

**Universidade Federal do Rio de Janeiro**



**Filogenia e Revisão Taxonômica de *Tradescantia* L.  
sect. *Austrotradescantia* D.R.Hunt (Commelinaceae)**

**Marco Octávio de Oliveira Pellegrini**

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**Universidade Federal do Rio de Janeiro  
Instituto de Biologia  
Programa de Pós-Graduação em Biodiversidade e Biologia Evolutiva**

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Dissertação de Mestrado apresentada ao  
Programa de Pós-Graduação em Biodiversidade  
e Biologia Evolutiva, da Universidade Federal  
do Rio de Janeiro, como parte dos requisitos  
necessários à obtenção do título de Mestre.

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*“I’ve heard it said that people come into our lives for a reason, bringing something we must learn. And we are led to those who help us most to grow, if we let them and we help them in return. Well, I don’t know if I believe that’s true, but I know I’m who I am today because I knew you... I have been changed **For Good.**”*

Glinda, The Good — Wicked, Broadway Musical

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## RESUMO

*Tradescantia* L. pertencente à Commelinaceae (Commelinales) e compreende cerca de 80 espécies de distribuição exclusiva na região Neotropical, sendo o segundo maior gênero da família e membro do clado Neotropical de Tradescantieae. Apesar de vários aspectos de *Tradescantia* já terem sido amplamente estudados (e.g. anatomia, citologia, fitoquímica e palinologia) dados sobre a taxonomia e a filogenia do grupo ainda são pouco abordados. O presente trabalho teve como objetivo apresentar um estudo sistemático sobre o gênero, focando em *Tradescantia* sect. *Austrotradescantia*. O Capítulo 1 apresenta a taxonomia das espécies de *Tradescantia* descritas por Frei Mariano Conceição Vellozo na sua obra *Flora fluminensis*, com comentários para as espécies brasileiras do gênero. O Capítulo 2 aborda o problema taxonômico que circunda o nome *Tradescantia cymbispatha*, indicando sua identidade e aplicação. Nesse mesmo trabalho são designados dois lectótipos e é descrita uma nova espécie, *Tradescantia praetermissa*. O Capítulo 3 apresenta a revisão taxonômica de *Tradescantia* sect. *Austrotradescantia*, com base em extensos trabalhos de campo, análises de materiais de herbários nacionais e internacionais e todas as obras originais relacionadas ao grupo. *Tradescantia* sect. *Austrotradescantia* apresenta 10 espécies restritas a América do Sul, tendo como sinapomorfias morfológicas o estigma punctiforme e os estames iguais entre si, densamente barbados com longos tricomas moniliformes na porção basal. Das 10 espécies reconhecidas, duas são novas para a ciência, duas são incluídas na seção e duas são nomes reestabelecidos. Ainda, é designado um total de sete lectótipos e um epítipo. Nesse capítulo também é apresentada uma hipótese filogenética para *Tradescantia* seção *Austrotradescantia*, feita com base em caracteres morfológicos, citogenéticos e fitoquímicos.

**Palavras chave:** Filogenia; nomenclatura; taxonomia; Thyrsantheminae; Tradescantiinae; trapoeraba

## ABSTRACT

*Tradescantia* L. is the second largest genus of Commelinaceae (Commelinales), which possess an exclusively Neotropical distribution and *circa de* 80 species and a member of the Neotropical clade of Tradescantieae. Although many aspects of *Tradescantia* such as anatomy, cytology, chemistry and palynology have been widely studied and well known, data on its systematics are still scant. The current work aims to present a more profound systematic study on the genus, focusing in *Tradescantia* sect. *Austrotradescantia*. Chapter 1 presents the taxonomy of *Tradescantia* names described by Friar Mariano Conceição Vellozo in his *Flora fluminensis*, with comments in the Brazilian species of the genus. Chapter 2 solves the taxonomic problem involving the name *Tradescantia cymbispatha*, indicating its identity and application. In the same work, two lectotypes are designated and a neglected new species, *Tradescantia praetermissa*, is described. Finally, Chapter 3 presents the taxonomic revision of *Tradescantia* sect. *Austrotradescantia*, based on extensive field, herbaria and bibliographical work. *Tradescantia* sect. *Austrotradescantia* comprises 10 species restricted to South America, having as morphological synapomorphies the punctate stigma and the equal stamens, densely bearded with long moniliform hairs in the basal portion of the filament. Also in this chapter, a phylogenetic hypothesis for *Tradescantia* section *Austrotradescantia* is presented based on morphological, cytological and phytochemical characters.

**Key words:** Nomenclature; phylogeny; taxonomy; Thyrsantheminae; Tradescantiinae; wandering Jew

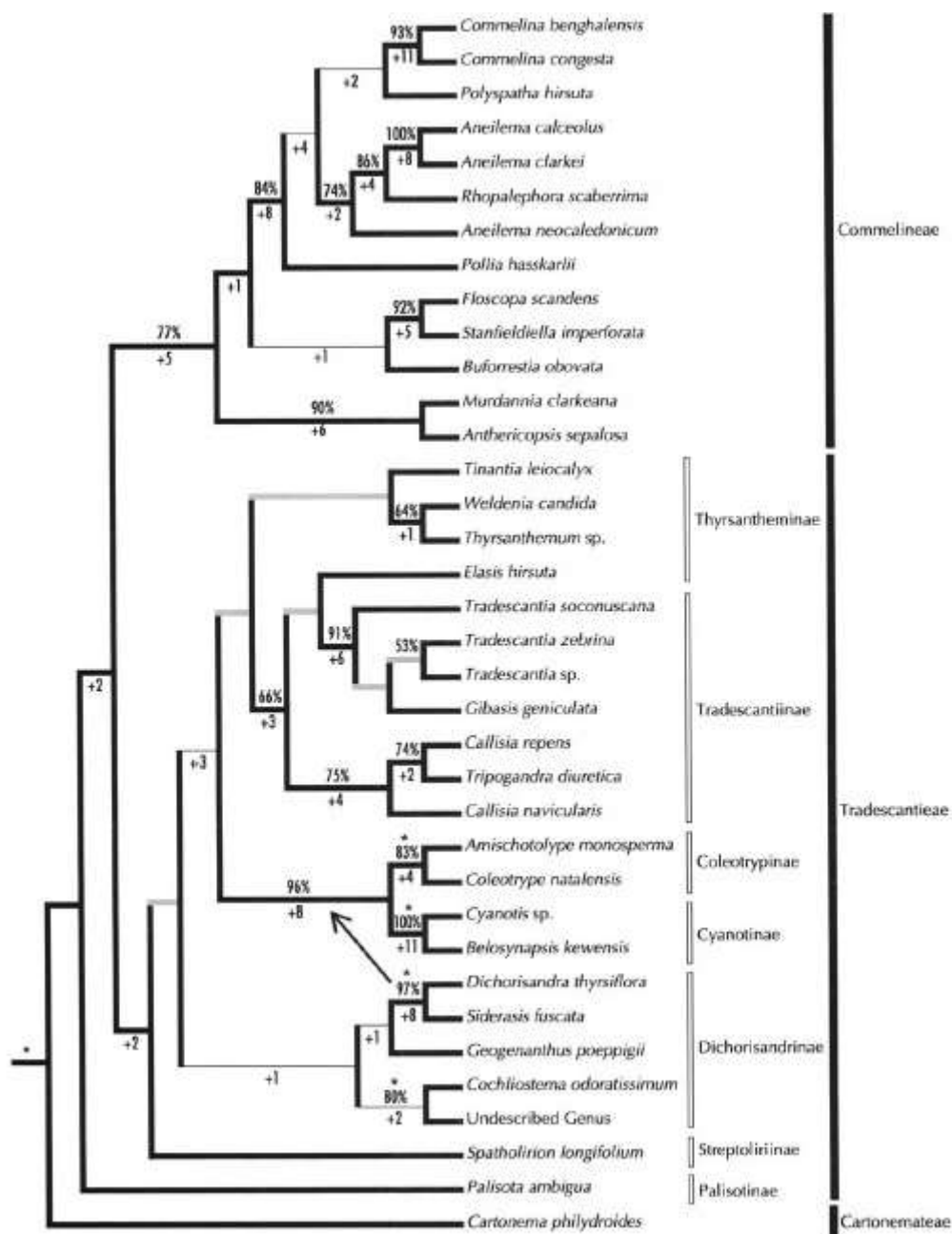
## INTRODUÇÃO GERAL

A região Neotropical é provavelmente a mais biodiversa do mundo e abriga um total estimado de 90.000–110.000 espécies de plantas com sementes; um número provavelmente maior que o total de espécies da África tropical, Ásia tropical e Oceania combinados (Antonelli & Sanmartín 2011). Esta foi definida por De Candolle (1820) como incluindo desde o México, passando pela América Central, até a América do Sul. Como já apontado por diversos autores (e.g. Antonelli & Sanmartín 2011, Condon *et al.* 2008, Calazans *et al.* 2014), informação filogenética em diferentes grupos de organismos se mostra de suma importância para um melhor entendimento da história biogeográfica e da diversidade da região Neotropical.

Commelinaceae é uma família de monocotiledôneas com distribuição predominante nas regiões tropicais e subtropicais do mundo (Faden 1998), tendo a região Neotropical como um dos seus centros de diversidade, devido ao grande número de representantes das subtribos Tradescantiinae e Dichorisandrinae (Hunt 1994; Hardy 2001; Aona 2008). A família pertencente à ordem Commelinales (APG 2009), sendo composta por 41 gêneros e aproximadamente 670 espécies (The Plant List 2013). A morfologia da família é bastante variável, abrangendo desde ervas diminutas [e.g. *Callisia filliformis* (M.Martens & Galeotti) D.R.Hunt], a ervas robustas [e.g. *Dichorisandra thyrsiflora* J.C.Mikan] a trepadeiras [e.g. *Dichorisandra hexandra* (Aubl.) C.B.Clarke]. As Commelinaceae são plantas suculentas, com folhas alternodísticas ou espiraladas, margens inteiras e bainhas fechadas. Células com mucilagem são frequentes e a presença de canais de ráfides é a sinapomorfia morfológica da família. As inflorescências são tirsóides formadas por 1–vários cincinos livres ou fusionados, sésseis ou pedunculados, dispostos de maneira verticilada, oposta ou alterna; reduções são bastante comuns nas estruturas de inflorescências e sinflorescências. As flores são efêmeras com corolas trímeras, deliquescentes e tornam Commelinaceae uma das famílias mais difíceis de serem estudadas com base em material herborizado. Geralmente apresentam grande especialização no androceu que pode variar de (1–)3–5–6 estames, dispostos em duas séries, nas flores masculinas ou hermafroditas, com 1–4 estaminódios ou suprimidos em diferentes gêneros, anteras com conectivos expandidos ou contraídos, e anteras de deiscência rimosa, poricida ou ainda rimosa, mas funcionalmente poricida. O gineceu é sempre súpero, 3-carpelar, mas a aborção de um ou mais lóculos são comuns em espécies de inúmeros gêneros (e.g. *Aneilema* R.Br.,

*Commelina* L.) ou caracterizam gêneros inteiros (e.g. *Floscopa* Lour.). Os frutos são cápsulas 2–3-valvadas, raro frutos secos indeiscentes, mais raro ainda bagas, as sementes possuem uma caliptra que fica posicionada sobre o embrião e é denominada embrioteca; a posição dessa estrutura se mostra de grande relevância taxonômica (Faden 1985; Faden 1991; Faden 1998; Panigo *et al.* 2010). A família é economicamente importante devido ao valor ornamental de inúmeros gêneros e pelo grande número de espécies invasoras, especialmente nos gêneros *Commelina* e *Tradescantia* L. (Hunt 2001; Burns 2008).

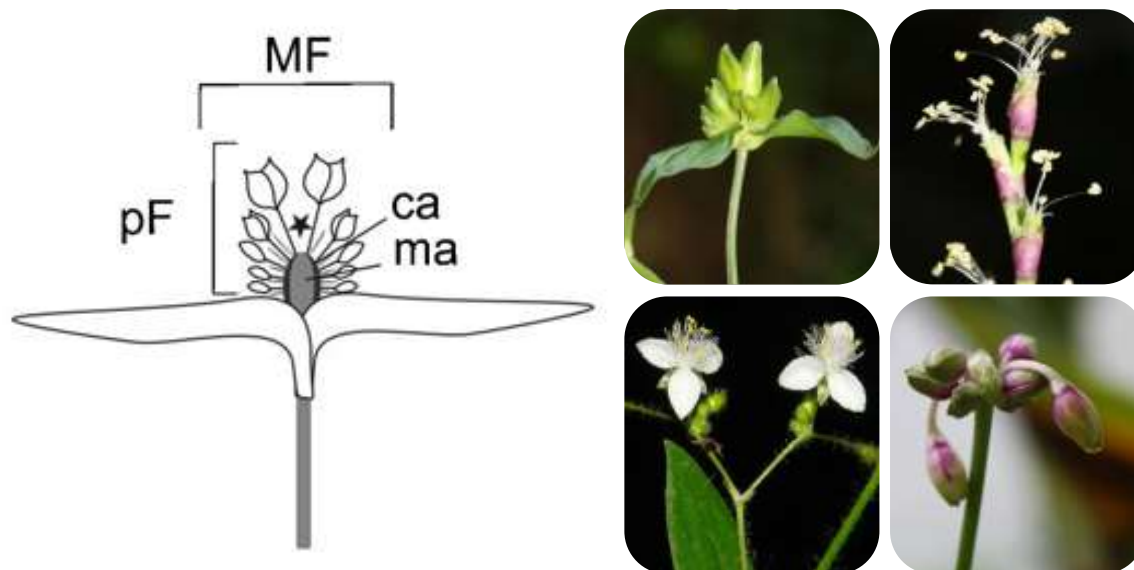
Atualmente Commelinaceae encontra-se dividida em duas subfamílias corroboradas por dados morfológicos e moleculares (Faden & Hunt 1991, Evans *et al.* 2003, Burns *et al.* 2011): Cartonematoideae e Commelinoideae (Fig. 1). Entretanto, estudos moleculares ainda são necessários para definir melhor os limites entre as subfamílias e tribos, já que a posição da subtribo Palisotinae ainda é incerta. *Palisota* Rchb., o único gênero da subtribo, é ora recuperado como grupo-irmão do restante da subfamília Commelinoideae (Evans *et al.* 2003) ou como grupo-irmão da tribo Commelineae (Burns *et al.* 2011). Cartonematoideae é restrita a Ásia, Austrália e África, e é representada por dois gêneros e cerca de 15 espécies (Faden 1998). Commelinoideae abrange a maior diversidade da família, com 39 gêneros, e distribuição predominantemente tropical e subtropical, sendo definida pela presença de canais de ráfides nunca próximos às nervuras foliares e pela presença de microtricomias glandulares. A subfamília é dividida em duas tribos Commelineae e Tradescantieae, a última sendo parafilética (Faden & Hunt 1991; Evans *et al.* 2003) (Fig. 1). Commelineae é caracterizada por apresentar estômatos com seis células subsidiárias onde o par terminal é menor que o segundo par lateral, os grãos de pólen apresentam exina espinulosa e teto perforado, flores predominantemente zigomorfás e tricomas nos filamentos (quando presentes) geralmente não moniliformes (Faden & Hunt 1991).



**Figura 1.** Árvore filogenética da família Commelinaceae resultante da análise combinada do gene plastidial *rbcL* e dados morfológicos (modificado de Evans *et al.* 2003).

A tribo Tradescantieae é caracterizada por apresentar estômatos com duas a quatro células subsidiárias, quando seis, o par terminal maior ou igual ao par lateral, os grãos de pólen apresentam exina insular-cerebroide e teto não-perforado, flores predominantemente actinomorfas e tricomas moniliformes nos filetes (Faden & Hunt 1991). Em sua atual circunscrição (Faden & Hunt 1991), a tribo é dividida em sete subtribos, sendo recuperada como parafilética, devido à posição de *Palisotinae*. A tribo tem sido foco de grande parte dos trabalhos sistemáticos na família, com vários gêneros revisados ou descritos recentemente (e.g. *Dichorisandra*, *Gibasis* Raf., *Plowmanianthus*

Hardy & Faden, *Tripogandra* Raf.; Aona 2008, Hunt 1986a, Hardy & Faden 2004, Handlos 1975, respectivamente). Ainda nesta tribo, grande parte dos esforços se concentrou em tentar organizar gêneros taxonomicamente complexos, como *Tradescantia* e *Callisia* Loefl. (Hunt 1975, 1980, 1986b, 1986c, respectivamente). As subtribos Tradescantiinae e Thysantheminae formam um clado exclusivamente Neotropical (Wade *et al.* 2006), chamado de “Complexo *Tradescantia*” por Woodson (1942) e “Aliança *Tradescantia*” por Hertweck & Pires (2014). Ambas as tribos são



**Figura 2.** Inflorescência característica da subtribo Tradescantiinae, chamada de duplo cincino dorsalmente fusionado. **MF**= Florescência principal; **pF**= Florescência parcial; **ma**= eixo principal; **ca**= eixo do cincino. Começando da esquerda superior, em sentido horário, estão representantes dos quatro gêneros atualmente aceitos em Tradescantiinae: *Tradescantia*, *Callisia*, *Tripogandra* e *Gibasis*. Modificado de Panigo *et al.* 2010.

recuperadas como parafiléticas em todos os trabalhos de filogenia realizados até o momento (Evans *et al.* 2000, Evans *et al.* 2003, Wade *et al.* 2006, Burns *et al.* 2011, Hertweck & Pires 2014). Entretanto, nenhuma posição taxonômica sobre a circunscrição das mesmas foi tomada, sendo ainda aceita a circunscrição originalmente proposta por Faden & Hunt (1991).

Tradescantiinae (*sensu* Faden & Hunt 1991) é composta pelos gêneros *Callisia*, *Gibasis*, *Tradescantia* e *Tripogandra*. A subtribo é caracterizada pelas suas florescências principais, que consistem de um tirso reduzido a apenas dois cincinos, fusionados dorsalmente, ou por dois a vários cincinos estipitados e geniculados organizados em um tirso umbelado (Faden & Hunt 1991; Panigo *et al.* 2010) (Fig. 2). Os cincinos são geralmente contraídos, em oposição aos cincinos alongados da subtribo Thysantheminae, com a exceção mais marcante sendo *Callisia warszewicziana* (Kunth

& Bouché) D.R.Hunt, que possui cincinos alongados e parcialmente fusionados (Faden & Hunt 1991). Ambas as subtribos vem sendo recuperadas como parafiléticas em todos os estudos filogenéticos, utilizando tanto dados moleculares quanto dados morfológicos, devido à inclusão de *Elasis* D.R.Hunt em Tradescantiinae (e.g. Evans *et al.* 2000; Evans *et al.* 2003; Wade *et al.* 2006; Hertweck & Pires 2014). A subtribo Thyrsoantheminae não apresenta sinapomorfias morfológicas e representa um agrupamento heterogêneo de gêneros pequenos ou monoespecíficos (obs. pess.).

*Tradescantia*, em sua circunscrição atual, é o segundo maior gênero da família com ca. 80 espécies e uma distribuição natural exclusivamente neotropical (Faden 1998; eMonocot 2010; The Plant List 2013). A última revisão taxonômica para o grupo foi realizada por Clarke (1881), que reconheceu 36 espécies organizadas em três seções. Duas das seções reconhecidas por Clarke (1881) atualmente são tratadas como gênero: *Descantaria*, caracterizada pelos estames dimorfos, hoje corresponde ao gênero *Tripogandra* (Handlos 1975); e *Monantha*, caracterizada pelas inflorescências unifloras axilares hoje corresponde ao gênero *Matudanthus* D.R.Hunt (Hunt 1978). A terceira seção, *Eutradescantia*, caracterizada por apresentar seis estames iguais ou subiguais, continha representantes atualmente posicionados em: *Callisia*, *Elasis*, *Gibasis*, *Gibasoides* D.R.Hunt e *Tradescantia sensu* Hunt (1980).

Com base em seus estudos sinópticos sobre a tribo Tradescantieae, Hunt (1975, 1980, 1986b) propôs uma nova classificação infragenérica para *Tradescantia*, que passou a abrigar 12 seções e quatro séries (subordinadas a uma mesma seção). Grande parte das seções estabelecidas por este autor representavam gêneros tradicionalmente segregados de *Tradescantia* como: *Campelia* Rich., *Cymbispatha* Pichon, *Mandonia* Hassk. *nom. illeg.*, *Rhoeo* Hance, *Setcreasea* K.Schum. & Sydow, e *Zebrina* Schnizl. Fora isso, outras seções propostas representam complexos de espécies tradicionalmente reconhecidos por outros autores, como o complexo *T. fluminensis* Vell. (Woodson 1942) e o complexo *T. virginiana* L. (Anderson & Woodson 1935). Essa classificação é atualmente aceita para o gênero, apesar de metade das seções propostas serem monoespecíficas (i.e. *Campelia*, *Coholomia*, *Parasetcreasea*, *Rhoeo*, *Separotheca* e *Zebrina*), o que se mostra pouco prático do ponto de vista sistemático.

Recentemente duas filogenias utilizando caracteres moleculares (Burns *et al.* 2011; Hertweck & Pires 2014) abordaram a classificação infragenérica proposta for

Hunt (1975, 1980, 1986b). Burns *et al.* (2011) apresentaram uma filogenia para a subfamília Commelinoideae e focaram a sua amostragem nos dois maiores gêneros da família, *Commelina* e *Tradescantia*, com o intuito de testar suas classificações infragenéricas. Esse trabalho teve representantes de nove das 12 seções e três das quatro séries propostas por Hunt (1975, 1980, 1986b), com uma pequena parcela das espécies do grupo (apenas 18 das ca. 80 espécies) e poucas espécies *typus* amostradas. O trabalho de Hertweck & Pires (2014) dispôs de uma amostragem bem mais ampla (30 de ca. 80 espécies), contando com algumas seções previamente não amostradas, porém manteve uma lacuna referente às espécies *typus* das seções e séries. Apesar da grande diferença amostral entre os trabalhos, a topologia recuperada é bastante congruente. Desconsiderando as seções monoespecíficas (i.e. 50% delas), apenas duas seções são consistentemente recuperadas como monofiléticas (i.e. *Austrotradescantia* e *Setcreasea*), dessas *Austrotradescantia* sempre com suporte elevado (BS= 84/ PP= 100, Burns *et al.* 2011; BS= 100, Hertweck & Pires 2014). Além disso, a seção apresenta características fitoquímicas (Martínez & Martínez 1993), citológicas (Jones & Jopling 1972) e morfológicas (Owens 1981) bastante características. *Tradescantia* seção *Austrotradescantia* nunca foi revisada, tendo recebido apenas uma sinopse (Hunt 1980), onde foi apresentado o número estimado de espécies, a distribuição da seção e sua morfologia geral. Esta dissertação se insere nesse contexto, visando preencher essa lacuna de conhecimento sobre o gênero *Tradescantia*, especialmente sobre a seção *Austrotradescantia*.

## OBJETIVOS

- Solucionar os problemas nomenclaturais envolvendo os nomes brasileiros de *Tradescantia*;
- Esclarecer os limites morfológicos entre as seções *Austrotradescantia* e *Cymbispatha*;
- Testar o monofiletismo de *Tradescantia* seções *Austrotradescantia* e *Cymbispatha*, e apresentar uma hipótese da sua relação com as seções restantes de *Tradescantia*, com base em caracteres morfológicos;
- Realizar a revisão taxonômica e apresentar a primeira hipótese filogenética para *Tradescantia* seção *Austrotradescantia*;



## ORGANIZAÇÃO DA DISSERTAÇÃO

A presente dissertação se encontra dividida em três capítulos que tratam da nomenclatura, taxonomia e filogenia de *Tradescantia* com enfoque na seção *Austrotradescantia*. Cada capítulo é apresentado na forma de artigo seguindo as normas de formatação das revistas onde cada um deles foi ou será submetido. A seguir, apresentamos uma breve sinopse de cada capítulo:

- **CAPÍTULO 1– A nomenclatural and taxonomic review of *Tradescantia* (Commelinaceae) species described in Vellozo’s *Flora fluminensis* with notes on Brazilian *Tradescantia*** – Esse capítulo encontra-se publicado na revista *Taxon* e apresenta uma revisão nomenclatural e taxonômica dos nomes de *Tradescantia* descritos pelo Frei José Mariano da Conceição Vellozo em sua obra *Flora fluminensis*.
- **CAPÍTULO 2– (Con)Fused bracts: The identity and application of *Tradescantia cymbispatha* and a neglected new *Tradescantia* species from Bolivia** – Esse capítulo encontra-se formatado segundo a revista *Taxon* e trata sobre questão nomenclatural envolvendo o nome *Tradescantia cymbispatha* C.B.Clarke que gerou confusão taxonômica entre *Tradescantia* as seções *Austrotradescantia* e *Cymbispatha*.
- **CAPÍTULO 3– Wandering through South America: Taxonomic revision and phylogeny of *Tradescantia* sect. *Austrotradescantia* (Comelinaceae)** – O Capítulo 3 encontra-se formatado de acordo com a revista *Botanical Journal of the Linnean Society* e apresenta a revisão taxonômica de *Tradescantia* sect. *Austrotradescantia* D.R.Hunt. Nesse capítulo também é apresentada uma hipótese filogenética *Tradescantia* seção *Austrotradescantia*, feita com base em caracteres morfológicos, citogenéticos e fitoquímicos.

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# CAPÍTULO 1

# A nomenclatural and taxonomic review of *Tradescantia* (Commelinaceae) species described in Vellozo's *Flora fluminensis* with notes on Brazilian *Tradescantia*

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**Abstract** *Tradescantia* names from Vellozo's *Flora fluminensis* are revised, five lectotypes and one epitype are designated; one name is accepted and three names are treated as synonyms. Notes on *Tradescantia* sect. *Austrotradescantia* and *Tradescantia* sect. *Cymbispatha* are presented, based on the studies of Vellozo's names. Also, further notes on the Brazilian *Tradescantia* and a key for the sections occurring in Brazil are here presented.

**Keywords** *Austrotradescantia*; *Cymbispatha*; Neotropical flora; Rio de Janeiro; Tradescantiinae

## ■ INTRODUCTION

During the 18th century (specifically 1777–1808), the Portuguese Empire conducted several scientific expeditions throughout its world-wide domains, called by historians the “Portuguese Philosophical Travels” (Pataca, 2011). These expeditions were divided and organized based on the political structure of the colonies. The Brazilian territory was covered by two expeditions: a northern one settled in the Amazonian city of Belém, coordinated by Alexandre Rodrigues Ferreira, and a southeastern one in Rio de Janeiro, coordinated by Friar José Mariano da Conceição Vellozo (Damasceno, 1977; Pataca, 2011).

The monumental publication *Flora fluminensis* was the result of Vellozo's expeditions and is the first work on the flora of Brazil that was written and edited by a Brazilian. It includes descriptions and illustrations of 1640 plants, arranged in one volume of descriptions and eleven volumes of plates (Borgmeier, 1961; Carauta, 1973; Cervi & Rodrigues, 2010). Borgmeier (1961) and Carauta (1969) have already discussed the complicated publishing history of this work in great detail. To summarize their discussion, *Flora fluminensis* was completed by Vellozo in 1790, but due to countless political reasons, printing up to page 352 was only completed in 1825 (Borgmeier, 1961; Carauta, 1969, 1973), and the distribution of the work began in 1827 (Carauta, 1973). A complete version of the text was only issued in 1881; in a special issue of the *Archivos do Museu Nacional do Rio de Janeiro* (Borgmeier, 1961; Lima, 1995), edited by Ladislau de Souza Mello-Netto, Director of the Museu Nacional do Rio de Janeiro (Mello-Netto, 1881). The printing of the plates was completed in 1829, but the distribution of the volumes did not occur until 1831

(Carauta, 1973). Nevertheless, two centuries later, most of the names of Commelinaceae described have not been properly reviewed or acknowledged. This is due to the historical difficulty associated with accessing physical copies of the publication, its complicated publishing history, and the overall depreciation of Vellozo's work (Borgmeier, 1961; Carauta, 1969, 1973; Valle, 1985).

As part of the ongoing studies of the revision of *Tradescantia* sect. *Austrotradescantia* D.R.Hunt by the authors, we conducted an extensive review of the Commelinaceae names published by Vellozo. We present the results of this review here together with taxonomical notes on Brazilian *Tradescantia* L. and a key for the Brazilian sections of *Tradescantia*.

## ■ TYPIFICATION

Many researchers have assumed that Vellozo did not make collections of the plants that he described as new. In fact, Vellozo's original specimens were sent to the Museu Real de Lisboa between 1797 and 1798; where he stayed for a while, organizing the herbarium collection (Borgmeier, 1937). During his stay at the Museu Real de Lisboa, it is probable that he inserted the specimens from his *Flora fluminensis* into the herbarium (Borgmeier, 1937, 1961; Lima, 1995). In addition to the specimens Vellozo placed in Lisboa, Hamy (1908) referred to 246 Vellozo specimens arranged in two separate batches (117 and 129 specimens) that were stated to have arrived in Portugal, with the first batch (consisting of 117 specimens) being sent to Paris (Bocage, 1862). Despite evidence that specimens collected by Vellozo, presumably including types of the names

he introduced, arrived in Europe, nothing is known about the current whereabouts of a single Vellozo specimen. Despite repeated attempts by botanists over many years, no original material has ever been found in Portugal or in Paris (e.g., Lima, 1995; Pastore, 2013). Due to the lack of vouchers, the iconographies have frequently been used by botanists for the purpose of reviewing the taxa described by Vellozo (Carauta, 1969; Mello Filho, 1975; Cervi & Rodrigues, 2010; Buzatto & al., 2013; Pastore, 2013; Aona-Pinheiro & al., 2014).

After a careful analysis of the *Flora fluminensis* we conclude that the illustrations of Commelinaceae presented by Vellozo (1831) are in general accurate, with few being considered inaccurate. According to the *Code* (McNeill & al., 2012: Art. 38.9), illustrations with analysis or diagnosis are eligible as type specimens. Since none of Vellozo's original specimens have been located, and in accordance with the requirements of the *Melbourne Code* (McNeill & al., 2012: Art. 9.3), the illustrations mentioned in the protologue, although published later, are considered to be part of the author's original material. Thus, Vellozo's illustrations are here selected as lectotypes. We have also designated an epitype when the original plate was insufficient to apply a name to a given species with certainty. The species are presented here in the same order as that of Vellozo's *Flora fluminensis* and the accepted names appear in bold.

## ■ TAXONOMY

1. *Tradescantia capitata* Vell., Fl. Flumin.: 139. 1829, nom. illeg., non Blume 1827 – **Lectotype (designated here):** [illustration] Original parchment plate of *Flora fluminensis* in the Manuscript Section of the Biblioteca Nacional, Rio de Janeiro [cat. no.: mss1198652\_155] and later published in Vellozo, Fl. Flumin. Icones 3: t. 151. 1831.

= ***Tradescantia zanonía*** (L.) Sw., Prodr.: 57. 1788 ≡ *Commelina zanonía* L.

*Nomenclatural notes.* – Due to the tortuous publishing history of Vellozo's work (Borgmeier, 1961; Carauta, 1969, 1973; Valle, 1985), doubt has arisen regarding whether Blume's or Vellozo's name had priority. Since Vellozo's *Flora fluminensis* was only effectively published in 1829 (Carauta, 1973), *Tradescantia capitata* Vell. is a later homonym of *T. capitata* Blume (= *Belosynapsis ciliata* (Blume) R.S.Rao). Thus Vellozo's name is illegitimate.

*Taxonomical notes.* – The plate for *Tradescantia capitata* Vell. perfectly illustrates the habit of *T. zanonía*, specifically the indumentum of the leaves (glabrous adaxially and villous to lanate abaxially), the axillar inflorescences breaking through the leaf-sheaths, the capitate stigma, and the capsules covered by the persistent and fleshy sepals. Thus, it is clear that *T. capitata* Vell. is a synonym of *T. zanonía*. This name was already cited as a synonym of *Campelia zanonía* (L.) Kunth (≡ *Tradescantia zanonía*) by Sampaio & Peckolt (1943).

2. *Tradescantia fluminensis* Vell., Fl. Flumin.: 140. 1829 – **Lectotype (designated here):** [illustration] Original parchment plate of *Flora fluminensis* in the Manuscript

Section of the Biblioteca Nacional, Rio de Janeiro [cat. no.: mss1198652\_156] and later published in Vellozo, Fl. Flumin. Icones 3: t. 152. 1831.

*Nomenclatural notes.* – *Tradescantia fluminensis* is the oldest name for this species and it is the type for *T. sect. Austrotradescantia*. This name is widely used in local Floras and taxonomic studies (e.g., Hunt, 1980; Barreto, 1997; Aona, 2009; Aona & Pellegrini, 2014). In the original description, Vellozo (1829) mentioned some ecological features of the species, including its occurrence in marine-influenced vegetation (restinga), but gave no specific location. Despite many efforts to collect *T. fluminensis* from restinga areas in Rio de Janeiro State have been made, all of these to date have been unsuccessful. The municipality of Paraty was the subject of at least one of Vellozo's expeditions (Borgmeier, 1937; Lima, 1995), and it possesses one of the few areas with well-preserved restinga vegetation in the state of Rio de Janeiro, being most probably the type locality of *T. fluminensis*.

3. *Tradescantia geniculata* Vell., Fl. Flumin.: 140. 1829 (“*giniculata*”), nom. illeg., non Jacq. 1763 ≡ *Cymbispatha geniculata* (Vell.) Pichon in Notul. Syst. (Paris) 12: 224. 1946 – **Lectotype (designated here):** [illustration] Original parchment plate of *Flora fluminensis* in the Manuscript Section of the Biblioteca Nacional of Rio de Janeiro [cat. no.: mss1198652\_157] and later published in Vellozo, Fl. Flumin. Icones 3: t. 153. 1831 – **Epitype (designated here):** BRAZIL. Rio de Janeiro, Petrópolis, bairro Castelânea, fl., 8 Aug 2010, *M.O.O. Pellegrini 17* (RB No. 595794!; isoeotype: RFA No. 36865!). — For an image of the lectotype, see Fig. 1A–B.

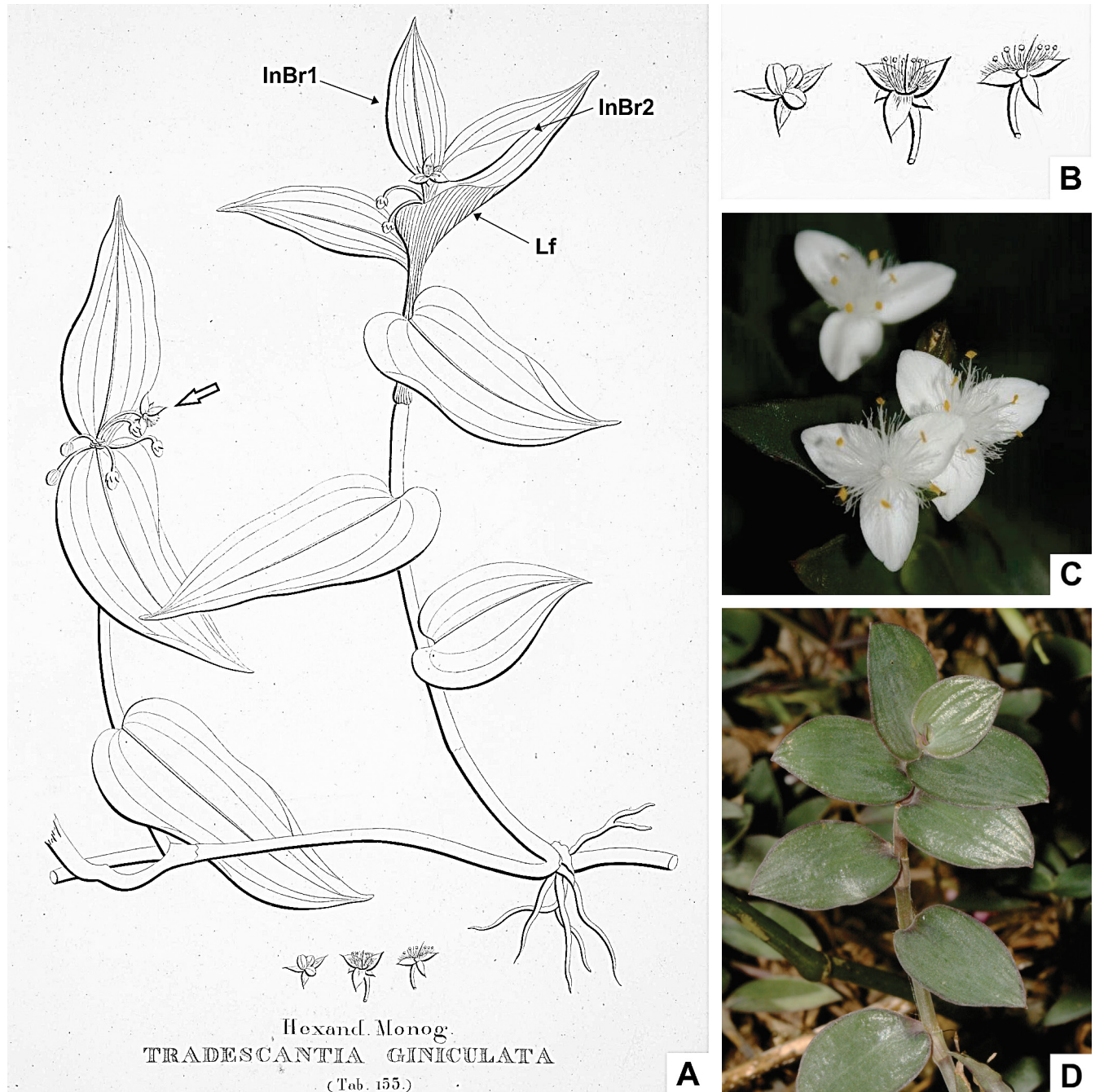
= ***Tradescantia mundula*** var. ***scabrida*** Seub. in Martius, Fl. Bras. 3(1): 249. 1855, **syn. nov.** – **Lectotype (designated here):** BRAZIL. s. loc., s. dat., *F. Sellow 3852* (B barcode B 10 0247278!).

*Nomenclatural notes.* – *Tradescantia geniculata* Vell. (published as *T. giniculata* in the *Icones*, an orthographic variant), the oldest name for this species, unfortunately is rendered illegitimate by the pre-existing *T. geniculata* Jacq. (≡ *Gibasis geniculata* (Jacq.) Rohweder). Although the plate presented by Vellozo for *T. geniculata* (1831: t. 153) is not informative for identification at the species level, it was clear enough to place this taxon in *T. sect. Austrotradescantia*.

There appears to be an historical confusion between *Tradescantia* sect. *Austrotradescantia* and *T. sect. Cymbispatha* (Pichon) D.R.Hunt. The confusion began with Clarke (1881), who described *T. cymbispatha* C.B.Clarke, which had subequal stamens (the two whorls being of different lengths), and listed *T. geniculata* Vell. as a synonym of his new species. Later, Pichon (1946) described the genus *Cymbispatha*, and characterized it as possessing inflorescences subtended by two cymbiform (spathe-like), basally fused bracts and seeds with lateral to semi-lateral embryotega. Pichon (1946) placed *T. cymbispatha* within the genus *Cymbispatha*, but to avoid the creation of a tautonym (McNeill & al., 2012: Art. 23.4), combined *T. geniculata* instead, unaware that it was an illegitimate name. Hunt (1980) reduced many of the genera segregated from

*Tradescantia* to sections of the latter, with *T.* sect. *Cymbispatha* being characterized by possessing inflorescences subtended by two cymbiform (spathaceous), basally fused bracts, subequal stamens, linear-sagitate to laterally tapered connective (sometimes the intern angle of the connective so obtuse that it is almost) and seeds with lateral to semi-lateral embryotege.

During the ongoing revision of *Tradescantia* sect. *Austrotradescantia*, it was found that none of the Brazilian *Tradescantia* species showed any of these characters. Vellozo's plate for *T. geniculata* (Vellozo, 1831: t. 153) shows the upper view of an inflorescence (Fig. 1A, white arrow), giving the impression that the bracts are fused, a characteristic of the section



**Fig. 1.** *Tradescantia geniculata* and *T. mundula* var. *scabrada*. **A–B**, image of the *T. geniculata* plate from the Biodiversity Heritage Library: **A**, line drawings of habit, inflorescence and floral characters (white arrow shows inflorescence seen from above); **B**, detail of floral and fruit characters, showing an open capsule, a complete flower and a flower with dissected corolla. **C–D**, *T. mundula* var. *scabrada*: **C**, detail of floral characters; **D**, detail of the stem and leaf morphology. — InBr1, inflorescence bract 1; InBr2, inflorescence bract 2; Lf, leaf. — All field photos by M.O.O. Pellegrini.



*Cymbispatha*. Nevertheless, the inflorescence on the right side, shown in lateral view, clearly shows that the bracts are separate from each other (Fig. 1A, InBr1 and InBr2). Moreover, the androecium details on the plate show six, equal-length stamens, with apparently rhomboid connective and punctate stigma (Fig. 1B).

Seubert (1855) described *Tradescantia mundula* var. *scabrída* (Fig. 1C–D) where he cited only Sellow “crescit in Brasilia meridionali” in the protologue. The material “*F. Sellow 3852*” was identified by Seubert himself as *T. mundula* var. *scabrída* and is well preserved, thus being the best option for a lectotype.

*Tradescantia geniculata* Vell. was cited by Clarke (1881) and Pichon (1946) as an accepted species and by Hunt (1980) as a name of uncertain status. Apart from that, it has remained neglected in recent Commelinaceae papers.

*Taxonomical notes.* – Vellozo’s description, in which he considers the stems as reptant, the leaves as cordate-oblong and the calyx (called by him “receptaculum”) as villous leaves no doubt regarding the inclusion of this name under the synonymy of *Tradescantia mundula* var. *scabrída*. It can be characterized by its velutine and fleshy leaves, which are bluish-green adaxially and vinous abaxially, with the secondary veins inconspicuous. The velutine hairs are hyaline and adpressed to the leaves making them hard to see with the naked eye, but are evident under the stereomicroscope.

4. *Tradescantia commelina* Vell., Fl. Flumin.: 140. 1829, nom. illeg., non Neuenh. 1797 – **Lectotype (designated here):** [illustration] Original parchment plate of *Flora fluminensis* in the Manuscript Section of the Biblioteca Nacional, Rio de Janeiro [cat. no.: mss1198652\_158] and later published in Vellozo, Fl. Flumin. Icones 3: t. 154. 1831).

= *Tripogandra diuretica* (Mart.) Handlos in *Rhodora* 77: 259. 1975 ≡ *Tradescantia diuretica* Mart.

*Nomenclatural notes.* – The illegitimate name *Tradescantia commelina* Vell. is a later homonym of *T. commelina* Neuenh. (= *Tinantia erecta* (Jacq.) Fenzl). This name was cited by Clarke (1881) and Handlos (1975) as a synonym of *Tripogandra diuretica*.

*Taxonomical notes.* – The plate presented for *Tradescantia commelina* (Vellozo, 1831: t. 154) clearly matches *Tripogandra diuretica* due to its linear-lanceolate leaves with an asymmetric base (those congested at the apex of the stem) and obovate petals. Also, the description cites the dimorphic stamens (characteristic of the genus), with barbate upper stamens.

## ■ RESULTS AND DISCUSSION

With the exclusion of *Tradescantia geniculata* Vell. from *T. sect. Cymbispatha*, the latter ceases to be represented in Brazil. The taxonomical confusion regarding *T. cymbispatha* C.B. Clarke will be dealt with in a future paper (Pellegrini & al., in prep.). The application and the sectional position of *T. repens* Vand. and *T. valida* G.Brückn. is still uncertain, with further investigations needed.

Thus, *Tradescantia* in Brazil is represented by three naturally occurring sections (*T. sect. Austrotradescantia*, *T. sect. Campelia* (L.C.Rich.) D.R.Hunt, *T. sect. Mandonia* D.R.Hunt) and a sub-spontaneous one (*T. sect. Zebrina* (Schnizl.) D.R.Hunt, which is native from Mexico). *Tradescantia* sect. *Campelia* is monospecific (Hunt 1986), and *T. sect. Mandonia* and *T. sect. Zebrina* are represented in Brazil by one species each (*T. ambigua* Mart. and *T. zebrina* Heynh. ex Bosse, respectively). *Tradescantia* sect. *Austrotradescantia* is represented by about 10 species. A key for the sections of *Tradescantia* occurring in Brazil is presented below.

### Key to the Brazilian sections of *Tradescantia*

1. Leaves spirally alternate; inflorescences axillary ..... 2
1. Leaves distichously alternate; inflorescences terminal or terminal and axillary ..... 3
2. Inflorescences perforating the leaf-sheath, pedunculate; sepals fleshy, vinous and tightly enclosing the capsule (forming a berry-like fruit); petals obovate, white; anthers white, connective sagitate; ovary glabrous; stigma trilobate ..... *T. sect. Campelia*
2. Inflorescences not perforating the leaf-sheath, sessile; sepals membranous, green, loosely enclosing the capsule; petals ovate to elliptic, pinkish to lilac; anthers yellow to yellowish-orange, connective rectangular to rhomboid; ovary hirsute; stigma truncate ..... *T. sect. Mandonia*
3. Cincinnus bracts conduplicate, falciform; sepals irregularly fused; petals clawed, fused in the mid portion of the claw (flowers tubular); stamens subequal, epipetalous, connective tapered; style cylindrical with obconical apex; stigma trilobate ..... *T. sect. Zebrina*
3. Cincinnus bracts leaf-like and slightly smaller than the leaves; sepals free; petals not clawed, free (flowers flat); stamens equal, free, connective rhomboid; style cylindrical with conical apex; stigma punctate ..... *T. sect. Austrotradescantia*

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# CAPÍTULO 2

1 **PELLEGRINI & AL., (Con)Fused bracts**

2  
3 **(Con)Fused bracts: The identity and application of *Tradescantia cymbispatha* and a**  
4 **neglected new *Tradescantia* species from Bolivia**

5  
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15

16 **Abstract.**

17 Towards a better understanding on the taxonomy of the enigmatic *Tradescantia*  
18 *cymbispatha* C.B.Clarke (Commelinaceae) – the source of the taxonomical confusion  
19 between *Tradescantia* sect. *Austrotradescantia* and sect. *Cymbispatha* – we reexamined  
20 the protologues of *T. geniculata* Vell., *T. mundula* var. *scabrida* Seub., *T. cymbispatha*  
21 C.B.Clarke var. *cymbispatha* and *T. cymbispatha* var. *villosissima* C.B.Clarke, *C.*  
22 *geniculata* Pichon, *T. cerinthoides* Kunth, and *T. koernickeana* Seub. Our analysis  
23 revealed a great deal of confusion caused by a misinterpretation of Vellozo's plate for *T.*  
24 *geniculata*. We conclude that *T. cymbispatha* is the accepted name for *T. geniculata*.  
25 Clarke's descriptions were based on a miscellaneous assembling of three different  
26 species of *Tradescantia*, and *T. cymbispatha* var. *villosissima* does not represent a  
27 variety, but it is in fact a synonym of *T. cerinthoides*. Due to this misunderstanding, a  
28 new *Tradescantia* species from Bolivia remained undescribed until now. More  
29 importantly, we clear the taxonomical confusion between these two sections and  
30 provide a table of morphological characters that distinguish them from each other.

31 **Keywords.**

32 *Austrotradescantia*, Brazil, *Cymbispatha*, Neotropical flora, Tradescantiinae, spiderwort

33

## 34 INTRODUCTION

35 In the last revision of Commelinaceae, Clarke (1881) published the most  
 36 comprehensive taxonomic treatment of *Tradescantia* L. to date. This treatment  
 37 recognized 36 species arranged in three sections. The first section, *Eutradescantia*, was  
 38 characterized by having six equal to sub-equal stamens; the second, *Descantaria*, was  
 39 characterized by having dimorphic stamens; and the third, *Monantha*, was characterized  
 40 by one-flowered axillar inflorescences. Currently, 12 sections and approximately 80  
 41 species are recognized in the genus (Faden, 1998; Hunt, 1975, 1980, 1986), with  
 42 sections *Austrotradescantia* and *Cymbispatha* presenting rather complicated taxonomic  
 43 histories and different unresolved names.

44 *Tradescantia cymbispatha* C.B.Clarke is the source of the long-standing  
 45 confusion between section *Austrotradescantia* and section *Cymbispatha* (Pellegrini &  
 46 al., 2015). It all began with Clarke's (1881) mention of *T. geniculata* Vell. (as *T.*  
 47 *giniculata*) on his species' protologue, as a synonym of his new name (Pellegrini & al.  
 48 2015). Clarke considered *Tradescantia cymbispatha* to be close to *T. commelinoides*  
 49 Schult. & Schult.f. due to its six unequal stamens, fused spathaceous cincinni bracts and  
 50 lateral embryotega. Clarke (1881: 296) also cites herbaria specimens from Bolivia and  
 51 Brazil (from the states of Minas Gerais and São Paulo), while *T. geniculata* was  
 52 described from state of Rio de Janeiro (Vellozo 1829). However, no other specimen  
 53 matching Clarke's (1881) concept of this species has been found in Brazil since then,  
 54 despite intensive fieldwork and an extensive survey of *Tradescantia* and its relatives in  
 55 herbaria. *Tradescantia cymbispatha* was considered of doubtful application by Hunt  
 56 (1980), have been used in that way in three floras (Barreto, 1997; Aona, 2010; Aona &  
 57 Pellegrini, 2015) and having been neglected in two others (Barreto, 2005; Aona, 2009).

58 In their revision of the *Tradescantia* names published by Vellozo, Pellegrini & al.  
 59 (2015) asserted that there is a great deal of taxonomical confusion involving *T.*  
 60 *geniculata* and *T. cymbispatha*, and that some riddles remain unsolved. In order to better  
 61 understand this enigmatic name, we reexamined the protologues of all names potentially  
 62 associated to the issue. In our analysis, it became clear that *T. cymbispatha* should be  
 63 the accepted name for *T. mundula* var. *scabrida* Seub., that the description provided by  
 64 Clarke was based on a miscellaneous assembling of three different *Tradescantia*  
 65 species, that *T. cymbispatha* var. *villosissima* C.B.Clarke does not represent a variety,  
 66 but is in fact a synonym of another species, and finally, that this confusion supports a  
 67 neglected new *Tradescantia* species from Bolivia.

## 69 METHODS

70 We reexamined the protologues of *T. geniculata* Vell., *T. mundula* var. *scabrida*,  
 71 *T. cymbispatha* C.B.Clarke var. *cymbispatha* and *T. cymbispatha* var. *villosissima*, *C.*  
 72 *geniculata* Pichon, *T. cerinthoides* Kunth, and *T. koernickeana* Seub. Additional  
 73 specimens from the following herbaria were also analyzed: B, G, K, LPB, MO, NY, P,  
 74 S and US (herbarium acronyms following Thiers, cont. updated).

75 The terminology of indumenta and shapes follows Radford & al. (1974);  
 76 inflorescence and morphology terminology follows Weberling (1965, 1989) and Panigo  
 77 & al. (2011), with some modifications; fruit terminology follows Spjut (1994); and seed  
 78 terminology follows Faden (1991). The conservation status was proposed following the  
 79 recommendations and criteria of *IUCN Red List Categories and Criteria, Version 3.1*  
 80 (IUCN, 2001). GeoCAT (Bachman & al., 2011) was used for calculating the Extent of  
 81 Occurrence (EOO) and the Area of Occurrence (AOO). The map was elaborated using

82 the software QGIS 2.6.1., data referring to the altitudinal gradient was taken from  
 83 Worldclim (Hijmans & al. 2005) and the distribution records were taken from the  
 84 analyzed herbaria material. Table 2, which presents the differences between  
 85 *Tradescantia* section *Austrotradescantia* and section *Cymbispatha*, was compiled based  
 86 on our ongoing revision of *Tradescantia* section *Austrotradescantia* (Pellegrini & al., in  
 87 prep.), herbaria and field material, on species protologues and other specialized  
 88 literature.

89

## 90 **THE IDENTITY AND APPLICATION OF *TRADESCANTIA CYMBISPATHA***

91 In his *Flora Fluminensis*, Vellozo (1829) described four new *Tradescantia*  
 92 species, one of them being *Tradescantia geniculata*. This is the oldest name for this  
 93 species, but it was rendered illegitimate since it is a posterior homonym of *T. geniculata*  
 94 Jacquin [= *Gibasis geniculata* (Jacq.) Rohweder] (Art. 54.1 of the *Code*, McNeill & al.,  
 95 2012; Pellegrini & al. 2015). In his taxonomic revision of Commelinaceae, Clarke  
 96 (1881) introduced different new genera and species for the family, but only four new  
 97 names were proposed for *Tradescantia*. *Tradescantia cymbispatha* C.B. Clarke which  
 98 was indirectly, but validly, proposed as a replacement name (Art. 41.3 of the *Code*,  
 99 McNeill & al., 2012) for the illegitimate *Tradescantia geniculata* Vell. (Jones & al.,  
 100 1981). As noted by Pellegrini & al. (2015), *T. geniculata* Vell. is a synonym of the older  
 101 *T. mundula* var. *scabrida* Seub. After intense field work in South and Southeastern  
 102 Brazil it became clear that this taxon merited the species rank. Nevertheless, as names  
 103 have no priority outside the rank in which they were published (Art. 11.2 of the *Code*,  
 104 McNeill & al., 2012), Clarke's name is the correct name for this species. Also,  
 105 according to the *Code* (Art. 7.4, McNeill & al., 2012), the type of *T. cymbispatha* is to  
 106 be considered the same as Vellozo's *T. geniculata* (1831: t. 153) and not the "*G.*  
 107 *Mandon 1237*" specimen from Bolivia, as previously understood by some (e.g. Tropicos  
 108 2014).

109 After examining all specimens cited by Clarke (1881: 296), it became clear that  
 110 they belong to three different species, namely *T. cerinthoides* Kunth, *T. umbraculifera*  
 111 Hand.-Mazz., and an undescribed new species from Bolivia. This analysis enabled us to  
 112 conclude that Clarke's description of the vegetative morphology of *T. cymbispatha* var.  
 113 *cymbispatha* is based on the material "*A. St.-Hilaire 548*" (which represents *T.*  
 114 *umbraculifera*), from the state of Minas Gerais, Brazil, whereas the description of the  
 115 reproductive (inflorescence, flower, fruit and seed) morphology is solely based on the  
 116 "*G. Mandon 1237*" specimen. His description of *T. cymbispatha* var. *villosissima* is also  
 117 a miscellaneous assembling, since the vegetative morphology is based on the "*A. St.-*  
 118 *Hilaire 1500*" (which represents *T. cerinthoides*) specimen from São Paulo, Brazil,  
 119 whereas the description of the reproductive morphology is solely based on the "*G.*  
 120 *Mandon 1237*" specimen. Nevertheless, as Clarke cited only one specimen for *T.*  
 121 *cymbispatha* var. *villosissima*, no typification is needed.

122 Since the specimens listed by Clarke (1881) represent three different species of  
 123 *Tradescantia*, his description of *T. cymbispatha* represents a miscellaneous assembling  
 124 and should not be regarded as a characterization of this species. Diagnostic features for  
 125 this species are given in Pellegrini & al. (2015), under the name *Tradescantia mundula*  
 126 var. *scabrida*, and a complete description will be presented in the ongoing taxonomic  
 127 revision of *Tradescantia* sect. *Austrotradescantia* (Pellegrini & al., in prep.)

128

129 **1. *Tradescantia cymbispatha* C.B. Clarke, in De Candolle, Monogr. Phan. 3: 296. 1881,**

130 ≡ *Tradescantia cymbispatha* var. *cymbispatha* C.B.Clarke, in De Candolle  
 131 Monogr. Phan. 3: 296. 1881, **syn. nov.** -- Basionym: *Tradescantia geniculata*  
 132 Vell., Fl. Flumin.: 140. 1829, nom. illeg. non *T. geniculata* Jacq., Select. Stirp.  
 133 Amer. Hist.: 94, t. 64. 1763 ≡ *Cymbispatha geniculata* Pichon, Notul. Syst. (Paris)  
 134 12: 224. 1946 -- Lectotype (designated by Pellegrini & al. 2015): [illustration]  
 135 Original parchment plate of “*Flora fluminensis*” in the Manuscript Section of the  
 136 Biblioteca Nacional of Rio de Janeiro [cat. no.: mss1198652\_157] and later  
 137 published in Vellozo, Fl. Flumin. Icones 3: t. 153. 1831 -- Epitype (designated by  
 138 Pellegrini & al. 2015): BRAZIL. Rio de Janeiro, Petrópolis, bairro Castelânea, fl.,  
 139 8 Aug 2010, *M.O.O. Pellegrini 17* (RB No. 595794!; isoeptype: RFA No.  
 140 36865!).

141 = *Tradescantia mundula* var. *scabrida* Seub. in Martius, Fl. Bras. 3(1): 249. 1855, **syn.**  
 142 **nov.** -- Lectotype (designated by Pellegrini & al. 2015): BRAZIL. *s. loc.*, *s. dat.*,  
 143 *F. Sellow 3852* (B barcode B 10 0247278!).  
 144

145 **2. *Tradescantia cerinthoides* Kunth, Enum. Pl. 4: 83. 1843 -- Lectotype (designated**  
 146 **here):** BRAZIL. Brasilia meridionalis, Dec. 1836, *F. Sellow 2963* (B 2ex barcode  
 147 B 10 0521011!, B 10 0521012!; isolectotypes: K barcode K 000363273!).

148 = *Tradescantia cymbispatha* var. *villosissima* C.B.Clarke, in De Candolle, Monogr.  
 149 Phan. 3: 296. 1881, **syn. nov.** Holotype: BRAZIL. Provincia de São Paulo, *s. die*,  
 150 *A. St.-Hilaire 1500* (P barcode P 02174044!)

151 = *Tradescantia koernickeana* Seub. in Martius, Fl. Bras. 3(1): 249. 1855 -- **Lectotype**  
 152 **(designated here):** BRAZIL Rio Grande do Sul, Rio Pardo, 23 Sept. 1833, *F.*  
 153 *Sellow 3033a* (B barcode B 10 0521013!; isolectotype: K barcode K 001040251!).  
 154

155 **Comments.** — When describing *T. cerinthoides*, Kunth (1843) cites that the  
 156 specimen in which he based his description was a collection from Sellow from southern  
 157 Brazil. Seubert (1855) cites collections by Sellow as examined material for the same  
 158 region and for the municipality of Rio Pardo, state of Rio Grande do Sul, as he describes  
 159 *T. koernickeana*. Clarke (1881) considers *T. koernickeana* a synonym of *T. cerinthoides*  
 160 and cites two materials (“*F. Sellow 2963*” and “*F. Sellow 3033a*”), which are considered  
 161 as syntypes of the latter. Hunt (2001) cites “T: Brazil, Rio Grande do Sul *F. Sellow*  
 162 *3033a* [B, K (fragment)]” as the lectotype for *T. cerinthoides*, indicating the material  
 163 was at B and K, but as the author did not indicate that an lectotype was being  
 164 designated, a valid typification was not accomplished (Art. 7.10 of the *Code*, McNeill &  
 165 al., 2012). Nonetheless, “*F. Sellow 2963*” matches perfectly the descriptions provided  
 166 by Kunth (1843) and Seubert (1855) for *T. cerinthoides*, but most importantly it  
 167 possesses a description and an attached illustration, in Kunth’s handwriting. In face of  
 168 the above mentioned, we designate “*F. Sellow 2963*” as the lectotype for *T.*  
 169 *cerinthoides*.

170 After analyzing “*F. Sellow 3033a*” materials at B and K, we noticed that they  
 171 fitted perfectly into Seubert’s concept of *T. koernickeana*, and the specimens matched  
 172 the specifications given by the author on the species protologue. The specimen  
 173 deposited at B was identified as *T. koernickeana* by Seubert himself. Thus, the specimen  
 174 at B seems to be the logical choice for a lectotype  
 175



176 **NAMING THE UNNAMED**

177 Several misinterpretations of Vellozo's plate (e.g. Clarke 1881; Pichon 1946) led  
 178 different authors to believe that the specimen from Bolivia had already been described.  
 179 Until now, this species has been mistakenly treated as *T. cymbispatha* and remained  
 180 officially unnamed. Therefore, it is described below as *Tradescantia praetermissa*  
 181 M.Pell.

182  
 183 ***Tradescantia praetermissa*** M.Pell., **sp. nov.**, Fig. 1

184 *Ad section Cymbispatha* (Pichon) D.R.Hunt *pertinens*, *Tradescantia commelinoidea*  
 185 Schult. & Schult.f. *affinis*, *sed ab ea radices gracili, foliis basi leviter inaequalibus*  
 186 *subpetiolatis, petalis alba, filamenta sursum barbata, connectivo cordatum-romboide*  
 187 *differt.*

188 **Holotype**:—BOLIVIA. Larecaja, near Sorata, Cerro del Iminapi, Fev.--May 1860, fl.,  
 189 fr., *G. Mandon 1237* (K barcode K 000363267!; isotypes: G No. 25290!, P 3ex barcode  
 190 P 02173916!, P 02173917!, P 02173918!, S barcode S 05-5926!, US barcode US  
 191 02219086!).

192  
 193 **Herbs** perennial, terrestrial or rupicolous, ca. 20–70 cm tall. **Roots** thin, fibrous. **Stem**  
 194 decumbent to ascending, delicate to slightly succulent, branching at the base, rarely  
 195 branching at the upper half, rooting at the basal nodes; internodes 3.8–15.9 cm long at  
 196 base, distally shorter, green with vertical reddish-purple striations to reddish-purple with  
 197 green spots, glabrous, with a leaf-opposed longitudinal line of short, uniseriate, light-  
 198 brown to hyaline hairs in the terminal portion of the stems. **Leaves** distichously-  
 199 alternate, sessile to subpetiolate; sheaths 0.7–2.6 cm long, green, hirsute turning  
 200 glabrous towards the apex, margin densely ciliate, hairs light-brown to hyaline; petiole  
 201 ca. 0.1–1.1 cm long to indistinct; blades elliptic to broadly elliptic to ovate to broadly  
 202 ovate, 1.7–10.4 × (0.7–)1.1–3.6 cm, flat, membranous, densely hirsute on both sides  
 203 turning sparsely hirsute to glabrous towards the apex of the stems, adaxially glossy  
 204 light-green, abaxially slightly lighter, rarely vinous tinted, turning olive-green to light-  
 205 brown when dry, base symmetrical to slightly asymmetrical, cordate to obtuse, rarely  
 206 cuneate, margin green to reddish-purple, entire, slightly revolute, apex acute to  
 207 acuminate; midvein conspicuous, adaxially impressed, abaxially prominent, rounded,  
 208 secondary veins conspicuous, adaxially slightly impressed, abaxially inconspicuous,  
 209 becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in  
 210 the distal portion of the stems, composed of a solitary main florescence or a main  
 211 florescence with 1–2 paraclades; main florescences a pedunculate double-cincinni fused  
 212 back to back; peduncles 0.6–3.3 cm long, green, glabrous with a dense longitudinal line  
 213 of short, uniseriate, light-brown to hyaline hairs; supernumerary bracts sometimes  
 214 present, leaf-like to slightly spathaceous, the same size as the leaves; peduncle bracts  
 215 present or not, bladeless sheaths, rarely with a reduced leaf-like blade, 1–2(–3) per main  
 216 florescence; cincinni bracts similar to each other, broadly cordate to cordate, 0.9–2.5 ×  
 217 1–2 cm, spathaceous, spread, hirsute to sparsely hirsute only at the margins to glabrous  
 218 on both sides, adaxially yellowish-green to light-green, abaxially slightly lighter, base  
 219 cordate to obtuse, overlapping, rarely separate from each other, fused, margin minutely  
 220 ciliolate becoming setose towards the base of the bract, apex acute; double cincinni ca.  
 221 (2–)4–8-flowered, condensed; bracteoles expanded, linear, hyaline. **Flowers** bisexual,  
 222 weakly zygomorphic due to calyx zygomorphy, ca. 1.5–2 cm diam., pedicels 3–5.8 mm  
 223 long, green, glabrous, geniculate at pre-anthesis and anthesis, reflexed at post-anthesis;

224 floral buds ovoid, zygomorphic, apex acute; sepals unequal, ovate, cucullate, 3.4–6.4 ×  
 225 2–3 mm, green, margin hyaline, apex acute, the uppermost bigger than the inferior two,  
 226 keeled, with long hyaline hairs along the keel, the lower two not-keeled, glabrous; petals  
 227 rhomboid to obovoid, not-clawed, 0.7–0.8 × 0.7–1 cm, white, base cuneate, margin  
 228 entire, apex obtuse to slightly rounded; stamens 6, in two whorls, unequal in length, the  
 229 outer whorl opposite to the sepals, shorter, the inner whorl opposite to the petals, longer,  
 230 filaments 3–7 mm long, distally sparsely bearded, hairs white, moniliform, much shorter  
 231 than the filaments, anthers ca. 1–1.5 × 0.8–1.1 mm, connective expanded, subcordate to  
 232 rhomboid-cordate, yellow, anther sacs globose to slightly elliptic, light-yellow, pollen  
 233 white colored; ovary sub-globose, 1.1–1.2 × 0.5–0.7 cm, white, glabrous, locules 3,  
 234 equal, 2-ovulate, style 1.8–2 cm long (shorter than the stamens), straight, white, stigma  
 235 subtrilobate, white. **Capsule** ellipsoid, apiculate due to persistent style base, 3.5–5.5 ×  
 236 2–2.7 cm, brown when mature. **Seeds** uniseriate, 1–2 per locule, ellipsoid to narrowly  
 237 trigonal, ventrally flattened, 1.9–2.3 × 1–1.4 mm, brownish to greyish-brown, testa  
 238 rugose arranged in radiated ridges, hilum linear, ½ the length of the seed, embryotega  
 239 semi-lateral.

240 **Examined material (Paratypes).** — **BOLIVIA. Cochabamba:** between Monte  
 241 Puncu and Sehuencas, 4 Feb. 1995, fl., *J.R.I. Wood 9302* (K); **La Paz:** Franz Tamayo,  
 242 Area Natural de Manejo Intregado Apolobamba, Madidi, Apolobamba, Cueva de  
 243 Selumacan, al lado del río de Pelechuco, por el antiguo camino Pelechuco-Apolo, 8 Jun.  
 244 2008, fl., fr., *A.F. Fuentes et al. 12848* (LPB, MO); *loc. cit.*, ladera de Jacotika, camino  
 245 de herradura Pelechuco-Apolo, bordeando río de Pelechuco, 13 Jun. 2008, fl., *H.*  
 246 *Huaylla & A.F. Fuentes 2774* (LPB, MO); *loc. cit.*, primera quebrada Santa Ana-  
 247 Jacotika, camino de herradura Pelechuco-Apolo, bordeando río de Pelechuco, 13 Jun.  
 248 2008, fl., *H. Huaylla & A.F. Fuentes 2856* (LPB); Murillo, Valle del Río Zongo, 32.1  
 249 km al N de la cumber, cerca de la boca del Río Jachcha Cruz, 14 Feb. 1988, *J.C.*  
 250 *Solomon 17817* (MO, US); *loc. cit.*, 27.4km below North dam at Lago Zongo, 16 Mar.  
 251 1984, fl., *J.C. Solomon et al. 11850* (MO); *loc. cit.*, Valle del Río Zongo, vecinidad de  
 252 Escuela Cambaya, 10 May 1990, fl., fr., *J.C. Solomon et al. 19046* (LPB, MO); *loc. cit.*,  
 253 Tunari, Apr. 1892, fl., *O. Kuntze s.n.* (NY barcode NY 02219083, US barcode US  
 254 00045845); **Santa Cruz:** Siberia, entre El Empalme y Locotal, 8 Apr. 2004, fl., fr., *D.*  
 255 *Rocabado et al. 466* (MO, NY, US). **ECUADOR. Azuay:** Nudo de Portete, pass  
 256 between headwaters of the rivers Tarqui and Giron, 10 Mar. 1945, fl., *W.H. Camp E-*  
 257 *2151* (K, NY); *loc. cit.*, 17km Southwest of Giron, 15 Jun. 1971, fl., fr., *B. MacBryde*  
 258 *450* (MO); **Chimborazo:** Cañon of the river Chanchan, about 3,11 mi north of Huigra,  
 259 19--28 May 1945, fl., fr., *W.H. Camp E-3298* (K, NY). **PERU. Amazonas:**  
 260 Chachapoyas, Leymebamba, Carretera a Celendín, entre Ishpingo-Pomacocha, 20 Aug.  
 261 1998, fl., fr., *V. Quipuscoa et al. 1385* (US); *loc. cit.*, a few kilometers from  
 262 Monlinapampa, 13 Mar. 1998, fl., *H. van der Werff et al. 14861* (MO); *loc. cit.*,  
 263 Chachapoyas, uppermost slopes and summit of Puma-urcu southeast of Chachapoyas,  
 264 fl., 7 Jun. 1962, *J.J. Wurdack 807* (NY, US); **Cajamarca:** Santa Cruz, ca. 3km ENE  
 265 Monteseo, 5 May 1987, fl., fr., *J. Santiesteban C. & J. Guevara 3* (F, MO, NY);  
 266 **Cusco:** Quispicanhis, Marcapata, 176km from Cusco on road to Maldonado, 8 Mar.  
 267 1991, fl., *P. Núñez & C. Paycarmayta 13092* (MO); *loc. cit.*, Urubamba, Machupicchu,  
 268 *s.d.*, fl., *D. Stafford 1225* (K); *loc. cit.*, Urubamba, river Urubamba, Machupicchu, Dec.  
 269 1946, fl., fr., *S.G.E. Saunders 3616* (K); *loc. cit.*, agus calientes, ruinas de Machupicchu,  
 270 24 Mar. 1987, fl., fr., *P. Núñez 7584* (MO, US); *loc. cit.*, 17 Jan. 2001, fl., *J.R. Grant et*  
 271 *al. 01-3906* (NEU, US); *loc. cit.*, Urubamba, Machupicchu, Puyupatamarca, 25 May

272 2004, fl., *W. Galiano et al.* 6459 (US, MO); *loc. cit.*, La Convención, Choq'ekiraw, 18  
 273 May 2004, fl., *L. Valenzuela et al.* 3517 (MO, US); *loc. cit.*, near Río Yanamayo,  
 274 bellow Pillahuata, 4--5 May 1925, fl., fr., *F.W. Pennell* 14034 (NY, US); **Concepción:**  
 275 Mito, 8--22 Jul. 1922, fl., fr., *Macbride & Featherstone* 1617 (US); **Huánuco:**  
 276 Chinchao, cumbre de Carpish, fl., 7 Feb. 1972, *J. Schunke* V. 5233 (F, NY); *loc. cit.*,  
 277 several kilometers West of Carpish summit, 8 Nov. 1938, fl., *H.E. Stork & O.B. Horton*  
 278 9897 (K); *loc. cit.*, trail from South entrance of Carpish tunnel to crest of ridge, 27 Feb.  
 279 1978, fl., *J.L. Luteyn & M. Lebron-Luteyn* 5468 (MO, NY, US); Huánuco, Carpish,  
 280 entre Tingo María y Huánuco, 4 Aug. 1947, fl., fr., *R. Ferreyra* 2110 (US); **Junín:**  
 281 Campalanayoc [Chanchamayo], near Palca, 11 Jan. 1986, fl., *Rudall & Kenton* 128-756  
 282 (K); *loc. cit.*, Tarma, Palca, Tarma-San Ramon road, 24 Dec. 1961, fl., *S.G.E. Saunders*  
 283 705 (K); *loc. cit.*, Río Comas, 1909--1914, fl., *A. Weberbauer* 6610 (NY, US); **Pasco:**  
 284 Cordillera Yanachaga, 12km East of main Oxapampa-Villa Rica road, 2 Mar. 1982, fl.,  
 285 fr., *A. Gentry & D. Smith* 35933 (MO, US); **Puno:** roadside, 10km South of Sandia, 14  
 286 Mar. 1986, fl., *B. Bennett* 2516 (NY).

287 **Etymology.** — The epithet means “overlooked”, “ignored”, in reference to this  
 288 species being neglected for such a long time.

289 **Distribution.** — It is known to occur in Bolivia, Ecuador and Peru (Fig. 2).

290 **Habitat.** — It is known to occur in the Andean region, rocky outcrops, wooded  
 291 slopes, moist cloud forest and moist forested valleys, between 1600--3200 m above the  
 292 sea level.

293 **Phenology.** — Blooming from November throughout June and fruiting from  
 294 March to June, more rarely in December.

295 **Conservation status.** — The degradation of the Larecaja region, Bolivia, by  
 296 farming, has caused the disappearance on many native species (Ochoa, 2001) which  
 297 reflects in the few recent collections of this species for this region. Nevertheless, *T.*  
 298 *praetermissa* seems to be a common plant elsewhere, growing at road sides and forest  
 299 trails throughout its EOO (around 669,800.000 km<sup>2</sup>) and its AOO (around 52,000.000  
 300 km<sup>2</sup>). Thus, we consider this species Least Concern (LC) according to the IUCN  
 301 criteria.

302 **Affinities.** — *Tradescantia praetermissa* was first compared by Clarke (1881, as  
 303 *T. cymbispatha*) with *T. commelinoides*, the only other species from *Tradescantia*  
 304 section *Cymbispatha* described at the time. They are similar due to the spread cincinni  
 305 bracts, rhomboid to broadly obovate petals, glabrous ovaries and the rugose-alveolate  
 306 testa, but differ from each other due to root morphology, the presence of supernumerary  
 307 bracts, petal color, filament bearding, connective shape and color. *Tradescantia poelliae*  
 308 D.R.Hunt, was segregated from the *T. commelinoides* complex (Hunt 1981), due to root  
 309 morphology, filaments bearding, connective color and shape and seed ornamentation,  
 310 among others differences. The same characters that differentiate *T. poelliae* from *T.*  
 311 *comelinoides*, bring it closer to *T. praetermissa*, but they can be differentiated by  
 312 many other morphological characters. Nevertheless, *T. praetermissa* is more closely  
 313 related to *T. gracillima* Standley, due to the presence of supernumerary bracts, petal  
 314 color, glabrous ovaries and ornamentation of the testa. They can be differentiated from  
 315 each other by their cincinni bracts, petal shape, filaments bearding, connective shape  
 316 and seed color (Table 1). The specimens from Panama identified as *T. cymbispatha*  
 317 represent *T. gracillima*.

318

319 **ON THE BOUNDARIES BETWEEN TRADESCANTIA SECTION**  
 320 **AUSTROTRADESCANTIA AND SECTION CYMBISPATHA**

321 In order to deconstruct the myth of a diffuse morphological boundary between  
 322 *Tradescantia* section *Austrotradescantia* and section *Cymbispatha*, we provide a list of  
 323 morphological characters that differentiate them from each other (Table 2). We reaffirm  
 324 that no representatives of *Tradescantia* section *Cymbispatha* are known to occur in the  
 325 Brazilian territory, as previously stated by Pellegrini & al. (2015). *Tradescantia* sect.  
 326 *Cymbispatha* ranges from Mexico to Bolivia (Andean region), with no overlap with the  
 327 distribution of *Tradescantia* sect. *Austrotradescantia*, which naturally ranges from  
 328 Southeastern and Southern Brazil (its diversity center) to Argentina, Paraguay, Uruguay  
 329 and Bolivia (Chaco region).

330

331 **CONCLUSION**

332 Systematic monographs are the only known mechanism for achieving quality  
 333 control in taxonomy and reducing the number of synonyms that clutter up databases and  
 334 hinder progress in our knowledge of the world's biodiversity and its conservation status  
 335 (Carvalho & al., 2014). Nevertheless, monographs that embrace all species in a given  
 336 group are only as good as the local research and collections that form their foundation.  
 337 The most typical path chosen by monographers is to start understanding a defined area  
 338 or small group of species, increasing the range by studying other floras, examining  
 339 herbarium specimens, studying other aspects of the group's biology and determining the  
 340 group's phylogeny (Thomas & al., 2012). Although several aspects of *Tradescantia*  
 341 such as chemotaxonomy (Martínez & Martínez, 1993), cytology (Jones & Jopling,  
 342 1972) and pollen morphology (Poole & Hunt, 1980) are well known, data on its  
 343 systematics are still scant. The present paper represents one of the steps towards the  
 344 monograph of the genus, a journey which was initiated by the studies of D.R. Hunt  
 345 (1975, 1980, 1986) from Royal Botanic Gardens, Kew.

346

347

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 361 de Janeiro — IB/UFRJ.

362

363

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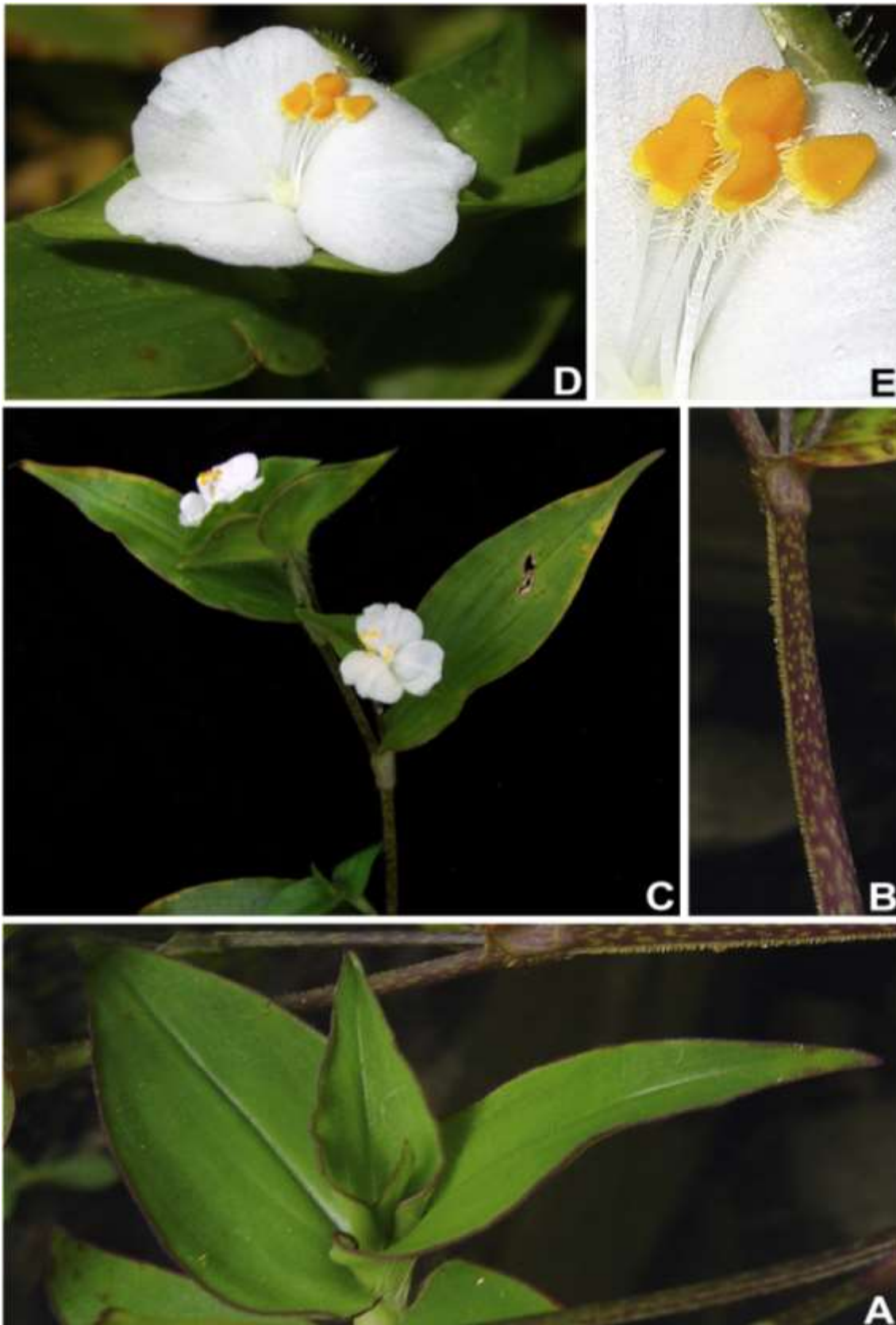
| <b>Character</b>            | <b><i>T. praetermissa</i></b>   | <b><i>T. gracillima</i></b>   | <b><i>T. commelinoides</i></b>  | <b><i>T. poelliae</i></b>                                       |
|-----------------------------|---|---|---|---|
| <b>Roots</b>                | Thin  | Thin  | Tuberous  | Thin  |
| <b>Leaves</b>               | Drying olive-green to light-brown   | Drying olive-green to light-brown   | Drying dark-brown to black  | Drying pinkish-brown  |
| <b>Supernumerary bracts</b> | Sometimes present   | Sometimes present   | Absent  | Absent  |
| <b>Cincinni bracts</b>      | Overlapping (rarely separate from each other), broadly cordate to cordate, spread, apex acute | Separate from each other, broadly depressed ovate to broadly depressed cordate to rotund, folded, apex obtuse | Separate from each other, ovate to cordate, spread, apex acute            | Separate from each other, ovate to elliptic, folded, apex acute |
| <b>Petals</b>               | White, rhomboid to broadly obovate  | White, ovate-trullate   | Magenta to pink to purplish-pink to lavender, rhomboid to broadly obovate | Pink, rhomboid to broadly ovate                                 |
| <b>Filaments</b>            | Sparsely bearded distally   | Glabrous  | Sparsely bearded basally  | Sparsely bearded medially                                       |
| <b>Connective</b>           | Subcordate to rhomboid-cordate, yellow  | Sagitate, yellow  | Tapered, magenta to pink to purplish-pink to lavender                     | Sagitate, yellow  |
| <b>Ovary</b>                | Glabrous  | Glabrous  | Glabrous  | With a few apical hairs   |
| <b>Seeds</b>                | Brownish to greyish-brown, testa rugose   | Brownish to orange-brown, testa finely rugose   | Brownish to greyish-brown, testa rugose-alveolate                         | Grey, testa alveolate   |

**Table 1.** Comparison of diagnostic morphological characters between *Tradescantia praetermissa* and related species.

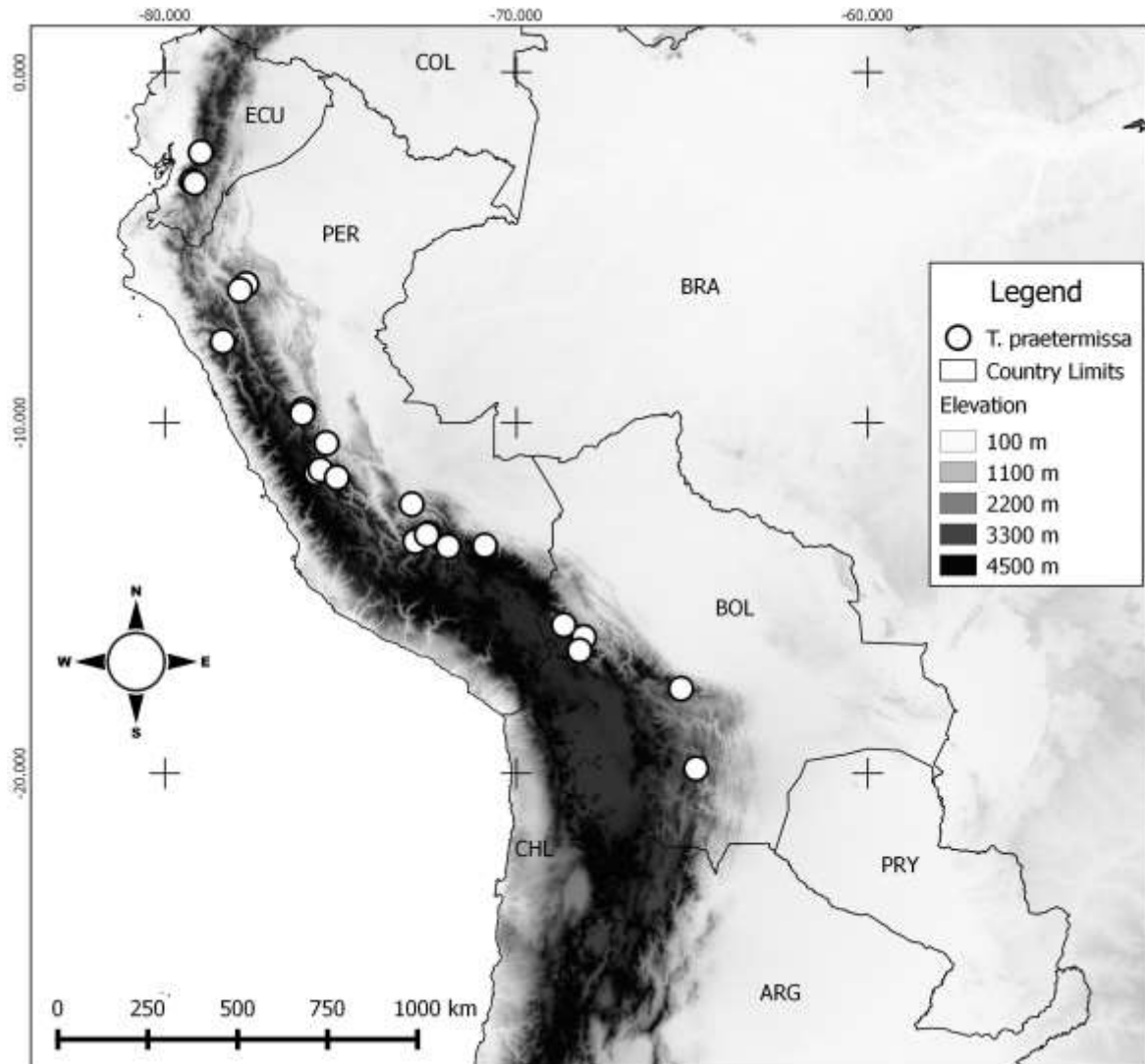
| <b>Character</b>            | <b><i>Tradescantia</i> sect. <i>Austrotradescantia</i> D.R.Hunt</b>   | <b><i>Tradescantia</i> sect. <i>Cymbispatha</i> (Pichon) D.R.Hunt</b>  |
|-----------------------------|---|--|
| <b>Leaves</b>               | Distichously-alternate, very rarely spirally-alternate  | Spirally-alternate or distichously-alternate   |
| <b>Inflorescence</b>        | Composed only of the main florescence   | Composed of the main florescence with 1–more<br>paraclasses, rarely composed only of the main<br>florescence |
| <b>Peduncle bracts</b>      | Absent  | Sometimes present (bladeless sheaths, rarely with an<br>expanded blade)                                      |
| <b>Supernumerary bracts</b> | Absent  | Sometimes present (leaf-like to slightly spathaceous)  |
| <b>Cincinni bracts</b>      | Leaf-like (rarely spathaceous), same size or smaller<br>than the leaves, basally free, the two bracts of different<br>sizes or subequal | Spathaceous, smaller than the leaves, basally fused,<br>bracts equal to subequal                             |
| <b>Sepals</b>               | Equal, all keeled   | Unequal (the uppermost keeled and bigger than the<br>others)   |
| <b>Petals</b>               | Elliptic to ovate   | Obovate to rhomboid to ovate- trullate   |
| <b>Stamens</b>              | Equal   | Subequal (the inner three slightly longer)   |
| <b>Filaments</b>            | Basally densely bearded, hairs as long as the<br>filaments  | Medially to distally (rarely basally) sparsely bearded,<br>hairs much shorter than the filaments             |
| <b>Connective</b>           | Rhomboid  | Cordate to subcordate to rhomboid-cordate to sagitate<br>to tapered  |
| <b>Anther sacs</b>          | Elliptic  | Rounded, rarely elliptic   |
| <b>Pollen</b>               | Yellow  | White  |
| <b>Ovules</b>               | Orthotropous  | Anatropous   |
| <b>Style</b>                | Cylindrical with conical apex   | Cylindrical throughout or with obconical apex  |
| <b>Stigma</b>               | Punctate  | Truncate to trilobate to subtrilobate  |
| <b>Embryotega</b>           | Dorsal  | Lateral to semi-lateral  |
| <b>Chromosome</b>           | Bimodal, small  | Unimodal, medium   |

**Table 2.** Morphological differences between *Tradescantia* sect. *Austrotradescantia* and sect. *Cymbispatha*.





**Fig. 1.** *Tradescantia praetermissa* M.Pell. **A**, leaves, showing reddish-purple margins. **B**, detail of the stem, showing the leaf-opposed line of uniseriate hairs. **C**, habit. **D**, flower. **E**, detail of the androecium, showing the distally bearded filaments and subcordate connectives. Field photos by A.F. Fuentes & H. Huaylla



**Fig. 2.** Distribution map of *Tradescantia praetermissa* M.Pell.

# CAPÍTULO 3

**Wandering throughout South America: Phylogeny and taxonomic revision  
of *Tradescantia* L. sect. *Austrotradescantia* D.R.Hunt (Commelinaceae)**

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**Short running title:** Phylogeny and taxonomic revision of *Tradescantia* sect.  
*Austrotradescantia*

**Abstract:** Throughout the years, three infrageneric classifications were proposed for *Tradescantia* along with several informal groups and species complexes. The current infrageneric classification assimilates many concepts adopted by previous authors. *Tradescantia* sect. *Austrotradescantia* was described, based on the “*T. fluminensis* Vell. complex”, as the only exclusively South American section of the genus. Nevertheless, no taxonomic treatment or phylogenetic study focusing on the group was ever made. Thus, the goal of this study was to infer the phylogenetic relationship between the remaining species of *T.* sect. *Austrotradescantia*, using morphological characters, in order to test the monophyly of sections *Austrotradescantia* and *Cymbispatha*. This study also presents the first taxonomic revision for *Tradescantia* sect. *Austrotradescantia*, with the description of two new species and nomenclatural novelties.

**Keywords:** Inflorescence morphology, invasive species, Tradescantiinae, spiderworts, wandering Jew.

## INTRODUCTION

*Tradescantia* L., as currently circumscribed, is the second largest genus (ca. 80 species) of Commelinaceae (Faden 1998; eMonocot 2010; The Plant List 2013). The family is economically important due to the ornamental value of many genera and by the great number of invasive species, especially in the genera *Commelina* L. and *Tradescantia* (Hunt 2001; Burns 2008). The genus is characterized by its main florescences composed by a double cincinni fused back to back, with each cincinni subtended by an expanded bract, actinomorphic flowers with six stamens, and seeds with linear hilum (Faden 1998; Panigo *et al.* 2011). Throughout the years, three infrageneric classifications were proposed for *Tradescantia*: Clarke (1881), Brückner (1930) and Hunt (1975, 1980, 1986). Aside from that, several informal groups and species complexes have often been recognized by different authors: e.g. Woodson (1942) and Anderson & Woodson (1935). The current infrageneric classification (Hunt 1975, 1980, 1986) assimilates many concepts adopted by previous authors. This classification also restructures the once pulverized *Tradescantia*, by reducing many segregated genera to sectional level (e.g. *Campelia* L.C.Rich., *Cymbispatha* Pichon, *Rhoeo* Hance, *Setcreasea* K.Schum. & Sydow and *Zebrina* Schniz.).

*Tradescantia* sect. *Austrotradescantia* was described by Hunt (1980), based on the “*T. fluminensis* Vell. complex” (Woodson 1942); as the only exclusively South American section of the genus, with its diversity center in Southeastern Brazil. It was characterized by its creeping habit, leaf-like to spatheous cincinni bracts, free petals and stamens, dorsal embryotega and numerous and bimodal chromosomes (Jones & Jopling 1972; Hunt 1980). At the time, Hunt (1980) included five species in the section, later (2001) reducing *T. blossfeldiana* Mildbr. to a synonym of *T. cerinthoides* Kunth. Pellegrini *et al.* (2015– Capítulo 1) reestablished *T. mundula* Kunth while dealing with the *Tradescantia* names of *Flora*

*fluminensis*. While Pellegrini *et al.* (Capítulo 2) solved the application of *T. cymbispatha* C.B. Clarke and considered it a member of the group, leaving the section with six species. Other studies showed that the section also presented a rather peculiar phytochemical profile (Martínez & Martínez 1993) and stigmatic morphology (Owen 1981), which differentiated it from the remaining species of the genus. Members of this section are economically important due to the ornamental value of their leaves, being hardy-plants, and their mat-forming habit. For these same reasons, *T. fluminensis* has escaped from cultivation and has become a major weed in countries such as Australia, New Zealand, Portugal, South Africa and USA (Hunt 2001; Burns 2008; Fowler *et al.* 2013).

*Tradescantia* sect. *Austrotradescantia* has been recovered as monophyletic with high statistical support in the two molecular based phylogenies for *Tradescantia* (BS=84/PP=100, Burns *et al.* 2011; BS=100, Hertweck & Pires 2014). Nevertheless, only two species, *T. fluminensis* and *T. blossfeldiana* (= *T. cerinthoides*) were sampled in both studies. Thus, the phylogenetic relationship among the remaining species of the section is still unknown. As pointed out by Pellegrini *et al.* (2015; Capítulo 2), there seems to be a confusion on the morphological limits between sections *Austrotradescantia* and *Cymbispatha*. Some species have been sometimes positioned in one section or in the other due to this misinterpretation.

Despite possessing few species, *Tradescantia* sect. *Austrotradescantia* has a complicated taxonomic history (Capítulo 2), due to many continuous and reticulate morphological characters (Martínez 1984), which makes terminology adopted by Woodson (1942) of “species complex” rather appropriate for this group (Pellegrini *et al.* 2013). Despite that, no taxonomic revision has ever been made for the section and no identification key is available for the group. Thus, the goal of this study was to infer the phylogenetic relationship between the remaining species of *Tradescantia* sect. *Austrotradescantia*, using

morphological, cytological and phytochemical characters; in order to test the monophyly of sections *Austrotradescantia* and *Cymbispatha*, and the boundaries between them. This study also presents the first taxonomic revision for *Tradescantia* sect. *Austrotradescantia*, including an identification key, synonyms, descriptions, comments, illustrations, distribution maps and conservation status, for all species.

## METHODS

### PHYLOGENETIC ANALYSIS

**Taxon Sampling:** Our study includes sampling from 49 taxa of the *Tradescantia* alliance, including all four genera currently accepted for subtribe Tradescantiinae (i.e. *Callisia*, *Gibasis*, *Tradescantia* and *Tripogandra*) and two genera from subtribe Thyrsantheminae (i.e. *Elasis* D.R.Hunt and *Tinantia* Scheidw.). Our ingroup includes all the 10 species of *Tradescantia* sect. *Austrotradescantia* accepted in the present study, six species from section *Cymbispatha*, four species from section *Tradescantia* (i.e. representatives from all four series: *Orchidophyllae*, *Sillamontanae*, *Virginianae* and *Tuberosae*), two species from section *Setcreasea* and a single species of sections *Campelia*, *Coholomia*, *Corinna*, *Mandonia*, *Parasetcreasea*, *Rhoeo*, *Separothesca*, and *Zebrina*, totaling 30 *Tradescantia* (ca. 38% of the genus). Type species from all section and series currently accepted for *Tradescantia* were sampled. Outgroup is represented by five *Gibasis* (with representatives from both sections *Gibasis* and *Heterobasis*), six *Callisia* (with representatives from sections *Hadrodemas*, *Leptocallisia* and *Callisia*), five *Tripogandra* and the monotypic *Elasis*, and rooted in two *Tinantia*. Details of voucher specimens are given in Table 1.



**Character Selection and Coding:** Characters were scored mainly from living specimens at the field and specimens kept at the Jardim Botânico do Rio de Janeiro greenhouses, and later complemented by spirit and herbarium samples from the same herbaria visited for the taxonomic revision. When living or herborized specimens were not available for examination, information was taken from published literature (Table 2). Character coding followed the recommendations of Sereno (2007) for morphological phylogenies. Primary homology hypotheses (De Pinna 1991) were proposed for root, stem, leaf, inflorescence architecture, floral, fruit, seed, palynological, anatomical characters, phytochemical and cytological characters (which are partly illustrated in Fig. 1). A total of 86 characters were scored, with 76 macromorphological, one palynological, two anatomical, three cytological and four phytochemical.

**Phylogenetic Analysis:** Data was entered into a matrix of characters per taxa using the software Mesquite 2.73 (Madison & Madison 2010). All characters were treated as unordered. Maximum parsimony (MP) analysis was performed using PAUP\* 4. (Swofford 2003), with a heuristic search with 1000 random taxon additions and tree bisection–reconnection (TBR) branch swapping. The consistency (CI) and retention indexes (RI) were calculated. We used the character optimization criterion of ACCTRAN (accelerated transformation optimization) (Swofford & Maddison 1987). Statistical support for each branch of the cladogram was evaluated via bootstrap (BS) analyses with 1000 random addition replication. The search parameters used to estimate the bootstrap values were the same as the initial heuristic search. We also evaluated clade reliability by using the Bremer index (BI) (Bremer 1994) and the presence of secondary homologies. The characters were optimized on the majority-rule (50% values) consensus trees using Mesquite 2.73 and WinClada ver. 1.0000 (Nixon 2002).

## TAXONOMIC REVISION

For a better understanding on the morphological variation of species, we gathered ecological data, live samples for cultivation, new spirit and herbaria vouchers, and field trips. Field trips were performed from 2010 to 2015 throughout the distribution range of the group in Southeastern and Southern Brazil. Live specimens were cultivated in Jardim Botânico do Rio de Janeiro's greenhouse, in order to observe, photograph and analyze fresh flowers, fruits and seeds as well as other phenological data. The description of species, phenology and illustrations were based on herborized, spirit, fresh, and cultivated specimens, besides observations. Fertile collections were deposited in RB herbarium. Additional specimens from the following herbaria were also analyzed: B\*, BHCB, BHZB\*, CESJ, CORD\*, CTES\*, ESA, FLOR, FURB, GUA, HAS, HB, HBR, HUSC\*, IAC, ICN\*, INPA\*, K, LIL\*, LPB\*, M\*, MBM, MBML, MO\*, NY\*, P\*, R, RB, RFA, RFFP, S\*, SI\*, SP, SPF, UEC, UPCB, US\*, VIC\* & WU\* (herbaria acronyms according to Thiers, continuously updated). Herbaria acronyms with \* were had their collections borrowed to RB.

The terminology of indumenta and shapes follows Radford *et al.* (1974); inflorescence morphology terminology follows Weberling (1965, 1989) and Panigo *et al.* (2011), with some modifications; fruit terminology follows Spjut (1994); and seed terminology follows Faden (1991). The conservation status was proposed following the recommendations and criteria of *IUCN Red List Categories and Criteria, Version 3.1* (IUCN, 2001). GeoCAT (Bachman *et al.*, 2011) was used for calculating the Extent of Occurrence (EOO) and the Area of Occurrence (AOO). The maps were elaborated using the software QGIS 2.6.1., data referring to the altitudinal gradient was taken from Worldclim (Hijmans *et al.*, 2005) and the distribution records were taken from the analyzed specimens.

## RESULTS

The cladistic analysis retrieved 5,000 equally parsimonious trees with 424 steps, Consistency Index (CI) of 0.3066 and Retention Index (RI) of 0.7042. From 86 studied characters, 82 were parsimony-informative. The monophyly of *Tradescantia* in its present circumscription is not supported by our analysis due to the position of *T. guatemalensis* (sect. *Coholomia*) as sister to *Elasis hirsuta* (BS= 99; BI= 3) (Fig. 2, 3). This relation can be also observed in the strict consensus (Fig. 5). With the exclusion of *T. guatemalensis*, the synapomorphies supporting the *Tradescantia s.s.* clade (BI= 1) are: erect stems (Character 2), expanded cincinni bracts (Character 34), the ellipsoid to rectangular seed (Character 74, which is a reversion) and leaf epidermis without silica crystals in specialized cells (Character 78, which is a reversion) (Fig. 4). Character 34 suffers only one reversion, being the synapomorphy supporting *T. ambigua* + *T. andrieuxii*. In the strict consensus tree *T. guatemalensis* is also recovered sister to *Elasis* (Fig. 5). This relation is supported by the following synapomorphies: leaves hirsute abaxially (Character 13), pilose sepals (Character 49, homoplastic), filaments sparsely medially bearded with long moniliform hairs (Characters 57–60), pistil shorter than the stamens (Character 71, homoplastic) (Fig. 4). It can be differentiated from *Tradescantia s.s.* by the following characters: reduced cincinni bracts (Character 34), 1–several pedunculate free cincinni (Characters 26, 28, 31), anther connectives not expanded (Characters 65–66), silica crystals in specialized cells with thickened walls (Character 78, homoplastic), mesophyll with bundle sheath sclerenchymatic extensions (Character 79, homoplastic) and chromosome number  $n= 4-5$  (Character 80). *Gibasis* is recovered as polyphyletic, split in three different clades (Fig. 4). *Tripogandra* was recovered monophyletic (BS= 67; BI= 1). *Callisia* is also recovered as polyphyletic, due to the position of *C. filiformis* as sister to *Tripogandra*, and *C. warszewicziana* as sister to

(*Tripogangra* + *C. filliformis*) + *Callisia* s.s. (BS= 56; BI= 1). The clade composed by *Tripogandra* + *Callisia* (BI= 1) is recovered as sister to *Tradescantia* s.s. (BI= 2) (Fig. 4).

*Tradescantia* sect. *Austrotradescantia* is the first clade to diverge in the genus (BS= 76; BI= 2), followed by the *Cymbispatha* clade (BS= 53; BI= 3), then by Core *Tradescantia* (Fig. 6). *Tradescantia* sect. *Austrotradescantia* is defined by the following synapomorphies: asymmetric leaf-bases (Character 16, homoplastic), keeled sepals (Character 47, homoplastic), filaments basally densely bearded with moniliform hairs (Characters 57–60, homoplastic), punctiform stigma (Characters 73), costate testa (Character 76, homoplastic), chromosomes  $n= 10$ –numerous (Character 80), and bimodal chromosomes (Character 82, homoplastic) (Fig. 4). *Tradescantia* sect. *Austrotradescantia* is divided in two clades (Fig. 4). In the strict consensus *T.* sect. *Austrotradescantia* is also recovered, but with all species inside a big polytomy (Fig. 5). The first clade is named as the *Tradescantia fluminensis* group (*T. chrysophylla* M.Pell sp. nov., *T. cymbispatha*, *T. fluminensis*, *T. mundula*, *T. tenela* Kunth, and *T. umbraculifera* Hand.-Mazz.). It is sustained by the following synapomorphies: delicate and creeping stems (Characters 2–3, homoplastic), subpetiolate and flat leaves (Character 6 & 8, homoplastic), cincinni bracts saccate at base (Character 37, homoplastic), and exclusively white petals (Character 55, homoplastic). Despite the low statistical support, the phylogenetic relationships of all species were well resolved, with the *T. chrysophylla* + *T. cymbispatha* clade being medially supported (BS= 71; BI= 1). The second clade is named as the *Tradescantia crassula* group (*T. cerinthoides* Kunth, *T. crassula*, *T. seubertiana* M.Pell. sp. nov., and *T. valida* G.Brückn.) (BS= 52). It is sustained by the following synapomorphies: succulent and erect stems (Characters 2–3, homoplastic), sessile and complicate to falcate leaves (Character 6 & 8, homoplastic), cincinni bracts not saccate at base (Character 37, homoplastic), petals varying from white to pink to lilac (Character 55, homoplastic), costate

testa (Character 76, homoplastic), and by the presence of sulfated phenolic acids (Character 86, homoplastic) (Fig. 4).

The *Cymbispatha* clade is composed by *Tradescantia* sect. *Rhoeo* sister to two clades (BS= 53; BI= 3). In the strict consensus only the clade corresponding to *T.* sect. *Cymbispatha* is still recovered, with the other clade being recovered inside a polytomy (Fig. 5). This clade is supported by the following synapomorphies: inflorescences composed of one main florescence plus 1–several paraclades (Character 22), accessory bracts present (Character 25), supernumerary bracts present (Character 33, homoplastic), spathaceous bracts (Character 35), flowers geniculate at anthesis and/or pre-anthesis (Character 43), subequal stamens (Character 61, homoplastic), connective cordate to sagitate to transversally linear (Character 65–66, homoplastic), white colored pollen (Character 69, homoplastic), lateral to semi-lateral embryotega (Character 75, homoplastic), and chromosome number varying from  $n= 5-6-7-8-10-11$  due to Robertsonian changes (Character 80) (Fig. 4). The first clade is composed by *T.* sect. *Cymbispatha* (BI= 3), being characterized by the following synapomorphies: flat flowers (Character 40, homoplastic) and free stamens (Character 63). The second clade is composed by *T.* sections *Campelia*, *Corinna* and *Zebrina* (BS= 53; BI= 2), and is characterized by its tubular flowers (Character 40, homoplastic), fused sepals (Character 44), and epipetalous stamens (Character 63, homoplastic). Core *Tradescantia* is retrieved as a polytomy of three clades. The following synapomorphies sustain Core *Tradescantia*: tuberous roots (Character 1, homoplastic), lanceolate sepals (Character 46, homoplastic), curved to C-shaped anther sacs (Character 67–68), and the presence of hidroxiluteolin (Character 83) (Fig. 4). The first clade is composed by *T.* sections *Separotheca*, *Setcreasea* and *Tradescantia* (series *Sillamontanae* and *Orchidophyllae*), and is sustained exclusively by floral synapomorphies: obtuse leaf apex (Character 17), tubular flowers (Character 40), filaments glabrous or medially bearded with short and sparse hairs (Characters 57–60), epipetaly

(Character 63), pistil shorter than the stamens (Character 71, homoplastic) and median sized chromosomes (Character 81, homoplastic). The second clade is composed by *T.* sections *Mandonia* and *Parasetcreasea* (BS= 58), and is defined by the following synapomorphies: predominantly axillar inflorescences to spike-like sinflorescences (Character 21), sessile inflorescences (Character 44), reduced cincinni bracts (Character 34) and truncate stigma (Character 73). The third clade is composed by *T.* sect. *Tradescantia* (series *Virginianae* and *Tuberosae*) (BS= 83; BI= 1), having as synapomorphies the linear leaves (Character 7), truncate leaf base (Character 15, homoplastic), conspicuous secondary veins (Character 18) and filaments densely medially bearded with moniliform hairs (Characters 57–59). *Tradescantia* sect. *Tradescantia* was recovered as polyphyletic, since series *Virginianae* and *Tuberosae* form clade two and series *Sillamontanae* and *Orchidophyllae* are part of clade three, called by us the *Setcreasea* clade. *Tradescantia* sect. *Setcreasea* is also recovered as paraphyletic due to section *Separothea* being recovered within it (BS= 66; BI= 2), being supported by its fused petal (Character 51) and by its clawed petals (Character 53) (Fig. 4). This clade is also recovered in the strict consensus (Fig. 5).

## DISCUSSION

This study features the most extensive sampling of *Tradescantia* sections *Austrotradescantia* and *Cymbispatha*, and is the first morphologically based phylogenetic hypothesis for the genus. A high proportion of homoplasies were found in our analysis, being evaluated through the IC and IR indexes, the large number of homoplastic synapomorphies supporting the clades, and the median to low bootstrap values obtained for most clades. This was the expected scenario for the family (Evans & Faden 1998; Evans *et al.* 2000), where most coded characters were recovered as homoplastic and recovered poorly-resolved topologies, highly incongruent to the ones recovered by the molecular dataset (Evans *et al.*

2000). Nevertheless, the 50% majority-rule consensus recovered a hypothesis highly congruent to the two molecular based phylogenies available for *Tradescantia* (Burns *et al.* 2011; Hertweck & Pires 2014). According to Hillis (1996) simulations, the greater sampling for a certain group, the higher the support and phylogenetic resolution for it. Thus, we believe that since our analysis focused on *T.* sections *Austrotradescantia* and *Cymbispatha*, and we sampled few species of the remaining sections, much of the phylogenetic information may have been lost. Thus, we believe that future studies are needed in order to clarify these groups' evolutionary histories.

***Tradescantia s.s. and sectional classification:*** Our topology did not recover *Gibasis*, or part of it within *Tradescantia*, as previous phylogenies did (Burns *et al.* 2011; Hertweck & Pires 2014). The two genera are morphologically, anatomically, cytologically and phytochemically very distinct from each other, and our topology supports that *Tradescantia* and *Gibasis* remain as separate genera. This makes us believe that the *Gibasis* samples (i.e. *G. geniculata*, *G. linearis* and *G. oaxacana*, Burns *et al.* 2011; Hertweck & Pires 2014) that cause both genera to be recovered as paraphyletic may be misidentified or may have suffered from contamination. We were only unable to sample *G. linearis* in our analysis, but none of the sampled species grouped with *Tradescantia*.

Our results agree with the two previous studies (Burns *et al.* 2011; Hertweck & Pires 2014) and does not supported Hunt's sectional classification (1975, 1980, 1986). We recover the same three clade pattern for *Tradescantia*, what makes evident that ecology and biogeography may play a great part in the evolutionary history of the genus. The first clade is restricted to South America, while the second one is restricted to understory environments from Mexico to Argentina. The last clade is restricted to Seasonally Tropical Dry Forests (STDF), deserts and savanna formations concentrated in North America [with exception of *T.*

*ambigua* and *T. boliviana* (Hassk.) J.R.Grant, which occur in the South American Dry Diagonal]. All three clades are supported by macromorphological characters, especially floral characters, cytology and phytochemistry. Nevertheless, further studies and sampling are needed in order to clarify the phylogenetic relationships inside Core *Tradescantia*.

***Tradescantia* sect. *Austrotradescantia*:** As mentioned above, many of the sections proposed by Hunt (1975, 1980, 1986) are not supported by our analysis. Nevertheless, *Tradescantia* sect. *Austrotradescantia* is invariably recovered as monophyletic regardless of the number of species sampled for the group (data not shown). The clade is also consistently recovered as sister to the remaining *Tradescantia* s.s. Both data corroborate the previously published phylogenies (Burns *et al.* 2011; Hertweck & Pires 2014) and also the phylogenetic hypothesis proposed for the genus by Martínez & Martínez (1993), based exclusively on phytochemical characters. This scenario suggests a South American origin in Tropical Rainforests for *Tradescantia*, with a subsequent occupation of the Andes and the West Indies by the *Cymbispatha* clade and a latter occupation of STDF and savannic formations by Core *Tradescantia*.

Two morphological groups can be clearly seen in *T.* sect. *Austrotradescantia*, being also recovered in our phylogeny (Fig. 3). The *Tradescantia fluminensis* group is composed by more herbaceous plants, with stems creeping to ascending at the apex, cincinni bracts saccate at base and petals always white. A marking exception is *T. tenella*, which possess fruticose, erect and extremely succulent stems, not saccate cincinni bracts and flowers that vary from pink to white. Nevertheless, it possesses the long subpetiolate, membranous to chartaceous leaves and conspicuous mid and secondary veins, which are characters common to this group. (Fig. 4). Since the leaves vary from membranous to chartaceous to slightly fleshy, vein pattern is very useful for species differentiation inside this clade. Both *T. fluminensis* (Fig. 11B) and



*T. mundula* (Fig. 12D) possess leaves with adaxially impressed secondary veins, while *T. cymbispatha* (Fig. 10D) possess inconspicuously impressed secondary veins. Cincinni bracts are useful for differentiating *T. umabraculifera*, which is the only species in the section with spatheaceous bracts rather than leaf-like (Fig. 15E). The species in this group occur almost exclusively in Tropical and Subtropical Rainforests, but are also commonly found growing as weedy plants throughout their distribution. The species from the *T. fluminensis* group are of easier distinction, since there is a wide morphological variation in leaf, indumenta and inflorescence characters.

*Tradescantia crassula* group is composed by more succulent plants, which generally grow in open areas, with erect stems, cincinni bracts not saccate at base and petals varying from white to pink to lilac. The leaves from these species are sessile and extremely succulent, with only the midvein conspicuous, but in some individuals of *T. crassula* (Fig. 8A) and *T. seubertiana* (Fig. 13B), the leaves are so fleshy that even the midvein is adaxially inconspicuous. The petal color variation can be found in the same population, under the same ecological conditions, and is probably genetically controlled. The species from the second group are intimately related to the two southern biomes that are characterized by open and /or drier vegetation formations: the Chaco (which is part of the Dry Diagonal) and the Pampa. The species from the *T. crassula* group are morphologically very similar due to many overlapping characters and indumenta type and pattern is the most useful character for separating these species. For the same reason, all species were recovered within a polytomy. Added to this, *T. cerinthoides* and *T. crassula* (the two low land species) possess a rather wide distribution range which overlaps with the narrowly distributed *T. seubertiana* and *T. valida* (both of them restricted to high elevation sites). It is probable that despite the geographical isolation of the last two species, they have not accumulated sufficient morphological autapomorphies to help distinguishing these biological entities. Much variation is recorded for

the two widely distributed species, which leaves few taxonomically informative characters to distinguish taxa. This is the main cause of misidentifications for this group. Thus, we suggest *T. crassula* group to be targeted for phylogeographic and reproductive studies to improve and deepen understanding of the taxonomic boundaries between these taxa.

***Tradescantia* sect. *Cymbispatha* and the *Cymbispatha* clade:** Our analysis reveals that important morphological characters considered being exclusive to *Tradescantia* sect. *Cymbispatha* are actually shared with the *Cymbispatha* clade. These characters are: subequal stamens and lateral to semi-lateral embryotega. Characters like, zygomorphic sepals and pedicels the same size as the flower buds or sessile to subsessile are not exclusive to *T.* sect. *Cymbispatha*, but are actually homoplastic synapomorphies to the two clades (flat flower + tubular flower groups) of the *Cymbispatha* clade. Spathaceous bracts, supernumerary bracts and pollen grains white or the same color as the petals, are recovered in our analysis as homoplastic synapomorphies to the *Cymbispatha* clade. Our topology makes evident the large amount of reproductive characters (inflorescence and floral) that support the *Cymbispatha* clade. Therefore, we suggest this groups' reproductive biology to be targeted for specific studies, in order to better understand the evolution of reproductive strategies in the genus.

## TAXONOMIC TREATMENT

1. *TRADESCANTIA* SECT. *AUSTROTRADESCANTIA* D.R.HUNT, KEW BULL. 35(2): 440. 1980. *Type*

*species: TRADESCANTIA FLUMINENSIS* VELL.

= *Tropitria* Raf., Fl. Tell. 3: 68. 1837. *Type species: Tropitria crassula* (Link & Otto) Raf. (≡

*Tradescantia crassula* Link & Otto)

**Herbs** chamaephytes, perennial, frequently succulent, terrestrial, rupicolous or epiphytes. **Roots** fibrous, non-tuberos. **Stems** creeping to ascending at the apex to erect to fruticose, little to densely branched, rooting at the basal nodes or at the distal ones when they

touch the substrate. **Leaves** sessile to subpetiolate; distichously or spirally-alternate, evenly distributed along the stem; sheaths closed; blades entire, flat to slightly falcate and/or complicate, base asymmetrical, midvein conspicuous, adaxially impressed, abaxially prominent, rounded, secondary veins conspicuous or inconspicuous. **Inflorescences** terminal or axillar in the distal portion of stems, composed of a solitary main florescence; main florescences a pedunculate double-cincinni fused back to back; supernumerary bracts absent; peduncle bracts absent; cincinni bracts leaf-like, rarely spathaceous, differing from the leaves mostly only in size, similar to each other to widely different in size, amplexicaulous or saccate, free from each other; double-cincinni, sessile, congested, bracteoles inconspicuous, hyaline. **Flowers** bisexual, actinomorphic, chasmogamous, flat (not forming a floral tube); pedicel upright at anthesis and pre-anthesis, reflexed at post-anthesis; floral buds ellipsoid to ovoid to broadly ovoid, apex acute; sepal equal, free, ovate, cucullate, dorsally keeled, rarely without keels, margin hyaline, apex acute, persistent in fruit; petals sessile, equal, free, elliptic to ovate to broadly ovate, flat or plicate, base cuneate to obtuse, margin entire, apex acute; stamens 6, arranged in two series, equal, filaments free from the petals, basally densely bearded with moniliform hairs, hairs as long as the stamens, white, anthers basifixed, rimose, connective expanded, rhomboid, yellow, anther sacs ellipsoid, divergent, yellow, pollen yellow; ovary sessile, sub-globose, white, glabrous, 3-locular, locules equal, locule 2-ovulate, ovule uniseriate, style straight, white, cylindrical, conical at the apex, stigma punctate, pistil longer than or the same length as the stamens. **Capsule** globose, light-brown to brown when mature, loculicidal, 3-valved, sometimes apiculate due to persistent style base. **Seeds** exarillate, 1–2 per locule, ellipsoid to narrowly trigonal, ventrally flattened, testa costate to rugose arranged in radiated ridges, hilum linear, embryotega dorsal.

**Distribution and habitat:** *Tradescantia* sect. *Austrotradescantia* is distributed from Southern Bolivia, Paraguay, Argentina, Southeastern to Southern Brazil and Uruguay (Map

1). Its species can be found growing in understory in moist and shady forests, open fields, rocky outcrops and are especially common in disturbed areas.

**Etymology:** The name means *Tradescantia* from the South, making reference to the exclusively South American distribution of the section.

#### KEY TO THE SPECIES OF TRADESCANTIA SECT. AUSTROTRADESCANTIA

1. Leaf-blades linear-lanceolate to lanceolate, base truncate to amplexicaulous to obtuse, apex acuminate; 1–3 inflorescences per leaf axis, cincinni bracts spathaceous, rarely leaf-like..... *T. umbraculifera*
1. Leaf-blades elliptic to ovate to obovate, base cuneate to obtuse to cordate, apex acute, rarely acuminate; always 1 inflorescence per leaf axis, cincinni bracts always leaf-like..... 2
2. Stem erect to ascending; all leaves sessile, blades falcate to complicate; cincinni bracts not saccate at base; pistil longer than the stamens..... 3
3. Leaves distichously-alternate to spirally-alternate, blades with indumenta on both sides or only abaxially, rarely glabrous on both sides, secondary veins adaxially slightly impressed; pedicels and sepals velutine to glandulous to sparsely hirsute to hirsute, sepals without keels..... *T. cerinthoides*
3. Leaves always distichously-alternate, blades glabrous on both sides, secondary veins adaxially inconspicuous; pedicels glabrous, sepals glabrous or with few hairs at the apex or restricted to the keel, sepals keeled..... 4
4. Leaf-sheaths margins glabrous; sepals glabrous..... *T. seubertiana*
4. Leaf-sheaths margins ciliate to setose; sepals with indumenta..... 5

5. Leaf-blades entirely green; pedicels glabrous; sepals green, setose, with sparse hairs restricted to the keel; petals white; testa costate..... *T. crassula*
5. Leaf-blades abaxially vinous tinted to vinous; pedicels sparsely pilose; sepals vinous, pilose at the apex; petals pink; testa rugose..... *T. valida*
2. Stem creeping to ascending at the apex or fruticose; basal leaves generally evidently subpetiolate, rarely all leaves sessile, blades flat; cincinni bracts saccate at base; pistil the same length as the stamens..... 6
6. Fruticose herbs, stems succulent; petals white to pink; testa rugose, hilum shorter than  $\frac{1}{2}$  the length of the seed..... *T. tenella*
6. Non-fruticose herbs, stems herbaceous; petals always white; testa costate, hilum longer than or equal  $\frac{1}{2}$  the length of the seed..... 7
7. Leaf-blades always with indumenta on both sides; basal-leaves sessile, secondary veins inconspicuous adaxially; sepals without keels..... 8
8. Leaf-sheaths velutine, margin setose, blades adaxially blueish-green, velutine, hairs hyaline, adpressed; cincinni bracts similar to each other; sepals velutine..... *T. cymbispatha*
8. Leaf-sheaths hirsute, margin densely hirsute, blades adaxially dark-green, hirsute, hairs golden to light-brown, upright; cincinni bracts strongly unequal among each other; sepals glandulous..... *T. chrysophylla*
7. Leaf-blades usually glabrous, rarely with indument on one or both sides of the blade, basal leaves short subpetiolate, secondary veins adaxially impressed; sepals keeled..... 9

9. Stems glabrous; leaf-sheaths glabrous, blades ovate to broadly ovate, rarely elliptic, membranous to slightly succulent, abaxially light-green, glabrous; floral buds ellipsoid, sepals pilose, hairs restricted to the keel, petals plicate..... *T. fluminensis*
9. Stems minutely velutine to velutine; leaf-sheaths minutely velutine to velutine, blades lanceolate to elliptic to broadly elliptic, rarely ovate, chartaceous, abaxially tinted vinous to vinous, minutely velutine to velutine; floral buds ovoid, sepals velutine in fresh material (hairs caducous when dry, generally persistent only along the keel), petals flat..... *T. mundula*

1.1. *TRADESCANTIA CERINTHOIDES* Kunth, Enum. Pl. 4: 83. 1843. *Type*: BRAZIL. Brasilia meridionalis, xii.1836, *F. Sellow 2963* (lectotype designated by Pellegrini *et al.* Capítulo 2: B 2ex barcode B 10 0521011!, B 10 0521012!; isolectotypes: K barcode K 000363273!). (Fig. 7)

= *Tradescantia crassula* var. *gaudichaudii* C.B.Clarke, Monogr. Phan. 3: 294. 1881. *syn. nov.*

*Type*: BRAZIL. Santa Catarina: *s. die.*, fl., *C. Gaudichaud 112* (holotype: P 2ex barcode P 02173932!, P 02173933!).

= *Tradescantia cymbispatha* var. *villosissima* C.B.Clarke, in De Candolle, Monogr. Phan. 3:

296. 1881. *Type*: BRAZIL. Provincia de São Paulo, *s. die*, fl., fr., *A. St.-Hilaire 1500* (holotype: P barcode P 02174044!).

= *Tradescantia blossfeldiana* Mildbr., Notizbl. Bot. Gart. Berlin-Dahlem 15: 222. 1940. *Type*:

ARGENTINA. *s. loc.*, *s. dat.*, *Blossfeld s.n.* (B *n.v.*).

= *Tradescantia decora* W.Bull, Cat. 1892: 3. 1892, *syn. nov.* *Type*: BRAZIL: Rio Grande do Sul, *s. dat.*, *s. leg. s.n.* (B *n.v.*).

= *Tradescantia koernickeana* Seub. in Martius, Fl. bras. 3(1): 249. 1855. *Type*: BRAZIL Rio Grande do Sul: Rio Pardo, fl., 23.ix.1833, *F. Sellow 3033a* (lectotype designated by Pellegrini *et al.* Capítulo 2: B barcode B 10 0521013!; isolectotype: K barcode K 001040251!).

**Herbs** terrestrial or rupicolous, ca. 12–54 cm tall. **Stem** erect, succulent, little branched, branching at the base, rarely branching at the upper half; internodes 1–7.4 cm long at base, distally shorter, green with vertical reddish-purple striations to vinous, glabrous to velutine to hirsute to glandulous, light-brown to hyaline hairs. **Leaves** distichously-alternate to spirally-alternate, sessile; sheaths 0.3–1.3 cm long, green to pinkish to vinous, glabrous to velutine, margin densely setose to hirsute to glandulous, hairs light-brown to hyaline; blades elliptic to

broadly elliptic to ovate to broadly ovate to obovate, 2–17.5 × 0.9–3 cm, falcate to complicate, succulent, velutine to glandulous on both sides or adaxially glabrous to sparsely hirsute, abaxially hirsute, hairs light-brown to hyaline, rarely glabrous on both sides, adaxially light-green to green to dark-green, rarely with vinous stripes, abaxially green to vinous, turning olive-green to brown when dry, cordate to obtuse, rarely cuneate, margin green to vinous, ciliolate to minutely ciliolate, slightly revolute, apex acute to obtuse; midvein conspicuous, adaxially impressed, secondary veins conspicuous, adaxially slightly impressed, abaxially slightly impressed, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 0.4–5.5 cm long, green to vinous, glabrous to velutine to glandulous, hairs light-brown to hyaline; cincinni bracts similar to each other, broadly elliptic to ovate to broadly ovate, 0.8–5.1 × 0.5–2.1 cm, leaf-like, velutine to hirsute on both sides or adaxially glabrous to sparsely hirsute, abaxially hirsute, hairs light-brown to hyaline, adaxially light-green to green to dark-green, rarely with vinous stripes, abaxially green to vinous, base cordate to obtuse, not saccate, margin minutely ciliolate, apex acute to obtuse; double cincinni ca. 6–20-flowered. **Flowers** ca. 1.3–1.5 cm diam., pedicels 0.5–2 cm long, green to vinous, velutine to glandulous to sparsely hirsute to hirsute, hairs hyaline to light-brown; floral buds ovoid; sepals 5–7.8 × 2.2–3.4 mm, without keels, green to vinous, velutine to glandulous to sparsely hirsute to hirsute, hairs hyaline to light-brown; petals 7.3–7.8 × 4.4–5 mm, flat, white to pink to lilac; filaments 4.7–5.3 mm long, anthers ca. 0.8–1 × 1.1–1.4 mm; ovary 1.2–1.5 × 1.1–1.3 cm, style 2.9–3.6 cm long; pistil longer than the stamens. **Capsule** 3.5–4.5 × 2.3–3 cm. **Seeds** 1.2–2.2 × 0.9–1.7 mm, grey, testa costate arranged in radiated ridges, hilum longer than ½ the length of the seed.

**Examined material:** ARGENTINA. **Buenos Aires:** Isla Martín García, 23.i.1997, fl., fr., *J. Hurrell & M. Belgrano 3415* (LP); La Plata, Gonnet, 15 bis entre Papini y Bordenave,



26.xi.2000, fl., *Delucchi 2451* (LP). **Corrientes**: Capital, Corrientes, 30.xi.1972, fl., fr., *M.C. Kirchmair 4* (CTES). BRAZIL. **Paraná**: Balsa Nova, Serra de São Luis do Purunã, Morro da Santa, região dos Campos Gerais, 6.x.2012, fl., fr., *F. Santos-Silva et al. 166* (RB, UPGB); Curitiba, estrada Curitiba-Ponta Grossa km 38, Serra São Luiz de Purunã, 18.x.1961, fl., fr., *E. Pereira 6081* (RB); *loc. cit.*, estrada Curitiba-Ponta Grossa km 38, Serra São Luiz de Purunã, 18.x.1961, fl., fr., *E. Pereira & G. Pabst 6084* (RB); Ponta Grossa, 18.x.1965, fl., fr., *G.L. Monteiro s.n.* (RFA 7951); *loc. cit.*, Parque Estadual de Vila Velha, 9.xi.1966, fl., fr., *P. Occhioni 3487* (RFA); Prudentópolis, Salto São João, 16.x.2005, fl., *S.L. Jung-Mendaçolli 1148* (IAC); Vila Velha, Parque Estadual de Vila Velha, 12.vii.1962, fl., fr., *Gomes & J. Mattos 1139* (RB). **Rio de Janeiro**: Rio de Janeiro, cultivada, 26.v.1972, fl., fr., *P. Carauta 1514* (RB). **Rio Grande do Sul**: Barão, sudoeste de Garibaldi, estrada para Carlos Barbosa, 22.xi.2005, fl., fr., *M.C. Machado & L.Y.S. Aona 606* (HUEFS, UEC); Caçapava do Sul, Pedra do Segredo, 22.xi.2005, fl., fr., *M.C. Machado & L.Y.S. Aona 621* (HUEFS, UEC); Cambará do Sul, RS-453, ca. 7.4 km a leste do entroncamento da RS-453 com a RS-020, 23.xi.2005, fl., *M.C. Machado & L.Y.S. Aona 603* (HUEFS, UEC); Capão da Canoa, estrada entre Riozinho e Maquine, ca. 22 km leste de Riozinho, 22.xi.2005, fl., fr., *M.C. Machado & L.Y.S. Aona 595* (HUEFS, UEC); Caxias do Sul, estrada para Mulada, 10.xii.2005, fl., fr., *M.C. Machado L.Y.S. Aona 739* (HUEFS, UEC); Cruz Alta, 10 km S de Cruz Alta, fl., fr., *A. Krapovickas & R. Vanni 36768* (CTES); Morro dos Conventos, 8.xi.1968, fl., fr., *A.R. Schultz et al. s.n.* (CTES 202948, ICN 5442); Piratini, fazenda Cerro Verde, 1.xi.1998, fl., fr., *L.P. Félix 8995* (HST, RB). **Santa Catarina**: Alfredo Wagner, Alto Limeirinha, 25.xi.2009, fl., fr., *A. Korte & A. Kniess 189* (FURB); Araranguá, Sombrio, 19.x.1944, fl., *R. Reitz c781* (RB); Içara, balneário Rincão, 9.xii.2010, fl., fr., *A. Korte & M.J. Rigon Jr. 5538* (FURB, RB); Palhoça, Pedra do Urubu, 3.xii.2010, fl., fr., *A. Korte 5432* (FURB); *loc. cit.*, Parque Estadual do Tabuleiro, 2.xii.2010, fl., fr., *A. Korte 5318* (FURB); *loc. cit.*, Guarda do Embaú,

i.iv.2013, *L.A. Funez & A.E. Zermiani 2015* (FURB); Urubici, estrada Serra do Corvo Branco, 6.xii.2005, fl., fr. *J.R. Stehmann et al. 1752* (UEC). **São Paulo:** Atibaia, Pedra Grande, no topo do morro, 29.xi.1961, fl., fr., *J. Mattos 9525* (RB, SP); Campos do Jordão, cultivada em Vinhedo, condomínio Marambaia, 10.viii.2004, fl., fr., *S.L. Jung-Mendaçolli 1137* (IAC). URUGUAY. **San José:** Balneario Kiyú, Río de la Plata, 21.xi.2007, fl., fr., *G.J. Seijo & V. Solis Neffa 3971* (CTES).

**Etymology:** The epithet means “*cerinthoides*” means “which looks like pollen grains”, probably making reference to the moniliform hairs of the filaments. These hairs are theorized by Faden (1992) to possess this exact function.

**Distribution and habitat:** Argentina, Brazil (São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) and Uruguay (Map 2). It can be found in the field formations growing in full sun or in shaded conditions, directly over rock or as a terrestrial plant. It can be also found in sand dunes and *restinga* formations.

**Conservation status:** Least Concern (LC).

**Nomenclatural notes:** *Tradescantia blossomfeldiana* was described by Mildbraed (1940) based on cultivated material by Blossfeld, from Argentina. Mildbraed gives a complete description that gives us no doubt that this species should be treated as a synonym of *T. cerinthoides*. Nevertheless, he cites no examined material. It is known that Mildbraed worked in Berlin (Stafleu & Cowan 1981) and it's very likely that the original material(s) used in the description is/are deposited at B. Unfortunately, due to the impossibility to personally visit the B herbarium we were unable to solve this mystery and designate a type for this name. Nevertheless, since the description presented on the protologue is extremely detailed, we have no doubt that *T. blossomfeldiana* should to be treated as a synonym of *T. cerinthoides*.

*Tradescantia decora* was described by Bull (1892), being characterized by its upright stems and spirally-alternate elongate lanceolate leaves. Despite not being able to analyze the type

specimen, since *T. cerinthoides* is the sole species in *T.* section *Austrotradescantia* which can possess spirally-alternate, we have no doubt *T. decora* should be treated as synonym of the latter.

**Taxonomic notes:** *Tradescantia cerinthoides* is a highly plastic species, being the sole species in the section where the phyllotaxy can vary in adult individuals. The spirally-alternate individuals of *T. cerinthoides* represent the morphological variation described by Seubert in *T. koernickeana*. It is part of the *T. crassula* group, possessing erect stems, succulent stems and leaves, not saccate cincinni bracts and flowers that vary from white to pink to lilac. It can be easily differentiated from the remaining species of this clade for being the sole species with sepals without keels and homogeneously covered with indumenta (that vary from glandulous to pilose to hirsute). Also, its leaves are generally densely covered by indumenta on the abaxial side, but some individuals with completely glabrous can leaves can also be found.

*Tradescantia cerinthoides* is the most popular species as pot plant, from the *T. crassula* group. This is due especially due to the beautiful pink to lilac flowers that are common in the cultivated individuals, and the dense leave indumenta.

1.2. *TRADESCANTIA CRASSULA* Link & Otto, Icon. Pl. Rar. 2: 13, pl. 7. 1828  $\equiv$  *Tropitria crassula* (Link & Otto) Raf., Fl. Tell. 3: 68. 1837. *Type*: BRAZIL. Rio Grande do Sul: Rio Pardo, xii.1836, *F. Sellow 3033* (**lectotype designated here**: B barcode B 10 0521014!). (Fig. 8)  
 – *Tradescantia crassipes* Graham, Edinburgh New Philos. J. Jan.–March: 388. 1829, *nom. nud.*

**Herbs** terrestrial, rupicolous or epiphytes, ca. 10–46 cm tall. **Stem** erect, succulent, little branched, branching at the base, rarely branching at the upper half; internodes (1.3–)3.2–5.4(–9.2) cm long at base, distally shorter, green, glabrous, sometimes with a leaf-opposed longitudinal line of short, uniseriate, light-brown to hyaline hairs in the terminal portion of the stems. **Leaves** distichously-alternate, sessile; sheaths 0.6–2 cm long, light-green, glabrous, margin ciliate to setose, hairs hyaline; blades elliptic to broadly elliptic to ovate to broadly ovate to obovate, rarely lanceolate, 4.4–12.8  $\times$  1.4–2.8 cm, falcate to complicate, succulent, glabrous on both sides, adaxially glossy light-green to green, sometimes glaucous, abaxially slightly lighter, turning olive-green to greyish-green to brown when dry, obtuse to truncate, rarely cuneate, margin green, minutely ciliolate to entire, slightly revolute, apex acute to obtuse, rarely acuminate; midvein conspicuous to inconspicuous, adaxially impressed to inconspicuous, secondary veins inconspicuous on both sides. **Inflorescences** terminal or axillary in the distal portion of the stems, 1 per leaf axis; peduncles (0.3–)1.4–3.6(–7.3) cm long, green, glabrous, sometimes with a leaf-opposed longitudinal line of short, uniseriate, light-brown to hyaline hairs; cincinni bracts similar to each other, rarely reduced in some axillary inflorescences, broadly ovate to ovate, 1.2–3.9(–6)  $\times$  0.7–2.1 cm, leaf-like, glabrous, adaxially light-green to green, abaxially slightly lighter, base cordate to obtuse, not saccate, margin entire to minutely ciliolate to sparsely hirsute near the base, apex acute; double

cincinni ca. 8–22-flowered. **Flowers** ca. 0.8–1.2 cm diam., pedicels 0.7–1.5 cm long, green, rarely vinous, glabrous; floral buds broadly ovoid; sepals 4.6–7.5 × 2.7–4.4 mm, dorsally keeled, green, setose, with sparse hyaline hairs restricted to the keel; petals 6–7.3 × 4.7–5.2 mm, flat, white; filaments 5.1–6.6 mm long, anthers ca. 6–8 × 1.1–1.3 mm; ovary 1.7–1.9 × 1.5–1.7 cm, style 4.2–5 cm long; pistil longer than the stamens. **Capsule** 3.6–4.2 × 2.1–2.7 mm. **Seeds** 1.2–1.8 × 1.1–1.6 mm, brown to greyish-brown, testa costate arranged in radiated ridges, hilum longer than ½ the length of the seed.

**Examined material:** ARGENTINA. **Misiones:** Cainguás, pequeño campo a la entrada del Salto Golondrina, sobre Arroyo Guiray, 8.xi.2000, fl., fr., *M.E. Múlgura de Romero et al.* 2470 (CTES, SI); General Manuel Belgrano, ruta nacional 101, 8 km de Bernardo de Irigoyen hacia San Antonio, Salto Andrecito, 15.x.1996, fl., *O. Morrone et al.* 1393 (CTES, SI). BRAZIL. **Minas Gerais:** Extrema, trilha para a Pedra das Flores, 24.x.2009, fl., *G.H. Shimizu* 226 (RB, UEC). **Rio Grande do Sul:** Barão, sudoeste de Garibaldi, estrada para Carlos Barbosa, 22.xi.2005, fl., fr., *M.C. Machado & L.Y.S Aona* 607 (UEC, HUEFS). **Santa Catarina:** Campo Belo do Sul, fazenda Gateados, 15.vii.2008, fr., *M. Verdi et al.* 2028 (FURB, RB). **São Paulo:** Jundiaí, Serra do Japi, 25.v.1994, fl., fr., *J. Semir et al.* 31648 (UEC); *loc. cit.*, trilha do Mirante, 18.vii.1995, fl., fr., *R. Mello-Silva et al.* 1074 (SPF); *loc. cit.*, Serra do Jundiaí, sentido bairro Eloy Chaves, próximo à represa do DAE, 23.i.1998, fl., *E.R. Pansarin* 136 (SP, UEC); Iepê, fazenda C.A.P.I., about 5km of Porto Alvorada along the rio Paranapenema, 22°45'S 52°9'W, fl., *G. Eiten et al.* 5998 (SP); Itararé, fazenda Ibiti (Ripasa), beira da estrada Itararé-Bonsucesso, 30.x.1993, fl., fr., *V.C. Souza et al.* 4531 (ESA, RB); São Paulo, Cidade Jardim, 11.iii.1932, fl., fr., *W. Hoehne s.n.* (IPA 69219, SPF 17149). **Etymology:** The epithet “*crassula*” makes reference to the extremely succulent vegetative parts characteristic of this species.

**Distribution and habitat:** Argentina and Brazil (Minas Gerais, São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) (Map 3). As most species of the *T. crassula* group, *T. crassula* is commonly found growing in field formations, under full sunlight, as rupicolous or terrestrial. Nevertheless, it can also be found at roadsides and understory in open forests.

**Conservation status:** Least Concern (LC).

**Taxonomical notes:** *Tradescantia crassula* is very plastic in plant stature, leaf shape and flower size. Nevertheless, all studied individuals always present glabrous leaves, white flowers and sepals with long hairs along the keel. Added to that, most of the known variation can be related to ecological conditions, since specimens with different morphs (more or less succulent plants, smaller or taller plants, plants with different leaf shapes) became very similar in cultivation.

1.3. TRADESCANTIA CHRYSOPHYLLA M.Pell. *sp. nov.*

*Tradescantia cymbispathae* C.B.Clarke *affinis, sed planta omnino aurum hirsuta praesertim in foliis et vagina, sepalis et pedicelli glandulosae.*

**Type:** BRAZIL. São Paulo: Biritiba Mirim, Estação Biológica de Boracéia, 24.xi.1983, fl., A. Custódio Filho 1910 (holotype: RB!; isotype: SP!). (Fig. 9)

**Herbs** terrestrial or rupicolous, ca. 11–27 cm tall. **Stem** creeping to ascending at the apex, delicate to slightly succulent, densely branched; internodes 1.5–8.2 cm long at base, distally shorter, hirsute, hairs golden to light-brown. **Leaves** distichously-alternate, sessile; sheaths 0.4–1 cm long, hirsute, margin densely hirsute, hairs golden; blades broadly elliptic to broadly ovate, 1.9–7 × 0.9–2.7 cm, flat, succulent, hirsute on both sides, hairs golden to light-brown, upright, adaxially dark-green, abaxially vinous, turning dark-brown to olive-green when dry, margin cordate to obtuse, ciliolate, apex acute; midvein conspicuous, adaxially impressed, secondary veins inconspicuous, adaxially inconspicuous, abaxially inconspicuous, becoming more evident abaxially when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 leaf axis; peduncles (0.4–)1.1–4.9 cm long, hirsute, hairs golden to light-brown; cincinni bracts strongly unequal among each other, elliptic to ovate to broadly ovate, 0.9–4.6 × 0.4–2 cm, leaf-like, hirsute, hairs golden to light-brown, dark-green, abaxially vinous, base cordate to obtuse, saccate, margin ciliolate, apex acute; double cincinni ca. (4–)6–12-flowered. **Flowers** ca. 1.1–1.6 cm diam., pedicels 0.9–1.2 cm long, glandulous; floral buds ovoid; sepals 4.7–5.8 × 2.6–4 mm, without keels, glandulous; petals 8.8–9 × 5.7–6.2 mm, white; filaments 6–6.2 mm long, anthers ca. 0.6–0.8 × 0.3–0.7 mm; ovary 1.5–1.7 × 1.2–1.4 mm, style 4–4.2 cm long; pistil the same length as the stamens. **Capsule** not seen. **Seeds** not seen.

**Examined material (paratypes):** BRAZIL. **Rio de Janeiro:** Itatiaia, Serra do Itatiaia, Maromba, 23.x.1931, fl., *C. Porto 2101* (RB). **Santa Catarina:** Rio do Sul, estrada Rio do Sul-Lontras, 3.xii.2013, fl., *A.L. Gasper et al. 3270* (FURB). **São Paulo:** Salesópolis, Estação Biológica de Boracéia, estrada para a barragem da SABESP no rio Guaratuba, 5.ix.1994, fl., *R. Simão-Bianchini et al. 505* (RB, SP, UEC).

**Etymology:** The epithet "*chrysophylla*" means golden leaves and is given after the golden hairs that cover the whole plant, but especially the leaves.

**Distribution and habitat:** Endemic to Brazil, more precisely to the states of Rio de Janeiro, São Paulo and Santa Catarina (Map 4). It can be found growing as a terrestrial or rupicolous herb, understory in shaded and moist forests.

**Conservation status:** Data Deficient (DD).

**Taxonomic notes:** *Tradescantia chrysophylla* can be differentiated from all the species of *Tradescantia* sect. *Austrotradescantia* by its dense hirsute golden indumenta, which covers the whole plant, especially the leaf sheaths and blades. It is morphologically similar to *T. cymbispatha* due to their sessile, succulent leaves homogeneously covered by indumenta, inconspicuous secondary veins and sepals without keels. Nevertheless, *T. chrysophylla*'s indumenta is hirsute and golden (sometimes becoming light-brown when over exposed to the sun), the cincinni bracts are strongly unequal among themselves, and the pedicels and sepals are covered by glandulous hairs.



1.4. *TRADESCANTIA CYMBISPATHA* C.B.Clarke in De Candolle, Monogr. Phan. 3: 296. 1881 ≡ *Tradescantia cymbispatha* var. *cymbispatha* C.B.Clarke, in De Candolle Monogr. Phan. 3: 296. 1881. Basionym: *Tradescantia geniculata* Vell., Fl. Flumin.: 140. 1829, *nom. illeg.* non *T. geniculata* Jacq., Select. Stirp. Amer. Hist.: 94, t. 64. 1763 ≡ *Cymbispatha geniculata* Pichon, Notul. Syst. (Paris) 12: 224. 1946. *Type*: [illustration] Original parchment plate of “*Flora fluminensis*” in the Manuscript Section of the Biblioteca Nacional of Rio de Janeiro [cat. no.: mss1198652\_157] and later published in Vellozo, Fl. Flumin. Icones 3: t. 153. 1831 (designated by Pellegrini *et al.* 2015). BRAZIL. Rio de Janeiro: Petrópolis, bairro Castelânea, fl., 8.viii.2010, *M.O.O. Pellegrini 17* (epitype: RB!; isoepitype: RFA! designated by Pellegrini *et al.* 2015). (Fig. 10)

= *Tradescantia mundula* var. *scabrada* Seub. in Martius, Fl. Bras. 3(1): 249. 1855. *Type*: BRAZIL. *s. loc.*, *s. dat.*, fl., *F. Sellow 3852* (lectotype designated by Pellegrini *et al.* 2015: B barcode B 10 0247278!).

**Herbs** terrestrial, rupicolous or epiphytes, ca. 5–23 cm tall. **Stem** creeping to ascending at the apex, delicate, densely branched; internodes 0.8–6.4 cm long at base, distally shorter, green to reddish-purple to vinous, velutine. **Leaves** distichously-alternate, sessile; sheaths 0.4–0.7 cm long, green to green with vinous striations to vinous, velutine, margin setose, hairs light-brown; blades broadly elliptic to broadly ovate, 1.2–4.6 × 0.6–2.2 cm, flat, succulent, velutine on both sides, hairs hyaline, adpressed, adaxially blueish-green, abaxially vinous tinted to vinous, turning olive-green to light-brown when dry, base cordate to obtuse, margin green to vinous, minutely ciliolate, slightly revolute, apex acute; midvein conspicuous, adaxially impressed, secondary veins inconspicuous, adaxially inconspicuous, abaxially inconspicuous, becoming more evident on both sides when dry. **Inflorescences** terminal or

axillar in the distal portion of the stems, 1 per leaf axis; peduncles 0.6–4.3 cm long, green to reddish-purple to vinous, velutine; cincinni bracts similar to each other, broadly elliptic to broadly ovate, 1–3.5 × 0.6–1.6 cm, leaf-like, velutine on both sides, adaxially blueish-green, abaxially vinous tinted to vinous, base cordate, saccate, margin minutely ciliolate, slightly revolute, apex acute; double cincinni ca. 6–8-flowered. **Flowers** ca. 0.9–1.5 cm diam., pedicels 0.9–1.6 cm long, vinous, velutine to glandulous; floral buds broadly ovoid; sepals 6–6.5 × 2–2.6 mm, without keels, vinous, rarely green, velutine; petals 0.5–0.7 × 0.3–0.5 cm, flat, white; filaments 4.1–4.6 mm long, anthers ca. 0.8–1 × 1–1.3 mm; ovary 0.9–1.2 × 0.6–1 cm, style 2.6–3.2 cm long; pistil the same length as the stamens. **Capsule** 2.9–3.8 × 1.8–2.2 mm. **Seeds** 1.4–1.8 × 1.1–1.5 mm, greyish-brown, testa costate arranged in radiated ridges, hilum ½ the length of the seed.

**Examined material:** ARGENTINA. **Buenos Aires:** Campana, Reserva Natural Estricta Otamendi, 1.xi.2004, fl., *S. Torre Robles et al.* 2048 (LP); General Pueyrredón, Reserva Integral Laguna De Los Padres, 29.x.2004, fl., *S. Torres Robles et al.* 2202 (LP); Punta Indio, Reserva De La Biosfera Parque Costero Del Sur, 12.x.2002, fl., *S. Torres Robles* 861 (LP). **Corrientes:** San Cosme, Ensenada Grande, ruta 12, 6.x.1971, fl., fr., *A. Krapovickas et al.* 20030 (CTES). **Misiones:** Apostóles, Escola Agrotécnica, x.1977, fl., fr., *A.L. Cabrera et al.* 28542 (CTES, SI); Cainguás, salto Tabay, 16.x.1947, fl., *S.A. Pierotti* 6606 (CTES); *loc. cit.*, 12.x.1975, fl., *E.M. Zardini et al.* 789a (LP); *loc. cit.*, Profundidad, 19.ix.1974, fl., *A. Krapovickas et al.* 25689 (CTES); Guraní, arroyo El Paraíso y ruta 2, 23.ix.1993, fl., *M. Rodriguez et al.* 705 (CTES, MNES); *loc. cit.*, 23.ix.1993, fl., *M. Rodriguez et al.* 823 (CTES, MNES); *loc. cit.*, San Vicente, Cuartel Rio Victoria, campo anexo INTA, 24.viii.1995, fl., *M.E. Torri et al.* 89 (CTES); *loc. cit.*, predio Guarani, picada hacia el arroyo Paraiso, cruzando el arroyo Itapyru, 19.ix.1995, fl., *S.G. Tressens et al.* 5384 (CTES); *loc. cit.*, Predio

Guarani, 15.x.1997, fl., *S.G. Tressens et al. 5940* (CTES); *loc. cit.*, Predio Guarani, parcela CIFOR, 31.viii.1999, fl., *S.G. Tressans et al. 6332* (CTES); Isla Martín García, 23.viii.1996, fl., *J. Hurrell & M. Belgrano 3131* (LP); Iguazú, Puerto Iguazú, 4.x.1910, fl., *Rodriguez 483* (LP); *loc. cit.*, Parque Nacional Iguazú, sendero Macuco, 14.x.1993, fl., *S.G. Tressens et al. 4507* (CTES); *loc. cit.*, Parque Nacional Iguazú, sendero Jacaratia, 9.viii.1995, fl., *R. Vanni et al. 3411* (CTES); Libertador General San Martín, salto Encantado, 10 km NE de Aristóbulo del Valle, 31.vii.1987, fl., *R. Vanni et al. 920* (CTES). **Santa Fé:** Rosario, 1.ix.1987, fl., *Franceschi & Fernández 1216* (CTES). BRAZIL. *s. loc., s. dat.*, fl., *F. Sellow s.n.* (B barcode B 10 0247277). **Paraná:** Palmeira, estrada Curitiba-Ponta Grossa, no trevo para Palmeira (BR-277), 2.ii.1995, fl., fr., *J.R. Stehmann & J. Semir 2143* (UEC). **Rio Grande do Sul:** Caçapava do Sul, Pedra do Segredo, 29.xii.2004, fr., *T.B. Breier et al. 1250* (UEC); Gramado, pousada Cabanas do Tio Müller, 11.xi.2006, fl., fr., *R. Marquete & E.V.S. Medeiros 4000* (RB); Passo Fundo, 30.x.1971, fl., *J.C. Lindeman et al. s.n.* (CTES 203179, ICN 8840); Santa Maria, vázea do rio Santa Maria, 45 km E de Don Pedrito, 15.x.1971, fl., *J.C. Lindeman et al. s.n.* (CTES 202945, ICN 8587). **Santa Catarina:** Alfredo Wagner, rua Anitápolis, 14.viii.2009, fl., fr., *M. Verdi et al. 2573* (FURB); Blumenau, Morro do Sapo, Parque Nacional da Serra do Itajaí, 5.x.2013, fl., *A.L. Gasper et al. 3110* (FURB); Bom Retiro, Campo Novo, acesso alternativo ao Campo dos Padres, 12.xi.2011, fl., fr., *A.L. Gasper et al. 2939* (FURB); Major Vieira, Rio da Serra, 27.x.2010, fl., *A. Korte & A. Kniess 4797* (FURB, RB); Rodeio, próximo a divisa Rodeio-Benedito Novo, 18.viii.2012, fl., *L.A. Funez 792* (FURB); *loc. cit.*, Bairro Ipiranga, 10.x.2013, fl., *L.A. Funez 2277* (FURB); *loc. cit.*, bairro Ipiranga, 10.x.2013, fl., *L.A. Funez 2278* (FURB). PARAGUAY. **Central:** Areguá, Cerro Kõi, x.1971, fl., *A. Schinini 4044* (CTES). **Cordillera:** Tobatí, 21.vii.1987, fl., *A. Krapovickas 41887* (CTES). **Itapúa:** 3.7 km de Trinidad camino a Jesus, 7.x.1993, fl., *A. Krapovickas &*

*C.L. Cristóbal 44503* (CTES). **Paraguarí:** Acahay, Cerro, 6.v.1987, fl., *R. Degen 155* (CTES, FCQ); Parque Nacional Ybycui [Iwykuí], 12.x.1979, fl., fr., *E. Bordas 1099* (CTES).

**Etymology:** This names makes clear the great nomenclatural confusion created by Clarke's misinterpretation of Vellozo's plate. The epithet means "boat-shaped bract", a character present only in the Bolivian species from section *Cymbispatha* (*T. praetermissa* M.Pell.) Clarke misused in his description, and not in the real *T. cymbispatha*.

**Distribution and habitat:** Argentina, Brazil (Rio de Janeiro, Paraná, Santa Catarina e Rio Grande do Sul) and Paraguay (Map 5). It can be found as terrestrial, rupicolous, rarely as an epiphyte, understory in shaded and moist forests.

**Conservation status:** Least Concern (LC).

**Taxonomic notes:** In field, *T. cymbispatha* is a very distinctive species being easily differentiated from the remaining species of the *T. fluminensis* group by its adaxially blueish-green, abaxially vinous leaves, which possess a peculiar velvety glow due to its dense villous and appressed hyaline hairs. The stems are prostrated and the populations form dense mats that may cover long areas, which produce a bluish herbaceous formation understory. The sepals are not keeled and homogenously velutine, making it easy to differentiate *T. cymbispatha* from *T. mundula* and *T. fluminensis* (which are part of the *T. fluminensis* morphological complex). Also, *T. cymbispatha* possesses some very interesting characters that become evident when specimens are dried. First, the intense blueish-green pigmentation of the adaxial side becomes dark-brown, while the vinous pigmentation (anthocyanin) evaporates, leaving the abaxial side light-brown. Second, despite no veins being visible in this species leaves due to its succulence; the dried leaves acquire a striate aspect due to the big epidermal domes this species possesses. These two characters are of great taxonomic utility for identifying herbaria specimens of *T. cymbispatha*.

1.5. TRADESCANTIA FLUMINENSIS Vell., Fl. Flumin.: 140. 1829. *Type*: [illustration] Original parchment plate of *Flora fluminensis* in the Manuscript Section of the Biblioteca Nacional, Rio de Janeiro [cat. no.: mss1198652\_156] and later published in Vellozo, Fl. Flumin. Icones 3: t. 152. 1831 (lectotype designated by Pellegrini *et al.* 2015). (Fig. 11)

= *Tradescantia albiflora* Kunth, Enum. Pl. 4: 84. 1843. *Type*: *s. loc.*, in horto reg. Berol. culta. *s. dat.*, *s. leg. s.n.* (B *n.v.*).

= *Tradescantia albovittata* Pynaert, Nursery Cat. (eds. Pynaert & Van Geert) 1: 15. 1886 ≡ *Tradescantia fluminensis* f. *albovittata* (Pynaert) Voss in Siebert & Voss, Vilm. Blumengärtn. ed. 3 1: 1144. 1895. *Type*: not found.

– *Tradescantia fluminensis* f. *aureovittata* Voss in Siebert & Voss, Vilm. Blumengärtn. ed. 3 1: 1144. 1895. *nom. nud.*

– *Tradescantia fluminensis* f. *bicolor* Voss in Siebert & Voss, Vilm. Blumengärtn. ed. 3 1: 1144. 1895. *nom. nud.*

– *Tradescantia laekenensis* L.H.Bailey & E.Z.Bailey, Hortus: 616. 1930. *nom. nud.*

– *Tradescantia striata* L.H.Bailey & E.Z.Bailey, Hortus: 616. 1930. *nom. nud.*

**Herbs** terrestrial, rupicolous or epiphytes, ca. 17–50 cm tall. **Stem** creeping to ascending at the apex, delicate to slightly succulent, densely branched; internodes (1.6–1.8–)2.3–9 cm long at base, distally shorter, green, glabrous, with a leaf-opposed longitudinal line of short, uniseriate, hyaline hairs in the terminal portion of the stems. **Leaves** distichously-alternate, subpetiolate; sheaths 0.2–1.3 cm long, green, glabrous, margin setose, hairs light-brown to hyaline; petiole ca. 0.2–1.5 cm long to indistinct; blades elliptic to broadly elliptic to ovate to broadly ovate, rarely elliptic, (1.3–1.6–)2.2–11.5 × (0.6–0.8–)1.1–4.8 cm, flat, membranous to slightly succulent, glabrous on both sides, adaxially glossy green, abaxially

light-green, turning olive-green to brown to dark-brown when dry, base cordate to obtuse, rarely cuneate, margin green, minutely ciliolate, apex acute; midvein conspicuous, adaxially impressed, secondary veins conspicuous, adaxially impressed, abaxially conspicuous, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 0.6–4.7 cm long, green, sparsely pilose near the cincinni bracts to glabrous with a dense longitudinal line of short, uniseriate, hyaline hairs; cincinni bracts similar to each other, broadly ovate to ovate, 1.1–5.7 × 0.5–2.6 cm, leaf-like, glabrous, green, abaxially slightly lighter, base cordate to obtuse, saccate, margin minutely ciliolate, sometimes becoming setose towards the base of the bract, apex acute; double cincinni ca. (4–)6–12-flowered. **Flowers** ca. 1.5–2 cm diam., pedicels 0.6–1.5 cm long, green, glabrous to distally sparsely glandulous; floral buds ellipsoid; sepals 4.6–6.7 × 2.6–4.4 mm, dorsally keeled, green, pilose, hairs restricted to the keel; petals 0.7–1 × 0.4–0.6 mm, plicate, white; filaments 5–5.2 mm long, anthers ca. 0.8–1 × 0.9–1 mm; ovary 1–2.1 × 0.9–1.3 mm, style 3.5–4.4 mm long; pistil the same length as the stamens. **Capsule** 3.3–4.1 × 2.7–2.9 cm. **Seeds** 1.4–1.6 × 1.1–1.2 mm, brownish to greyish-brown, testa costate in radiated ridges, hilum equal ½ the length of the seed.

**Examined material:** ARGENTINA. **Buenos Aires:** La Plata, 18.x.1928, fl., *A.L. Cabrera 441* (LP); *loc. cit.*, 15.x.1941, fl., *A.L. Cabrera 9796* (LP). **Chaco:** 1° de Mayo, colonia Benítez, 4.x.1973, fl., *A.G. Schulz 18472* (CTES). **Corrientes:** Mercedes, Macrosistema Ibera, estancia Rincon del Diablo, 28.viii.1998, fl., *M.M. Arbo et al. 8010* (CTES); Santo Tomé, Garruchos, destacamento de prefectura a orillas del río Uruguay, 6.ix.1993, fl., *M.M. Arbo et al. 5826* (CTES). **Misiones:** Iguazú, Puerto Peninsula, 17.ii.1971, fl., *A. Krapovickas et al. 18333a* (CTES). BRAZIL. **Espírito Santo:** Castelo, trilha para o Forninho, 15.x.2008, fl., *R.C. Forzza et al. 5334* (CEPEC, MBM, RB, UPCB); Vargem Alta, 2.ix.1946, fl., *A.C.*

*Brade 19416* (RB). **Minas Gerais**: Caldas, Serra de São Domingos, 28.ii.2013, fl., *M.O.O. Pellegrini & J.F. Barbosa 321* (RB); Tiradentes, Serra de São José, 3.x.1987, fl., fr., *M. Peron 358* (RB). **Paraná**: Curitiba, Jardim Botânico de Curitiba, 26.viii.1993, fl., *J. Cordeiro & J.M. Silva 1092* (MBM, UEC). **Rio de Janeiro**: Guapimirim, granja Monte Olivete, margem do rio Bananal, 17.xi.1993, fl., *J.M.A. Braga et al. 844* (RB); *loc. cit.*, Rio Bananal, 16.viii.1995, fl., fr., *J.A. Lira Neto et al. 94* (RB); Mangaratiba, Reserva Ecológica do Rio das Pedras, próximo ao poço do Rio Grande, 31.xi.1996 to 1.xi.1996, fl., fr., *J.A. Lira Neto et al. 472* (RB); Nova Friburgo, morro da Caledônia, 8.vi.1977, fl., fr., *G. Martinelli et al. 2465* (RB); *loc. cit.*, Mury, cachoeira do rio das Flores, 24.vii.1986, fl., fr., *M. Leitman 135* (RB); *loc. cit.*, Macaé de Cima, fazenda Ouro Verde, 30.vii.1994, fl., *C.M. Vieira et al. 610* (RB); *loc. cit.*, 10.x.2004, fl., *A.F.P. Machado 363* (RB, SPF); Petrópolis, Cascatinha, 18.vii.1943, fl., fr., *O. Campos Goés & D. Constantino 348* (RB); *loc. cit.*, vii.1944, fl., fr., *O. Campos Goés & E. Dionisio 797* (RB); *loc. cit.*, estrada da Saudade, Morro Seco, xii.1943, fl., fr., *O. Campos Goés & E. Constantino 920* (RB); *loc. cit.*, Castelânea, 8.ix.2010, fl., *M.O.O. Pellegrini 48* (RB, RFA); Resende, Parque Nacional do Itatiaia, margem do rio Campo Belo, perto do lote 17, 17.x.1977, fl., *V.F. Ferreira & Briolanjo 136* (RB); Rio Claro, Lídice, Parque Estadual Cunhambebe, caminho para o Alto da Serra, 7.viii.2013, fl., fr., *B.C. Bandeira et al. 256* (RB); Rio de Janeiro, Tijuca, caminho do morro do Archer, 10.xi.1948, fl., fr., *A.C. Brade et al. s.n.* (RB 65375); *loc. cit.*, Parque Nacional da Tijuca, 27.x.1995, fl., fr., *M.G. Bovini et al. 899* (RB); *loc. cit.*, trilha para o morro da Cocanha, Alto da Boa Vista, 16.i.1994, fl., fr., *J.M.A. Braga & R. Neves 943* (RB); *loc. cit.*, 1.xi.1996, *J.M.A. Braga 3647* (RB); *loc. cit.*, Vargem Grande, morro do Manga Larga, 2.xii.1995, fl., fr., *C.M. Vieira et al. 758* (RB); Santa Maria Madalena, *s. dat.*, fl., fr., *A. Lisbôa s.n.* (RB 2653); Teresópolis, Venda Nova, 22.viii.2004, fl., *C.H.R. Paula 650* (RB); *loc. cit.*, Parque Nacional da Serra dos Órgãos, Praça da Barragem, 12.ix.2014, fl., *L.S.B. Calazans et al. 448* (RB). **Santa Catarina**:

Turvo, Arar, 20.x.1943, fl., *R. Reitz c73* (RB). **São Paulo:** Biritiba Mirim, Estação Biológica de Boracéia, 29.ix.1983, fl., *A. Custódio Filho 1568* (RB, SP); Campinas, fazenda Santa Eliza, Monjolinho, 9.ix.2004, fl., *J.L.M. Aranha Filho et al. 26* (UEC); Cunha, Reserva Estadual de Cunha, Instituto Florestal, Secretaria de Agricultura, 20.xi.1979, fl., fr., *A. Fonseca Vaz 294* (RADAM, RB); Itapeva, rodovia Francisco Alves Negrão, SP-258, entre Itapeva-Itararé, km 289, 23.x.2007, fl., *R.C. Forzza et al. 4765* (CEPEC, RB, SPF); Santo André, Reserva Biológica do Alto da Serra de Paranapiacaba, 11.x.2006, fl., *M. Kirizawa 3550* (RB, SP); São Paulo, Butantã, 16.ix.1919, fl., *F.C. Hoehne s.n.* (SP 3414); *loc. cit.*, Mandaqui, v.1913, fl., *Toledo 637* (RB); *loc. cit.*, Jardim Botânico e Parque do Estado, 12.viii.1968, fl., *T. Sendulksy 981* (RB, SP); *loc. cit.*, mata do Instituto de Botânica de São Paulo, 22.xi.1976, fl., *F.S. Cavalcante & I.T. Menezes 5* (RB, SP); *loc. cit.*, 14.x.1982, fl., *M.C.B. Attié et al. 52* (RB, SP); *loc. cit.*, Reserva da Cidade Universitária Armando de Salles Oliveira, 18.viii.1998, fl., *M. Groppo Jr. 345* (SP, SPF); *loc. cit.*, Reserva Biológica do Parque Estadual das Fontes do Ipiranga, 20.iv.1979, fl., *M. Kirizawa 418* (RB, SP); *loc. cit.*, 20.vi.1979, fl., *M. Kirizawa 419* (RB, SP); *loc. cit.*, 25.vi.1979, fl., *J.A. Correa 94* (RB, SP); *loc. cit.*, 9.ix.1980, fl., *M.G.L. Wanderley 138* (RB, SP); *loc. cit.*, 1.ix.1982, fl., *R.D. Marassi 5* (RB, SP).

**Etymology:** The epithet “*fluminensis*” makes reference to the region it was collected, the state of Rio de Janeiro.

**Distribution and habitat:** Argentina and Brazil (Espírito Santo, Rio de Janeiro, Minas Gerais, São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) (Map 6). It can be found growing as terrestrial or epiphyte understory in shaded moist forests, as a weed and at roadsides.

**Conservation status:** Least Concern (LC).



**Nomenclatural notes:** Most of the missing types are assumed to be lost at B herbarium, but due to the impossibility to personally visit the B herbarium we were unable to designate a type for these names. Thus, based on the description presented on these names protologues' and on comments made by Hunt (1980, 2001, pers. comm.), we decided to maintain the previous synonymizations until the types specimens are properly analyzed.

**Taxonomic notes:** The name *T. fluminensis* has been misapplied for almost all species of *Tradescantia* sect. *Austrotradescantia*, including species from the *T. crassula* group. Here we consider *T. fluminensis* as a much lesser variable entity than accepted by previous authors (Seubert 1871; Clarke 1881; Hunt 1980). *Tradescantia fluminensis* can be differentiated from the remaining species of the *T. fluminensis* group (and from the *T. fluminensis* complex) by its ascending stem apex, slightly succulent to membranous leaves, basally subpetiolate, green on both sides, glabrous, with impressed secondary veins adaxially and pilose sepals, with hairs just along the keel.

1.6. TRADESCANTIA MUNDULA Kunth, Enum. Pl. 4: 83. 1843.  $\equiv$  *Tradescantia mundula* Kunth var. *mundula*. *Type*: URUGUAY. Montevideo, xii.1836, fl., *F. Sellow 2103* (holotype: B barcode B 10 0247279!). (Fig. 12)

**Herbs** terrestrial, rupicolous or epiphytes, ca. 8–26(–31) cm tall. **Stem** creeping to ascending at the apex, delicate, densely branched; internodes 1–6.2(–9.3) cm long at base, distally shorter, green to vinous, minutely velutine to velutine, generally with a leaf-opposed longitudinal line of short, uniseriate, hyaline hairs. **Leaves** distichously-alternate, basal leaves subpetiolate; sheaths 0.5–1.2 cm long, green to vinous, minutely velutine to velutine, margin sparsely setose to densely setose, hairs light-brown to hyaline; petiole ca. 0.2–0.5(–1–1.3) cm long to indistinct; blades lanceolate to elliptic to broadly elliptic, rarely ovate, 1.1–6.7(–7.8–13.4)  $\times$  0.6–3.4 cm, flat, chartaceous, adaxially glabrous to sparsely velutine to minutely velutine, abaxially minutely velutine to velutine, rarely glabrous, adaxially glossy green, abaxially tinted vinous to vinous, turning olive-green to brown when dry, base cuneate, rarely obtuse, margin green, minutely ciliolate, slightly revolute, apex acute to acuminate; midvein conspicuous, adaxially impressed, secondary veins conspicuous, adaxially impressed, abaxially inconspicuous, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 1.4–5.3(–9.3) cm long, green, glabrous with a dense longitudinal line of short, uniseriate, hyaline hairs; cincinni bracts similar to each other, broadly elliptic to ovate, 2.2–5.3(–8.7–10.6)  $\times$  1–2.1 cm, leaf-like, adaxially glabrous to sparsely velutine to minutely velutine, abaxially tinted vinous to vinous, rarely light-green, minutely velutine to velutine, green, base cordate to obtuse, saccate, margin minutely ciliolate, slightly revolute, apex acute to acuminate; double cincinni ca. 6–8-flowered. **Flowers** ca. 1–1.4 cm diam., pedicels 0.9–1.7 cm long, green to vinous,

glandulous to velutine; floral buds ovoid; sepals 5.1–7.5 × 2.4–4.1 mm, dorsally keeled, green, velutine, hairs caducous when dry, generally persistent only along the keel; petals 6.3–7.6 × 3.8–5.1 mm, flat, white; filaments 4.4–5.6 mm long, anthers ca. 1–1.2 × 0.8–1 mm; ovary 1.4–1.9 × 1–1.3 cm, style 3–5 mm long; pistil the same length as the stamens. **Capsule** 2.7–3.6 × 2.3–2.7 cm. **Seeds** 1–1.7 × 0.9–1.3 mm, greyish-brown to grey, testa costate arranged in radiated ridges, hilum longer than ½ the length of the seed.

**Examined material:** ARGENTINA. **Buenos Aires:** Punta Lara, selva marginal de La Plata, 31.x.1948, fl., *A.B. Joly s.n.* (IPA 69118, SPF 17142). **Chaco:** General Vedia, x.1939, fl., fr., *A. Schinini 9329* (CTES); *loc. cit.*, 25.viii.1974, fl., *A. Schinini 18801* (CTES). **Corrientes:** Santo Tomé, Arroyo Chimiray, 23.ix.1974, fl., *A. Krapovickas et al. 26247* (CTES); *loc. cit.*, ruta 40 y arroyo Chimiray, 8.x.1980, fl., fr., *A. Schinini & O. Ahumada 20823* (CTES); *loc. cit.*, Garruchos, estancia San Juan Bautista, 20.ix.1974, fl., *Krapovickas et al. 25805* (CTES); *loc. cit.*, río Uruguay y arroyo Chimiray, 9.x.1980, fl., *A. Schinini & O. Ahumada 20931* (CTES). **Entre Rios:** Concordia, salto Grande, 21.ix.1951, fl., *A.L. Cabrera 10773* (LP). **Misiones:** Apóstoles, San José, bosque de Urunday, 3.x.1980, fl., fr., *R. Martínez Crovetto 11473* (CTES); Concepción de la Sierra, 3.ii.1948, fl., *A. Schinini 6979a* (CTES); Guaraní Predio Guaraní, rumbo a arroyo Paraíso, limite con IPS, 16.ix.1997, fl., *S.G. Tressens et al. 6037* (CTES); Iguazú, Puerto Peninsula, 17.ii.1971, fl., *A. Krapovickas et al. 18333a* (CTES). BRAZIL. **Minas Gerais:** Camanducaia, Monte Verde, 22.viii.2001, fl., fr., *L.D. Meireles et al. 511* (RB, UEC); *loc. cit.*, 20.ix.2001, fl., *L.D. Meireles et al. 616* (RB, UEC); *loc. cit.*, 19.x.2002, fl., fr., *L.D. Meireles et al. 1191* (RB, UEC). **Paraná:** Antônia, Reserva Natural do Cachoeira, 11.ix.2009, fl., *B.D. Kellermann et al. 42* (FURB, JOI, UPCB); Curitiba, estrada Curitiba-Ponta Grossa km 38, serra São Luiz de Purunã, 18.x.1961, fl., *E. Pereira 6093* (RB); Lapa, próximo à ponte junto ao rio Passa Dois, 4.x.2012, fl., *F. Santos-Silva et al. 149* (RB,

UPCB); Marumby, rio Taquaral, 15.xi.1943, fl., *G. Hatschbach 70* (RB). **Rio Grande do Sul:** Capão da Canoa, estrada entre Riozinho e Maquine, ca. 22 km a leste de Riozinho, 23.xi.2005, fl., *M.C. Machado e L.Y.S. Aona 594* (HUEFS, UEC); Caxias do Sul, estrada para Mulada, 10.xii.2005, fl., fr., *M.C. Machado & L.Y.S. Aona 740* (HUEFS, UEC). **São Paulo:** Bonsucesso de Itararé, estrada Bonsucesso-Itararé, descida da serra, 13.xi.1994, fl., fr., *V.C. Souza et al. 7226* (ESA, UEC, RB, SP, SPF); *loc. cit.*, descida da serra entre a Pedreira Cobastalco e Bonsucesso de Itararé, 19.viii.1995, fl., *V.C. Souza et al. 8847* (ESA, HRCB, RB, SP, SPF, UEC, UFP); *loc. cit.*, saindo da SP-258, 7 km de Bonsucesso, 23.x.2007, *R.C. Forzza et al. 4774* (RB, SPF); Cunha, Parque Estadual da Serra do Mar, Núcleo Cunha, 15.xi.2006, fl., *E.J. Lucas et al. 301* (ESA, RB); Iporanga, Fazenda Intervales, base do Carmo, 24.viii.1992, fl., *M. Kirizawa et al. 2642* (RB, SP); Itararé, estrada de Itararé-Bonsucesso, 27.xi.1993, fl., *V.C. Souza et al. 4789* (ESA, RB); *loc. cit.*, pedreira Cobastalco, 22.xi.1994, fl., *K.D. Barreto et al. 3256* (ESA, RB, SPVR); Santa Izabel Igarata, 26.ix.1950, fl., *M. Kuhlmann 2548* (RB, SP); São Paulo, Butantã, 27.viii.1917, fl., *F.C. Hoehne s.n.* (SP 463); *loc. cit.*, Parque do Estado de São Paulo, 28.ix.1951, fl., *W. Hoehne 3604* (RB, SPF); *loc. cit.*, Parque Morumbi, 23.x.1987, fl., *V.C. Souza et al. 1087* (SPF).

**Etymology:** The epithet “*mundula*” means adorned, making reference to the velutine stems, leaves and sepals that characterize this species.

**Distribution and habitat:** Argentina, Brazil (Minas Gerais, São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) and Uruguay (Map 7). It can be found growing as a terrestrial, rupicolous or epiphyte understory in shaded and moist forests and also in open forests.

**Conservation status:** Least Concern (LC).

**Taxonomic notes:** *Tradescantia mundula* is a small-sized herb and the smallest species from the section. It is morphologically similar to *T. fluminensis*, especially when specimens are analyzed dried. Nevertheless, *T. mundula* can be differentiated from the latter by its prostrate

habit, inconspicuous secondary veins, abaxially vinous, chartaceous, elliptic leaves and homogeneously velutine sepals. It can be differentiated from *T. cymbispatha* by its subpetiolate basal leaves, adaxially dark-green, chartaceous, glabrous with a plastic glow, elliptic, base cuneate, and keeled sepals.

1.7. TRADESCANTIA SEUBERTIANA M.Pell. *sp. nov.*

*Tradescantia crassulae* Link & Otto *affinis*, sed planta alpina, vaginae et sepali omnino glabrata et petali rosea.

**Type:** BRAZIL. Santa Catarina: Grão-Pará, Serra do Corvo, 4.x.2014, fl., *M.O.O.Pellegrini et al.* 436 (holotype: RB!; isotypes: MBM!, US!). (Fig. 13)

**Herbs** rupicolous, ca. 20–40 cm tall. **Stem** erect, succulent, little branched, branching at the base, rarely branching at the upper half; internodes 3.1–6.3 cm long at base, distally shorter, green to reddish-purple to vinous, glaucous, glabrous. **Leaves** distichously-alternate, sessile; sheaths 0.4–1.3 cm long, green to green with vinous striations to vinous, glaucous, glabrous, margin glabrous; blades ovate to broadly ovate, 2.8–7.7 × 0.9–3.2 cm, falcate to complicate, succulent, glabrous, adaxially light-green, glaucous, abaxially slightly lighter to reddish-purple to vinous, glaucous, turning olive-green to light-brown when dry, base cordate to obtuse, rarely cuneate, margin green, entire, slightly revolute, apex acute; midvein conspicuous to inconspicuous, adaxially impressed to inconspicuous, secondary veins inconspicuous on both sides, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 1.6–3.7 cm long, green to reddish-purple to vinous, glaucous, glabrous; cincinni bracts similar to each other, ovate to broadly ovate, 0.7–3.3 × 0.4–1.2 cm, leaf-like, glabrous, adaxially light-green, glaucous, abaxially slightly lighter to reddish-purple to vinous, glaucous, base cordate to obtuse, not saccate, margin entire, apex acute; double cincinni ca. 6–14-flowered. **Flowers** ca. 0.8–1 cm diam., pedicels 0.7–1.4 cm long, green to reddish-purple to vinous, glaucous, glabrous; floral buds ellipsoid; sepals 4.8–5.9 × 2.4–4.6 mm, dorsally keeled, green to reddish-purple to vinous, glaucous, glabrous; petals 6.3–7 × 3.2–4.4 mm, pink; filaments 2.8–3.2 mm long,

anthers ca.  $0.5\text{--}0.8 \times 1.3\text{--}1.5$  mm; ovary  $1\text{--}1.3 \times 0.9\text{--}1.2$  cm, style 4.3–8.5 cm long; pistil longer than the stamens. **Capsule**  $1.8\text{--}2.6 \times 1.8\text{--}2.2$  cm. **Seeds**  $1\text{--}1.2 \times 0.8\text{--}1$  mm, grey to greyish-brown, testa costate in radiated ridges, hilum longer than  $\frac{1}{2}$  the length of the seed.

**Examined material (paratypes):** BRAZIL. **Rio Grande do Sul:** rio Pelotas, BR-116, km 270, 23.xi.1980, fl., A. Krapovickas & R. Vanni 36870 (CTES); Vacaria, entre Vacaria e Caxias do Sul, 26.x.1961, fl., fr., E. Pereira 6527 (RB); Veranópolis, 10 km S de Veranópolis, fl., J. Lindeman & B. Irgang s.n. (CTES 202947, ICN 8107).

**Etymology:** This species is named after the prominent German botanist Moritz August Seubert (1818–1878), in appreciation for his extensive contribution to Commelinaceae systematics, especially for his contributions to the knowledge of the Brazilian Commelinaceae and *Tradescantia* sect. *Austrotradescantia*.

**Distribution and habitat:** It's endemic to the alpine region of Rio Grande do Sul and Santa Catarina, Brazil (Map 8). It can be found growing on wet rock walls, from ca. 700 to 1.800 meters above the sea level.

**Conservation status:** *Tradescantia seubertiana* is known from only four locations and very small populations and none is inside a conservation unit. Thus, it should be considered Critically Endangered (CR), B2ab(iii,v);D.

**Taxonomic notes:** *Tradescantia seubertiana* is morphologically similar to *T. crassula* and *T. valida*, being differentiated from them by being completely glabrous plants, which includes the leaf-sheath margin (a very uncommon character in the Commelinaceae), and its alpine habit in wet rock walls. Also it can be differentiated from *T. crassula* by its pink flowers.

1.8. TRADESCANTIA TENELLA Kunth, Enum. Pl. 4: 83. 1843.  $\equiv$  *Tradescantia fluminensis* var. *tenella* (Kunth) C.B. Clarke in De Candolle Monogr. Phan. 3: 295. 1881  $\equiv$  *Tradescantia fluminensis* f. *tenella* (Kunth) Voss in Siebert & Voss, Vilm. Blumengärtn. ed. 3 1: 1143. 1895. *Type*: URUGUAY. Montevideo, xii.1836, fl., fr., *F. Sellow d2290* (holotype: B barcode B 10 0247280!). (Fig. 14)

= *Tradescantia anagallidea* Seub. in Martius, Fl. bras. 3(1): 249. 1871. *syn. nov.* *Type*: BRAZIL. *s. loc.*, *s. dat.*, fl., fr., *F. Sellow 2801-67* (holotype: B barcode B 10 0247281!).

**Herbs** terrestrial, rupicolous or epiphytes, ca. 6–48 cm tall. **Stem** fruticose, succulent, densely branched; internodes 1.5–9.2 cm long at base, distally shorter, green to vinous, glandulous to sparsely hirsute to glabrous, with a leaf-opposed longitudinal line of short, uniseriate, hyaline hairs in the terminal portion of the stems. **Leaves** distichously-alternate, subpetiolate; sheaths 0.3–1.3 cm long, green, glabrous to hirsute, margin densely setose, hairs light-brown to hyaline; petiole ca. 0.2–2.4 cm long to indistinct; blades to ovate to broadly ovate, rarely elliptic to lanceolate, (0.5–0.9–)1.5–14.8  $\times$  0.6–3.6 cm, flat, membranous to chartaceous, sparsely hirsute to glabrous, adaxially light-green to green to dark-green, sometimes with a vinous stripe along the midvein, abaxially slightly lighter to vinous, turning olive-green to greyish-green when dry, base cordate to obtuse, rarely cuneate, margin green, minutely ciliolate, apex acute to acuminate; midvein conspicuous, adaxially impressed, secondary veins conspicuous, adaxially impressed, abaxially conspicuous, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 1.9–5.3(–9.3) cm long, green to vinous, glabrous with a dense longitudinal line of short, uniseriate, light-brown to hyaline hairs; cincinni bracts strongly unequal among each other, elliptic to ovate to broadly ovate, (0.4–)1–8.1  $\times$  0.3–3.1



cm, leaf-like, glabrous to sparsely hirsute, light-green to green to dark-green, sometimes with a vinous stripe along the midvein, abaxially slightly lighter to vinous, base cordate to obtuse, not saccate, margin minutely ciliolate, apex acute; double cincinni ca. (4–)10–14-flowered. **Flowers** ca. 0.4–1.4 cm diam., pedicels 0.5–1.7 cm long, green to vinous, glandulous, rarely glabrous; floral buds ovoid; sepals 3–6.6 × 1.8–2.5 mm, dorsally keeled, green, glandulous to sparsely glandulous, rarely glabrous; petals 6.5–6.8 × 4–5.1 cm, white to pink; filaments 3.8–4.1 mm long, anthers ca. 0.9–1.1 × 1.2–1.8 mm; ovary 1.6–1.8 × 1.1–1.4 cm, style 3.5–3.8 mm long; pistil the same length as the stamens. **Capsule** 2.6–3.6 × 2.2–2.5 cm. **Seeds** 0.9–1.7 × 0.9–1.5 mm, grey to greyish-brown, testa rugose arranged in radiated ridges, hilum shorter than ½ the length of the seed.

**Examined material:** ARGENTINA. **Buenos Aires:** Isla Martín García, 21.x.1992, fl., fr., *J. Hurrell et al. 1244* (LP); loc. cit., Reserva Natural y Sitio Histórico Isla Martín García, 30.x.2004, fl., *S. Torres Robles et al. 1987* (LP). **Corrientes:** Capital, Corrientes, invernáculo del Instituto de Botánica del Nordeste, Facultad de Ciencias Agrarias, 10.ix.2002, fl., fr., *G. Seijo 2889* (CTES); San Luis del Palmar, 26.ix.1973, fl., *C. Quarín & S.G. Tressans 1399* (CTES); San Martín, Tres Cerros, Co. Capará, 15.ix.1979, fl., fr., *A. Schinini et al. 18456* (CTES); Sauce, 25 km SW de Sauce, ruta 126, 20.x.1977, fl., fr., *O. Ahumada et al. 1174* (CTES). **Chaco:** Colonia Benítez, 18.ix.1942, fl., *A. Schinini 3539* (CTES). **Jujuy:** Iturbe, Del Guairá, 8.x.1952, fl., fr., *J.E. Montes 12776* (LP); Ledesma, La Candelaria, El Tremental, xi.1974, fl., *O. Marvin 19* (LP); San Salvador de Jujuy, Zapla, 9.xi.1974, fl., *A. Burkart et al. 30419* (LP, SI). **Misiones:** Cainguás, Salto Tabay, 12.x.1975, fl., *E.M. Zardini et al. 789b* (LP); Candelaria, Profundidad, 19.ix.1974, fl., *A. Krapovickas et al. 25712* (CTES); Iguazú, Puerto Istueta, 27.ix.1950, fl., *J.E. Montes 10201* (CTES); loc. cit., Parque Nacional do Iguazú, sendero frente a Isla San Martín, 10.viii.1995, fl., fr., *R. Vanni et al. 4221* (CTES);

San Ignacio, San Ignacio, 3 a 5 km camino a Teyucuaré, 8.xi.1913, fl., fr., *M.N. Correa et al.* 5371 (BAB, CTES, SI); San Pedro, Moconá, Prefectura Nacional Pepirí Mini, 13.x.2003, fl., *D. Hojsgaard* 307 (CTES, MNES). **Tucumán:** Famaillá, Quebrada y Lules, 21.xi.1910, fl., *S. Venturi* 1074 (LP); *loc. cit.*, entre Famaillá y Santa Lucía, 4.xi.2002, fl., fr., *A.A. Cocucci* 1982 (CORD). BRAZIL. *s. loc.*, *s. dat.*, fl., *F. Sellow s.n.* (B barcode B 10 0247277). **Minas Gerais:** Tiradentes, caminho para a Serra de São José, 16.i.1994, fl., fr., *A.M. Giulietti et al.* 13666 (K, SPF). **Paraná:** Curitiba, Vila Nova, 21.xi.1972, fl., fr., *P. Occhioni* 5238 (RFA); Foz do Iguaçu, *s. dat.*, *J.G. Kuhlmann s.n.* (RB 166655); *loc. cit.*, Cataratas do Iguaçu, 27.ix.1967, fl., *O. Boelcke* 13449 (CTES); *loc. cit.*, Cataratas do Iguaçu, 27.ix.1967, fl., *A. Krapovickas* 13373 (CTES); *loc. cit.*, margem do rio Iguaçu, abaixo das cataratas, próximo a administração do parque, 8.x.2012, fl., fr., *R.C. Forzza et al.* 7379 (RB, UP CB). **Rio de Janeiro:** Itatiaia, Parque Nacional do Itatiaia, planalto, proximidades do Brejo da Lapa, 3.xii.1996, fl., fr., *J.M.A. Braga et al.* 3708 (RB); *loc. cit.*, Parque de Furnas, 3.vi.1987, fl., fr., *L.C. Giordano & D.P. Costa* 313 (RB). **Rio Grande do Sul:** Viamão, Estiva, km 48 da estrada para Cidreira, 22.ix.1972, fl., *B. Irgang & L. Baptista s.n.* (CTES 203223, ICN 10224). **Santa Catarina:** Blumenau, morro do Sapo, Parque Nacional Serra do Itajaí, 21.i.2013, fl., fr., *L.A. Funez et al.* 1610 (FURB); Bom Retiro, fazenda Campo dos Padres, 17–19.xi.1956, fl., fr., *L.B. Smith & R. Klein* 7726 (RB); *loc. cit.*, Campo Novo, acesso alternativo ao Campo dos Padres, 12.xi.2011, fl., fr., *A.L. Gasper et al.* 2916 (FURB); Cerro Negro, margem do rio Tijolos, 22.iii.2007, fl., fr., *C.R. Grippa* 33 (FURB); Nova Trento, rio Veado, 29.ix.2010, fl., fr., *A. Korte & A. Kniess* 4496 (FURB, RB); Presidente Nereu, Braço Thieme, 15.x.2009, fl., fr., *A. Korte & A. Kniess* 433 (FURB); Timbó, rorro Azul, 23.viii.2012, fl., fr., *L.A. Funez* 775 (FURB); Urubici, cascata do Avencal, 15.i.2013, fl., fr., *L.A. Funez & A.E. Zermiani* 1400 (FURB). **São Paulo:** São Paulo, Santo Amaro, 20.x.1943, fl., fr., *L. Rotto* 812 (SP); Serra do Mar, margem esquerda do rio Quilombo, 9.x.1989, fl.,

*D.G. Scaravelli s.n.* (ESA 5253); Tapiraí, cachoeira do Chá, 18.x.1994, fl., *K.D. Barreto et al.* 3056 (ESA, RB, SPVR, US). URUGUAY. **Lavalleja**: Cerro Arequita, 11.x.1970, fl., fr, *H.A. Fabris & F.O. Zuluaga* 7870 (LP).

**Etymology:** The epithet “*tenella*” means delicate, small, probably making reference to the small portion available to Kunth to describe the species and its delicate appearance.

**Distribution and habitat:** Argentina, Brazil (Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) and Uruguay (Map 9). It can be found growing as terrestrial, rupicolous or epiphyte understory in shaded and moist forests, between rocks near waterfalls and in clay ravines.

**Conservation status:** Least Concern (LC).

**Taxonomic notes:** *Tradescantia tenella* is the most peculiar species from the *T. fluminensis* clade. Nevertheless, this species possesses fruticose, erect and extremely succulent stems, not saccate cincinni bracts and flowers that vary from pink to white, which would be characteristic of the *T. crassula* group. Thus, *T. tenella* can be confused with species from both clades. *Tradescantia tenella* can be differentiated from the species of the *T. fluminensis* group by its erect and succulent stems, not saccate cincinni bracts and flowers that vary from white to pink. It can be differentiated from the remaining species of the *T. crassula* group by its fruticose habit, cincinni bracts strongly unequal among themselves, small flowers and sepals with glandulous hairs, rarely glabrous.

A great deal of morphological variation is recorded for this species regarding plant stature and leaf size and shape. Since this species is not as common as most species of *Tradescantia* sect. *Austrotradescantia*, we were unable to collect all the different morphs and evaluate the change in their morphology. But since all the other studied species presented changes and the different morphs became similar in cultivation, we believe same is true for *T. tenella*.

1.9. TRADESCANTIA UMBRACULIFERA Hand.-Mazz., Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 79: 204. 1908. *Type*: BRAZIL. São Paulo: Campinas, i.1900, fl., *J. Campos Novaes 1218* (**lectotype designated here**: WU N° 0061328!; isolectotype US barcode US 00046114!). (Fig. 15)

= *Tradescantia fluminensis* var. *pubescens* C.B. Clarke in De Candolle, Monogr. Phan. 3: 295.

1881, *syn. nov.* *Type*: BRAZIL. Provincia de St. Paul and Rio, South Brazil, 1861-1862, fl., *J. Weir s.n.* (**lectotype designated here**: K barcode K 000363269!).

**Herbs** terrestrial, rupicolous or epiphytes, ca. 25–60 cm tall. **Stem** creeping to ascending at the apex, slightly succulent to slightly fibrous, little to densely branched; internodes 2.8–10 cm long at base, distally shorter, green to reddish-purple to vinous, glabrous to sparsely pilose, with a leaf-opposed longitudinal line of short, uniseriate, light-brown to hyaline hairs in the terminal portion of the stems. **Leaves** distichously-alternate, sessile; sheaths 0.5–2.3 cm long, green to reddish-purple to vinous, glabrous to pilose to sparsely hirsute, margin densely setose, hairs light-brown to hyaline; blades linear-lanceolate to lanceolate, 3.8–19.1 × 1–3.1 cm, flat, chartaceous, rarely membranous, glabrous on both sides to adaxially glabrous, abaxially velutine to pilose, hairs hyaline, adaxially glossy dark-green, abaxially slightly lighter, rarely vinous tinted to completely vinous, turning dark-brown to black when dry, base truncate to amplexicaulous to obtuse, margin green, minutely ciliolate to ciliolate, apex acuminate; midvein conspicuous, adaxially impressed, secondary veins conspicuous, adaxially slightly impressed to impressed, abaxially prominent, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1–3 per leaf axis; peduncles 0.5–4.3 cm long, green, pilose to glabrous with a dense longitudinal line of short, uniseriate, light-brown to hyaline hairs; cincinni bracts similar to

each other, cordate to broadly cordate, rarely lanceolate,  $0.5-1.2(-2.3-6.2) \times 0.5-1(-1.4)$  cm, spatheaceous, rarely leaf-like, glabrous to pilose to sparsely hirsute, green to dark-green, abaxially slightly lighter at the base, base cordate to obtuse, saccate, margin minutely ciliolate to ciliolate, apex acute, rarely acuminate; double cincinni ca. (4-)8-12-flowered. **Flowers** ca. 1.3-2.2 cm diam., pedicels 0.5-1.2 mm long, white to vinous, rarely green, sparsely glandulous; floral buds ellipsoid; sepals  $5.2-8.1 \times 2-3.7$  mm, dorsally keeled, green, pilose along the keel, with hairs gathered at the base in the insertion of the pedicel, rarely glabrous; petals  $0.8-1.2 \times 0.3-0.6$  cm, white; filaments 5.7-6.8 mm long, anthers ca.  $0.8-1 \times 0.9-1.2$  mm; ovary  $1.2-2 \times 0.8-1.3$  mm, style 4.8-6.2 mm long; pistil longer than the stamens. **Capsule**  $2.7-3.8 \times 2.1-2.5$  cm. **Seeds**  $1.6-1.9 \times 1.2-1.5$  mm, greyish-brown, testa costate arranged in radiated ridges, hilum longer than  $\frac{1}{2}$  the length of the seed.

**Examined material:** ARGENTINA. **Chaco:** 1° de Mayo, Colonia Benítez, 10.xi.1973, fl., *A.G. Schulz s.n.* (CTES 203094). **Corrientes:** Ituzaingó, desembocadura del arroyo Garapé em el río Paraná, 45 km al E de Ituzaingó, 24.iv.1975, fl., fr., *A. Schinini et al. 11243* (CTES). **Misiones:** Cainguaús, salto Marvilla, 4.v.1999, fl., *N.B. Deginani et al. 998* (CTES, SI); Candelaria, Profundidad, 19.ix.1974, fl., *A. Krapovickas et al. 25711* (CTES); *loc. cit.*, Candelaria-Loreto, 22.vi.1949, fl., fr., *J.E. Montes 4222* (LP); Capital, Posadas, Jardín Botánico, 17.vii.2001, fl., fr., *M. Grabielle 5* (CTES, MNES); Concepción de la Sierra, 3.ii.1948, fl., *A. Schinini 6979b* (CTES); Eldorado, ruta 17, desvío 2 km a San Pedro, 20.i.1973, fl., *A. Schinini & A. Fernandez 5933* (CTES); *loc. cit.*, ruta 17, 89 km E de Eldorado, 22.i.1973, fl., *A. Schinini & A. Fernandez 6002* (CTES); General Manuel Belgrano, 12 km S de Bernardo de Irigoyen, ruta 14, Cerro Tigre, 15.ii.1970, fl., *V. Maruñak 107* (CTES, LP); Guaraní, predio Guaraní, picada al arroyo Soberbio, 15.iii.1994, fl., *S. Tressens et al. 4881* (CTES); *loc. cit.*, rumbo cerca de Papael Misionero, 28.iv.1999, fl., *S. Tressens et*

*al.* 6279 (CTES); Iguazú, rio Paraná, 10 km S de Puerto Iguazú, frente a Puerto Bertoni, 28.iii.1970, fl., *A. Krapovickas et al.* 15780 (CTES); *loc. cit.*, Parque Nacional Iguazú, Sendero Macuco, 6.viii.1991, fl., *R. Vanni et al.* 2666 (CTES); *loc. cit.*, Parque Nacional Iguazú, Sendero Macuco, 23.iv.1996, fl., *J. Herrera* 174 (CTES); Leandro M. Alem, 2 km al NE de cerro Azul, 10.iii.1969, fl., *A. Krapovickas et al.* 15070 (CTES); Libertador General San Martín, predio UNLP, valle del arroyo Cuña Pirú, 19.vii.1998, fl., fr., *F. Biganzoli et al.* 126 (LP, SI); Montecarlo, arroyo Piray Guazú y ruta 12, 15.ii.1980, fl., *A. Schinini* 19909 (CTES); San Pedro, 89 km E de Eldorado, 22.i.1973, fl., *A. Schinini & A. Fernandez* 6014 (CTES); *loc. cit.*, ruta provincial 17, desvío 5 km a Tabuna por ruta provincial 224, 26.i.1973, fl., *A. Schinini & A. Fernandez* 6100 (CTES); *loc. cit.*, de San Pedro a Puerto Piray, 20 km de San Pedro, ruta provincial 16, 28.ii.1995, fl., *F.O. Zuloaga et al.* 5063 (CTES, SI); *loc. cit.*, cruzando el puente sobre el Yabotí hacia los obrajes, ruta proyectada 102, 9.v.1999, fl., *N.B. Deginani et al.* 1213 (CTES, SI); Santa Anna, 1907, fl., *s. leg. s.n.* (LP 19175). BRAZIL. **Minas Gerais:** Aiuruoca, PCH-Aiuruoca, área de vazão reduzida, RPPN Cachoeira do Tombo, 26.iii.2009, fl., *P.H.A. Melo & D.M. Torres* 3392 (ESAL, RB); Cambuquira, fazenda Esplanada, 25.iii.2004, fl., fr., *M.C. Weyland Vieira* 2025 (RB); Carrancas, Serra de Bicas, 30.iv.1999, fl., *A.O. Simões et al.* 821 (UEC); Lima Duarte, Parque Estadual da Serra do Ibitipoca, trilha entre a gruta do Fugitivo e gruta dos Três Arcos, 11.iii.2004, fl., *R.C. Forzza et al.* 3173 (CEPEC, K, MBM, NY, RB, SPF, UEC); *loc. cit.*, entre a gruta dos Viajantes e a gruta dos Três Arcos, 20.i.2005, fl., *R.C. Forzza et al.* 3965 (K, MBM, RB, SPF, UEC); *loc. cit.*, gruta dos Três Arcos, 17.iii.2005, fl., *R. Dias-Melo et al.* 234 (CEPEC, NY, RB); *loc. cit.*, gruta dos Viajantes, e córrego Monjolinho, 25.i.2010, fl., *R. Mello-Silva* 3239 (RB, SPF); São Thomé das Letras, próximo ao Pico do Gavião, 22.ii.1999, fl., *M.C. Assis et al.* 596 (RB, SPF); *loc. cit.*, APA São Thomé, Vale do Cantagalo, 4.ii.2015, fl., *E.R. Sattelmayer* 22 (HUSC, RB). **Paraná:** Antonina, rio Cotia, 24.iii.1966, fl., *G. Hatschbach* 14155 (MBM,

RFA); Foz do Iguaçu, Parque Nacional do Iguaçu, 25.iv.1949, fl., *J. Falcão* 96 (RB); *loc. cit.*, 19.ii.1960, fl., *E. Pereira* 5364 (HB, RB); Sapopema, 5.iv.1996, fl., *L.P. Feliz & A. Leporga* 11 (RB, UEC). **Rio de Janeiro:** Itatiaia, estrada região do planalto, 31.i.1966, fl., fr., *S. Andrade* 730 (RB); *loc. cit.*, 23.i.2012, fl., *M.O.O. Pellegrini* 192 (RB); *loc. cit.*, Parque Nacional do Itatiaia, estrada para o pico das Agulhas Negras, 15.ii.1995, fl., *J.M.A. Braga et al.* 2015 (RB); Resende, Parque Nacional do Itatiaia, BR-485, brejo da Lapa, 22.ii.2014, fl., fr., *L.S.B. Calazans et al.* 241 (HRCB, RB, VIES); Teresópolis, Parque Nacional da Serra dos Órgãos, trilha para a pedra do Sino, 05.xii.2001, fl., *F. Feres et al.* 19 (RB, UEC); *loc. cit.*, 12.ix.2014, fl., fr., *L.S.B. Calazans et al.* 453 (RB); *loc. cit.*, trilha do rio Soberbo, 22.ix.2010, fl., *M. Nadruz et al.* 2471 (RB). **Santa Catarina:** Blumenau, morro do Sapo, Parque Nacional Serra do Itajaí, 05.xi.2012, fl., *L.A. Funez* 1285 (FURB); *loc. cit.*, morro do Cachorro, 31.i.2014, fl., *A.L. Gasper et al.* 3439 (FURB); Dona Emma, gruta Nossa Senhora de Fátima, 26.i.2012, fl., *L.A. Funez* 309 (FURB); *loc. cit.*, RPPN Bugarkopf, trilha principal, 6.ii.2013, fl., fr., *L.A. Funez* 1681 (FURB); Itaiópolis, arroio das Pombas, 3.ii.2010, fl., *A. Korte & A. Kniess* 1631 (FURB); Itapiranga, Laranjeiras, SC-66, 14.ii.2009, fl., *M. Verdi et al.* 1631 (FURB); Jaraguá do Sul, Serra do Jaraguá, 31.viii.1997, fl., *Schwacke* 13350 (RB); Mondaí, 4.ii.2009, fl., *M. Verdi et al.* 2638 (FURB, RB); *loc. cit.*, Linha Cascalho, 5.iii.2009, fl., *M. Verdi et al.* 1746 (FURB); *loc. cit.*, Linha Capirara, BR-283, 9.iii.2009, fl., *M. Verdi et al.* 77 (FURB); Romelândia, Esperança, 2.iii.2009, fl., *A. Stival-Santos & S. Silveira* 439 (FURB, RB); São Bento do Sul, Ano Bom/Braço Esquerdo, 29.i.2010, fl., *S. Dreveck & F.E. Carneiro* 1667 (FURB). **São Paulo:** Barra do Turvo, 10 km de Barra do Turvo em direção a Pariqueraçu, 14.ii.1995, fl., fr., *J.P. Souza et al.* 89 (ESA, SP, UEC, UFP); *loc. cit.*, Parque Estadual da Jacupiranga, 24.iii.2005, fl., fr., *M. Carboni et al.* 119 (ESA, UEC); Eldorado Paulista, Parque Estadual Jacupiranga, Núcleo Cedro, 14.ii.1995, fl., fr., *H.F. Leitão Filho et al.* 33267 (HRCB, SP, SPF, UEC); Ilhabela, Parque Estadual da Ilhabela, trilha da Água Branca,

23.viii.1995, fl., *A. Rapini 48* (SP, SPF, UEC, UFP); São Paulo, Jardim Botânico e Parque do estado, 10.viii.1967, fl., fr., *R. Faria 40* (SP); *loc. cit.*, Serra da Cantareira, 13.iv.1901, fl., *s. leg. 300* (SP); *loc. cit.*, Serra da Cantareira, no Horto Florestal, 30.iii.1967, fl., *J. Mattos 14542* (RB, SP). PARAGUAY. **Alto Paraná:** Vivero Florestal Itaipú, 13.vi.1980, fl., *G. Caballero Marmorì 739* (CTES). **Canindeyú:** Jejui-mi, a unos 1500 m al N de la caseta, 8.v.1996, fl., *G. Marín & B. Jiménez 191* (BM, CTES, FMB, PY). **Guairá:** Colonel Independencia, arroyo Guazú, camino a San Gervasio, 27.iii.1993, fl., *A. Schinini et al. 28031* (CTES).

**Etymology:** The epithet “*umbraculifera*” means “with umbrellas”, making reference to the many inflorescences this species generally produces, and most importantly, to the small spathaceous cincinni bract that is characteristic of it.

**Distribution and habitat:** Argentina and Brazil (Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina e Rio Grande do Sul) and Paraguay (Map 10). It can be found growing as terrestrial and epiphyte understory in shaded and moist forests.

**Conservation status:** Least Concern (LC).

**Nomenclatural notes:** When describing *T. umbraculifera*, Handel-Mazzetti (1908) cites the material “Campinas (leg. *Campos Novaes*)”, but cites no collection number or the herbarium where the type is located. According to Stafleu & Cowan (1981), Handel-Mazzetti’s specimens can be found in the WU herbarium, the author’s institution. Nevertheless, since a duplicate of this material was found in the US herbarium, a lectotypification is necessary. Thus, we designate the specimen at WU as the lectotype.

In the protologue of *T. fluminensis* var. *pubescens*, Clarke (1881) lists three specimens: “Rio: in sylvis (*Gaudichaud n. 1794; J. Weir*)” and “St-Gabriel (*Aug. de St-Hilaire n. 44*)”. Since Clarke’s research were done on the Royal Botanical Gardens, Kew (Stafleu & Cowan 1981),



the specimen “*J. Weir s.n.*”, deposited in K, seem to be the best choice for an lectotype. Added to this, the specimen matches the diagnosis provided on the protologue by the author.

**Taxonomic notes:** *Tradescantia umbraculifera* is the most peculiar species in the whole section *Austrotradescantia*, because of its spathaceous cincinni bracts and numerous inflorescences per leaf axis. These two characters tell this species apart from all the other species of the section. Added to that, when dried, specimens of *T. umbraculifera* acquire a peculiar dark-brown to black color, which is unique in the group. Nevertheless, young individuals of *T. umbraculifera* are sometimes confused with *T. fluminensis*, since they don't possess them numerous inflorescences. Also, it is rather commonly confused with *T. crassula* and is due to the robust habit of both species.

1.10. *TRADESCANTIA VALIDA* G.Brückn., Notizbl. Bot. Gart. Berlin–Dahlem 11: 510. 1932.  
*Type*: BOLIVIA [BRAZIL]: cult. in Hort. Bot. Münster/W., 28.iv.1932, fl., *s. leg. s.n.*  
 (holotype: B barcode B 10 0296487!). (Fig. 16)

**Herbs** terrestrial or rupicolous, ca. 50–70 cm tall. **Stem** erect, succulent, little branched, branching at the base, rarely branching at the upper half; internodes 1.8–7 cm long at base, distally shorter, green with vertical reddish-purple striations to reddish-purple with green striations, glabrous. **Leaves** distichously-alternate, sessile; sheaths 0.4–0.8 cm long, green to vinous, glabrous, margin ciliolate, hairs hyaline; blades elliptic to broadly elliptic to ovate, 2.7–9 × 1.1–2.5 cm, falcate to complicate, succulent, glabrous, adaxially light-green, abaxially vinous tinted to vinous, turning olive-green to light-brown when dry, base cordate to obtuse, margin vinous, ciliolate, slightly revolute, apex acute; midvein conspicuous to inconspicuous, adaxially inconspicuous, secondary veins inconspicuous, adaxially inconspicuous, abaxially inconspicuous, becoming more evident on both sides when dry. **Inflorescences** terminal or axillar in the distal portion of the stems, 1 per leaf axis; peduncles 3.5–5.2 cm long, green, glabrous; cincinni bracts similar to each other, broadly ovate to ovate, 1.6–3.5 × 0.4–1.2 cm, leaf-like, glabrous, light-green, abaxially slightly lighter, base cordate to obtuse, not saccate, margin minutely ciliolate, apex acute; double cincinni ca. 10–16-flowered. **Flowers** ca. 1–1.2 cm diam., pedicels 1–2 cm long, vinous, sparsely pilose; floral buds ellipsoid; sepals ca. 5–6 × 1.5–3 mm, vinous, dorsally keeled, pilose at the apex; petals ca. 5–6 × 3–4 cm, pink; filaments ca. 4–5 mm long, anthers ca. 0.8–1 × 1–1.2 mm; ovary ca. 1–1.5 × 1–1.3 cm, style ca. 5 mm long; pistil longer than the stamens. **Capsule** ca. 3–4 × 2–3 cm. **Seeds** ca. 2–3 × 1–1.5 mm, brownish to greyish-brown, testa rugose arranged in radiated ridges, hilum longer than ½ the length of the seed.

**Examined material:** BOLIVIA. **Beni:** Provincia de Ballivia, lower slopes of Serrania Pilon Lajas, 14.3 km N of the bridge over the Río Quiquibey, 10.vi.1985, fl., *J.C. Solomon 13916* (LPB, MO, NY, US).

**Etymology:** The epithet “*valida*” means erect, stiff, making reference to the plants’ posture and succulent stem.

**Distribution and habitat:** *Tradescantia valida* was described based on cultivated material, supposedly from Brazil (Brückner 1932). Nevertheless, we found no Brazilian specimen that matched the species protologue and the morphology of the holotype. Added to that, the only other collection known from this species is for the Ballivia, Beni, Bolivia. We believe it is possible that a confusion regarding the origin of this specimen may have occurred. Thus, *Tradescantia valida* is endemic to Bolivia (Map 11). It can be found growing as rupicolous or in shallow sandy and rocky soils in open areas or understory in Bosque Boliviano.

**Conservation status:** Data Deficient (DD).

**Taxonomic notes:** *Tradescantia valida* is similar to *T. seubertiana* due to their glabrous, abaxially vinous leaves, vinous pedicels and pink flowers. However *T. valida* can be differentiated from *T. seubertiana* by its ciliate leaf-sheath margins and pilose sepals. Also, the two species grow considerably apart, *T. valida* being native from Bolivia and *T. seubertiana* being endemic to the alpine region of Santa Catarina, Brazil.

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**Table 1.** Voucher specimens used in the phylogenetic analysis.

| <b>Taxon</b>   | <b>Sections &amp; Series</b>      | <b>Voucher specimens</b>                     |
|--|-----------------------------------|--|
| <i>Tinantia erecta</i> (Jacq.) Fenzl                     | –                                 | M.O.O. Pellegrini 315 (RB)                   |
| <i>Tinantia sprucei</i> C.B.Clarke                       | –                                 | L.A.S. Santos 1149 (RB)                      |
| <i>Tradescantia cerinthoides</i> Kunth                   | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 445 (RB)                   |
| <i>Tradescantia crassula</i> Link & Otto                 | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 439 (RB)                   |
| <i>Tradescantia chrysophylla</i> M.Pell.                 | Section <i>Austrotradescantia</i> | A. Custódio Filho 1910 (RB)                  |
| <i>Tradescantia fluminensis</i> Vell.                    | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 48 (RB)                    |
| <i>Tradescantia mundula</i> Kunth                        | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 434 (RB)                   |
| <i>Tradescantia seubertiana</i> M.Pell.                  | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 436 (RB)                   |
| <i>Tradescantia tenella</i> Kunth                        | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 431 (RB)                   |
| <i>Tradescantia umbraculifera</i> Hand.-Mazz.            | Section <i>Austrotradescantia</i> | M.O.O. Pellegrini 192 (RB)                   |
| <i>Tradescantia valida</i> G.Brückn.                     | Section <i>Austrotradescantia</i> | <i>s.leg.sn.</i> (B barcode B 10<br>0296487) |
| <i>Tradescantia zanonii</i> (L.) Sw.                     | Section <i>Campelia</i>           | M.O.O. Pellegrini 412 (RB)                   |
| <i>Tradescantia commelinoides</i> Schult. &<br>Schult.f. | Section <i>Cymbispatha</i>        | C.G. Pringle 6402 (F)                        |
| <i>Tradescantia gracilima</i> Standl.                    | Section <i>Cymbispatha</i>        | P.C. Standley 55158 (F)                      |
| <i>Tradescantia grantii</i> Faden                        | Section <i>Cymbispatha</i>        | J.R. Grant 92-01801 (K)                      |
| <i>Tradescantia poellie</i> D.R.Hunt                     | Section <i>Cymbispatha</i>        | W.D. Stevens 11360 (MBM)                     |
| <i>Tradescantia praetermissa</i> M.Pell.                 | Section <i>Cymbispatha</i>        | G. Mandon 1237 (K)                           |
| <i>Tradescantia standleyi</i> Steyerm.                   | Section <i>Cymbispatha</i>        | Kejos 44603 (K)                              |
| <i>Tradescantia guatemalensis</i> C.B.Clarke             | Section <i>Coholomia</i>          | E. Cabrera 7583 (RB)                         |
| <i>Tradescantia soconuscana</i> Matuda                   | Section <i>Corinna</i>            | R.B. Faden 98 (RB)                           |

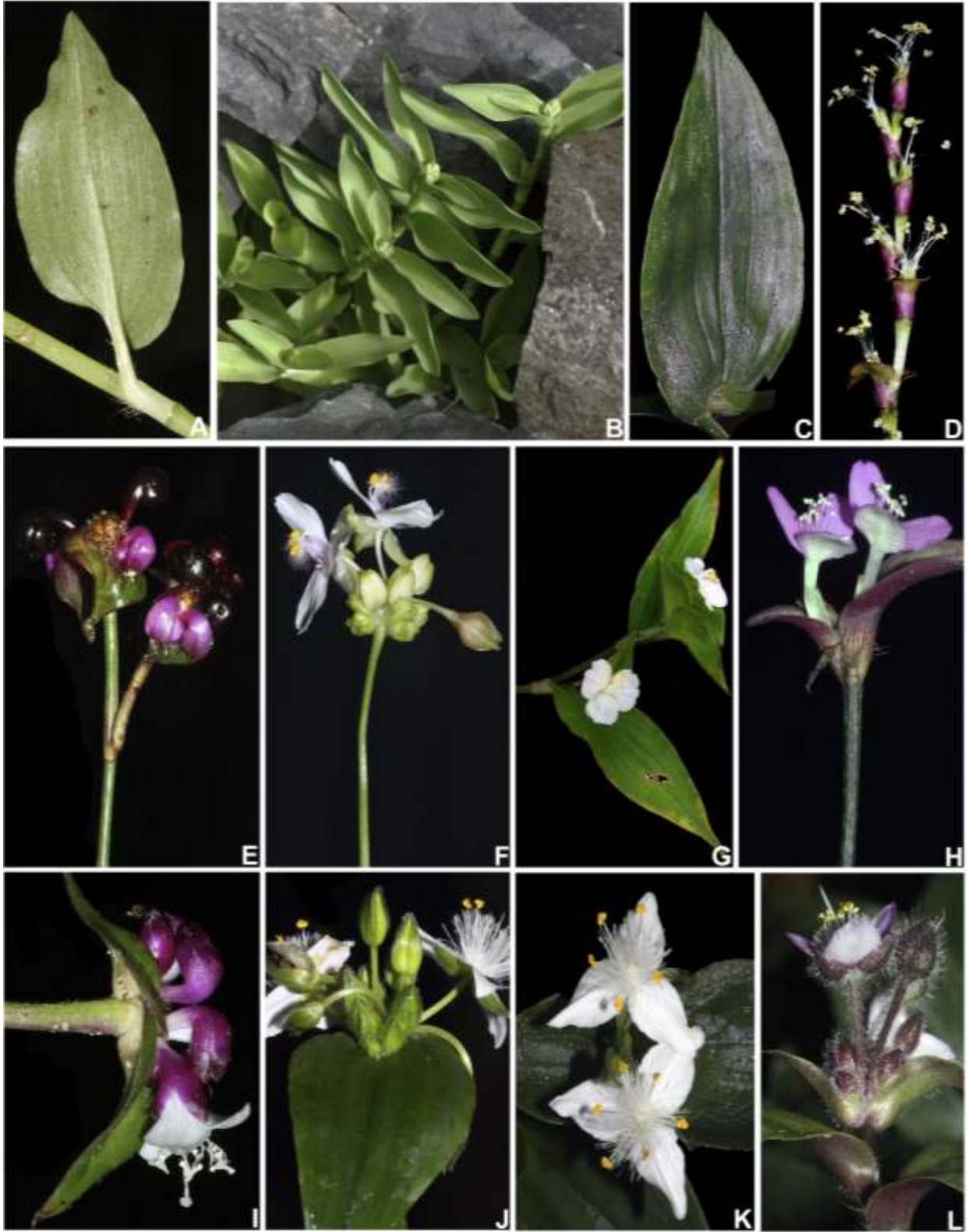


|   |   |   |
|---|---|---|
| <i>Tradescantia ambigua</i> Mart.                               | Section <i>Mandonia</i>                                       | J. Paula-Souza 11037 (RB)                   |
| <i>Tradescantia andrieuxii</i> C.B. Clarke                      | Section <i>Parasetcreasea</i>                                 | D.R. Hunt 8158 (K)                          |
| <i>Tradescantia spathacea</i> Sw.                               | Section <i>Rhoeo</i>  | M.O.O. Pellegrini 446 (RB)                  |
| <i>Tradescantia virginiana</i> L.                               | Section <i>Tradescantia</i> , Series<br><i>Virginianae</i>    | R. Kral 47112 (MBM)                         |
| <i>Tradescantia sillamontana</i> Matuda                         | Section <i>Tradescantia</i> , Series<br><i>Sillamontanae</i>  | S.S. White 30 (MICH)                        |
| <i>Tradescantia pinetorum</i> Greene                            | Section <i>Tradescantia</i> , Series<br><i>Tuberosae</i>      | E.L. Greene s.n. (NDG barcode<br>NDG 10405) |
| <i>Tradescantia orchidophylla</i> Rose &<br>Hemsl.              | Section <i>Tradescantia</i> , Series<br><i>Orchidophyllae</i> | M.E. Jones 467 (US)                         |
| <i>Tradescantia pygmaea</i> D.R. Hunt                           | Section <i>Separothesa</i>                                    | A. Forrer s.n. (NDG barcode<br>NDG 10418)   |
| <i>Tradescantia brevifolia</i> (Torr.) Rose                     | Section <i>Setcreasea</i>                                     | W.H. Emory 1500a (NY)                       |
| <i>Tradescantia pallida</i> (Rose) D.R. Hunt                    | Section <i>Setcreasea</i>                                     | M.O.O. Pellegrini 447 (RB)                  |
| <i>Treadescantia zebrina</i> Heynh. ex Bosse                    | Section <i>Zebrina</i>  | R.C. Forzza 7374 (RB)                       |
| <i>Elasis hirsuta</i> (Kunth) D.R. Hunt                         | –   | H. Balslev 10518 (MBM)                      |
| <i>Gibasis consobrina</i> D.R. Hunt                             | Section <i>Gibasis</i>  | J.N. Rose 5870 (NY)                         |
| <i>Gibasis geniculata</i> (Jacq.) Rohweder                      | Section <i>Heterobasis</i>                                    | M.O.O. Pellegrini 213 (RB)                  |
| <i>Gibasis oaxacana</i> D.R. Hunt                               | Section <i>Heterobasis</i>                                    | D.R. Hunt 8175                              |
| <i>Gibasis pellucida</i> (M. Martens & Galeotti)<br>D.R. Hunt   | Section <i>Gibasis</i>  | M.O.O. Pellegrini 5 (RFA)                   |
| <i>Gibasis karwinskyana</i> (Schult. & Schult. f.)<br>Rohweder  | Section <i>Gibasis</i>  | D.R. Hunt 8014 (K)                          |
| <i>Callisia filiformis</i> (M. Martens & Galeotti)<br>D.R. Hunt | Section <i>Leptocallisia</i>                                  | M. Sobral-Leite 814 (RB)                    |

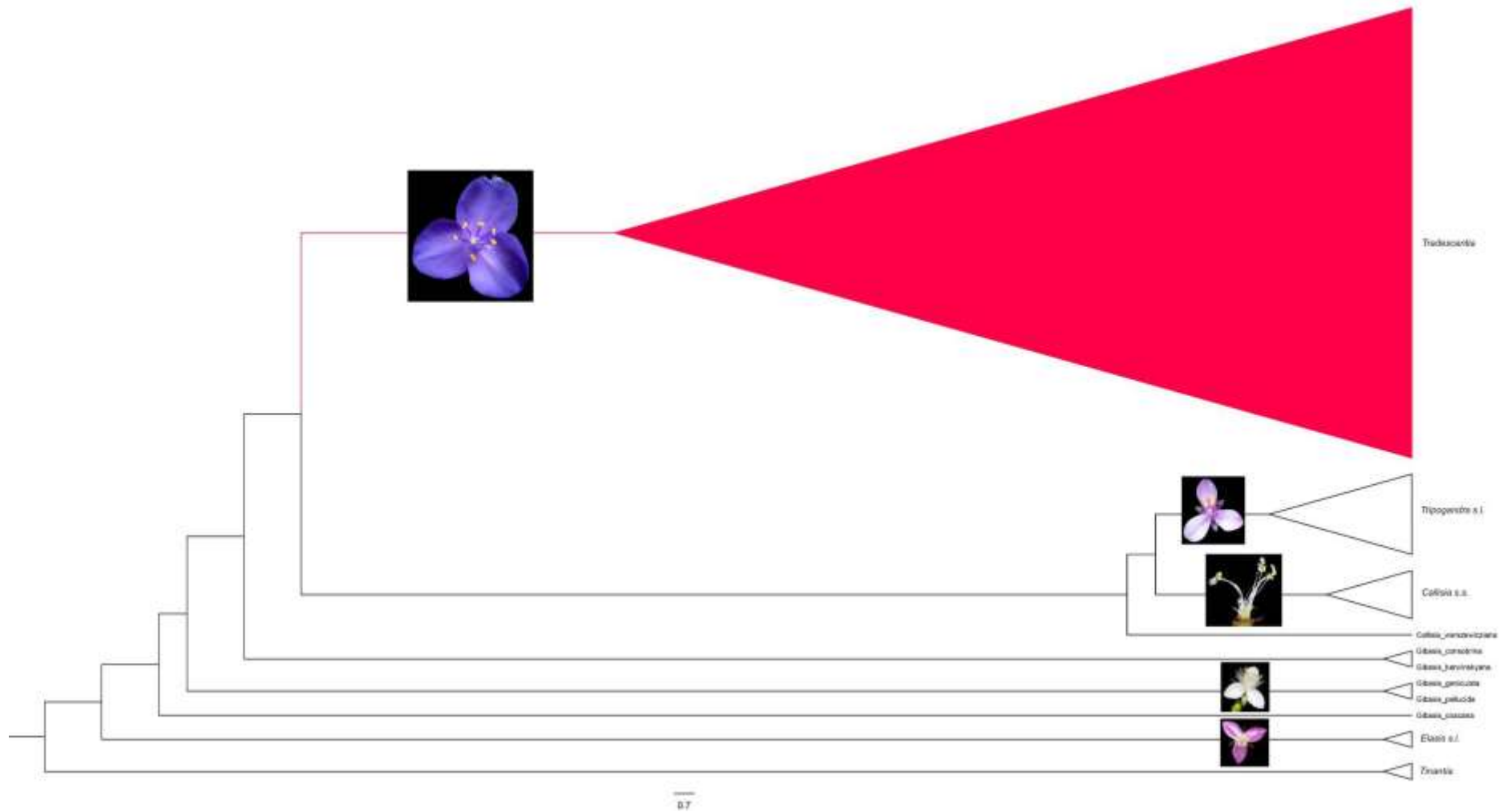
|   |                              |  |
|---|------------------------------|--|
| <i>Callisia fragrans</i> (Lindl.) Woodson                   | Section <i>Callisia</i>      | T. S. Filgueiras 3443 (RB)               |
| <i>Callisia gentlei</i> Matuda                              | Section <i>Callisia</i>      | M.O.O. Pellegrini 448 (RB)               |
| <i>Callisia monandra</i> (Sw.) Schult. &<br>Schult.f.       | Section <i>Leptocallisia</i> | M.O.O. Pellegrini 430 (RB)               |
| <i>Callisia repens</i> (Jacq.) L.                           | Section <i>Callisia</i>      | M.O.O. Pellegrini 80 (RB)                |
| <i>Callisia warszewicziana</i> (Kunth &<br>Bouché) D.R.Hunt | Section <i>Hadrodemas</i>    | O. Campos Góes 167 (RB)                  |
| <i>Tripogandra brasiliensis</i> Handlos                     | –                            | G. Eiten 4458 (SP)                       |
| <i>Tripogandra diuretica</i> (Mart.) Handlos                | –                            | M.O.O. Pellegrini 4 (RFA)                |
| <i>Tripogandra elata</i> D.R.Hunt                           | –                            | C.A. Ferreira Junior s.n. (RB<br>588051) |
| <i>Tripogandra glandulosa</i> (Seub.)<br>Rohweder           | –                            | M.O.O. Pellegrini 298 (RB)               |
| <i>Tripogandra purpurascens</i> (Schauer)<br>Handlos        | –                            | J.P. Souza 7579 (ESA)                    |
| <i>Tripogandra warmingiana</i> (Seub.)<br>Handlos           | –                            | M.O.O. Pellegrini 223 (RB)               |

**Table 2.** Primary literature sources for information used in the phylogenetic analysis.

| <b>Character</b> | <b>Source</b>  |
|------------------|--|
| Pollen           | Poole & Hunt 1980  |
| Cytology         | Anderson & Sax 1936; Jones & Jopling 1972; Jones, Kenton & Hunt 1981; Martínez 1984; Martínez & Ginzo 1985; Jones 1990 |
| Phytochemistry   | Martínez & Sawin 1985; Martínez & Martínez 1993  |

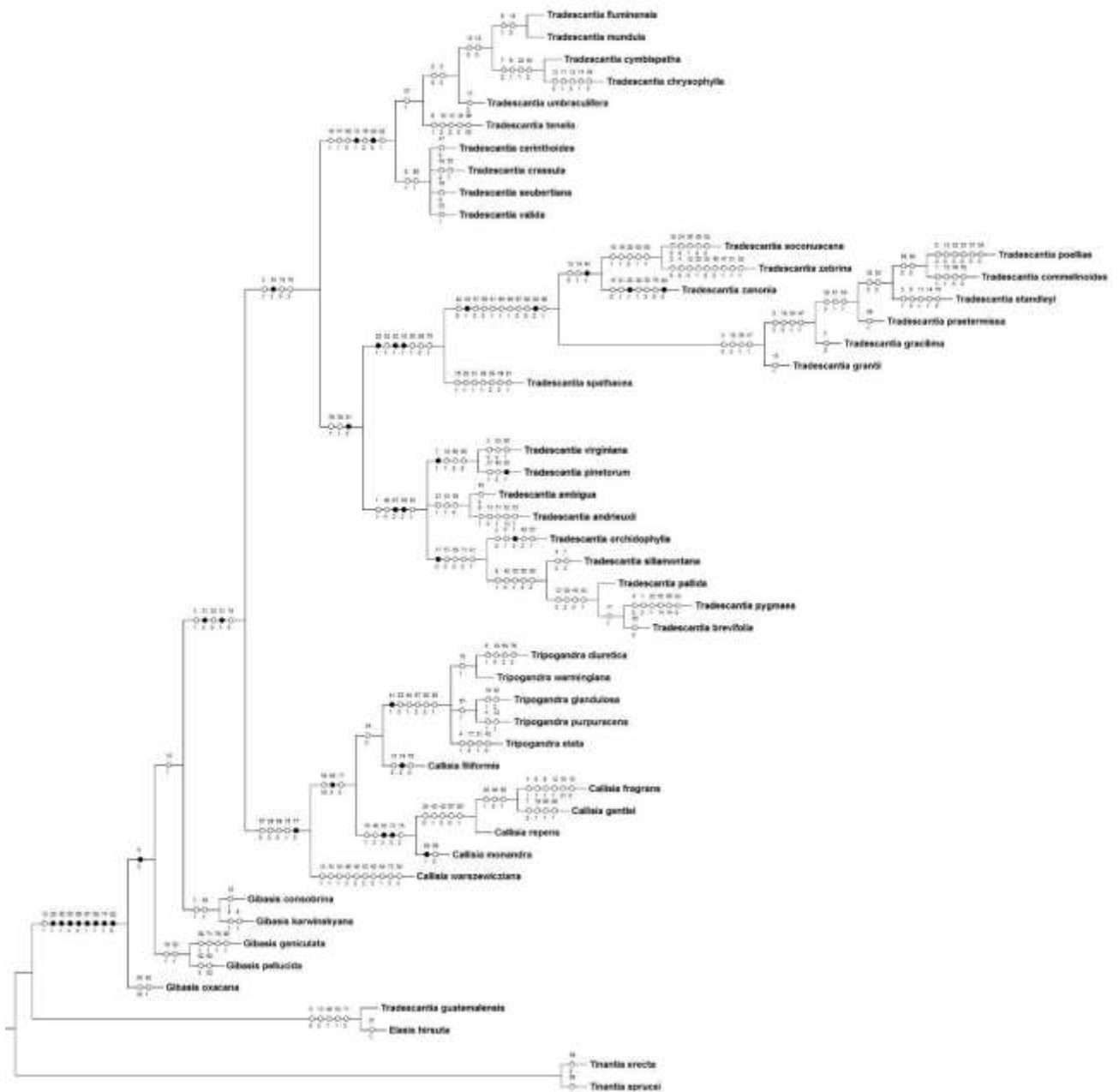


**Fig. 1.** Morphological characters used in the phylogenetic analysis. **A**, Subpetiolate leaf (Character 6) and asymmetrical base (Character 16) in *Tradescantia tenella*. **B**, Complicate leaves (Character 8) in *Tradescantia crassula*. **C**, Impressed secondary veins (Character 18) in *Tradescantia fluminensis*. **D**, Predominantly axillar to spike-like sinflorescence (Character 21) in *Callisia repens*. **E**, Sinflorescence with two paraclades (Character 22) in *Tradescantia zanonía*. **F**, Cincinni fused back-to-back (Character 27), contracted cincinni (Character 30), fused cincinni (Character 31), vestigial cincinni bracts (Character 34), flower display of 60° (Character 41), shorter opposite-sepal stamens (Character 61), sigmoid filaments (Character 62), and zygomorphic androecium (Character 64) in *Tripogandra diuretica*. **G**, Present supernumerary cincinni bracts (Character 33) in *Tradescantia praetermissa*. **H**, Cincinni bracts saccate at base (Character 37), tubular flower (Character 40), fused petals (Character 51), clawed petals (Character 53), shorter opposite-sepal stamens (Character 61), connective transversally-linear (Characters 65–66), round anther sacs (Characters 67–68), pollen white colored (Character 69), and trilobed stigma (Character 73) in *Tradescantia zebrina*. **I**, Tubular flower (Character 40), flowers geniculate at anthesis and pre-anthesis (Character 43), fused sepals (Character 44), filaments bearded with sparse and short hairs (Characters 57, 59), shorter opposite-sepal stamens (Character 61), connective transversally-linear (Characters 65–66), round anther sacs (Characters 67–68), pollen white (Character 69), and trilobed stigma (Character 73) in *T. zanonía*. **J**, Keeled sepals (Character 47) in *Tradescantia fluminensis*. **K**, Filaments bearded with dense and long hairs (Characters 57, 59), basal filaments hairs (Characters 58, 60), connective rhomboid (Characters 65–66), ellipsoid anther sacs (Characters 67–68), and pollen yellow (Character 69) in *T. fluminensis*. **L**, Pistil longer than the androecium (Character 71) and punctate (Character 73) in *Tradescantia cerinthoides*. All photos by M.O.O. Pellegrini, except G by H. Huaylla.



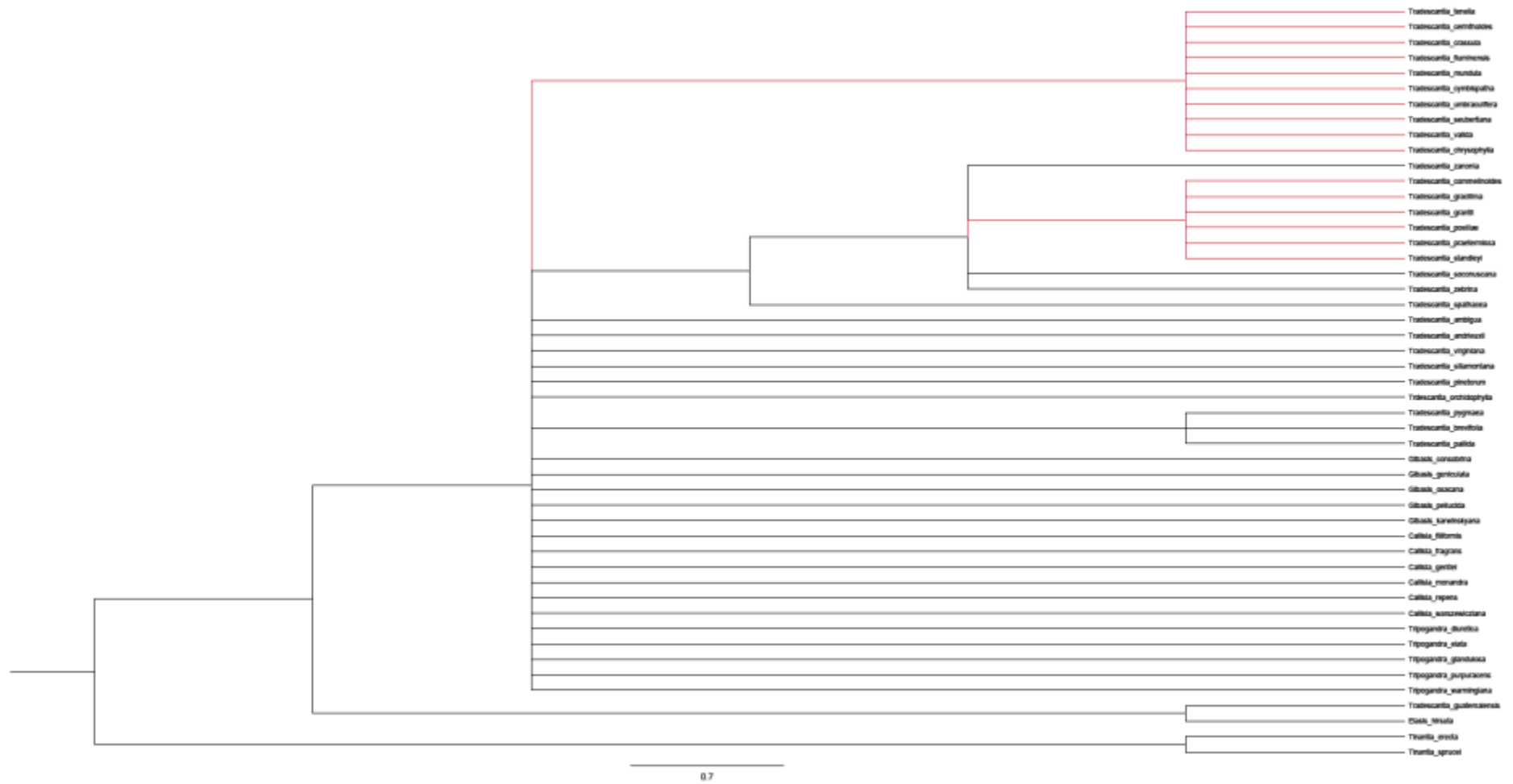
**Fig. 2.** Majority rule showing the relation between the genera in Tradescantiinae and their floral morphology. *Tradescantia s.s.* is depicted in red.





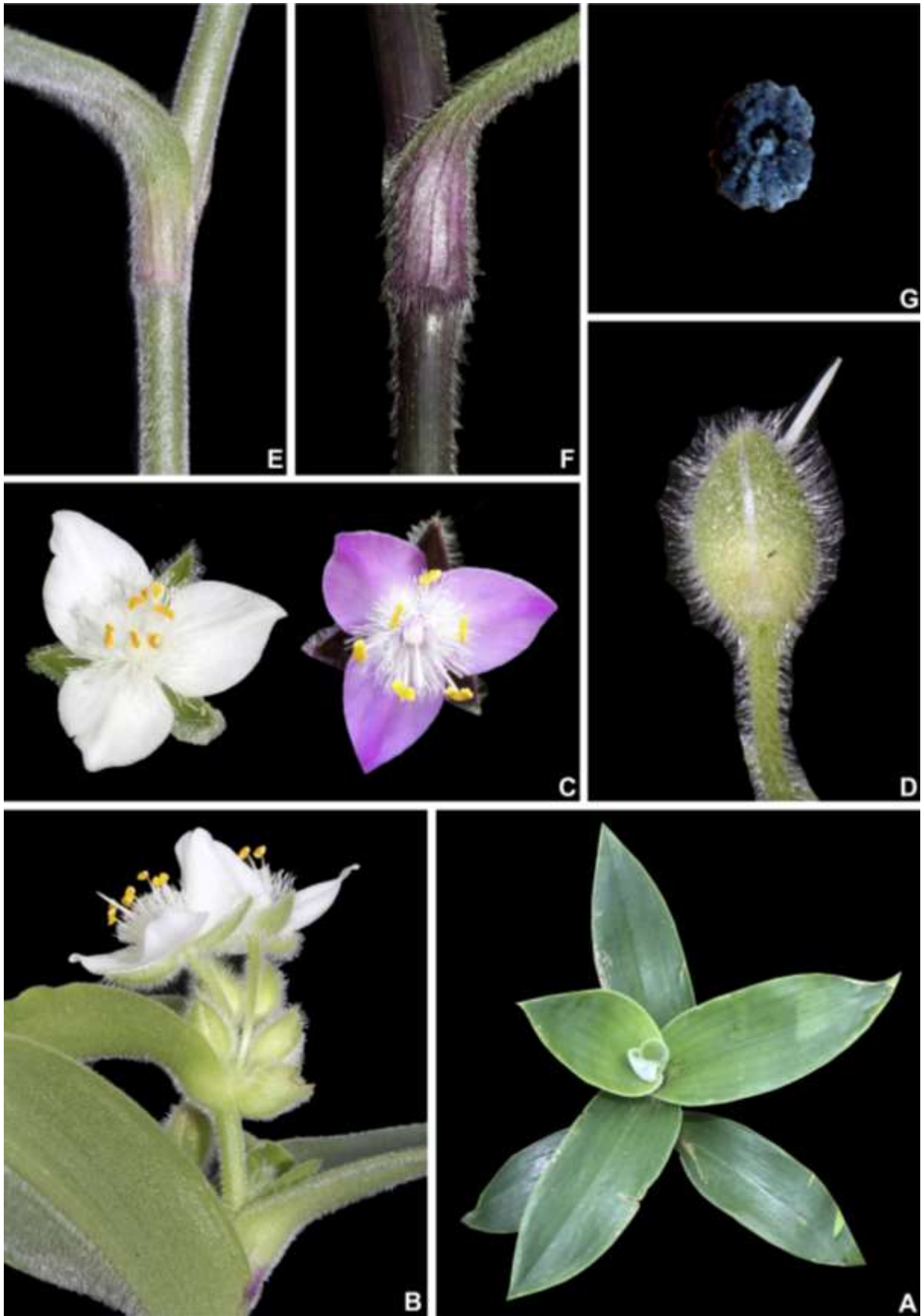
**Fig. 4.** Majority rule tree showing the character state optimizations at each node of the cladogram, represented by circles. In each circle, the numbers above and below represent the character and character state numbers, respectively (as reported in Supplement).



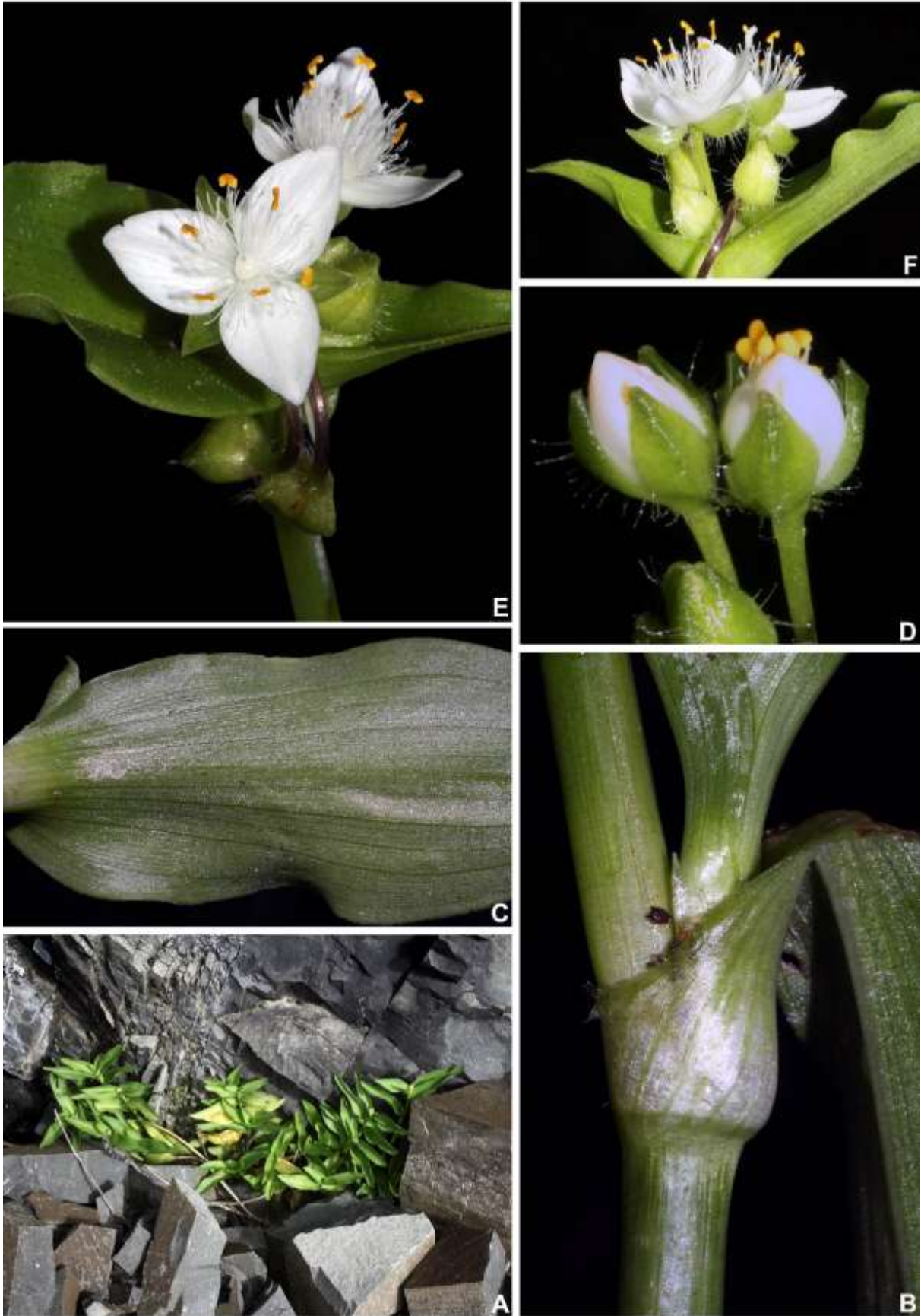


**Fig. 5.** Strict consensus tree. *Tradescantia* sections *Austrotradescantia* and *Cymbispatha* are depicted in red.





**Fig. 7.** *Tradescantia cerinthoides* Kunth. **A**, habit. **B**, detail of the inflorescence, showing the not saccate cincinni bract base, and side view of the flower, showing the pistil longer than the androecium. **C**, flowers, showing the petal color variation form white to lilac. **D**, detail of flower at post-anthesis, showing the pedicel's and sepals' velutine indumenta. **E--F**, detail of the stem and leaf-sheath, showing the variation in color and indumenta: **E**, green stem, pinkish leaf-sheath, with velutine indumenta; **F**, vinous stem, vinous leaf-sheath, with hirsute indumenta. **G**, seed, showing the costate testa and dorsal embryotega. Field photos by M.O.O. Pellegrini.



**Fig. 8.** *Tradescantia crassula* Link & Otto. **A**, habit, showing the erect stems and complicate leaves. **B**, detail of the stem and leaf-sheath. **C**, blade abaxial view. **D**, detail of floral buds, showing the sepals' indumenta restricted to the keels. **E**, flower. **F**, detail of the inflorescence, showing the not saccate cincinni bract base. Field photos by M.O.O. Pellegrini.

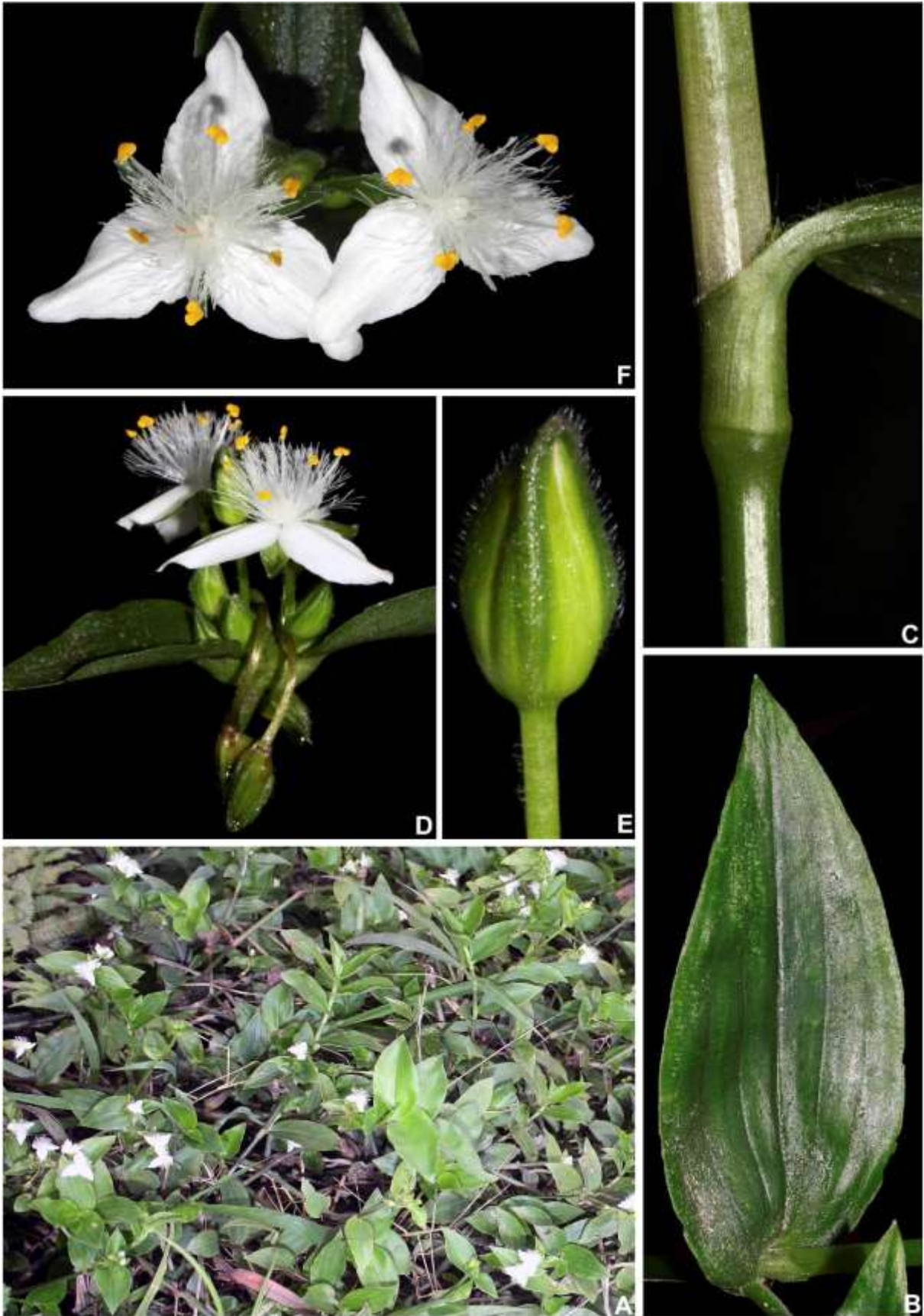


**Fig. 9.** *Tradescantia chrysophylla* M. Pell. Photo of the Isotype. Photo by M.O.O. Pellegrini.





**Fig. 10.** *Tradescantia cymbispatha* C.B.Clarke. **A**, habit, showing the opaque aspect of the leaves due to the velutine indumenta. **B**, detail of the stem, showing the predominant vinous color of the stem and leaves. **C**, detail of the leaf-sheaths and of the abaxial side of the blades, showing the velutine and hyaline indumenta. **D**, adaxial side of the leaf-blade, showing the inconspicuous secondary veins and the velutine and hyaline indumenta. **E**, detail of flower at post-anthesis, showing the pedicel's and sepals' velutine indumenta. **F**, flowers. Field photos by M.O.O. Pellegrini.



**Fig. 11.** *Tradescantia fluminensis* Vell. **A**, habit, showing the opaque aspect of the leaves due to the velutine indumenta. **B**, adaxial side of the leaf-blade, showing the impressed secondary veins. **C**, detail of the stem, showing the setose leaf-sheath margin. **D**, detail of the inflorescence, showing the saccate cincinni bract base, the plicate petals and the pistil the same length as the androecium. **E**, floral bud, showing the keeled sepals and the pilose indumenta restricted to them. **F**, flowers, showing the plicate petals. Field photos by M.O.O. Pellegrini.



**Fig. 12.** *Tradescantia mundula* Kunth. **A**, habit, showing the opaque aspect of the leaves due to the velutine indumenta. **B**, detail of the stem, showing the minutely velutine leaf-sheath and subpetiole. **C**, adaxial side of the leaf-blade, showing the vinous tinted coloration. **D**, adaxial side of the leaf-blade, showing the impressed secondary veins. **E**, flower. **F**, detail of the inflorescence, showing the saccate cincinni bract base. **G**, detail of flower at post-anthesis, showing the pedicel's and sepals' velutine indumenta. Field photos by M.O.O. Pellegrini.

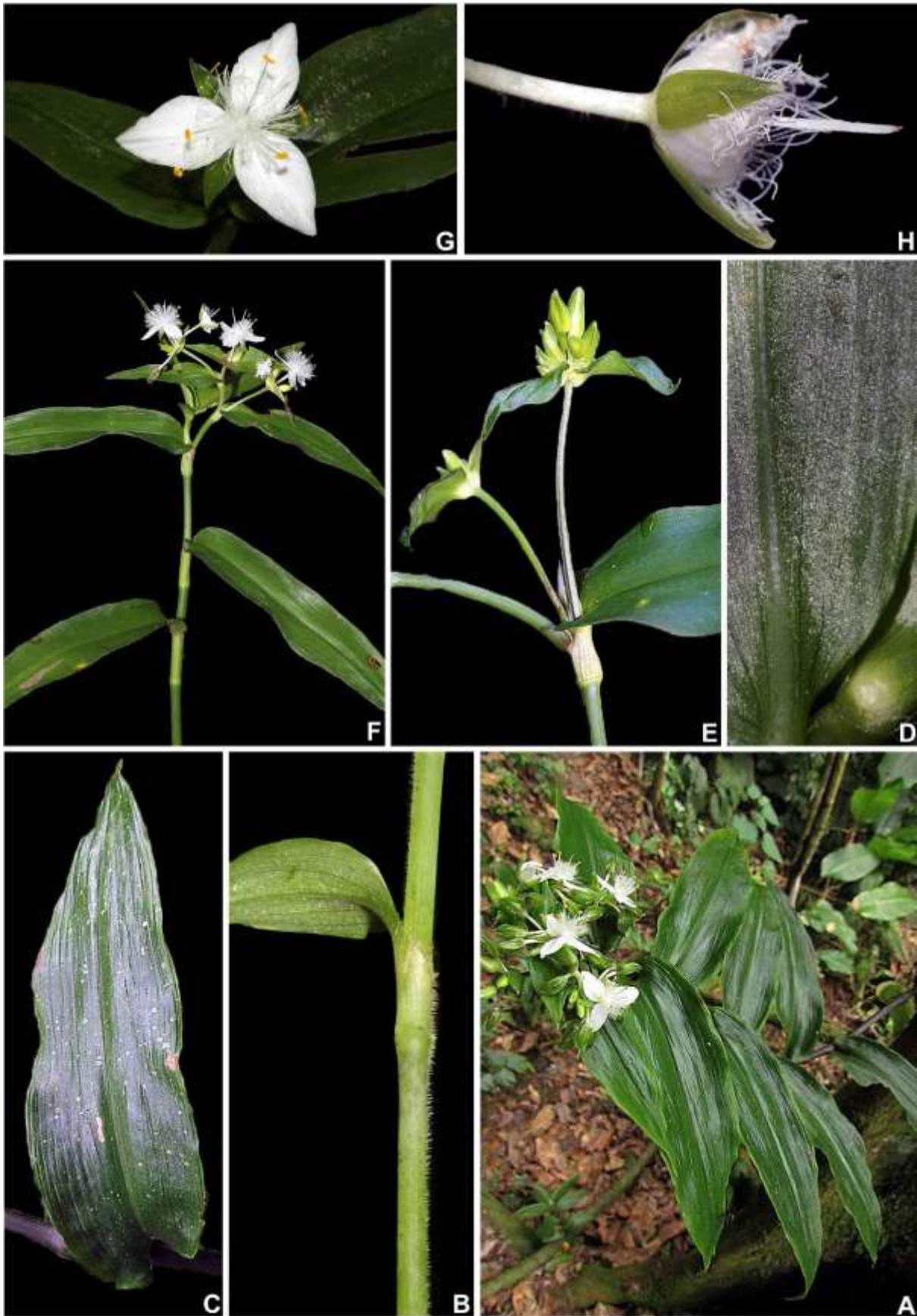


**Fig. 13.** *Tradescantia seubertiana* M.Pell. **A**, Serra do Corvo Branco, Santa Catarina, Brazil. **B**, habit, showing an individual growing on the wet rock wall. **C**, habit, showing the erect stem position. **D**, detail of the stem, leaf-sheath and the abaxial side of the leaf-blade, showing the reddish-purple coloration and the complete absence of indumenta. **E**, detail of the floral buds and flowers at post-anthesis, showing the reddish-purple coloration of the pedicels and sepals, and the complete absence of indumenta. **F**, detail of the inflorescence, showing the not saccate cincinni bract base, and side view of the flower, showing the pistil longer than the androecium. **G**, flower, showing the pink coloration of the petals. Field photos by M.O.O. Pellegrini.





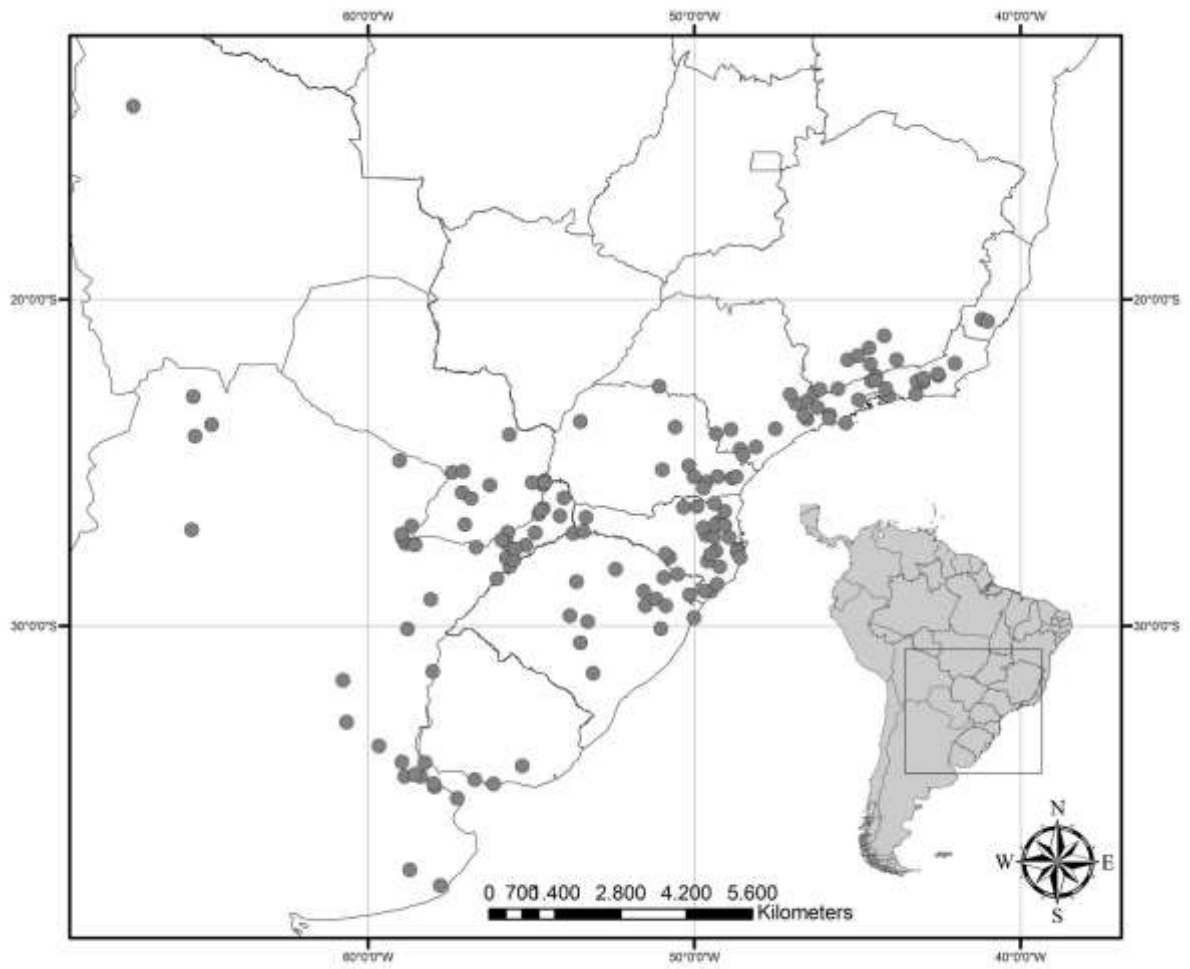
**Fig. 14.** *Tradescantia tenella* Kunth. **A**, habit, showing fruticose growth-form. **B**, detail of the stem and the leaf-sheath, showing the leaf-opposed line of uniseriate hairs and the setose leaf-sheath margin. **C**, abaxial side of the leaf-blade, showing the subpetiole and the vinous coloration. **D**, adaxial side of the leaf-blade, showing the impressed secondary veins and the vinous stripe along the midvein. **E**, detail of the adaxial side of the leaf-blade, showing the hirsute indumenta. **F**, detail of the inflorescence, showing the saccate cincinni bract base. **G**, flower and flower at post-anthesis showing the glandulous indumenta of the sepals. Field photos by M.O.O. Pellegrini.



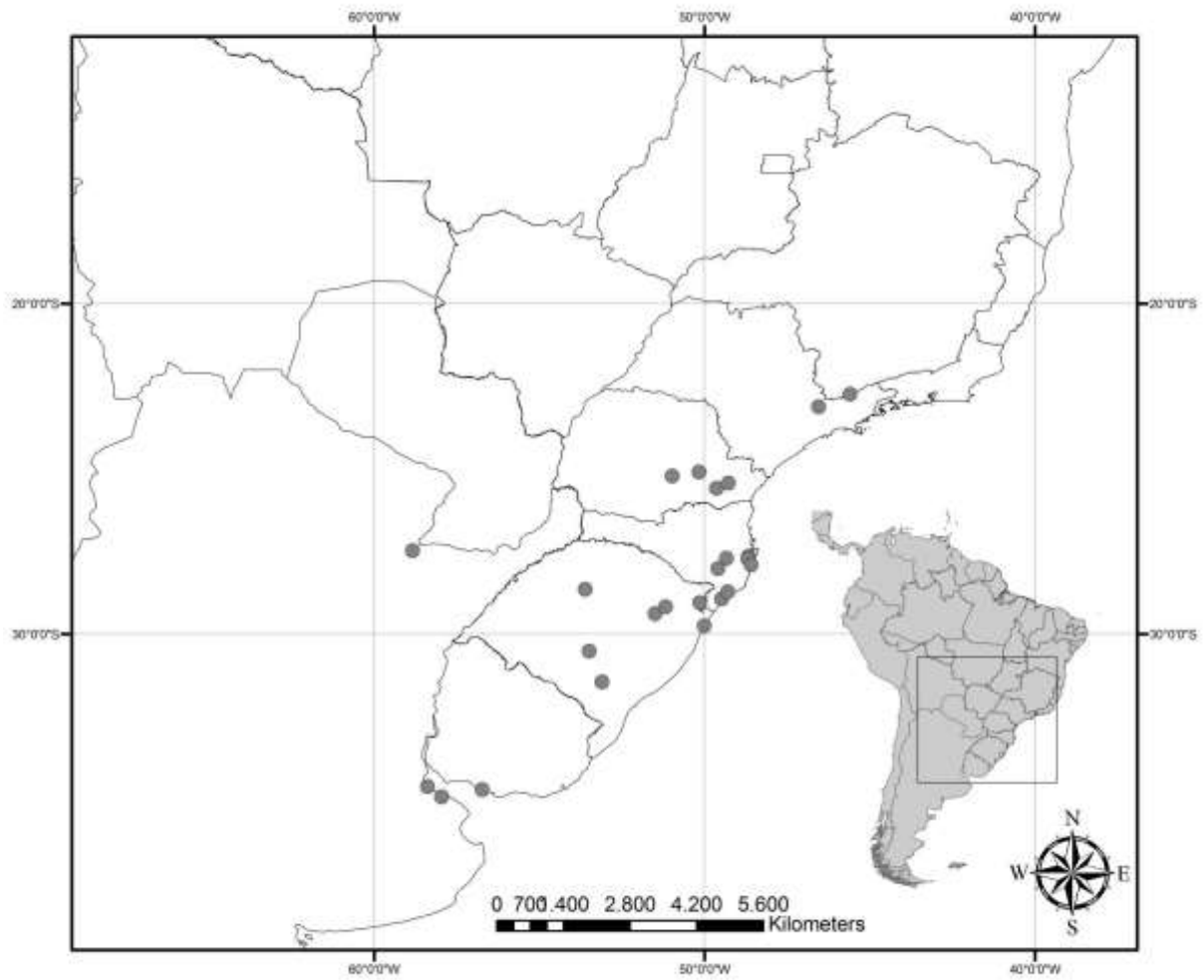
**Fig. 15.** *Tradescantia umbraculifera* Hand.-Mazz. **A**, habit, showing the species growing as an epiphyte. **B**, detail of the stem and the leaf-sheath, showing the leaf-opposed line of uniseriate hairs and the setose leaf-sheath margin. **C**, adaxial side of the leaf-blade, showing the impressed secondary veins. **D**, abaxial side of the leaf-blade. **E**, detail of two inflorescences emerging from the same leaf-sheath, showing the spatheaceous cincinni bracts and their saccate base. **F**, general aspect of the stem showing the many and congested inflorescences at its apex. **G**, flower. **H**, flower at post-anthesis showing the white pedicel and the glabrous sepals. Field photos by M.O.O. Pellegrini, except A by L.A. Funez and F by H. Medeiros.



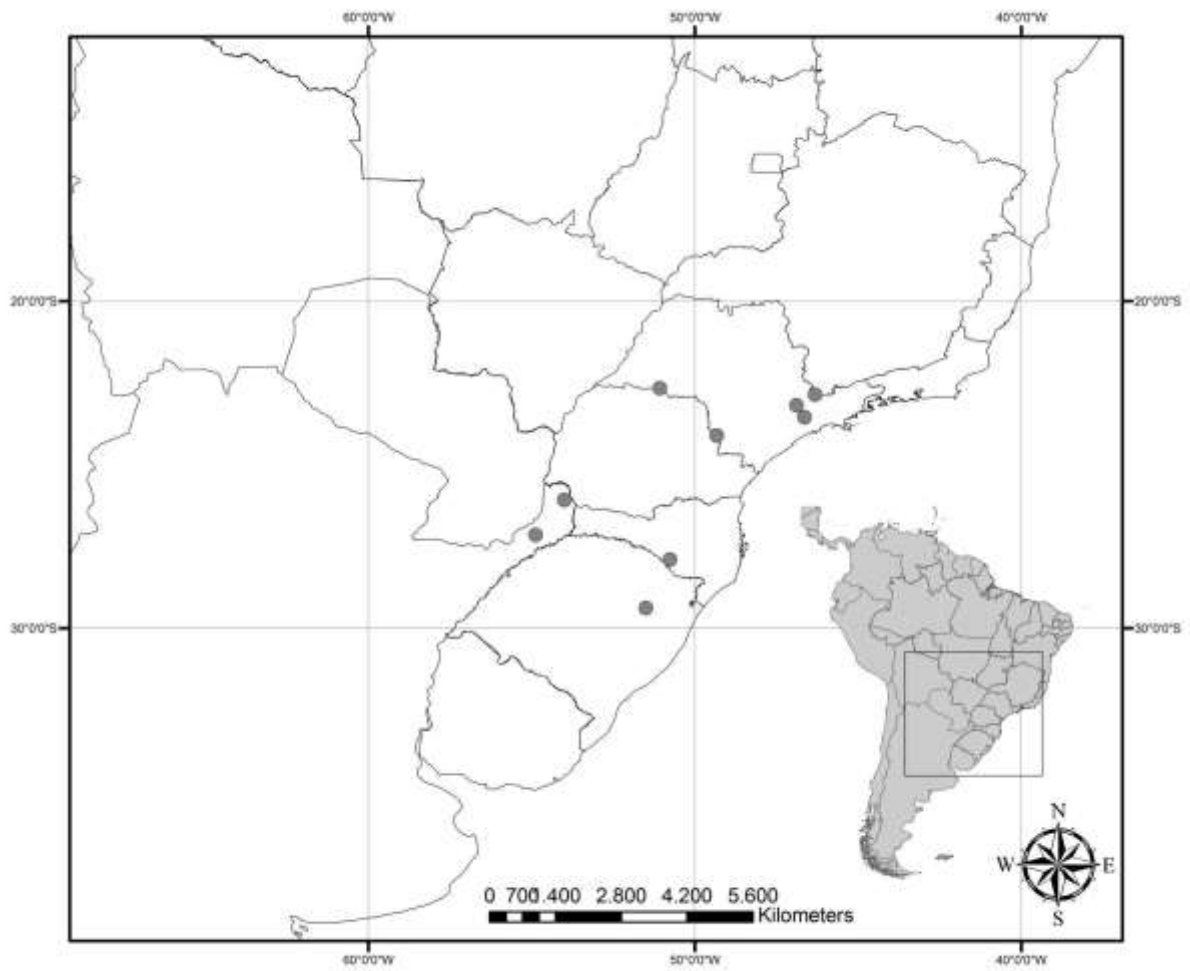
**Fig. 16.** *Tradescantia valida* G.Brückn. Photo of the Holotype. Photo by JSTOR.



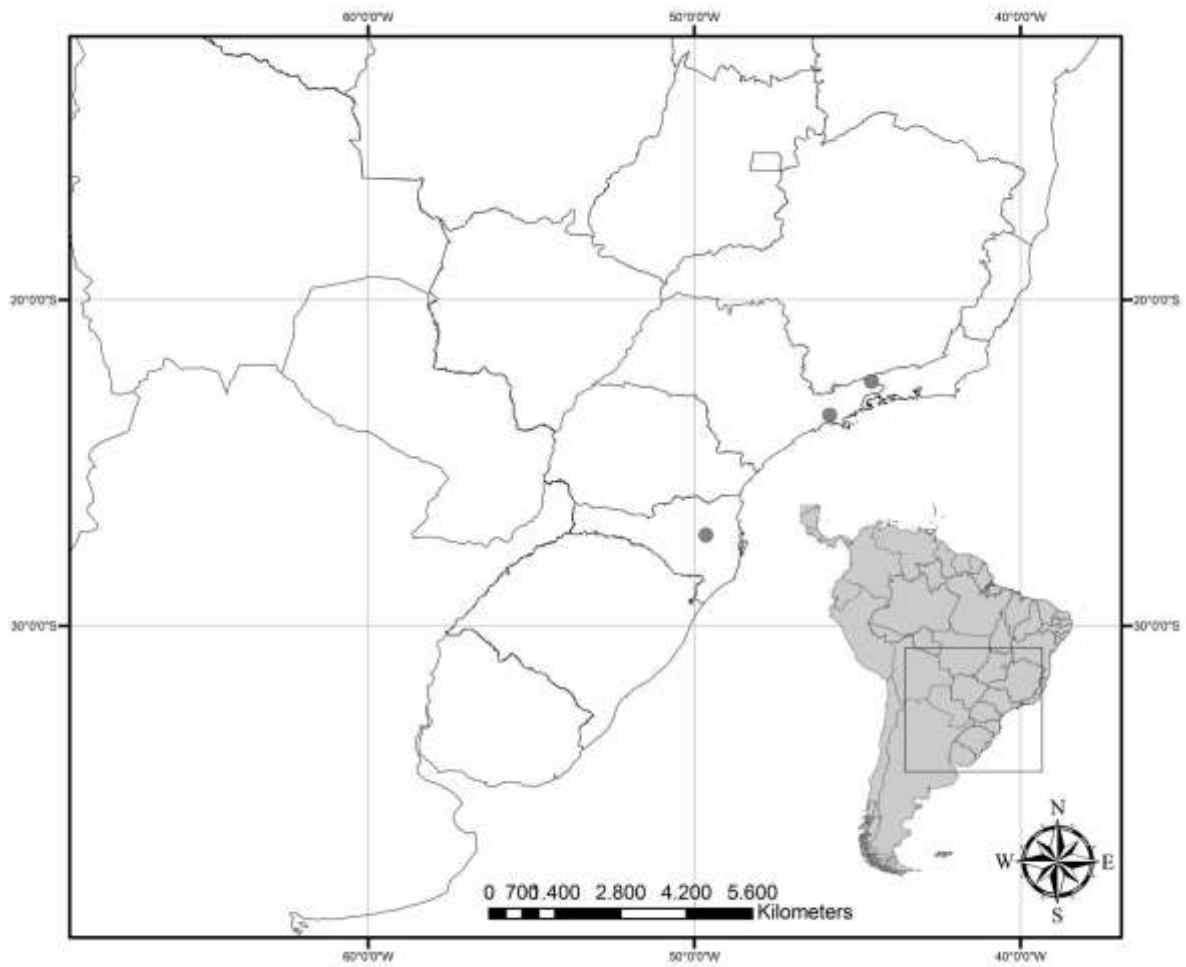
**Map 1.** Distribution map of *Tradescantia* L. section *Austrotradescantia* D.R.Hunt.



**Map 2.** Distribution map of *Tradescantia cerinthoides* Kunth.

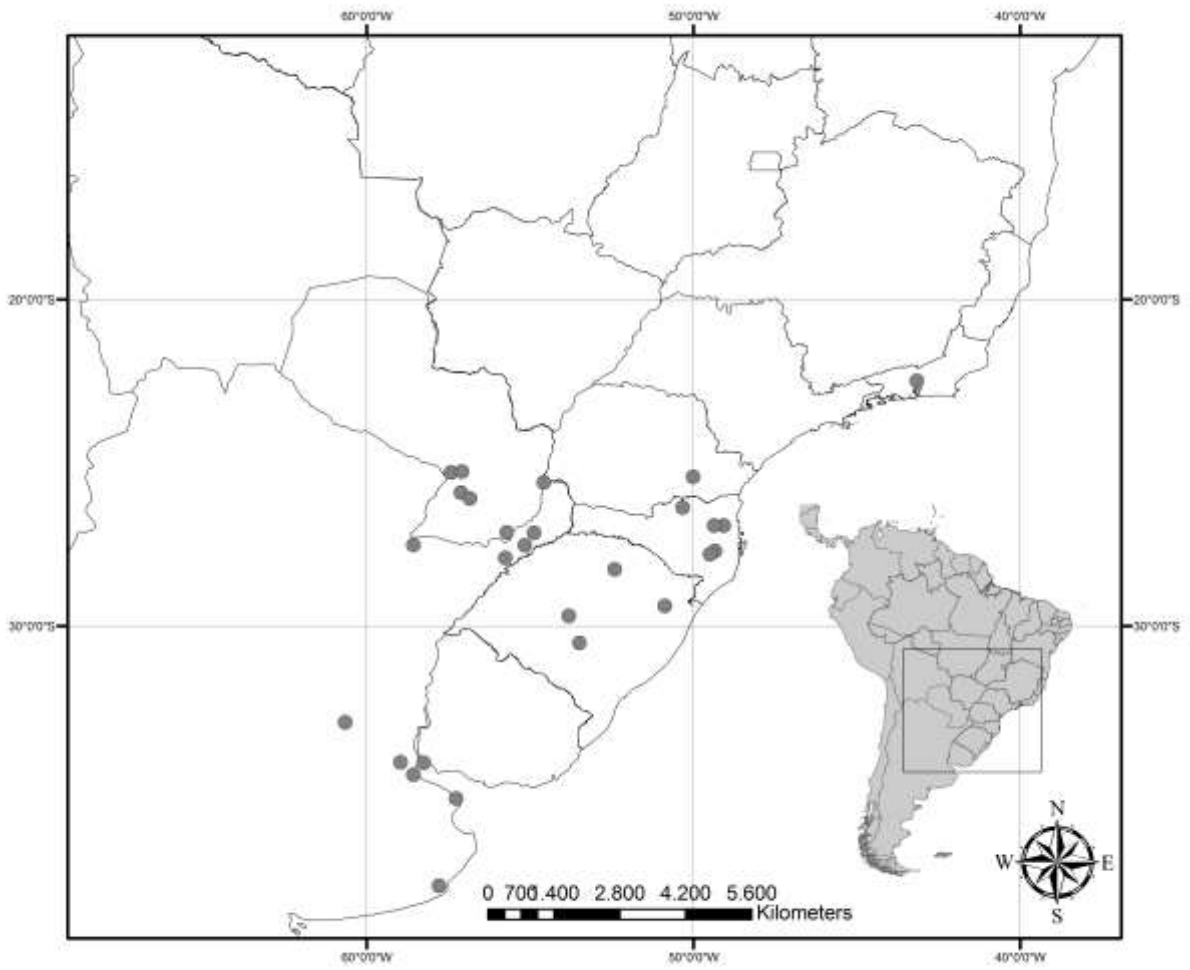


**Map 3.** Distribution map of *Tradescantia crassula* Link & Otto.

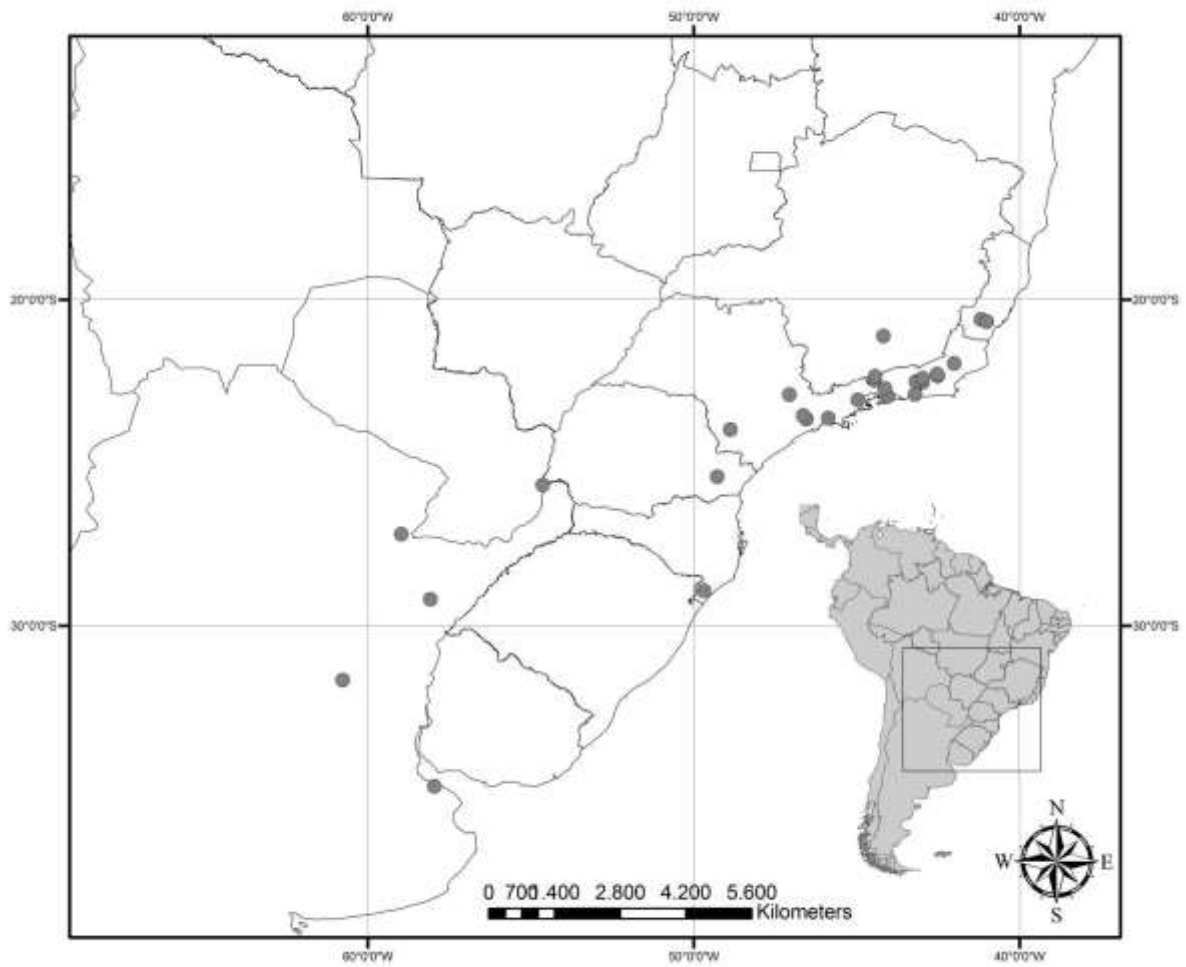


**Map 4.** Distribution map of *Tradescantia chrysophylla* M.Pell.

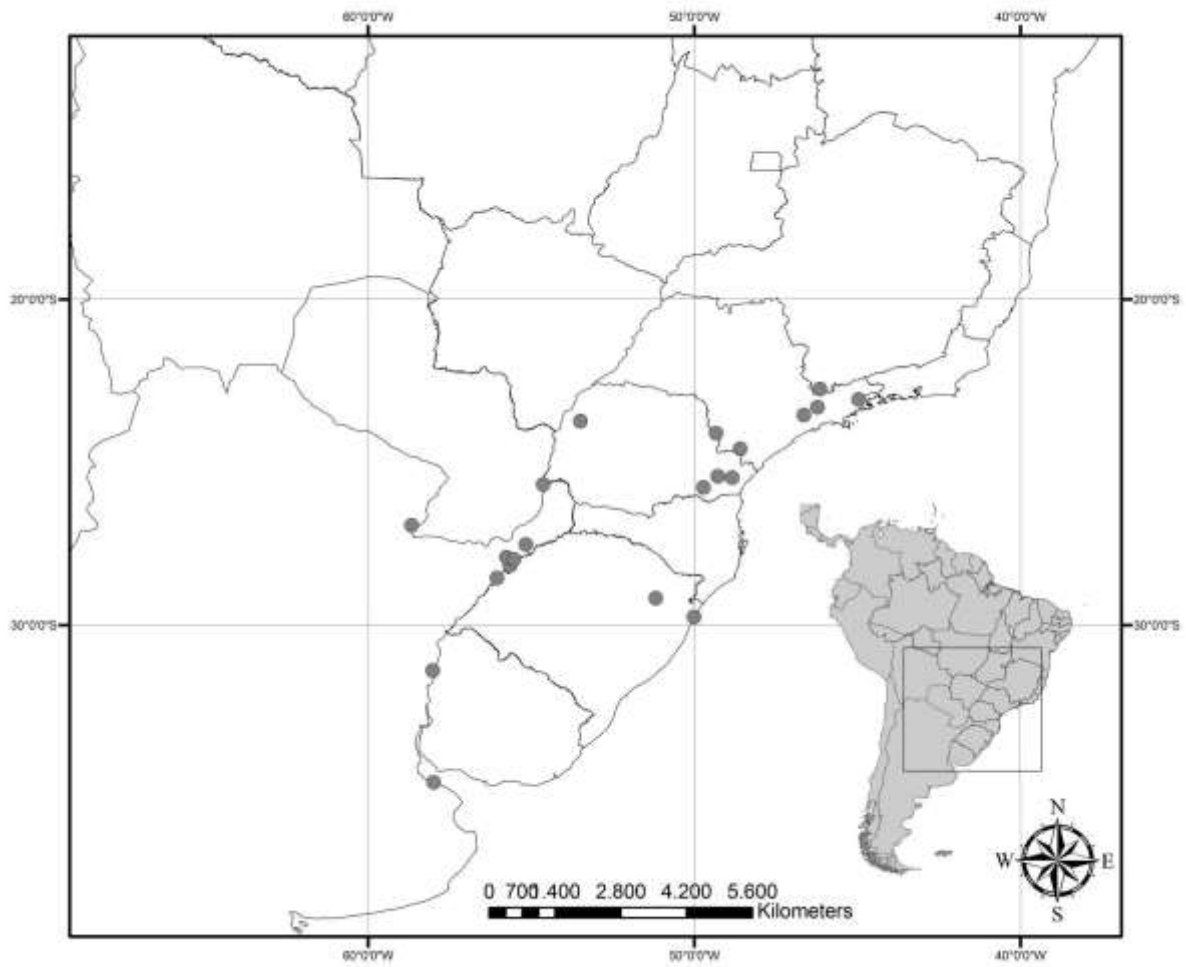




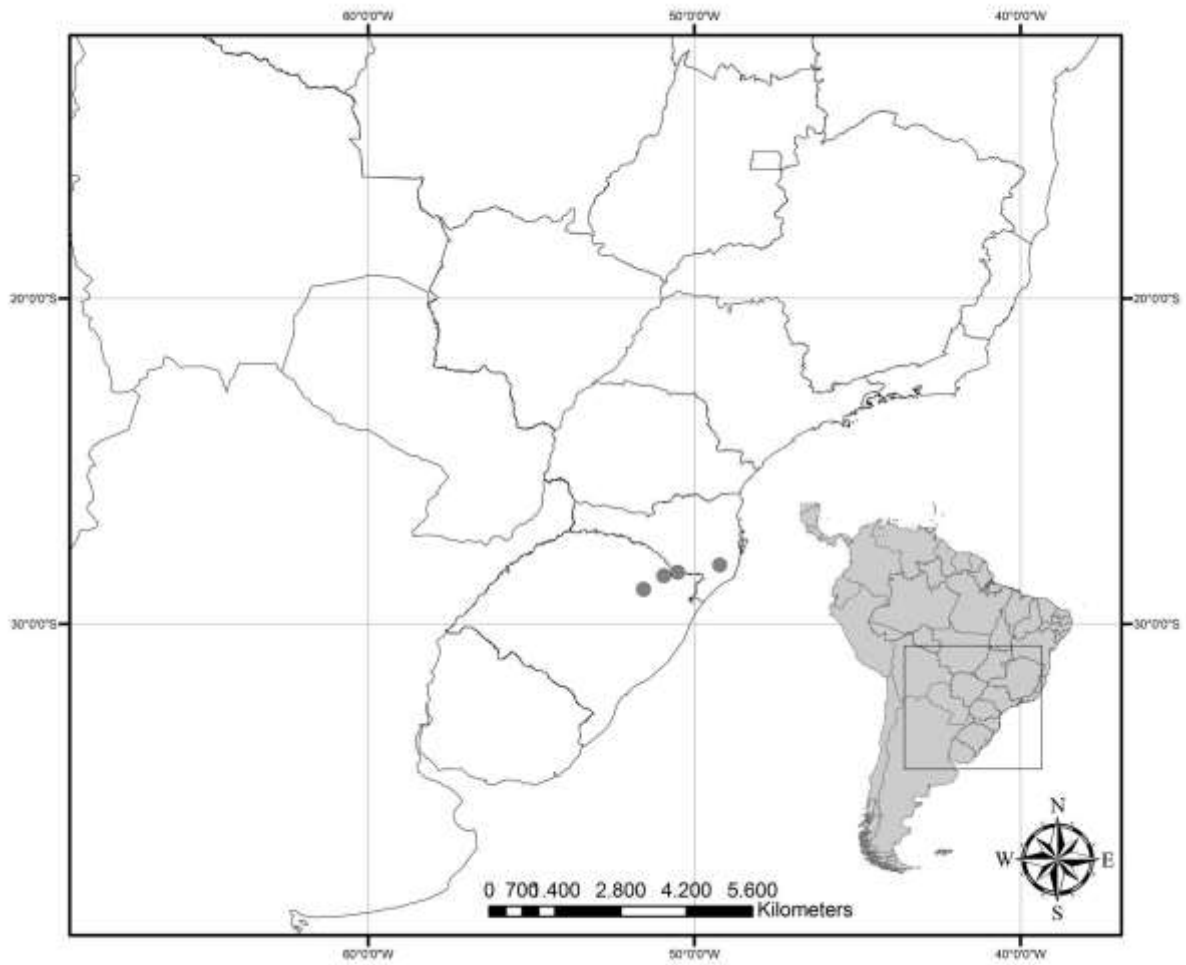
**Map 5.** Distribution map of *Tradescantia cymbispatha* C.B. Clarke.



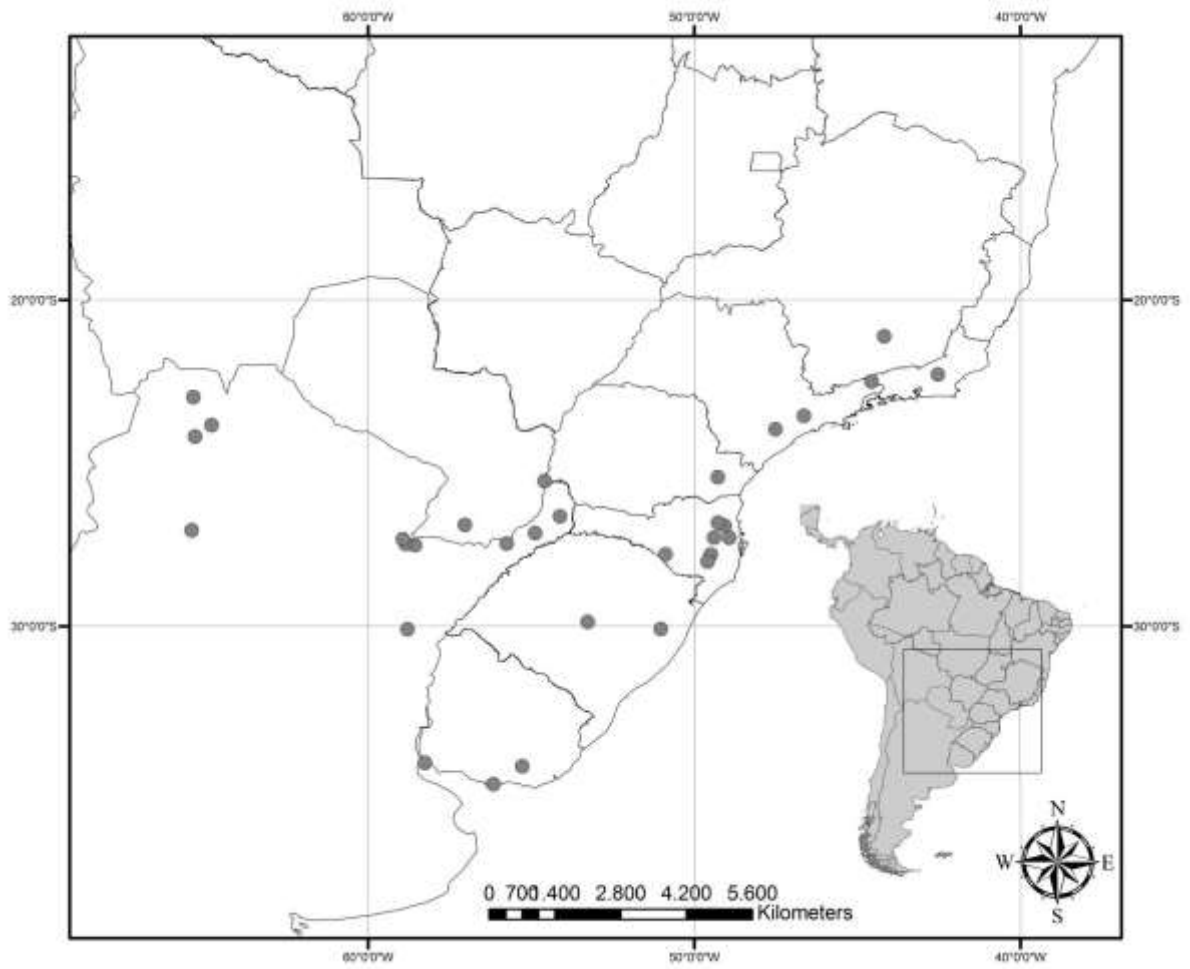
**Map 6.** Distribution map of *Tradescantia fluminesis* Vell.



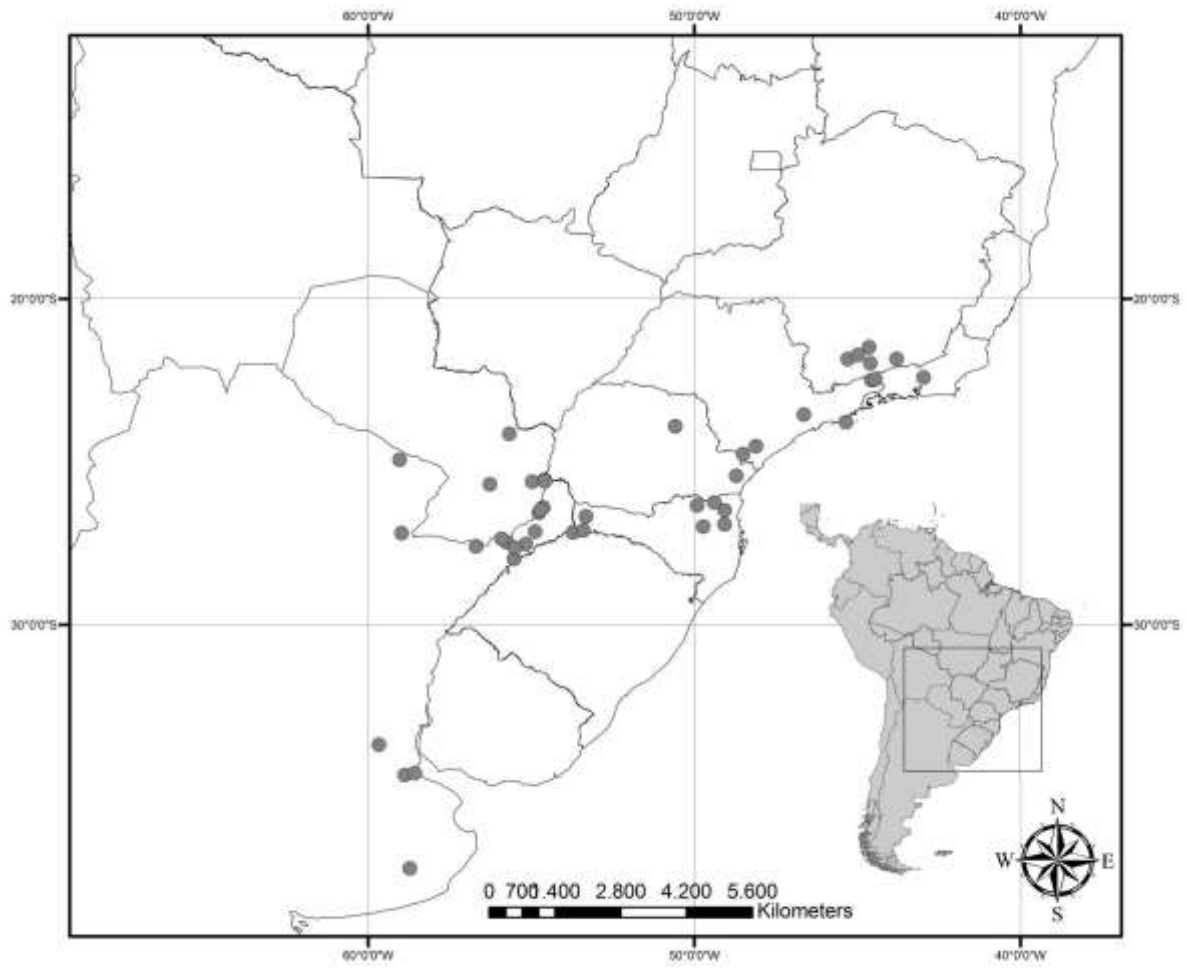
**Map 7.** Distribution map of *Tradescantia mundula* Kunth.



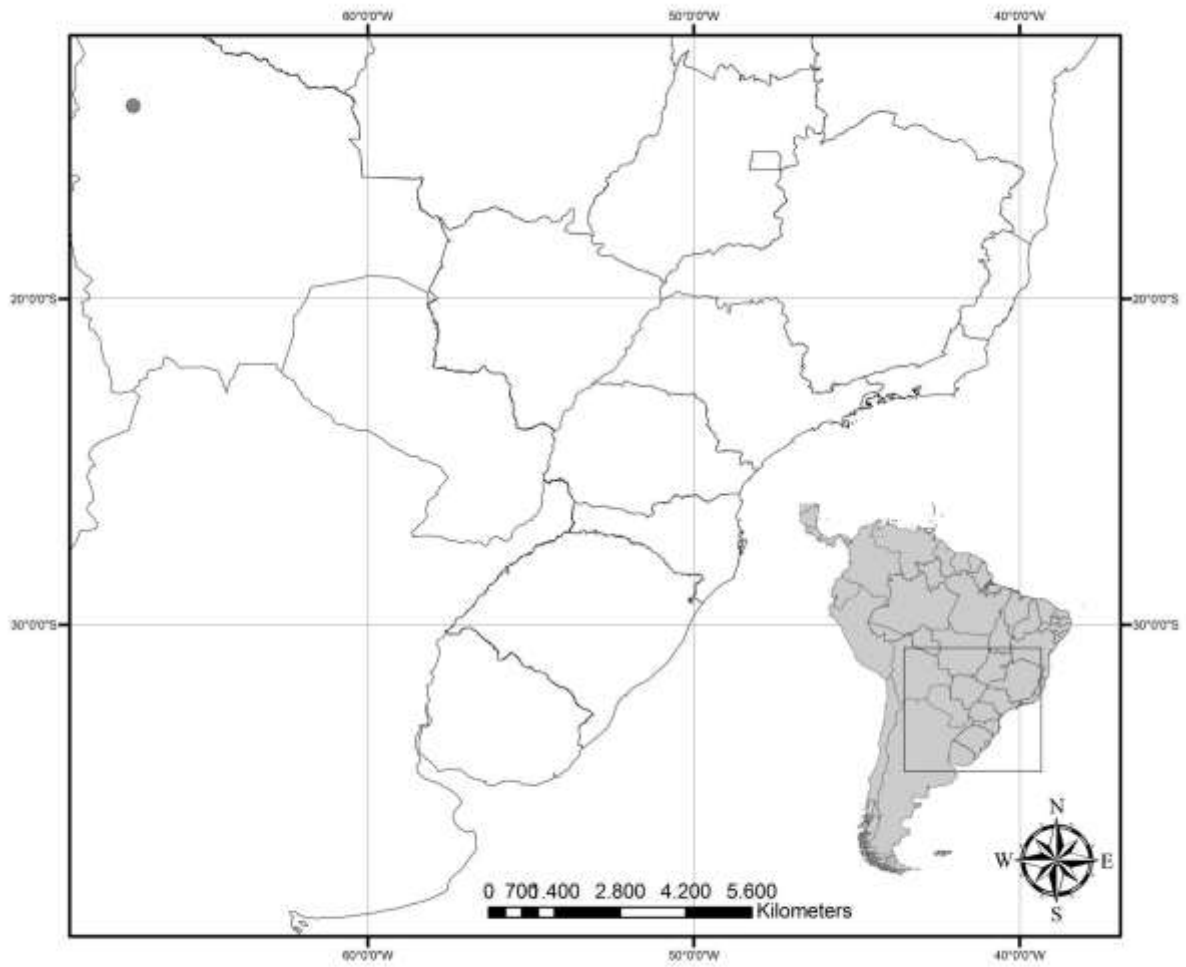
**Map 8.** Distribution map of *Tradescantia seubertiana* M.Pell.



**Map 9.** Distribution map of *Tradescantia tenella* Kunth.



**Map 10.** Distribution map of *Tradescantia umbraculifera* Hand.-Mazz.



**Map 11.** Distribution map of *Tradescantia valida* G.Brückn.

## SUPPLEMENT 1– LIST OF CHARACTERS

1. Roots, form: non-tuberous (0); tuberous (1)
2. Stem, posture: prostrate (0); ascending to erect (1)
3. Stem, consistency: herbaceous (0); fibrous to succulent (1)
4. Leaves, phyllotaxy: distichously-alternate (0); spirally-alternate to rosette arranged (1)
5. Leaves, position: evenly distributed along the stem (0); congested (1)
6. Leaves, insertion: sessile (0); subpetiolate (1)
7. Leaves, blade, shape: elliptic to lanceolate (0); linear (1); ovate (2); obovate to rotund (3)
8. Leaves, blade, architecture: flat (0); falcate to complicate (1)
9. Leaves, blade, indument, adaxial side: absent (0); present (1)
10. Leaves, blade, indument, adaxial side, type: velutine (0); pilose (1); hirsute (2) lanate (3); glandulous (4)
11. Leaves, blade, indument, adaxial side, color: hyaline (0); golden to light-brown (1)
12. Leaves, blade, indument, abaxial side: absent (0); present (1)
13. Leaves, blade, indument, abaxial side, type: velutine (0); pilose (1); hirsute (2) lanate (3); glandulous (4)
14. Leaves, blade, indument, abaxial side, color: hyaline (0); golden to light-brown (1)
15. Leaves, blade, base, shape: cuneate (0); truncate (1); obtuse to cordate (2)
16. Leaves, blade, base, symmetry: symmetrical (0); asymmetrical (1)
17. Leaves, blade, apex, shape: obtuse (0); acute (1); acuminate (2)
18. Leaves, blade, adaxial side, secondary veins, impression: conspicuous (0); inconspicuous (1)
19. Leaves, blade, adaxial side, longitudinal striations: absent (0); present (1)



20. Leaves, blade, abaxial side, color: green (0); vinous to brown (1)
21. Sinflorescence, structure: terminal or in the terminal portion of the stem (0);  
predominantly axillar to spike-like (1)
22. Inflorescence, structure: only with the main florescence (0); main florescence plus 1–  
many paraclades (1)
23. Inflorescence, emergency: not breaking through the leaf-sheath (0); breaking through  
the leaf-sheath (1)
24. Inflorescence, peduncle, development: sessile (0); pedunculated (1)
25. Inflorescence, peduncle, accessory bracts: absent (0); present (1)
26. Cincinni, number per main florescence: one (0); two (1); more than two (2)
27. Cincinni, disposition: subopposite (0); verticillate or back-to-back (1)
28. Cincinni, peduncle, development: sessile (0); pedunculated (1)
29. Cincinni, posture: non-geniculate (0); geniculate (1)
30. Cincinni, contraction: contracted (0); elongated (1)
31. Cincinni, fusion: free from one another (0); fused (1)
32. Cincinni, number per bract: one (0); more than one (1)
33. Cincinni, bracts supernumerary: absent (0); present (1)
34. Cincinni, bracts, development: vestigial (0); reduced (1); expanded (2)
35. Cincinni, bracts, shape: leaf-like (0); spatheous (1)
36. Cincinni, bracts, fusion: free from one another (0); fused (1)
37. Cincinni, bracts, base: non-saccate (0); saccate (1)
38. Cincinni, bracts, base, overlapping: non-overlapping (0); overlapping (1)
39. Bracteoles, development: reduced (0); expanded but not enclosing the cincinnus (1)  
developed and enclosing the cincinnus (2).
40. Flower, shape: flat (0); tubular (1)

41. Flower, angle of display: 0° (0); torsion of 60° (1)
42. Flower, pedicel length: sessile to subsessile to about the same length of floral bud (0);  
long, longer than the length of floral bud (1)
43. Flower, pedicel, posture at anthesis and pre-anthesis: non-geniculate (0); geniculate (1)
44. Sepals, fusion: free (0); fused at least in some point (1)
45. Sepals, shape among each another: all equal or subequal (0); a single sepal  
differentiated (1)
46. Sepals, shape: elliptic (0); ovate (1); linear to lanceolate (2)
47. Sepals, keel: absent (0); present (1)
48. Sepals, consistency: membranous (0); chartaceous (1); fleshy (2)
49. Sepals, indumentum: glabrous (0); pilose to velutine to setose to lanate (1); hirsute (2);  
glandulous (3)
50. Sepals, color: hyaline to white (0); predominantly green (1); vinous to pink (2)
51. Petals, fusion: free (0); fused at least at some point (1)
52. Petals, shape: elliptic to ovate (0); obovate (1); lanceolate to linear (2); rhomboid to  
rotund (3)
53. Petals, claw: absent (0); present (1)
54. Petals, shape among each another: all equal to subequal (0); a single petal  
differentiated (1)
55. Petals, color: blue (0); white (1); pink to lilac to purple (2); green to hyaline (3)
56. Androecium, stamens, number (including staminodes): six (0); three to one (1)
57. Androecium, stamens, external series (opposite-sepal), bearding: absent to sparse and  
short (0); dense or sparse and long (1)
58. Androecium, stamens, external series (opposite-sepal), bearding, position: basal (0);  
up to median region (1); terminal (2)

59. Androecium, stamens, internal series (opposite-petal), bearding: absent to sparse and short (0); dense or sparse and long (1)
60. Androecium, stamens, internal series (opposite-petal), bearding, position: basal (0); up to the median region (1); terminal (2)
61. Androecium, stamens, series, relative size: equal (0); external series shorter (internal series longer) (1); two types of stamens in the same series, non-comparable series (2)
62. Androecium, stamens, filament, curvature: sigmoid (0); erect (1)
63. Androecium, stamens, fused to corolla: free (0); epipetalous (1)
64. Androecium, symmetry: actinomorphic (0); zygomorphic (1)
65. Androecium, stamens, external series (opposite-sepal), connective, general shape: non-expanded or elliptic (0); cordate to sagitate to transversally linear (1); quadrangular to curved (2); semicircular (3); rhomboid (4)
66. Androecium, stamens, internal series (opposite-petal), connective, general shape: non-expanded or elliptic (0); cordate to sagitate to transversally linear (1); quadrangular to curved (2); semicircular (3); rhomboid (4)
67. Androecium, stamens, external series (opposite-sepal), anther sac, shape: rounded (0); elliptic (1); reniform to curved (2); linear (3)
68. Androecium, stamens, internal series (opposite-petal), anther sac, shape: rounded (0); elliptic (1); reniform to curved (2); linear (3)
69. Androecium, stamens, pollen, color: white or similar colored to the corolla (0); yellow (1)
70. Androecium, stamens, pollen, ornamentation: spinous (0); reticulate (1); insular-cerebroid (2); areolate (3); granular-verrucous (4)
71. Gynoecium, pistil, relative length: shorter than stamens (0); equaling the stamens (1); longer than stamens (2)

72. Gynoecium, style, curvature: sigmoid (0); erect (1)
73. Gynoecium, stigma, shape: capitate to trilobate to subtrilobate (0); punctate (1); truncate to capitulate (2); peniciliform (3)
74. Seed, shape: elliptic to rectangular (0); triangular to triangular-rounded (1); tetrahedral (2)
75. Seed, embryotege, position: dorsal (0); lateral to semi-lateral (1)
76. Seed, testa, ornamentation: smooth (0); reticulate to foveolate (1); striate to costate to tuberculate (2); rugose (3)
77. Seed, hilum: punctate to elliptic (0); linear (1); curved (2)
78. Anatomy, leaf epidermis, silica crystals in specialized cells: absent (0); in differentiated cells with thickened walls (1); in non-differentiated cells with thin walls (2)
79. Anatomy, mesophyll, bundle sheath: diffuse (0); with sclerenchymatic extensions (1)
80. Chromosomes, number:  $n= 4-5$  or multiple of (0);  $n= 6$  or multiple of (1);  $n= 7-8$  or multiple or varying from  $5-6-10-11$  due to Robertsonian Change (2);  $n= 8$  or multiple of (3);  $n= 17$  or multiple of (4);  $n=$  probable multiple of 10 (5)
81. Chromosomes, size: small, equal or smaller than  $5\mu\text{m}$  (0); medium, larger than  $5\mu\text{m}$  and smaller than  $10\mu\text{m}$  (1); large, equal or larger than  $10\mu\text{m}$  (2)
82. Chromosomes, karyotype, homogeneity: unimodal (0); bimodal (1)
83. Phytochemical, hidroxiluteolin: absent (0); present (1)
84. Phytochemical, C-glycosides: absent (0); mono-C-glycosides (1); di-C-glycosides (2)
85. Phytochemical, flavonoid, quercetin: absent (0); present (1)
86. Phytochemical, sulfated phenolic acid: absent (0); present (1)

## SUPPLEMENT 2– MORPHOLOGICAL MATRIX

Matrix with the 49 terminals and the first 30 characters. The characters that were not coded due to lack of data of the analyzed specimens and/or from literatures sources are coded as “?”; characters that did not apply were coded as “-”; and the polymorphic characters were coded with a “/” between each state it presented.

| Taxon                   | 1 | 2 | 3   | 4   | 5   | 6 | 7     | 8 | 9   | 10  | 11  | 12  | 13  | 14  | 15    | 16  | 17    | 18 | 19 | 20  | 21  | 22 | 23 | 24 | 25 | 26    | 27    | 28 | 29 | 30  |   |
|-------------------------|---|---|-----|-----|-----|---|-------|---|-----|-----|-----|-----|-----|-----|-------|-----|-------|----|----|-----|-----|----|----|----|----|-------|-------|----|----|-----|---|
| <i>Tin. erecta</i>      | 0 | 1 | 1   | 1   | 1   | 1 | 0     | 0 | 1   | 2   | 0   | 1   | 1   | 0   | 0     | 0   | 2     | 0  | 0  | 0   | 0   | 0  | 0  | 0  | 1  | 0     | 0/1/2 | 1  | 1  | 0   | 1 |
| <i>Tin. sprucei</i>     | 0 | 1 | 1   | 1   | 1   | 1 | 0     | 0 | 1   | 2   | 0   | 1   | 1   | 0   | 0     | 0   | 1/2   | 0  | 0  | 0   | 0   | 0  | 0  | 0  | 1  | 0     | 0     | 1  | 1  | 0   | 1 |
| <i>T. tenella</i>       | 0 | 2 | 1   | 0   | 0   | 1 | 0/2   | 0 | 0/1 | 2   | 0   | 0/1 | 2   | 0   | 0/2   | 1   | 1/2   | 0  | 0  | 0/1 | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 0  | 0  | 0   |   |
| <i>T. cerinthoides</i>  | 0 | 1 | 1   | 0   | 0   | 0 | 0/2/3 | 1 | 0/1 | 1   | 0/1 | 0/1 | 1/2 | 0/1 | 0/2   | 1   | 0/1   | 0  | 0  | 0/1 | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 0  | 0  | 0   |   |
| <i>T. crassula</i>      | 0 | 1 | 1   | 0/1 | 0   | 0 | 0/2/3 | 1 | 0   | -   | -   | 0   | -   | -   | 0/2   | 1   | 0/1/2 | 1  | 0  | 0   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 0  | 0  | 0   |   |
| <i>T. fluminensis</i>   | 0 | 0 | 0   | 0   | 0   | 1 | 0/2   | 0 | 0   | -   | -   | 0   | -   | -   | 0/2   | 1   | 1     | 0  | 0  | 0   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 0  | 0  | 0   |   |
| <i>T. mundula</i>       | 0 | 0 | 0   | 0   | 0   | 1 | 0/2   | 0 | 0/1 | 0   | 0   | 1   | 0   | 0   | 0/2   | 1   | 1/2   | 0  | 0  | 0/1 | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. cymbispatha</i>   | 0 | 0 | 0   | 0   | 0   | 0 | 2     | 0 | 1   | 0   | 0   | 1   | 0   | 0   | 2     | 1   | 1     | 1  | 0  | 1   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. umbraculifera</i> | 0 | 0 | 1   | 0   | 0   | 0 | 0     | 0 | 0/1 | 1/2 | 0   | 0/1 | 1/2 | 0   | 0/1/2 | 1   | 2     | 0  | 0  | 0   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. seubertiana</i>   | 0 | 1 | 1   | 0   | 0   | 0 | 2     | 1 | 0   | -   | -   | 0   | -   | -   | 0/2   | 1   | 0/1   | 1  | 0  | 0/1 | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. valida</i>        | 0 | 1 | 1   | 0   | 0   | 0 | 0/2   | 1 | 0   | -   | -   | 0   | -   | -   | 0/2   | 1   | 1     | 1  | 0  | 1   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. chrysophylla</i>  | 0 | 0 | 0   | 0   | 0   | 0 | 2     | 0 | 1   | 2   | 1   | 1   | 2   | 1   | 2     | 1   | 1     | 1  | 0  | 1   | 0   | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. zanonina</i>      | 0 | 1 | 1   | 1   | 1   | 1 | 0     | 0 | 0   | -   | -   | 1   | 0   | 0   | 0     | 0   | 2     | 1  | 0  | 0/1 | 1   | 1  | 1  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. commelinoides</i> | 1 | 1 | 0/1 | 0   | 0   | 1 | 0/2   | 0 | 0/1 | 1   | 0   | 0/1 | 1   | 0   | 2     | 1   | 1/2   | 0  | 0  | 0/1 | 0   | 1  | 0  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. gracilima</i>     | 0 | 0 | 0   | 0   | 0   | 1 | 2     | 0 | 0/1 | 2   | 0   | 0/1 | 2   | 0   | 2     | 1   | 1     | 0  | 0  | 0   | 0   | 1  | 0  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. grantii</i>       | 0 | 0 | 0   | 1   | 1   | 1 | 0     | 0 | 0   | -   | -   | 1   | 1   | 0   | 0     | 0   | 1/2   | 0  | 0  | 0   | 0   | 1  | 0  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. poelliae</i>      | 0 | 0 | 0   | 0   | 0/1 | 1 | 0     | 0 | 0/1 | 2   | 0   | 0   | -   | -   | 0     | 1   | 1/2   | 0  | 0  | 1   | 0/1 | 0  | 0  | 1  | 0  | 1     | 0     | 1  | 0  | 0   |   |
| <i>T. praetermissa</i>  | 0 | 1 | 0   | 0   | 0   | 1 | 0     | 0 | 0/1 | 2   | 0   | 0/1 | 2   | 0   | 2     | 1   | 1/2   | 0  | 0  | 0   | 0   | 1  | 0  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. standleyi</i>     | 0 | 1 | 1   | 0   | 0   | 0 | 0/2   | 0 | 1   | 2   | 1   | 1   | 2   | 1   | 0/2   | 1   | 1     | 0  | 0  | 0   | 0   | 1  | 0  | 1  | 1  | 1     | 1     | 0  | 0  | 0   |   |
| <i>T. guatemalensis</i> | 0 | 0 | 0   | 1   | 0   | 0 | 0/2   | 0 | 0/1 | 2   | 0   | 0/1 | 2   | 0   | 0/2   | 0/1 | 1/2   | 0  | 0  | 0   | 0   | 0  | 0  | 1  | 0  | 0/1/2 | 1     | 1  | 0  | 0   |   |
| <i>T. soconuscana</i>   | 0 | 1 | 1   | 1   | 1   | 1 | 0     | 0 | 0   | -   | -   | 1   | 0   | 1   | 0/2   | 1   | 1/2   | 0  | 1  | 0   | 0   | 0  | 0  | 0  | 0  | 0     | 1     | 0  | 0  | 0/1 |   |
| <i>T. ambigua</i>       | 1 | 1 | 1   | 1   | 0   | 0 | 0     | 0 | 0   | -   | -   | 1   | 1   | 0   | 1/2   | 0   | 2     | 0  | 0  | 0   | 1   | 0  | 0  | 0  | 0  | 1     | 0     | 0  | 0  | 0   |   |
| <i>T. andrieuxii</i>    | 1 | 1 | 1   | 1   | 0   | 0 | 0/1   | 1 | 0   | -   | -   | 1   | 0   | 0   | 0/2   | 0   | 1/2   | 1  | 0  | 0/1 | 1   | 0  | 0  | 0  | 0  | 1     | 0     | 0  | 0  | 0   |   |

|                          |   |     |   |   |   |     |       |     |     |     |   |     |     |   |     |   |     |     |   |     |     |   |   |   |   |       |   |   |   |     |
|--------------------------|---|-----|---|---|---|-----|-------|-----|-----|-----|---|-----|-----|---|-----|---|-----|-----|---|-----|-----|---|---|---|---|-------|---|---|---|-----|
| <i>T. spathacea</i>      | 0 | 1   | 1 | 1 | 1 | 0/1 | 0     | 0   | 0   | -   | - | 0   | -   | - | 1   | 0 | 1   | 1   | 0 | 1   | 1   | 1 | 0 | 1 | 1 | 1     | 0 | 0 | 0 | 0   |
| <i>T. virginiana</i>     | 1 | 1   | 0 | 1 | 0 | 0   | 1     | 0   | 1   | 1   | 0 | 1   | 1   | 0 | 1   | 0 | 2   | 0   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. sillamontana</i>   | 1 | 1   | 1 | 0 | 0 | 0   | 2     | 1   | 1   | 3   | 0 | 1   | 3   | 0 | 0/2 | 0 | 0/1 | 1   | 0 | 0/1 | 0   | 0 | 0 | 0 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. pinetorum</i>      | 1 | 1   | 1 | 1 | 0 | 0   | 1     | 1   | 1   | 1   | 0 | 1   | 1   | 0 | 1   | 0 | 2   | 0   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. orchidophylla</i>  | 1 | 0   | 1 | 1 | 1 | 0   | 3     | 1   | 1   | 1   | 0 | 1   | 1   | 0 | 0   | 0 | 0   | 0   | 0 | 0/1 | 0   | 0 | 0 | 0 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. pygmaea</i>        | 1 | 1   | 1 | 0 | 0 | 0   | 2     | 1   | 0   | -   | - | 0   | -   | - | 2   | 0 | 1   | 1   | 0 | 1   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. brevifolia</i>     | 1 | 1   | 1 | 1 | 0 | 0   | 0/3   | 1   | 0   | -   | - | 0   | -   | - | 0/2 | 0 | 1   | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. pallida</i>        | 1 | 1   | 1 | 1 | 0 | 0   | 0     | 1   | 0   | -   | - | 0   | -   | - | 0   | 0 | 0   | 0   | 0 | 0/1 | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>T. zebrina</i>        | 0 | 0   | 1 | 0 | 1 | 1   | 0/2   | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 2   | 1   | 1 | 1   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>E. hirsuta</i>        | 0 | 0   | 0 | 1 | 0 | 0   | 0/2   | 0   | 1   | 2   | 0 | 1   | 2   | 0 | 2   | 1 | 2   | 0   | 0 | 0   | 1   | 0 | 0 | 1 | 0 | 0/1/2 | 1 | 1 | 0 | 0/1 |
| <i>G. consobrina</i>     | 1 | 0   | 0 | 0 | 0 | 0   | 0     | 0   | 0/1 | 1   | 0 | 0/1 | 1   | 0 | 2   | 1 | 2   | 1   | 0 | 0/1 | 0   | 0 | 0 | 1 | 0 | 1/2   | 1 | 1 | 1 | 0/1 |
| <i>G. geniculata</i>     | 0 | 0/1 | 0 | 0 | 1 | 0   | 0/1/2 | 0   | 0/1 | 1/3 | 0 | 1   | 1/3 | 0 | 2   | 1 | 1/2 | 0   | 0 | 0/1 | 0   | 0 | 0 | 1 | 0 | 1     | 1 | 1 | 1 | 0/1 |
| <i>G. oxacana</i>        | 0 | 0/1 | 0 | 1 | 1 | 1   | 0/2   | 0   | 1   | 1   | 0 | 1   | 1   | 0 | 2   | 0 | 1/2 | 0/1 | 0 | 0/1 | 0   | 0 | 0 | 1 | 0 | 1/2   | 1 | 1 | 1 | 0/1 |
| <i>G. pellucida</i>      | 0 | 0   | 0 | 0 | 1 | 0   | 0     | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 1   | 0   | 0 | 1   | 0   | 0 | 0 | 1 | 0 | 1     | 1 | 1 | 1 | 0/1 |
| <i>G. karwinskyana</i>   | 1 | 1   | 0 | 1 | 0 | 0   | 0     | 1   | 0   | -   | - | 0   | -   | - | 2   | 0 | 2   | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1/2   | 1 | 1 | 1 | 0/1 |
| <i>C. filiformis</i>     | 0 | 0   | 0 | 0 | 0 | 0   | 0     | 0   | 0   | -   | - | 0   | -   | - | 0   | 0 | 1   | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>C. fragrans</i>       | 0 | 0   | 1 | 1 | 1 | 0   | 0     | 1   | 1   | 0   | 0 | 1   | 0   | 0 | 0/1 | 0 | 1/2 | 1   | 0 | 0   | 1   | 0 | 0 | 0 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>C. gentlei</i>        | 0 | 0   | 1 | 0 | 1 | 0   | 2     | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 1   | 1   | 1 | 1   | 1   | 0 | 0 | 0 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>C. monandra</i>       | 0 | 0   | 1 | 0 | 1 | 0   | 0/2   | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 1/2 | 1   | 0 | 0   | 0/1 | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>C. repens</i>         | 0 | 0   | 1 | 0 | 1 | 0   | 0/2/5 | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 1   | 1   | 0 | 1   | 1   | 0 | 0 | 0 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>C. warszewicziana</i> | 0 | 0   | 1 | 1 | 1 | 0   | 0     | 0   | 0   | -   | - | 0   | -   | - | 1   | 0 | 2   | 1   | 0 | 0   | 1   | 0 | 0 | 1 | 0 | 0/1   | 0 | 1 | 0 | 1   |
| <i>Trip. diuretica</i>   | 0 | 0   | 0 | 0 | 1 | 0   | 0/1/2 | 0   | 0/1 | 0/1 | 0 | 0/1 | 0/1 | 0 | 1/2 | 1 | 1/2 | 0   | 0 | 0/1 | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>Trip. elata</i>       | 0 | 1   | 1 | 1 | 0 | 0   | 0/1   | 1   | 0   | -   | - | 0   | -   | - | 1/2 | 0 | 2   | 1   | 0 | 0   | 1   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>Trip. glandulosa</i>  | 0 | 0/1 | 1 | 0 | 0 | 0   | 0/2   | 0/1 | 0   | -   | - | 0   | -   | - | 1/2 | 1 | 1   | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>Trip. purpuracens</i> | 0 | 1   | 0 | 1 | 0 | 0   | 0/2   | 1   | 0/1 | 1   | 0 | 1   | 1   | 0 | 2   | 0 | 1   | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |
| <i>Trip. warmingiana</i> | 0 | 0   | 0 | 0 | 0 | 0/1 | 0/2   | 0   | 0   | -   | - | 0   | -   | - | 2   | 1 | 1/2 | 1   | 0 | 0   | 0   | 0 | 0 | 1 | 0 | 1     | 0 | 0 | 0 | 0   |

**Continuation:** Matrix with the 49 terminals and the character 31 to 60. The characters that were not coded due to lack of data of the analyzed specimens and/or from literatures sources are coded as “?”; characters that did not apply were coded as “-”; and the polymorphic characters were coded with a “/” between each state it presented.

| Taxon                   | 31 | 32 | 33 | 34  | 35  | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46  | 47 | 48 | 49  | 50  | 51 | 52  | 53 | 54 | 55    | 56 | 57 | 58  | 59  | 60 |
|-------------------------|----|----|----|-----|-----|----|----|----|----|----|----|----|----|----|----|-----|----|----|-----|-----|----|-----|----|----|-------|----|----|-----|-----|----|
| <i>Tin. erecta</i>      | 0  | 1  | -  | 0   | -   | -  | -  | -  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 3   | 1/2 | 0  | 3   | 0  | 1  | 2     | 0  | 1  | 0/2 | 0/1 | 1  |
| <i>Tin. sprucei</i>     | 0  | 1  | -  | 0   | -   | -  | -  | -  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 0   | 1   | 0  | 3   | 0  | 1  | 2     | 0  | 1  | 0/2 | 0/1 | 1  |
| <i>T. tenella</i>       | 1  | 0  | 0  | 2   | 0   | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 0/3 | 1   | 0  | 0   | 0  | 0  | 1/2   | 0  | 1  | 0   | 1   | 0  |
| <i>T. cerinthoides</i>  | 1  | 0  | 0  | 2   | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 0  | 1  | 1/2 | 1/2 | 0  | 0   | 0  | 0  | 1/2   | 0  | 1  | 0   | 1   | 0  |
| <i>T. crassula</i>      | 1  | 0  | 0  | 1/2 | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. fluminensis</i>   | 1  | 0  | 0  | 2   | 0   | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. mundula</i>       | 1  | 0  | 0  | 2   | 0   | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. cymbispatha</i>   | 1  | 0  | 0  | 2   | 0   | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 0  | 1  | 1   | 2   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. umbraculifera</i> | 1  | 0  | 0  | 2   | 0/1 | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 0/1 | 1   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. seubertiana</i>   | 1  | 0  | 0  | 2   | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 0   | 1/2 | 0  | 0   | 0  | 0  | 2     | 0  | 1  | 0   | 1   | 0  |
| <i>T. valida</i>        | 1  | 0  | 0  | 2   | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 1  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 2     | 0  | 1  | 0   | 1   | 0  |
| <i>T. chrysophylla</i>  | 1  | 0  | 0  | 2   | 0   | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1   | 0  | 1  | 3   | 2   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 0   | 1   | 0  |
| <i>T. zanonina</i>      | 1  | 0  | 1  | 2   | 1   | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 1  | 1   | 0  | 2  | 1   | 2   | 0  | 3   | 0  | 0  | 1     | 0  | 0  | 1   | 0   | 1  |
| <i>T. commelinoides</i> | 1  | 0  | 0  | 2   | 1   | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 3   | 0   | 0  | 3   | 0  | 0  | 2     | 0  | 1  | 0   | 1   | 0  |
| <i>T. gracilima</i>     | 1  | 0  | 1  | 2   | 1   | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 1     | 0  | 0  | -   | 0   | -  |
| <i>T. grantii</i>       | 1  | 0  | 1  | 2   | 1   | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 1   | 1   | 0  | 0/1 | 0  | 0  | 1     | 0  | 0  | -   | 0   | -  |
| <i>T. poelliae</i>      | 1  | 0  | 0  | 2   | 1   | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 1   | 1   | 0  | 3   | 0  | 0  | 2     | 0  | 0  | 1   | 0   | 1  |
| <i>T. praetermissa</i>  | 1  | 0  | 1  | 2   | 1   | 1  | 0  | 1  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 1   | 1   | 0  | 3   | 0  | 0  | 1     | 0  | 1  | 2   | 1   | 2  |
| <i>T. standleyi</i>     | 1  | 0  | 0  | 2   | 1   | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1   | 1  | 1  | 1   | 1   | 0  | 1/3 | 0  | 0  | 2     | 0  | 1  | 1   | 1   | 1  |
| <i>T. guatemalensis</i> | 0  | 0  | 0  | 1   | -   | 0  | 0  | -  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0/2 | 0  | 1  | 1   | 1   | 0  | 0   | 0  | 0  | 0/2   | 0  | 1  | 1   | 1   | 1  |
| <i>T. soconuscana</i>   | 1  | 0  | 1  | 2   | 1   | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 1  | 1  | 1  | 0/1 | 0  | 0  | 1   | 0   | 0  | 2   | 1  | 0  | 1/2   | 0  | 0  | -   | 0   | -  |
| <i>T. ambigua</i>       | 1  | 0  | 1  | 1/2 | -   | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0   | 0  | 1  | 2   | 1   | 0  | 0   | 0  | 0  | 1/2   | 0  | 1  | 1   | 1   | 1  |
| <i>T. andrieuxii</i>    | 1  | 0  | 1  | 1   | -   | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 0  | 0   | 0  | 1  | 0/1 | 1   | 1  | 1/3 | 1  | 0  | 0/2   | 0  | 1  | 1   | 1   | 1  |
| <i>T. spathacea</i>     | 1  | 0  | 1  | 2   | 1   | 0  | 0  | 1  | 1  | 1  | 0  | 1  | 1  | 0  | 0  | 1   | 0  | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 1     | 0  | 1  | 1   | 1   | 1  |
| <i>T. virginiana</i>    | 1  | 0  | 0  | 2   | 0   | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 0   | 0  | 1  | 1   | 1   | 0  | 3   | 0  | 0  | 0/1/2 | 0  | 1  | 1   | 1   | 1  |

|                          |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |     |     |     |   |     |     |   |     |     |     |     |   |
|--------------------------|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|-----|-----|-----|---|-----|-----|---|-----|-----|-----|-----|---|
| <i>T. sillamontana</i>   | 1   | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0/1 | 0   | 1/3 | 0   | 0 | 2   | 0   | 0 | -   | 0   | -   |     |   |
| <i>T. pinetorum</i>      | 1   | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 1   | 0   | 0/3 | 0   | 0 | 0/2 | 0   | 1 | 1   | 1   | 1   |     |   |
| <i>T. orchidophylla</i>  | 1   | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 1   | 0   | 0   | 0   | 0 | 1   | 0   | 0 | -   | 0   | -   |     |   |
| <i>T. pygmaea</i>        | 1   | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0   | 1   | 1/3 | 1   | 0 | 2   | 0   | 0 | -   | 0   | -   |     |   |
| <i>T. brevifolia</i>     | 1   | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0   | 1   | 0/1 | 1   | 0 | 2   | 0   | 0 | -   | 0   | -   |     |   |
| <i>T. pallida</i>        | 1   | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0   | 0/1 | 0/1 | 1   | 0 | 2   | 0   | 0 | 1   | 0   | 1   |     |   |
| <i>T. zebrina</i>        | 1   | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1   | 0   | 1   | 0   | 2 | 0   | 0   | 1 | 0   | 1   | 1   |     |   |
| <i>E. hirsuta</i>        | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1   | 1   | 1   | 0   | 0 | 0   | 0   | 2 | 0   | 1   | 1   | 1   |   |
| <i>G. consobrina</i>     | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1   | 1   | 1   | 0   | 0 | 0   | 0   | 2 | 0   | 1   | 1   | 1   |   |
| <i>G. geniculata</i>     | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0/3 | 1   | 0   | 0   | 0 | 0   | 1   | 0 | 1   | 1   | 1   | 1   |   |
| <i>G. oxacana</i>        | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0   | 1   | 0   | 0   | 0 | 1/2 | 0   | 1 | 0/2 | 1   | 0/2 | 1   |   |
| <i>G. pellucida</i>      | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0   | 1   | 0   | 3   | 0 | 0   | 1   | 0 | 1   | 0/2 | 1   | 0/2 |   |
| <i>G. karwinskyana</i>   | 0   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0   | 1   | 0   | 0   | 0 | 1/2 | 0   | 1 | 1   | 1   | 1   | 1   |   |
| <i>C. filiformis</i>     | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 3   | 1   | 0   | 1   | 0 | 0   | 1/2 | 0 | 0   | -   | 0   | -   |   |
| <i>C. fragrans</i>       | 1   | 0 | 0 | 1 | - | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1   | 1   | 1   | 0   | 0 | 0   | 1   | 0 | 0   | -   | 0   | -   |   |
| <i>C. gentlei</i>        | 1   | 0 | 0 | 1 | - | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1   | 1   | 1   | 0   | 1 | 0   | 0   | 1 | 0   | 0   | -   | 0   | - |
| <i>C. monandra</i>       | 1   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 3   | 1   | 1   | 0   | 2 | 0   | 0   | 3 | 1   | 0   | -   | 0   | - |
| <i>C. repens</i>         | 1   | 0 | 0 | 1 | - | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1   | 1   | 1   | 0   | 2 | 0   | 0   | 3 | 0/1 | 0   | -   | 0   | - |
| <i>C. warszewicziana</i> | 0/1 | 0 | 0 | 1 | - | 0 | 0 | - | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0   | 2   | 0   | 0   | 0 | 0   | 2   | 0 | 0   | -   | 0   | -   |   |
| <i>Trip. diuretica</i>   | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0   | 1/2 | 0   | 0/1 | 0 | 0   | 1/2 | 0 | 0   | -   | 1   | 1   |   |
| <i>Trip. elata</i>       | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1   | 1/2 | 0   | 1   | 0 | 0   | 1/2 | 0 | 0   | -   | 1   | 1   |   |
| <i>Trip. glandulosa</i>  | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3   | 1   | 0   | 0/1 | 0 | 0   | 1/2 | 0 | 1   | 0   | 0   | -   |   |
| <i>Trip. purpuracens</i> | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 3   | 1/2 | 0   | 1   | 0 | 0   | 2   | 0 | 1   | 0   | 0   | -   |   |
| <i>Trip. warmingiana</i> | 1   | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1   | 1/2 | 0   | 0   | 0 | 0   | 2   | 0 | 0   | -   | 1   | 1   |   |



**Continuation:** Matrix with the 49 terminals and the character 61 to 86. The characters that were not coded due to lack of data of the analyzed specimens and/or from literatures sources are coded as “?”; characters that did not apply were coded as “-”; and the polymorphic characters were coded with a “/” between each state it presented.

| Taxon                   | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 |
|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| <i>Tin. erecta</i>      | 2  | 0  | 0  | 1  | 0  | 0  | 3  | 3  | 1  | 3  | 2  | 0  | 2  | 0  | 1  | 3  | 2  | 0  | 0  | 4  | 0  | 1  | 0  | 1  | 0  | 0  |
| <i>Tin. sprucei</i>     | 2  | 0  | 0  | 1  | 0  | 0  | 3  | 3  | 0  | 3  | 2  | 0  | 2  | 0  | 1  | 3  | 2  | 0  | 0  | 4  | 0  | 1  | ?  | 1  | ?  | 0  |
| <i>T. tenella</i>       | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 3  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | 0  |
| <i>T. cerinthoides</i>  | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | 1  |
| <i>T. crassula</i>      | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | 1  |
| <i>T. fluminensis</i>   | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | 0  |
| <i>T. mundula</i>       | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. cymbispatha</i>   | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. umbraculifera</i> | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. seubertiana</i>   | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. valida</i>        | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 3  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. chrysophylla</i>  | 0  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 2  | 1  | 0  | 0  | 5  | 0  | 1  | 0  | 1  | 0  | ?  |
| <i>T. zanonina</i>      | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 2  | 1  | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 0  | 0  | 1  |
| <i>T. commelinoides</i> | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. gracilima</i>     | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. grantii</i>       | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. poelliae</i>      | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | ?  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. praetermissa</i>  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. standleyi</i>     | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. guatemalensis</i> | 0  | 1  | 0  | 0  | 0  | 0  | 3  | 3  | 1  | 2  | 0  | 1  | 2  | 0  | 0  | 3  | 1  | 1  | 1  | 0  | 0  | 1  | 0  | 2  | 0  | 0  |
| <i>T. soconuscana</i>   | 1  | 1  | 1  | 0  | 1  | 1  | 0  | 0  | 0  | 2  | ?  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 2  | 2  | 0  | 0  | 2  | 0  | 1  |
| <i>T. ambigua</i>       | 0  | 1  | 0  | 0  | 4  | 4  | 2  | 2  | 1  | 2  | 2  | 1  | 2  | 0  | 0  | 3  | 1  | 0  | 0  | 1  | 2  | 0  | 1  | 2  | 0  | 0  |
| <i>T. andrieuxii</i>    | 0  | 1  | 0  | 0  | 4  | 4  | 2  | 2  | 1  | 2  | 2  | 1  | 2  | 0  | 0  | 3  | 1  | 0  | 0  | 1  | 2  | 0  | 1  | 2  | 0  | 0  |
| <i>T. spathacea</i>     | 1  | 1  | 0  | 0  | 4  | 4  | 1  | 1  | 0  | 2  | 0  | 1  | 0  | 0  | 1  | 3  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 1  | 0  | 0  |

|                          |   |   |   |   |     |     |   |   |   |     |   |   |   |     |   |     |   |     |   |   |   |   |   |   |   |   |
|--------------------------|---|---|---|---|-----|-----|---|---|---|-----|---|---|---|-----|---|-----|---|-----|---|---|---|---|---|---|---|---|
| <i>T. virginiana</i>     | 0 | 1 | 0 | 0 | 2   | 2   | 2 | 2 | 1 | 2   | 2 | 1 | 0 | 0   | 0 | 3   | 1 | 0   | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 1 |
| <i>T. sillamontana</i>   | 0 | 1 | 0 | 0 | 2   | 2   | 2 | 2 | 1 | 2   | 0 | 1 | 0 | 0   | 0 | 1   | 1 | 0   | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| <i>T. pinetorum</i>      | 0 | 1 | 0 | 0 | 2   | 2   | 2 | 2 | 1 | 2   | 2 | 1 | 0 | 0   | 0 | 3   | 1 | 0   | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 0 |
| <i>T. orchidophylla</i>  | 0 | 1 | 1 | 0 | 4   | 4   | 2 | 2 | 1 | 2   | 0 | 1 | 0 | 0   | 0 | ?   | 1 | 0   | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| <i>T. pygmaea</i>        | 0 | 1 | 1 | 0 | 1/4 | 1/4 | 2 | 2 | 1 | 2   | 0 | 1 | 0 | 0/1 | 0 | ?   | 1 | 0   | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 |
| <i>T. brevifolia</i>     | 0 | 1 | 1 | 0 | 2   | 2   | 2 | 2 | 1 | 2   | 0 | 1 | 0 | 0   | 0 | ?   | 1 | 0   | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| <i>T. pallida</i>        | 0 | 1 | 1 | 0 | 2   | 2   | 2 | 2 | 1 | 2   | 0 | 1 | 0 | 0   | 0 | ?   | 1 | 0   | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| <i>T. zebrina</i>        | 1 | 1 | 1 | 0 | 1   | 1   | 0 | 0 | 0 | 2   | 2 | 1 | 0 | 0   | 1 | 3   | 1 | 0   | 0 | 2 | 2 | 0 | 1 | 2 | 0 | 1 |
| <i>E. hirsuta</i>        | 0 | 1 | 0 | 0 | 0   | 0   | 3 | 3 | 1 | 2   | 0 | 1 | 2 | 0   | 0 | 3   | 1 | 1   | 1 | 0 | ? | ? | ? | ? | ? | ? |
| <i>G. consobrina</i>     | 0 | 1 | 0 | 0 | 4   | 4   | 1 | 1 | 1 | 2   | 2 | 1 | 2 | 1   | 0 | 3   | 1 | 1   | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>G. geniculata</i>     | 0 | 1 | 0 | 0 | 4   | 4   | 1 | 1 | 1 | 2   | 1 | 1 | 2 | 1   | 0 | 1   | 1 | 1   | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| <i>G. oxacana</i>        | 0 | 1 | 0 | 0 | 4   | 4   | 1 | 1 | 1 | 1/2 | ? | 1 | 2 | 1   | 0 | ?   | 1 | 1   | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| <i>G. pellucida</i>      | 0 | 1 | 0 | 0 | 4   | 4   | 1 | 1 | 1 | 1/2 | 2 | 1 | 2 | 1   | 0 | 3   | 1 | 1   | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>G. karwinskyana</i>   | 0 | 1 | 0 | 0 | 4   | 4   | 1 | 1 | 1 | 2   | 2 | 1 | 2 | 1   | 0 | ?   | 1 | 1   | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>C. filiformis</i>     | 1 | 1 | 0 | 0 | 3   | 3   | 1 | 1 | 0 | ?   | 0 | 1 | 2 | 1   | 0 | 0   | 0 | 1/2 | 0 | 0 | ? | 0 | 0 | 1 | 0 | 0 |
| <i>C. fragrans</i>       | 0 | 1 | 0 | 0 | 3   | 3   | 0 | 0 | 0 | 1   | 0 | 1 | 3 | 1   | 0 | 2   | 0 | 1/2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| <i>C. gentlei</i>        | 0 | 1 | 0 | 0 | 1   | 1   | 0 | 0 | 0 | 1   | 0 | 1 | 3 | 1   | 0 | 2   | 0 | 1/2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| <i>C. monandra</i>       | - | 1 | 0 | 0 | 0   | 0   | 1 | - | 0 | 1   | 0 | 1 | 3 | 1   | 0 | 2   | 0 | 1/2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>C. repens</i>         | 0 | 1 | 0 | 0 | 3   | 3   | 0 | 0 | 0 | 1   | 0 | 1 | 3 | 1   | 0 | 2   | 0 | 1/2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| <i>C. warszewicziana</i> | 1 | 0 | 0 | 1 | 4   | 4   | 1 | 1 | 0 | 2   | 2 | 0 | 2 | 1   | 0 | 1   | 0 | 1/2 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| <i>Trip. diuretica</i>   | 1 | 0 | 0 | 1 | 0   | 0   | 3 | 3 | 0 | 0   | 0 | 1 | 2 | 1   | 0 | 2   | 0 | 1/2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| <i>Trip. elata</i>       | 1 | 0 | 0 | 1 | 0   | 2   | 3 | 1 | 0 | 0   | 0 | 1 | 2 | 1   | 0 | 1   | 0 | 1/2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| <i>Trip. glandulosa</i>  | 1 | 0 | 0 | 1 | 0   | 3   | 3 | 1 | 0 | 0   | 0 | 1 | 2 | 1   | 0 | 1/2 | 0 | 1/2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| <i>Trip. purpuracens</i> | 1 | 0 | 0 | 1 | 0   | 3   | 3 | 1 | 0 | 0   | 0 | 1 | 2 | 1   | 0 | 1/2 | 0 | 1/2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| <i>Trip. warmingiana</i> | 1 | 0 | 0 | 1 | 0   | 2   | 3 | 1 | 0 | 0   | 0 | 1 | 2 | 1   | 0 | 1   | 0 | 1/2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |

## CONSIDERAÇÕES FINAIS

A revisão nomenclatural realizada para os nomes brasileiros de *Tradescantia* resultou no reestabelecimento de dois nomes (*T. cymbispatha* e *T. mundula*) previamente tratados na sinonímia de *T. fluminensis*, na descrição de uma nova espécie da Bolívia e a elucidação da posição de *T. cymbispatha* como membro de *T.* seção *Austrotradescantia*. Mais especificamente, durante a análise dos nomes de *Tradescantia* publicados na *Flora fluminensis*, foram designados cinco lectótipos, um epítipo e um novo sinônimo. Ainda, na tentativa de elucidar a identidade e a aplicação do nome *T. cymbispatha* foram designados dois novos sinônimos, dois lectótipos e foram apresentados caracteres morfológicos para a diferenciação entre *Tradescantia* seções *Austrotradescantia* e *Cymbispatha*. Com isso, também se confirmou a ausência de representantes de *T.* seção *Cymbispatha* em território brasileiro. Apesar da extensa revisão nomenclatural feita no presente trabalho, *Tradescantia* ainda apresenta nomes de aplicação incerta que necessitam ser melhor analisados.

Para desenvolvimento da filogenia morfológica foram levantados 86 caracteres morfológicos, focando principalmente na macromorfologia das plantas estudadas. Destes, 82 se mostraram informativos para parcimônia. Entretanto, caracteres micromorfológicos, citológicos e fitoquímicos, levantados por meio de literatura, se mostraram bastante importante para a resolução e sustentação de vários clados dentro de *Tradescantia*. Dessa maneira, é bastante possível que trabalhos focados na anatomia do grupo virão a contribuir grandemente para o melhor entendimento de suas relações filogenéticas. *Tradescantia* não foi recuperado como monofilético e nossos resultados evidenciam a necessidade de transferir *T. guatemalensis* para o gênero *Elasis*. Dessa maneira, *Tradescantia* s.s. apresenta como sinapomorfias caule ereto, brácteas do cincino expandidas, sementes elipsoides a retangulares com hilo linear e epiderme foliar sem cristais de sílica em células especializadas. Os resultados obtidos com base na análise de caracteres morfológico é altamente congruente com os resultados recuperados com base em caracteres moleculares. *Tradescantia* encontra-se dividido em três grandes clados, sendo *T.* seção *Austrotradescantia* o primeiro grupo a divergir, seguido pelo clado *Cymbispatha* (composto pelas seções *Campelia*, *Corinna*, *Cymbispatha* e *Zebrina*), e posteriormente por *Core Tradescantia* (composto pelas seções *Mandonia*, *Parasetcreasea*, *Separotheca*, *Setcreasea* e *Tradescantia*). *Core Tradescantia* apresenta

a maior diversidade de espécies do gênero, e apresenta distribuição relacionada às Florestas Tropicais Sazonais Secas e regiões desérticas norte-americanas. Esses resultados nos permitem, em um futuro próximo, expandir a matriz morfológica para incluir mais representantes de *Core Tradescantia*, e realizar uma análise combinada com os dados moleculares já existentes.

O tratamento taxonômico realizado para *Tradescantia* seção *Austrotradescantia* resultou no reconhecimento de 10 espécies, sendo duas espécies previamente consideradas *insertae sedis*, dois nomes reestabelecidos, duas espécies novas para a ciência e quatro lectótipos. A seção apresenta distribuição exclusivamente sul-americana, extratropical austral, tendo como centro de diversidade a região Sul do Brasil. Nessa região são registradas nove das 10 espécies aceitas para o grupo. As espécies de *T.* seção *Austrotradescantia* ocorrem no Chaco, Floresta Atlântica e Pampa, tendo preferência por ambientes antropizados, formações campestres, vegetações sobre afloramentos rochosos, sub-bosques de florestas ombrófilas densas e florestas estacionais semidecíduas, e mais raramente ocorrendo em formações de restinga. A distribuição de praticamente todos os táxons foi ampliada devido ao esforço de coleta por toda a distribuição brasileira da seção, somado a grande quantidade de coleções analisadas. A exceção é *T. fluminensis*, que teve a sua circunscrição revista, gerando uma diminuição na distribuição tradicionalmente aceita para a espécie. As duas novas espécies descritas são os únicos táxons endêmicos do território brasileiro, enquanto *T. valida* é endêmica da Bolívia. O presente trabalho conta com uma chave inédita para *T.* seção *Austrotradescantia*, possibilitando uma identificação precisa das espécies.

# ANEXOS

GUSTAVO MARTINELLI  
& MIGUEL AVILA MORAES (ORGS.)

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# Livro Vermelho da Flora do Brasil

2013

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CIP-Brasil. Catalogação na publicação Sindicato Nacional dos Editores de Livros, RJ

L762

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Inclui bibliografia e índice  
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APOIOS

Ministério do  
Meio Ambiente



# COMMELINACEAE

Lidyane Yuriko Saleme Aona-Pinheiro, Marco Octávio Pellegrini,  
Arthur Sérgio Mouço Valente, Daniel Maurenza, Danielli Cristina Kutschenko,  
Júlio Souza Reis Júnior, Marcelo Bueno de Abreu

Commelinaceae compreende 42 gêneros e cerca de 664 espécies (Faden, 1998; Hardy; Faden, 2004; Aona *et al.*, 2012; Aona-Pinheiro; Amaral, 2012). Podem ser reconhecidos alguns centros de diversidade para a família como: Brasil (*Dichorisandra* J.C. Mikan), México (*Gibasis* Raf.), África (*Aneilema* R.Br.) e Ásia (*Commelina* L.) (Aona, 2008; Hunt, 1986; Faden, 1991; Gajurel; Shrestham, 2009, respectivamente). No Brasil, ocorrem 13 gêneros e cerca de 69 espécies, podendo ser encontradas de norte a sul em formações florestais e campestres, em áreas alagadas, alteradas, sendo também amplamente cultivadas como ornamentais (Barreto, 1997; Aona; Pellegrini, 2012). Apesar disso, poucas espécies brasileiras estão presentes em Campos de Altitude e outros locais acima da faixa de 1.500 m.s.m. São plantas geralmente suculentas, eretas ou decumbentes, raramente escandentes, em geral terrestres, às vezes rupícolas, saxícolas e aquáticas emergentes, com apenas dois gêneros exclusivamente epífitos: *Belosynopsis* Hassk. e *Cochliostema* Lem. (Faden, 1985). Apresentam folhas simples, alternas, dísticas ou espiraladas; bainha fechada. Inflorescência terminal e/ou axilar ou basal, composta por cincinos agregados em tirso, subtendidas por brácteas foliáceas ou envolvidas por brácteas espatáceas. Suas flores trímeras são em geral delíquescentes e tornam Commelinaceae uma das famílias mais difíceis de serem estudadas com base em material herborizado (Faden, 1991). Apresentam grande variação no androceu, tendo como base 6 estames perfeitos, em 2 séries, mas 1–4 destes podem estar modificados em estaminódios ou suprimidos em alguns gêneros. Suas anteras apresentam deiscência rimosa ou, mais raramente, poricida. No Brasil, Commelinaceae inclui diversas espécies, ocorrendo na Amazônia, na Caatinga e no Cerrado, mas tendo sua maior diversidade na Mata Atlântica, em especial nos Estados da Bahia, Espírito Santo e Rio de Janeiro (Aona; Pellegrini, 2012). Há um grau acentuado de endemismo e especialização nas linhagens na tribo Dichorisandrinae, à qual pertencem os gêneros *Dichorisandra* e *Siderasis* Raf. As plantas desses gêneros têm grande valor ornamental, ocorrendo principalmente em matas úmidas bem preservadas (Aona, 2008), e sendo ameaçadas principalmente pela perda de qualidade de hábitat e por coletas ilegais. Além disso, a Mata Atlântica tem apenas 11,37% de sua cobertura original (Ribeiro *et al.*, 2009) e é considerada um dos *hotspots* mundiais, onde um número expressivo de espécies recém-descritas ou ainda desconhecidas para a ciência pode estar em sério risco de extinção.

## *Dichorisandra acaulis* Cogn.

**Risco de extinção: EN B1ab(i,ii,v)** 🌐

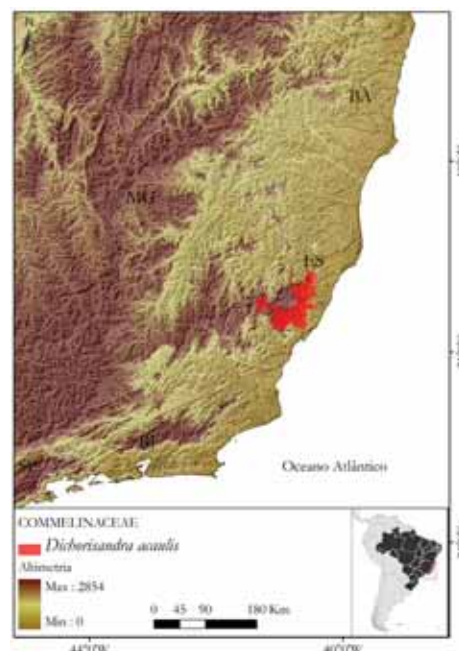
Avaliador: Daniel Maurenza

Data: 11-09-2012

Distribuição: ES

Bioma: Mata Atlântica

**Justificativa:** *Dichorisandra acaulis* é uma erva com distribuição restrita ao Estado do Espírito Santo. A EOO estimada é inferior a 5.000 km<sup>2</sup>, colocando a espécie na categoria “Em perigo” (EN). As Matas de Tabuleiros foram historicamente desmatadas devido à expansão da ocupação urbana e à mudança do uso do solo destinado à agricultura, o que reduziu a EOO da espécie. Assim, supõe-se que as ameaças tornaram a população severamente fragmentada, com as subpopulações isoladas em áreas legalmente protegidas. Devido ao seu potencial ornamental, a AOO e o número de indivíduos adultos também podem estar em declínio.





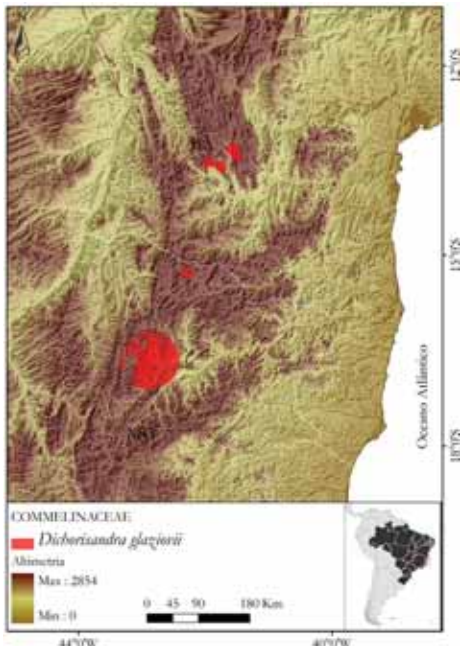
*Dichorisandra glaziovii* Taub.**Risco de extinção:** VU D2 🌐

Avaliador: Daniel Maurenza

Data: 11-09-2012

Distribuição: BA; MG

Biomas: Caatinga, Cerrado, Mata Atlântica



**Justificativa:** *Dichorisandra glaziovii* é uma espécie herbácea com distribuição restrita aos campos rupestres da Serra do Espinhaço (MG) e da região da Chapada da Diamantina (BA), locais ameaçados por perda de habitat. As subpopulações conhecidas no município Grão Mogol sofrem pressão principalmente pela atividade mineradora, que causa declínio de localidade. Já as subpopulações da Chapada da Diamantina estão em risco por diversos fatores, tais como a atividade agropecuária, o fogo, o turismo e a invasão de espécies exóticas. Similarmente, o município de Salinas apresenta desmatamento devido à atividade agropecuária que é a base econômica da região. Assim, são identificadas três situações de ameaça que podem tornar a espécie criticamente em perigo de extinção ou extinta em futuro próximo.

*Dichorisandra leucophthalmos* Hook.**Risco de extinção:** VU A4c; B1ab(iii,v) 🌐

Avaliador: Daniel Maurenza

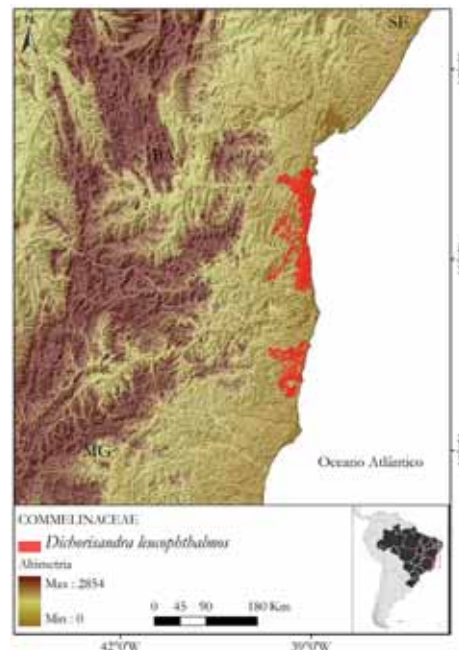
Data: 11-09-2012

Distribuição: BA

Bioma: Mata Atlântica

**Justificativa:** *Dichorisandra leucophthalmos* é uma espécie herbácea terrícola que ocupa o sub-bosque das florestas úmidas do sul da Bahia. Na área de ocorrência, é comum o uso do sistema agrícola de cabruca, que elimina

a vegetação de sub-bosque para o plantio do cacau, um método que atinge exatamente o extrato ocupado pela espécie. O uso do sistema de cultivo cabruca diminuiu nos últimos anos, ao passo que a atividade pecuária aumentou, e há perspectiva de crescimento, tendo em vista as boas condições ambientais para essa prática. Foi estimada uma EOO inferior a 20.000 km<sup>2</sup>, colocando a espécie na categoria “Vulnerável” (VU). As subpopulações conhecidas indicam menos de 10 situações de ameaças, que, pelo exposto acima, reduzem a EOO, AOO, qualidade do habitat e o número de indivíduos maduros. Ademais, as ameaças tornam possível inferir que houve uma redução populacional no passado e projetar uma diminuição da população num futuro imediato. Considerando que a espécie é uma erva de sub-bosque e rizomatosa, suspeita-se que apresente crescimento lento e tempo de geração de cerca de cinco anos, de modo que as ameaças podem reduzir o tamanho populacional em pelo menos 30% no período de três gerações.

*Dichorisandra neglecta* Brade**Risco de extinção:** CR\*B2ab(iii,v) 🌐

Avaliador: Daniel Maurenza

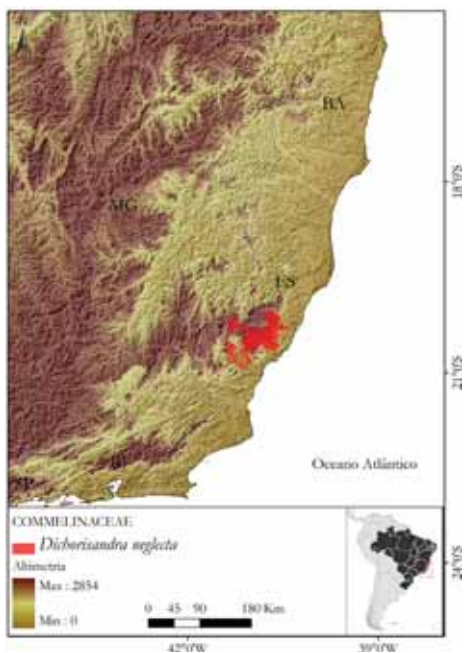
Data: 11-09-2012

Distribuição: ES

Bioma: Mata Atlântica

**Justificativa:** *Dichorisandra neglecta* é uma espécie herbácea rara e restrita ao Estado do Espírito Santo. A única coleta botânica conhecida é o material-tipo, um indivíduo de 1 m de altura, localizado em mata úmida dentro de uma fazenda particular. Assim, a AOO estimada é inferior a 10 km<sup>2</sup>, colocando a espécie na categoria “Criticamente em perigo” (CR). O município de ocorrência, em 2010, contabiliza apenas 10,8% dos remanescentes de Mata

Atlântica, um resultado proveniente dos diversos ciclos econômicos de monoculturas como a cana-de-açúcar, mandioca, banana e café, que desmataram as áreas florestais. O crescimento populacional também é responsável pela perda de biodiversidade, uma vez que o senso demográfico apontava aproximadamente 143.000 habitantes em 1991, e 195.000 em 2007. Foi localizada apenas uma subpopulação, que, em vista do que foi exposto, submete a população de *D. neglecta* ao declínio da EOO, AOO, da qualidade do habitat e do número de indivíduos adultos. Ademais, considerando que o material-tipo foi coletado em 1949, é possível suspeitar que a espécie esteja extinta.



### *Siderasis fuscata* (Lodd.) H.E.Moore

**Risco de extinção:** EN B1ab(ii,iii,v)+2ab(ii,iii,v) 🌐

**Avaliador:** Daniel Maurenza

**Data:** 11-09-2012

**Distribuição:** RJ

**Bioma:** Mata Atlântica

**Justificativa:** *Siderasis fuscata* é uma espécie herbácea endêmica do Brasil. Ocorre nos sub-bosques das florestas litorâneas do Estado do Rio de Janeiro, na faixa altitudinal sub-montana, indicando alta especificidade de habitat. A EOO estimada é inferior a 5.000 km<sup>2</sup> e a AOO é menor que 500 km<sup>2</sup>, colocando a espécie na categoria “Em perigo” (EN). As subpopulações conhecidas estão localizadas em florestas de região metropolitana, nos municípios do Rio de Janeiro e Niterói, que tiveram 82,4% e 77,3% de área desmatada, limitando a população a localidades severamente fragmentadas. Embora as localidades conhecidas estejam inseridas em áreas de proteção integral, o fácil acesso humano e outros fatores advindos da expansão urbana são ameaças que resultam no declínio da qualidade

do habitat da espécie. O potencial ornamental de *S. fuscata* torna o extrativismo uma ameaça que causa o declínio da AOO e do número de indivíduos maduros. Ademais, o registro botânico mais recente foi coletado em 1982, de modo que se fazem necessárias maiores investigações sobre a atual distribuição da espécie.



### Equipe Técnica

**Analistas:** Arthur Sérgio Mouço Valente, Daniel Maurenza, Danielli Cristina Kutschenko

**Analista SIG:** Júlio Souza Reis Júnior, Marcelo Bueno de Abreu

**Avaliador:** Daniel Maurenza

**Revisora:** Tainan Messina

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Abaixo: *Siderasis fuscata* | Categoria: EN (Foto: M.O.O. Pellegrini)



Gustavo Martinelli, Tainan Messina &  
Luiz Santos Filho

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Livro Vermelho  
da Flora do Brasil

2014

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Plantas Raras  
do Cerrado

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Bibliotecária Juliana Farias Motta CRB7- 5880

L788

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Título tradução paralela: Red Book of the Flora of Brazil – Rare Plants of the Cerrado  
Inclui apêndice  
Inclui bibliografia e índice remissivo  
ISBN 978 85 88742 65 9

1. Plantas - Brasil. 2. Botânica - Brasil. 3. Plantas raras - Brasil. 4. Plantas do cerrados - Brasil. Messina, Tainan, org. II. Santos Filho, Luiz Antonio dos, org. III. Título.

CDD: 581.98161

APOIOS

Ministério do  
Meio Ambiente



p. 1: Coleoptera em Asteraceae,  
Serra do Cipó, MG  
Foto: Lucas Moraes  
p. 3: *Dasyphyllum reticulatum*  
Foto: Maurício Mercadante  
p. 45: *Prepusa montana*  
Foto: Gustavo Shimizu

# COMMELINACEAE

Marco Octávio de Oliveira Pellegrini, Lidyanne Yuriko Saleme Aona-Pinheiro,  
Luiz Santos Filho, Thiago Serrano

Commelinaceae caracteriza-se por ervas ou lianas, terrícolas, rupícolas ou palustres, raramente epífitas, distribuídas em 41 gêneros e aproximadamente 670 espécies. A família ocorre principalmente nas regiões tropicais e subtropicais em formações florestais e campestres (Faden & Hunt, 1991). No Brasil, é representada por 14 gêneros e cerca de 80 espécies. Desses, 10 gêneros e 29 espécies são encontradas no Cerrado (Aona & Pellegrini, 2014). Diferentemente da Floresta Atlântica que é o centro de diversidade de *Dichorisandra* (Aona, 2008), o Cerrado é fortemente representado pela tribo Commelineae e pela subtribo Tradescantiinae, em especial pelos gêneros *Commelina* e *Tripogandra* (Aona & Pellegrini, 2014). *Tripogandra* é proporcionalmente um dos gêneros mais problemáticos no Brasil, com três das sete espécies listadas para o país sendo pouco conhecidas e raramente coletadas (Pellegrini *et al.*, 2013). Dessas sete espécies, duas foram consideradas como raras (Barreto, 2009) e categorizadas como ameaçadas, segundo os critérios IUCN. Inúmeras espécies de Commelinaceae de áreas secas apresentam vários níveis de suculência em seus caules e folhas, que aliados as suas belas flores, as tornam de grande interesse ornamental e horticultural. Dos grupos brasileiros de áreas secas, *Tripogandra* e *Tradescantia*, seção *Austrotradescantia*, são especialmente cobiçados por colecionadores de todo mundo (Hunt, 2001). Essas plantas são fortemente ameaçadas pela coleta seletiva de indivíduos como ornamentais (Hunt, 1979), a mineração de calcário, a intensa exploração agropecuária e o crescimento urbano (Herrmann *et al.*, 1998; Pellegrini *et al.*, 2013).

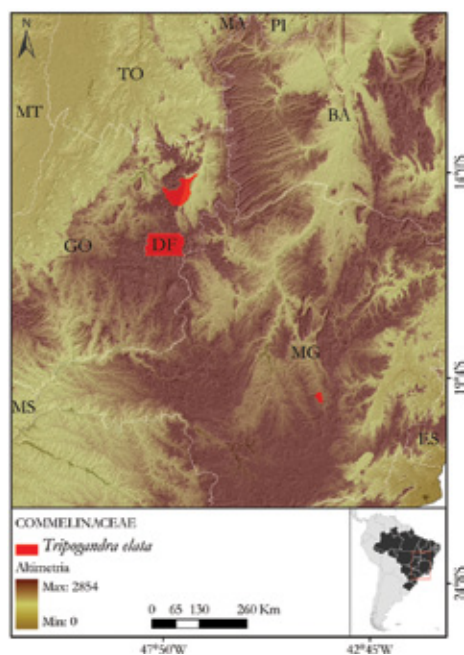
## *Tripogandra elata* D.R.Hunt

**Risco de extinção: EN B2ab(i,ii,iii,iv,v)** 🌐

Avaliador(a): Luiz Santos Filho

Data: 06-02-2014

Bioma: Cerrado



**Justificativa:** Espécie herbácea de ocorrência no Distrito Federal e nos estados de Goiás e Minas Gerais (AOO = 24 km<sup>2</sup>) (Hunt, 1979; Barreto, 2009; Aona & Pellegrini, 2013). Desenvolve-se em Cerrado *lato sensu*, sendo encontrada em Matas de Galeria sobre rochas calcárias,

onde forma pequenas subpopulações (Hunt, 1979; Barreto, 2009; Aona & Pellegrini, 2013). Apesar de protegida pela APA Carste de Lagoa Santa (CNCFlora, 2013) e cultivada no Museu de Biologia Mello Leitão (MBML) e no Jardim Botânico de Belo Horizonte (Pellegrini, com. pess.), suas subpopulações são diretamente afetadas pela coleta seletiva de indivíduos férteis para ornamentação (Hunt, 1979) e pela mineração de calcário desenvolvida na área de distribuição da espécie (Pellegrini, com. pess.), o que a torna susceptível à extinção caso não sejam tomadas medidas de controle das ameaças incidentes.

## *Tripogandra warmingiana* (Seub.) Handlós

**Risco de extinção: VU A4c;B2ab(i,ii,iii,iv)** 🌐

Avaliador(a): Luiz Santos Filho

Data: 07-02-2014

Bioma: Cerrado; Mata Atlântica

**Justificativa:** Espécie herbácea, popularmente conhecida como “marianinha”, ocorre nos estados da Bahia, Espírito Santo, Minas Gerais e Rio de Janeiro (Aona & Pellegrini; Pellegrini *et al.*, 2013). É encontrada em Cerrado e Mata Atlântica, onde se desenvolve em Floresta de Galeria sobre afloramentos calcários, Floresta Semidecidual e Floresta Higrófila (Pellegrini *et al.*, 2013). Forma subpopulações constituídas por poucos indivíduos, preferencialmente em locais sombreados e úmidos (Pellegrini *et al.*, 2013). Está sujeita a menos de 10 situações

de ameaça, considerando suas localidades de ocorrência, sendo poucas as subpopulações protegidas por unidades de conservação. Esse fato, somado à intensa exploração do solo com as atividades agropecuárias (Herrmann *et al.*, 1998; Pellegrini *et al.*, 2013), a mineração e o desenvolvimento urbano (Herrmann *et al.*, 1998), afeta sua área de distribuição e a coloca em risco de extinção. A espécie pode apresentar uma redução populacional significativa em um futuro próximo, causado pelas ameaças incidentes que acarretam declínio de EOO, AOO, da extensão e qualidade de seus habitats e da representatividade de suas subpopulações.



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*Carste de Lagoa Santa*. Belo Horizonte: Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – Ibama-CPRM-Geride-Fundação Biodiversitas.

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Souza, V. C. & Lorenzi, H. 2008. *Botânica sistemática: guia ilustrado para identificação das famílias de fanerógamas nativas e exóticas no Brasil, baseado na APG III*. 3ª ed. Nova Odessa: Instituto Plantarum, 768 p.

*Tripogandra elata* | Categoria: EN (foto: Carlos Alberto Ferreira Jr.)  
Espécime cultivado no Jardim Botânico de Belo Horizonte





# Plantas vasculares do Paraná

Miriam Kaehler

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Paulo Henrique Labiak Evangelista

Osmar dos Santos Ribas

Ana Odete Santos Vieira

Gerdt Guenther Hatschbach



# Plantas vasculares do Paraná

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## Combretaceae

**Miriam Kaehler**

5 gên. e 11 spp. Nativas: 9 spp. Exóticas: 2 spp.

- Buchenavia kleinii* Exell  
*Combretum fruticosum* (Loefl.)  
 Stuntz  
*Combretum laxum* Jacq.  
*Conocarpus erectus* L.  
*Laguncularia racemosa* (L.)  
 C.F.Gaertn.  
*Terminalia argentea* Mart.  
*Terminalia australis* Cambess.  
*Terminalia catappa* L. **Exót.**  
*Terminalia glabrescens* Mart.  
*Terminalia ivorensis* A. Chev. **Exót.**  
*Terminalia triflora* (Griseb.) Lillo

## Commelinaceae

**Lidyane Yuriko Saleme Aona**  
**Marco Pellegrini**

6 gên. e 23 spp. Nativas: 21 spp. Exóticas: 2 spp.

- Commelina benghalensis* L.  
*Commelina diffusa* Burm.f.  
*Commelina erecta* L.  
*Commelina obliqua* Vahl  
*Commelina schomburgkiana* Klotzsch  
*Commelina villosa* C.B. Clarke ex  
 Chodat & Hassl.  
*Dichorisandra hexandra* (Aubl.) C.B.  
 Clarke  
*Dichorisandra incurva* Mart. ex  
 Schult.f.  
*Dichorisandra paranaensis* D.Maia,  
 Cervi & Tardivo  
*Dichorisandra pubescens* Mart. ex  
 Schult. & Schult.f.  
*Dichorisandra thyrsoiflora*  
 J.C.Mikan

- Floscopa glabrata* (Kunth) Hassk.  
*Gibasis geniculata* (Jacq.) Rohweder  
*Tradescantia anagallidea* Seub.  
*Tradescantia cerinthoides* Kunth  
*Tradescantia crassula* Link & Otto  
*Tradescantia fluminensis* Vell.  
*Tradescantia pallida* (Rose) D.R.  
 Hunt **Exót.**  
*Tradescantia umbraculifera* Hand.-  
 Mazz.  
*Tradescantia zanonii* (L.) Sw.  
*Tradescantia zebrina* Bosse **Exót.**  
*Tripogandra diuretica* (Mart.)  
 Handlos  
*Tripogandra glandulosa* (Seub.)  
 Rohweder

## Connaraceae

**Miriam Kaehler**

2 gên. e 4 spp. Nativas: 4 spp.

- Connarus rostratus* (Vell.) L.B.Sm.  
*Connarus suberosus* Planch.  
*Rourea gracilis* G.Schellenb.  
*Rourea martiana* Baker

## Convolvulaceae

**Rosangela Simão Bianchini**

12 gên. e 100 spp. Nativas: 94 spp. Exóticas: 6 spp.

- Aniseia martinicensis* (Jacq.) Choisy  
 var. *ambigua* Hallier f.  
*Bonamia agrostopolis* (Vell.) Hallier f.  
*Convolvulus bonariensis* Cav.  
*Convolvulus crenatifolius* Ruiz & Pav.  
*Convolvulus hasslerianus* (Chodat)  
 O'Donell  
*Cuscuta boliviana* Yunck.  
*Cuscuta epilinum* Weihe **Exót.**

**Basellaceae Raf.** ■

Accepted Name, Correct name by conservation

FB57

**Taxonomic Hierarchy**

Flora → Angiosperms → Basellaceae Raf.

**Life Form and Substrate****Life Form**

Liana/scandent/vine

**Substrate**

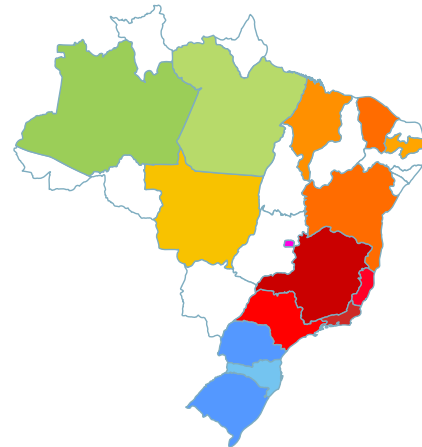
Terrestrial

**Origin**

Native

**Endemism**

Is not endemic from Brazil

**Distribution****Geographic distribution****Norte** (Amazonas, Pará)**Nordeste** (Bahia, Ceará, Maranhão, Paraíba)**Centro-oeste** (Distrito Federal, Mato Grosso)**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)**Phytogeographic Domains**

Atlantic Rainforest

**Vegetation Type**

Anthropic area, Ombrophylous Forest (Tropical Rain Forest)

**Reference**

- ERIKSSON, R. 2004. Basellaceae. In: N. Smith et al. (eds.), Flowering plants of the Neotropics. Princeton University Press, Princeton, EUA, pp. 44-45.
- ERIKSSON, R. 2007. A synopsis of Basellaceae. Kew Bulletin 62(2): 297-320.
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- SPERLING, C.R. & BITTRICH, V. 1993. Basellaceae. In: K. Kubitzki (ed.), The families and genera of vascular plants, Vol. 4. Berlin, Springer Verlag, p. 143-146.

**Genus***Anredera* Juss., *Basella* L.**Synopsis for Brazil**

|        | Accepted | Endemic | Synonyms |
|--------|----------|---------|----------|
| Genera | 2        | 0       | 7        |

|            |   |   |    |
|------------|---|---|----|
| Species    | 3 | 0 | 14 |
| Subspecies | 0 | 0 | 1  |
| Varieties  | 0 | 0 | 5  |

**How To Cite**

Pellegrini, M.O.O.; Sakuragui, C.M. *Basellaceae* in **Lista de Espécies da Flora do Brasil**. Jardim Botânico do Rio de Janeiro. Available in: <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB57>. Access on: 29 Jun. 2015

Last edited by Pellegrini, M.O.O. in 22/01/2015 - 18:42:16

**Cabombaceae Rich. ex A.Rich.** ■

Accepted Name, Correct name

FB69

**Taxonomic Hierarchy**

Flora → Angiosperms → Cabombaceae Rich. ex A.Rich.

**Life Form and Substrate**

## Life Form

Herb

## Substrate

Aquatic

**Origin**

Native

**Endemism**

Is not endemic from Brazil

**Distribution**

## Geographic distribution

**Norte** (Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins)**Nordeste** (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)**Centro-oeste** (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

## Vegetation Type

Aquatic vegetation

**Reference**FASSETT, N.C. 1953. A monograph of *Cabomba*. Castanea 13: 116-128.

FERES, F. &amp; AMARAL, M.C.E. 2003. Cabombaceae. In M.G.L. Wanderley, G.J. Shepherd, A.M. Giulietti &amp; T.S. Melhen (eds.) Flora Fanerogâmica do Estado de São Paulo, vol. 3. FAPESP/ RiMa. São Paulo. pp. 9-11.

FRANCISCO, L.V. & BARRETO, R.C. 2007. *Cabomba* Aubl. (Cabombaceae): caracterização morfoecológica e delimitação entre as espécies ocorrentes no Brasil. Revista Brasileira de Biociências 5(2): 1077-1079.

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ØRGAARD, M. 1991. The genus *Cabomba* (Cabombaceae) - a taxonomic study -. Nord. J. Bot. 11(2): 179-203.

WILLIAMSON, P.S. &amp; SCHNEIDER, E.L. 1993. Cabombaceae. In K. Kubitzki, J.G. Rohwer &amp; V. Bittich (eds.) The families and genera of vascular plants, vol. 2. Springer Verlag. Berlin. pp. 157-161.

**Genus***Cabomba* Aubl.**Synopsis for Brazil**

|            | Accepted | Endemic | Synonyms |
|------------|----------|---------|----------|
| Genera     | 1        | 0       | 1        |
| Species    | 4        | 0       | 9        |
| Subspecies | 0        | 0       | 0        |
| Varieties  | 2        | 0       | 1        |

**How To Cite**

Amaral, M.C.E.; Pellegrini, M.O.O.; Lima, C.T. *Cabombaceae* in *Lista de Espécies da Flora do Brasil*. Jardim Botânico do Rio de Janeiro. Available in: <<http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB69>>. Access on: 29 Jun. 2015

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## Comelinaceae Mirb. ■

Accepted Name, Correct name by conservation

FB91

### Taxonomic Hierarchy

Flora → Angiosperms → Commelinaceae Mirb.

### Life Form and Substrate

#### Life Form

Herb, Liana/scandent/vine

#### Substrate

Aquatic, Rupicolous, Terrestrial

### Origin

Native

### Endemism

Is not endemic from Brazil

### Distribution

#### Geographic distribution

**Norte** (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins)

**Nordeste** (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)

**Centro-oeste** (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)



#### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

#### Vegetation Type

Anthropic area, Caatinga (stricto sensu), High Altitude Grassland, Flooded Field (Várzea), Grassland, Highland Rocky Field, Carrasco Vegetation, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Inundated Forest (Várzea), Seasonally Deciduous Forest, Seasonal Evergreen Forest, Seasonally Semideciduous Forest, Ombrophylloous Forest (Tropical Rain Forest), Mixed Ombrophylloous Forest, Coastal Forest (Restinga), Aquatic vegetation, Rock outcrop vegetation

### Reference

AONA, L.Y.S. 2008. Revisão taxonômica e análise cladística do gênero *Dichorisandra* J.C.Mikan (Comelinaceae). Ph.D. dissertation. Universidade Estadual de Campinas, São Paulo, Brazil.

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FADEN, R.B. 1998. Comelinaceae. In K. Kubitzki (ed.) The families and genera of vascular plants, vol. 4. Springer Verlag. Berlin. pp. 109-128.

### Genus

*Aneilema* R.Br., *Buforesstia* C.B.Clarke, *Callisia* Loeffl., *Commelina* L., *Cyanotis* D. Don, *Dichorisandra* J.C.Mikan, *Floscopa* Lour., *Geogenanthus* Ule, *Gibasis* Raf., *Murdannia* Royle, *Palisota* Rchb. ex Endl., *Plowmanianthus* Faden & C.R.Hardy, *Siderasis* Raf., *Tinantia* Scheidw., *Tradescantia* L., *Tripogandra* Raf.

### Synopsis for Brazil

|        | Accepted | Endemic | Synonyms |
|--------|----------|---------|----------|
| Genera | 14       | 1       | 75       |



|            |    |    |     |
|------------|----|----|-----|
| Species    | 84 | 41 | 320 |
| Subspecies | 4  | 0  | 7   |
| Varieties  | 7  | 2  | 71  |

**How To Cite**

Aona, L.Y.S.; Pellegrini, M.O.O. *Comelinaceae* in **Lista de Espécies da Flora do Brasil**. Jardim Botânico do Rio de Janeiro. Available in: <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB91>. Access on: 29 Jun. 2015

Last edited by Pellegrini, M.O.O. in 08/03/2015 - 23:13:48

## Haloragaceae R.Br. ■

Accepted Name, Correct name by conservation

FB125

### Taxonomic Hierarchy

Flora → Angiosperms → Haloragaceae R.Br.

### Life Form and Substrate

#### Life Form

Herb, Subshrub

#### Substrate

Aquatic, Rupicolous, Terrestrial

### Origin

Native

### Endemism

Is not endemic from Brazil

### Distribution

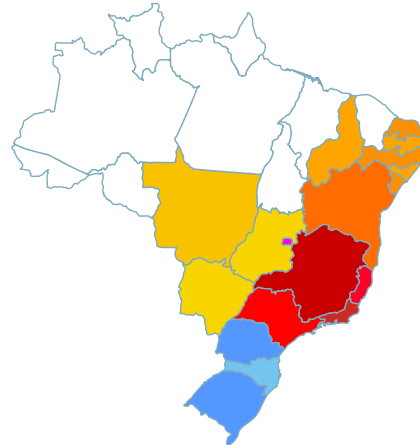
#### Geographic distribution

**Nordeste** (Alagoas, Bahia, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)

**Centro-oeste** (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)



#### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

#### Vegetation Type

Highland Rocky Field, Cerrado (lato sensu), Coastal Forest (Restinga), Aquatic vegetation

### Reference

FEVEREIRO, P.C.A. 1975. Haloragáceas. In R. Reitz & R.M. Klein (eds.) Flora Ilustrada Catarinense, parte I, fasc. Halor Itajaí, Herbário Barbosa Rodrigues, 17pp, 3 fig., 3 mapas.

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MOODY, M.L. & LES, D.H. 2007. Phylogenetic systematics and character evolution in the angiosperm family Haloragaceae. American Journal of Botany 94(12): 2005-2025.

MOODY, M.L. & LES, D.H. 2010. Systematics of the aquatic angiosperm genus *Myriophyllum* (Haloragaceae) Systematic Botany 35(1): 121-139.

ORCHARD, A.E. 1981. A revision of South American *Myriophyllum* (Haloragaceae), and its repercussions on some Australian and North American species. Brunonia 4(1): 27-65.

PRAGLOWSKI, J. 2009. The pollen morphology of the Haloragaceae with reference to taxonomy. Grana 10(3): 159-239.

### Genus

*Halogaris* J.R.Forst. & G.Forst., *Laurembergia* P.J.Bergius, *Myriophyllum* L., *Proserpinaca* L.

### Synopsis for Brazil

|            | Accepted | Endemic | Synonyms |
|------------|----------|---------|----------|
| Genera     | 3        | 0       | 4        |
| Species    | 5        | 0       | 15       |
| Subspecies | 0        | 0       | 1        |
| Varieties  | 0        | 0       | 7        |

**How To Cite**

Amaral, M.C.E.; Pellegrini, M.O.O. *Haloragaceae* in *Lista de Espécies da Flora do Brasil*. Jardim Botânico do Rio de Janeiro. Available in: <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB125>. Access on: 30 Jun. 2015

Last edited by Pellegrini, M.O.O. in 27/10/2014 - 11:36:42

## Nymphaeaceae Salisb. ■

Accepted Name, Correct name

FB173

### Taxonomic Hierarchy

Flora → Angiosperms → Nymphaeaceae Salisb.

### Life Form and Substrate

#### Life Form

Herb

#### Substrate

Aquatic

### Origin

Native

### Endemism

Is not endemic from Brazil

### Distribution

#### Geographic distribution

**Norte** (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins)

**Nordeste** (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)

**Centro-oeste** (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)



#### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

#### Vegetation Type

Aquatic vegetation

### Reference

BOSCH, T.; LÖHNE, C. & WIERSEMA, J.H. 2008. Phylogeny and evolutionary patterns in Nymphaeales: integrating genes, genomes and morphology. *Taxon* 57: 1052–1081.

CASPARY, R. 1878. Nymphaeaceae. In C.F.P.Martius, A.W. Eichler & I. Urban (eds.) *Flora Brasiliensis*. Lipsiae, Frid. Fleischer, vol. 4, parte 2, pp. 131-184, tab. 28-36.

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FERES, F. & AMARAL, M.C.E. 2003. Nymphaeaceae. In M.G.L. Wanderley, G.J. Shepherd, A.M. Giulietti & T.S. Melhen (eds.) *Flora Fanerogâmica do Estado de São Paulo*, vol. 3. FAPESP/ RiMa. São Paulo. pp. 241-493.

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LIMA, C.T.; GIULIETTI, A.M. & SANTOS, F.A.R. 2012. Flora da Bahia: Nymphaeaceae. *Sitientibus série Ciências Biológicas* 12(1): 69-82.

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### Genus

*Euryale* Salisb., *Nymphaea* L., *Victoria* Lindl.

#### Synopsis for Brazil

|            | Accepted | Endemic | Synonyms |
|------------|----------|---------|----------|
| Genera     | 2        | 0       | 3        |
| Species    | 23       | 6       | 34       |
| Subspecies | 2        | 0       | 0        |
| Varieties  | 0        | 0       | 10       |



#### How To Cite

Amaral, M.C.E.; Pellegrini, M.O.O.; Lima, C.T. *Nymphaeaceae* in **Lista de Espécies da Flora do Brasil**. Jardim Botânico do Rio de Janeiro. Available in: <<http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB173>>. Access on: 30 Jun. 2015

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## Pontederiaceae Kunth ■

Accepted Name, Correct name

FB197

### Taxonomic Hierarchy

Flora → Angiosperms → Pontederiaceae Kunth

### Life Form and Substrate

#### Life Form

Herb

#### Substrate

Aquatic, Terrestrial

### Origin

Native

### Endemism

Is not endemic from Brazil

### Distribution

#### Geographic distribution

**Norte** (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins)

**Nordeste** (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)

**Centro-oeste** (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

**Sudeste** (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

**Sul** (Paraná, Rio Grande do Sul, Santa Catarina)



#### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

#### Vegetation Type

Caatinga (stricto sensu), Flooded Field (Várzea), Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Coastal Forest (Restinga), Aquatic vegetation

### Reference

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85-96.

SOUSA, D.J.L. 2014. Taxonomia e morfologia das Pontederiaceae do estado da Bahia. Dissertação de Mestrado. Universidade Estadual de Feira de Santana, Bahia. 105p.

**Genus**

*Eichhornia* Kunth, *Heteranthera* Ruiz & Pav., *Hydrothrix* Hook.f., *Pontederia* L.

**Synopsis for Brazil**

|            | Accepted | Endemic | Synonyms |
|------------|----------|---------|----------|
| Genera     | 4        | 1       | 21       |
| Species    | 23       | 1       | 107      |
| Subspecies | 0        | 0       | 1        |
| Varieties  | 0        | 0       | 20       |

**How To Cite**

Amaral, M.C.E.; Pellegrini, M.O.O.; Sousa, D.J.L. *Pontederiaceae* in **Lista de Espécies da Flora do Brasil**. Jardim Botânico do Rio de Janeiro. Available in: <<http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB197>>. Access on: 30 Jun. 2015

Last edited by Pellegrini, M.O.O. in 25/01/2015 - 22:21:24

**Saururaceae Rich. ex T.Lestib. ■**

Accepted Name, Correct name

FB129147

**Taxonomic Hierarchy**Flora → [Angiosperms](#) → [Saururaceae Rich. ex T.Lestib.](#)**Life Form and Substrate**

Life Form

Herb

Substrate

Terrestrial

**Origin**

Naturalized

**Endemism**

Is not endemic from Brazil

**Distribution**

Geographic distribution

**Sudeste** (Minas Gerais, Rio de Janeiro, São Paulo)

Phytogeographic Domains

Atlantic Rainforest

Vegetation Type

Anthropic area

**Reference**

ALVES, R.J.V. *et al.* 2013. First report of naturalization of *Houttuynia cordata* Thunb. 1783 (Piperales: Saururaceae) in South America. Check List 9(3): 642-644.

CHENG-YIH, W. & KUBITZKI, K. 1993. Saururaceae. In K. Kubitzki, J.G. Rohwer & V. Bittich (eds.) The families and genera of vascular plants, vol. 2. Springer Verlag. Berlin. pp. 586-588.

MENG, S.W. *et al.* 2003. Phylogeny of Saururaceae based on morphology and five regions from three plant genomes. Ann. Missouri Bot. Gard. 90: 592-602.

NIANHE, X. & BRACH, A.R. 1999. Saururaceae. In C.Y. Wu, P.H. Raven & D.Y. Hong (eds.) Flora of China. Science Press & Missouri Botanical Garden Press, Beijing & St. Louis, vol. 4, pp. 108-109.

**Genus***Houttuynia* Thunb.**Synopsis for Brazil**

|         | Accepted | Endemic | Synonyms |
|---------|----------|---------|----------|
| Genera  | 1        | 0       | 1        |
| Species | 1        | 0       | 4        |





|            |   |   |   |
|------------|---|---|---|
| Subspecies | 0 | 0 | 0 |
| Varieties  | 0 | 0 | 3 |

**How To Cite**

Pellegrini, M.O.O. *Saururaceae* in **Lista de Espécies da Flora do Brasil**. Jardim Botânico do Rio de Janeiro. Available in: <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB129147>. Access on: 30 Jun. 2015

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## BASELLACEAE

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**Trepadeiras volúveis**, sem gavinhas, suculentas, herbáceas ou ocasionalmente sufruticosas. **Caule** suculento, herbáceo ou lignificado, às vezes produzindo tubérculos aéreos e/ou subterrâneos. **Folhas** simples, alterno-espiraladas, pecioladas; sem estípulas. **Inflorescências** axilares ou terminais, espigas, racemos, panículas ou dicásios. **Flores** sésseis ou pediceladas, actinomorfas com exceção do cálice, bissexuais ou raramente funcionalmente unissexuais, casmógamas ou cleistógamas, subtendidas por 2 bractéolas; sépalas 2, valvares, opostas, alternas com as bractéolas, petaloides, persistentes e acrescente nos frutos, livres a parcialmente conatas; pétalas 5, imbricadas, patentes ou eretas, persistentes e levemente acrescentes nos frutos; estames 5, epipétalos, conatos na base ou até 3/4 do comprimento, anteras dorsifixas, bitecas, deiscência rimosa, extrorsa; ovário súpero, gamocarpelar, unilocular, uniovulado, placentação basal, estilete 1-3, inteiro a trifido até próximo à base, estigma linear a capitado ou trilobado. **Fruto** aquênio, indeiscente, perianto persistente envolvendo sua base ou totalmente. **Sementes** com a testa membranosa.

Basellaceae é uma família de distribuição tropical e subtropical, tendo como centro de diversidade a região andina sul americana (Sperling & Bittrich 1993; Eriksson 2007). Compreende quatro gêneros e 19 espécies (Eriksson 2007) dos quais apenas *Anredera* Juss. é nativo do Brasil, sendo representado por duas espécies (Pellegrini & Sakuragui 2014). O gênero *Basella* L. é de origem africana (Sperling 1987; Eriksson 2007) e ocorre no Brasil apenas como subespontâneo ou como cultivado (Pellegrini & Sakuragui 2014).

A família apresenta grande valor alimentício e medicinal, com várias espécies cultivadas para esses fins: bertalha-verdadeira, olluco e folha-gorda [i.e. *Basella alba* L., *Ullucus tuberosus* Caldas e *Anredera cordifolia* (Ten.) Steenis, respectivamente]. No estado do Espírito Santo a família é representada pelo gênero *Anredera*.

Eriksson, R. 2004. Basellaceae. In: N. Smith *et al.* (eds.), Flowering plants of the Neotropics, pp. 44-45. Princeton University Press, Princeton, EUA.

Eriksson, R. 2007. A synopsis of Basellaceae. *Kew Bulletin* 62(2): 297-320.

Eriksson, R. 2009. Neotropical Basellaceae. In: Milliken, W.; Klitgård, B. & Baracat, A., Neotropikey-Interactive key and information resources for flowering plants of the Neotropics. (<http://www.kew.org/science/tropamerica/neotropikey/families/Basellaceae.htm>).

Moquin-Tandon, C.H.B.A. 1849. Basellaceae In: de Candolle, A.P. Prodr. 13(2): 220-230, 462. Paris.

Pellegrini, M.O.O. & Sakuragui, C.M. 2014. Basellaceae. In: Lista de Espécies da Flora do Brasil. Jardim Botânico do Rio de Janeiro. (<http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB57>)

Sperling, C.R. 1987. Systematics of the Basellaceae. PhD Dissertation. Harvard University, Cambridge, EUA. 291 pp.

Sperling, C.R. & Bittrich, V. 1993. Basellaceae. In: K. Kubitzki (ed.), The families and genera of vascular plants, v. 4, p. 143-146. Berlin: Springer Verlag.

### 1. *Anredera* Juss., nom. cons.

**Trepadeiras** suculentas, ocasionalmente sufruticosas. **Caule** glabro, suculento ou lignificado, liso ou rugoso, às vezes produzindo tubérculos aéreos. **Folhas** carnosas a membranáceas. **Inflorescências** axilares ou terminais, racemos ou panículas, pedúnculo delgado, não-carnoso, bractéolas conatas. **Flores** pediceladas, casmógamas, bissexuais, raramente funcionalmente unissexuais, perfumadas; estames reflexos em botão; estilete 1, inteiro a trifido até próximo à base, estigma linear a capitado ou trilobado. **Aquênio** envolto na base a completamente envolto pelo perianto persistente, membranáceo a paleáceo.

*Anredera* é o maior gênero da família, compreendendo 12 espécies. Exclusivamente Neotropical, é distribuído desde o sul dos Estados Unidos, passando pelo Caribe, até a Argentina e o Uruguai. Tem como centro de diversidade a região andina da América do Sul. *Anredera* pode ser facilmente diferenciada de *Basella* pelas inflorescências com raques

não-carnosas (*vs.* carnosas em *Basella*), bractéolas conatas (*vs.* livres), flores pediceladas e perfumadas (*vs.* sésseis e inodoras) e pelo pólen esférico e espinhoso (*vs.* cuboide a sub-cuboide e reticulado). No estado do Espírito Santo está representado por duas espécies.

Brink Jr., R.C.B. & Steenis, C.G.G.J. 1956. (21) Proposal to conserve the generic name 2428 *Anredera* Juss. 1789 against *Fallopia* Adans. 1763 (Basellaceae). *Taxon* 5(8): 198.

Hauman, L. 1925. Notes sur le genre *Boussingaultia* H.B.K. *Anales Mus. Nac. Hist. Nat. Buenos Aires* 33: 347-359.

Soukup, J. 1966. El género *Boussingaultia* H.B.K. fué reducido a sinónimo de *Anredera* Juss. *Biota* 6: 158-160.

Sperling, C.R. 1995. New species and new combinations in *Anredera* Juss. (Basellaceae). *Phytologia* 79(1): 1-4.

### Chave para as espécies de *Anredera*

1. Folhas com margem não revoluta *in sicco*; pétalas uniformes, patentes; estilete 1, trífido ..... 1.1. *Anredera cordifolia*
1. Folhas com margem levemente revoluta a revoluta *in sicco*; 2 pétalas mais externas patentes, 3 pétalas mais internas eretas; estilete 1, inteiro ..... 1.2. *Anredera tucumanensis*

1.1. *Anredera cordifolia* (Ten.) Steenis, Fl. Males., Ser. 1, Spermat. 5(3): 303. 1957. Fig. 1A-E

**Trepadeiras** suculentas ou ocasionalmente sufruticosas. **Caule** produzindo tubérculos aéreos quando maduro. **Folhas** membranáceas a carnosas, verde a verde-escuras, lustrosas; pecíolo 0,2–1,7 cm compr.; lâminas 1,1-9,5 x 0,7-5 cm, sub-cordadas a largo-cordadas, raro ovadas ou elípticas, margem não revoluta *in sicco*. **Racemos ou panículas**, axilares ou terminais. **Flores** bissexuais, pedicelos 1-1,5 mm compr.; bractéolas triangulares a largo-ovadas; sépalas 1,5-2 x 1,5-2 mm, largo-ovadas a largo-elípticas, patentes, alvas a alvo-esverdeadas; pétalas 2-3 x 1-2 mm, uniformes, patentes, elípticas a obovadas, alvas a alvo-esverdeadas; filetes triangulares, alvos, anteras alvas; estilete 1, trífido, estigma capitado. **Aquênio** envolto na base pelo perianto persistente, patente.

*Distribuição geográfica e ambiente*— Regiões central e sul da América do Sul, incluindo o Brasil (Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, Santa Catarina). *Anredera cordifolia* ocorre em áreas abertas ou antrópicas de Floresta Atlântica, sendo menos comum em áreas sombreadas.

Espécimes examinados— Guarapari: Praia do Morro, 18.II.1988, fl., L. Krieger 25069 (CESJ). Itaguaçu: Jatiboca, 31.V.1946, fl., A.C. Brade et al. 18501 (NY, RB). Santa Teresa: 25.XI.1953, fl., A.P. Duarte 4008 (HAS, RB).

Material adicional examinado— RIO DE JANEIRO. Cabo Frio: Restinga de Cabo Frio, 21.I.1967, fl., D. Sucre 1436 (HB, RB, UNB). Petrópolis: Castelânea, 16.II.2013, fl., M.O.O. Pellegrini 305 (RB). Rio de Janeiro: Estrada para Jacarepaguá, 17.VI.1958, fl., fr., E. Pereira et al. 3883 (NY, RB, RFA).

1.2. *Anredera tucumanensis* (Lillo & Hauman) Sperling, Phytologia 79(1):3. 1995. Fig. 1F-J

**Trepadeiras** suculentas ou ocasionalmente sufruticosas. **Caule** não produzindo tubérculos aéreos. **Folhas** carnosas, verde a verde-escuras, lustrosas; pecíolo 3-9 mm compr.; lâminas 0,8-7,8 x 0,3-5,6 cm, ovadas a elípticas, margem levemente revoluta a revoluta *in sicco*. **Panículas, raro racemos**, axilares ou terminais. **Flores** bissexuais, pedicelos 0,5-1 mm compr.; bractéolas romboides a rotundas; sépalas 2,5-3 x 1,5 mm, elípticas a obovadas, patentes, alvas a alvo-esverdeadas; pétalas 2,5-3,5 x 1-1,5 mm, elípticas, alvas, 2 pétalas mais externas patentes, 3 mais internas eretas, mais estreitas, mais claras, às vezes menores em comprimento e hialinas; filetes triangulares, alvos, anteras alvas; estilete 1, inteiro, estigma capitado. **Aquênio** envolto completamente pelas 3 pétalas mais internas, eretas.

*Distribuição geográfica e ambiente*— Equador, Bolívia, Argentina e Brasil (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul). *Anredera tucumanensis* é registrada pela primeira vez para o estado do Espírito Santo, onde ocorre em um fragmento de Floresta Ombrófila Densa Alto-montana no Parque Estadual do Forno Grande.

Espécime examinado— Castelo: Parque Estadual do Forno Grande, trilha para a Goela da Onça, 19.VII.2008, fl., R. Goldenberg et al. 1193 (CEPEC, MBML, RB, UPCB).

Material adicional examinado— MINAS GERAIS. Alto Caparaó: Parque Nacional do Caparaó, ao lado da trilha no Vale Verde, 2.VIII.1996, fl., L.S. Leoni 3405 (ESA). RIO DE JANEIRO. Teresópolis: Serra do Órgãos, 27.VII.1944, fl., fr., E. Pereira 404 (HB, RB); Petrópolis: Araras, Base da Pedra Maria Comprida, 10.VIII.1968, fl., D. Sucre & P.I.S. Braga 3455 (CEPEC, INPA, K, MBM, MG, MO, NY, RB).

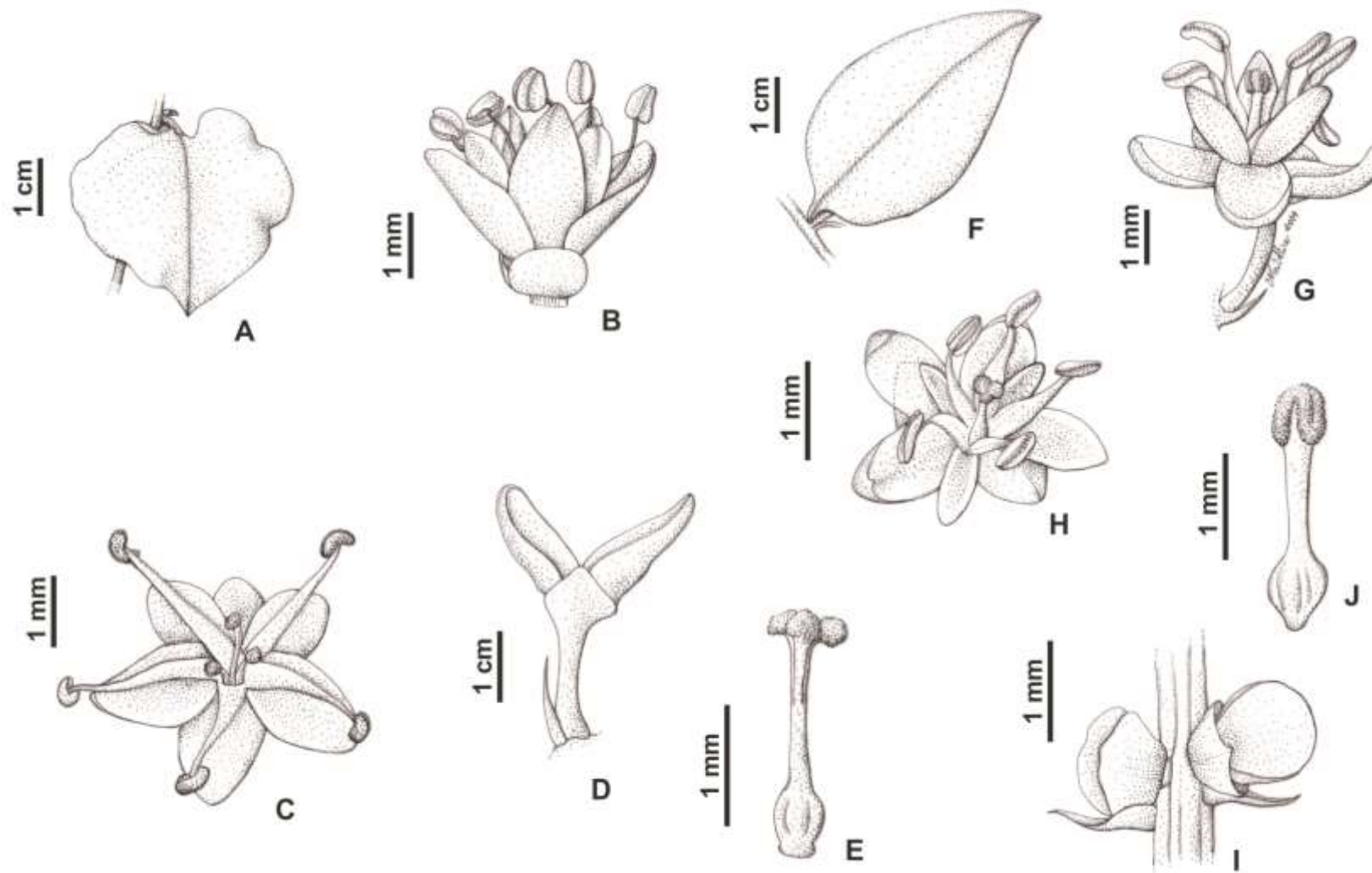


Figura 1. *Anredera cordifolia*. A. Folha. B. Flor vista de lado. C. Flor vista de cima. D. Detalhe da bractéola. E. Detalhe do gineceu evidenciando o estilete tripartido. *Anredera tucumanensis*. F. Folha. G. Flor vista de lado. H. Flor vista de cima. I. Detalhe da bractéola. J. Detalhe do gineceu, evidenciando o estilete inteiro (A-E, M.O.O. Pellegrini 305; F-J, E. Pereira 404).

## **Notes on the Pontederiaceae names described in Vellozo's *Flora fluminensis***

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Running title: Pontederiaceae in Vellozo's *Flora fluminensis*



**Abstract- Notes on the Pontederiaceae names described in Vellozo's *Flora fluminensis***

The names of Pontederiaceae described by Vellozo in his *Flora fluminensis* are here revised, with an orthographical correction, two lectotypes and one epitype designated.

**Key words**

Aquatic flora, Commelinales, *Eichhornia*, *Heteranthera*, Rio de Janeiro

**Resumo- Notas nos nomes de Pontederiaceae descritos por Vellozo na *Flora fluminensis***

No presente trabalho são revisados os nomes de Pontederiaceae publicados por Vellozo na *Flora fluminensis*, com uma correção ortográfica, dois lectótipos e um epítipo designados.

**Palavras-chave**

Commelinales, *Eichhornia*, *Heteranthera*, plantas aquáticas, Rio de Janeiro

## Introduction

Vellozo's *Flora fluminensis* is a monumental work and the first one edited by a Brazilian botanist on our country's flora (Cervi & Rodrigues 2010). With funding of the Portuguese Empire, *Flora fluminensis* was a relevant part of the "Portuguese Philosophical Travels" that took place during the XVIII century. This Empire conducted several scientific expeditions across its world-wide domains with two campaigns in the Brazilian territory, with one of them being coordinated by Friar José Mariano da Conceição Vellozo (Damasceno 1977; Pataca 2011).

*Flora fluminensis* has been widely neglected since its publication due its historically difficult access and tortuous publishing history. It is also worth mentioning that at the time of its publication Vellozo's work was considered non-scientific, thus being highly depreciated by the academic community (Borgmeier 1961; Carauta 1969, 1973; Valle 1985). Combining this context with the general downgrading of taxonomy by the academic community, many plant groups lack recent floristic and taxonomic treatments (Funk 2006). This is also true for most aquatic plant families (Paz & Bove 2007), and Pontederiaceae is no exception. The group has been extensively studied under its reproductive and evolutionary aspects, but possesses just few papers are recorded on taxonomy, especially dealing with their poorly resolved generic limits (Graham *et al.* 1998; Gomes 2000; Ness *et al.* 2011). For these reasons, little attention was ever given to the names of Pontederiaceae published by Vellozo (1829). These names were only featured in two national floras (Horn 1987a, 1987b), but completely out of the context of the Rio de Janeiro state flora or of a nomenclatural revision. This paper is part of a series dealing with the nomenclatural problems of the Commelinales names in Vellozo's *Flora fluminensis* (Aona-Pinheiro *et al.* 2014; Pellegrini *et al.* 2015; Pellegrini & Forzza *in press*; Pellegrini & Carvalho *in press*).

## Original specimens and Typification

The original specimens collected by Vellozo were sent to the Museu Real de Lisboa between 1797 and 1798 (Hamy 1908; Borgmeier 1937). In addition to the specimens Vellozo placed in Lisboa, Hamy (1908) referred to 246 Vellozo specimens arranged in two separate batches (117 and 129 specimens) that were stated to have arrived in Portugal, with the first batch (consisting of 117 specimens) being sent to Paris (Bocage, 1862). Nevertheless, those specimens were expropriated during the Napoleonic invasion of Portugal in 1808 and nothing is known about the current whereabouts of Vellozo's original collection (Lima 1995; Cervi & Rodrigues 2010; Pastore 2013). Thus, making the iconographies of *Flora fluminensis* the best option for lectotypes and reviewing the described taxa (Carauta 1969; Mello Filho 1975; Cervi & Rodrigues 2010; Pellegrini *et al.* 2015).

Considering the abovementioned scenario, the names of Pontederiaceae described by Vellozo are here revised, with two lectotypes and an orthographical correction. An epitype was designated when the original plate was insufficient to apply a name to the given species with certainty. The species are presented here in the same order as that of Vellozo's *Flora fluminensis*.

## Taxonomy

**1. *Heteranthera reniformis*** Ruiz & Pavón, Fl. Peruv. 1: 43, pl. LXXI. 1798.

*Buchosia aquatica* Vellozo, Fl. Flumin.: 33. 1829. **Lectotype (designated here):** [illustration]

Original plate on parchment of "*Flora fluminensis*" in the Manuscript Section of the Biblioteca Nacional of Rio de Janeiro [mss1095062\_084] and later published by Vellozo (1831. Fl. Flumin. Icon. 1: t. 80). **Epitype (designated here):** BRAZIL. Rio de Janeiro: Rio de Janeiro, entre o

Leblon e a Gávea, fl., 1942, *Dionisio s.n.* (2 ex RB 57561!). — For an image of the lectotype, see Fig. 1A-B; for an image of the epitype, see Fig. 2.

**Nomenclatural notes:** According to the *Code* (McNeill *et al.* 2012, Art. 60.1) the name *Buch'osia* consists of an orthographical error, which under the *Code* (McNeill *et al.* 2012, Art. 60.10) should be corrected by the suppression of the apostrophe. Although this is a situation of automatic correction, the wrong spelling is still used in scientific publications (Castellanos 1959; Horn 1985, 1987b). Nevertheless, since publications regarding the Pontederiaceae and Vellozo names have been few in the past years, this name has been long forgotten. Thus it is formalized here that the correct name for the genus is *Buchosia*, over the originally spelled *Buch'osia*.

Horn (1987a, 1987b) was the first to publish as *Buchosia aquatica* a synonym of *H. reniformis*, since Horn (1985) represents his unpublished Ph.D. thesis, and by means of the *Code* is not considered validly published (McNeill *et al.* 2012, Art. 29.1). The same is valid for all nomenclatural and taxonomical decisions proposed by the author at this time. Despite publishing the new synonym, Horn (1987a, 1987b) failed to lectotypify Vellozo's name in both publications, since he never cited Vellozo's plate. Thus, a lectotype is needed for the proper application of this name, being here designated.

**Taxonomical notes:** Despite *Buchosia* being considered a synonym of *Heteranthera* by Horn (1987a, 1987b), there does not seem to be an agreement over the application of *B. aquatica*, since it is often disregarded or missing in databases (e.g. eMonocot; The Plant List), being cited only in Tropicos.org. After carefully examining the original plate and description of *B. aquatica* it became clear that there are significant differences between the plant described and illustrated by Vellozo (1829, 1831) to the any known species of the genus *Heteranthera*, with respect to reproductive characters. Vellozo's description for *Buchosia* mentions a 4-locular gynoeceium and 4-valved capsules that are unknown for Pontederiaceae

(the fruit can be a 3-valved capsule or an achene, depending on the genus). These features can be also seen in the plate for *Buchosia aquatica* (Vellozo 1831, v. 1: t. 80; Fig. 1B). The plate also depicts a multibracteate inflorescence, with bracts of the same size as or bigger than the flowers, actinomorphic flowers and glabrous androecium (Fig. 1A-B). In contrast, *H. reniformis* is known to possess inflorescences subtended by a single bract, zygomorphic flowers and barbate stamens (Horn 1985). Nevertheless, many important vegetative, inflorescence and ecological features match perfectly to those of *H. reniformis*, such as the creeping and amphibious habit, reniform leaf blades with obtuse apex and all flowers opening at the same time (Horn 1985, 1987a, 1987b; Fig. 1A & E), leaving no doubt that it should be considered a synonym of the later.

The incongruence between *B. aquatica* and *H. reniformis* suggests that significant characters were wrongly portrayed for the plant in question. Thus, its lectotype is demonstrably ambiguous and cannot be critically identified for purposes of the precise application of the name. Thus, I apply Article 9.8 of the *Code* (McNeil *et al.*, 2012), and the selection of an epitype for *B. aquatica* serves to fix the application of this name in accordance with its current usage.

## 2. *Eichhornia azurea* (Sw.) Kunth, Enum. Pl. 4: 129. 1843.

*Pontederia aquatica* Vellozo, Fl. Flumin.: 144. 1829.  $\equiv$  *Eichhornia aquatica* (Vell.) Schltldl., Abh. Naturf. Ges. Halle 6: 177. 1862. **Lectotype (designated here):** [illustration] Original plate on parchment of “*Flora fluminensis*” in the Manuscript Section of the Biblioteca Nacional of Rio de Janeiro [mss1198652\_168] and later published by Vellozo (1831. Fl. Flumin. Icon. 3: t. 164). — For an image of the lectotype, see Fig. 1C-D.

**Nomenclatural notes:** In the same way as above mentioned, Horn (1987a, 1987b) was the first to consider *Pontederia aquatica* a synonym of *E. azurea*. Nevertheless, he also failed to lectotypify Vellozo's name in both publications. Thus, a lectotype is here designated.

**Taxonomical notes:** *Eichhornia azurea* (Fig. 1F) is morphologically similar to *E. heterosperma* Alexander (Fig. 1G), being differentiated from the latter by its monomorphic seeds, puberulous stamens, fimbriate corolla margins and median-superior lobe of the corolla with a yellow spot [vs. dimorphic seeds, glabrous stamens, entire corolla margins and median-superior lobe of the corolla without a yellow spot] (Alexander 1939; Pellegrini pers. obs.). Besides that, only *E. azurea*, *E. crassipes* (Mart.) Solms and *E. diversifolia* (Vahl) Urb. are known to occur in the state of Rio de Janeiro (Amaral *et al.* 2015).

Vellozo's plate depicts perfectly the growth form, leaf and flower morphology characteristic to *E. azurea*, with only the stamens being mistakenly illustrated as glabrous (Fig. 1C-D). This is probably due to the fact that Vellozo's plates, especially the details, were mainly drawn based on dried specimens (H.C. Lima, *pers. comm.*). The description (Vellozo 1829) is impressively detailed when compared with the descriptions presented by botanists contemporary to him (such as Linnaeus), since he describes morphological, ecological and phenological aspects of this species. Thus, that being said, *P. aquatica* should be treated as a synonym of *E. azurea*, with no need to designate an epitype.

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Acosta and Herison Medeiros for the pictures of *Eichhornia azurea* and *E. heterosperma*, respectively. The author would also like to thank Rafael Felipe de Almeida for suggestions on the manuscript and help with the edition of the plates, and three anonymous reviewers for valuable additions on the manuscript.

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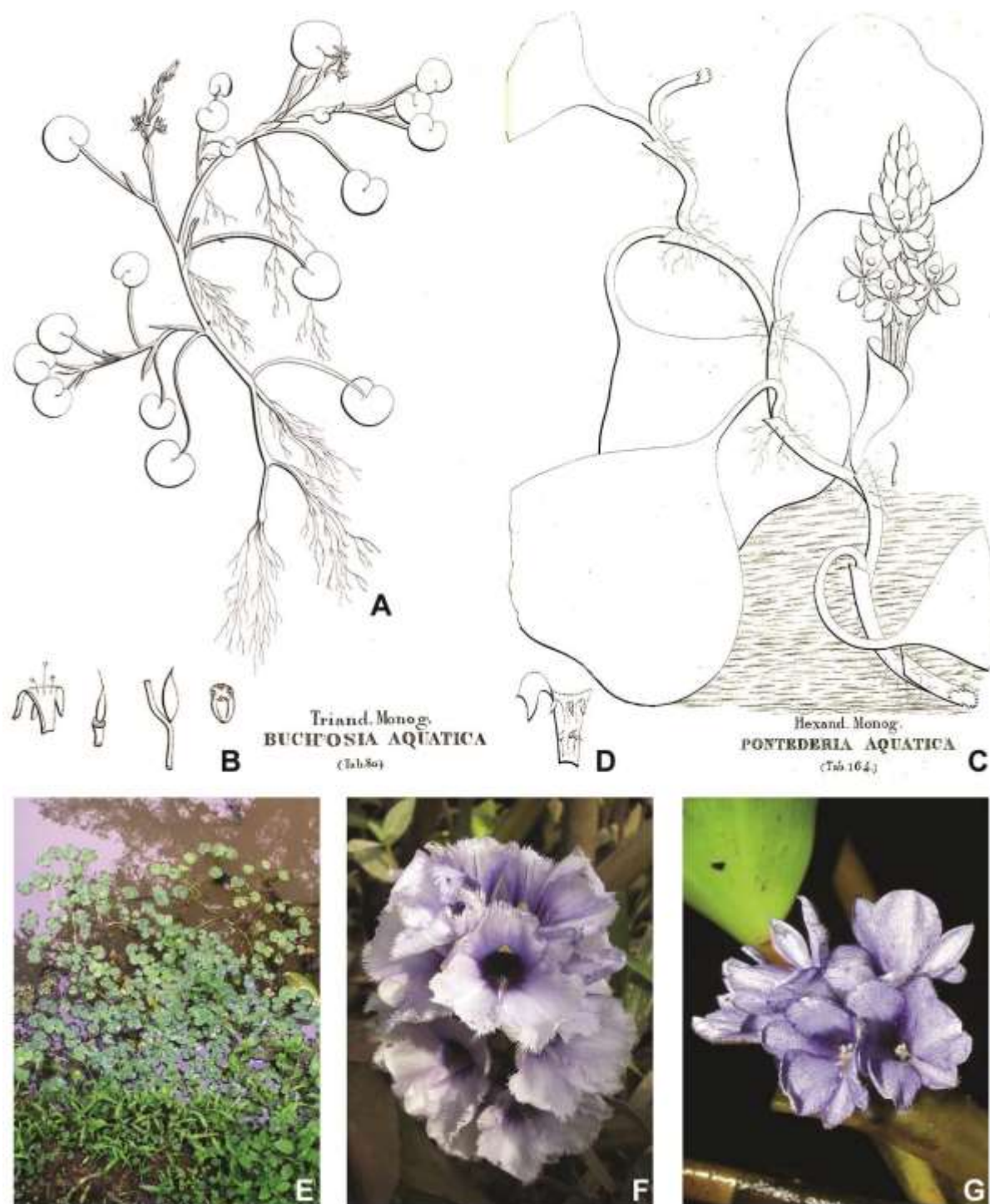
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**Figure 1**– Original plate of Vellozo’s Pontederiaceae names and field photos of the species. **A-B**, photo of *Buchosia aquatica* plate from the Biodiversity Heritage Library: **A**, line drawings of habit, inflorescence and floral characters; **B**, detail of floral and fruit characters, showing an open flower, the gynoecium and a 4-locular capsule. **C-D**, photo of *Pontederia aquatica* plate from the Biodiversity Heritage Library: **C**, line drawings of habit, inflorescence and floral characters; **D**, detail of floral characters, showing an open flower. **E-G**, Field photos of Pontederiaceae: **E**, *Heteranthera reniformis*; **F**, *Eichhornia azurea*; **G**, *Eichhornia heterosperma* (A.B.S. de Oliveira 9, Coleção LABEV 6420- Laboratório de Botânica e Ecologia Vegetal da Universidade Federal do Acre). **E** by M.O.O. Pellegrini, **F** by A. Cardoso and **G** by M. Acosta.



Figure 2— Photo of the epitype of *Buchosia aquatica* (Dionisio s.n., RB 57561).

FLÓRULA DO PARQUE NACIONAL DA RESTINGA DE JURUBATIBA, RIO DE  
JANEIRO, BRASIL: COMMELINACEAE<sup>1</sup>.

(Com 1 figura)

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Commelinaceae do PARNA Jurubatiba

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RESUMO: O presente estudo é uma contribuição ao projeto “Flora do Parque Nacional da Restinga de Jurubatiba, Rio de Janeiro, Brasil”. A família Commelinaceae encontra-se representada na área por três gêneros e seis espécies: *Commelina benghalensis* L., *C. erecta* L., *Dichorisandra hexandra* (Aubl.) Kuntze ex Hand.–Mazz., *D. procera* Mart. ex Schultes f., *D. thyrsiflora* Mikan e *Floscopa glabrata* (Kunth) Hassk. São aqui apresentadas descrições, ilustrações, comentários sobre a fenologia e os habitats, e uma chave de identificação para as espécies.

Palavras-chave: Commelinaceae. Floresta Atlântica. Taxonomia. Rio de Janeiro.

ABSTRACT: The present work is a contribution to the project “The Flora of the Restinga de Jurubatiba National Park, Rio de Janeiro, Brazil”. The Commelinaceae is represented by three genera and six species in the park area: *Commelina benghalensis* L., *C. erecta* L., *Dichorisandra hexandra* (Aubl.) Kuntze ex Hand.–Mazz., *D. procera* Mart. ex Schultes f., *D. thyrsiflora* Mikan e *Floscopa glabrata* (Kunth) Hassk. Descriptions, illustrations, comments on the habitat, phenology of the species and an identification key are here presented.

Key words: Commelinaceae. Atlantic Rainforest. Taxonomy. Rio de Janeiro.

## COMMELINACEAE Mirb.

**Ervas** anuais ou perenes, frequentemente suculentas, glabras a esparsamente pilosas, rizomatosas ou estoloníferas; raízes fibrosas, finas ou espessadas; caule simples ou ramificado. **Folhas** simples, alternas dísticas ou espiraladas; bainha fechada, glabra, pilosa a densamente pilosa; margem inteira, ciliada ou glabra. **Inflorescências** compostas por um ou vários cincinos, livres ou fusionados, subtendidos por brácteas foliosas ou espatáceas, terminal, axilar e/ou basal. **Flores** actinomorfas ou zigomorfas, unissexuadas ou bissexuadas, ocasionalmente cleistógamas; sépalas 3, geralmente subiguais, livres ou conatas; pétalas 3, geralmente deliquescentes, iguais a desiguais, livres a parcialmente conatas; estames (1–3–5–)6, às vezes 1–3 modificados em estaminódios, filetes livres a contatos, às vezes epipétalos, glabros ou pilosos, anteras com deiscência rimosa ou mais raramente poricida; ovário súpero, 2–3-locular, estilete simples. **Frutos** cápsula loculicida ou mais raramente baga, 2–3-valvar, raramente indeiscente. **Sementes** ariladas ou não, testa com superfície lisa, rugosa, reticulada a reticulada-foveolada, areolada a areolada-foveolada, embrioteca dorsal, lateral ou semi-lateral.

Família predominantemente pantropical, com aproximadamente 41 gêneros e 650 espécies (FADEN & HUNT, 1991; APG III, 2009), representada no Brasil por 14 gêneros e aproximadamente 79 espécies (AONA & PELLEGRINI, 2013). São plantas que ocorrem nos mais diversos ecossistemas, podendo ser encontradas desde locais com forte influência antrópica, restingas, cerrados, mangues, florestas tropicais e subtropicais, até regiões temperadas (AONA & PELLEGRINI, 2013; BARRETO, 1997; FADEN, 1998). Commelinaceae carece bastante de trabalhos florísticos e taxonômicos recentes, especialmente no Brasil (PELLEGRINI *et al.*, 2013). No PNRJ está representada por três gêneros e seis espécies.

### CHAVE PARA IDENTIFICAÇÃO DOS TÁXONS

1. Inflorescências reduzidas a 1-2 cincinos, subtendidas por uma espata; estames 6, sendo 3 superiores modificados em estaminódios e 3 inferiores férteis.

2. Bainha com margem ereta, folhas ovadas a largo-ovadas; inflorescências com os 2 cincinos férteis; pétala inferior pigmentada, cuculada; semente com testa estriada-reticulada... 1. *Commelina benghalensis*

2'. Bainha com margem auriculada, folhas ovado-lanceoladas a lanceoladas; inflorescências com o cincino superior abortado, inferior fértil; pétala inferior hialina, involuta; semente com testa lisa... 2. *Commelina erecta*

1'. Inflorescências em tirso propriamente ditos, subtendidas por uma bráctea foliácea; estames 6, todos férteis.

3. Sépalas com tricomas glandulares; anteras com deiscência rimosa; ovário e cápsulas estipitados, 2-loculares; sementes não-ariladas, embrioteca lateral... 6. *Floscopa glabrata*

3'. Sépalas glabras ou com tricomas não-glandulares; anteras com deiscência poricida; ovário e cápsulas sésseis, 3-loculares; sementes ariladas, embrioteca dorsal.

4. Plantas escandentes; caule ramificado; estames voltados para o lado superior da flor, anteras creme com o ápice ou os sacos polínicos lilases a azulados; arilo alaranjado... 3. *Dichorisandra hexandra*

4'. Plantas eretas; caule não-ramificado; 4 estames voltados para o centro da flor, os 2 laterais inferiores voltados para o lado externo, anteras amarelas; arilo alvo a acinzentado.

5. Anteras deiscentes por dois poros apicais; frutos completamente creme a esverdeados... 4. *Dichorisandra procera*

5'. Anteras deiscentes por um único poro apical; creme a esverdeados, com o ápice atrovináceo... 5. *Dichorisandra thyrsiflora*

#### *Commelina* L.

O gênero *Commelina* apresenta ca. 170 espécies e é o maior gênero da família, apresentando distribuição predominantemente pantropical. (FADEN, 1998). No Brasil



ocorrem oito espécies que crescem nos mais diversos ambientes, sendo encontradas em todas as regiões e biomas brasileiros (AONA & PELLEGRINI, 2013). No PNRJ está representado por duas espécies.

1. *Commelina benghalensis* L. (Fig. 1, A–B)

Species Plantarum 1: 41. 1753.

**Ervas** ca. 30cm, terrestres; caule prostrado, ramificado. **Folhas** alternas dísticas, subpecioladas; bainha 1,1–1,6cm compr., margem ciliada, tricomas hialinos a castanhos; lâminas ovadas a largo-ovadas, 2,3–7,4×0,9–3,4cm, esparsamente setosas a glabras, tricomas alvos, margem às vezes repanda, base arredondada, ápice agudo. **Inflorescências** aparentemente terminais, subtendidas por uma espata, inflorescências cleistógamas subterrâneas às vezes presentes, 1–3 por ramo; séssil a subséssil, pedúnculo 1–2mm compr. Composta por 2 cincinos, o superior 1–3-floro, exserto, o inferior 3–5-floro, incluso, curto-piloso; espata transversalmente rombóide, 1,8–2×1–1,2cm, hirsuta, tricomas hialinos, margem posterior conata, ápice obtuso. **Flores** zigomorfas, bissexuais ou masculinas; sépalas 3, alvo-azuladas, hialinas; sépala dorsal ovada-lanceolada, 2–3×1,5–2,5mm, ápice agudo, sépalas ventrais livres, ovadas, 3–3,5×1,5–2mm, ápice obtuso; pétalas 3, sendo 2 superiores, azuis, unguiculadas, limbo reniforme a sub-cordado, 6–7×5–6mm, ápices arredondados; 1 inferior, alvo-azulada, séssil, ovado-lanceolada, cuculada, ca. 3×3mm, ápice agudo; estaminódios 3, filetes alvo-azulados, 2–3mm compr., anteródios amarelos, cruciformes, ca. 1×0,5mm; estames 3, desiguais estames laterais, filetes azulados, 5–6mm compr., anteras alvo-azuladas, ovadas, ca. 1×0,8mm; estame central, filete azulado, ca. 5mm compr., antera amarela, sagitifórm, falcada, ca. 1,5×0,5mm; ovário alvo, globoso, glabro, liso, ca. 1×1mm, estilete 5,5–6mm compr., estigma capitado. **Cápsulas** deiscentes, pardacentas, elipsoides, glabras, 4–5×3–4mm. **Sementes** castanhas, elípticas a ovadas, ca. 2×1,5mm, testa estriada-reticulada, embrioteca lateral.

Material examinado: Mun. Macaé: Córrego de Ouro, Fazenda Vitória, Morro do Oratório, *J.P.P.Carauta 1364* (RB, U); Lagoa de Cabiúnas (Jurubatiba), *M.F.Arnaud 1* (RFA).

*Commelina benghalensis* pode ser encontrada em todos os estados brasileiros (AONA & PELLEGRINI, 2013), sendo especialmente comum em ambientes mais secos e/ou antropizados. É dificilmente encontrada em locais sombreados, tendo preferência por ambientes luminosos e expostos. Apesar de terem sido encontradas apenas duas coletas para essa espécie, em uma das etiquetas, a espécie é referida como “comum no local”. Essa falta de registros, provavelmente, se deve a similaridade entre as espécies do gênero e por serem comumente tratadas como ruderais. Isso acaba por tornar as coletas desse gênero, proporcionalmente, escassas em relação a sua comum ocorrência.

Foi encontrada próxima a Lagoa de Jurubatiba e na Fazenda Vitória, sendo provavelmente encontrada por toda a extensão do parque, nas regiões de restinga arbustiva aberta, especialmente no primeiro cordão arenoso. No PNRJ foi encontrada com flor nos meses de maio e abril.

## 2. *Commelina erecta* L. (Fig. 1, C–D)

Species Plantarum 1: 41. 1753.

**Ervas** ca. 80cm, terrestres; caule ereto ou apoiante, ramificado. **Folhas** alternas dísticas, sésseis; bainha 0,8–1,1cm compr., margem auriculada, ciliada, tricomas alvos; lâminas lanceoladas a ovado-lanceoladas, 2–9×0,5–2,5cm, glabras a setosas a vilosas, tricomas alvos, base arredondada a cuneada, ápice agudo a acuminado. **Inflorescências** aparentemente terminais, subtendidas por uma espata, 1–3–(4) por ramo; séssil a subséssil, pedúnculo 2–4mm compr. Composta por 2 cincinos, o superior abortado e inconspícuo ou ausente; o inferior 3–5-floro, exserto, curto-piloso; espata depresso-ovovada a sub-cordada, 2,2–2,4×1,3–1,7cm, hirsuta a setosa a glabra, tricomas hialinos, margem posterior conata, ápice agudo. **Flores** fortemente zigomorfas, bissexuais ou masculinas; sépalas 3, alvo-esverdeadas, hialinas; sépala dorsal ovada-lanceolada, ca. 3–4×2–3,5mm, ápice agudo; sépalas ventrais conatas, ovadas, 5–7×5–6mm, ápice obtuso; pétalas 3, 2 superiores, azuis, unguiculadas, limbo reniforme depresso-ovovado, 1–2×1–2,5cm, ápices arredondados; 1 inferior, alva, hialina, séssil, lanceolada, fortemente involuta, 3–4×1–1,5mm, ápice agudo; estaminódios 3, filetes alvos, 5–7mm compr., anteródios amarelos, cruciformes, 1,5–2×2–2,5mm; estames 3, desiguais;

estames laterais 2, filetes alvo-azulados, 7–8mm compr., anteras alvas, ovadas, 1,5–2×0,5–1mm; estame central 1, filete alvo, 6–7mm compr., antera amarela, sagitiforme, falcada, 2,5–3×1–2,5mm; ovário alvo, globoso, glabro, liso, 1–1,5×0,7–1mm, estilete 7–8mm compr., estigma trilobado. **Cápsulas** deiscentes, pardacentas, oblongas, glabras, 5–6×3–4mm. **Sementes** pardas, elípticas, 2–3×1–2mm, testa lisa, embrioteca lateral.

Material examinado: Mun. Carapebus: restinga aberta, formação de *Allagoptera arenaria* (guriri), *T.Konno et al. 1174* (R); *loc. cit.*, Projeto Carapebus, mata, *R.Moura et al. 53* (R). Mun. Macaé: Praia de Cabiúnas, caminho para a Lagoa de Jurubatiba, *J.Fontella et al. 4029* (R); *loc.cit.*, Parque Nacional da Restinga de Jurubatiba, *J.P.P.Carauta et al. 412* (R); Parque Nacional da Restinga de Jurubatiba, entre as Lagoas Comprida e Carapebus, *A.J. Castelo 173* (RB). Mun. Quissamã: restinga aberta, *M.C.Oliveira et al. 761* (R).

*Commelina erecta* apresenta ampla distribuição geográfica e também no Brasil, ocorrendo em todos os estados brasileiros e em uma grande variedade de ecossistemas, como ambientes palustres, restingas, Cerrado, Caatinga, Floresta Atlântica, Floresta Amazônica e áreas antropizadas (AONA & PELLEGRINI, 2013). Na medicina popular é empregada no tratamento de diabetes, reumatismo, pressão alta e enfermidades nos olhos, sendo conhecida vulgarmente como “trapoeraba” ou “erva-de-santa-luzia”. É facilmente encontrada por toda a extensão do parque, nas regiões de restinga arbustiva aberta, especialmente no primeiro cordão arenoso. Exemplares em floração e frutificação podem ser observados ao longo de todo o ano, mas com o pico da floração e frutificação ocorrendo durante os meses chuvosos.

#### *Dichorisandra* J.C.Mikan

*Dichorisandra* é um gênero neotropical que ocorre da América Central até a Argentina e possui ca. 54 espécies, muitas ainda novas para a ciência (AONA, 2008). No Brasil espécies de *Dichorisandra* podem ser encontradas em todos os estados brasileiros, apresentando maior concentração de espécies nos estados do Rio de Janeiro, Minas Gerais, Espírito Santo e Bahia. As espécies do gênero ocorrem preferencialmente em

floresta atlântica, mata de altitude, mata semi-decídua, floresta amazônica de terra firme e restinga litorânea (AONA & AMARAL, 2009).

3. *Dichorisandra hexandra* (Aubl.) Kuntze ex Hand.-Mazz. (Fig. 1, E–G)

Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 79: 203. 1908.

*Commelina hexandra* Aubl.

**Ervas** trepadeiras, terrestres; caule apoiante, raro ereto, ramificado. **Folhas** alternas dísticas, sésseis a sub-pecioladas; bainha 1–1,7cm compr., margem ciliada, tricomas alvos a castanhos; lâminas lanceoladas a ovado-lanceoladas, 6,9–7,8×1,5–2,3cm, face abaxial com tricomas esparsos, caducos, mais abundantes na base, face adaxial glabra a com raros tricomas, principalmente na base, ou glabra com nervura central pilosa, tricomas alvos a castanhos, base arredondada a cuneada, ápice acuminado. **Inflorescências** em tirso, terminais. **Flores** zigomorfas devido à posição dos estames, bissexuais ou masculinas; sépalas 3, alvo-esverdeadas, elípticas a ovais, 7–7,6×3–3,5cm, livres, pilosas, ápice agudo; pétalas 3, roxas a roxo-azuladas, terço basal alvo, obovais-elípticas a largo-obovadas, 7–8,2×3–3,5mm; estames 6, subiguais, voltados para o lado superior da flor, filetes alvos, ca. 2mm compr., anteras creme, sacos polínicos ou ápices lilases a azulados, alongadas, 2–3×0,5–1mm, deiscentes por 2 poros apicais; ovário alvo-esverdeado, globoso, glabro, liso a levemente rugoso, ca. 2×2mm, estilete 3–3,5mm compr., estigma truncado. **Cápsulas** deiscentes, cremes a esverdeadas, ápice atro-vináceo, globosas, glabras, lisas a levemente rugosas, 5–6×5mm. **Sementes** cinzas a pretas, elípticas a ovais, ca. 4×3mm, testa rugosa, arilo alaranjado, embrioteca dorsal.

Material examinado: Mun. Macaé: Jurubatiba, margem da lagoa de Cabiúnas, *J.P.P. Carauta et al.* 7412 (R).

Material adicional: Mun. Cabo Frio: Morro do Mico, próximo ao Bairro Jacaré, *C.Farney* 4556 (RB). Sem município definido: Estrada para Angra dos Reis, *D.Sucre* 10676 (RB).

*Dichorisandra hexandra* é a espécie com mais a ampla distribuição dentro do gênero. Ela ocorre na Argentina, Bolívia, Colômbia, Costa Rica, El Salvador, Guiana Francesa, Guatemala, Panamá, Paraguai, Peru, Suriname, Venezuela e no Brasil está presente em todas as regiões (BARRETO 1997, AONA & PELLEGRINI 2013). Ocorre, preferencialmente, em Floresta Ombrófila Densa Atlântica, em Floresta Estacional Semidecidual e na Floresta Ombrófila Densa Amazônica (AONA, 2008), sendo pouco frequente em matas de restinga. Pode ser encontrada em flor e fruto durante todo o ano.

4. *Dichorisandra procera* Mart. ex Schultes f. (Fig. 1, H–J)

in Schultes & Schultes f., Syst. veg. 7 (2): 1187. 1830.

**Ervas** até ca. 1,5m alt., terrestres; caule ereto, não ramificado ou ramificado na metade superior. **Folhas** alternas espiraladas, sésseis a sub-pecioladas; bainha 1,0–2,6cm compr., margem glabra a ciliada, tricomas castanhos; lâminas elípticas a lanceoladas, 10,6–25,1×2,3–6cm, glabras, raro com esparsos tricomas na base, base cuneada, margem glabra, ápice acuminado. **Inflorescências** em tirsos, terminais. **Flores** zigomorfas devido à posição dos estames, bissexuais ou masculinas; sépalas 3, arroxeadas, elípticas a obovais, cuculadas, 8×5mm, livres, glabras; pétalas 3, roxas a roxo-azuladas, terço basal alvo, obovadas a romboides, 8–10×5–7mm; estames 6, desiguais, 4 estames voltados para o centro da flor, os 2 laterais inferiores voltados para o lado externo, filetes alvos, 1–2mm compr., anteras amarelas, alongadas, 3–4×2mm, deiscentes por 2 poros apicais; ovário alvo a esverdeado, globoso, glabro, liso, ca. 2×2mm, estilete ca. 4mm compr., estigma truncado. **Cápsulas** deiscentes, creme a esverdeadas, globosas, glabras, lisas, ca. 1,5×1,5mm. **Sementes** cinzas a pretas, largo-elípticas a ovadas, 3–4×3mm, testa rugosa, arilo branco a acinzentado, embrioteca dorsal.

Material examinado: Mun. Macaé: Carapebus, Fazenda São Lázaro, restinga, vegetação fechada, próxima de pastagem, lado esquerdo da estrada, *L.C.Giordano et al. 1608* (RB); Restinga de Cabiúnas, mata de restinga, *D.Araújo & N.C.Maciel 4341* (GUA). Mun. Quissamã: Estrada para Barra do Furado, ca. 3km de Quissamã, *D.Zappi 393 et al.* (UEC).

Material adicional: RIO DE JANEIRO. Mun. Parati: Ponta do Algodão (Ponta Lava), Ilha dos Cocos, mata secundária, APA Cairuçu, *L.C. Giordano et al. 1099* (RB, UFP).

Espécie endêmica do Brasil, com distribuição restrita aos estados de Alagoas, Bahia, Espírito Santo, Rio de Janeiro, Minas Gerais e Pernambuco (AONA & PELLEGRINI, 2013). É característica das formações de restinga arbórea e Floresta Ombrófila Densa de Terras Baixas (AONA, 2008). Apesar disso, a espécie é pouco comum no estado do Rio de Janeiro.

*Dichorisandra procera* foi muitas vezes confundida com *D. thyrsoiflora* devido ao seu porte, disposição dos estames e pela ausência de pilosidade nas folhas. Apesar disso, difere da mesma por apresentar anteras deiscentes por dois poros apicais, enquanto que *D. thyrsoiflora* apresenta anteras deiscentes por um único poro apical (AONA, 2008). Além disso, *D. procera* apresenta frutos completamente creme a esverdeados, enquanto *D. thyrsoiflora* apresenta frutos creme a esverdeados com o ápice atro-vináceo.

##### 5. *Dichorisandra thyrsoiflora* J.C.Mikan (Fig. 1, K–L)

Delectus Florae et Faunae Brasiliensis, t. 3. 1820.

**Ervas** até ca. 2m alt., terrestres; caule ereto, não ramificado ou ramificado na metade superior. **Folhas** alternas espiraladas, sésseis a sub-pecioladas; bainha 1,2–3,6cm compr., margem ciliada, tricomas alvos a castanho-claros; lâminas lanceoladas a ovado-lanceoladas, 9–23,8×1,5–8,8cm, glabras, base cuneada, ápice agudo. **Inflorescências** em tirso, terminais. **Flores** zigomorfas devido à posição dos estames, bissexuais ou masculinas; sépalas 3, arroxeadas, ovada-elípticas a elípticas, cuculadas, 7–9×3,5–5mm, livres, glabras a curto-pilosas no terço basal; pétalas 3, roxas a roxo-azuladas, terço basal alvo, obovadas a romboides, 0,9–1,5×0,8–1,5cm; estames 6, desiguais, 4 estames voltados para o centro da flor, os 2 laterais inferiores voltados para o lado externo, filetes alvos, 2–5mm compr., anteras amarelas, alongadas, 4–6×1–2mm, deiscentes por 1 poro apical; ovário alvo a alvo-esverdeado, globoso, glabro, liso, 2–2,5×1–2mm, estilete 2–4mm compr., estigma truncado. **Cápsulas** deiscentes, creme, ápice atro-purpúreo, globosas, glabras, lisas, 1,4–1,6×1,2–1,5cm. **Sementes** cinzas a pretas,

elípticas a reniformes, 4–5×3–4mm, testa rugosa, arilo branco a acinzentado, embrioteca dorsal.

Material examinado: Mun. Carapebus: mata em depressão próxima à estrada para a praia, *A.Costa et al.* 848 (R); orla da mata inundada, *J.Fontella et al.* 4016 (R); Fazenda São Lázaro, *J.Fontella et al.* 4134 (R); Praia de Carapebus, entre Lagoa Paulista e Lagoa de Carapebus, *C.P.R.Batista et al.* 32 (R); mata de restinga, *A.S.Oliveira et al.* 3807 (R); mata, *R.Moura et al.* 52 (R); Restinga de Carapebus, 2km da sede da Fazenda São Lázaro em direção a praia, *P.C.A.Fevereiro & M.G.Santos* 27 (RB, UFF); Restinga de Carapebus, Fazenda São Lázaro, *M.G.Santos et al.* 227 (RB, UFF); Restinga de Carapebus, Fazenda São Lázaro, *J.M.A.Braga et al.* 1172 (RB); Fazenda São Lázaro, *L.C.Giordano* 1608 (RB); Fazenda São Lázaro, *M.G.Bovini* 965 (RB). Mun. Macaé: Pico do Frade de Macaé, *G.Martinelli* 9112 *et al.* (RB); Restinga de Carapebus, *D.Araújo* 3740 *et al.* (GUA); Restinga de Carapebus, *D.Araújo & N.C.Maciel* 3790 (GUA); Próximo a Lagoa de Carapebus, na orla arbórea em lugar úmido, *D.Araújo & N.Crud* 3586 (GUA); Airis, Fazenda Cachoeira, *J.P.P.Carauta* 1257 (GUA); Forte Marechal Hermes, restinga em morrete a beira mar, *R.Melo-Silva & J.R.Pirani* 857 (RB, SPF, NY). Mun. Quissamã: ao longo da estrada RJ-106, sentido Barra do Furado, *J.P. Fontella et al.* 3540 (R); restinga aberta, *I.M.Silva et al.* 765 (R); Machado, mata à beira da estrada, local brejoso, *I.M.Silva et al.* 921 (R); nascente da Lagoa Preta, restinga aberta, *I.M.Silva et al.* 772 (R); orla da mata, *M.C.Oliveira et al.* 819 (R); Imbiu, mata de restinga, *M.C.Oliveira et al.* 1178 (R); dentro da mata, em local úmido, *I.M.Silva et al.* 942 (R); cerca de 500m da praia do Visgueiro, *I.M.Silva et al.* 968 (R).

*Dichorisandra thyrsiflora* é uma espécie endêmica do Brasil, ocorrendo exclusivamente nos estados do Rio de Janeiro, Minas Gerais e Bahia (AONA & PELLEGRINI, 2013). Apesar disso, devido a sua grande beleza, é encontrada em diversos estados brasileiros e países ao redor do mundo como planta ornamental (AONA, 2008). Na medicina popular é empregada no tratamento de problemas renais e urinários. É conhecida vulgarmente como “cana-de-macaco”, “gengibre-azul” e “cana-do-brejo”. É uma espécie bastante comum e característica de restingas e outras vegetações de influência marítima, mas também pode ser encontrada em regiões serranas, tendo de maneira geral preferência

por ambientes mais sombreados e úmidos (AONA, 2008). Pode ser encontra em floração em frutificação ao longo de todo o ano.

*Floscopa* Lour.

Gênero pantropical, com ca. 20 espécies (FADEN, 1998). No Brasil é representado por quatro espécies, três exclusivas do domínio Amazônia e *F. glabrata*, que ocorre em todas as regiões brasileiras (AONA & PELLEGRINI, 2013). As espécies desse gênero são encontradas em vegetação aberta ou fechada, mas sempre associado a corpos d'água ou em locais bastante úmidos.

6. *Floscopa glabrata* (Kunth) Hassk. (Fig. 1, M–N)

Commelinaceae Indicae 166. 1870.

*Dithyocarpus glabratus* Kunth

**Ervas** perenes, até 1m alt., palustres a aquáticas emergentes. **Caule** ereto, pouco a não ramificado, glabros a densamente pilosos, tricomas curtos, alvos. **Folhas** alternodísticas, sésseis; bainhas 0,5–2,4cm compr., glabras a densamente hirsutas, margem ciliada, tricomas longos, alvos; lâminas linear-lanceoladas a ovado-lanceoladas, 2,5–15×0,5–2,5cm, verdes, ápice agudo a acuminado, margem ciliada, glabra a hirsutas, tricomas alvos, base cuneada a arredondada. **Inflorescências** em tirso, terminais e axilares, pedunculadas, congestas nos ápices dos ramos, cincinos 8–20-flores. **Flores** fortemente zigomorfas, bissexuais; sépalas levemente côncavas, elípticas a ovadas, 2–3×1–1,5mm, sub-iguais, róseas a lilases, externamente com tricomas glandulares; pétalas elíptico-obovadas a largo-elípticas, a inferior mais estreita e levemente involuta ou cuculada, ca. 2×1mm, alvas a róseas a lilases, margem inteira, ápice agudo; estames superiores 3, menores, filetes ca. 1,5mm compr., róseos a lilases, glabros, livres, anteras ca. 0,4×0,3mm, amarelas, rimosas, sacos polínicos ovados a elípticos, levemente curvos, conectivo expandido, elíptico, estames inferiores 3, maiores, filetes ca. 2mm compr., róseos a lilases, glabros, livres a conatos na base, anteras ca. 0,4×0,3mm, amarelas, rimosas, saco polínico ovados a elípticos, conectivo não-expandido; ovário ovóide, estipitado, ca. 0,4–0,5×0,3–0,4mm, róseo, glabro, liso, estilete 7–8mm compr., curvo, estigma truncado, papiloso. **Cápsulas** obcordadas, levemente achatadas



lateralmente, estipitadas, 1–2×1,5–3mm, pardacentas a acinzentadas, sépalas persistentes. **Sementes** cinzas, globosas, ca. 1,2×1mm, testa costada a tuberculada, embrioteca lateral.

Material examinado: Mun. Macaé: estrada para a Lagoa Comprida, à margem do canal, *D.Araújo & N. Crud 5028* (GUA).

Material adicional: RIO DE JANEIRO. Mun. Santa Maria Madalena: Tamanduá, *E. Pereira 1261* (IPA, RB, UB). Mun. Silva Jardim: Reserva Biológica de Poço das Antas, região próxima a BR-101, área do aceiro *C.M. Vieira 914* (RB).

*Floscopa glabrata* apresenta ampla distribuição no Brasil, desde a Região Norte até a Região Sul. Ocorre geralmente em locais muito úmidos, às margens de córregos e rios, em igapós e até mesmo dentro da água (AONA & PELLEGRINI, 2013). A floração da espécie, bem como a frutificação, ocorre em praticamente todos os meses do ano.

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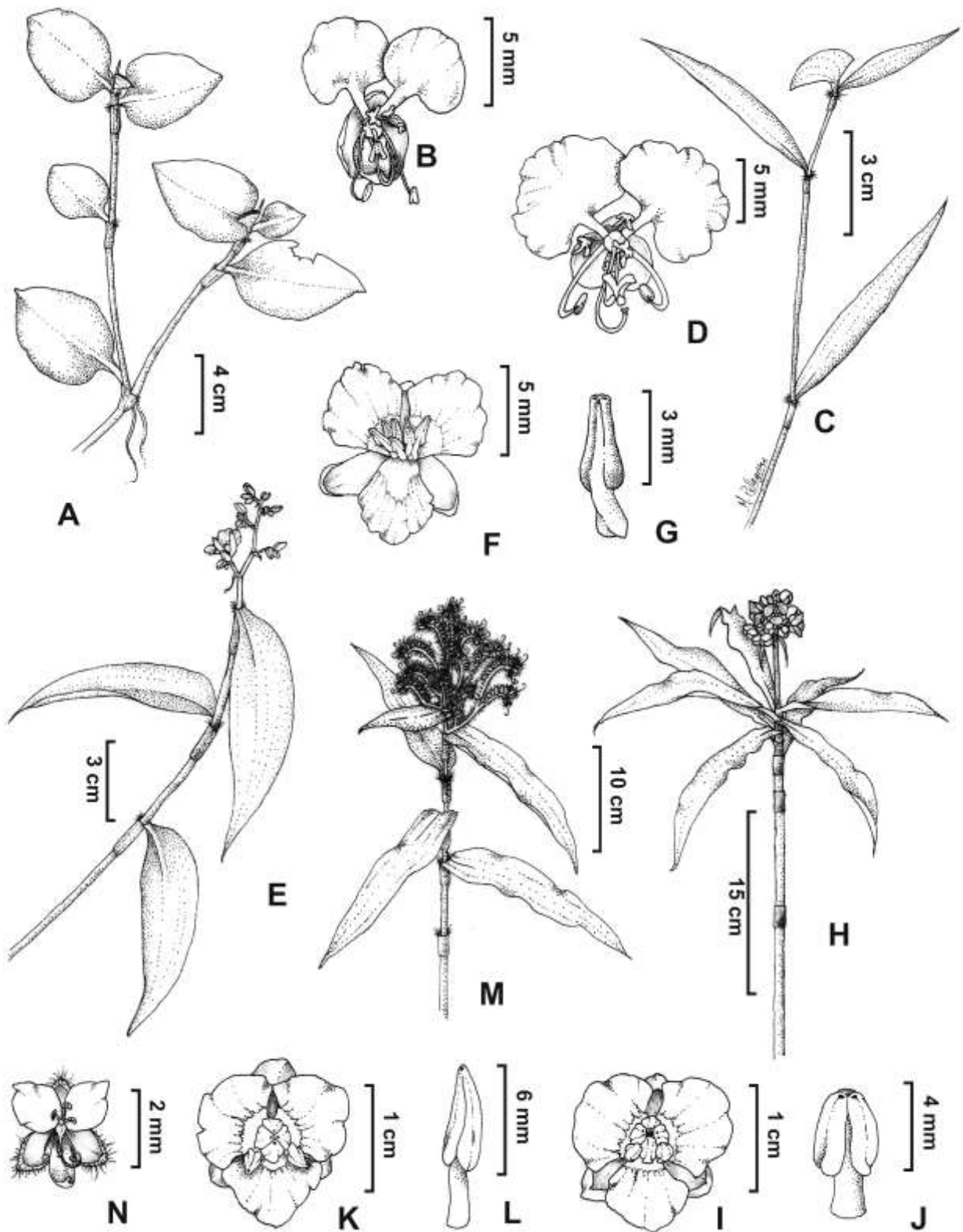


Fig. 1- *Commelina benghalensis*: (A) hábito; (B) flor hermafrodita. *Commelina erecta*: (C) hábito; (D) flor hermafrodita. *Dichorisandra hexandra*: (E) hábito; (F) detalhe da flor masculina, mostrando a posição dos estames; (G) estame, evidenciando dois poros apicais. *Dichorisandra procera*: (H) hábito; (I) detalhe da flor mostrando a posição dos estames; (J) estame, evidenciando dois poros apicais. *Dichorisandra thyrsiflora*: (K) flor masculina; (L) estame, evidenciando apenas um poro apical. *Floscopa glabrata*: (M) hábito; (N) flor. A–B: M.F.Arnaud 1 (RFA); C–D: A.J. Castelo 173 (RB); E–G: J.P.P. Carauta et al. 7412 (R); H–J: L.C.Giordano et al. 1608 (RB); K–L: R.Melo-Silva & J.R.Pirani 857 (RB, SPF, NY); M–N: D.Araújo & N. Crud 5028 (GUA).

