati*).
Lundell C.L. 674, 847 (*D. unguis-cati*).
Lustran P. 479 (*D. unguis-cati*).
López C.L. 291 (*D. unguis-cati*).
Macedo A. 3009 (*D. hispida*), 2024 (*D. quadrivalvis*), 281, 1985, 1991 (*D. unguis-cati*).
Macía M.J. 4488 (*D. uncata*).
Madison M.T. 5223 (*D. unguis-cati*).
Magallanes J.A.S. 1108, 1576, 2976, 4223 (*D. quadrivalvis*).
Maguire B. 56784, s.n. (*D. quadrivalvis*).
Malme G.O.A. 1002 (*D. cynanchoides*).
Malmierca L. s.n. (*D. unguis-cati*).
Malvárez M.R. 115 (*D. unguis-cati*).
Mamani M.F. 799, 860 (*D. quadrivalvis*), 398 (*D. uncata*).
Manara B.J. s.n., s.n. (*D. unguis-cati*).
Manso S. 1645 (*D. uncata*).
Marcano V. 894 (*D. steyermarkii*).
Marcano-Berti L. 268 (*D. dentata*), s.n. (*D. uncata*), s.n. (*D. unguis-cati*).
Marquez R.W. 210, s.n. (*D. unguis-cati*).
Martin P.S. s.n. (*D. unguis-cati*).
Martinez A.M. 582, 643 (*D. quadrivalvis*).
Martino G. de 338 (*D. unguis-cati*).
von Martius C.F.P. s.n. (*D. unguis-cati*).
Maruffa A.C. 45 (*D. unguiculata*).
Marunak V. 77 (*D. unguis-cati*).
Marutla A.C. 45 (*D. unguiculata*).
Mathias M.E. 5045 (*D. uncata*).
Matuda E. 5679, 15679, 17568, 18373, 18634, 18767 (*D. unguis-cati*).
McDowell T. 2198 (*D. quadrivalvis*).
McVaugh R. 1404 (*D. quadrivalvis*).
Meebold A. s.n. (*D. cynanchoides*).
Mejia M. 129, 9398 (*D. unguis-cati*).
Mello B. s.n. (*D. unguiculata*).
Mello H. s.n. (*D. unguis-cati*).
Melo E. de 1384 (*D. unguis-cati*).
Melo P.H.A. 538 (*D. chodatii*).
Mennega A. 194 (*D. uncata*).
Mereles F. 529, 5257 (*D. cynanchoides*).
Mexia Y. 4339 (*D. cynanchoides*), 5132, 6572 (*D. unguis-cati*).
Meyer S.A. s.n. (*D. unguis-cati*).
Meyer T. 4798, 5078, 8486 (*D. chodatii*), 3899 (*D. cynanchoides*), 12679 (*D. quadrivalvis*).
Moers 7967 (*D. unguis-cati*).
Mogensen B. 1010, 1198 (*D. unguis-cati*).
Molina R.A. 7306 (*D. quadrivalvis*), 2299 (*D. uncata*), 946, 1829, 7806, 11887, 11912, 13825 (*D. unguis-cati*).

Montalvo E.A. 3211 (*D. quadrivalvis*).
 Montes F. 1 (*D. uncata*).
 Montes J. 4299 (*D. unguis-cati*).
 Montes J.E. 751 (*D. unguis-cati*).
 Montes J.M. 129 (*D. unguis-cati*).
 Montes R.A. 256 (*D. unguis-cati*).
 Moore H.E. Jr. 6326 (*D. unguis-cati*).
 Morales J.F. 2371, 2474, 3514 (*D. quadrivalvis*), 3854 (*D. uncata*), 4124, 4157, 4169-4170 (*D. unguis-cati*).
 Morales R.L. 176 (*D. quadrivalvis*).
 Morel J. 745, 857, 1716 (*D. cynanchoides*), 309, 1405 (*D. unguis-cati*).
 Moreno P.P. 671, 4264, 16230, 16951, 21247, 21563, 21780, 22918, 23486, 23531, 25150 (*D. quadrivalvis*),
 12447, 13311, 25693 (*D. uncata*), 356, 2472, 8434, 16273, 22903, 25364, 26739 (*D. unguis-cati*).
 Mori S.A. 11194, 12830 (*D. quadrivalvis*), 22908, 22960 (*D. steyermarkii*), 11055 (*D. unguiculata*), 11524, 18641
 (*D. unguis-cati*).
 Morillo G. 4239 (*D. uncata*), 4225, 4227 (*D. unguis-cati*).
 Morton C.V. 4715, 6283 (*D. unguis-cati*).
 Mostacedo B. 2814 (*D. quadrivalvis*).
 Moura L. 1918 (*D. unguis-cati*).
 Mroginski L. 551 (*D. dentata*).
 Murguia O. 524 (*D. unguis-cati*).
 Múlgura M. 1444 (*D. chodatii*).
 Nee M.H. 28814, 35263, 35732, 38949, 44665, 45014, 48893 (*D. quadrivalvis*), 4105, 11359, 25804, 34243,
 35265, 35434, 35662, 37766, 38294, 40545, 41530, 41583, 46074, 47111, 47508, 47970, 48073 (*D. unguis-cati*).
 Neill D.A. s.n. (*D. quadrivalvis*), 3871 (*D. unguis-cati*).
 Nelson A. 5175 (*D. quadrivalvis*).
 Nevers G. de 4624, 4762, 6485 (*D. uncata*).
 Nicora E.G. 3317 (*D. dentata*).
 Noblick L.R. 3471 (*D. quadrivalvis*).
 Nogueira Silva P.E. 84 (*D. quadrivalvis*).
 Novara L.J. 3796 (*D. cynanchoides*), 2675, 2691, 3098, 8097, 9009 (*D. unguis-cati*).
 Nuñez P. 10796, 12144, 14248, 14630 (*D. uncata*), 9774, 12803 (*D. unguis-cati*).
 O'Donnell C.A. 2896 (*D. unguis-cati*).
 Oersted s.n. (*D. unguis-cati*).
 Oldeman R.A.A. s.n. (*D. steyermarkii*), s.n. (*D. uncata*), 1023, 1047, 1133 (*D. unguis-cati*).
 Oliveira E. 374, 1149 (*D. unguis-cati*).
 Oliveira P.I. 106, 757 (*D. unguis-cati*).
 Opler P.A. 682, 1753 (*D. unguis-cati*).
 Ortega J. 4545 (*D. unguis-cati*).
 Ortega J. G. 7237 (*D. unguis-cati*).
 Ortiz M. 813 (*D. quadrivalvis*), 1275 (*D. unguis-cati*).
 Osten C. 8994 (*D. cynanchoides*), 8995 (*D. unguis-cati*).
 Pabst G. 5731, 6193, 6547 (*D. unguis-cati*).
 Padre E.J. s.n. (*D. quadrivalvis*), 283 (*D. unguis-cati*).
 Palacios M.A. 40 (*D. unguis-cati*).
 Palmer E. 242, 365, 367 (*D. unguis-cati*).
 Paniagua N. 5649 (*D. uncata*).
 Panizza S. s.n. (*D. unguis-cati*).
 Partida J.A. 2005 (*D. unguis-cati*).
 Patino V. 228 (*D. unguis-cati*).
 Paz P. 160 (*D. uncata*), 251 (*D. unguis-cati*).
 Paz R.C. 294 (*D. uncata*).
 Pedersen T.M. 879, 5986, 8121, s.n. (*D. cynanchoides*), 1212, 2750, 6539, s.n. (*D. unguis-cati*).

Pereira B.A.S. 799 (*D. unguis-cati*).
 Pereira E. 182, 9928 (*D. quadrivalvis*).
 Perez L. 460 (*D. uncata*).
 Pierotti S.A. 1191 (*D. chodatii*), 5058, 11534, s.n. (*D. cynanchoides*), 1207 (*D. unguis-cati*).
 Pierre L.L. 320 (*D. unguis-cati*).
 Piper C.V. 6023 (*D. unguis-cati*).
 Pipoly J.J. 11734 (*D. uncata*).
 Pires E. 1382 (*D. unguis-cati*).
 Pires J.M. 17311 (*D. quadrivalvis*), 4424 (*D. unguis-cati*).
 Pires S. 175 (*D. unguis-cati*).
 Pittier H. 11678 (*D. quadrivalvis*), 4003, 10960, 11767 (*D. uncata*), 124, 1973, 13481, 14381, 14398, 14802 (*D. unguis-cati*).
 Pizzaia L.N. 1109 (*D. chodatii*), 1301 (*D. unguis-cati*).
 Pompeia S. 162 (*D. unguis-cati*).
 Pontin s.n. (*D. unguis-cati*).
 Poliquesi 328 (*D. hispida*).
 Porto M.L. 576 (*D. cynanchoides*).
 Poveda A.L.J. 4194 (*D. quadrivalvis*).
 Prance G.T. 26229 (*D. quadrivalvis*), 59358 (*D. unguis-cati*).
 Pringle C.G. 3656, 5123, 5788 (*D. unguis-cati*).
 Proctor G.R. 16816, 17821, 17924, 42001 (*D. unguis-cati*).
 Puch A. 498 (*D. quadrivalvis*).
 Pulle A.A. 548 (*D. uncata*).
 Pérez B. 396 (*D. cynanchoides*), 199, 698, 803 (*D. unguis-cati*).
 Pérez S. 48 (*D. unguis-cati*).
 Quarín C. 27, 355 (*D. cynanchoides*), 262, 264 (*D. dentata*), 1547, 2030, 3430 (*D. unguis-cati*).
 Queiroz L.P. de 1126 (*D. quadrivalvis*).
 Quesada 139 (*D. quadrivalvis*).
 Quintana G. 1048, 1225 (*D. uncata*).
 Rabelo A.M. 1425 (*D. uncata*).
 Rabelo B.V. 1846, 2073 (*D. uncata*).
 Rambo B. 40522, 44933 (*D. cynanchoides*), 49222, 53182 (*D. quadrivalvis*), 41508, 44004, 44658, 46719 (*D. unguis-cati*).
 Ramia M. 5317 (*D. uncata*), 2861 (*D. unguis-cati*).
 Ratter J.A. s.n., s.n. (*D. unguis-cati*).
 Regnell A.F. 40, s.n. (*D. unguis-cati*).
 Reitz R. s.n. (*D. dentata*), 7, 14, 23, 2774, 7360, 7403, 13657, 14371, 16211 (*D. unguis-cati*).
 Renteria E. 4569 (*D. uncata*).
 Renvoize S.A. 3529 (*D. cynanchoides*), 3185 (*D. quadrivalvis*), 3361, 3532 (*D. unguis-cati*).
 Richardson A. 653 (*D. quadrivalvis*).
 Richter E. s.n. (*D. unguis-cati*).
 Rivero R. 1699 (*D. unguis-cati*).
 Robles L. 172 (*D. quadrivalvis*).
 Robles R. 1434, 1492, 1849, 1895 (*D. uncata*).
 Robleto W. 398, 422, 932, 2107 (*D. quadrivalvis*), 657 (*D. uncata*), 880, 1190, 1741, 1968 (*D. unguis-cati*).
 Rocha E. de S.F. da 783 (*D. quadrivalvis*).
 Rodriguez D. 1063 (*D. quadrivalvis*).
 Rodriguez J.V. 758 (*D. steyermarkii*).
 Rojas T. 3360 (*D. dentata*), 13743 (*D. hispida*), s.n. (*D. uncata*), 1513 (*D. unguis-cati*).
 Roldan F.J. 557, 961 (*D. uncata*).
 Romero B.T. 395 (*D. unguis-cati*).
 Romero C.R. 9721 (*D. unguis-cati*).

Romero-Castaneda R. 93, 123, 1136, 1731, 2326, 9619, 10037 (*D. uncata*), 345, 1071, 9609 (*D. unguis-cati*).
Rose J.N. 1561, 12917 (*D. unguis-cati*).
Rosengurtt B. 5710 (*D. unguis-cati*).
Rotman A. 545 (*D. unguis-cati*).
Royo O. 679 (*D. unguis-cati*).
Ruano J.M. 1048 (*D. unguis-cati*).
Rueda R. 2656, 3082, 3097, 4773, 8804, s.n. (*D. uncata*), 7386 (*D. unguis-cati*).
Ruiz Teran L.E. 2891 (*D. unguis-cati*).
Runyon R. 901 (*D. unguis-cati*).
Rusby H.H. 1137, 2569, s.n., s.n. (*D. uncata*).
Rzedowski J. 940, 10342, 25627, 43169 (*D. quadrivalvis*).
Saavedra R. 260 (*D. chodatii*).
Sacco J.C. da 268 (*D. unguis-cati*).
Saddi N. 2038, 2038, 7183 (*D. uncata*).
Saer J. 145, 182, 212 (*D. unguis-cati*).
Sagot P. 399 (*D. uncata*), 1370 (*D. unguis-cati*).
Saldías M. 2779, 3751, 4357, 5118 (*D. unguis-cati*).
Salick J. 8278 (*D. uncata*).
Samuels J.A. 152, 395 (*D. uncata*).
Sanabria A. 382 (*D. unguis-cati*).
Sandino J.C. 1828 (*D. quadrivalvis*).
Sandoval E. s.n. (*D. quadrivalvis*), 1176 (*D. unguis-cati*).
Sandoval M. s.n. (*D. unguis-cati*).
Sandwith N.Y. 1549 (*D. uncata*).
Santos E. dos 2038, 2647 (*D. unguis-cati*).
Santos G. dos 231, 315, 318 (*D. uncata*), 63, 65, 67, 79, 125 (*D. unguis-cati*).
Santos R.S. 24340 (*D. quadrivalvis*).
Sauvain M. 150 (*D. uncata*).
Schinini A. 11633, 17322, 18668 (*D. cynanchoides*), 10384, 16723, 25117 (*D. dentata*), 5435 (*D. quadrivalvis*), 4892, 28716 (*D. uncata*), 10262, 10754, 11393, 14362, 17761, 18272, 20349, 25014 (*D. unguis-cati*).
Schipp W.A. s.n., s.n. (*D. uncata*).
Schlwaegrichen s.n. (*D. unguis-cati*).
Schott A. 399, 776 (*D. unguis-cati*).
Schott H.W. s.n., s.n. (*D. unguis-cati*).
Schreiter 3363, 10890, 11401 (*D. quadrivalvis*), 157, 3473, 10889 (*D. unguis-cati*).
Schulz A.G. 2394, 7845, 8914, 10664, 18144 (*D. cynanchoides*), 34, 461, 17569, s.n., s.n. (*D. quadrivalvis*), 35, 64, 462, 1612, 1624, 2398, 2411, 3043, 3430, 7657, 7854, 8007, 8109, 8132, 8400, 8646 (*D. uncata*), 37, 463, 1616, 1631, 1633, 2388, 2410, 2419, 3453, 6956 (*D. unguis-cati*).
Schulz C. 826 (*D. cynanchoides*).
Schunke J.M. 317 (*D. unguis-cati*).
Schunke-Vigo J. 7852, 8455 (*D. uncata*), 902, 4431, 6682, 8538 (*D. unguis-cati*).
Schuvarzer M. s.n. (*D. unguis-cati*).
Schwarz G.J. 508, 4879, 4879, 36021 (*D. unguis-cati*).
Sehnem P.A. 7541 (*D. unguis-cati*).
Seibert R.J. 1500 (*D. unguis-cati*).
Seidel R. 4149, 8563, 8563 (*D. uncata*).
Seigler D. s.n. (*D. cynanchoides*).
Sellow F. 1633, s.n. (*D. unguis-cati*).
Sermeno A. 182 (*D. unguis-cati*).
Sesmeros 254 (*D. unguis-cati*).
Shafer J.A. 1591 (*D. unguis-cati*).
Shattuck O.E. 264, 944 (*D. unguis-cati*).

Shepherd G.J. 2128 (*D. uncata*).
Shiki D. s.n. (*D. uncata*).
Silva 955 (*D. hispida*).
Silva J.D. da s.n. (*D. quadrivalvis*).
Silva N.T. da 2160 (*D. cynanchoides*), 2644, 2853 (*D. quadrivalvis*).
Silva W.R. s.n. (*D. unguis-cati*).
Silveira M. 1595 (*D. steyermarkii*).
Simá P. 1800 (*D. unguis-cati*).
Sinaca C. S. 380, 1505, 1555 (*D. unguis-cati*).
Skutch A.F. 4872 (*D. unguis-cati*).
Sleumer H.O. 1996 (*D. chodatii*).
Smith A.C. 3278 (*D. quadrivalvis*).
Smith F.D. 171, 250 (*D. quadrivalvis*).
Smith H.H. 1133 (*D. quadrivalvis*), 751 (*D. uncata*), 822, 1134 (*D. unguis-cati*).
Smith L.B. 7622, 12716 (*D. quadrivalvis*), 7633, 12572, 12868, 13551 (*D. unguis-cati*).
Smith R.F. s.n. (*D. uncata*).
Soels 23 (*D. unguis-cati*).
Soeprato s.n. (*D. uncata*).
Solano J. 212 (*D. uncata*).
Solomon J.C. 6437, 12382 (*D. uncata*), 7965, 9841, 9952, 10334, 11000, 11198, 11241 (*D. unguis-cati*).
Soria N. 2650, 3966 (*D. quadrivalvis*), 1886, 2077, 3906 (*D. unguis-cati*).
Sota A.V. de la 3337, 3372 (*D. cynanchoides*).
Sota E.R. de la 626 (*D. cynanchoides*).
Sousa M. 4432, 4517 (*D. uncata*).
Souza A.A. 35 (*D. unguis-cati*).
Sparre B. 13228 (*D. uncata*).
Spichiger R. 2396 (*D. quadrivalvis*), 2402 (*D. unguis-cati*).
Splitgerber F.L. 422 (*D. uncata*).
Standley P.C. 53566, 54754 (*D. uncata*), 10171, 10275, 21839, 23045, 29440, 29683, 40203, 79627, 87383, 89057, 91854 (*D. unguis-cati*).
Steere W.C. 1473 (*D. unguis-cati*).
Stehle H. 1817 (*D. unguis-cati*).
Steinbach J. 1625 (*D. quadrivalvis*), 1583, 6466, 7195-7196, 7359, 8135 (*D. unguis-cati*).
Steinbach R. 380 (*D. uncata*).
Stevens G. 69 (*D. quadrivalvis*).
Stevens W.D. 17153, 20153 (*D. quadrivalvis*), 20019 (*D. uncata*), 2849, 14750, 17355 (*D. unguis-cati*).
Steyermark J.A. 107647, 122832, 127206 (*D. quadrivalvis*), 60643, 89166, 93003, 93071, 120739, 120855, 121443, 121688 (*D. steyermarkii*), 38971, 39217, 39528, 87778, 102031, 102096, 114697, 121226, s.n. (*D. uncata*), 37597, 38043, 39111, 46091, 62408, 95144, 99162, 101517, 102128, 102284, 111552, 111830, 111996, 112042, 113797, 116414, 120761, 122847, 122917, 123178 (*D. unguis-cati*).
Strudwick J.J. 3112 (*D. uncata*).
Sturrock 368 (*D. unguis-cati*).
Stutz L.C. 1414 (*D. quadrivalvis*), 340, 1141, 1717-1718 (*D. uncata*).
Sucre B. 3506 (*D. unguis-cati*).
Sánchez L. 95 (*D. quadrivalvis*).
Tamayo F. 4129 (*D. quadrivalvis*), 274 (*D. unguis-cati*).
Teague G.W. 48, 401, 643 (*D. unguis-cati*).
Terribile M. 863 (*D. cynanchoides*).
Thomas W.W. 4635 (*D. uncata*).
Ticona J.P. 66 (*D. unguis-cati*).
Tillet S.S. 45149 (*D. steyermarkii*).
Timaná M. 2446 (*D. quadrivalvis*), 1846, 2128, 2449, 3278, s.n. (*D. uncata*).

Toledo C.S. 11378 (*D. quadrivalvis*), 11790 (*D. unguis-cati*).
Toledo M. 786 (*D. quadrivalvis*), 163, 435, 513, 513 (*D. unguis-cati*).
Tonduz A. 13866 (*D. quadrivalvis*), 9797, 14891 (*D. uncata*).
Torres M. 13 (*D. quadrivalvis*).
Torrey J. 2 (*D. quadrivalvis*).
Tressens D. 1556, 1877 (*D. unguis-cati*).
Tressens S.G. 598 (*D. cynanchoides*), 1487 (*D. dentata*), 1052 (*D. quadrivalvis*), 1359, 5466 (*D. uncata*), 873, 1976, 3103 (*D. unguis-cati*).
Triana J.J. 4124, s.n. (*D. quadrivalvis*).
Trigos R.C. 2773 (*D. uncata*).
Troll C. 360, 361 (*D. unguis-cati*).
Trujillo B. 4140 (*D. quadrivalvis*), 6331, 9285, 9482 (*D. unguis-cati*).
Tucker J.M. 1341 (*D. unguis-cati*).
Ucan E. 1516 (*D. unguis-cati*).
Ule U. 7846, 7967 (*D. unguis-cati*).
Uribe-Uribe 2736 (*D. unguis-cati*).
Urrelo J. 267 (*D. unguis-cati*).
Urtubey E. 9 (*D. unguis-cati*).
Uslar Y. 380 (*D. unguis-cati*).
Vaca A. s.n. (*D. unguis-cati*).
Vahl s.n. (*D. unguis-cati*).
Valerio M. 411 (*D. uncata*), 477, 959 (*D. unguis-cati*).
Valla J.J. s.n. (*D. cynanchoides*).
Vanni R. 465 (*D. unguis-cati*).
Varela 80 (*D. cynanchoides*), 2127 (*D. unguis-cati*).
Varela G. 49 (*D. unguis-cati*).
Vargas C.C. 13675, 23405 (*D. unguis-cati*).
Vargas I.G. 1585, 1659, 1674, 2887 (*D. quadrivalvis*), 6277 (*D. unguis-cati*).
Vargas L. 1241 (*D. unguis-cati*).
Vazquez T.M. 2508 (*D. unguis-cati*).
Velazquez L.C. 294 (*D. quadrivalvis*).
Ventura A.F. 11157, 20339 (*D. quadrivalvis*), 20458 (*D. uncata*), 3420, 8350, 12604, 12673, 12755, 20169 (*D. unguis-cati*).
Venturi S. 5458, 9908 (*D. cynanchoides*), 279, 5378 (*D. quadrivalvis*), 961, 3549, 5388, 5398, 9513, 9581, 9662, 39356 (*D. unguis-cati*).
Vianna E. s.n. (*D. cynanchoides*).
Vieira A.O.S. 167 (*D. unguis-cati*).
Viellard C.J. s.n. (*D. unguiculata*).
Villacorta R. 557 (*D. uncata*).
Villalobos 113 (*D. unguis-cati*).
Villavicencio X. 1391, 1767 (*D. uncata*).
Vincelli P.C. s.n. (*D. quadrivalvis*).
Vásquez R. 6293, 7229, 9324, 20275 (*D. uncata*), 12065 (*D. unguis-cati*).
Wallace R. 146 (*D. quadrivalvis*).
Walt S. de 795 (*D. unguis-cati*).
Walter B.M.T. 4 (*D. unguis-cati*).
Ward D.B. 7785 (*D. quadrivalvis*).
Wasun R. 1577 (*D. unguis-cati*).
Wedel H. von 654 (*D. uncata*).
Wedermann E. 2575 (*D. quadrivalvis*), 2407, 2534 (*D. uncata*).
Wendt T. 3832, 31992, s.n. (*D. unguis-cati*).
Wetmore R.H. 75 (*D. unguis-cati*).

Whitefoord C. 5288, 5978 (*D. unguis-cati*).
Wiggins I.L. 5666, s.n. (*D. unguis-cati*).
Williams L.O. 4208, 8624, 11878 (*D. uncata*), 12793, 13603 (*D. unguis-cati*).
William J. 214 (*D. chodatii*).
Wingfield R. 5722 (*D. unguis-cati*).
Woodbury R.O. s.n. (*D. unguis-cati*).
Woodson R.E. 1308, 1450, s.n. (*D. unguis-cati*).
Woolston A.L. 481 (*D. chodatii*), 325, 964 (*D. unguis-cati*).
Woytkowski F. 34465 (*D. uncata*).
Wright C. 1340 (*D. unguis-cati*).
Wright D. s.n. (*D. cynanchoides*), s.n. (*D. unguis-cati*).
Zabala S. 249 (*D. unguis-cati*).
Zamora V.N. 1397, 2265 (*D. unguis-cati*).
Zandoval J.A. s.n. (*D. unguis-cati*).
Zanoni T. 21934, 38607 (*D. unguis-cati*).
Zardini E. 6868, 8289, 9180, 16595, 22688, 25238, 29557, 31221, 32322 (*D. cynanchoides*), 2539, 3072, 3106, 3787, 6371, 7138, 7470, 8104, 10864, 13240, 18215, 21740, 22018, 31177 (*D. quadrivalvis*), 6862, 16957, 17491, 17794, 18027, 19812, 19950, 21585, 21665, 22325, 22758, 25236, 25255, 28222, 28634, 28688, 28696, 29423, 29483, 31247, 31258 (*D. uncata*), 1188, 1194, 2894, 3735, 4953, 5085, 7515, 8772, 9084, 9512, 10336, 10990, 11272, 11786, 12075, 12261, 12309, 13070, 13231, 13767, 14294, 14462, 14489, 14652, 14723, 17500, 17970, 19657, 20442, 21072, 21543, 21750, 21906, 26399, 27714, 27986, 28156, 28345, 28524, 29712, 29926, 30255, 30679, 30768, 30925, 313078, 31148, 31194, 31201, 31205, 31990, 32090, 32336, 32537 (*D. unguis-cati*).
Zarucchi J.L. 4132 (*D. unguis-cati*).
Záiga R. 425 (*D. quadrivalvis*).