

Universidade Federal de Minas Gerais
Instituto de Ciências Biológicas
Departamento de Botânica

Final Report

Systematics and taxonomy of
***Solanum* section *Extensum* D`Arcy**
(Solanaceae)

Principal Investigator: Leandro Lacerda Giacomini

Belo Horizonte, May 10th 2015

1. Financial Report

The total amount awarded by IAPT in 2013 was fully used to support the planned activities: visiting four U.S. herbaria, that are most representative for the study group. The trips to F, MO, NY and US herbaria (acronyms from *Index Herbariorum*, <http://sweetgum.nybg.org/ih/>) were all made in April and May 2013, during the period that I was based at the University of Utah, in Salt Lake City, UT, as a visiting researcher; this significantly reduced the costs.

The trip expenses that could be covered with the grant are listed below, in Table 1.

Table 1: Expenses covered with the awarded IAPT grant in 2013.

Item description	Date	Amount
Hostel stay in Chicago, IL	22nd to 26th April 2013	U\$ 334.08
Apartment rental in Saint Louis, MO	5th to 17th May 2013	U\$ 195.00
Hostel stay in Washington, DC	18th to 22nd May 2013	U\$ 509.90
	TOTAL	U\$ 1038.98

The booking confirmations and/or receipts of the listed expenses are presented in the Appendix.

2. Technical and Scientific Report

Solanum L. is one of the most diverse genera of vascular plants, with between 1250 and 1700 species (Nee 1999). The complexity of its taxonomy and impossibility of studying it in its totality led researchers to propose several infrageneric classification systems, that have been re-examined and replaced along the years. Currently, the comprehensive molecular phylogenetic studies of Weese & Bohs (2007) and Särkinen et al (2013) proposes 12 to 15 major lineages within it. One of these lineages is the Brevantherum clade, an exclusively New World group, characterized mainly by the lack of prickles and presence of stellate hairs in the majority of its almost 100 species (Giacomin 2015). The clade includes six sections traditionally accepted in past classification systems, most of which do not have well established limits.

Considering this scenario, a revision of the sectional limits was proposed as part of my PhD dissertation (concluded in February 2015), and a comprehensive molecular phylogenetic framework would be the first and most important step towards it. Nevertheless, even using a three plastid and nuclear gene dataset (summarizing almost 5 kb) with a robust sampling, we could not gather satisfactory data to sustain a formal sectional revision (Giacomin 2015).

During the course of the project development, we realized therefore that a greater and more important achievement prior to the completion of the systematic treatment proposed to members of *Solanum* sect. *Extensum* D'Arcy, was a better understanding of the species limits of whole *Brevantherum* clade, where sect. *Extensum* is included (Weese and Bohs 2007). We therefore assumed that a synopsis of the species of the clade should be achieved to support a complete revision of the clade instead, considering the still weak sectional delimitations of *Brevantherum*, even with a comprehensive molecular phylogenetic work available (Giacomin 2015). We then pursued this goal and this report will mainly treat of these results.

As proposed in the IAPT grant application, besides other European and Central and South American herbaria, four of the U.S. collections should be visited (F, MO, NY and US), as they hold a significant amount of types of the *Brevantherum* clade species and are representative for the Neotropics. The visits to these collections were made in April and May 2013 and greatly helped in the completion of the synopsis as a considerable amount of material could be studied (Table 2).

Some of the examined material were chosen as lectotypes of the listed species and an example is shown in Figure 1.

Table 2: North American herbaria visited during the revisionary work of *Solanum* clade *Brevantherum* (sensu Giacomin 2015), with the estimated of specimens examined per collection.

Herbarium visited	Location	Date	Estimated specimens examined
F	Chicago, IL	22nd to 26 de Abril de 2013	960
MO	Saint Louis, MO	6 a 17 de Maio de 2013	930
US	Washington, DC	20 a 22 de Maio de 2013	510
NY	New York, NY	24 a 31 de Maio de 2013	740
TOTAL			3140

As the main results of the synopsis, we list 102 species, of which eight are new to science and one is a later homonym that needs a new name. This represents a considerable increase in the number of accepted species by other authors [e.g. Bohs (2005) listed ca. 60 species].

The complete synopsis of the clade composed the third chapter of my PhD dissertation, and will be presented in full below. A full revision of the *Brevantherum* clade is under construction and together with the new species descriptions should be finished soon.



Figure 1: Specimen chosen as the lectotype of *Solanum cinnamomeum* Sendtn. [G. Gardner 557 (NY)].

Literature cited

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- Särkinen T, Olmstead RG, Bohs L, Knapp S (2013) A phylogenetic framework for evolutionary study of the nightshades (Solanaceae): a dated 1000-tip tree. BMC Evolutionary Biology 13: 214. doi: 10.1186/1471-2148-13-214
- Giacomin LL (2015) *Solanum* L. clado Brevantherum (Solanaceae): Sistemática e Diversidade. Ph.D. Dissertation, Universidade Federal de Minas Gerais, Brazil.
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UNIVERSIDADE FEDERAL DE MINAS GERAIS
INSTITUTO DE CIÊNCIAS BIOLÓGICAS

Departamento de Botânica

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UFMG

LEANDRO LACERDA GIACOMIN

***SOLANUM* L. CLADO BREVANTHERUM (SOLANACEAE):
SISTEMÁTICA E DIVERSIDADE**

Tese apresentada ao Programa de Pós-Graduação em Biologia Vegetal do Departamento de Botânica do Instituto de Ciências Biológicas da Universidade Federal de Minas Gerais, como requisito parcial à obtenção do título de Doutor em Biologia Vegetal.

Área de Concentração: Morfologia, Sistemática e Diversidade Vegetal

Orientador: Prof. Dr. João Renato Stehmann
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BELO HORIZONTE – MG

2015

CHAPTER 3

Synopsis of the Brevantherum clade of *Solanum* (Solanaceae)

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Synopsis of the *Brevantherum* clade of *Solanum* (Solanaceae)

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Abstract

The understanding of the complex taxonomy of hyperdiverse genus *Solanum* had a huge advance recently and monographs of several groups are getting to completion. The groups still lacking comprehensive studies are among the most diverse and poorly understood ones. One of this is the *Brevantherum* clade. In this study a synoptic survey of species and names within the *Brevantherum* clade is presented to support a future revision. We list 93 accepted species within it, with the pertaining synonymy, and point out 8 putative new species, besides a later homonym that needs a designation of a new name, summarizing 102 taxa. Of these 68 are known to occur in Brazil, making of it the country that contains the higher number of species of the clade. Twenty two lectotypes for accepted species are designated and comments are given when pertinent. Notes on distribution are also provided.

Resumo

O entendimento da complexa taxonomia do hiperdiversificado gênero *Solanum* teve um grande avanço recentemente, e monografias de diversos grupos tem sido concretizadas. Os grupos que ainda demandam estudos abrangentes estão entre os mais diversos e pouco entendidos. Um destes é o clado Brevantherum. Neste trabalho é apresentada uma sinopse das espécies e nomes pertencentes ao clado Brevantherum, no intuito de prover dados para uma futura revisão. São listadas 93 espécies aceitas para o clado, e a sinonímia associada a cada uma, além de 8 espécies citadas como não descritas, e um homônimo posterior que necessita da designação de um novo nome, perfazendo 102 taxa. Das espécies listadas, 68 ocorrem no Brasil, fazendo do país o mais diverso em espécies do clado. Vinte e dois lectótipos são designados para espécies aceitas e comentários são fornecidos quando pertinente. Notas sobre a distribuição das espécies também são apresentadas.

Key words

New World, trichomes, taxonomy, synonymy, Atlantic Forest

Introduction

With an estimate species number ranging from 1200 to 1400 (Weese and Bohs 2007, Särkinen et al 2013a), *Solanum* (Solanaceae) is one of the most diverse angiosperm genera (Frodin 2004). The genus has an important economic appeal, containing widely cultivated crops such as the tomato (*S. lycopersicon* L.), the potato (*S. tuberosum* L.), and the eggplant (*S. melongena* L.). Despite its economic significance, the understanding of its taxonomy is incomplete, especially due to the astonishing diversity found in tropical Andes and in the Atlantic Forest of Brazil, its two main diversity centers (D'Arcy 1991, Knapp 2002b). As an example, recent checklists for the genus in Brazil (Stehmann et al. 2014) and Peru (Särkinen et al., in prep.) list 271 and 275 species each, respectively. Furthermore, several species have recently been described from both Peru and Brazil, highlighting that much diversity remain to be discovered (e.g. Giacomini et al. 2013, Giacomini and Stehmann 2014, Knapp 2010, Knapp and Nee 2009, Särkinen et al. 2013b, Tepe and Bohs 2009 among several others).

Recent efforts towards a better understanding of *Solanum* systematics using molecular data, identified at least 12 – 15 main clades within it (e.g. Bohs 2005, Weese and Bohs 2007, Särkinen et al. 2013a), allowing focused taxonomic studies within each of these clades. Of the clades firstly recognized in Bohs (2005) several have been focus of taxonomic studies. In Table 1 a status of the taxonomic knowledge within clades recognized by Bohs (2005) is shown, organized in two main inclusive clades (Särkinen et al. 2013a) that are sister to the *Thelopodium* species group and, some of the monographs existent for the clades are listed. Most groups of *Solanum* listed have been revised recently, and steps towards a complete monograph of the genus are being taken. Notably, some of the most diverse groups and that have a complex taxonomy were the last left to be done (e.g. Morelloids and *Leptostemonum*). Also, among the groups that still lack a complete revision is the *Brevantherum* clade. The *Brevantherum* clade of *Solanum* comprises mainly neotropical species and its diversity has been underestimated in some recent systems such as in Bohs (2005), Nee (1999) and Hunziker (2001), which cited about 60 species to the clade. Most recent studies indicate that the expected diversity within the *Brevantherum* clade could be 60% higher (L.L. Giacomini, unpub. data).

Historically, *Brevantherum* Seithe was established as a section (Seithe 1962) within subgenus *Stellatipilum* Seithe, later being elevated to the subgeneric level by D'Arcy (1972), which

considered *Stellatipilum* as a non-natural group. By D'Arcy (1972) time, five sections were associated to subgen. *Brevantherum* (Seithe) D'Arcy: *Brevantherum*, *Extensum* D'Arcy, *Holophylla* (G. Don) Walp., *Lepidotum* Seithe and *Pseudocapsicum* Bitter. Later on, sections *Cernuum* Carvalho & Shep. (Carvalho and Shepherd 1991) and *Stellatigeminatum* Child (Child 1998) were described as part of subgen. *Brevantherum*, the latter being supposedly segregated from *Extensum*. Nevertheless, posterior studies showed evidence that section *Pseudocapsicum* was part of sect. *Geminata* (G. Don) Walp. (Knapp 2002a) and the larger section *Holophylla* has shown to be a non-monophyletic group, with members associated to several other sections (Bohs, 2005). As established by Bohs (2005) the so called *Brevantherum* clade comprised, in two main lineages, the small and delicate herbs and shrubs belonging to sect. *Gonatotrichum* Bitter as well as more robust shrubs and trees from the five other formal established sections, all bearing stellate and lepidote trichomes. More recently, a group of shrubs endemic to central-eastern Brazil, the *Solanum inornatum* species group, was also resolved within the clade as a third main lineage, sister to *Gonatotrichum* together with all other species [Giacomin and Stehmann 2014, Giacomin et al. in prep. (Chapter 1 of this dissertation)]. As understood in here therefore, the *Brevantherum* clade is composed by these three main subclades: sect. *Gonatotrichum*, the *Inornatum* group and a third subclade that comprises all species with stellate and lepidote trichomes (except for *S. lignescens* Fernald), hereafter called *Stellate* subclade [Giacomin et al. in prep. (Chapter 2 of this dissertation)].

A few monographs have been written to infraspecific groups within the *Brevantherum* clade, but no monographic treatment to the entire large clade exist thus far (Table 1). Of the taxonomic works available, Roe's treatments (1967, 1972) were the first completed, comprising mostly species that belong to sect. *Brevantherum*, and treating a total of 27 species. More recently Carvalho (1996) treated sections *Cernuum* and *Lepidotum* considering nine species in each. Although this two works were a considerable advance in the taxonomy of the *Brevantherum* clade they cannot be considered to be up to date. Since Roe's and Carvalho's treatments a huge amount of specimens became available, and some new species were described (Knapp 2010, Nee 1991, 2000). Furthermore, Carvalho (1996) do not designate lectotypes to all the accepted species. More recently, section *Gonatotrichum* was revised (Stern et al. 2013) and eight species were treated within it. The *Inornatum* group is under study, as some species were recently described (Giacomin and Stehmann 2014) and a comprehensive treatment of its six species is to be completed soon [Giacomin et al. in prep. (Chapter 1 of this dissertation)].

Considering that ca. 100 species are expected to be part of the clade (L.L. Giacomini unpub. data), and no more than half of these species have been treated in available revisions, this paper aims to provide initial data to support a complete revision of the *Brevantherum* clade. A synopsis of the accepted species as part of the clade is presented, with the pertaining synonymy. Some lectotypes are designated, and notes on distribution and morphology of the species are also given, when pertinent. A complete monograph of the species of the *Brevantherum* clade is to be accomplished in the next years.

Materials and Methods

The treatment presented here was made after revising the following herbaria (acronyms from *Index Herbariorum*, <http://sweetgum.nybg.org/ih/>): ALCB, BHCB, BM, BR, CEPEC, CESJ, EAC, ESA, F, FURB, G, GFJP, GUA, HRCB, HST, HUEFS, IAC, IAN, IPA, INPA, K, LPB, M, MBM, MBML, MEXU, MG, MO, NY, P, PAMG, PEUFR, R, RB, SP, SPF, SPSF, UEC, UFP, US, USM, USZ, VIC, W and WU. Additional type material, that were not present in the visited herbaria was analyzed, when possible, through digitized images that are available in Jstor Global Plants (<https://plants.jstor.org/>), in each of the cited Institutions website, or were kindly provided by staff and curators of the cited collections, and are noted with the word “image” after each specimen. Barcodes of type specimens, when present, are noted after a dash after the herbarium citation. Analyzed material is followed by an exclamation mark (!).

We accept the limits defined for the *Brevantherum* clade in Giacomini et al. (in prep.; Chap. 1 of this dissertation), which are based on molecular data. As morphological synapomorphies for the clade are not well defined, and for practical reasons, the synopsis is organized observing the tree main subclades cited above and established in Giacomini et al. (in prep.; Chap. 1 of this dissertation), which are sect. *Gonatotrichum*, the *S. inornatum* species group and the Stellate subclade. The two first were defined morphologically in Stern et al. (2013) and Giacomini et al. (in prep.; Chap. 1 of this dissertation), and the Stellate subclade comprises all species in *Solanum* that contain this set of characters: the lack of prickles and explosive dehiscent fruits, and presence of stellate or lepidote trichomes. Within these subclades, species are cited alphabetically. Lectotypes are designated for names of accepted species.

We have followed the morphological species concept, where taxa is recognized as distinct by possessing a unique suite of characters and separated by morphological gaps, from related entities (Mallet, 1995). Lectotypifications and nomenclatural changes proposed are all in accordance with the International Code of Nomenclature for algae, fungi, and plants (McNeill et al. 2012). The trichome morphology, when further discussed, follows the definitions of Roe (1971). Considered names above species but in supra and infrageneric ranks are only listed when the type corresponds to a species belonging to the *Brevantherum* clade, and only in this cases infrageneric synonyms *pro parte* are cited. These names are organized chronologically. For the distribution notes, abbreviations for states, departments, or provinces used follows each country official system.

Taxonomic treatment

***Solanum* L., Sp. pl. 184. 1753.**

Lectotype species designated by Henderson (1974): *Solanum nigrum* L. [For generic synonymy of *Solanum* see D’Arcy (1972) and Knapp (2013)].

The Brevantherum clade sensu Giacomini et al. (in prep. Chap. 1 of this dissertation)

Cliocarpus Miers, Ann. & Mag. Nat. Hist. 11(4): 141. 1849. Type species: *Cliocarpus gardneri* Miers (= *S. didymum* Dunal).

Solanum grad. ambig. *Lepidota* Dunal, in DC., Prodr. 13(1): 29, 131. 1852. Type species: *Solanum lepidotum* Dunal.

Solanum subsection *Asterochlaena* Lowe, Man. Fl. Madeira 2(1): 80. 1868. Type species: *Solanum auriculatum* Ait. (= *S. mauritanium* Scop.).

Solanum section *Gonatotrichum* Bitter, Repert. Spec. Nov. Regni Veg. 11: 230. 1912. Type species: *Solanum gonatotrichum* Bitter (= *S. turneroides* Chodat).

Solanum series *Durigibbosa* Bitter, Rep. Spec. Nov. Regni Veg. 16: 79. 1920. Lectotype species, designated by D’Arcy 1972: *Solanum cladotrichum* Vand. ex Dunal.

Solanum section *Brevantherum* Seithe, Bot. Jahrb. 81: 297. 1962. Type species: *Solanum verbascifolium* L. sensu Seithe (= *S. erianthum* D. Don).

Solanum section *Lepidotum* Seithe, Bot. Jahrb. 81: 298. 1962. Type species: *Solanum lepidotum* Dunal; superfluous lectotype designated by Seithe 1962: *Solanum swartzianum* Roem. & Schult.

Solanum subgen. *Brevantherum* (Seithe) D'Arcy, Ann. Missouri Bot. Gard. 59: 267. 1972. Type species: *Solanum verbascifolium* L. sensu Seithe (= *S. erianthum* D. Don).

Solanum sect. *Extensum* D'Arcy, Ann. Missouri Bot. Gard. 59: 268. 1972. Type species: *Solanum extensum* Bitter (= *S. cordovense* Sessé & Moc.).

Solanum sect. *Cernuum* Carvalho & Shep., Solanaceae III: Taxonomy, Chemistry, Evolution [Hawkes JG, Lester RN, Nee M, Estrada N (eds.)]: 269. 1991. Type species: *Solanum cernuum* Vell.

Solanum subsect. *Vellozianum* Carvalho & Shep., Solanaceae III: Taxonomy, Chemistry, Evolution [Hawkes JG, Lester RN, Nee M, Estrada N (eds.)]: 270. 1991. Type species: *Solanum vellozianum* Dunal

Solanum sect. *Stellatigeminatum* Child, Feddes Repert. 109: 412. 1998. Type species: *Solanum schlechtendalianum* Walp.

Solanum subsect. *Cliocarpus* (Miers) Child, Feddes Repert. 109: 413. 1998. Type species: *Solanum megalochiton* Mart. (= *S. didymum* Dunal)

Key to the subclades of *Brevantherum*

- 1 Fruits watery, explosively dehiscent; herbs to shrubs; inflorescences sessile or with minute peduncles, < 2 mm.....sect. *Gonatotrichum*
- Fruits not notably watery, not explosively dehiscent; shrubs to trees; inflorescences sessile to long pedunculate.....2
- 2 Plants presenting unbranched, simple trichomes only; fruits few-seeded, 4-10 seeds *S. inornatum* group
- Plants presenting stellate or lepidote trichomes on the stems or leaves; fruits few to many seeded (normally more than 10)..... Stellate subclade

Species Enumeration

Sect. Gonatotrichum Bitter

1. *Solanum adscendens* Sendtn., In Mart., Fl. Bras. 10: 17. 1846.

Solanum amarantoides Dunal var. *hirtellum* Dunal, in DC., Prodr. 13 (1): 56. 1852.

Type. BRAZIL. "Brasilia australiore," *F. Sellow s.n.* (lectotype, designated by Stern et al. 2013, pg. 476: P-P00319345!; isolectotype: B (destroyed), photos of isolectotype [F neg. 2798]: F!, G!, GH!).

Distribution. Northern Argentina and southern Brazil (Rio Grande do Sul).

2. *Solanum deflexum* Grennm. Proc. Amer. Acad. Arts 32: 301. 1897.

Bassovia setosa Brandegee, Univ. Cal. Publ. Bot. 6: 373. 1917.

Solanum setosum (Brandegee) Bitter, Repert. Spec. Nov. Regni Veg. 18: 307. 1922.

Salpichroa wrightii A. Gray, Syn. Fl. of N. Amer., ed. 2(1). 1: 231. 1886.

Type. MEXICO. Oaxaca: Cuicatlán, 15 Jul 1895, *L.C. Smith 403* (lectotype, designated by Stern et al. 2013, pg. 479: GH-GH00295516; possible isolectotype: MEXU-00540158!).

Distribution. From southern U.S.A. (Arizona) to Costa Rica.

3. *Solanum evolvuloides* Giacomini & Stehmann, PhytoKeys 7: 1–9. 2011.

Type. BRAZIL. Bahia: Mun. Jequié, Distrito de Cachoeirinhas, caatinga arbustiva em topo de morro, com lajeados graníticos, 299 m, 13°54'14.4"S, 40°01'46.8"W, 10 Jul 2009, *L.L. Giacomini & L. Echternacht 974* (holotype: BHCBI; isotypes, BM!, MBM!, NY!, RB!).

Distribution. Endemic to northeastern Brazil (BA).

4. *Solanum hoffmansegii* Sendtn., In Mart., Fl. Bras. 10: 112. 1846.

Type. BRAZIL. “In provincia Paraensi a Siber lectum comunicavit Com. de Hoffmansegg,” *F.W. Sieber* [as Siber] s.n. (lectotype, designated by Stern et al. 2013, pg. 483: BR-BR000000699204!; isolectotype: M-M0090348!).

Distribution. Central-western and northern Brazil (PA and TO).

5. *Solanum lignescens* Fernald, Proc. Amer. Acad. Arts 33: 91. 1897.

Solanum roei Ugent & Iltis, Phytologia 40: 379. 1978.

Type. MEXICO. Guerrero: Acapulco, Nov 1894, *E. Palmer 216* (lectotype, designated by Stern et al. 2013, pg. 486: US-259574!; isolectotypes: F-66593!, GH-GH00077503, MO-3378770!, K!, NY-NY00139001!).

Distribution. South-western Mexico through Nicaragua.

6. *Solanum manabiense* Stern., J. Bot. Res. Inst. Texas 3(2): 504. 2009.

Type. ECUADOR. Manabí: Pacoche Reserve, road from Manta to San Lorenzo, 2 km W of El Aromo, 01°04'09.5''S, 80°52'03.2''W, 350 m, 8 Feb 2009, *S. Stern & E.J. Tepe 377* (holotype: QCNE; isotypes: BM, F, QCA, MO-6262688!, NY, UT!).

Distribution. Coastal Ecuador.

7. *Solanum olympicum* Hassl. Repert. Spec. Nov. Regni Veg. 9: 116. 1911.

Solanum parcistrigosum Bitter, Repert. Spec. Nov. Regni Veg. 12: 75. 1913.

Type. PARAGUAY. Alto Paraguay: Olimpo Berg [Fuerte Olimpo], Dec 1907, *K. Fiebrig 1392* (holotype: G-G00357994!).

Distribution. Northwestern Argentina, Bolivia, central-western and eastern Brazil (BA, GO, MS) and Paraguay.

8. *Solanum turneroides* Chodat. Bull. Herb. Boissier sér. 2, 2: 814. 1902.

Solanum gonatotrichum Bitter, Repert. Spec. Nov. Regni Veg. 11: 230. 1912.

Solanum geniculatistrigosum Bitter, Repert. Spec. Nov. Regni Veg. 11: 232. 1912.

Solanum flavistrigosum Bitter, Repert. Spec. Nov. Regni Veg. 12: 74. 1913.

Type. PARAGUAY. In campis arenosis pr. fl. Capibary, 5 Sep 1898–1899, *E. Hassler 4396* (lectotype, designated by Stern et al. 2013, pg. 492: G-G00076272!; isolectotypes BM-BM000074102, NY-NY00172221!, UC-944864).

Distribution. Eastern Bolivia, Brazil (MS) and Paraguay. In Stern et al. (2013; Fig. 5) a point was erroneously assigned to the state of Rondônia in Brazil.

The Solanum inornatum species group

9. *Solanum bradei* Giacomini & Stehmann, Phytokeys 38: 71. 2014.

Type. BRAZIL, Rio de Janeiro: Mun. Itatiaia. Parque Nacional do Itatiaia, continuação da BR após posto de vigilância, margens da estrada próximo a casa, 1171 m, 22°26'11.15''S, 44°37'27.55''W, 3 Nov 2008, *L.L. Giacomini, L.H.Y. Kamino & T.E. Almeida 359* (holotype: BHCB!-BHCB-012523; isotypes: BM!, NY!, RB!).

Distribution. Southeastern Brazil (MG, SP and RJ).

10. *Solanum espiritosantense* Giacomini sp. nov. ined.

Type. BRAZIL, Espírito Santo: Mun. Ibitirama, Parque Nacional do Caparaó, trilha saindo do Tecnotruta, que leva ao córrego do Calçado, 20°28'04''S, 41°44'00''W, 1113 m, 9 Feb 2011, *L.L. Giacomini, T.M. Machado & F.S. Souza 1243* (holotype: BHCB!; isotypes NY!, RB!).

Distribution. Endemic to southeastern Brazil (ES).

11. *Solanum friburgense* Giacomini & Stehmann, Phytokeys 38: 78. 2014.

Type. BRAZIL. Rio de Janeiro: Mun. Nova Friburgo. Reserva Ecológica de Macaé de Cima, trilha para o Vale dos xaxins. 27 Oct 1990, *A. Amorim, B.C. Kurtz & L. Sylvestre 276* (holotype: RB-00413518!; isotypes: BHCB!, MO!)

Distribution. Endemic to southeastern Brazil (RJ).

12. *Solanum inornatum* Witasek, Denkschr. Akad. Wiss Wien 79: 342. 1910.

Type. BRAZIL, Prov. São Paulo, “In Silvis Prope Alto da Serra”, 900 m.s.m., May 1901, *R. Wettstein & V. Schiffner s.n.* (lectotype designated in Giacomini et al. in prep.: WU-0041526!).

Distribution. Endemic to southeastern Brazil (SP).

13. *Solanum kriegei* Giacomini & Stehmann, *Phytokeys* 38: 81. 2014.

Type. BRAZIL. Minas Gerais: Parque Estadual da Serra do Ibitipoca, Proximidades da Lombada, 1650 m, 21°41'S, 43°53'W, 20 Jan 2005, *R.C. Forzza, L.C. Assis, L.M. Bezerra, M.F. Calió & L.G. Temponi* 3959 (holotype: RB!; isotypes: BHCB!, BM!)

Distribution. Endemic to southeastern Brazil (MG).

14. *Solanum refractifolium* Sendtn. In Mart., *Fl. Bras.* 10: 31. 1846.

Cyphomandra itabirensis Dunal, in DC., *Prodr.* 13 (1): 400. 1852.

Type. BRAZIL. *F. Sellow s.n.* [holotype: B (destroyed); lectotype, designated by Giacomini et al. in prep.: P-P00370180!; isolectotype: F-621165!].

Distribution. Central-western and southeastern Brazil (GO and MG).

The Stellate subclade

15. *Solanum abutiloides* (Griseb.) Bitter & Lillo, *Repert. Spec. Nov. Regni Veg.* 12: 136. 1913.

Cyphomandra abutiloides Griseb. *Abh. Königl. Ges. Wiss. Göttingen* 24: 249. 1879.

Solanum hibiscifolium Rusby, *Mem. Torrey Bot. Club* 6: 88. 1896.

Type. ARGENTINA. Jujuy: Prope urbem Jujuy, *P.G. Lorentz & G. Hieronymus* 995 (lectotype, designated by Morton 1976, pg. 157: CORD-00006108! image; isolectotypes: G 00343374!, GOET 003470! image, GOET 003471! image, GOET 003469! image).

Distribution. Central-southern Bolivia and north-west of Argentina.

16. *Solanum anisocladum* Giacomini & Stehmann, *J. Bot. Res. Inst. Texas* 7(1): 97. 2013.

Type. BRAZIL. Pernambuco: Mun. Jaqueira, RPPN Frei Caneca, Serra do Urubu, trilha da Mata da Caranha, topo da serra, 08°42'52.5"S, 35°50'54"W, 700 m, 31 Mar 2012, *L.L. Giacomini et al.* 1794 (holotype: BHCB-BHCB002730!; isotypes: NY!, RB!, UFP!, UT!).

Distribution. Northeastern Brazil (AL, BA, PE and SE).

17. *Solanum appressum* Roe, *Brittonia* 24: 263. 1972.

Type. PERU. Junin: Tarma, edge of forest remnant, behind Hotel Turistas at San Ramon, on E side of Rio Tullumayo, 860 m, 1 Dec 1962, *H. H. & C. Iltis* 296 (holotype: WIS-0220422!; isotypes: K!, US!, WIS!).

Distribution. Amazonian Brazil (AC and AM), Bolivia, Colombia, Ecuador and Peru.

18. *Solanum argenteum* Dunal, in Poir., Encycl., Suppl. 3: 755. 1814.

Solanum argenteum Dunal var. *angustifolium* Sendtn., in Mart., Fl. Bras. 10: 30. 1846.

Solanum argenteum Dunal var. *luridum* Sendtn., in Mart., Fl. Bras. 10: 30. 1846.

Solanum argenteum Dunal var. *parvifolium* Dunal, in DC., Prodr. 13(1): 137. 1852.

Type. BRAZIL. Rio de Janeiro, *J. Dombey s.n.* (P-P00319916!).

Distribution. Central-western, southeastern and southern Brazil (ES, GO, MG, PR, RJ and SP).

19. *Solanum armentalis* J.L. Gentry & D'Arcy, Ann. Missouri Bot. Gard. 64: 376. 1978. [1977]

Type. COSTA RICA. Puntarenas: open forest 1 mile due south of San Vito de Java, ca. 3500 ft, 18 Aug 1967, *P.H. Raven 21887* (holotype: MO-5306038!; isotypes: F!)

Distribution. Endemic to Costa Rica (Puntarenas and San José), close to the Pacific coast.

20. *Solanum asperum* Rich., Act. Soc. Hist. Nat. Paris 1: 107. 1792.

Solanum asperum var. *angustifolium* Sendtn. in Mart. Fl. Bras. 10: 40. 1846.

Solanum callicarpifolium Kunth & Bouché var. *asperum* (Vahl) M. Gomez, Anal. Hist. Nat. Madrid 23: 268. 1894.

Solanum callicarpifolium Kunth & Bouché var. *radula* (Vahl) M. Gomez, Anal. Hist. Nat. Madrid 23: 268. 1894.

Solanum salvifolium Lam., Tabl. Encycl. Meth. 2: 14. 1793.

Solanum radula Vahl, Ecologiae Amer. 2: 16. 1798.

Type. FRENCH GUYANA. Cayenne, *J.B. Leblond s.n.* (lectotype, designated by Roe 1967, pg. 372: P-P00324016!)

Distribution. Widespread in Central and South America; Belize, Brazil, Bolivia, Colombia, Guyana, French Guyana, Mexico, Panama, Suriname, Trinidad and Tobago, Venezuela,

21. *Solanum atitlanum* Roe, Brittonia 19: 364. 1967.

Type. GUATEMALA. Solola, 3 km E of Panajachel on highway 1, 1860 m, 1 Aug 1965, *K. Roe, E. Roe & S. Mori 773* (holotype: WIS-0220424!; isotypes: BM!, ENCB, F!, US!, WIS!)

Distribution. Guatemala, Honduras and Nicaragua.

22. *Solanum axillifolium* Roe, Brittonia 19: 363. 1967.

Type. MEXICO. Oaxaca: just south of Cacahuatpec at km 232 on road to Pinotepa Nacional, ca. 500 m, 22 Jul 1965, *K. Roe, E. Roe & S. Mori 492* (holotype: WIS-0220426!; isotypes: ENCB, F!, US! G!).

Distribution. Southwestern Mexico and Guatemala.

23. *Solanum bicolor* Willd. ex. Roem. & Schult., Syst. Veg. 4: 661. 1819.

S. callicarpifolium Kunth & Bouché, Ind. Sem. Hort. Berol. App. 10. 1853.

Type. VENEZUELA. Sucre: Cumana, *A.J.A. Bonpland & F.W.H.A. von Humboldt 127* (holotype: B-W04310-010! image).

Distribution. Brazil, Colombia, Guyana, Porto Rico, Saint Helena, Saint Vicent, Trinidad and Tobago and Venezuela.

24. *Solanum brevipedicellatum* Roe, Brittonia 19: 361. 1967.

Type. GUATEMALA. Quezaltenango, along the Pacific escarpment 4 km N of Santa Maria Planta Eléctrica on highway 9s, ca. 2000 m, 31 Jul 1965, *K. Roe, E. Roe & S. Mori 741* (holotype: WIS-0220427!; isotypes: BM!, CAS, DS, ENCB, MICH, NY!, US!, WIS!)

Distribution. Southern Mexico and Guatemala.

25. *Solanum bullatum* Vell., Fl. Flum. 84. 1829. Icon. 2, tab. 104. 1831.

Type. BRAZIL. [Rio de Janeiro]: “silvis maritimis” (lectotype, designated in Knapp et al. in prep.: Vellozo, J.M. da C., *Flora Fluminensis Icones 2: tab. 104. 1831.*)

Distribution. Southeastern Brazil (MG, PR, SP, SC and RJ).

26. *Solanum caelicolum* Giacomini & Stehmann, J. Bot. Res. Inst. Texas 7(1): 102. 2013.

Type. BRAZIL, Espírito Santo: Colatina, Alto Moacir, Prop.: Lalau, 19°29'37"S, 40°33'08"W, 200 m, 20 Mar 2007, *V. Demuner et al. 3273* (holotype: MBML!; isotype: BHCN-BHCN002734!).

Distribution. Endemic to southeastern Brazil (ES).

Comments. Species closely related to *S. maranguapense* Bitter, although some differences are noted. If populations are found between the range extension of the two species, they might show to be a conspecific cline.

27. *Solanum capoerum* Dunal, in DC., Prodr. 13 (1): 112. 1852.

Solanum sericeum Vell., Fl. Flum. 83. 1829. Icon. 2, tab. 97. 1831, nom. illeg. non *S. sericeum* Ruiz & Pav. 1799.

Type. BRAZIL, [Rio de Janeiro]: Serra dos Orgãos, *J. Lhotsky 109* (holotype: G-G00145056!; isotypes: MO!, MPU! image).

Distribution. Endemic to southeastern Brazil (MG and RJ).

Comments. Related to *S. sellowianum* Sendtn. and *S. rufescens* Sendtn., differs from it by the densely pubescent leaves in both sides, adaxially with stalked trichomes and abaxially with the mesophyll never visible. A species for long overlooked.

28. *Solanum carautae* Carvalho, Ann. Missouri Bot. Gard. 78: 226. 1991.

Type. BRAZIL, Rio de Janeiro: Mun. Paraty, Paraty-Mirim, a beira da Estrada, 8 Dec 1976, D. Araújo, M.C. Viana, R.F. Oliveira & J.P. Carauta 1421 (holotype: GUA!; isotypes: GUA!, MO!, RB!).

Distribution. Endemic to southeastern Brazil (RJ and SP).

Comments. Putatively a giant form of *S. swartzianum* Roem. & Schult. but with distinct leaf shapes and long pedunculate inflorescences. Future genetic population studies are desirable.

29. *Solanum castaneum* Carvalho, Pesq. Bot. 46:19. 1996.

Solanum jubatum Dunal var. *gigantifolium* Dunal, in DC., Prodr. 13(1): 133. 1852.

Type. BRAZIL, Rio de Janeiro: 1831-33, C. Gaudichaud 505 (holotype: P-00325356!; isotypes: G!).

Distribution. Southeastern and southern Brazil (ES, MG, PR, SP and RJ).

30. *Solanum celsum* Standl. & C.V. Morton, Publ. Field Mus. Nat. Hist., Bot. Ser. 18(3): 1077. 1938.

Solanum chiriquinum Standl., Ann. Missouri Bot. Gard. 27: 336. 1940.

Type. COSTA RICA. San José: El General, 950 m, Jan. 1936, A.F. Skutch 2364 (holotype: US-1642351!; isotypes: A, GH!, K!, MICH, MO-1103607!, NY!).

Distribution. Costa Rica (Cordillera de Talamanca) and Northern Panamá.

Comments. Closely related to *S. lepidotum* Dunal, differs by the adaxial surface of the leaves not covered by the somewhat lepidote trichomes, which do not have the lateral rays completely. The type of *S. chiriquinum* Standley have lepidote trichomes with central rays developed, as those of *S. sellowii* Dunal, but less pronounced.

31. *Solanum cernuum* Vell., Fl. Flum. 84. 1829. Icon. 2, tab. 103. 1831.

Solanum caldense Carvalho, Ann. Missouri Bot. Gard. 78: 224-226. 1991.

Solanum oliveirae Carvalho, Ann. Missouri Bot. Gard. 78: 235-237. 1991.

Type. BRAZIL, [Rio de Janeiro]: [Rio de Janeiro]: “Habitat silvis et campis maritimis, et mediterraneis, praecipue excultis”; (lectotype, designated in Carvalho 1996, pg. 22: Vellozo, J.M. da C., Flora Fluminensis Icones 2: tab. 103. 1831.)

Distribution. Central-western, northeastern and southeastern Brazil (BA, DF, ES, GO, MG, SP and RJ)

Comments. Both *S. caldense* and *S. oliveirae* apparently constitute depauperate specimens of *S. cernuum*, being treated in here as extreme variations of the last.

32. *Solanum chiapasense* Roe, Brittonia 19: 367. 1967.

Type. MEXICO. Chiapas: 4 km SW of Las Rosas on road to Soyatitán and Venustiano Carranza, ca. 900 m, 8 Aug 1965, *K. Roe, E. Roe & S. Mori* 986 (holotype: WIS-0220431!; isotypes: CAS! image, DS, ENCB, G!, US!, WIS!)

Distribution. Southern Mexico (Chiapas and Quintana Roo) and Guatemala.

33. *Solanum cinnamomeum* Sendtn. in Mart., Fl. Bras. 10 44. 1846.

Solanum praealtum Sendtn. in Mart., Fl. Bras. 10: 44. 1846.

Type. BRAZIL. “In Brasilia Media” [*In Brasilia ad montes “Serra dos Orgaos”*], 1838, *G. Garner* 557 (lectotype, here designated: NY-00139093!; isolectotypes: BM!, E!, F!, G!, K!, NY! P!, US!, W!)

Distribution. Northwestern, southeastern and southern Brazil (BA, ES, MG, PR, RJ and SP).

Comments. Sendtner (1846) cited two types for *S. cinnamomeum*. We choose Gardner collection (557, NY) as the type, as it is deposited in several herbaria, constitute a very informative and well preserved material, and has a label supposedly signed by Gardner.

34. *Solanum cladotrichum* Vand. ex Dunal, Hist. Solan., 236. 1813.

Solanum cladotrichum Dunal var. *floccosum* (Sendtn.) Dunal in DC., Prodr. 13 (1): 119. 1852.

Solanum papillosum Sendtn. in Mart., Fl. Bras. 10: 37. 1846.

Solanum papillosum Sendtn. var. *floccosum* Sendtn. in Mart., Fl. Bras. 10: 37. 1846.

Type. BRAZIL. (attributed to description without name in Vandelli, Spec. Flor. Bras., in Script. Roem. 1788. “*S. caule inermi frutescente flexuoso, foliis ovatis, calycibus, caule, foliis, pilis ramosis adspersis; foliis pagina superiore simul tuberculatis; floribus cymosis*”; no herbarium specimens known to exist).

Distribution. Northwestern and southeastern Brazil (BA, ES, MG, RJ and SP).

Comments. Although published by Dunal in 1813, the circumscription of the species adopted here corresponds to the one presented in 1852 by Dunal. The species as four others (*S. adenotrichum* Dunal, *S. didymum* Dunal, *S. integerrimum* Dunal and *S. vellozianum* Dunal) published by Dunal in 1813, were originally based in the descriptions of Vandelli (1788), and no specimens are known to exist. Considering that a long research has already been made, ideally neotypes should be designated. But Carvalho (1996) cites an illustration as a type of *S. vellozianum* (“Icon. t. 37”, l.c.) pointing out that illustrations might exist, and should be designated as types, in the lack of specimens. Nevertheless, different versions of Dunal (1813) work were consulted in five different libraries, and all contain only 26 illustrations (Tab.1 – Tab.26). As we could not figure out what exactly Carvalho (1996) cited, we

postpone the decision to designate a neotype, until MPU herbarium is visited (Dunal's original affiliation), to seek for possibly unpublished illustrations, pertaining to these species.

35. *Solanum clathratum* Sendtn., in Mart., Fl. Bras. 10: 35. 1846.

Type. PERU. Mainas alto, Tocache, Jul 1830, *E.F. Poeppig 1891* (lectotype, here designated: W!).

Distribution. Bolivia, Brazil (AC), Ecuador and Peru.

Comments. Sendtner (1846) cites two syntypes, one from Mexico (Galeotti) and one from Peru (Poeppig). Considering that the collection from Mexico corresponds to *S. schlechtendalianum* Walp., Poeppig specimen is here designated as lectotype.

36. *Solanum concinnum* Schott ex Sendtn. in Mart., Fl. Bras. 10: 36. 1846.

Solanum diantherum Vell., Fl. Flumin. 83. 1829. Icon. 2: t. 99. 1831.

Solanum pruriens Dunal in DC., Prodr. 13 (1): 120. 1852.

Type. BRAZIL. "Brasilia australis", *F. Sellow s.n.* (lectotype, here designated: BR-836610!; isolectotypes: F!, P!, W!).

Distribution. Southeast to south of Brazil (MG, PR, RJ, RS, SC and SP).

Comments. Although an older epithet, *S. diantherum* is here listed among the synonyms, its rejection is being proposed in a separate work. The Sellow collection at BR is proposed as lectotype as it is a rich material, and duplicates are found elsewhere.

37. *Solanum conglobatum* Dunal, in DC. Prodr. 13(1): 112. 1852.

Type. BOLIVIA. "S. Crucis, Brasil," May 1845, *A. D'Orbigny 644* (holotype: P!; isotype: MPU! image).

Distribution. Boliva, Brazil (AC, MT and RO) and Peru in adjacent areas.

Comments. Specimens determined as *S. conglobatum* from lowland in Brazil (Acre and Rondônia) and Peru, might belong to a new species.

38. *Solanum cordovense* Sessé & Mociño, Fl. Mex., in La Naturaleza ser. 2, 2, Suppl. Part 5: 55. 1894.

Solanum edwardsii Standl., Trop. Woods 37: 31. 1934.

Solanum extensum Bitter, Repert. Spec. Nov. Regni Veg. 13: 94. 1914.

Solanum lundellii Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 8: 42. 1930.

Solanum luridum Pav. ex Dunal, in DC., Prodr. 13(1): 113. 1852.

Solanum perattenuatum I. M. Johnst., Sargentia 8: 265. 1949.

Solanum vernale Standl. & L.O. Williams, Ceiba 3: 218. 1953.

Type. MEXICO. "Habitat in Cordovae montibus" [México: Veracruz, Córdoba] (neotype, designated by Knapp 2008b, pg. 11: MA-604616! image; isoneotype: MA-604615! image.)

Distribution. Belize, Colombia, Costa Rica, Guatemala, Guyana, Mexico, Nicaragua, Panama, Suriname. Possibly Brazil (poor specimen available).

39. *Solanum davidsei* Carvalho, Ann. Missouri Bot. Gard. 78: 229. 1991.

Type. VENEZUELA. Bolivar: Gran Sabana, km 145 along hwy., 2 km S of La Ciudadella, 3 Dec 1973, *G. Davidse 4716* (holotype: MO!; isotype: VEN).

Distribution. Venezuela (BO).

Comments. Some minor morphological differences allow the recognition of the species, but the distance between leaves cited by Carvalho (1996) as diagnostic is highly variable and apparently not useful.

40. *Solanum didymum* Dunal, Hist. Solan. 236. 1813.

Solanum didymum Dunal var. *subglabrum* Dunal in DC., Prodr. 13 (1): 125. 1852.

Solanum didymum Dunal var. *subvirgatum* Witasek, Denkschr. Akad. Wissensch. Wien 79: 338. 1910.

Solanum didymum Dunal var. *tomentosum* Dunal in DC., Prodr. 13 (1): 125. 1852.

Solanum eriocalyx Dunal, in DC., Prodr. 13(1): 124. 1852, nom. illeg. non *S. eriocalyx* Dunal. 1813.

Solanum gemellum Mart. ex Sendtn., in Mart., Fl. Bras. 10: 28. 1846.

Solanum megalochiton Mart., Flora 21, 2, Beibl.: 63. 1838.

Solanum megalochiton Mart. var. *villosotomentosum* Dunal in DC., Prodr. 13 (1): 124. 1852.

Solanum neves-armondii Dusén, Arch. Mus. Nac. Rio de Janeiro 13: 92. 1905.

Solanum pseudomegalochiton Witasek, Denkschr. Akad. Wissensch. Wien 79: 335. 1910.

Solanum pseudomegalochiton Witasek var. *dunalii* Witasek, Denkschr. Akad. Wissensch. Wien 79: 336. 1910.

Solanum trichocalyx Dunal, in DC., Prodr. 13(1): 679. 1852.

Type. BRAZIL. (attributed to description without name in Vandelli, Spec. Flor. Bras., in Script. Roem. 1788. "Solanum caule inerme, fruticoso: foliis geminis, altero minore, ovatis, acuminatis, integerrimis, utrinque villosis: floribus axillaribus, confertis"; no herbarium specimens known to exist).

Distribution. Widespread in central to eastern and south of Brazil (BA, ES, GO, MG, PR, RJ, RS, SC, SP)

Comments. As no herbarium specimen is known to exist, the species concept is based on the original description and infraspecific taxa described by Dunal (1852). As for *S. cladotrichum*, a neotype should be designated, but this decision is postponed for the same reasons (see Comments in *S. cladotrichum* above). The synonymy of *S. megalochiton* is here presented for the first time. The species is highly variable and although some synonyms are included, its limits are narrowed, not including specimens from Northern Brazil.

41. *Solanum dillonii* S. Knapp, PhytoKeys 1: 39. 2010.

Type. PERU. Cajamarca: Prov. Celendin, on road from Celendin to Balsas, east of pass on descent to Balsas, 2002 m, 6°52'13"S, 78°30'91"W, 12 Dec 2007, *S. Stern, E. Tepe, S. Leiva & M. Zapata 119* (holotype: USM!; isotypes: BM-BM001016881!, HAO†, NY-NY00986687!, UT!).

Distribution. Southern Ecuador and central-northern Peru.

42. *Solanum disticophyllum* Sendtn. in Mart., Fl. Bras. 10: 35. 1846.

Solanum badilloi Benítez, *Ernstia* 44: 1. 1987.

Solanum distichophyllum Sendtn. var. *gracile* Sendtn., in Mart., Fl. Bras. 10: 35. 1846.

Type. BRAZIL. Rio Amazonas, *E.F. Poeppig 2613* (lectotype, here designated: P-P00578809!; islectotypes: B [destroyed, F neg!], BM!, F!, P!)

Distribution. Amazonian Brazil (AC, AM, AP, PA, RO, RR), French Guyana, Guyana, Suriname and Venezuela.

Comments. Among the two syntypes cited by Sendtner (1846), Poeppig collection is chosen as the lectotype, although poorer than Martius one (M), considering that duplicates are represented in three other herbaria.

43. *Solanum erianthum* D. Don, Prodr. Fl. Nep. 96. 1825.

Solanum erianthum var. *adulterinum* (Ham. ex G. Don) Baker & Simmonds, in Williams, *Flora Trinidad & Tobago* 2(4): 264. 1953.

Solanum eriocalyx Dunal, *Hist. Solan.* 237. 1813.

S. mauritianum Blanco, *Fl. Filip.* ed. 1, 134. 1837, nom. illeg. non *S. mauritianum* Scop. 1788.

Solanum pubescens Roxb. *Fl. Ind.* 2: 244. 1824, nom. illeg. non *S. pubescens* Willd. 1794.

Solanum racemosum Mill., *Gard. Dict.* ed. 8, no. 28. 1768, nom. illeg. non *S. racemosum* Jacq. 1760.

Solanum verbascifolium var. *adulterinum* (Ham.) G. Don, *Gen. Hist.* IV. 415. 1838.

Solanum verbascifolium var. *exstipulatum* O. Ktze. *Rev. Gen. Pl.* 2: 455. 1891.

Type. NEPAL. "in Valle Nepalia propa Kalmanda", 1821, *N. Wallich Herb. 2616c* (lectotype, designated by Roe 1967, pg. 359: K!).

Distribution. Pantropical. In the New World, from southern United States through Ecuador.

44. *Solanum goodspeedii* Roe, Brittonia 24: 272. 1972.

Type. PERU: Puno: Sandia, trail near Sagrario, 1000-1300 m, 26 May 1942, *R. D. Metcalf 30638* (holotype: UC; isotypes: A!, MO!, US!)

Distribution. Bolivia and Peru.

45. *Solanum granuloso-leprosum* Dunal in DC, Prodr. 13 (1): 115. 1852.

Solanum verbascifolium var. *auriculatum* sensu O. Ktze. *Rev. Gen. Pl.* 3: 228, 1898.

Solanum verbascifolium subf. *eueriocarpum* Hassl. Repert. Spec. Nov. Regni Veg. 15: 117.1918.

Solanum verbascifolium subf. *intermedium* Hassl. Repert. Spec. Nov. Regni Veg. 15: 117. 1918.

Solanum verbascifolium f. *eupulverulentum* sensu Hassl. Repert. Spec. Nov. Regni Veg. 15: 117.1918.

Solanum verbascifolium f. *granuloso-leprosum* (Dun.) Hassl. Repert. Spec. Nov. Regni Veg. 15:117. 1918

Type. BRAZIL. *C.P. Martius 1259* (lectotype, designated by Roe 1972, pg. 266: P!; isolectotypes: BM!, NY!).

Distribution. Argentina, Brazil (widespread, except in the north), Paraguay and Uruguay.

46. *Solanum hazenii* Britton, Bull. Torrey Bot. Club 46: 338. 1922.

S. verbascifolium var. *viridi-scabrum* Dunal in DC., Prodr. 13(1): 115. 1852.

Type. TRINIDAD AND TOBAGO. Saddle Road, Trinidad, *N.L. Britton & T.E. Hazen 156* (holotype: NY!; isotype: GH! image).

Distribution. Low lands in Central America, from Pacific coastal Mexico to Panama, and in South America in Colombia, Ecuador and Venezuela. Also in the West Indies.

47. *Solanum hirtellum* (Spreng.) Hassl., Repert. Spec. Nov. Regni Veg. 15: 218. 1918.

Atropa hirtella Spreng., Syst. Veg. (ed. 16)1: 699. 1825.

Solanum gracillimum Sendtn. in Mart., Fl. Bras. 10: 36. 1846.

Solanum hirtellum (Spreng.) Hassl. var. *diminutum* Hassl., Repert. Spec. Nov. Regni Veg. 15: 218. 1918.

Type. BRAZIL. (holotype: B, destroyed; no duplicates located). BRAZIL. São Paulo: Ubatuba, Parque Estadual da Serra do Mar, Núcleo Picinguaba, trilha saindo da Base Cambucá para sede da fazenda, 18 m, 23°19'43"S, 44°56'21"W, 26 Jan 2012, *L.L. Giacomini & T.E. Almeida 1693* (neotype, here designated: BHCN!; isoneotypes: ICN!, NY!, RB!, UT!).

Distribution. Northwestern Argentina, south and south-east Brazil and Paraguay.

Comments. The Sprengel collection sold to B (all Solanaceae) were mostly destroyed with possible few exceptions of Willdenow herbarium. Therefore, a neotype for the species is designated.

48. *Solanum iltisii* Roe, Brittonia 24: 256. 1972.

Type. PERU. Abancay: Apurimac, NNW of Abancay at km 16 of Cuzco road (ca. 5 km air), 19 Dec 1962, *H. H. Iltis & D. Ugent 636* (holotype: WIS-0256193!; isotypes: F!, K!, US!, USM!).

Distribution. Northwestern Bolívia and southern Peru..

49. *Solanum inelegans* Rusby, Mem. Torrey Bot. Club 4: 229. 1895.

Type. BOLIVIA. La Paz: vic. La Paz, Yungas, 10,000 ft, 1890, *M. Bang* 709 (lectotype here designated: NY-00172040!; isolectotypes: BM!, E! image, G!, K!, MO!, NDG! image, PH! image, US!, WIS! image)

Distribution. Bolivia and Peru.

Comments. Of the two syntypes of Bang cited (709 and 715), 709 (NY) is chosen as the lectotype, as it is apparently annotated by Rusby and duplicates are in several herbaria elsewhere.

50. *Solanum isodynamum* Sendtn. in Mart., Fl. Bras. 10: 33. 1846.

Type. BRAZIL. “Brasilia australiore”, *F. Sellow s.n.* (holotype: B, destroyed; lectotype, here designated: P-P00336076!; isolectotypes: BM!, F!, G!, K!).

Distribution. Endemic southeastern Brazil (MG).

Comments. In the lack of the holotype, destroyed in B, the P material is designated as a lectotype, as it is a representative specimen, with both flower and fruit.

51. *Solanum itatiaiae* Dusén, Arkiv Bot. 9 (5): 17-18. 1910.

Solanum terminale Vell., Fl. Flumin. 84. 1829. Icon. 2: t. 101. 1831, nom. illeg. non *S. terminalle* Forssk. 1775.

Type. BRAZIL. Serra do Itatiaia, ca. 2100 m, 17 Oct 1910, *P. Dusén* 2004 (lectotype, here designated: S! [cat. n° 04-2923]).

Distribution. Endemic to southeastern Brazil (MG, RJ and SP).

Comments. The synonymy of *S. terminale* Vell. is assigned to *S. itatiaiae* for the first time, considering a citation to Cunha, in São Paulo. The lectotype is assigned to Dusén collection (2004; S) considering that was the only one found annotated by the author, and the drawings presented in the protologue are glued together with the specimen.

52. *Solanum julocrotonoides* Hassl., Bull. Herb. Boiss. 2, 7: 929. 1907.

Type. PARAGUAY. Dry fields near Caaguazu, Feb 1905, *E. Hassler* 8945 (lectotype, designated by Becerra et al. 2013, pg. 162: G-00076576!; isolectotypes: BM!, F!, G!, GH!, K!, NY!, W!).

Distribution. Coastal Argentina, Brazil (MS) and Paraguay.

53. *Solanum lacerdae* Dusén, Arch. Mus. Nac. Rio de Janeiro 13: 33. 1905.

S. podotrichum Glaz. ex Taub., Bull. Soc. Bot. France 58, Mem. 3f: 496. 1911.

Type. BRAZIL. Rio de Janeiro - Minas Gerais - São Paulo, Itatiaia, entre Retiro de Ramos e Maciera do Couto, 2100 m, VI/1902, *P. Dusén s.n.* (lectotype, here designated: RB-00544164!)

Distribution. Southeastern Brazil (MG, PR, RJ, SC and SP).

Comments. Dusén numbered several collections in different herbaria with the number 477, but the dates annotated are not always the same, so even with the same number, it is hard to affirm that the collections are from the same specimen, and to state that isolectotypes do exist. The sheet deposited in RB is chosen as the lectotype, as it is deposited in Brazil.

54. *Solanum lantana* Sendtn. in Mart., Fl. Bras. 10: 36. 1846.

Solanum myosotis Dunal in DC., Prodr. 13 (1): 102. 1852.

Type. BRAZIL. Prov. Sebastianopolitanae, Serra d'Estrella, Jan – Mar 1823, *L. Riedel s.n.* (lectotype, here designated: BR-829052!; isolectotypes: LE, NY!, US!).

Distribution. Northeastern and southeastern Brazil (BA, ES, RJ and SP).

Comments. Among the syntypes, Riedel's collection in BR is chosen as the lectotype, considering it bears opened flowers and conforms to the peculiar habit of the species.

55. *Solanum leontopodium* Sendtn. in Mart., Fl. Bras. 10: 38. 1846.

Type. BRASIL. “Brasilia australiore”, *F. sellow s.n.* (lectotype here designated: G-G00343487!; isolectotype: P!)

Distribution. Northeastern and Southeastern Brazil (BA, ES and RJ).

Comments. Both syntypes found (G and P) are poor specimens, and do not give a real idea of the plants habit. But as the P specimen is constituted of only a small branch fragment, G specimen is chosen as the lectotype.

56. *Solanum lepidotum* Dunal, Solan. Syn. 17. 1816.

Solanum citrifolium Roem. & Schult., Syst. 4: 662. 1819.

Solanum bifidum Dunal, in DC., Prodr. 13(1): 122. 1852.

Solanum bifidum var. *grandifolium* A. Gilli, Repert. Spec. Nov. Regnum Veg. 94: 320. 1983.

Solanum lepidotum Dunal var. *lepidiochlamys* Carvalho, Ann. Missouri Bot. Gard. 78: 231. 1991.

Solanum lepidotum Dunal var. *trianae* Carvalho, Ann. Missouri Bot. Gard. 78: 231. 1991.

Solanum steyermarkii Carvalho, Ann. Missouri Bot. Gard. 78: 243. 1991.

Type. COLOMBIA. *F.W.H.A. von Humboldt & A.J.A. Bonpland s.n.* (holotype: B? destroyed?; isotype: P!)

Distribution. Belize, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Peru.

57. *Solanum leucodendron* Sendtn. in Mart., Fl. Bras. 10: 43. 1846.

Type. BRAZIL. Serra de Estrela, 1 Jan 1823, *L. Riedel s.n.* (lectotype, here designated: BR-553794!; isolectotypes: LE, NY!).

Distribution. Northeastern and southeastern Brazil (BA, ES, MG and RJ).

Comments. The specimen at BR seems to be originally annotated and bears the Martii Herbarium label, and is therefore chosen as the lectotype.

58. *Solanum maranguapense* Bitter, Repert. Spec. Nov. Regni Veg. 16: 403. 1920.

Type. BRASIL. Ceará: Serra de Maranguape, 800 m, Oct 1910, *E. Ule 9104* (holotype: B, destroyed; lectotype, here designated: G-G00343510!; isolectotype: K!).

Distribution. Endemic to northeastern Brazil (BA, CE, PE).

Comments. As *S. maranguapense* bears few flowers at a time, both of specimens analyzed could not be considered rich. The G specimen is chosen, considering it has more flowers, and seems better preserved.

59. *Solanum martii* Sendtn. in Mart., Fl. Bras. 10: 41. 1846.

Type. BRAZIL. Minas Gerais: Serra de São Geraldo, *C.F.P. Martius s.n.* (holotype: M-M-0112562!).

Distribution. Endemic to southeastern Brazil (ES, MG, RJ and SP).

60. *Solanum mauritianum* Scop., Delic. Insub. 3: 16. 1788.

Solanum auriculatum Ait. Hort. Kew. ed. 1, 1: 246. 1789.

Solanum verbascifolium L. var. *auriculatum* Maiden. Agric. Gaz. New South Wales 6. 1895.

Solanum verbascifolium var. *auriculatum* (Ait.) O. Ktze. Rev. Gen. Pl. 2: 455. 1891.

Solanum tabaccifolium Vell. Fl. Flum. 81. 1829; Icon. Tab. 89. 1835.

Solanum carterianum Rock, Indig. Trees Hawaiian Isl. 423. 1913.

Type. Unknown. (lectotype, here designated: Scop. Icon. Tab. 8. 1788).

Distribution. Uruguay and south and south-east Brazil; introduced in Africa, India, Australia, and several islands in Atlantic, Indian, and Pacific.

Comments. A type specimen of the widespread *S. mauritianum* is not known, and here we agree with the opinion of Roe (1972) that the drawing presented in Scopoli (l.c.) is informative for the species, being designated as lectotype.

61. *Solanum murinum* Sendtn. in Mart., Fl. Bras. 10: 29. 1846.

Type. BRAZIL. Rio de Janeiro: In Serra dos Orgãos, 1823, *L.B. de Karwinski s.n.* (holotype: BR-829055!).

Distribution. Endemic to southeastern Brazil (ES and RJ).

62. *Solanum oxapampense* S. Knapp, *PhytoKeys* 1: 42. 2010.

Type. PERU. Pasco: Prov. Oxapampa, Oxapampa-Villa Rica road, 7 km from road head, 2120 m, 10°36'S, 75°20'W, 4 Jan 1984, *D.N. Smith & J. Albán* 5558 (holotype: USM-123391!; isotypes: MO-5784802!, NY-NY00723838!).

Distribution. Endemic to central Peru.

63. *Solanum pachimatium* Dunal in DC., *Prodr.* 13 (1): 133. 1852.

Type. BRAZIL. *F. Sellow* s.n. (lectotype, here designated: BM-000815902!; isolectotypes: BM!, BR!, G!, LE, MPU, P!, UPS! image).

Distribution. Endemic to southeastern Brazil (MG and RJ).

Comments. Although Dunal (1852) splicitly cites Banks Herbarium for the type material, two sheets are found in BM, and one of them is chosen as the lectotype.

64. *Solanum paranense* Dusén, *Arkiv. Bot.* 9 (15): 12. 1910.

Type. BRAZIL. Paraná: Roça Nova, 24 Nov 1903, *P. Dusén* 2211 (lectotype, here designated: R-R000025889!; isolectotypes: R! F!, K!, NY!, S!, US!).

Distribution. Endemic to southern Brazil (PR, RS and SC).

Comments. Among the several syntypes found, the R material cited is chosen as the lectotype, as it is deposited in a Brazilian collection and represented by a rich, informative specimen. Care should be taken, as in R three different sheets were found.

65. *Solanum pereirae* Carvalho, *Ann. Missouri Bot. Gard.* 78: 237, 240. 1991.

Type. BRAZIL Rio de Janeiro: Mun. Santa Maria Madalena, Tamanduá, 18 Mar 1955, *E. Pereira* 1270 (holotype: RB!, 3 sheets!; isotype: SP!)

Distribution. Endemic to southeastern Brazil (ES and RJ). Cultivated at PE.

66. *Solanum placitum* C.V. Morton in Gleason & Smith, *Bull. Torrey Bot. Club* 60: 394. 1933.

Solanum fulgens (J.F.Macbr.) K.E. Roe, *Brittonia* 24: 275. 1972.

Solanum umbellatum Mill. var. *fulgens* J.F. Macbr. *Field Mus. Nat. Hist., Bot. Ser.* 13(5B,1): 222. 1962.

Type. BRAZIL. Mato Grosso: source of Jatuarana River, Machado River region, 20 Dec 1931, *B.A. Krukoff* 1583 (holotype: NY!; isotypes: BM!, K!, P!, U).

Distribution. Central Peru and central and northern Brazil (AC, MT and RO).

67. *Solanum plumense* Fernald, Proc. Amer. Acad. Arts 35: 569. 1900.

Type. MEXICO. Oaxaca: Pluma Hidalgo, 3000 - 4800 ft, *E. W. Nelson 2493* (holotype: GH!; isotype: US!).

Distribution. Mexico (Guerrero and Oaxaca).

68. *Solanum pulverulentifolium* Roe, Brittonia 19: 365. 1967.

Type. MEXICO. Chiapas: 1-2 km S of Jitotol on highway 195 at km 65 - 66, ca. 1550 m, 11 Aug 1965, *K. Roe, E. Roe & S. Mori 1174* (holotype: WIS-0220040!; isotypes: CAS! Image, DS, ENCB, US!, WIS!).

Distribution. Southern Mexico (Chiapas).

69. *Solanum punctulatum* Dunal, in DC., Prodr. 13(1): 122. 1852.

Type. JAMAICA. sin. loc., 1819, *J. Wiles s.n.* (holotype: G!).

Distribution. Endemic to Jamaica.

70. *Solanum ramulosum* Sendtn. in Mart., Fl. Bras. 10: 45. 1846.

Type. BRAZIL. [as *Brasilia meridionalis*], *F. Sellow s.n.* (lectotype, designated by Becerra et al. 2013, pg. 163: F-0073384!; isolectotypes: BR!, K!).

Distribution. Argentina, Paraguay and southern Brazil (PR, RS, SC and SP).

71. *Solanum riparium* Pers., Syn. Pl. 1. 1805.

Solanum dichotomum Ruiz & Pavon, Fl. Peruv. 2: 34. *pl. 166b*. 1799, nom illeg. non *S. dichotomum* Vand. 1771.

Solanum verbascifolium var. *caducum* O. Ktze. Rev. Gen. Pl. 3(2): 228. 1898.

Solanum carnosipes Rusby, Bull. New York Bot. Gard. 4: 420. 1907.

Type. PERU. "Habitat in *Huanuci* Provincia ad torrentium margines", *H. Ruiz and J. Pavón s.n.* (lectotype, designated by Knapp 2008c, pg. 312: MA-747183! Image; isolectotypes: MA! images).

Distribution. Argentina, Bolivia, Brazil, Ecuador and Peru.

72. *Solanum rufescens* Sendtn. in Mart., Fl. Bras. 10: 39. 1846.

S. rufescens Sendtn. var. *glabrescens* Sendtn. in Mart., Fl. Bras. 10: 39. 1846.

Type. BRAZIL. "Brasilia australis", *F. Sellow s.n.* (lectotype, here designated: BR-829065!; isolectotypes: B [destroyed], F!, GOET! image, K!)

Distribution. South and southeastern Brazil (ES, MG, PR, RJ, RS, SC and SP).

Comments. Of the found syntypes, the one designated as a lectotype matches with Sendtner concept of the type variety, as other syntypes (of a different collector) seem to constitute an undescribed taxa.

73. *Solanum rugosum* Dunal in DC., Prodr. 13 (1): 108. 1852.

Type. BRAZIL. Bahia: *J. Blanchet s.n.* (lectotype, designated by Roe 1967, pg. 370: P!).

Distribution. Belize, Brazil, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, Guadeloupe, Guyana, Guyana Francesa, Honduras, Martinique, Nicaragua, Panama, Peru, Puerto Rico, Surinam, Venezuela.

74. *Solanum saltiense* S. Moore, Trans. Linn. Soc. London, Ser. 2. 4: 404. 1895.

Type. BRASIL. Mato Grosso: between Santa Cruz and Campos de Tapirapuan, Sep 1891, *S. Moore 377* (lectotype here designated: BM-000815890! [half sheet]; isolectotype: NY!).

Distribution. Bolivia and Brazil (MT and RO).

Comments. The specimen chosen as lectotype is part of composed sheet, where numbers 377 and 377a are glued together. Number 377 represent a better preserved fragment.

75. *Solanum sambuciflorum* Sendtn. in Mart., Fl. Bras. 10: 38. 1846.

Type. BRAZIL. Goiás: inter Fazenda Cocaes & Santa Cruz, *J.B.E. Pohl 3572* (lectotype, here designated: W! [cat. n°0003301]; isolectotypes: F!, W!)

Distribution. Central-west and south-east of Brazil (GO and MG).

Comments. Both specimens at W are equally informative and the F is clearly a duplicate distributed after publication.

76. *Solanum sanctae-catharinae* Dunal in DC., Prodr. 13 (1): 109. 1852.

S. citrifolium Willd. ex Roem. & Schult. var. *ochrandrum* (Dunal) Hassl., Repert. Spec. Nov. Regni Veg. 15: 218. 1918.

Solanum ochrandrum Dunal, in DC., Prodr. 13(1):110. 1852.

Solanum sanctae-catharinae Dunal f. *nummularifolium* Witasek, Denkschr. Akad. Wissensch. Wien 79: 334. 1910.

Type. BRAZIL. Santa Catarina: *C. Gaudichaud 163* [lectotype, designated by Becerra et al. 2013, pg. 164 (wrongly cited as “*Gaudichaud s.n.*”): P-00371154; isolectotypes: G]

Distribution. Southeastern and southern Brazil (ES, MG, PR, RJ, RS, SC and SP).

77. *Solanum schlechtendalianum* Walp., Repert. 3: 61. 1844.

Solanum geminiflorum Schltld. & Cham. Linnaea 5: 112. 1830.

Solanum edwardii Kunth & C.D.Bouché, Ind. Sem. Hort. Berol. 1846.

Solanum oblitum Dunal in DC., Prodr. 13(1): 126. 1852.

Solanum riedlei Dunal in DC., Prodr. 13(1): 109. 1852.

Solanum fragile Wright ex Griseb. Cat. Pl. Cub. 189. 1866.

Solanum lasiantherum Van Heurck & Müll.Arg., Observ. Bot. 48. 1870.

Solanum gentlei Lundell, Contr. Univ. Michigan Herb. 8: 84. 1942.

Type. MEXICO. Veracruz: Xalapa, *C. Schiede 138* (holotype: B, destroyed?; isotypes MO!, P!).

Distribution. Argentina, Belize, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guyana Francesa, Guatemala, Guyana, Honduras, Mexico, Panama, Perú, Surinam, Venezuela.

78. *Solanum schwackeanum* L.B. Sm. & Downs, Phytologia 10: 48. 1964.

Solanum schwackei Glaz., Bull. Soc. Bot. France 58, Mem. 3: 494. 1911.

Type. BRAZIL. Santa Catarina: Blumenau, 1884, *C.A.W. Schwacke 175* (holotype: US!; isotype: R!).

Distribution. Southeastern and southern Brazil (ES, PR, RJ, SC and SP).

Comments. There is no consensus on the validity of the names published by Glaziou (1911), as they lack adequate descriptions and diagnosis. A request for a binding decision is being prepared to all names in *Solanum* and is going to be submitted to be voted on the taxonomy committee in 2017.

79. *Solanum selachophyllum* Bitter, Repert. Spec. Nov. Regni Veg. 16: 82. 1919.

Type. PERU. Huanuco: Monzón, *A. Weberbauer 3399* (holotype: B, destroyed; lectotype, here designated: MOL! image; isolectotype: F!).

Distribution. Ecuador and Peru.

Comments. As the holotype was destroyed at B, and the F sheet comprises only a fragment, the MOL specimen is chosen as the lectotype.

80. *Solanum sellowianum* Sendtn. in Mart., Fl. Bras. 10: 38. 1846.

S. heliotropifolium Dunal var. *sellowianum* (Sendtn.) Dunal in DC., Prodr. 13(1): 118. 1852.

Type. BRAZIL. *F. Sellow s.n.* (holotype: B, destroyed; lectotype, here designated: F-621106! fragment).

Distribution. Brazil (BA, MG and PR).

Comments. Although a very poor sheet, the F specimen is the only type material known for *S. sellowianum* besides the image of the Berlin material destroyed during the World War II.

81. *Solanum sellowii* Dunal in DC., Prodr. 13 (1): 134. 1852.

Solanum swartzianum Roem. & Schult. var. *tomentosum* Sendtn., in Mart., Fl. Bras. 10: 31. 1846.

Type. BRAZIL. *F. Sellow s.n.* (holotype: BM!; isotypes: F!, MPU! image).

Distribution. Endemic to southeastern Brazil (MG, RJ and SP).

82. *Solanum semotum* M. Nee, Bol. Mus. Paraense Emílio Goeldi, sér. Bot., 7(2): 515. 1991.

Type. BRAZIL. Amapá: Encampment 3, km. 134, road to Amapá, "Água Azul", 0°50'N, 51°15'W, 23 Jul 1962, *J. M. Pires & P. B. Cavalcante* 52252 (holotype MG!; isotypes COL, K!, MO!, NY!, S, US!).

Distribution. Central-western and northern Brazil (AC, AP, MA, MT, PA and RO).

83. *Solanum solum* Macbride, Field Mus. Nat. Hist., Bot. Ser. 13(5-B,1): 220.1962.

Solanum pintoii Castillo, Rev. Acad. Colomb. Cienc. Exact. Fis. Nat. 67: 783. 1990.

Type. PERU. Junín: Hacienda Schunke, La Merced, *J. Macbride* 5764 (holotype: F!)

Distribution. Peru and Colombia.

84. *Solanum sooretamum* Carvalho, Ann. Missouri Bot. Gard. 78: 240, 243. 1991.

Type. BRAZIL. Espírito Santo: Forest Reserve of Sooretama, 9 Aug 1965, *R.P. Belém* 1534 (holotype: UB; isotype: CEPEC!)

Distribution. Northeastern and southeastern Brazil (BA, ES and MG).

85. *Solanum stipulaceum* Willd. ex Roem. & Schult., Syst. Veg. 4: 662. 1819.

Solanum auriculatum var. *angustifolium* Sendtn. in Mart. Fl. Bras. 10: 41. 1846.

Solanum auriculatum var. *pulverulentum* Sendtn. in Mart. Fl. Bras. 10: 41. 1846.

Solanum hebecarpum Salzm. ex Sendtn. in Mart. Fl. Bras. 10: 41. 1846.

Solanum hebecarpum var. *eriocarpum* Dunal in DC. Prodr. 13(1): 114. 1852.

Solanum verbascifolium f. *eriocarpum* (Dun.) Hassl. Repert. Spec. Nov. Regni Veg. 15: 117. 1918.

Solanum verbascifolium subf. *eriocarpum* Hassl. Repert. Spec. Nov. Regni Veg. 15: 117. 1918.

Solanum verbascifolium f. *hebecarpum* (Salzm.) Hassl. Repert. Spec. Nov. Regni Veg. 15: 117. 1918.

Solanum verbascifolium f. *pulverulentum* Hassl. Repert. Spec. Nov. Regni Veg. 15: 117. 1918.

Type. BRAZIL. *J.C. Hoffmannsegg s.n.* (holotype: B-Willd! image).

Distribution. Central-western, northeastern and southeastern Brazil (AL, BA, CE, GO, MG, PB, PE, PI and SE).

86. *Solanum subsylvestre* L.B. Sm. & Downs, *Phytologia* 10: 429. 1964.

Solanum gemellum Sendtn. var. *racemiforme* Witasek, Denkschr. Akad. Wissensch. Wien 79: 337. 1910.

Type. BRAZIL. Santa Catarina, Canoinhas, Salseiro, alt. 750 m., 15 Sep 1962, R. Klein 3006 (holotype: US!; isotype: HBR).

Distribution. Southern and southeastern Brazil (PR, RS, SC and SP).

87. *Solanum swartzianum* Roem. & Schult., *Syst. Veg.* 4: 602. 1819.

Solanum aureum Thunb. Pl. Bras. Dec. 2: 20. 1818.

Solanum ahlbergii Dunal, in DC. Prodr. 13(1): 372. 1852.

Solanum swartzianum Roem. & Schult. var. *sordidum* Sendtn., in Mart., Fl. Bras. 10: 31. 1846.

Solanum swartzianum Roem. & Schult. var. *argyrophyllum* Dunal, in DC., Prodr. 13(1): 135. 1852.

Solanum swartzianum Roem. & Schult. subsp. *argyrophyllum* (Dunal) Carvalho, Pesquisas, Bot. 46: 52. 1996.

Solanum swartzianum Roem. & Schult. var. *chrysophyllum* Dunal, in DC., Prodr. 13(1): 135. 1852.

Solanum swartzianum Roem. & Schult. subsp. *chrysophyllum* (Dunal) Carvalho, Pesquisas, Bot. 46: 50. 1996.

Solanum argenteum Dunal var. *lepidocarpum* Dusén, Arq. Mus. Nac. Rio de Janeiro 13: 93. 1905.

Solanum hatschbachii Carvalho, Ann. Missouri Bot. Gard. 78: 229. 1991.

Type. BRASIL. “crescit in Villa Riccam” Aug 1814, G.W. Freyreis s.n. (holotype: UPS-BOT:V-005146! image).

Distribution. From northeastern to southern Brazil (BA, ES, MG, PB, PR, RJ, SC and SP) and Venezuela.

88. *Solanum trachycyphum* Bitter, *Repert. Spec. Nov. Regni Veg.* 16: 81. 1919.

Type. COLOMBIA. Cauca: Juza, 1600-1800 m, Aug, F. C. Lehmann 6682 (holotype: B, destroyed; lectotype designated by Roe 1972, pg. 272: F!; isolectotype: US!).

Distribution. Colombia, Ecuador and Peru.

89. *Solanum umbellatum* Mill., *Gard. Dict.* Ed. 8, n° 27. 1768.

Solanum cortex-virens Dunal in DC., Prodr. 13(1): 372. 1852. nom. illeg. superfl. *Solanum. receptum* van Heurck & Muell. Arg. in van Heurck, Obs. Bot. I, p. 46. 1870.

Solanum chlorophloium St.-Lag. Ann. Soc. Bot. Lyon 7: 135.

Solanum lanceifolium Sessé & Moc. Fl. Mexic., ed. 2, 51. 1894. nom. illeg. non *S. lanceifolium* Jacq.

Type. MEXICO, Campeche, *W. Houstoun s.n.* (holotype: BM?, not found).

Distribution. Central and South America, from Mexico to Ecuador.

90. *Solanum umbratile* J.R. Johnst., Proc. Amer. Acad. Arts 40: 695. 1905.

Type. VENEZUELA. Nueva Esparta, Margarita Island, Juan Griego trail, *J.R. Johnston 321* (holotype: GH!, isotypes: G!, LE, W!)

Distribution. Venezuela, at Isla Margarita and in the continent, close to the coast.

91. *Solanum vellozianum* Dunal, Hist. Solan. 236. 1813.

Type. Unknown (lectotype, designated by Carvalho 1996, pg. 31: Dunal Icon. Tab. 35, ined. 1813).

Distribution. Endemic to southeastern Brazil (ES, MG, RJ and SP).

Comments. The plate designated by Carvalho (1996) as lectotype could not be studied, as different versions of Dunal (1813) from different libraries, did not contained it. The species concept presented here is based on material cited by Dunal later (1852).

92. *Solanum velutissimum* Rusby, Mem. Torrey Bot. Club 6: 89. 1896.

Type. BOLIVIA: Vicinity of Sorata, 8000 ft, Nov 1892, *Bang 1627* (holotype: NY!; isotypes: BM!, E, G!, HBG, MO!, NY!)

Distribution. Central-northern Bolivia.

93. *Solanum verecundum* M. Nee, Kurtziana 28(1): 137–140, fig. 1. 2000.

Type. ECUADOR. Sucumbios: El Salado, colecciones en el sendero a la finca del Sr. Segundo Pacheco, 1400 m, 13 Oct 1990, *J. Jaramillo, E. Grijalva & M. Grijalva 13285* (holotype: QCA; isotype: NY-NY00381798!).

Distribution. Ecuador and north-central Peru.

Homonyms and undescribed species

94. *Solanum capsicoides* Mart., Flora 21, Beibl. 2: 78. 1838. nom. illeg. supfl. non *S. capsicoides* All. 1773.

Witheringia acuminata Dunal, in DC., Prodr. 13(1): 403. 1852.

Type. BRASIL. Rio de Janeiro: Monte Corcovado, *C. Martius 254* (syntypes: BR!, K!)=Nee photo 1100 "Legit. Luschnath", K! "1838").

Distribution. Southeastern Brazil (Rio de Janeiro).

Comments. This species was treated as a synonym of *S. hirtellum* (Spreng.) Hassl. by past authors, and this circumscription is not accepted in here. As it is a later homonym, a new name need to be proposed for it. But as no flowers are available on the examined material, and a complete description cannot be written, this decision is postponed.

95. *Solanum* sp1

Specimen examined (selected). BRAZIL. Minas Gerais: Mun. Camanducaia, mata do Altair, 1900 m, 8 Dec 2000 (fl, fr), *G.S. França 199* (BHCB, RB).

Distribution. Southeastern Brazil, in Minas Gerais and São Paulo, along Mantiqueira range.

Comments. New species closely related to *S. sellowianum* and *S. itatiaiae*.

96. *Solanum* sp2

Specimen examined (selected). BRAZIL. Bahia: Mun. Santa Teresinha, 14,5 km na rod. Elísio Medrado/Sta. Teresinha, Torre da Embratel, ca. 7 km do Distrito de Pedra Branca, Serra da Gibóia, 12°51'13'' S, 39°28'33''W, 750 m, 24 Feb 2000 (fr), *J.G. Jardim et al. 2828* (ALCB, CEPEC).

Distribution. Northeastern Brazil, at Bahia and Pernambuco so far.

Comments. Undescribed species related to *S. anisocladum* and *S. didymum*, but with long calyx lobes and different indumentation.

97. *Solanum* sp3

Specimen examined (selected). BRAZIL. Espírito Santo: Mun. Santa Teresa, São Lourenço, Reserva Biológica de São Lourenço, 700 m, 22 Set 1998 (fl, fr), *L. Kollmann et al. 596* (BHCB, MBML, RB).

Distribution. Southeastern Brazil, at Espirito Santo.

Comments. Undescribed species; probably related to *S. rufescens*, but much smaller and with packed inflorescences.

98. *Solanum* sp4

Specimen examined (selected). BRAZIL. Pernambuco: Mun. Jaqueira, RPPN Frei Caneca, Serra do Urubu, em subosque de fragmento de Floresta Ombrófila Densa, na trilha da Mata da Guariba, 8°42'59''S, 35°50'21''W, 698 m, 31 Mar 2012 (fl), *L.L. Giacomini et al. 1785* (BHCB).

Distribution. Northeastern Brazil, Pernambuco and Sergipe.

Comments. New species related to *S. argenteum* but with a brown indumentation and larger inflorescence.

99. *Solanum* sp5

Specimen examined (selected). BRAZIL. Minas Gerais: Mun. Santa Maria do Salto, Distrito de Talismã, RPPN Loredano Aleixo (Fazenda Duas Barras), trilha que permeia o fragmento localizado atrás da sede da fazenda, passando pelo pasto, 16°24'13''S, 40°03'28''W, 820 m, 31 Oct 2013 (fl), *L.L. Giacomini et al. 1957* (BHCB).

Distribution. Northern Espírito Santo and adjacent Minas Gerais in southeastern Brazil.

Comments. Undescribed species, related to *S. swartzianum*, with inconspicuous tiny scales, as those of *S. chiriquinum*.

100. *Solanum* sp6

Specimen examined (selected). BRAZIL. Bahia: Mun. Piritiba, 20 Apr 1994 (fr), *J.L.S. Lima 250* (ALCB, HTSA).

Distribution. Northeastern Brazil, in Alagoas, Pernambuco and Bahia.

Comments. Sister species to *S. didymum*, but with strongly asymmetric leaves and short pedicels.

101. *Solanum* sp7

Specimen examined (selected). BRAZIL. Bahia: Mun. Ribeirão do Largo, ca. 23 km na estrada Itambé/Encruzilhada, 15°19'39''S, 40°45'05''W, 870 m, 24 Aug 2001 (fl), *A.M. Carvalho et al. 6907* (CEPEC).

Distribution. Northern Espírito Santo and adjacent Bahia in Brazil.

Comments. A possible case of convergent speciation, this undescribed species is related to *S. cinnamomeum* and compose a species pair with it, with the exactly same characters of *S. oxapampense* and *S. verecundum*.

102. *Solanum* sp8

Specimen examined (selected). BRAZIL. Rondônia: Mun. Porto Velho, ca. 2 km E of Mineração at Campo Novo, 10°34'S, 63°35'W, 300 m, 22 Apr 1987 (fr), *M. Nee 34967* (INPA, NY).

Distribution. Rondonia and southern Para, in Amazonian Brazil.

Comments. Species previously identified as *S. schwackeanum* but with a much more sparse indumentation and with sessile inflorescences, and longer pedicels.

Doubtfull species and names

Solanum adenotrichum Dunal, Hist. Solan. 236. 1813. Possibly a synonym of *S. concinnum* Sendtn. (1846), considering the description of the protologue, but no type is known to exist,

and Dunal (1852) do not list the name under or associated with *S. pruriens* (= *S. concinnum*). Further examination of Dunal (1813) original plates, in MPU, might reveal the association of the name. If in fact corresponds to *S. concinnum* it will have priority over it.

Solanum heliotropiifolium Dunal, in DC., Prodr. 13(1): 117. 1852. Type (Dupré 54) supposedly at MPU, not seen.

Solanum huehuetecum Standl. & Steyerm., Publ. Field Mus. Nat. Hist., Bot. Ser. 23: 234. 1947. The types at F and US are a mixture; the specimen corresponding to *Solanum* is for sure a member of sect. *Gonatotrichum*. Nevertheless the furcated trichomes are not found in any other species of the section, and further specimens from same region need to be analyzed.

S. integerrimum Dunal, Hist. Solan. 236. 1813. Possibly a synonym of *S. rufescens* Sendtn. (1846), considering the description. No type is known to exist. Further examination of Dunal (1813) original plates, in MPU, might reveal the association of the name. If in fact corresponds to *S. rufescens* it will have priority over it.

Acknowledgments

The author thank the curators of the cited herbaria and institutions, that allowed visits or kindly sent material on loan. A. Silva, M. Macnamara, N. Fumeaux, S. Knapp and T. Särkinen gently helped during the visits to NY, MO, G and BM. This work was supported by CNPq grants 479921/2010-5, 148363/2010-5 and 309304/2013-0 and FAPEMIG grants APQ-01600-08 and APQ-01706-13 and by NSF, grant DEB-0316614. A fellowship was provided by CAPES to the author through the *Ciências Sem Fronteiras* program, allowing his visit to University of Utah, and IAPT Grants in Plant Systematics allowed visiting some U.S.A. herbaria.

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Table 1. Major clades of *Solanum* firstly identified in Bohs 2005, after Särkinen et al. 2013a. Modified from Knapp (2013).

Inclusive clade (Särkinen et al. 2013a)	Clade name (from Bohs 2005)	# of species (approximate)	Recent monographs (examples)	approximate % of species monographed to date [completed (in prep.)]
Unnamed	Thelopodium	3	Knapp 2000	100%
Clade I	African non-spiny	15	Knapp and Vorontosova (in prep.)	?? (100%)
	Normania	3	Bohs and Olmstead 2001	100%
	Archaeosolanum	9	Symon 1994	100%
	Dulcamaroid	43	Knapp 2013	100%
	Morelloid	75	Edmonds 1977, Barboza and Särkinen et al. (in prep.)	?? (100%)
	Regmandra	11	Bennet 2008	100%
	Potato (including several subclades)	200	Spooner et al. 2004, Peralta et al. 2008, Tepe and Bohs 2011, Spooner et al. in press.	60% (100%)
Clade II	Nemorense	4	J.L. Clark (unpub. data)	50%
	Wendlandii/Allophyllum	12	Bohs 1990, Knapp et al. (in prep)	25% (100%)
	Cyphomandra	50	Bohs 1994, Bohs 2001	100%
	Geminata	150	Knapp 2002b; Knapp 2008a	100%
	Brevantherum	100	Roe 1972, Carvalho 1996, Stern et al. 2013	50%
	Leptostemonum	450	Whalen 1979, Whalen et al. 1981 and several groups being studied	~50% (~80%)

Appendix

Bookings and receipts of the listed expenses.

1) Booking confirmation at Chicago, IL, USA



Leandro Giacomini <giacomini.leandro@gmail.com>

Confirmation: 257044 (Giacomini)

HI-Chicago Reservations <reservation.chicago@hiousa.org>
Para: giacomini.leandro@gmail.com

18 de abril de 2013 10:37

04/18/2013

Mr. Leandro Giacomini

Dear Mr. Giacomini

Thank you for choosing Hostelling International Chicago for your accommodation needs. We hope that you will enjoy your stay with us in our wonderful city and we look forward to hosting you. The arrival date on your reservation is Friday, 04/19/2013 for 3 night(s). You have reserved 1 bed(s) in a CO-ED Private Room With Shared Bath. The total charge due at check-in is 334.08 including taxes. There is an additional charge of \$3.00 per night/per person, if you do not have a current Hostelling International membership. Your confirmation number is 257044. A government issued ID or passport is required upon check-in. Lockers area available for use at no cost but you must provide your own lock.

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In the event you are unable to stay with us, you must cancel your reservation 24 hours prior to your arrival or you will be charged the equivalent of 1 night's stay including taxes. If we can be of any further assistance please do not hesitate to call us at +1(312) 360-0300 or visit our website at www.hichicago.org

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2) Receipt of apartment rental in Saint Louis, MO, USA

Missouri Botanical Garden		Reservation		04/10/2013 Page 1	
Guest	Giacomin, Leandro			Paid?	<input type="checkbox"/> 08128
Assigned To	M3: 1901 Maury, 3rd Floor	B	Twin	Days	13 13
From	05/05/2013	To	05/17/2013	Per Diem	
Charge To	<Guest Pay>			Daily Rate	\$15.00
Credit To	5303-01U-038	Customer PO		Total	\$195.00
Notes				Amount Paid	\$0.00
				Print On Memo?	<input type="checkbox"/>
				Type	<None>

3) Booking confirmation in Washington, DC, USA



Leandro Giacomin <giacomin.leandro@gmail.com>

Your Confirmed Booking from hostelworld.com

bookings@hostelworld.com <bookings@hostelworld.com>
Para: giacomin.leandro@gmail.com

10 de abril de 2013 16:02



Booking confirmed for Leandro Giacomin. Reference no. is 49367-53576642

Thank you for booking online through downtownwashingtonhostel.com in association with Hostelworld.com

Booking Information

	Date	Room Details	Price	Guests	Total
Downtown Washington Hostel	18th May '13	2 Bed Mixed Dorm	US\$54.99	2	US\$109.98
506 H Street NE	19th May '13	2 Bed Mixed Dorm	US\$49.99	2	US\$99.98
Washington DC	20th May '13	2 Bed Mixed Dorm	US\$49.99	2	US\$99.98
p. 202-370-6390	21st May '13	2 Bed Mixed Dorm	US\$49.99	2	US\$99.98
email:	22nd May '13	2 Bed Mixed Dorm	US\$49.99	2	US\$99.98
downtowndchotel@gmail.com					

Rooms Total: US\$509.90

10% Deposit (US\$50.99) will be billed in USD: US\$50.99

Service Charge: US\$2.00

Charge on Card (Service Charge + Deposit): US\$52.99

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US\$458.91