Phytotaxa 42: 19–25 (2012)
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

Trichocline cisplatina (Asteraceae, Mutisieae), a new species from southern Brazil and Uruguay

EDUARDO PASINI [1] & MARA REJANE RITTER [2]

[1] *Programa de Pós-Graduação em Botânica, Universidade Federal do Rio Grande do Sul, Av. Bento Gonçalves, 9500, Porto Alegre, Rio Grande do Sul 91501-970, Brazil. E-mail: eduardo.pasini@yahoo.com.br*
[2] *Departamento de Botânica, Universidade Federal do Rio Grande do Sul, Av. Bento Gonçalves, 9500, Porto Alegre, Rio Grande do Sul 91501-970, Brazil. E-mail: mara.ritter@ufrgs.br*

Abstract

A new species of *Trichocline* from southern Brazil and Uruguay is described as *T. cisplatina*. The new species is similar to the allopatric species *T. catharinensis* in involucre features and phyllary shape. *Trichocline cisplatina* can be distinguished by its procumbent scape, pinatifid leaves with up to ten pairs of rounded and flexuose lobes that occasionally form secondary lobes, ray florets with a yellow-orange corolla, wider involucre and phyllaries, and an ovary with whitish 2-seriate trichomes that are inflated at the apex and densely distributed. The new species occurs in the southeastern region of Rio Grande do Sul State, Brazil and southeastern Uruguay, on grasslands with sandy or rocky soils or dunes, and is endemic to the region. Here we provide a description of *T. cisplatina*, information about its conservation status and ecology, a distribution map, illustrations, and a key for identification of the native species of *Trichocline* from southern Brazil and Uruguay.

Resumo

Uma nova espécie de *Trichocline* do Sul do Brasil e Nordeste do Uruguai é descrita como *T. cisplatina*. A nova espécie é similar à espécie alopátrica *T. catharinensis*, devido a características do invólucro e formato das filárias. *Trichocline cisplatina* pode ser distinguida por apresentar escapo procumbente, folhas pinatissectas, com até dez pares de lobos arredondados e flexuosos, eventualmente formando lobos secundários, flores do raio de coloração amarelo-dourado, invólucro e filárias mais largos, ovário com tricomas esbranquiçados, 2-seriados, apresentando o ápice inflado. A nova espécie ocorre no sudeste do Estado do Rio Grande do Sul, Brasil e sudeste do Uruguai, em campos com solo arenoso e rochoso em morros graníticos ou em formações de dunas e é endêmica dessa região. No presente trabalho são fornecidas a descrição de T. *cisplatina*, informações sobre seu status de conservação, ecologia, mapa de distribuição, ilustrações e chave de identificação das espécies de *Trichocline* nativas do sul do Brasil e Uruguai.

Key words: Compositae, *Gerbera* complex, Pampa, Rio Grande do Sul state, rocky hills, coastal region

Introduction

Trichocline Cass. (1817: 13) (Asteraceae, Mutisieae), is placed in the "*Gerbera* complex" and comprises about 22 species (Funk *et al*. 2009). The genus occurs predominantly in South America, with only one species restricted to southwestern Australia (Zardini 1975, Katinas *et al.* 2008, Funk *et al.* 2009). The South American species are distributed from Peru to southern Argentina and Chile, south and southeastern Brazil, Paraguay and Uruguay. According to Zardini (1975), the genus has two main centers of diversity: Andean and central Argentina (12 species) and southern Brazil, Uruguay and adjacent regions (nine species). They are perennial, acaulescent herbs, characterized by their monocephalous scapose capitulescences, with colorful ray corollas,

Accepted by P. Pelser: 11 Jan. 2012; published online in PDF: 23 Jan. 2012

which are generally red, yellow, orange, or rarely white. The cypselae are truncate at the apex and are pubescent. They have a pappus of scabrid, capillary bristles (Katinas *et al.* 2008). The species occur in sandy or rocky grasslands, shrublands, or human-modified areas such as roadsides with exposed soil. Most of the species are found at high elevation such as in the Andes and only few of them can be found at sea level, for example, on the coastal plains of southern Brazil and Uruguay. According to Zardini (1975), *Trichocline* is represented in Brazil by seven species. In the Brazilian state of Rio Grande do Sul, the genus is represented by six species, occurring in two of the Biogeographic Provinces proposed by Cabrera & Willink (1973): the Pampean Province (southern part of the state) and the Paranense Province (northern part of the state). Most of these species occur continuously from Southern Brazil to northeastern Argentina and Uruguay in the Pampean Biogeographical Province.

During a taxonomic study of the genus *Trichocline* for the State of Rio Grande do Sul, Brazil, we discovered a new species of the genus, endemic to grasslands on sandy or rocky soils and dunes of the coastal region of southern Brazil and southeastern Uruguay. *Trichocline cisplatina* is most similar to *T. catharinesis* Cabrera (1973: 44), but these species can be distinguished from each other by vegetative and reproductive characteristics. Here, the new species is described and illustrated.

Taxonomic treatment

Trichocline cisplatina E. Pasini & M.R.Ritter, *sp. nov.* (Figs. 1 and 2)

Trichoclini catharinense affinis sed ab ea habitu prostrato, scapo procumbente, foliis adpressis ad solo, fortiter pinatifida, usque ad decem paribus lobis rotundatis in marginibus, denique lobis secundariis formanti; involucris longioribus; floribus marginibus aureis cum corolla bilabiato-ligulata; ovario papillis claviformibus elongatis et albis differt.

Type:—BRAZIL. Rio Grande do Sul: Arroio Grande, próximo à ponte do Passo do Ricardo, em campo limpo, úmido e arenoso, às margens do Rio Piratini, associado à *Eryngium horridum* Malme, hábito prostrado, escapo procumbente, 31º54'48.9''S, 52º39'542. 21''W, 60 m, September 2011, fl., *E. Pasini, A. A. Schneider* e *F. Torchelsen 898* (holotype: ICN!; isotype: ICN!; LP!; MO!; RB!).

Herbs perennial, acaulescent, with scape reaching up to 23 cm when flowering, glabrous to tomentose. *Xylopodium* 2–5 × 2 cm. *Leaves* rosulate, sessile; blade discolorous, glabrous to pubescent above and glabrescent to tomentose below, flexuose, oblanceolate or spatulate, 4.5–24 × 0.5–5.5 cm, base sessile, attenuate, margin pinatisect, 4–10 pairs of rounded and flexuose lobes, 0.5–2.5 × 0.5–2.0 cm, eventually forming secondary lobes, apex obtuse to subacute. *Inflorescence* monocephalic, scapigerous, scape glabrescent to tomentose, procumbent, 6–20 × 0.2–0.4 cm, with leafy bracts; bracts 1-6, linear, glabrescent to tomentose, 1.0–6.5 cm long, eventually coming from the base of the rosette. *Capitula* radiate, heterogamous; involucre hemispheric to campanulate, 1.8–3.0 × 1.8–5.0 cm; phyllaries 3-4-seriate, imbricate, green, the outermost phyllaries spreading, lanceolate to spatulate, 10–20 × 1.7–5.0 mm, adaxial surface glabrescent to tomentose, apex acute, eventually mucronate, the median phyllaries spatulate, 12–22 × 1.7–2.7 mm, adaxial surface tomentose, apex acute, the inner most phyllaries lanceolate, membranaceous, 14–24 × 1.7–2.7 mm, glabrous to glabrescent on both surfaces, apex acuminate, brownish red at apex and margins; receptacle concave, epaleaceous, alveolate, glabrous. *Florets* dimorphic, ray florets pistillate, uniseriate, 15–25, corollas ligulate-bilabiate, abaxial lip liguliform, lanceolate, 14–22.3 × 2.3–4.2 mm, 3-lobed in the apex, adaxial surface tomentose, with 4-celled trichomes, sparsely distributed, adaxial lip bisect, lobes filiform and spiral, 7.5–13.6 mm long; corolla yellow-orange, tube 5.5–9.8 mm long, with 4-celled trichomes sparsely distributed; staminodes 1.7–3.4 mm long, apex acute to acuminate, base caudate, papillose, margin reflex near the apex when acuminate; style 11–19 mm long, bifid, exserted, style lobes dorsally papillose, 0.7–1.2 mm long; disc florets bisexual, 50-80, corollas bilabiate, abaxial lip 3-lobed, reflex to revolute, 2.6-5 × ca. 1 mm, with 4-celled trichomes sparsely distributed, adaxial lip bifid, lobes lanceolate, reflex to revolute, 1.2-4.5 mm

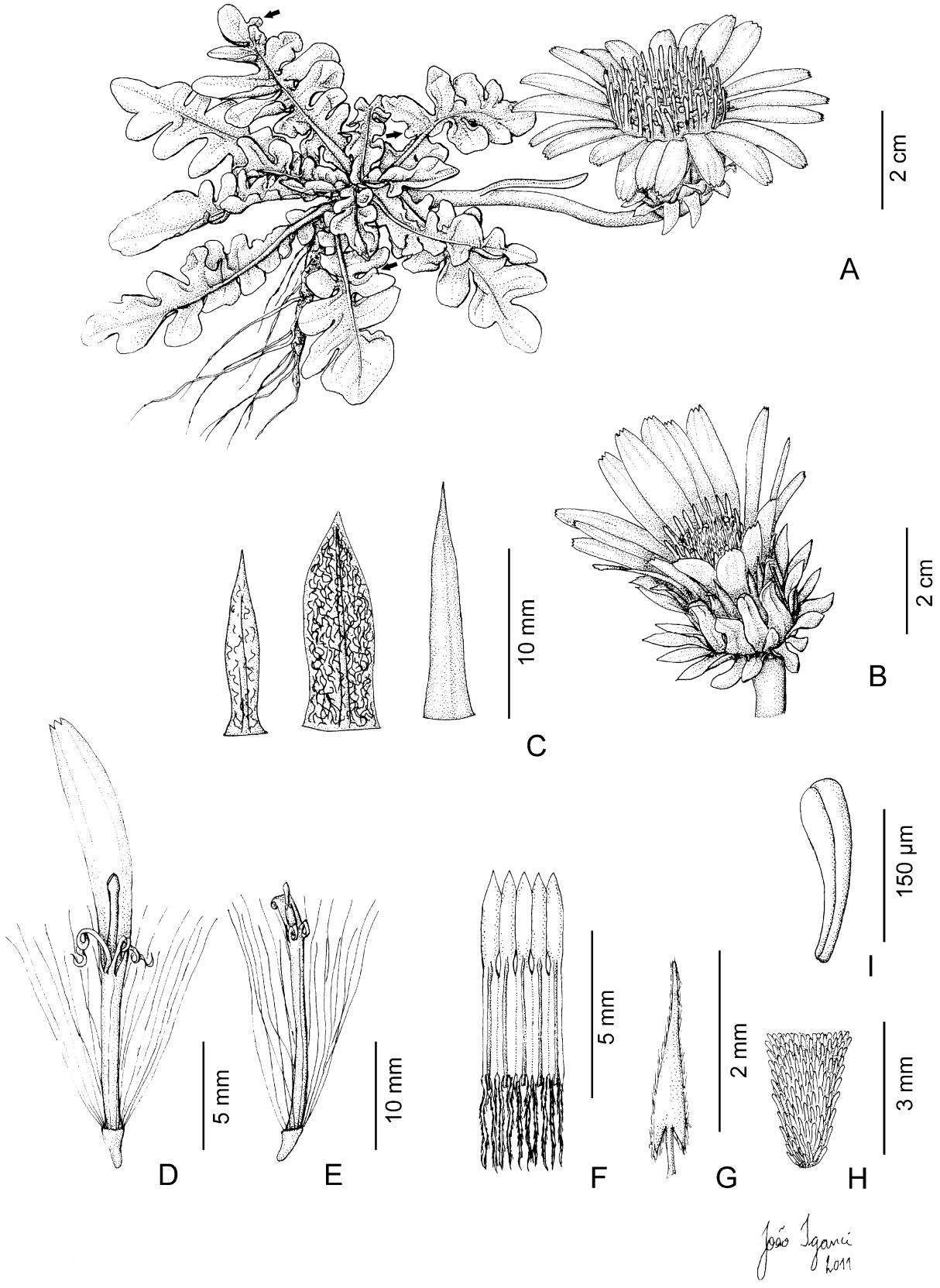


FIGURE 1. *Trichocline cisplatina*. **A.** Habit (*E. Pasini et al. 897*, ICN). Black arrows indicates the position of the secundary lobes of the leaves. **B.** Representative capitulum (*E. Pasini et al. 898*, ICN). **C.** Outermost to innermost phyllaries (*E. Pasini et al. 898*, ICN). **D.** Pistillate ray floret (*Cabrera 32122*, SI). **E.** Bisexual disc floret (*Cabrera 32122*, SI). **F.** Stamen of bisexual disc floret (*Cabrera 32122*, SI). **G.** Staminode of pistillate ray florets (*Cabrera 32122*, SI). **H.** Ovary (*Cabrera 32122*, SI). **I.** Trichome of the ovary (*E. Pasini et al.* 897, ICN). Illustration by João Vieira Iganci.

long, corolla tube 10–18 mm long; stamens 7.6–9.3 mm long, apical appendages lanceolate, apex acute, base slightly constricted, basal appendages caudate, papillose, 2–3.2 mm long, filaments papillose at the base, style 10.8–19.7 mm long, bifid, exserted, style lobes dorsally papillose, 0.7–1.2 mm long. *Ovary* cylindrical, obovate or obconical, truncate at the apex, 2.3–5 × 2–3.2 mm, with whitish 2-seriate trichomes, inflated at the apex, densely distributed, 170–230 μm long; pappus uniseriate, 12–18.3 mm long, whitish, with barbellate bristles.

Distribution and habitat:—*Trichocline cisplatina* was collected in southern Brazil, in the State of Rio Grande do Sul (Fig. 3) in the physiographic regions locally known as Encosta do Sudeste, Litoral and Serra do Sudeste. It is also known from southeastern Uruguay, municipality of La Pedrera, Rocha Province. The region where the species occurs belongs to the Pampean Biogeographical Province, which is restricted to Rio Grande do Sul State in Brazil (Cabrera & Willink 1973). The floristic physiognomies in which this species in found vary from grasslands and shrublands to pioneer vegetation along coastal plains in the southeastern part of the State, at an elevation range between 0 to 400 m a.s.l. According to field observations and notes associated with herbarium specimens, *T. cisplatina* grows on grasslands and shrublands with rocky or sandy soils and dunes.

Phenology:—Flowering and fruiting specimens have been collected from September to May.

Conservation Status:—According to the *IUCN Red list* (IUCN 2001) the species is considered to be vulnerable (VU, subcriteria A3, A1's (c) and (e)–a decline of quality of habitat and the effect of introduced taxa), due to the introduction of *Pinus* spp. and the presence of *Ulex europaeus* L. (1753: 741) in the area of occurrence of the species.

Etymology:—The specific epithet refers to the species occurrence in the former Cisplatina Province, which once belonged to Brazil and today is within Uruguayan territory. In Latin, "cis" means on this side, and "Platina" refers to Río de la Plata or Riverplate.

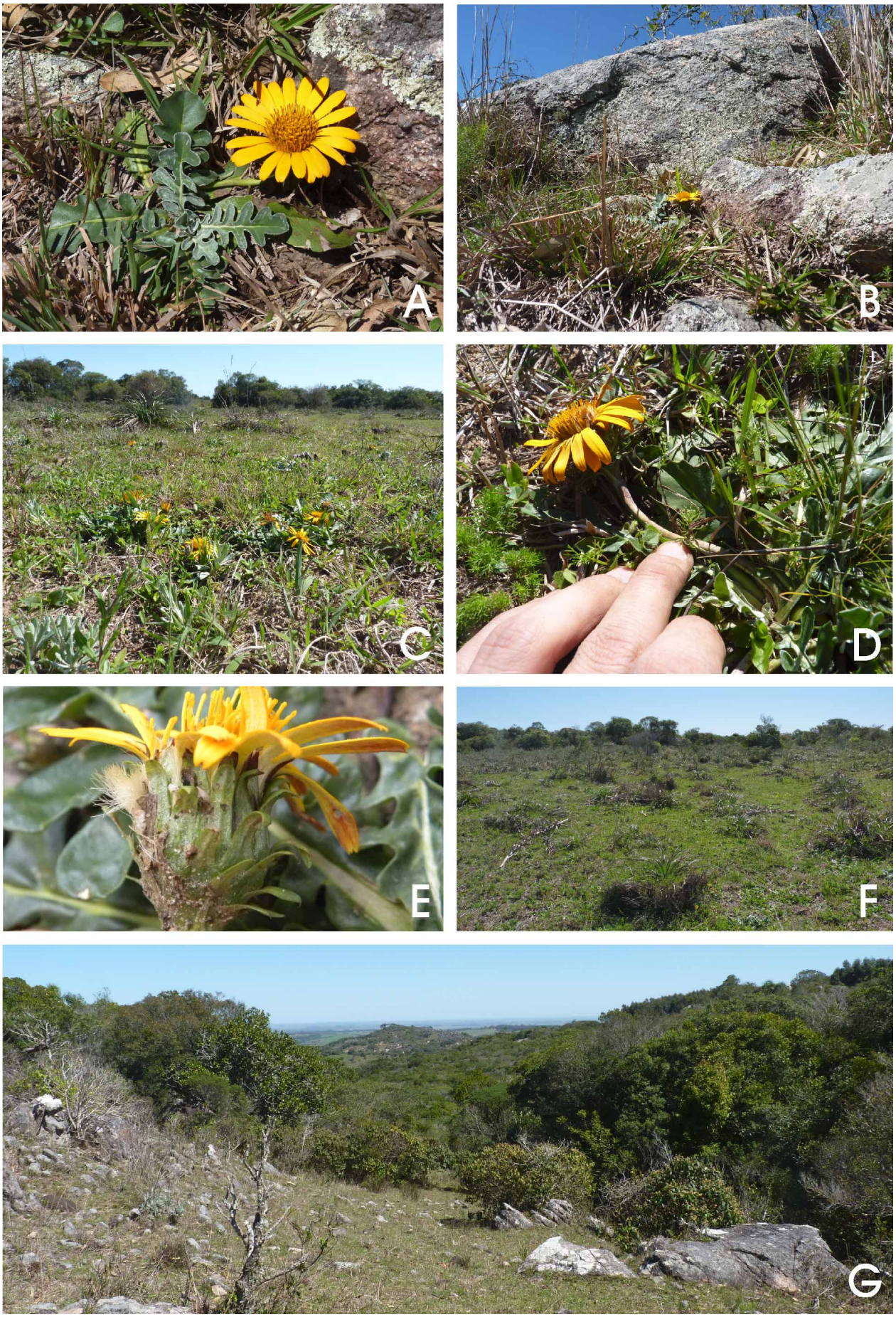
Additional specimens examined (paratypes)**:—**BRAZIL. Rio Grande do Sul: **Arroio Grande**, Passo do Ricardo, rio Piratini, campo arenoso, 4 November 1961, *G. Pabst & E. Pereira 6782* (HB); **Capão do Leão**, Cerro das Almas, 21 September 2011, fl., *E. Pasini, A.A. Schneider & F. Torchelsen* 987 (ICN); **Herval**, em campo arenoso, 21 September 2011, fl., *E. Pasini, A.A. Schneider & F. Torchelsen 899* (ICN); **Pedro Osório**, 8 November 1973, fl., *J.C. Sacco, E.C. dos Santos & E. dos Santos s.n.* (CTES 121249, FLOR 18222, PACA 68784, PEL 8759); **Pelotas**, Fazenda Capão Redondo, a 23 km do IBDF, na rodovia para Jaguarão, no campo limpo, 16 January 1981, *J. Mattos, N. Silveira & N. Mattos 22263* (HAS); Rincão do Meio, 19 May 1959, *J.C. Sacco 1199* (HBR); **Rio Grande**, Domingos Petroline, 5 October 1982, *I.V. Gonçalves 135* (HURG).

URUGUAY. Rocha: **La Pedrera**, dunas, Jan 1981, *A. L. Cabrera 32311* (SI, LP); Punta de las Rocas, 9 December 2001, *E. Figueredo s.n.* (MVJB 21080).

This new species was first collected by Sacco (*Sacco 1199*) in 1959 and identified by B. Rambo in the same year as *T. incana* Cass. (1826: 216). In the last fifty years the species has been identified by taxonomists as *T. catharinensis*, *T. incana*, *T. macrocephala* Less. (1830: 288), *T. sinuata* (Don) Cabrera (1953: 531) or as *Trichocline* sp. In fact, the renowned botanist A.L. Cabrera, who described the most morphologically similar species, *T. catharinensis*, in 1973, collected this new species, and identified it as *Trichocline* sp.

According to Zardini (1975) *T. catharinensis* is restricted to southern Brazil, endemic to high elevation areas between 750 and 1500 m (Santa Catarina and Rio Grande do Sul States). However in the examined material of *T. catharinensis*, Zardini cites some herbarium specimens (*E. Pereira 8445*, *Pereira & Pabst 7720*, *Pereira 6782* & *Pabst 6608*, *Burkart 25200*) that occur in the southern region of Rio Grande do Sul state, in lower elevations areas between 0 to 400 m. In the present work these materials indicated by Zardini were analyzed and identified as *T. cisplatina*.

FIGURE 2. *Trichocline cisplatina*. **A.** Habit. **B**. Habitat. **C.** Population along River Piratini, Arroio Grande, Rio Grande do Sul State, Brazil. **D.** Detail of the species showing the procumbent scape. **E.** Capitulum showing the phyllaries. **F.** Ocurrence site on sandy grasslands. **G.** Ocurrence site on hill with shrubland vegetation. Photo credits: A, B, C, D, F, G, H by E. Pasini and E by F. Torchelsen.


A
B
C
D
E
F
G

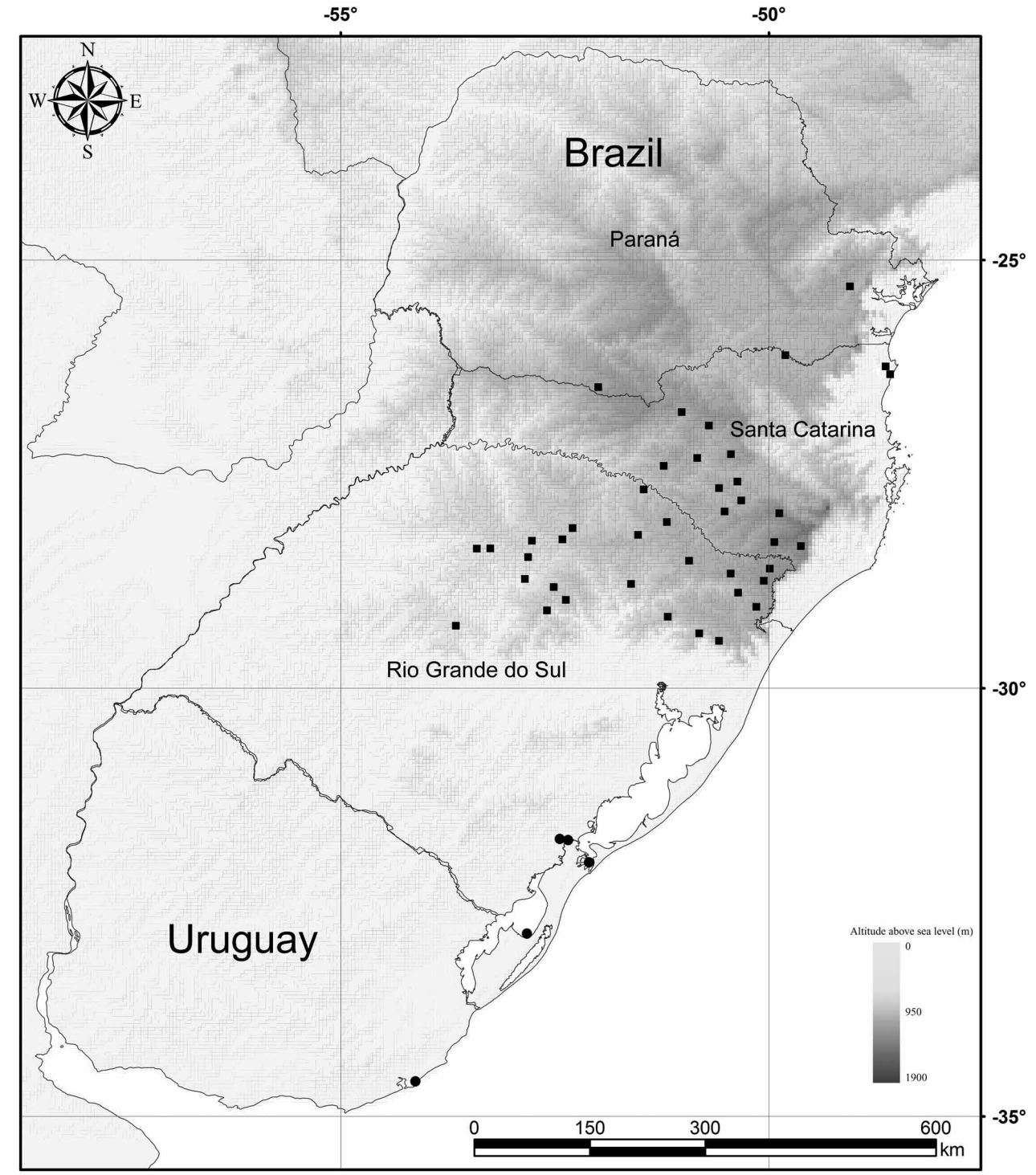


FIGURE 3. Distribution map of *Trichocline cisplatina* (circles) and *Trichocline catharinensis* (squares).

Trichocline cisplatina is similar to *T. catharinensis* in the morphology of the innermost phyllaries. These are lanceolate, brownish red and 1-2-seriate in both species. According to Cabrera & Klein (1973), there are two varieties of *T. catharinensis*: *T. catharinensis* var. *catharinensis* and *T. catharinensis* var. *discolor* Cabrera (1973: 48). The new species is most similar to *T. catharinenses* var. *discolor*, with which it shares pinatifid leaves and whitish ovary trichomes. *Trichocline cisplatina* can be distinguished from both varieties of *T. catharinensis* by its procumbent scape, deeply pinatifid leaves with 4-10 pairs of rounded lobes, yellow-orange ray floret corollas, broader capitula and phyllaries and ovaries with 2-seriate trichomes that are inflated at the apex and densely distributed. Furthermore, these two species have a disjunct distribution in southern

Brazil. *Trichocline catharinensis* occurs in grasslands and shrublands of high elevation areas between 750 to 1500 m and *T. cisplatina* is endemic to low elevation areas in the coastal region of southern Rio Grande do Sul State and southeastern Uruguay, occurring on grasslands and shrublands with rocky or sandy soils and dunes.

Key to the native species of *Tricholine* from the State of Rio Grande do Sul, Brazil and Uruguay

1. Corolla of ray florets red to orange red; pappus bristles undulate at the apex ..... *T. macrocephala* Less.
- Corolla of ray florets yellow to golden yellow; pappus bristles not undulate at the apex ..... 2.
2. Leaves glabrous to glabrescent ..... 3.
- Leaves tomentose to lanose ..... 5.
3. Scape 55–80 cm long; leaves 20–30 cm long ..... *T. maxima* Less.
- Scape 2–20 cm long; leaves 3–14 cm long ..... 4.
4. Leaf margin irregularly pinatisect; phyllaries glabrous, apex and margin reddish brown ..... *T. humilis* Less.
- Leaf margin crenate, never pinatisect; phyllaries white-tomentose on the external surface, apex and margin whitish ..... *T. heterophylla* Less.
5. Scape ebracteate; leaf blade coriaceous, shiny on the adaxial surface, lobes strongly acute at the apex and undulate at the base; plant with dense lanose indumentum ..... *T. incana* Cass.
- Scape with up to 12 bracts; leaf blade membranaceous, opaque on the adaxial surface, lobes subacute to rounded at the apex; plant with tomentose indumentum ..... 6.
6. Corolla of ray florets yellow to orange-yellow; scape erect or sinuose leaves blade oblanceolate, margin entire, sinuate or lobate, with up to 6 pairs of lobes; ovary with trichomes not inflated at the apex, sparsely distributed ..... *T. catharinensis* Cabrera
- Corolla of ray florets yellow-orange, never yellow; scape procumbent; leaves blade spatulate, margin strongly pinatisect, with up to 10 pairs of lobes, eventually forming secondary lobes ovary with trichomes inflated at the apex, densely distributed ..... *T. cisplatina* E. Pasini & M.R. Ritter

Acknowledgements

The first author would like to thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for the financial aid. The authors are also grateful to Angelo Alberto Schneider for suggestions on the manuscript and Latin diagnosis, João Ricardo Vieira Iganci for preparing the illustrations, Fábio Torchelsen for field trips assistance and for providing wonderful photographs and especially Greta Dettke for map design.

References

Cabrera, A.L. (1953) *Manual de La Flora de los Alrededores de Buenos Aires*. Editorial Acme, Buenos Aires, 531 pp.

Cabrera, A.L. & Klein, R.M. (1973) Compostas. Tribo: Mutisieae. *In*: Reitz, R. (ed.), *Flora Ilustrada Catarinense*. Herbário Barbosa Rodrigues, Itajaí, pp. 1–124.

Cabrera, A.L. & Willink, A. (1973) *Biogeografia de America Latina*. Colección de Monografías Científicas OEA Serie Biología, Monografía 13. O.E.A., Washington D.C. 120 pp.

Cassini, H. (1817) *Bulletin des Sciences par la Societe Philomatique Paris* 13: 1791–1805.

Cassini, H. (1826) Trichocline. *In*: Cuvier, F. (eds.), *Dictionnaire des Sciences Naturelles*. Le Normant, Paris, 55: 215–219.

Funk, V.A., *et al.* (eds.) (2009) *Systematics, Evolution and Biogeographics of Compositae*. IAPT, Vienna, 965 pp.

IUCN (2001) *IUCN red list categories and criteria*, version 3.1. IUCN Red List Unit, Cambridge U.K. Available from: http://www.iucn.org/about/work/programmes/species/red_list/about_the_red_list/ (accessed: 20 Aug 2011).

Katinas, L., Pruski, J., Sancho, G., Tellería, M.C. (2008) The Subfamily Mutisioideae (Asteraceae). *Botanical Review.* 74: 469–716. DOI 10.1007/s12229-008-9016-6.

Linnaeus, C. (1753) *Species Plantarum*. Salvii, Holmiae.

Lessing, C.F. (1830) De synanthereis herbarii regii Berolinensis dissertatio tertia. *Linnaea* 5: 237–298.

Monge, M. (2010) *Trichocline in Lista de Espécies da Flora do Brasil.* Jardim Botânico do Rio de Janeiro. Available from: http://floradobrasil.jbrj.gov.br/2010/FB005515 (acessed: 15 Sep 2010).

Zardini, E.M. (1975) Revisión del género *Trichocline* (Compositae). *Darwiniana* 19: 618–733.