Scientific Electronic Archives
Issue ID: Sci. Elec. Arch. Vol. 12 (4)
August 2019
Article link
http://www.seasinop.com.br/revista/index.php?journal=SEA&page=article&op=view&path%5B%5D=738&path%5B%5D=pdf
Included in DOAJ, AGRIS, Latindex, Journal TOCs, CORE, Discoursio Open Science, Science Gate, GFAR, CIARDRING, Academic Journals Database and NTHRYS Technologies, Portal de Periódicos CAPES.
ISSN 2316-9281

Occurrence of species of *Mandevilla* Lindl. (Apocynaceae Juss.: Apocynoideae) in Lavras (MG), Brazil: ecological and taxonomical implications

F. A. Z. Vital

Federal University of Lavras

Author for correspondence: flavio.zagotta@hotmail.com

Abstract: *Mandevilla* Lindl. (Apocynaceae) presents approximately 150 species, which guarantees the largest specific contingent in Apocynoideae, and these taxa occur in regions that extend from Mexico to Argentina, in the most varied habitats. Due to its vast occurrence in the region and the high ornamental value of numerous species, the present work aimed to catalog the native species of *Mandevilla* occurring in the county of Lavras. A description of the species found was also performed, a comparison was made with the occurrence reported in other surveys. The data were obtained by consulting the collection of herbaria that presented collections for the municipality. Six species were identified: *Mandevilla illustris* (Vell.) Woodson, *M. hirsuta* (Rich.) K.Schum., *M. longiflora* (Desf.) Pichon, *M. pohliana* (Stadelm.) A.H.Gentry, *M. tenuifolia* (J.C.Mikan) Woodson, *M. velame* (A.St.-Hil.) Pichon. The occurrence of species of *Mandevilla* was considered to be high when compared to the other surveys consulted, and this fact was favored by the pedological and vegetative conformation of the area, which are highly favorable for the establishment and development of the representatives of this genus.
Keywords: Floristic survey. Taxonomy. Specific distribution.

Introduction

Apocynaceae Juss. belongs to Gentianales Juss. ex Bercht. and J. Presl, being a second largest of the this order, with about 3700 species (ENDRESS, 2001; ENDRESS & BRUYNS, 2000; RAPINI, 2012). In Brazil, a family is represented by about 95 genera and 850 species, occurring in diverse environments, from the Cerrado to perennial wet forests (JUDD et al., 2009; SOUZA & LORENZI, 2012). The monophyly of the family is confirmed by the presence of latex, the ovaries separated and a modified head of stigma (ENDRESS & BRUYNS, 2000; SIMÕES et al., 2006; SOUZA & LORENZI, 2012). This family has five subfamilies, Apocynoideae Burnett, Periplocoideae Kostel, Secamonoideae Endl. And Asclepiadoideae Duby, which can be differentiated by: total or partial fertility of the anthers, number cavities of anthers and the type of pollinia (ENDRESS et al., 2007; ENDRESS et al., 2014).

Apocynoideae can be diagnosed by the following morphological parameters: opposite leaves; corolla with dextrorsal prefloration; partially fertile anthers; pollen in monads or individual unities; and comous seeds with tufts of well-defined hairs (ENDRESS & BRUYNS, 2000). Apocynoideae presents 76 genera and 860 species distributed in five tribes (Apocyneae, Echiteae, Malouetieae, Mesechiteae and Wrigghtieae) (SENNBLAD et al., 1998; SIMÕES et al., 2007; PICHON, 1950). The subtribe Mandevillinae, included in the Mesechiteae tribe, presents the glabrous and concave retinaculum (ENDRESS & BRUYNS, 2000; SIMÕES et al., 2004). This work advocates only individuals of the genus *Mandevilla* Lindl., which is included in the Mandevillinae subtribe, being the most diverse genus specifically of the subfamily Apocynoideae, with a total of 150 species (MATOZINHOS & KONNO, 2008; SIMÕES et al., 2007). The most relevant characteristics for the identification of this genus are: inflorescences in racemes, anthers with truncated or chordate bases, and umbraculiform stigmatiferous head (SIMÕES & KINOSHITA, 2002). According to SALES (1993), *Mandevilla* species occur in regions that extend from Mexico to Argentina, in several habitats.

Over a period of time, where the field of phylogeny was still deficient, three groups of the Mendevillinae subtribe had conflicting positions regarding generic identity: *Mandevilla* Lindl., *Macrosiphonia* Müll.Arg. and *Quiotania* Zarucchi. *Macrosiphonia* is a genus with 10 species, which raised the species of the North American subgenus *Telosiphonia* (Woodson) Henrickson to the genus category (BARBAN, 1985; HENRICKSON, 1996; SIMÕES et al., 2007). The differences between *Mandevilla* and *Macrosiphonia* are tenuous, based on the habit and structure of the stigmatiferous head (WOODSON, 1933). The genus *Quiotania* differs from *Mandevilla* by the absence of tube of the pronounced corolla (ZARUCCHI, 1991). In the circumscription of WOODSON (1933), *Mandevilla* would be paraphyletic, but with the inclusion of *Macrosiphonia* and *Quiotania*, would become a monophyletic genus (SIMÕES et al., 2004; 2006). In this way, SIMÕES et al. (2007) synonimized these two genera in *Mandevilla*. Currently *Mandevilla* is subdivided into two subgenres: *Mandevilla* and *Exothostemon* (G. Don) Woodson (MATOZINHOS & KONO, 2011).

The genus *Mandevilla* Lindl. belongs to the subfamily Apocynoideae and presents approximately 150 species, which guarantees the largest contingent of this subfamily (SIMÕES et al., 2007). The distribution of its species occurs in the habitats of Caatinga, Campo Rupestre, Cerrado, Ciliary Forest or Gallery, Deciduous Seasonal Forest, Seasonal Semideciduous Forest and Restinga (MOROKAWA et al., 2013; SIMÕES & KINOSHITA, 2002).

In order to complement the studies on the species occurrence, this work aimed to generate native species of *Mandevilla* genus occurring in the county of Lavras. A description of the species of data was also performed, and a comparison was made with a relation reported in other surveys, which indicated the domain of this genus.

Material and Methods

Study Area

The county of Lavras is located in the region of Alto Rio Grande, inserted in the mesoregion of Campos das Verentes, Minas Gerais (Brazil), with altitudes varying from 500 to 1200 meters and approximately 564.5 Km² (NSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA - IBGE, 2009; QUEIROZ et al., 1980). The climate is the tropical altitude type which is characterized by dry winters and mild summers, with annual average temperature of 19.4ºC and average annual rainfall of 1529.5 mm, concentrated in the months of November and February (DEPARTAMENTO DE METEOROLOGIA NACIONAL - DNM et al., 1992). The region is characterized by rugged and mountainous topography. The local flora is quite diverse, with transitional areas between the Cerrado of Central Brazil and semideciduous forests of the Southeast and South of the country. In general, the Campo Rupestre and altitude field physiognomies are associated with the shallow and young soils of the upper. In this study, the highest values of forest cover were observed, discriminated by soil fertility, water regime and frequency of fires (OLIVEIRA-FILHO et al., 1994; CHAGAS JUNIOR et al., 2010).

Species Survey

The present survey was carried out in two complementary stages, from April 2013 to March of 2014. In the first stage, exsicates of *Mandevilla* species occurring in the municipality were cataloged, which are included in the collection of the ESAL Herbarium of the Department of Biology of the Federal University of Lavras (UFLA). In the second stage, surveys were carried out in national and international herbaria, which had records of specimens collected from *Mandevilla* species collected in Lavras (MG), through electronic consultation via SpeciesLink (splink.org.br) (Table 1).

Table 1. Herbariums consulted in this study. Acronyms according to Index Herbarium (HOLMGREN & HOLMGREN, 2009).

Acronyms	Herbarium	Locality
ESA	Escola Superior de Agricultura Luiz de Queiroz	Piracicaba – SP. BR
IBt	Herbário Maria Eneyda P. Kaufmann Fidalgo	Água Funda – SP. BR
JBRJ	Herbário Dimitri Sucre Benjamin	Rio de Janeiro – RJ. BR
NY	The New York Botanical Garden	Nova York – NY. EUA
UEC	Herbário da Universidade Estadual de Campinas	Campinas – SP. BR

Results and Discussion

For the genus *Mandevilla* were found the six species *Mandevilla illustris* (Vell.) Woodson*, M. hirsuta* (Rich.) K.Schum.*, M. longiflora* (Desf.) Pichon*, M. pohliana* (Stadelm.) A.H.Gentry*, M. tenuifolia* (J.C.Mikan) Woodson and *M. velame* (A.St.-Hil.) Pichon (Table 2).

Table 2. List of *Mandevilla* species occurring in the county of Lavras (MG).

Species	Habit	Habitat
Mandevilla illustris (Vell.) Woodson	SB	C
Mandevilla hirsuta (Rich.) K.Schum.	LI	C
Mandevilla longiflora (Desf.) Pichon	SB	R
Mandevilla pohliana (Stadelm.) A.H.Gentry	SB	C
Mandevilla tenuifolia (J.C.Mikan) Woodson	SB	C
Mandevilla velame (A.St.-Hil.) Pichon	SB	C

LABEL: SB – Subshrub; LI – Liana; C – Cerrado; R – Campo Rupestre.

Characterization of Species

Mandevilla illustris is a subshrub with showy corolla, pink with purplish blotch on the fauce and presence of a well-developed xylopodium (MONGUILHOTT & MELLO-SILVA, 2008). It occurs predominantly in Cerrado. In Brazil the collection reports are allied to the states of the Distrito Federal, Goiás, Minas Gerais, Mato Grosso, Mato Grosso do Sul, São Paulo and Paraná. Its flowering season occurs in the months of October to January (SALES, 1993) (Figure 1A).

Mandevilla hirsuta can be identified by the coleters throughout the leaf limb, its slightly zygomorphic corolla and the coleters opposed to the chalice (SIMOES & KINOSHITA, 2002). According to VASCONCELLOS & GOUVEA (1993) the flowering season occurs from October to January. This species is widely distributed from Brazil to Mexico, in riparian habitats (Figure 1B).

Mandevilla longiflora is an albo-woolly subshrub, easily recognized by its corolla with a lower tube whose length varies from 7.5 to 14cm. Its flowering season takes place predominantly between the months of September and December. Reports indicate that this species is anthropic, occurring from southern Mexico to Uruguay (VASCONCELLOS & GOUVEA, 1993) (Figure 1 C).

Mandevilla pohliana is an erect subshrub, with the upper tube of the corolla dilated and tubolous. This was the species with the highest occurrence in the county of Lavras quantitatively. It can be collected with flowers in the interval of months from September to July. There are records of the distribution of this species in Bolivia, Paraguay, and Argentina, in addition to being widely distributed in the highlands and mountains of the Midwest, Southeast and South of Brazil, in cerrado and Campo Rupestre fields, and in Santa Catarina and Rio Grande do Sul, in restingas (SALES, 1993) (Figure 1D).

Mandevilla tenuifolia recognized by subshrub habit and linear leaves, with a very evident xylopodium (Figure 1 E). It is the most widely distributed species of the genus, occurring in the savannas and rupestrian fields of Central Brazil, in the Caatingas of the Northeast and in the meadows of the North and Suriname regions. Its flowering season occurs in the period that extends from December to May (SALES, 1993).

Mandevilla velame is a subshrub with thickly albolanuginous leaves on both sides, and a follicular fruit 16 cm long, with white-woolly hairiness (VASCONCELLOS & GOUVEA, 1993). Its flowers occur from October to April; fruits from January to June. It occurs from the Center-West of Brazil to Uruguay and Argentina (SIMÕES & KINOSHITA, 2002) (Figure 1 F).

Considering the habitat of the species, all were located in Cerrado, except for *Mandevilla longiflora*, typical species of Campo Rupestre. When we considered the habit, the great majority was characterized as a subshrub, only Mandevilla hirsuta presented habit of liana (or climbing).

Comparison of Species Found in Lavras with Other Locations

The results of the present study were compared with five surveys performed in Minas Gerais (Table 3). From the comparisons, it was verified that the greatest diversity specific to the genus *Mandevilla* was simultaneously observed in Lavras and Carrancas (SIMÕES & KINOSHITA, 2002).

The greater similarity of species with Carrancas is probably due to the fact that these two municipalities are inserted in the same mountainous formation and also because of the proximity of the two municipalities, which share very similar characteristics among the vegetation types.

In relation to the survey carried out in the Toca dos Urubus (FERREIRA & FORZZA, 2009), this area presented only one specimen, the species *Mandevilla pohliana*, this is a reflection of the small territorial extension when compared to the other surveys studied.

The *M. longiflora* species occurred in practically all areas compared to this study, except at the Toca dos Urubus (FERREIRA & FORZZA, 2009). The vegetative mosaic of this area is composed of forest patches, Cerrado, Campo Rupestre and altitude fields, but as the Campo Rupestre portion is very small, this interfered in the occurrence of M. longiflora because it is a species with predominance occurring in this habitat.

Figure 1. Species of *Mandevilla* occurring in the county of Lavras (MG). (A) *Mandevilla illustris* (Vell.) Woodson. (B) *Mandevilla hirsuta* (Rich.) K.Schum. (C) *Mandevilla longiflora* (Desf.) Pichon. (D) *Mandevilla pohliana* (Stadelm.) A.H.Gentry. (E) *Mandevilla tenuifolia* (J.C.Mikan) Woodson, evident xylopodium (BLACK ARROW). (F) *Mandevilla velame* (A.St.-Hil.) Pichon. SCALE BAR: 10 cm (A, B, C, D, E, F).

Table 3. Species of *Mandevilla* Lindl. found in realized surveys in Minas Gerais, Brazil.

AREA	COMMON SPECIES	AUTHORS
Carrancas (Carrancas - MG)	*Mandevilla illustris* (Vell.) Woodson *Mandevilla hirsuta* (Rich.) K.Schum. *Mandevilla longiflora* (Desf.) Pichon *Mandevilla pohliana* (Stadelm.) A.H.Gentry *Mandevilla tenuifolia* (J.C.Mikan) Woodson *Mandevilla velame* (A.St.-Hil.) Pichon	Simões & Kinoshita (2002)
Parque Estadual do Ibitipoca (Lima Duarte – MG)	*Mandevilla illustris* (Vell.) Woodson *Mandevilla longiflora* (Desf.) Pichon *Mandevilla pohliana* (Stadelm.) A.H.Gentry *Mandevilla tenuifolia* (J.C.Mikan) Woodson	Monguilhott & Mello-Silva (2008)
Poços de Caldas (Poços de Caldas - MG)	*Mandevilla longiflora* (Desf.) Pichon *Mandevilla illustris* (Vell.) Woodson *Mandevilla hirsuta* (Rich.) K.Schum.	Vasconcellos & Gouvea (1993)
Serra São José (Tiradentes – MG)	*Mandevilla longiflora* (Desf.) Pichon *Mandevilla hirsuta* (Rich.) K.Schum. *Mandevilla tenuifolia* (J.C.Mikan) Woodson	Alves & Kolbek (2009)
Toca dos Urubus (Baependi – MG)	*Mandevilla pohliana* (Stadelm.) A.H.Gentry	Ferreira & Forzza (2009)

Conclusion

Species of the genus *Mandevilla* had a significant occurrence in the county of Lavras, accounting for six individuals. This fact was favored by the pedological and vegetative conformation of the area, which are highly favorable for the establishment and development of representatives of this genus. his fact was favored by the pedological and vegetative conformation of the area, which are highly favorable for the establishment and development of representatives of this genus.

References

ALVES, R.J.V.; KOLBEK, J. Summit vascular flora of Serra de São José, Minas Gerais, Brazil. Rio de Janeiro, RJ, Brazil. Check List. v. 5, n. 1, p. 035–073, 2009.

BARBAN. J.R. Revisão taxonômica do gênero *Macrosiphonia* Müll. Arg. (Apocynaceae). Dissertaçãode Mestrado. UNICAMP. Campinas. p. 350, 1985.

BRAGATTO-VASCONCELLOS, M.B.; KINOSHITA-GOUVEA, L.S. As Apocynaceae da Região de Poços de Caldas, Minas Gerais, Brasil. Acta Botoanica Brasilica. v. 7, n. 1, p. 32-48, 1993.

CHAGAS-JUNIOR, J.M.; CARVALHO, D.A.; MANSANARES, M.E. A Família Bignoniaceae Juss. (Ipês) No Município De Lavras, Minas Gerais. Cerne. v. 16, n. 4, p. 517-529, 2010.

DEPARTAMENTO NACIONAL DE METEOROLOGIA - DNM. Normais climatológicas (1961 - 1990). Brasília. p. 84 p., 1992.

ENDRESS, M.E. Apocynaceae and Asclepiadaceae: united they stand. Haseltonia, The Hague. v. 8, p. 2-9, 2001.

ENDRESS, M. E.; BRUYNS, P. V. A revised classification of the Apocynaceae s.l. The Botanical Review. v. 66, n. 1, p. 1-56, 2000.

ENDRESS, M.E.; LIEDE-SCHUMANN, S.; MEVE, U. Advances in Apocynaceae: the enlightenment, an introduction. Annals of the Missouri Botanical Garden, Saint Louis, v. 94, n. 2, p. 259-267, 2007.

ENDRESS, M.E.; LIEDE-SCHUMANN, S.; MEVE, U. An updated classification for Apocynaceae. Phytoaxa. v. 159, n. 3, p. 175-194, 2014.

FERREIRA, F.M.; FORZZA, R.C. Florística e caracterização da vegetação da Toca dos Urubus, Baependi, Minas Gerais, Brasil. Biota Neotrop. v. 9, n. 4, p. 42-56, 2009.

JUDD, W.S.; CAMPEBELL, C.S.; KELLONGG, E.A.; STEVENS, P.F. & DONOGHUE, M.J. Tradução: André Olmos Simões; Rodrigo B. Singer;Rosana Farias Singer; Tatiana Teixeira de Souza Chies. Sistemática Vegetal – Um Enfoque Filogenético. Artmed. p. 612, 2009.

HENRICKSON. J. Studies *in Macrosiphonia* (Apocynaceae): generic recognition of *Telosiphonia.* Aliso. v.14, n.3, p. 179-195, 1996.

HOLMGREN, P.K.; HOLMGREN, N.H. Index herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Disponível em: <http://sweetgum. nybg.org/ih/>. 2009.

MOROKAWA, R.; SIMÕES, A. O.; KINOSHITA, L. S. Apocynaceae s. str. do Parque Nacional da Serra da Canastra, Minas Gerais, Brasil. Rodriguésia. v. 64, n. 1, p. 179-199, 2013.

MATOZINHOS, C.N.; KONNO, T.U.P. Diversidade taxonômica de Apocynaceae na Serra Negra, MG, Brasil. Hoehnea. v. 38, n. 4, p. 569-595, 2011.

MATOZINHOS, C.N.; KONNO, T.U.P. Apocynaceae s.vl. na Reserva Biológica da Represa do Grama, Descoberto, Minas Gerais, Brasil. Rodriguésia. v. 59, p. 87–98, 2008.

MONGUILHOTT, L.; MELLO-SILVA, R. Apocynaceae do Parque Estadual de Ibitipoca, Minas Gerais. Boletim Botânico da Universidade de São Paulo. v. 26, n. 2, p. 93-130, 2008.

OLIVEIRA-FILHO, A.T.; ALMEIDA, R.J.; MELLO, J.M.; GAVILANES, M.L. Estrutura fitossociológica e variáveis ambientais em um trecho da mata ciliar do córrego dos Vilas Boas, Reserva Biológica do Poço Bonito, Lavras (MG). Revista Brasileira de Botânica. v. 17, n. 67-85, 1994.

PICHON, M. Classification des Apocynaceae Mandevilla. Bulletin du Muséum national d'histoire naturelle. v. 20, n. 1, p. 101-108, 1950.

QUEIROZ, R.; SOUZA, A.G.; SANTANA, P.; ANTUNES, F.Z.; FONTES, M. Zoneamento Agroclimático do Estado de Minas Gerais. Viçosa: UFV. p.114, 1980.

RAPINI, A. Taxonomy "under construction": advances in the systematics of Apocynaceae, with emphasis on

the Brazilian Asclepiadoideae. Rodriguésia. v. 63, n. 1, p. 75-88, 2012.

SALES, M.F. Estudos taxonômicos de *Mandevilla* Lindley subgênero *Mandevilla* (Apocynaceae) no Brasil. Tese de doutorado. Universidade Estadual de Campinas. Campinas. p. 145, 1993.

SENNBLAD, B.; ENDRESS, M.E.; BREMER, B. Morphology and molecular data in phylogenetic fraternity: the tribe Wrightieae (Apocynaceae) revisited. American Journal of Botany. v. 85, p. 1143-1158, 1998.

SIMÕES, A.O.; KINOSHITA, L.S. The Apocynaceae s.str. of the Carrancas region, Minas Gerais, Brazil. Darwiniana. v. 40, p. 127–169, 2002.

SIMÕES, A.O.; ENDRESS, M.E.; VAN DER NIET, T.; KINOSHITA, L.S.; CONTI, E. Tribal and intergeneric relationships of Mesechiteae (Apocynaceae, Apocynoideae): Evidencefrom three noncoding plastid DNA regions and morphology. American Journal of Botany. v. 91, p. 1409–1418, 2004.

SIMÕES, A.O.; CASTRO, M. de M.; KINOSHITA, L.S. Calycine colleters of seven species of Apocynaceae (Apocynoideae) from Brazil. Botanical Journal of the Linnean Society. v. 152, n. 3, p. 387-398, 2006.

SIMÕES, A.O.; KINOSHITA, L.S. & ENDRESS, M.E. New combinations and synonyms in *Mandevilla* Lindley (Apocynaceae). Novon. v. 17, n. 1, p. 87-90, 2007.

SOUZA, V., LORENZI, H. Botânica Sistemática: guia ilustrado para identificação das famílias de Fanerógamas nativas e exóticas no Brasil, baseado em APG III. 3. Ed. Nova Odessa: Instituto Plantarum. p. 830, 2012.

WOODSON, J.E.Jr. Studies in the Apocynaceae V. The American Genera of Echitoideae. Annals of the Missouri Botanical Carden. v. 20, n. 1, p. 605-790, 1993.

ZARUCCHI, J.L. Quiotania: A new genus of Apocynaceae–Apocynoideae from Northern Colombia. Novon. v. 1, p. 33–36, 1991.