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Systematic revision of the genus Isostigma Less. (Asteraceae, Coreopsideae)

Guadalupe Peter

Abstract

PETER, G. (2009). Systematic revision of the genus Isostigma Less. (Asteraceae, Coreopsideae). *Candollea* 64: 5-30. In English, English and French abstracts.

Isostigma Less. *(Asteraceae, Coreopsideae)* is a South American genus, distributed in Argentina, Brazil, Bolivia, Paraguay, and Uruguay. This genus has 2 subgenus *(Isostigma* Less. and *Microtrichon* Guad. Peter) including 11 species (*Isostigma acaule* (Baker) Chodat, *Isostigma brasiliense* (Gardner) B. D. Jacks., *Isostigma cordobense* Cabrera, *Isostigma dissitifolium* Baker, *Isostigma herzogii* Hassl., *Isostigma hoffmannii* Kuntze, *Isostigma molfinianum* Sherff, *Isostigma peucedanifolium* (Spreng.) Less., *Isostigma scorzonerifolium* (Baker) Sherff, *Isostigma simplicifolium* Less. and *Isostigma sparsifolium* Guad. Peter) and 6 varieties. Here are described the new subgenus *Microtrichon* and the taxon *Isostigma peucedanifolium* var. *strictum* Guad. Peter. Three new status and combinations are made: *Isostigma peucedanifolium* var. *crithmifolium* (Less.) Guad. Peter, *Isostigma peucedanifolium* var. *speciosum* (Less.) Guad. Peter and *Isostigma simplicifolium* var. *riedelii* (Baker) Guad. Peter. Three lectotypes are designated for the names *Isostigma hoffmannii*, *Isostigma peucedanifolium* var. *crithmifolium* and *Isostigma scorzonerifolium*. Two neotypes are designated for the names *Isostigma cordobense* and *Isostigma simplicifolium* Less. var. *simplicifolium*. One name *(Isostigma megapotamicum* (Spreng.) Sherff) is excluded. Distribution maps and identification keys are provided.

Key-words

ASTERACEAE – *Isostigma* – South America – Systematics – Taxonomy

Résumé

PETER, G. (2009). Révision systématique du genre Isostigma Less. (Asteraceae, Coreopsideae). *Candollea* 64: 5-30. En anglais, résumés anglais et français.

Isostigma Less. *(Asteraceae, Coreopsideae)* est un genre sud-américain, distribué en Argentine, au Brésil, en Bolivie, au Paraguay et en Uruguay. Ce genre comprend 2 sous-genres (*Isostigma* Less. et *Microtrichon* Guad. Peter) incluant 11 espèces *(Isostigma acaule* (Baker) Chodat, *Isostigma brasiliense* (Gardner) B. D. Jacks., *Isostigma cordobense* Cabrera, *Isostigma dissitifolium* Baker, *Isostigma herzogii* Hassl., *Isostigma hoffmannii* Kuntze, *Isostigma molfinianum* Sherff, *Isostigma peucedanifolium* (Spreng.) Less., *Isostigma scorzonerifolium* (Baker) Sherff, *Isostigma simplicifolium* Less. et *Isostigma sparsifolium* Guad. Peter) et 6 variétés. Ici sont décrits le nouveau sous-genre *Microtrichon* et le taxon *Isostigma peucedanifolium* var. *strictum* Guad. Peter. Trois lectotypes sont désignés pour les noms *Isostigma hoffmannii*, *Isostigma peucedanifolium* var. *crithmifolium* et *Isostigma scorzonerifolium*. Deux néotypes sont désignés pour les noms *Isostigma cordobense* et *Isostigma simplicifolium* Less. var. *simplicifolium*. Un nom *(Isostigma megapotamicum* (Spreng.) Sherff) est exclu. Des cartes de distribution et des clés d'identification sont aussi données.

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Introduction

The South American genus *Isostigma* Less. *(Asteraceae, Coreopsideae)* includes 11 species distributed in Argentina, Brazil, Bolivia, Paraguay, and Uruguay. The genus is closely related to the genus *Chrysanthellum* Rich. *Isostigma,* together with *Chrysanthellum, Diodontium* F. Muell., *Glossocardia* Cass., and *Trioncinia* (F. Muell.) Veldkamp, form the generic group *Chrysanthellum* (Ryding & Bremer, 1992; Karis & Ryding, 1994). This group is characterised by having alternate and/or basally rosulate leaves, Kranz syndrome, and long, subulate-appendaged style branches (Karis & Ryding, 1994).

Taxonomic history

Isostigma was first recognised by Lessing (1831), who transferred *Tragoceras peucedanifolium* Spreng. as *Isostigma peucedanifolium* (Spreng.) Less. *Tragoceras peucedanifolium* was described by Sprengel (1826), based on Sello's material from the state of Rio Grande do Sul, Brazil. Lessing (1831) described three other species in his work *(Isostigma crithmifolium* Less., *I. simplicifolium* Less., and *I. speciosum* Less.). Gardner (1848) described *Glossogyne brasiliensis* Baker, which was subsequently transferred to *Isostigma* by Bentham & Hooker (1873). Baker (1884) described *I. microcephalum* Baker, and considered it as a synonym of *Glossogyne brasiliensis*. Two other species *(Isostigma dissitifolium* Baker and *I. stellatum* Baker) and a variety *(I. speciosum* var. *riedelii* Baker) were described in the same work. Some species were originally described as belonging to the genus *Bidens* L. in the "Flora Brasiliensis" (Baker, 1884). These were later transferred to *Isostigma: Bidens acaulis* Baker by Chodat (1901), *B. glycinifolius* Baker and *B. scorzonerifolius* Baker by Sherff (1923, 1926). Kuntze (1898) and Malme (1899) added other new species to *Isostigma, I. hoffmannii* Kuntze and *I. foliosum* Malme respectively.

Chodat (1901), Hassler (1909, 1916) and Sherff (1923) described and disposed of various taxa, this culminating with the work of Sherff (1926) which recognised 11 species in the genus. Sherff subsequently described *I. molfinianum* Sherff (Sherff, 1931) and the new variety *I. crithmifolium* var. *nanum* Sherff (Sherff, 1935). In 1959, Cabrera (1959) described another new species: *I. cordobense* Cabrera. *Isostigma crithmifolium* var. *nanum* and *I. cordobense* were considered as synonyms by Ariza-Espinar (2000). The latest species of *Isostigma* was described as *I. sparsifolium* Guad. Peter (Peter, 2006). There are several partial treatments of the genus in recent regional floras (Ariza-Espinar, 1969, 2000; Cabrera, 1974; Peter, 2004a, 2004b, 2005). The aim of the present study is to provide anatomical data, to delimite the species and to resolve nomenclatural and typification problems.

Generic relationships

The tribe *Coreopsideae* has 25 genera and ca. 500 species, is cosmopolitan, with a concentration of species in America, especially Mexico (Bremer, 1987; Ryding & Bremer, 1992). Inside the tribe, there are some large genera that are poorly delimited, such as *Bidens* and *Coreopsis* L. (Karis & Ryding, 1994; Kimball & Crawford, 2004; Mort & al., 2008).

Ryding & Bremer (1992) presented a cladistic study of the *Coreopsideae*, and suggested that it had three groups of genera, with the status of subtribes or informal generic groups (Karis & Ryding, 1994): the *Coreopsis* group, the *Chrysanthellum* group, and the *Petrobium* group.

Sherff (1926) considered *Isostigma* related to *Bidens*, with differences only in the stigmatic branches: elongated in *Isostigma,* and generally shorter and broadened distally in *Bidens*. Depending on which genera were included in the different cladistic analysis, the closest genera related to *Isostigma* varied. In the work of Ryding & Bremer (1992) were *Glossogyne* Cass. and *Guerreroia* Merr. (currently *Glossocardia*), or *Chrysanthellum* in the works of Karis (1993) and Karis & Ryding (1994), or *Glossogyne* according to Kimball & Crawford (2004).

Key to the South American genera of *Coreopsideae*

1. Cypselae heteromorphic 2
1a. Cypselae homomorphic 3

2. Leaves alternate ..... *Chrysanthellum* Rich.
2a. Leaves opposite ..... *Heterosperma* Cav.

3. Inner phyllaries connate 1/3 or more ..... *Thelesperma* Less.
3a. Inner phyllaries free or connate only at the base 4

4. Trees or large shrubs with entire leaves ..... *Narvalina* Cass.
4a. Herbs, shrubs or climbers 5

5. Pappus with 6-16 awns, retrorsely barbelate ..... *Ericentrodea* S. F. Blake & Sherff
5a. Pappus with up to 4 (-8) aristae or awns 6

6. Pappus with a spinulose-hispid corona ..... *Cyathomone* S. F. Blake
6a. Pappus without corona 7

7. Leaves rosulate or alternate 8
7a. Leaves opposite or whorled 9

8. Cypselae winged or with cartilaginous or spongy margins ..... *Coreopsis* L.
8a. Cypselae wingless or with narrow hyaline margins ..... *Isostigma* Less.

9. Disc cypselae with neck. Staminal filaments hirsute ..... *Cosmos* Cav.
9a. Disc cypselae without neck. Staminal filaments glabrous 10
10. Cypselae winged or with cartilaginous or spongy margins ..... *Coreopsis* L.
10a Cypselae absent or wingless 11
11. Roots not tuberous. Pappus absent or up to 4 hispid awns ..... *Bidens* L.
11a. Roots tuberous. Pappus absent or 2 minute teeth ..... *Dahlia* Cav.

Material and methods

Morphological data

This study has been based on the examination of the morphological characters derived from herbarium material. Specimens from herbarium AS, BA, BAB, BBB, BHCB, BM, CORD, CTES, ESA, F, FCQ, G, HUH/GH, LIL, LP, MA, MO, NY, PY, S, SI, SP, SPF, TEX/LL, UFMT and US were examined. Data for the distribution maps and habitat were taken from herbarium specimen locality data. For the occurrence in biogeographic province localities CABRERA & WILLINK (1980) were followed.

Results and discussion

Isostigma Less. in Linnaea 6: 513. 1831.

Type species: *Tragoceras peucedanifolium* Spreng. (≡ *I. peucedanifolium* (Spreng.) Less.)

Perennial herbs or subshrubs. *Stems* simple or ramified, striate, glabrous. *Leaves* distributed along the stem, or rosulate with the distal leaves developed or reduced to bracteoles; entire, furcate, pinnatisect to multipinnatisect, sessile, petiolate or decurrent in pseudopetiole; leaflets filiform, linear to narrowly ovate. *Capitula* solitary or grouped in capitulescences, generally radiate. *Involucre* campanulate, subglobose, or cylindrical, 3- to 4-seriate. *Phyllaries* with margins hyaline, ciliate; the outer triangular, the inner generally ovate, scarious, longer than the outer. *Receptacle* flat or slightly convex, alveolate, paleaceous. *Paleae* membranous, keeled at the base, yellowish. *Ray florets* female, limb linear, elliptical, obovate, or ovate, 2- to 3-dentate, yellow, white, or purple. *Disc florets* perfect, yellow or purple, corolla tubular; limb abruptly broadened, 4- to 5-lobed. *Anthers* obtuse or slightly sagittate, with apical connectival appendages ovate. *Style* bifid with appendages branches long, subulate, pubescent on the outer face. *Cypselae* linear, flattened, truncate at the apex, smooth or striate, glabrous or hispid on the apex, margin, and/or on the ribs, winged or wingless. *Pappus* 2-aristate, rarely reduced, aristae triangular or acicular, smooth or antrorsely hispid.

The genus comprises 2 subgenera with 11 species.

Habit. – Perennial herbs or subshrubs; erect or ascending, rarely decumbent.

Root. – Principal axis and ramified, some species have a xylopodium.

Stem. – Simple, or simple at the base and ramified in the upper part, or ramified at the base and simple in the upper part, or totally ramified. In all the species the stem is striate and glabrous. The epidermis is unistratified, with stomata. There is subepidermal collenchyma under the striae and subepidermal chlorenchyma in the valleys. The collateral vascular bundles are bordered by sclerenchyma fibers. There are minor vascular bundles associated with secretory ducts. All the species have Kranz anatomy, without variation among them (PETER & KATINAS, 2003), constituted by a single layer of palisade chlorenchyma, followed inside by a single layer of Kranz cells. The pith is formed by colorless parenchyma.

Leaf. – Entire, pinnate- or bipinnatisect. The entire leaves can be linear to narrowly ovate with the apex entire or briefly bi-tridentate, obovate with the apex dentate, or linear, very long with the apex entire or tridentate. The pinnate- or bipinnatisect leaves have linear, filiform, or ovate leaflets. They can be petiolate, attenuate in pseudopetiole, or sessile. Their distribution in the stems can be: (1) basal leaves rosulate and distal ones reduced to bracteoles; (2) basal leaves rosulate and distal ones distributed in the stems; (3) all leaves distributed along the stems, alternate, rarely opposite or subopposite.

The leaves of all species are amphistomatic and have Kranz anatomy. The Kranz anatomy can be of two different types: (1) *Eryngiophyllum* type (BROWN, 1975) and (2) *Isostigma* type (PETER & KATINAS, 2003). In the species with *Eryngiophyllum* type, the photosynthetic mesophyll and the Kranz sheath are continuous subepidermal layers. The vascular bundles lie in the colourless internal parenchyma. Secretory ducts and sclerenchyma tissue are also present. In the species with *Isostigma* type, there are several units formed by the photosynthetic mesophyll and the Kranz sheath enclosing one to four collateral vascular bundles. These units are commonly connected by vascular tissue, which is accompanied by the mesophyll and the Kranz sheath. Secretory ducts are present, but sclerenchyma tissue is completely absent in this type. Some species have glandular trichomes.

The petioles are generally broadened at the base, semi-amplexicaul, with margin hyaline, ciliate. Distribution of tissues is similar to that of the leaves.

Capitulum. – Solitary, terminal or rarely axillary, or grouped in capitulescences; longly pedunculate, generally radiate or rarely discoid.

Involucre. – Campanulate, subglobose, or cylindrical, 3- to 4-seriate; receptacles are flat or slightly convex, alveolate, paleaceous; phyllaries of the involucre have margins hyaline, ciliate; they are glabrous or puberulous on the back. The outer phyllaries are triangular and the inner are generally ovate, scarious, and longer than the outer.

Palea. – Linear to narrowly ovate, with apex acute, sometimes spatulate, membranous, keeled at the base, yellowish, glabrous or puberulous.

Ray floret. – Female; corollas have limb linear, elliptical, obovate, or ovate, 2- to 3-dentate; yellow, white, or purple; glabrous or puberulous.

Disc floret. – Perfect; corollas tubular, with limb broadened abruptly, 4- to 5-lobed; purple or yellow.

Stamen. – Filaments are glabrous; anthers are obtuse or slightly sagittate, with apical connectival appendages ovate.

Style. – Bifid, with short branches, papillosae in the inner face; branches have long appendages, subulate, pubescent on the dorsal face.

Cypsela. – Linear, flattened, truncate at the apex, generally striate, hispid on the apex, margin, and/or on the ribs, less frequently glabrous, winged or wingless; pappus biaristate, rarely reduced; the aristae are acicular or triangular, smooth or antrorsely hispid.

Distribution and habitat. – Distributed in Paraguay, central and southern Brazil, north-western Uruguay, eastern Bolivia, and north-eastern and central Argentina (Fig. 1). Six species occur in Paraguay, one of which is endemic *(I. acaule* (Baker) Chodat). Five species occur in Brazil, three species and two varieties being endemic (*I. brasiliense* (Gardner) B. D. Jacks., *I. scorzonerifolium* (Baker) Sherff, *I. sparsifolium, I. peucedanifolium* var. *strictum* Guad. Peter (here described), and *I. simplicifolium* Less. var. *simplicifolium).* Five species grow in Argentina, two of which are endemic *(I. cordobense* and *I. molfinianum).*

The species of *Isostigma* subgen. *Isostigma* grow in rocky soils, sandy or clay-sandy; in dunes, ravines, beaches, low hills, savannas, steppes, palmars, and grasslands, dry and frequently burned habitats. They often occur in disturbed habitats, but some taxa *(I. peucedanifolium* (Spreng.) Less. var. *peucedanifolium* and var. *crithmifolium* (Less.) Guad. Peter (new status and combinations here)) are threatened with extinction (EN) in the State of Rio Grande do Sul (CONSEMA, 2008). Species of the subgenus *Microtrichon* Guad. Peter grow in marshy places, usually in clay soils.

Some species are widespread *(I. hoffmannii, I. peucedanifolium, I. simplicifolium),* but most have restricted distributions. Biogeographically, the genus occurs in the provinces of Cerrado, Parana, Prepunean, Chacoan, Espinal, Pampean, and Amazonas (in the ecotone with the Cerrado) (CABRERA & WILLINK, 1980).

Chromosome number. – TURNER (1988) postuled a base chromosome number of "$x = 8$ or possibly $x = 4$" for the genus *Chrysanthellum,* diploid counts of $2n = 16$, 18 and 24 repeated for three or more species. Within *Isostigma* diploid counts are known for two species (DEMATTEIS & FERNÁNDEZ, 1999): *I. peucedanifolium* ($2n = 24$) and *I. hoffmannii* ($2n = 18$). This is consistent with an ancestral base number of $x = 4$ or 6, but possibly $x = 9$. The lower number could represent aneuploid derivities (TURNER, *pers. comm.).*

Subgeneric delimitation. – *Isostigma* was never delimitated at infrageneric level. It would, therefore, appear that different types of Kranz anatomy, the presence of glandular trichomes and schlerenchyma, are characteristics that are reliable to the circumscription of infrageneric group in *Isostigma.*

Key to the subgenus of *Isostigma:*

1. Leaves pinnate- to multi-pinnatisect, leaflets linear to filiform; if entire the basal leaves always rosulate with the distal ones reduced to bracteoles *(I. simplicifolium).* Leaves glabrous ..... **I.** subgen. ***Isostigma***

1a. Leaves entire or dentate at the apex; if pinnatisect, plants decumbent, with leafy stems at the prostrated part and scapiform in the upper one, leaves with leaflets linear to ovate *(I. hoffmannii).* Leaves puberulous, with few glandular hairs, evident only under the microscope ..... **II.** subgen. ***Microtrichon***

Key to the species of *Isostigma:*

1. Leaves pinnate- to multi-pinnatisect, leaflets linear to filiform; if entire the basal leaves always rosulate with the distal ones reduced to bracteoles *(I. simplicifolium).* Leaves glabrous 2

1a. Leaves entire or dentate at the apex; if pinnatisect, plants decumbent, with leafy stems at the prostrated part and scapiform in the upper one, leaves with leaflets linear to ovate *(I. hoffmannii).* Leaves puberulous, with few glandular hairs, evident only under the microscope 7

2. Cypselae glabrous 3

2a. Cypselae hispid 5

3. Leaves distributed along the stem ..... **3. *I. dissitifolium***

3a. Leaves rosulate with the distal leaves reduced to bracteoles 4

4. Leaves simple, linear, decurrent at the base, apex entire or dentate ..... **5. *I. simplicifolium***

4a. Leaves ternate-, pinnate-, or multi-pinnatisect; if entire, capitula discoid (var. *strictum*) .... **4. *I. peucedanifolium***

5. Ray florets purple ..... **2. *I. cordobense***

5a. Ray florets yellow or white 6

Fig. 1. – Geographical distribution of the genus *Isostigma* Less.

6. Ray florets yellow. Leaves crowded or rosulate at the base of stems and peduncles ..... **1. *I. brasiliense***
6a. Ray florets white. Leaves distributed along the stem..... ..... **6. *I. sparsifolium***

7. Capitula in capitulescences. Plants erect 8
7a. Capitula solitary. Plants decumbent 10

8. Leaves subulate. Ray florets conspicuous, yellow .... **11. *I. scorzonerifolium***
8a. Leaves linear to narrowly elliptical or obovate. Ray florets inconspicuous, purple or brown-purplish 9

9. Plants lower than 30 cm tall. Leaves proximal 3-furcate, distal leaves entire ..... **10. *I. molfinianum***
9a. Plants 30-70 cm tall. All leaves entire .... **8. *I. herzogii***

10. Leaves simple, obovate, 3- to 8-dentate at the apex .... **7. *I. acaule***
10a. Leaves pinnatisect, leaflets linear to narrowly ovate .... **9. *I. hoffmannii***

I. *Isostigma* Less. subgen. ***Isostigma***

Perennials, glabrous, generally with xylopodium. *Stems* simple or ramified, leafy or with basal leaves rosulate and the distal ones reduced to bracteoles. *Leaves* peciolate, pinnate- to multi-pinnatisect, rarely entire and linear; leaflets filiform to linear. *Capitula* solitary. *Leaves* with Kranz anatomy of type *Eryngiophyllum*, with sclerenchyma tissue.

1. *Isostigma brasiliense* (Gardner) B. D. Jacks. in Index Kew. 1: 1240. 1895 (Fig. 2).

≡ *Glossogyne brasiliensis* Gardner in Lond. J. Bot. 7: 408. 1848.

≡ *Isostigma microcephalum* Baker in Mart., Fl. Bras. 6(3): 239. 1884 [nomen illeg.].

Lectotypus (designated by Veldkamp & Kreffer, 1991): **Brazil. Edo Goiás:** Campos, Nossa Senhora d'Abadia, V.1840, *Gardner 4253* (BM!; iso-: BR, F [971500]!, F [1013397]!, G!, LP [photo], GH!, K [digital image]!, NY! 169460, NY [169461]!, P [digital image]!, W [photocopy]!).

= *I. stellatum* Baker in Mart., Fl. Bras. 6(3): 239. 1884. **Typus: Brazil. Edo Mato Grosso do Sul:** São Paulo, in saxosis fissuris rupium ripae riv. Parana pr. Urubupunga, VIII.1826, *Riedel 410* (holo-: P [digital image]!, GH [photo], LP [photo]; iso-: NY!) (synonymised by Sherff, 1926).

Perennials 10-35 cm tall. *Stems* ramified at the base, ascending. *Leaves* crowded or rosulate at the base of the stem and the base of the peduncles; semiamplexicaul, glabrous; simple, subulate, mucronate at the apex; or deeply pinnatisect, with 1-2 pairs of leaflets; 5-70 × 0.2-0.5 mm; margin ciliate at the base; leaflets subulate or filiform, acute or acuminate, 10-35 × 0.2-0.5 mm. *Capitula* solitary, terminal or rarely axillar, radiate, 5-9 × 11-20 mm in flowering, 5-8 × 7-12 mm in fruit; longly pedunculate. *Involucre* campanulate, 3-seriate, 3-5 × 4-8 mm. *Phyllaries* scarious, margin hyaline, ciliate, brownish; outer phyllaries triangular to ovate; inner phyllaries ovate, acute or mucronate. *Paleae* linear, 3- to 5-nerved, puberulous; apex something spatulate, acute or mucronate, crenate; nerves brownish. *Ray florets* with limb elliptical to obovate, 4- to 7-nerved, 2-dentate, 8-12 × 2-4.5 mm, yellow; teeth subacute or rounded. *Disc florets* with limb 4-lobed, 2-4 mm long, yellow with brownish nerves. *Anthers* 1.5-2 mm long. *Style* branches with appendages 2 mm long, sometimes absent in the ray florets. *Cypselae* linear, flattened, striate with the midrib prominent or trigonous, hispid, 4-5 × 0.5-0.7 mm, black. *Pappus* 2-aristate, aristae acicular, antrorsely hispid up to the apex, 2-3 mm long.

Distribution and habitat. – Occurs in the centre and southern Brazil (Goiás, Minas Gerais, and Mato Grosso do Sul-São Paulo), in the biogeographical provinces of Cerrado and Parana (Fig. 3). This species grows in fissures among stones and rocky beaches.

Flowering period. – August-May.

Nomenclatural notes. – Bentham & Hooker (1873) considered *Glossogyne brasiliense* as belonging to *Isostigma,* but they did not formally make the combination. The combination was made by Jackson (1895).

Baker (1884) described two species, *I. stellatum* and *I. microcephalum*, the former having simple leaves, the latter with compound leaves. *Isostigma brasiliense* has variability in leaf shape, simple and pinnatisect leaves may occur on the same specimen. Because of this, following Sherff (1926), *I. stellatum* is considered as synonym of *I. brasiliense*. On the other hand, *I. microcephalum* is a superfluous name since it is based on *Gardner 4253*, which is the type of *Glossogyne brasiliense*.

Observations. – Gardner (1848) described *G. brasiliensis* as a species with 5-dentate disc florets and without ray florets. Following this criterion, Baker (1884) and Sherff (1926) described the capitula of this species as discoid. In the present work, only 4-lobed disc florets were observed and the presence of ray florets was confirmed. Label data of *Riedel 410* notes that the species was collected along the Parana River, near Salto do Urubupungá, therefore it could be collected in the States of Mato Grosso do Sul or São Paulo.

The collection date of type material varies among 1840 (BM, K), 1841 (GH, K, LP, P), and the period 1836-1841 (NY). There are three specimens with the same collector and number *(Regnell 783),* but they have different date and localities. They were assigned to two different species: *Isostigma brasiliense* (F [591979]) and *I. sparsifolium* (F [642009], P).

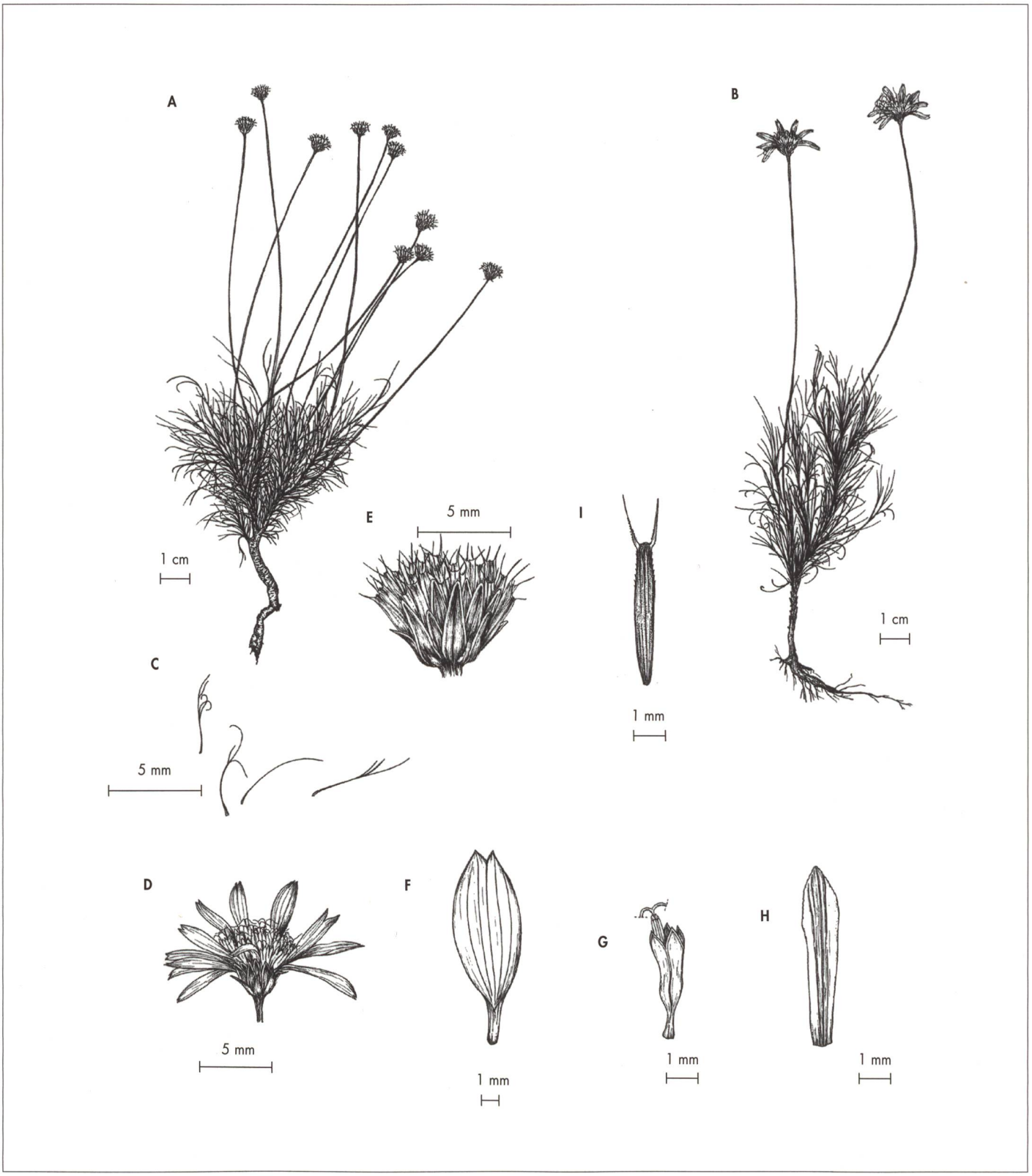

Fig. 2. – *Isostigma brasiliense* (Gardner) B. D. Jacks. **A-B.** Plants; **C.** Different types of leaves; **D.** Flowering capitulum; **E.** Capitulum in fruit; **F.** Corolla of ray floret; **G.** Disc floret; **H.** Paleae; **I.** Cypsela.

[**A, E:** *Gardner 4253*, BM; **B-D, F, H-I:** *Macedo 2627*, US; **G:** *Regnell 783*, F] [Drawn by Guadalupe Peter]

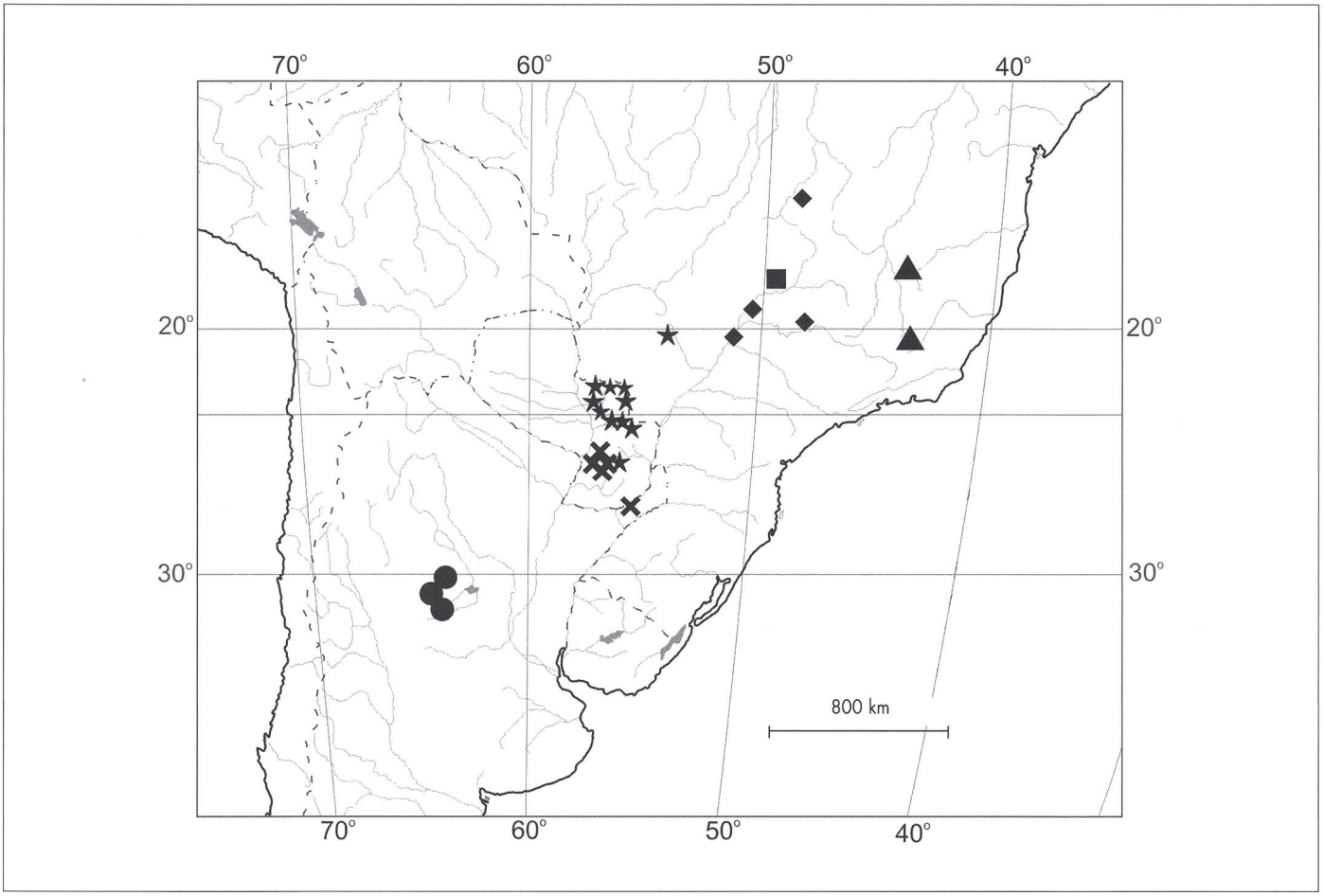

Fig. 3. – Geographical distribution of ◆ *Isostigma brasiliense* (Gardner) B. D. Jacks.; ● *I. cordobense* Cabrera; ✖ *I. dissitifolium* Baker; ▲ *I. simplicifolium* Less. var. *simplicifolium*; ★ *I. simplicifolium* var. *riedelli* (Baker) Guad. Peter; ■ *I. sparsifolium* Guad. Peter.

Iconography. – SHERFF (1926: plate 23, fig. n-t).

Examined specimens. – **BRAZIL. Edo Minas Gerais:** Mun. Ituiutaba, Canal de S. Simão, 15.X.1950, *Macedo 2627* (BBB, BM [632485], BM [632492], US); Uberaba, XII.1848, *Regnell Ser. III 783* (F [591979]). Rio Parana, s.d., *Riedel 115b* (F); s.l., 1862-63, *Riedel s.n.* (K [photography in BBB]); s.l., s.d., *Riedel s.n.* (GH).

2. ***Isostigma cordobense*** Cabrera in Notas Mus. La Plata, Bot. 19: 202. 1959 (Fig. 4).

Typus: ARGENTINA. Dpto Ischilín: Sierras al este de Deán Funes, IV.1951, *Sayago 701* (holo-: LP!; iso-: CORD!).

= *I. crithmifolium* var. *nanum* Sherff in Amer. J. Bot. 22: 708. 1935. **Typus: ARGENTINA. Prov. Córdoba:** Capilla del Monte, Sierra de Córdoba, 1000 m, XII.1917, *Hosseus 1032* (holo-: B [destroyed]). **Neotypus** (designated here): **ARGENTINA. Prov. Córdoba:** Valle de Punilla, Capilla del Monte, cerca del Cerro Uritorco, 23.XI.1917, *Hosseus 1054* (CORD!) (synonymised by ARIZA-ESPINAR, 2000).

Perennials 6-20 cm tall. *Stems* ramified, decumbent, with ascending branches. *Leaves* crowded at the base of the stem, more sparse until the apex, alternate or the proximal ones subopposite; semiamplexicaul, glabrous; proximal leaves deeply pinnatisect, with 1-2 pairs of leaflets; distal leaves simple, linear; 7-27 mm long; margin ciliate especially at the base; leaflets linear, acute or acuminate, 6-18 × 0.5-1 mm. *Capitula* solitary, terminal, radiate, 15-18 × 20-30 mm in flowering, 13-18 × 13-18 mm in fruit; peduncle 50-130. *Involucres* campanulate, 3- to 4-seriate, 8-13 × 10-17 mm. *Phyllaries* with margin hyaline; outer phyllaries linear to triangular, acute, leafy; inner phyllaries ovate or broadly ovate, obtuse, scarious, apex crenate, brownish, glabrous or puberulous. *Paleae* linear, 5- to 9-nerved; apex acute or spatulate, margin serrate.

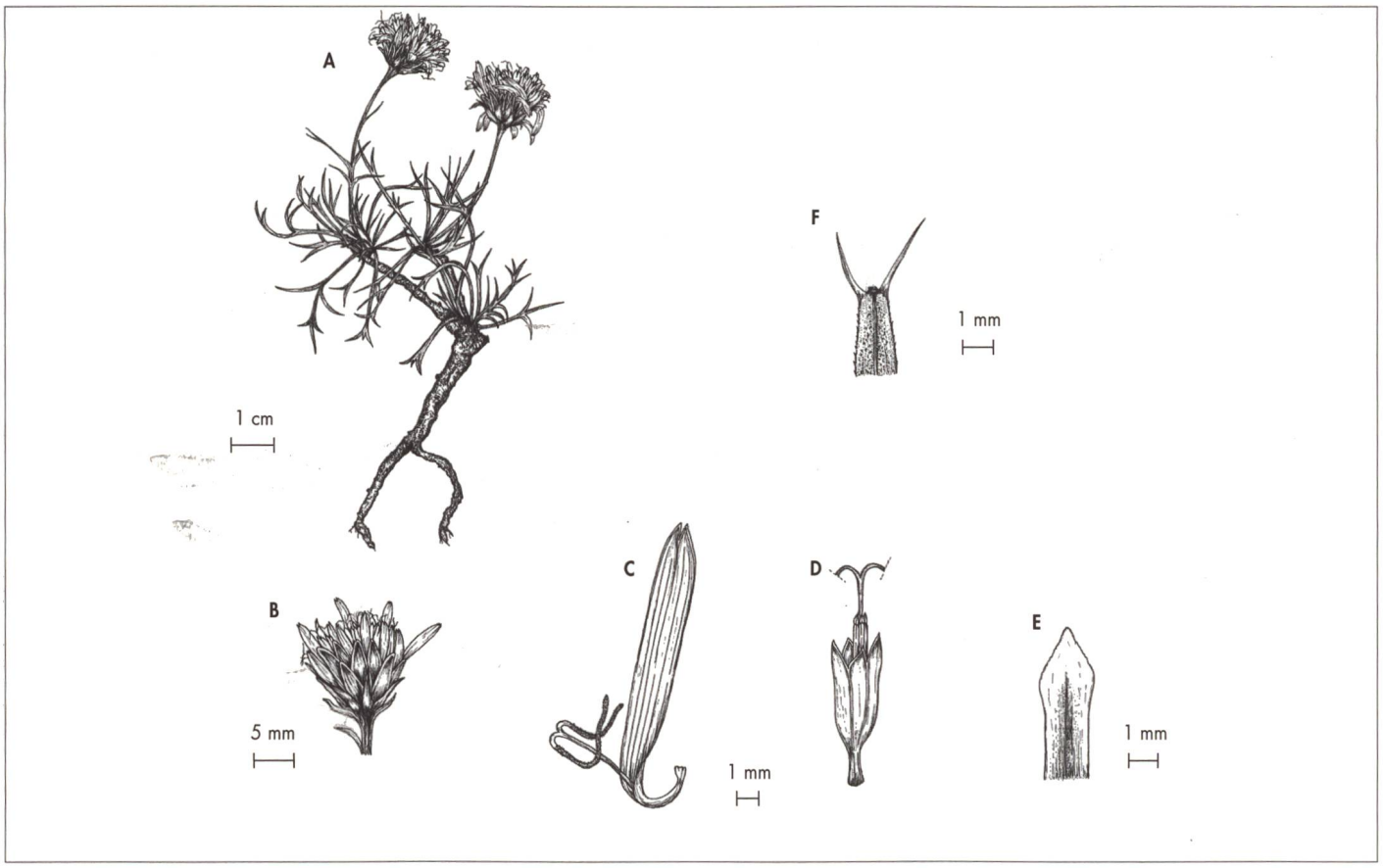

Fig. 4. – *Isostigma cordobense* Cabrera. **A.** Plant; **B.** Flowering capitulum; **C.** Ray floret; **D.** Disc floret; **E.** Apex of the paleae; **F.** Apex of the cypsela. [*Ariza-Espinar 1969*, LP] [Drawn by Guadalupe Peter]

Ray florets with limb linear, 6- to 7-nerved, 2-dentate, 9-14 × 1.5-2.5 mm, purple; teeth acute. *Disc florets* with limb 4-lobed, 5-5.5 mm long, yellowish with apex reddish or brownish. *Anthers* 2.5-3 mm long. *Style* branches with appendages 4-6 mm long. *Cypselae* linear, flattened, striate with the midrib prominent, hispid, 10-14 × 1 mm, dark. *Pappus* 2-aristate, aristae acicular, smooth or antrorsely hispid at the base, 4-5.5 mm long.

Distribution and habitat. – Habits in the centre of Argentina (Córdoba), where it is endemic to the Sierras Chicas and Sierras del Norte, in the district Serrano of the Chacoan biogeographic Province (Fig. 3). Grows in low hills in dense patches.

Flowering period. – November-May.

Iconography. – Cabrera (1959: 203, fig. 5); Ariza-Espinar (2000: 64, fig. 19).

Examined specimens. – **Argentina. Dpto Capital:** Córdoba, campo de la Escuela de Agricultura, V.1905, *s.coll. 14449* (F [672850]). **Dpto Colón:** Saldán, lomas frente al balneario San Remo, 22.XI.1964, *Ariza-Espinar 1969* (CORD, LP); Saldán, en las inmediaciones del balneario San Remo, 2.II.1975, *Ariza-Espinar 2882* (CORD). **Dpto Tulumba:** Cerro Sauce Punco, 18.XII.1947, *Meyer 13065* (CORD).

3. ***Isostigma dissitifolium*** Baker in Mart., Fl. Bras. 6(3): 239. 1884.

   ≡ *I. peucedanifolium* var. *dissitifolium* (Baker) Hassl. in Repert. Spec. Nov. Regni Veg. 14: 277. 1916.

   Lectotypus (designated by Sherff, 1926: 251): **Paraguay. Paraguarí:** Guarapí (commune de Yaguaron), sur les collines incultes, VI.1877, *Balansa 907* (K [digital image]!; iso-: F!, G!, P [265804, digital image]!, P [265805, digital image], P [265806, digital image]!).

Perennials 0.6-1 m tall, with xylopodium. *Stems* multiple, moderately ramose, erect, leafy, 1.5-3 mm diam (up to 5 mm at the base of the capitulum). *Leaves* basal crowded, distal ones distributed along the stems, alternate or rarely opposite or subopposite; semiamplexicaul, glabrous; proximal leaves deeply

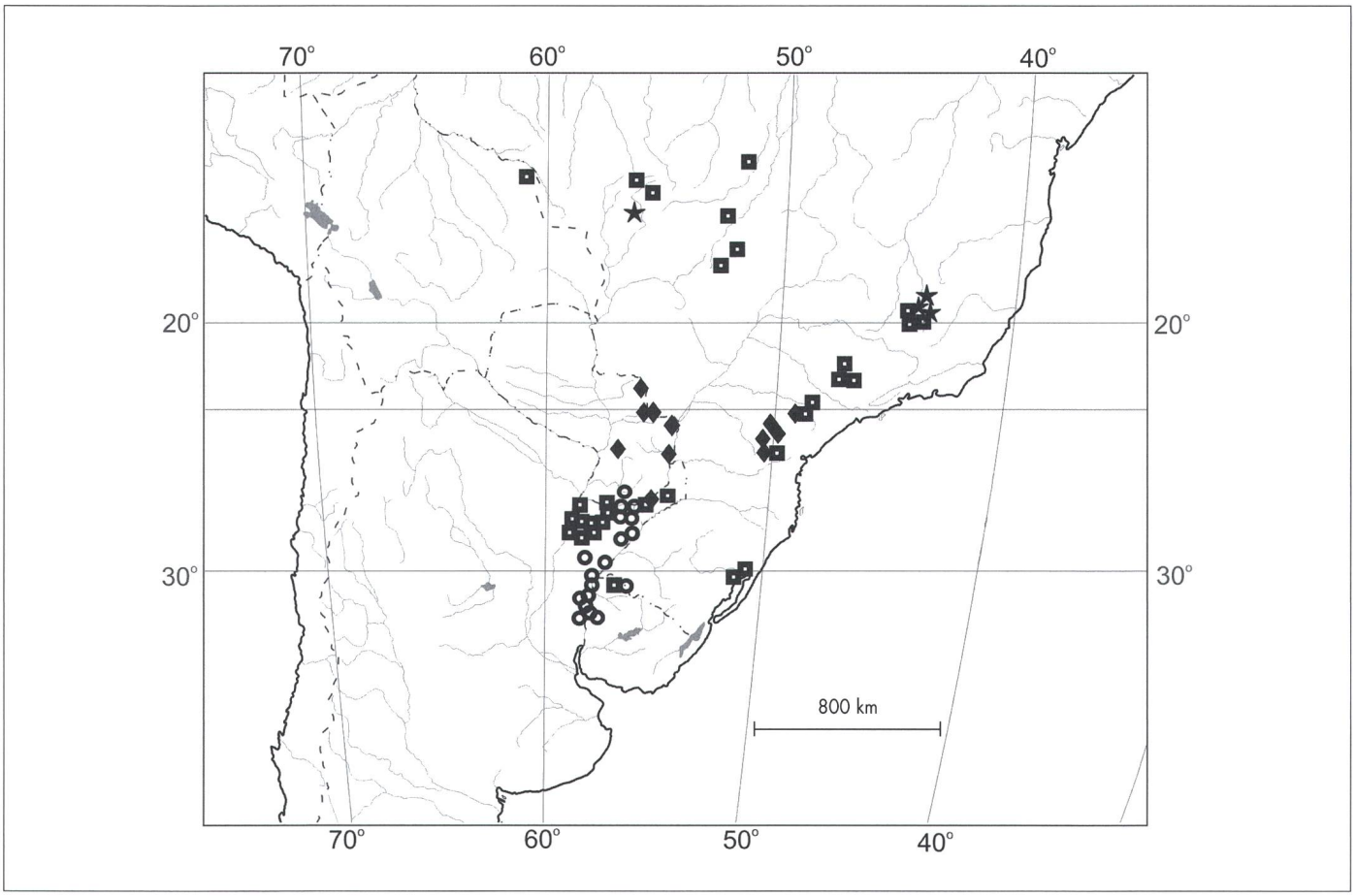

Fig. 5. – Geographical distribution of ◘ *Isostigma peucedanifolium* (Spreng.) Less. var. *peucedanifolium*; o *I. peucedanifolium* var. *crithmifolium* (Less.) Guad. Peter; ◆ *I. peucedanifolium* var. *speciosum* (Less.) Guad. Peter; ★ *I. peucedanifolium* var. *strictum* Guad. Peter.

pinnatisect; distal leaves deeply pinnatisect or simple, subulate; 20-160 mm long, shorter upwards; margin hyaline, broader at the base, ciliate; leaflets linear to subulate, acute or acuminate, 3-100 × 0.5-1 mm; petiole up to 40 × 1-1.5 mm. *Capitula* solitary, terminal, radiate, 14-20 × 17-50 mm in flowering, 13-20 × 15-30 mm in fruit; longly pedunculate, peduncles something broader distally. *Involucres* broadly campanulate or subglobose, 3-seriate, 10-12 × 15-20 mm. *Phyllaries* glabrous, margin hyaline, narrow; outer phyllaries 8-10, subulate or linear, acute or acuminate, foliose; inner phyllaries ovate, obtuse, scarious, brownish with the margin brown-purple. *Paleae* linear to filiform, 2- to 8-nerved; apex something spatulate, acute, crenate; purplish, nerves dark. *Ray florets* 14, limb linear, 10-nerved, 2- to 3-dentate, 15-16 × 2-2.5 mm, discolour, purplish in the back, white in the face; teeth acute. *Disc florets* with limb 5-lobed, 4-5 mm long, purple. *Anthers* 3 mm long; *style* branches with appendages 4-5 mm long. *Cypselae* linear, flattened, striate, 3- to 5-ribbed, midrib prominent, glabrous, narrowly winged, 9-18 × 1.5-2.5 mm, dark, with apex, wings, and base yellow. *Pappus* 2-aristate, aristae triangular, smooth, up to 1.5 mm long.

Distribution and habitat. – Occurs in southern Paraguay (Cordillera and Paraguarí), and north-eastern Argentina (Misiones), in the biogeographic Province of Parana (Fig. 3). Grows in regions of hills, high rocky places, among grasses, and sandy soils.

Flowering period. – September-June. This species rebuds after fires.

Nomenclatural notes. – SHERFF (1926: 251) mentioned *I. fiebrigii* Hieron. as a synonym of *I. dissitifolium,* but it is an invalid name because it has not been published.

Observations. – HASSLER (1916) considered *I. dissitifolium* to be a variety of *I. peucedanifolium,* distinguishing them by its different distal leaves. In *Isostigma*, there are not transitional

forms between developed and reduced distal leaves. Then, size and distribution of leaves were considered as important characters to distinguish species within the genera (SHERFF, 1926). Because of that, *I. dissitifolium* is maintained as a good species.

Iconography. – SHERFF (1926: plate 24, fig. a, f, j); PETER (2004b, 209, fig. 1).

Examined specimens. – **ARGENTINA. Dpto Candelaria-San Ignacio:** Campo entre Santa Ana y San Ignacio, I.1922, *Molfino s.n.* (F [672852]).

PARAGUAY. Dpto Cordillera: Cordillera Central, Cerros de Tobatí, IX.1902, *Hassler 6309* (BM, F, G, G, GH, NY); Cordillera de los Altos, II.1898/1899, *Hassler 3944* (G); Cordillera de los Altos, XI.1902, *Fiebrig 450* (BM, F, G, GH, US); Cordillera de los Altos, Caacupé, Tobatí, XII.1936, *Archer & Rojas 4894* (LP); Along road between Caacupé and Tobatí, 2.I.1937, *Archer & Rojas 4894* (NY); Itacurubí, X.1885/1895, *Hassler 1074* (G); Mbocayá guazú-ty, 18.XII.1950, *Schwarz 11118* (LIL); San Bernardino, X.1915, *Hassler 1509* (G); Inter rupibus dunatae pr. Valenzuela (cult. in J. Bot), X.1942, *Pavetti 9998* (AS); Paraguaria centralis, 1897, *Hassler 3944* (BM); s.l., s.d., *Hassler s.n.* (G); s.l., s.d., *s.coll.* (G).

4. *Isostigma peucedanifolium* (Spreng.) Less.

Perennial herbs, 0.2-2 m tall, with xylopodium up to 40 × 4-8 cm. *Scapes* simple, one to several in each plant, erect, aphyllous or with leaves reduced to bracteoles. *Leaves* rosulate; semiamplexicaul, glabrous; simple or deeply ternate-, pinnate-, bipinnate-, to multipinnatisect; margin ciliate at base; leaflets acute or acuminate. *Capitula* solitary, terminal, radiate or discoid. *Involucres* campanulate to hemispheric, 3- to 4-seriate. *Phyllaries* with margin scarious, sometimes ciliate, dark brown; outer phyllaries 7-10, 1- to 2-seriate, linear to narrowly triangular, broadened at base, apex attenuate, acute, foliose; inner phyllaries 2-seriate, linear to ovate, acute or obtuse, scarious, apex entire or crenate, brownish. *Paleae* subulate to linear-ovate, 3- to 7-nerved; apex acute with margin irregular; nerves and apex brown-purplish. *Disc florets* with limb 5-lobed (or 5-dentate), 4-7.5 mm long, purple; lobes triangular. *Anthers* 3-4 mm long; *style* branches with appendages 3-6 mm long. *Cypselae* linear to elliptical, flattened, striate, midrib prominent or trigonous, glabrous; wingless to narrowly winged, brown with base, apex, and margins yellowish. *Pappus* 2-aristate to null, aristae acicular to triangular, deciduous, smooth, 0.5-5(-7) mm long.

Distribution and habitat. – Inhabits in the biogeographic provinces of Parana, Espinal, Pampean, Cerrado, Amazon, and Chacoan (Fig. 5).

Notes. – The next four taxa are considered to be varieties because they have continuous distribution which shows intergradation near areas of sympatry (Fig. 5). *Isostigma peucedanifolium* var. *peucedanifolium* has very divided leaves, the other varieties have leaves with different levels of division, but never as divided as the typical variety. Leaflets of the variety *peucedanifolium* are canaliculate or with obovate section, rarely flat, narrower than the other. The variety *crithmifolium* differs from var. *peucedanifolium* by its wider and flat leaflets. *Isostigma peucedanifolium* var. *speciosum* (Less.) Guad. Peter has bracteolate scapes, expanded at the base of the capitulum. The variety *strictum* has smaller, discoid capitula, leaves simple or trifurcate, with erect leaflets.

Key to the varieties of *Isostigma peucedanifolium:*

1. Scape expanded at the base of the capitulum (4-7 mm diam), more than 20-bracteolate distally ..... **4c.** var. ***speciosum***

1a. Scape isodiametric all along, less than 10-bracteolate distally 2

2. Capitula discoid, up to 14 × 25 mm in flowering. Leaves simple, trifurcate (if pinnatisect, with leaflets erect) ..... **4d.** var. ***strictum***

2a. Capitula radiate, 10-30 × 20-60 mm in flowering. Leaves ternate-, pinnate-, bipinnate-, to multipinnatisect 3

3. Leaves pinnate- to multipinnatisect in the distal third; leaflets filiform, canaliculate, generally revolute, up to 0.7 mm wide ..... **4a.** var. ***peucedanifolium***

3a. Leaves ternate-, pinnate- to bipinnatisect in the distal half; leaflets linear, flat, 0.5-3 mm wide ..... **4b.** var. ***crithmifolium***

4a. *Isostigma peucedanifolium* (Spreng.) Less. var. ***peucedanifolium*** in Linnaea 6: 514. 1831.

≡ *Tragoceras peucedanifolium* Spreng., Syst. Veg. 3: 576. 1826 [as *"Tragoceros"*].

Lectotypus (designated by SHERFF, 1926: 253): **BRAZIL.** Rio Grande, s.d., *Sello s.n.* (B [destroyed]).

Lectotypus (designated by PETER, 2005: 234): **BRAZIL.** Rio Grande, s.d., *Sello s.n.* (K [photo]!; iso-: E [photocopy]!).

Scapes aphyllous to 10-bracteolate distally, 3.5(-4) mm diam at the base of the capitulum. *Leaves* deeply pinnatisect to multipinnatisect since the distal third; 4-54 cm long; leaflets 1-3 pairs, which are divided up to four times, filiform or subulate, acute, revolute, 5-200 × 0.2-0.7(-1) mm. *Capitula* radiate, 10-30 × 12-50 mm in flowering, 10-27 × 15-40 mm in fruit. *Phyllaries* glabrous. *Paleae* 3-nerved. *Ray florets* 9-30, limb linear to obovate, 3- to 12-nerved, 2- to 3(-4)-dentate, 5-25 × 2-3 mm, purplish or purplish in the back and white in the face; teeth acute. *Cypselae* 7-22 × 1-2.5 mm. *Pappus* 2-aristate to null. *Chromosome* number, $2n = 24$ (DEMATTEIS & FERNÁNDEZ, 1999).

Common names. – "Clavel del campo" (Argentina: Misiones); "cravo" (Brazil); "cravo do campo" (Brazil: Minas Gerais); "saudades do campo" (Brazil: São Paulo).

Distribution and habitat. – Occurs in central-southern Brazil (Goiás, Mato Grosso, Minas Gerais, Paraná, Rio Grande do Sul, and São Paulo), southern Paraguay (Itapúa and Misiones), north-eastern Bolivia (Santa Cruz), north-western Uruguay (Artigas), and north-eastern Argentina (Corrientes and Misiones) (Fig. 5). Grows in dry, high, infertile, and burned places; in acid, lateritic, sandy, clay-sandy, gravely, and rocky soils; among 30-1050 m. It forms little populations in savannas, steppe of grass or rush, "campos rupestres", rush of *Elionurus* Willd. with palmars of *Butia paraguayensis* (Barb. Rodr.) L. H. Bailey and *B. yatay* (Mart.) Becc. ("yatay pony"), open "cerrado" fields with low subshrubs or trees, edges of gallery forests and islet of forest, gullies, sandy and fixed dunes, gently slopes, high edge of brooks, sandy ravine of rivers, uplands, low hills with *Cereus* (Becc.) Becc., crops of pines and degraded places, grazing fields. It may be occasional, uncommon, locally frequent or abundant.

Flowering period. – August-May, with fruits the whole year.

Nomenclatural notes. – Neither SPRENGEL (1826) nor LESSING (1831) cited number or data of the type material collected by Sellow. SHERFF (1926) mentioned that probably it had been collected in the State of Río Grande do Sul, in Brazil, or perhaps, in Uruguay. This author cited material deposited in B as the type. So I consider that material as the lectotype. But it could not be founded in B, because it has been destroyed (Wallnöfer, *pers. comm.).* There is a duplicate deposited in K I considered as the lectotype.

Isostigma megapotamicum (Spreng.) Sherff was erroneously associated to *Isostigma* through a misinterpretation of the type material. When the right type was found, the name was associated with *Thelesperma* (SHERFF, 1927; PETER, 2005). Therefore, in this treatment *Isostigma megapotamicum* is excluded from *Isostigma.*

Observations. – The florets are fragrant, nice sweet smelling (e.g., *Goodland 60, Saldías & Arroyo 3545, Arbo & al. 6966),* and the leaves have a scent similar to fennel (in label *Schulz 7132).* It is used as saffron (in label of a specimen (LP [28874]).

Iconography. – SHERFF (1926, plate 24, fig. g, k, l); PETER (2005: 235, fig. 1).

Selected specimens. – **ARGENTINA. Dpto Bella Vista:** 10 km S de Bella Vista, ayo. Toropí, 22.V.1973, *Schinini 6510* (CTES, LP). **Dpto Berón de Astrada:** Itá Ibaté, 15 km al W, Arroyo Santa Isabel, 16.I.1977, *Schinini 14082* (CTES, F). **Dpto Capital:** Arroyo Riachuelo, lomada arenosa, 13.II.2004, *Peter 243* (BBB). **Dpto Concepción:** entre Santa Rosa y Río Santa Lucía, 5.II.1968, *Krapovickas & Cristóbal 13768* (CTES, LP). **Dpto Empedrado:** Empedrado, Ea. Tres Marías, cercano al río Paraná, 27°50'S 59°W, 20.III.1998, *Schinini 34383* (CTES, NY). **Dpto General Paz:** 15 km E de Itá Ibaté, Ruta 12, Ayo. Santa Lucía, 9.IV.1972, *Mroginski & al. 753* (CTES). **Dpto Goya:** camino a Las Mercedes, 14.XII.1948, *Cabrera 10535* (LP). **Dpto Ituzaingó:** Villa Olivari, Establecimiento Forestal, Reserva, 10.II.2004, *Peter 242* (BBB). **Dpto Lavalle:** Cerrito, Ruta 152 y Arroyo Batel, 21.XI.1979, *Schinini & al. 18867* (CTES, OS). **Dpto Mburucuyá:** Estancia "Santa Teresa", 15.XII.1951, *Pedersen 1392* (MO). **Dpto Saladas:** Pago Alegre, 6.XII.1949, *Schwarz* 9016 (LIL). **Dpto San Cosme:** Paso de la Patria, near cementery, 26.XI.1978, *Renvoize 3610* (CTES, MO, NY). **Dpto San Miguel:** 12 km NE de San Miguel, Estancia Toro-Y, San Miguel Cué, 4.III.1990, *Vanni & al. 1714* (CTES, GH). **Dpto San Roque:** Ea. Añá Cuá, 17.XII.1970, *Carnevali 2251bis* (CTES [83562], CTES [197744], F, LIL). **Dpto Cainguás:** Campo Grande, 13.III.1948, *Noratti 166* (BAB). **Dpto Candelaria:** Loreto, 20.I.1972, *Krapovickas & Mroginski 20754* (CTES). **Dpto San Ignacio:** campo several km W of San Ignacio, overlooking Río Alto Paraná, 6.II.1982, *Anderson 12376* (CTES, NY).

BOLIVIA. Dpto Santa Cruz: Velasco, Parque Nacional Noel Kempff Mercado, Las Gamas, 14°40'S 60°46'W, 10.XI. 1993, *Saldías & Arroyo 3545* (MO).

BRAZIL. Edo Goiás: Mun. Mineiros, Parque Nacional das Emas, Estrada para saida do Parque, 31.XII.1992, *Roque & al. 47* (SPF); Serra do Caiapó, ca. 50 km S of Caiapônia on road to Jataí, 17°12'S 51°47'W, 26.X.1964, *Irwin & Soderstrom 7366* (NY, OS, US). **Edo Mato Grosso:** Chapada dos Guimarães, Cachoeira Véu de Noiva, do Rio Coxipozinho, 15°30'S 55°45'W, 21.X.1985, *Pirani 1305* (F, MO, NY, SPF, US). **Edo Minas Gerais:** Mun. Belo Horizonte, Barreiro, 31.I.1933, *Mello Barreto 3808* (F); near Lagoa de Pampulha, VIII.1945, *Williams & Assis 7407* (GH); Mun. Caeté, Fazenda Geriza, 19°57'S 43°42'W, 8.X.1961, *Felippe 30* (BBB, NY); Mun. Macacos, 18.XI.1980, *Madalena & Grandi 483* (BHCB); Mun. Santa Luzia, Lagoa Santa, Jaguara, 22.X.1965, *Goodland 60* (NY); Planalto of Serra do Cipó (a portion of Serra do Espinhaço), 85 km north-northeast of Belo Horizonte, vicinity of road from Lagoa Santa to Conceição do Mato Dentro, at km 112 from Belo Horizonte, 22.XI.1965, *Tryon & Tryon 6806* (GH). **Edo Paraná:** Mun. Ponta Grossa, Rio Guavirova, 3.XII.1969, *Hatschbach & Ravenna 23047* (CTES, US). **Edo Rio Grande do Sul:** Guaiba, Fazenda S. Maximiano, BR-116, km 307, 27.XI.1990, *Matzenbacher s.n.* (F [2078134]); Porto Alegre, Morro Santa Teresa, 12.I.1938, *Rambo 2339* (LP, SP). **Edo São Paulo:** Mun. Itapetininga, Estrada S. Paulo-Itapetininga, km 163 bacia do rio Tatuí, 23°21'S 47°53'W, 27.XII. 1960, *Válio 202* (NY, SP); Mun. Itirapina, Itirapina, 17.VIII.1986, *da Silva Ribeiro 60* (SPF); Fazenda Campininha, 3,4 km NNW de Pádua Sales, 17.XI.1960, *Mattos & Mattos 8467* (SP); Mun. São Carlos, Estrada entre Iti-

rapina e a Represa do Lobo, próximo ao pedágio municipal, 10.XI.1995, *Souza & al. 9340* (ESA). **State indeterminate:** s.l., s.d., *Sello 3327* (GH); s.l., s.d., *Sello s.n.* (GH, HAL [photocopy BBB], NY [274183], NY [274184], W [photography LP], W [photocopy BBB], WRSL [photocopy BBB]).

Paraguay. Dpto Itapúa: Isla Yacyretá, 6 km de la Estancia Melgarejo, 24.III.1993, *Quintana & al. 166* (CTES). **Dpto Misiones:** Ayolas, 27°25'S 56°50'W, 2.II.1988, *Schinini & Vanni 25954* (CTES).

Uruguay. Dpto Artigas: Artigas, junto al río Cuareim, I.1936, *Chebataroff 1998* (LP).

4b. *Isostigma peucedanifolium* var. ***crithmifolium*** (Less.) Guad. Peter, **comb. et stat. nov.** (Fig. 6)

≡ *I. crithmifolium* Less. in Linnaea 6: 515. 1831.

Lectotypus (designated by Sherff, 1926: 253): **Uruguay** (probably): s.l., II.1823, *Sello s.n.* (B [destroyed])

Lectotypus (designated here): **Uruguay** (probably): s.l., *Sello s.n.* (P! [photo GH]).

Scapes aphyllous to 10-bracteolate distally, 1.2-3 mm diam up to 4 mm at the base of the capitulum. *Leaves* deeply ternate-, pinnate-, or bipinnatisect since the distal half; 4.5-26 cm long; leaflets 1-3 pairs, narrowly linear, flat, striate, opposite, 2-75 × 0.5-3 mm; petiole 15-190 × 1-5 mm. *Capitula* radiate, 15-23 × 20-50 mm in flowering, 13-23 × 20-40 mm in fruit. *Involucres* 10-20 × 12-37 mm. *Phyllaries* glabrous. *Paleae* 7-nerved. *Ray florets* 9-15, limb linear, narrowly obovate or elliptical, 12- to 17-nerved, 2- to 3(-4)-dentate, 12-25 × 2-4 mm, purple or purple in the back and white in the face. *Cypselae* 12-19 × 1-2.5 mm, outer shorter than inner. *Pappus* 2-aristate.

Common name. – "Clavel del campo" (Argentina: Entre Ríos).

Distribution and habitat. – Inhabits western Uruguay (Paysandú and Salto), southern Paraguay (Itapúa and Misiones), southern Brazil (Rio Grande do Sul), and north-eastern Argentina (Corrientes, Entre Ríos, and Misiones) (Fig. 5). Grows in clay-sandy soils, in grasslands, savannas, and dunes, sandy prairies, dry and high, "campos", on railways and embankment, rocky hills, sandy and rocky ravines. Rare to very common.

Flowering period. – November-April.

Nomenclatural notes. – According to Sherff (1926), four specimens of *Sello s.n.* from Brazil, were deposited at B, two of them with the label "Salto, Febr. 23" and other "S. José del Uruguay, Feb., 23". Sherff (1926) noted that Sello probably collected the type material in Uruguay. Since there is Villa San José, in Argentina, near the Uruguay river (Department of Colón, province of Entre Ríos), the type material could have been collected in an Argentinean place. On the label of the photo of the lectotype (GH) occurs "Herbier Muséum Paris. Brésil. province de Rio-Grande (Herbier Impérial du Brésil N° 1058)", but there is a little label adhered to the stem: "Sello... Feb 23". This date coincides with that mentioned by Sherff (1926) when he designated the specimen of B as lectotype. The material deposited in Berlín was destroyed. Because of that, the specimen of P has been designated here as the lectotype.

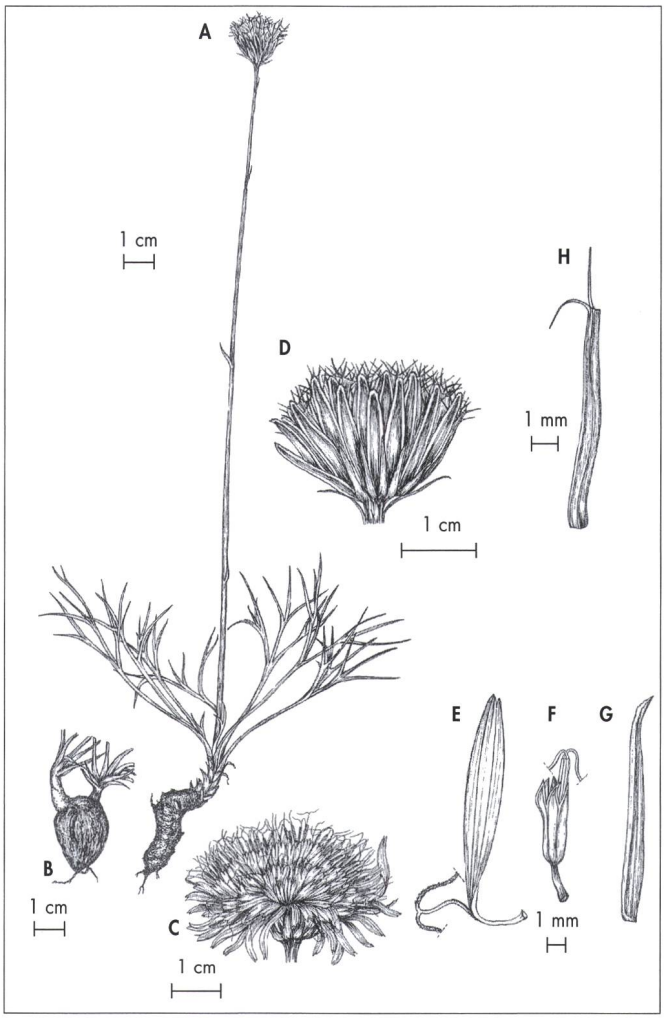

Fig. 6. – *Isostigma peucedanifolium* var. *crithmifolium* (Less.) Guad. Peter. **A.** Plant; **B.** Xilopodium; **C.** Flowering capitulum; **D.** Capitulum in fruit; **E.** Ray floret; **F.** Disc floret; **G.** Paleae; **H.** Cypsela.

[**A:** *Long 664*, BBB; **B:** *Ibarrola 1450*, NY; **C-D:** *Ibarrola 2465*, GH; **E-H:** *Pedersen 7682*, LP] [Drawn by Guadalupe Peter]

Observations. – The florets are fragrant, with a smell similar to carnation (Cabrera, 1974).

Iconography. – Sherff (1926: plate 24, fig. b, c); Cabrera (1974: 386, fig. 225).

Selected specimens. – **Argentina. Dpto Gral. Alvear:** Torrent F.C.N.E.A., 2/10.XII.1936, *Spegazzini 272* (CTES). **Dpto Ituzaingó:** Ruta 39, a 10 km de Ruta 14, 11.II.1978, *Cabrera & Sáenz 29101* (CTES, LP). **Dpto Monte Caseros:** Río Mocoretá, 20.I.1995, *Long 667* (BBB). **Dpto Paso de los Libres:** Est. "Santa Ana", rincón de S. Ana, 21 km E de Bonpland, costa Río Uruguay, 19.XI.1973, *Lourteig & al. 2809* (CTES). **Dpto Santo Tomé:** Provincial road nº 39, about 10 km NW of Playadito, 18.XI.1976, *Pedersen 11523* (CTES, GH). **Dpto Colón:** Parque Nacional El Palmar, roquerío frente a La Glorieta, 20.XII.1986, *Xifreda & Maldonado 600* (LP, SI). **Dpto Concordia:** Concordia, 24/30.XI.1936, *Spegazzini 99* (BAB). **Dpto Federación:** Colonia Ensanche, Costa Lago Salto Grande, Campo Zampedri, 3.I.1999, *Grassini 340* (BBB). **Dpto Capital:** Itaembé, 30.I.1935, *Rodríguez 520* (BA).

Brazil. Edo Rio Grande do Sul: Quaraí, Estancia do Jardín, I.1945, *Rambo 26022* (LP).

Paraguay. Dpto Itapúa: Colonia Gral. Delgado, Estancia "San Miguelito", 12.II.1956, *Pedersen 4271* (GH, LP, NY, US). **Dpto Misiones:** Santiago, Estancia "La Soledad", 27.XII.1965, *Pedersen 7682* (LP, NY).

Uruguay. Dpto Paysandú: Quebracho, limestone country north of, 9.XII.1943, *Bartlett 21138* (GH, LP, NY, TEX); Río Uruguay y arroyo Chapicuy, 21.II.1941, *Rosengurtt B-3210* (LP). **Dpto Salto:** Salto, camino de acceso a la ciudad, rumbo a Arapey, 31º21'38"S 57º56'30"W, 24.XI.2001, *Seijo & al. 2379* (CTES).

4c. ***Isostigma peucedanifolium*** var. ***speciosum*** (Less.) Guad. Peter, **comb. et stat. nov.**

≡ *I. speciosum* Less. in Linnaea 6: 515. 1831.

Lectotypus (designated by Sherff, 1926: 256): **Brazil.** s.l., *Sello s.n.* (B [destroyed]).

Neotypus (designated by Peter, 2004b: 212): **Brazil. Edo Paraná:** Vila Velha, en campo cerca de la iglesia, 16.I.1987, *Krapovickas & Cristóbal 40922* (CTES!; iso-: F!, GH!).

= *I. peucedanifolium* f. *discoidea* Hassl. in Repert. Spec. Nov. Regni Veg. 14: 277. 1916. **Typus: Paraguay. Cordillera:** Cerros de Tobatí, 31.I.1903, *Fiebrig 810* (holo-: G!; iso-: AS!, BM!, F!, GH!, RSA [photocopy]!) (synonymised by Sherff, 1926).

= *I. peucedanifolium* f. *radiata* Hassl. in Repert. Spec. Nov. Regni Veg. 14: 277. 1916. **Lectotypus** (designated by Peter, 2004b: 212): **Paraguay. Dpto Canindeyú:** in campo Ipé-hú, Sierra Mbaracayú, XII.1898/99, *Hassler 5586* (G!). **Syntypus: Paraguay.** Sierra de Amambay in campo siacese Punta Pará, IV.1907-08, *Hassler 10366* (G!) (synonymised by Sherff, 1926).

Scapes more than 20-bracteolate distally, 2-3 mm diam, expanded at the base of the capitulum, up to 7 mm diam. *Leaves* deeply ternate- or bi-ternatisect, rarely entire, linear, canaliculate, acute; 8-45 cm long, up to 1 mm wide; leaflets up to 8, linear or subulate, acute or acuminate, 20-150 × 0.5-2.5 mm, similar to the petiole, ascending; petiole canaliculate; basal bracteoles 20 cm long, gradually shorter and denser to the apex. *Capitula* radiate or rarely discoid, 13-25 × 25-60 mm in flowering, 16-20 × 30-42 mm in fruit. *Involucres* 14-25 × 25-35 mm. *Phyllaries* glabrous or puberulous. *Paleae* 7-nerved. *Ray florets* 15-20, limb linear, 14-nerved, 2- to 3-dentate, 16-25 × 2.5-4 mm, purple or purple in the back and yellow or white in the face. *Cypselae* 11-18 × 2-3 mm. *Pappus* 2-aristate to rudimentary, aristae up to 2 mm long, one longer than the other.

Common names. – "Clavel de campo" (Argentina: Misiones); "clavelón" (Argentina: Misiones); "Cravo do campo" (Brazil: São Paulo).

Distribution and habitat. – Grows in north-eastern Argentina (Misiones), south-eastern Brazil (Mato Grosso do Sul, Paraná, and São Paulo), eastern and southern Paraguay (Alto Paraná, Amambay, Canindeyú, and Cordillera) (Fig. 5). Inhabits in "cerrado"; hills, high fields, plateaus, slopes, valley boundaries, savannas, grasslands, "campos", and bordering forests; from 200-700 m; in dry and burned places. It can be scarce to locally abundant.

Flowering period. – November-March. This species rebuds after fires.

Observations. – Some specimens (e.g., *Dusén 4345*, *Dusén 16444*, *Jörgensen 4806, Hatschbach 5442, Koyama & al. 13847, Pereira 8300 & Pabst 7575)* do not have the scape expanded at the base of the capitulum, but such plants are considered to belong to this variety because they are characterised by the distally bracteolate scape. The florets have a smell similar to carnation *(Montes 14903).*

Illustrations. – Sherff (1926: plate 24, fig. d, e); Peter (2004b: 211, fig. 3).

Examined specimens. – **Argentina. Dpto San Ignacio:** San Ignacio (Colonia), 12.III.1956, *Montes 14903* (NY). **Brazil. Edo Paraná:** Mun. Ponta Grossa, Rod. BR-277, km 522, próximo a Vila Velha, 3.II.1999, *Cruz & al. 80* (BHCB); Vila Velha, 10.II.1960, *Pereira 5240* (F); Vila Velha, 14.I.1964, *Pereira 8300 & Pabst 7575* (LP); Vila Velha, 5.III.1970, *Koyama & al. 13847* (SP); Capão Grande, 7.III.1904, *Dusén 4345* (BM, SI); Capão Grande, 3.II.1909, *Dusén 7676* (BM); Desvio Ribas, 17.XII.1911, *Dusén 11359* (GH); Estrada do Café, km 70 PR, 7.II.1965, *Dombrowski 1474* (LP); Jaguariaíva, 17.I.1915, *Dusén 16444* (F, GH, SI); Rio Tibagi, 30.I.1959, *Hatschbach 5442*, hoja b (LIL). **Edo São Paulo:** Itapetininga, 5.XI.1887, *Loefgren 16773* (NY, US).

Paraguay. Dpto Alto Paraná: Reserva Abierta, 20 km NE de Hernandarias, Ea. Santa Elena, zona Río Pirá Pytá, 2.I.1991, *Caballero Mármori 2009* (CTES). **Dpto Amambay:** Sierra de Amambay, 1907/1908, *Hassler 5586* (G); Co. Torín, Sierra de Amambay, II.1922, *Rojas 4239* (LP). **Dpto Canindeyú:** Estancia Prim(av)era, I.1932, *Jörgensen 4806* (F [1028919], F [1028920], MO, LL).

4d. *Isostigma peucedanifolium* var. ***strictum*** Guad. Peter, **var. nova** (Fig. 7)

Typus: Brazil. Edo Minas Gerais: Municipio de Jaboticatubas, Serra do Cipó (the highest part of the long narrow Serra do Espinha), along road at km 112.4 (1.4 km along road N of "Chapeu do Sol"), 19°19'S 43°46'W, 22.XI.1965, *Eiten & Eiten 6767* (holo-: US!; iso-: SP!).

A varietate peucedanifolia differt foliis indivisis, trifurcatis vel pinnatisectis, segmentis strictis 0.2-1 mm; capitulis discoideis ad 1.4 x 2.5 cm.

[Leaves entire, if pinnatisect, then trifurcate, leaflets erect, 0.2-1 mm; capitula discoid until 1.4 × 2.5 cm].

Scapes less than 10-bracteolate distally, 1-3 mm wide. *Leaves* simple, trifurcate, or pinnatisect; 60-380 mm long; leaflets 1-2 pairs, filiform, erect, 9-180 × 0.2-1 mm; petiole 35-240 mm long. *Capitula* discoid, 9-14 × 10-25 mm in flowering, up to 16 × 30 mm in fruit. *Paleae* spatulate at the apex. *Pappus* reduced.

Common names. – "Cravo dos campos" (Brazil); "saudades do campo" (Brazil); "cravo" (Brazil: Minas Gerais); "cravo do campo" (Brazil: São Paulo).

Distribution and habitat. – Occurs in central and southeastern Brazil (Mato Grosso, Minas Gerais, and São Paulo) (Fig. 5). Grows on rocky and sandy soils; between 140-960 m. It inhabits dry fields, "campos rupestres", and open "cerrado". May be infrequent to very abundant.

Flowering period. – July-January.

Examined specimens. – **Brazil. Edo Mato Grosso:** Mun. Cuiabá, Sto. Antônio de Leverger, 15°47'11"S 56°04'17"W, Est. Sto. Antônio Ranchaõ de Lagõa, 9.XI.1978, *Macedo & al. 972* (UFMT). **Edo Minas Gerais:** Mun. Belo Horizonte, Parque Vera Cruz, 8.XI.1932, *Mello Barreto 3806* (F); Serra do Taquaril, 12.VII.1934, *Mello Barreto 3812* (BHCB); Mun. Caeté, Alto do Serrote, 1.XII.1933, *Mello Barreto 3811* (BHCB, F); Mun. Jaboticatubas, Usina Pacifico Mascarenhas, 15.XI.1939, *Mello Barreto 10238* (BHCB); Mun. Sabará, km 35 da estrada para Caeté, 43°53'42"S 43°42'09"W, 14.VIII. 1998, *Rapini & al. 644* (SPF); Mun. Santa Luzia, Lagoa Santa, 26.IX.1863, *Warming s.n.* (F 667979, NY); Lagoa Santa, 20.XI.1933, *Mello Barreto 3809* (BHCB); pr. S. Luzia, 24.X.1924/1929, *Riedel 595* (NY); Mun. Santana do Riacho, km 105, ao longo da rodovia Belo Horizonte-Conceição do Mato Dentro, 4.X.1981, *Pirani & al. 20264* (SPF); Serra do Cipó, 24.X.1974, *Hatschbach 35288* (MO); Serra do Cipó, 3,5 miles from Hotel Chapeu de Sol, 19.XII.1959, *Maguire & al. 44644* (NY); Serra do Cipó, estrada para Cerro, imediações do Chapéu de Sol, 19.XII.1966, *Campos 2* (SP); Serra do Cipó, km 107, Chapéu do Sol, ao longo da Rod. Belo Horizonte-Conceição do Mato Dentro, 13.XI.1984, *Stannard & al. s.n.* (BBB, SPF 34981); Serra do Cipó, Rodovía Belo Horizonte-Conceição do Mato Dentro, ca. 2 km após o Córrego Vitalino, 12.I.1995, *Souza & al. 10282* (ESA). **Edo São Paulo:** Emas Cerrado, 30.XI.1978, *Morretes s.n.* (SPF 19667).

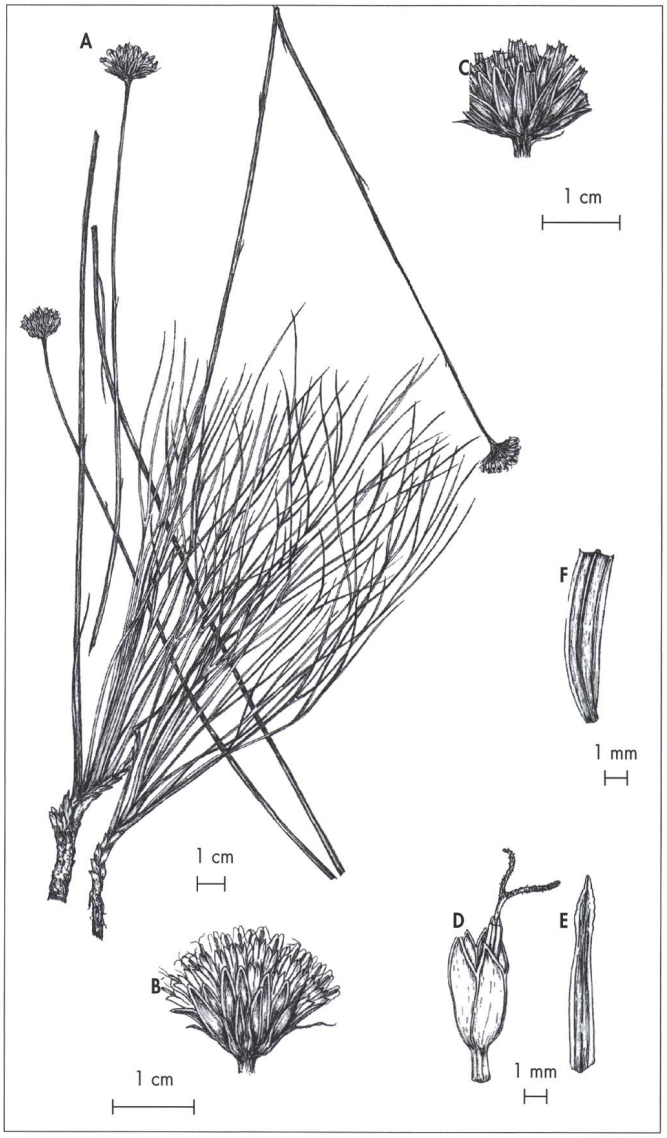

Fig. 7. – *Isostigma peucedanifolium* var. *strictum* Guad. Peter; **A.** Plant. **B.** Flowering capitulum; **C.** Capitulum in fruit; **D.** Disc floret; **E.** Paleae; **F.** Cypsela. [**A-B:** *Eiten & Eiten 7676*, US; **C:** *Mello Barreto 3811*, BHCB; **D-F:** *Stannard & al. s.n.*, SPF] [Drawn by Guadalupe Peter]

5. ***Isostigma simplicifolium*** Less.

Perennial herbs. *Scapes* simple, one to several in each plant, erect, leafy at the base, with distal leaves reduced to bracteoles, denser distally. *Leaves* rosulate; semiamplexicaul, glabrous; simple, linear or very longly obovate, entire, with apex acute, rounded, mucronate, or up to 4-dentate, elongate, flat, striate, parallel nerved; teeth linear, acute; margin hyaline, sometimes revolute; base gradually narrow (like a pseudopetiole), 1-2 mm wide, canaliculate and thicker. *Capitula* solitary, terminal, radiate. *Involucres* campanulate or subglobose, 3- to 4-seriate. *Phyllaries* glabrous, margin membranous, ciliate or fimbriate; outer phyllaries 1- to 2-seriate, linear to narrowly triangular, acute, foliose; inner phyllaries linear, triangular, or narrowly ovate, scarious, apex crenate, brown-purplish. *Paleae* linear to narrowly triangular, 9- to 10-nerved; apex acute or subobtuse, margin irregular; apex and nerves reddish. *Ray florets* purple in the back and lighter in the face. *Disc florets* with limb 5-lobed, purple. *Anthers* 4 mm long. *Cypselae* linear, narrowly ovate or elliptical, flattened, 3-ribbed, midrib prominent, glabrous, subwinged, wings entire hyaline, 10-18 × 1.5-3 mm, dark or yellow. *Pappus* 2-aristate, aristae triangular, acute, ascending, smooth, 0.5-3 mm long.

Distribution and habitat. – Occurs in the biogeographic provinces of Parana, Chacoan, and Cerrado.

Notes. – *Isostigma simplicifolium* is highly variable in longitude of the leaves, shape of the limb of ray florets, size of the ray florets, and width of the scapes. Sometimes these different traits are present in the same specimen. In spite of that, the number of bracteoles in the stem and the size of the capitula are characters of enough weight to establish two varieties, especially because they have a disjoint distribution (Fig. 3).

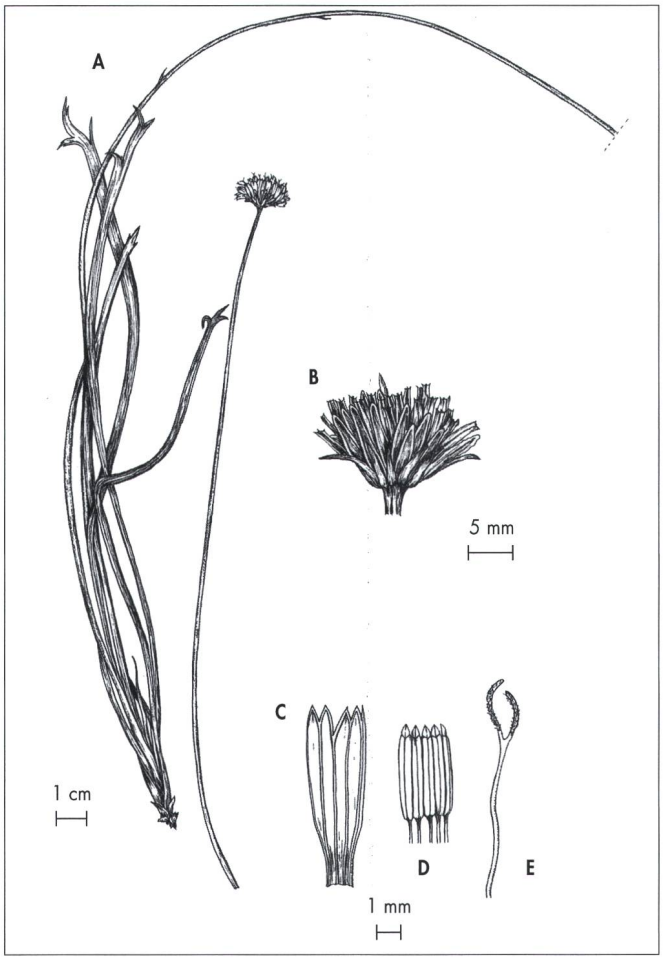

Fig. 8. – *Isostigma simplicifolium* Less. var. *simplicifolium*. **A.** Plant; **B.** Capitulum in fruit; **C.** Dissected disc floret; **D.** Stamens; **E.** Style.
[*Claussen s.n.*, BM] [Drawn by Guadalupe Peter]

Key to the varieties of *Isostigma simplicifolium:*

1. Scapes 4- to 7-bracteolate, isodiametric. Capitula 10-15 × 13-19 mm. Involucres 8 × 13-15 mm ..... **5a.** var. ***simplicifolium***

1a. Scapes 20- to 50-bracteolate, generally expanded at the base of the capitula. Capitula 12-30 × 20-60 mm. Involucres 10-12 × 18-40 mm ..... **5b.** var. ***riedelii***

5a. ***Isostigma simplicifolium*** Less. var. ***simplicifolium*** in Linnaea 6: 513. 1831 (Fig. 8).

Lectotypus (designated by Sherff, 1926: 249): **Brazil:** Fazenda da Porteira, 1818, *Sello 873* (numbered also 1111) (B [destroyed]).

Neotypus (designated here): **Brazil. Edo Minas Gerais:** Mun. Joaquim Felício, Serra do Cabral, 21.X.1999, *Hatschbach, Spichiger, Cervi & Barbosa 69434* (US!; iso-: B [digital image]!).

Herbs up to 75 cm tall. *Scapes* less than 7-bracteolate, 1-1.5 mm diam. *Leaves* 100-270 × 2-6 mm. *Capitula* 10-15 × 13-19 mm in flowering, 10 × 18 mm in fruit. *Involucres* 8 × 13-15 mm. *Ray florets* with limb linear, 3-dentate. *Disc florets* with limb 6.5 mm long; lobes acute; *style* branches with appendages 3.5 mm long.

Common name. – "Cravo do campo" (Brazil: Minas Gerais).

Distribution and habitat. – Occurs in south-eastern Brazil (Minas Gerais) (Fig. 3). It inhabits in "campo rupestre", on sandy soils.

Flowering period. – October.

Nomenclatural notes. – In the original description, Lessing (1831) mentioned: "Sellow in Brasilia", without specifying number or herbarium. Baker (1884) studied two of Sello's specimens from Brazil, in Fazenda da Porteira *(Sello 873)* and

San Antonio do Monte *(Sello 1111)*. In his revision of this genus, SHERFF (1926) cited the specimen *Sello 873* as type material, numbered also as *1111*, collected in Fazenda da Porteira in 1818, and deposited in B. He considered these materials to be part of the same specimen with different numbers. According to SHERFF (1926), the type consists of three sheets: (1) one of them has the locality Fazenda da Porteira; (2) the second one says only Brazil; (3) and the third sheet contains two specimens, one corresponding to *I. simplicifolium,* with a label similar to the first sheet, and another corresponding with *I. peucedanifolium* var. *crithmifolium,* with the locality San Antonio do Monte. Since, the specimens deposited at B were destroyed and I did not find any other specimens collected by Sello, a neotype is designated in the present work, with the data of the protologue.

Iconography. – SHERFF (1926: plate 23, fig. c, d, e, f, v, w).

Examined specimens. – **BRAZIL. Edo Minas Gerais:** without date, *Sch. Bip.* (probably) *s.n.* (F [970798]); Ouro Branco, II.1835, *Riedel 2978* (F). S.l., 1840, *Claussen s.n.* (BM [632486]).

5b. *Isostigma simplicifolium* var. ***riedelii*** (Baker) Guad. Peter, **comb. et stat. nov.** (Fig. 9)

≡ *I. speciosum* var. *riedelii* Baker in Mart., Fl. Bras. 6 (3): 240. 1884.

≡ *I. riedelii* (Baker) Chodat in Bull. Herb. Boiss. ser. 2, 2: 394. 1902.

Typus: BRAZIL. Rio Grande do Sul: In campis siccis frequens, Rio Pardo, 1828, *Riedel 602* (holo-: P [265912, digital image]!; iso-: GH!, P [265911, digital image, photo GH]!).

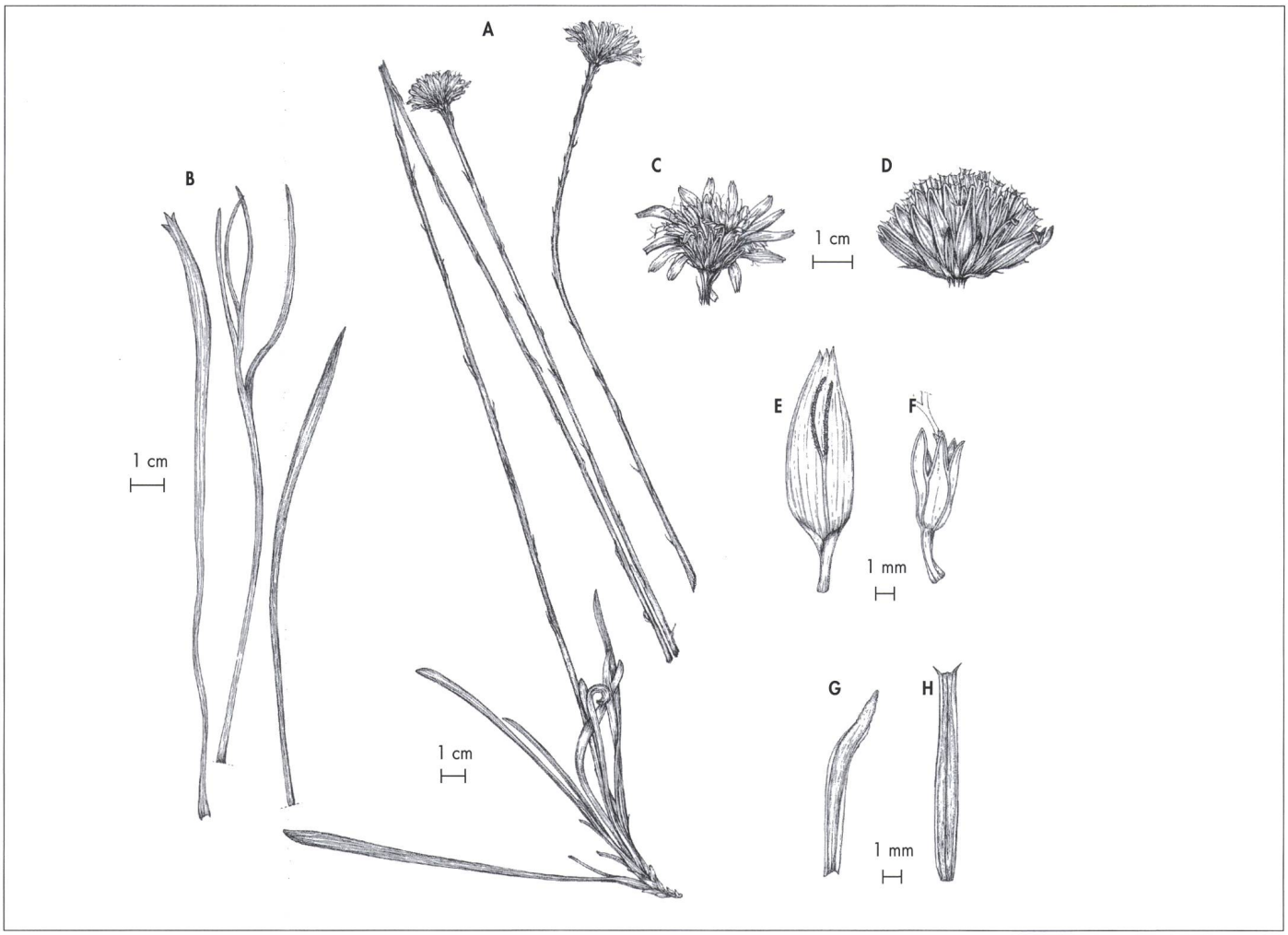

Fig. 9. – *Isostigma simplicifolium* var. *riedelii* (Baker) Guad. Peter. **A.** Plant; **B.** Different types of leaves; **C.** Flowering capitulum; **D.** Capitulum in fruit; **E.** Ray floret. **F.** Disc floret; **G.** Paleae; **H.** Cypsela.

[**A-C, F, G:** *Hassler 8047*, GH; **D:** *Fernández Casas 6328*, NY; **E:** *Hassler 9927*, G; **H:** *Fiebrig s.n.*, G] [Drawn by Guadalupe Peter]

Herbs 0.5-2 m tall, with xylopodium. *Scapes* 20- to 50-bracteolate, expanded at the base of the capitulum (up to 6 mm wide). *Leaves* 50-450 × 1.5-9 mm; teeth up to 70 × 2.5 mm; bracteoles shorter and denser distally. *Capitula* 12-30 × 20-60 mm in flowering, 14-23 × 18-36 mm in fruit. *Involucres* 10-12 × 18-40 mm. *Ray florets* with limb linear to ovate, 10- to 22-nerved, 2- to 3-dentate to deeply partite; teeth acute or mucronate. *Disc florets* with limb 5-6 mm long. *Style* branches with appendages 4-6 mm long.

Distribution and habitat. – Occurs in eastern Paraguay (Amambay, Caaguazú, Canindeyú, Concepción, and San Pedro) and southern Brazil (Rio Grande do Sul) (Fig. 3). Grows in dry fields, edge of rivers, high and dry prairies, among subshrubs, high plateaus, low ridges and slopes near rivers, forests and "cerrado" thickets, with frequent fires, 250-300 m.

Flowering period. – August-March.

Nomenclatural notes. – Baker (1884) mentioned Schultz Bipontinus as the author of *Isostigma speciosum* var. *riedelii,* but Schultz Bipontinus did not publish the name. Erroneously, the name *I. riedelii* was assigned to Baker (1884), but was really published by Chodat (1902).

There were localised Riedel's specimens whose labels coincide with the cited in the original description. They are *Riedel 602* in P (P [265912 & 265911]), and without number in GH. Thus, these specimens are considered as type material.

Iconography. – Sherff (1926: plate 23, fig. i, j, k, l, m, x, y); Basualdo & Soria (2002: 61, fig. 24).

Examined specimens. – **Brazil:** s.l., 1862, *Riedel s.n.* (K [photography BBB]).

Paraguay. Dpto Amambay: Cerca y al sur de Bella Vista, 13.II.1982, *Fernández Casas & Molero 6328* (MO, NY); camino a Colonia Estrella, 1 km W del Hito 1/44, 22°22'S 55°45'W, 10.XII.1997, *Schinini & Dematteis 33624* (CTES); Esperanza, VIII.?, *Hassler 567* (G); Ea. San Luis, Sierra de Amambay, cerca del límite Brasil-Paraguay, 22°22'64"S 55°47'20"W, 6.III.2002, *Schinini & al. 35857* (CTES, FCQ, PY); Fluminis Apa, in campis in regione cursus superioris, iter ad Paraguariam septentrionalem, XI.1901/2, *Hassler 8047* (BM, F, G, GH, MO); Sierra de Amambay, XII.1907/08, *Hassler 9927* (BM, F, G, 561, 578); Sierra de Amambay, VIII.1907/ 08, *Hassler 10567* (G); Sierra de Amambay, 1907/08, *Hassler s.n.* (G); 51 km por ruta 3, luego del cruce con ruta 5, 22°17'S 56°25'W, 13.XII.1997, *Schinini & Dematteis 33796* (CTES, GH). **Dpto Caaguazú:** In vicinii Caaguazú, III.1905, *Hassler 9238* (BM, F, G, GH). **Dpto Canindeyú:** Entre Curuguaty e Ypehu, cerca de Villa Ygatymí, 4.II.1982, *Fernández Casas & Molero 5926* (NY); Mbaracayú Natural Reserve, 24°09'37"S 55°17'06"W, 15.I.1998, *Zardini & Leognino 48052* (MO); Sierra de Mbaracayú, Río Tapiraguay, XII.1898/99, *Hassler 5978* (G). **Dpto Concepción:** 20 km N de Cororo, I.1992, *Soria 5084* (FCQ); Zwischen Río Apa und Río Aquidabám, Villa Lana, I.1908/1909, *Fiebrig 4755* (BM, G, GH). **Dpto San Pedro:** Rancho Laguna Blanca, a 500 m del retiro al N, 23°44'04.3"S 56°17'49.6"W, 16.I.2002, *González & López 798* (FCQ); Ruta a Capitán Bado, Estancia Monte Alto, I.1992, *Soria 5106* (FCQ); San Pedro Yaguareté Forest around aserradero, 23°47'46"S 56°12'41"W, 12.III.1998, *Zardini & Guerrero 48390* (US); San Pedro Yaguareté Forest around aserradero, 23°47'46"S 56°12'41"W, 12.III.1998, *Zardini & Guerrero 48391* (US). Paraguay septentrional, 1908, *Fiebrig s.n.* (G).

6. ***Isostigma sparsifolium*** Guad. Peter in Novon 16: 378. 2006.

≡ *I. impala* B. N. Sm. & Turner [nomen nudum].

Typus: Brazil. Edo Goiás: 37 km NW of Itumbiara on road to Rio Verde, 2.II.1959, *Irwin 2543* (holo-: F!; iso-: TEX!, UC [digital image]!).

Perennials 10-15 cm tall. *Stems* ramified at the base, ascending, leafy, narrowly winged, wings hyaline. *Leaves* distributed along the stems, alternate, rarely opposite; semi-amplexicaul, glabrous; pinnatisect, 15-30 mm long; margin ciliate at the base; leaflets 1-3 pairs, filiform, 5-30 × 0.2 mm. *Capitula* solitary, terminal and axillar, radiate, 7-8 × 13-20 mm in flowering, 7-8 × 6-9 mm in fruit; pedunculate, peduncles erect, aphyllous or leafy at the base, 30-90 mm long. *Involucres* campanulate to hemispheric, 3-seriate, 3-4 × 4-5 mm. *Phyllaries* scarious, brownish, margin hyaline; outer phyllaries triangular, subobtuse; inner phyllaries triangular to narrowly ovate, acute, rounded, or acuminate. *Paleae* linear or narrowly obovate, 3- to 5-nerved, puberulous on the nerves; apex acute, rounded, or mucronate, with margin crenate. *Ray florets* with limb elliptical to obovate, 4- to 5-nerved, 2-dentate, 6-9 × 1.5-3.5 mm, white with reddish nerves; teeth acute or rounded. *Disc florets* with limb 4-lobed, 2-4 mm long, yellow with reddish nerves. *Anthers* 1.5-2 mm long. *Style* branches with appendages 2 mm long. *Cypselae* linear, flattened, striate with midrib prominent or trigonous, hispid on the margin, apex, and ribs, or on the distal half, 3-3.5 × 0.5-0.7 mm, yellow, brownish, or black. *Pappus* 2-aristate with a ciliate crown, aristae acicular, antrorsely hispid up to the apex, 2-4 mm long.

Distribution and habitat. – Occurs in central-southern Brazil (Goiás and San Pablo), in the biogeographic province of Cerrado (Fig. 3). Grows among grasses in forest clearings on brown sandy soils. Locally abundant.

Flowering period. – October-February.

Nomenclatural note. – The type specimen was previously named *I. impala* B. N. Sm. & Turner by Smith & Turner (1975), in a work about Kranz syndrome in *Asteraceae.* Neither this name was accompanied by a description, nor did authors mention it as a new species. Therefore, *I. impala* is a *nomen nudum* (Peter, 2006).

Iconography. – Peter (2006: 379, fig. 1).

Examined specimens. – **Brazil. Edo São Paulo:** Cama Verde, St. José, X.1855, *Regnell 783* (F [642009]); s.l., X.1849, *Regnell 783* (P [265914, digital image BBB]).

II. *Isostigma* subgen. ***Microtrichon*** Guad. Peter, **subgen. nov.**

Type species: *I. molfinianum* Sherff

Folia simplicia indivisa vel ad apicem dentata, si pinnatisecta foliolis ovatis, puberulis; caules foliacei; capitula in pseudocorymbis.

[Leaves entire or dentate at the apex, if pinnatisect, then the folioles ovate, puberulae; stem leafy; capitula in pseudocorymbes.]

Perennials. *Stems* branched, erect and leafy, or decumbent and leafy at the prostrated part; glabrous. *Leaves* simple, sessile or decurrent at the base, entire or dentate at the apex, or pinnatisect with leaflets linear to ovate; puberulous, with few glandular hairs, evident only under the microscope. *Capitula* in capitulescences, rarely solitary. *Leaves* with Kranz anatomy of type *Isostigma,* without sclerenchyma tissue.

Etymology. – The name alludes to the glandular hairs present on the leaves, in opposition to the glabrous leaves of the typical subgenus.

7. *Isostigma acaule* (Baker) Chodat in Bull. Herb. Boiss. ser. 2, 1: 417. 1901 (Fig. 10).

≡ *Bidens acaulis* Baker in Mart., Fl. Bras. 6(3): 247. 1884.

Lectotypus (designated by Sherff, 1926: 246): **Paraguay. Dpto Central:** Plaine d'Arégua, dans les terrains argileux, I.1875, *Balansa 913* (K [photo seen]!; iso-: F!, G!).

= *Isostigma vailianum* Britton in Ann. New York Acad. Sci. 7: 149. 1893. **Typus: Paraguay. Dpto Central:** Lympio, 19.V.1889, *Morong 734* (holo-: NY!; iso-: BM!, F!, GH!, K [photo seen]!, US! [digital image]!) (synonymised by Chodat, 1902).

Perennials 8-35 cm tall. *Stems* simple, something branched and decumbent at the base, leafy at the prostrated part and scapiform in the upper one. *Leaves* rosulate in the prostrated part, alternate, rarely opposite; semiamplexicaul, puberulous; simple, obovate, apex 3- to 8-dentate, decurrent at the base; 12-80 × 2-15 mm; margin ciliate and wider at the base; teeth acute or acuminate. *Capitula* solitary, terminal, radiate or discoid, 9-15 × 13-22 mm in flowering and 12-15 × 12-18 mm in fruit; peduncles ascending, aphyllous or 1- to 3-bracteolate. *Involucres* campanulate to subglobose, 3-seriate, 6-7 × 9-12 mm. *Phyllaries* with margin hyaline, ciliate; outer phyllaries triangular to linear, acute or acuminate, green; inner phyllaries ovate, obtuse, apex crenate, brownish. *Paleae* linear to narrowly ovate, 3-nerved, puberulous; apex acute or spatulate, with margin crenate or fimbriate; nerves dark. *Ray florets* with limb elliptical, 4- to 7-nerved, 2- to 3-dentate, 4-5 × 1.5-2 mm, purple; teeth acute. *Disc florets* with limb 4-lobed, 3-3.5 mm long, purple. *Anthers* 2-2.5 mm long. *Style* branches with appendages 2-3.5 mm long. *Cypselae* linear, flattened, 3-ribbed, with midrib prominent or subtetragonous, glabrous or hispid on the margin and midrib, 5-14 × 1 mm, brownish with the apex yellowish. *Pappus* 2-aristate, aristae acicular, divergent, sometimes reflexed, smooth or antrorsely hispid at the base, 1.5-3 mm long.

Distribution and habitat. – Occurs in south-eastern Paraguay (Central and Presidente Hayes), in the Chacoan biogeographic province (Fig. 11). Grows in "parques", clay, low soils, swamps, and modified land.

Flowering period. – August-May.

Iconography. – Sherff (1926: plate 23, fig. a, b).

Examined specimens. – **Paraguay. Dpto Central:** Asunción, Ñu Guazú, III.2003, *Zardini s.n.* (FCQ [44582]); Jardín Botánico, XI.1939, *Rojas 8704* (AS, LP); Paso Ñandeyara, camino del Botánico a Limpio, 1.V.1972, *Schinini 4714* (CTES, G); Ypané, near, 16.XI.1969, *Pedersen 9317* (LP, NY). **Dpto Presidente Hayes:** Barrancas Río Trinidad, 15.I.1918, *Hassler 1683a* (AS); Tacuaral, IX.1885/1895, *Hassler 1030* (G, NY); campo Tacuaral, 1897, *Hassler 3811* (BM, G, NY); Trinidad, Parque Botánico, bañados del Río Paraguay, VIII.1916, *Rojas 1683a, b* (LP); Campo Grande, IV.1916, *Hassler 1683/349* (AS); Campo Grande, 14.II.1946, *Pavetti 13250* (AS).

8. Isostigma herzogii Hassl. in Repert. Spec. Nov. Regni Veg. 7: 358. 1909.

Typus: Bolivia. Dpto Santa Cruz: Häufig im Kamp von Santiago de Chiquitos, ca. 600 m, V.1907, *Herzog 617* (holo-: G!).

Perennials 30-70 cm tall. *Stems* branched, erect, leafy, up to 5 mm wide; branches 1-3 mm wide. *Leaves* basal crowded, distal opposite or alternate, with longer internodes; semiamplexicaul, puberulous; simple, linear to narrowly elliptical or ovate, acute, sessile or decurrent at the base; 15-100 × 1.5-10 mm, smaller toward the apex; margin ciliate at the base. *Capitula* in capitulescences of few capitula, terminal, some solitary, axillar, radiate, 9-10 × 14-20 mm in flowering and 10-15 × 7-15 mm in fruit; peduncles with a leaf at the base, 1- to 2- bracteolate, 2-100 mm long. *Involucres* narrowly campanulate in flowering and cylindrical in fruit, 3-seriate. *Phyllaries* dark with lighter nerves, with margin hyaline, ciliate; outer phyllaries narrowly triangular, acute, or something rounded, foliose, generally reflex; inner phyllaries narrowly ovate, obtuse, scarious, apex crenate. *Paleae* subulate to linear, 3-nerved, puberulous on the mid nerve and distal half; apex acute, entire, or irregular. *Ray florets* with limb linear, 4- to 5-nerved, 2-dentate to deeply 3-partite, 3-6 × 1-1.5 mm,

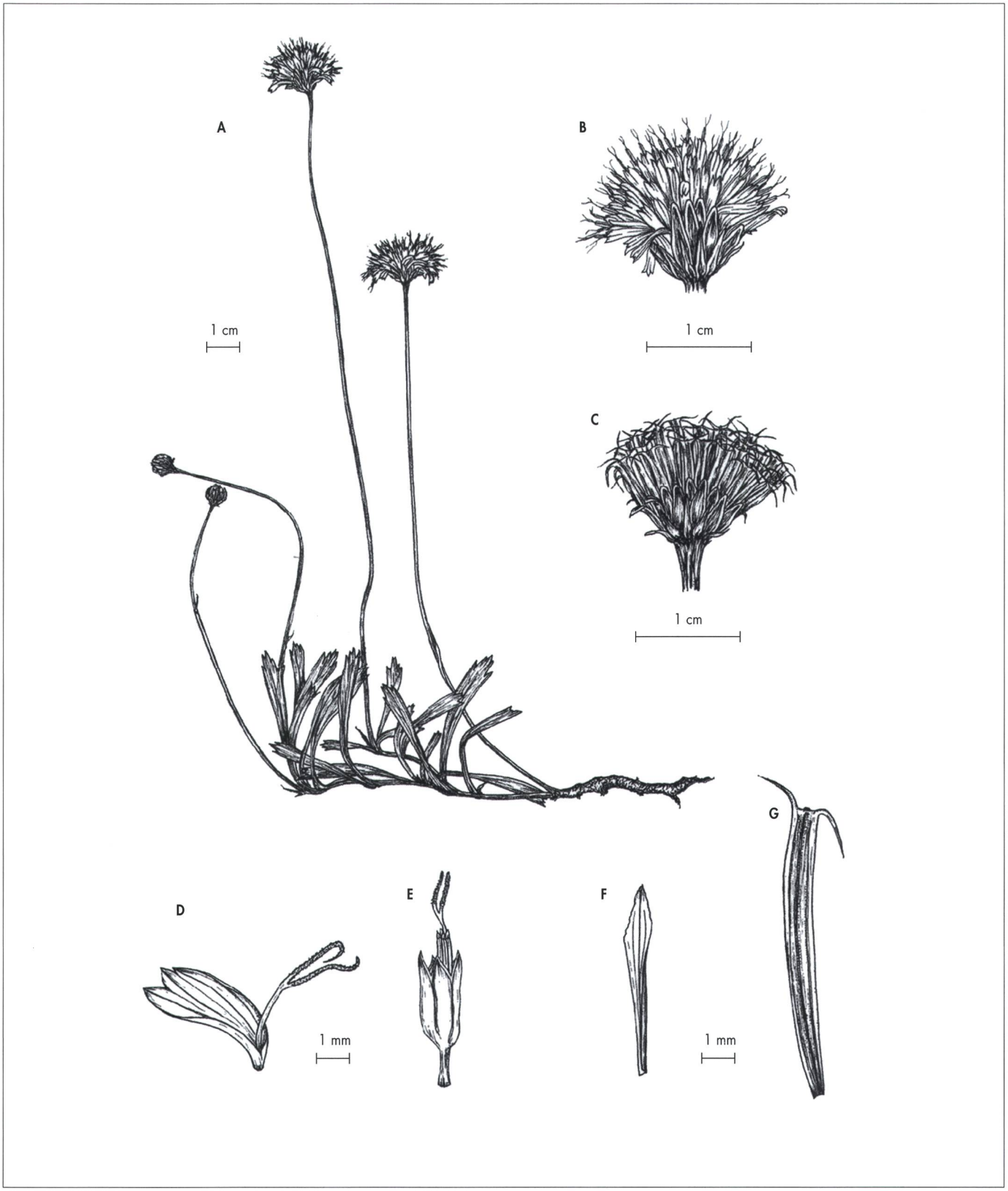

Fig. 10. – *Isostigma acaule* (Baker) Chodat. **A.** Plant; **B.** Flowering capitulum; **C.** Capitulum in fruit; **D.** Ray floret; **E.** Disc floret; **F.** Paleae; **G.** Cypsela. [**A-B:** *Hassler 3811*, BM; **C:** *Schinini 4714*, CTES; **D-F:** *Rojas 8704*, LP; **G:** *Morong 734*, NY] [Drawn by Guadalupe Peter]

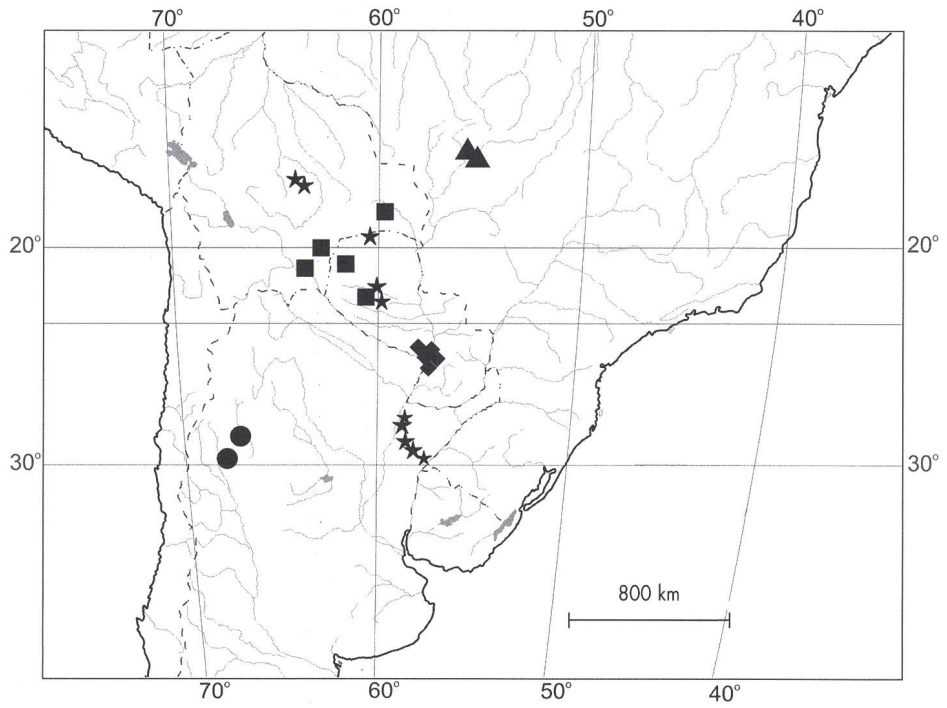

Fig. 11. – Geographical distribution of ◆ *Isostigma acaule* (Baker) Chodat; ■ *I. herzogii* Hassl.; ★ *I. hoffmannii* Kuntze; ● *I. molfinianum* Sherff; ▲ *I. scorzonerifolium* (Baker) Sherff.

purple; teeth acute. *Disc florets* with limb 4-lobed, 3-4 mm long, purple. *Anthers* 2 mm long. *Style* branches with appendages 3 mm long. *Cypselae* linear to narrowly elliptical, flattened, 1- to 2-ribbed, hispid, 6-12 × 1-1.2 mm, outer shorter and wider, brownish to black. *Pappus* 2-aristate, aristae acicular, smooth or hispid at the base, 1.5-5 mm long, sometimes one longer than the other.

Distribution and habitat. – Occurs in south-eastern Bolivia (Santa Cruz and Tarija) and western Paraguay (Boquerón), in the Chacoan biogeographic Province (Fig. 11). It grows in rocky slopes and sandy dunes; savannas; subshrubby fields, and Chacoan forest; in sandy, xeric, drained, burned, and grazed places, slightly hilly. It is abundant in field, between 400-600 m.

Flowering period. – March-May.

Observation. – It smells as "quilquiña" *(Porophyllum ruderale* Cass.) (in sched. *Fuentes 2394).*

Iconography. – Sherff (1926: plate 24, fig. i, o, r, t, u); Peter (2004a: 530, fig. 1).

Examined specimens. – **Bolivia. Dpto Tarija:** Ruta Tarija-Villa Montes, El Angosto, 11 km E de Villa Montes, 26.V.1971, *Krapovickas & al. 19317* (CTES). **Dpto Santa Cruz:** Estancia Rancho Chico (puesto nuevo) y alrededores, 20°07'40"S 62°36'14"O, 22.V.1998, *Fuentes 2394* (CTES).

Paraguay. Dpto Boquerón: Ruta Trans Chaco, 20 km SE, Nueva Asunción, 6.V.1993, *Mereles & Degen 5094* (CTES). **Dpto Chaco:** Teniente Enciso, 9.III.1980, *Caballero Mármori 658* (CTES).

9. *Isostigma hoffmannii* Kuntze, Revis. Gen. Pl. 3: 160. 1898.

Lectotypus (designated by Sherff, 1926: 250): **Bolivia. Dpto Santa Cruz:** Yapacani, 400 m, VI.1892, *Kuntze s.n.* (B [destroyed]).

Lectotypus (designated here): **Bolivia. Dpto Santa Cruz:** Yapacani, 400 m, VI.1892, *Kuntze s.n.* (NY!; iso-: US [digital image]!).

Perennials 7-60 cm tall. *Stems* simple, something branched at the base, decumbent, leafy at the prostrated part and scapiform in the upper one. *Leaves* rosulate or crowded in the prostrated part, opposite or alternate; semiamplexicaul, puberulous; pinnatisect or rarely bipinnatisect, decurrent at the base; 10-65 × 12-25 mm, shorter toward the apex; margin ciliate and wider at the base; leaflets 1-3 pairs, linear to narrowly ovate, little divided, sometimes furcate or dentate at the apex, acute or acuminate, 1-20 × 0.5-4 mm. *Capitula* solitary, terminal, radiate or discoid, 8-20 × 10-35 mm in flowering, 10-17 × 13-23 mm in fruit; longly pedunculate, peduncles ascending, aphyllous or 1- to 3-bracteolate. *Involucres*

subglobose or campanulate, 3(-4)-seriate, 4-8 × 8-15 mm. *Phyllaries* with margin hyaline, ciliate; outer phyllaries triangular to linear, acute or acuminate, foliose, green, sometimes reflexed; inner phyllaries ovate or narrowly ovate, obtuse or acute, scarious, brownish. *Paleae* linear or narrowly ovate, 7-nerved, puberulous; apex acute, with margin ciliate; nerves and apex reddish. *Ray florets* with limb linear to elliptical, 3- to 7-nerved, 2- to 3-dentate, 3-9 × 1-1.5 mm, purple; teeth acute. *Disc florets* with limb 4-lobed, 3-6 mm long, purple. *Anthers* 3-3.5 mm long; *style* branches with appendages 2-4 mm long. *Cypselae* linear, flattened, 3-ribbed with midrib prominent or trigonous, hispid on margins, apex, and ribs, narrowly winged, 5-19 × 0.8-1.2 mm, outer shorter, dark with apex yellow. *Pappus* 2-aristate, aristae acicular, smooth or antrorsely hispid at the base, 2-5 mm long. *Chromosome* number, $2n = 18$ (Dematteis & Fernández, 1999).

Common name. – "Siempreviva" (Bolivia: Santa Cruz).

Distribution and habitat. – Occurs in central Bolivia (Santa Cruz), western Paraguay (Boquerón and Chaco), and northeastern Argentina (Corrientes), in the biogeographic provinces of Chacoan, Espinal, and Amazon (Fig. 11). Grows in grazing fields, "pampas", savannas and grasslands with subshrubs, slightly grazed but not disturbed, low and sparse grasslands, stabilised dunes, places with frequent fires, open forest, eroded river banks, savannas with islands of forest, palm fields, clay soils, frequently sandy or sandy-muddy, seasonally water saturated, somewhat salty, up to 500 m. Rare.

Flowering period. – October-July.

Nomenclatural notes. – *Isostigma lorentzii* Hieron. was mentioned by Sherff (1926: 250) as a name that appeared in herbarium label. Since it was not accompanied by a description, it is considered as *nomen nudum.*

Observations. – Kuntze (1898) described *I. hoffmannii* as a species with disc florets 5-dentate. However, only 4-lobed disc florets were found during the present work. Its florets are fragrant (in *Tressens & al. 2448*).

Iconography. – Sherff (1926: plate 24, fig. h, s, p, q); Peter (2004a: 533, fig. 3).

Selected specimens. – **Argentina. Dpto Bella Vista:** 3 km W del Paso Torre, de Río Santa Lucía, 18.VI.1970, *Carnevali 2194* (CTES). **Dpto Empedrado:** Ea. "El Plata", 6.XII.1977, *Pedersen 12015* (CTES, SI). **Dpto Lavalle:** Ruta 12, 20 km S de Ruta 123, 13.XII.1996, *Dematteis & Schinini 548* (CTES, MA). **Dpto Mercedes:** Ruta 119, 28 km S del acceso a Mercedes, 19.II.1984, *Tressens & al. 2195* (CTES). **Dpto Paso de los Libres:** Road from Mercedes to Paso de los Libres, near the Miriñay, 5.XI.1976, *Pedersen 11365* (CTES, SI).

Bolivia. Dpto Santa Cruz. Prov. Andrés Ibáñez: 3 km NW of Lomas de Arena, 17°55'S 63°10'W, 22.V.1991, *Nee 40514* (NY, US). **Prov. Buena Vista:** 12.IV.1915, *Steinbach 1184* (GH, NY). **Prov. Sara:** Buena Vista, 11.XII.1920, *Steinbach 5205* (F, GH). **Prov. Warnes:** Pampa de Viru-Viru, a 17 km de la ciudad de Santa Cruz, zona del Aeropuerto Internacional de Viru-Viru, zona sur, 17°39'46"S 63°69' 24"W, 3.II.1994, *Menacho & al. 324* (CTES).

Paraguay. Dpto Boquerón: Campo Loa, 21.III.1995, *Mereles & Degen 5886* (FCQ); Estancia San Ramón, 22°41' 30"S 60°30'W, 12.XII.1992, *Pérez & al. 2510* (CTES, CTES [284294]). **Dpto Chaco:** Palmar de las Islas, III.1998, *Mereles 2854* (FCQ).

10. ***Isostigma molfinianum*** Sherff in Bot. Gaz. 91: 312. 1931 (Fig. 12).

Typus: Argentina. Prov. La Rioja: Quebrada Totoral, cerca de Catinzaco, II.1896, *Bodenbender s.n.* (holo-: GH!; iso-: CORD!, LP!).

Perennial 13-30 cm tall. *Stems* branched, erect or suberect, leafy, 1-4 mm wide. *Leaves* basal rosulate or crowded, distal sparser toward the apex, alternate, rarely opposite or subopposite; semiamplexicaul, puberulous; entire (generally the distal ones), linear to subulate, acute or acuminate, sessile; or narrowly obovate, apex 3-dentate or trifurcate, decurrent in pseudopetiole; 20-55 × 1-5 mm, shorter toward the apex; margin ciliate; teeth acute or acuminate, up to 25 mm long. *Capitula* in capitulescences of few capitula, axillar, not evidently radiate, 4.5-12 × 7-13 mm in flowering and 9-11 × 8-13 mm in fruit; peduncles 12-50 mm long, some bracteolate. *Involucres* campanulate to cylindrical, 3-seriate. *Phyllaries* glabrous or puberulous on the back, margin hyaline, ciliate; outer phyllaries triangular, acute or acuminate, foliose; inner phyllaries triangular, scarious, margin irregular at the apex; brownish. *Paleae* linear, 5- to 6-nerved, glabrous or pubescent on the back; apex attenuate, acute or acuminate, ciliate, entire or irregular; brownish. *Ray florets* 8-10, limb linear to linear-elliptical, 5- to 6-nerved, 2-dentate, 4-6 × 1 mm, purple or brown-yellowish. *Disc florets* with limb 4-lobed, 5 mm long, purple. *Anthers* 2-3 mm long. *Style* branches with appendages 2-4 mm long. *Cypselae* narrowly obovate to narrowly elliptical, flattened, smooth or striate with the midrib prominent, hispid on the margins, ribs, or distal half; 6-9 × 1.5-2 mm, outer shorter, brown with base, apex, and margins yellowish. *Pappus* 2-aristate, aristae acicular, broad at the base, sometimes reflexed, smooth or antrorsely hispid at the base, 3-5.5 mm long.

Distribution and habitat. – Occurs in central-western Argentina (Catamarca and La Rioja), in the Prepunean biogeographic Province (Fig. 11). Grows in humid places, 1400-4525 m. Rare.

Flowering period. – January-July.

Nomenclatural notes. – *Bodenbenderia riojana* Kurtz is considered to be a *nomen nudum,* because it was mentioned without description in a floristic list by Kurtz (1896: 31).

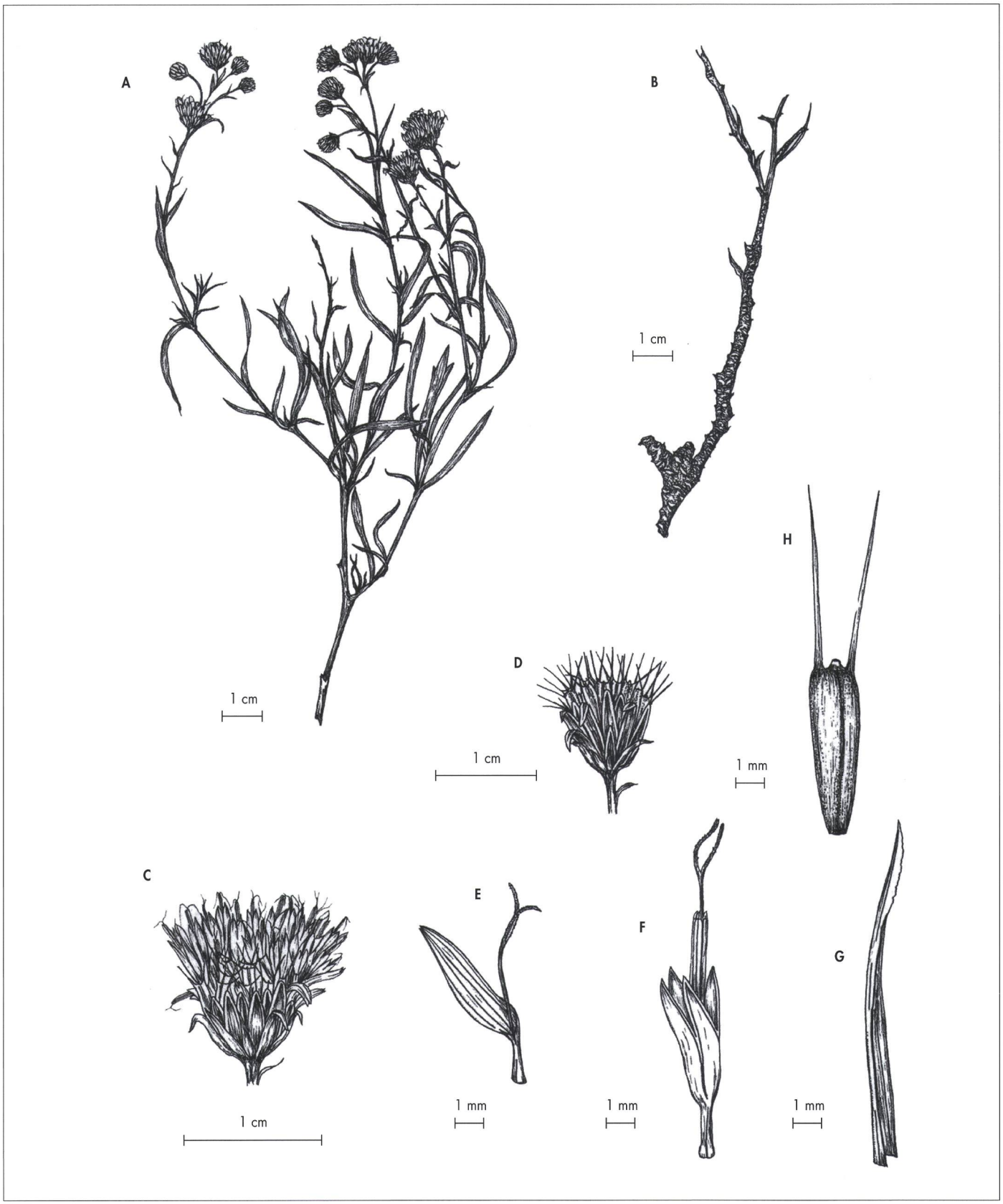

Fig. 12. – *Isostigma molfinianum* Sherff. **A.** Plant; **B.** Base of the plant; **C.** Flowering capitulum; **D.** Capitulum in fruit; **E.** Ray floret; **F.** Disc floret; **G.** Paleae; **H.** Cypsela. [**A:** *Hayward 8612*, BA; **B:** *Spegazzini 33185*, BAB; **C-D:** *Spegazzini 33306*, F; **E-H:** *Bodenbender s.n.*, CORD] [Drawn by Guadalupe Peter]

The isotype at CORD has the same data of the holotype, but is identified as belonging to the herbaria as *Kurtz 9025*.

Observations. – *Isostigma molfinianum* is a species related to *I. herzogii*. SHERFF (1926) distinguished them by leaf shape, 2- to 3-furcate in *I. molfinianum* and entire in *I. herzogii*. Besides, *I. molfinianum* has stems wider at the base, with shorter internodes, consequently its stems are leafier than the stems of *I. herzogii*. The leaves vary from entire to furcate in these species (ARIZA-ESPINAR, 1969) as confirmed in the examined specimens. In spite of that, they can be distinguished by plant size and leaf shape.

Examined specimens. – **ARGENTINA. Prov. Catamarca:** s.l., I.1910, *Lillo s.n.* (F); I-II.1910, *Spegazzini 33185* (BAB); 1.II.1910, *Spegazzini 33306* (F). **Prov. La Rioja:** dpto Capital, 20 km N de Carrizal (entre Mazán y La Rioja), 4.VII.1933, *Hayward 8612* (BA); dpto Chilecito, Famatina, Cuesta de Catinzaco, al pie, cerca del Puesto de Catinzaco, 30.I.1906, *Kurtz 13369* (CORD).

11. *Isostigma scorzonerifolium* (Baker) Sherff in Bot. Gaz. 81: 246. 1926 (Fig. 13).

≡ *Bidens scorzonerifolius* Baker in Mart., Fl. Bras. 6(3): 247. 1884.

Lectotypus (designated by SHERFF, 1926: 247): **BRAZIL. Edo Mato Grosso:** Cuiabá, 1834, *Da Silva Manso 215* (BR).

= *Bidens glycinifolius* Baker in Mart., Fl. Bras. 6: 247. 1884. ≡ *Isostigma glycinifolium* (Baker) Sherff in Bot. Gaz. 76: 78. 1923. **Lectotypus** (designated by SHERFF, 1923: 78): **BRAZIL. Edo Mato Grosso:** in subhumidis graminosis. pr. Cujaba, V.1827, *Riedel* 970 (P [digital image, photo GH, photo LP]!; iso-: K [photo]!) (synonymised by SHERFF, 1926).

= *Isostigma foliosum* Malme in Kongl. Svenska Vetensk. Acad. Handl. 32(5): 66. 1899. **Lectotypus** (designated here): **BRAZIL. Edo Mato Grosso:** prope Coxipó pr. Cuyabá, 26.IV.1894, *Malme 1584* (S [05-741, digital image]!; iso-: BM!, G!, R [photo]!, S [R-3074, digital image]!). **Syntypus: BRAZIL. Edo Mato Grosso:** inter Arecá et Coxipó Mirim pr. Cuyabá, 1.IV.1894, *Malme s.n.* (not located) (synonymised by SHERFF, 1926).

Perennials 43-70 cm tall, with xylopodium. *Stems* simple at the base, branched distally to form the capitulescence, erect, leafy at the base with sparse leaves distally, 2 mm lat. *Leaves* basal crowded, distal alternate; semiamplexicaul, puberulous; entire, subulate or linear, acute or acuminate, decurrent, sessile; 65-190 × 2.5-4.5 mm, shorter toward the apex; margin ciliate. *Capitula* in capitulescences of few capitula, radiate, 10-17 × 20-35 mm in flowering, 11 × 15 mm in fruit; peduncles with 1 bracteole at the base, aphyllous or something bracteolate, 25-125 mm long. *Involucres* campanulate, 3-seriate, 5-8 × 9-10 mm. *Phyllaries* scarious, glabrous or puberulous, margin hyaline, ciliate, dark; triangular to ovate, acute or acuminate. *Paleae* narrowly ovate, 13-nerved, puberulous on the back, margin hyaline, nerves brownish; apex acuminate with margin ciliate. *Ray florets* 8-14, limb elliptical or ovate, 6- to 9-nerved, 2-dentate, 9-12 × 2.5-4 mm, yellow; teeth acute. *Disc florets* with limb 4-lobed, 4-5 mm long, yellow. *Anthers* 2 mm long; *style* branches with appendages 3-5 mm long. *Cypselae* linear, flattened, striate, with the midrib prominent, hispid on the margins, midrib, and apex, 6-7 × 1 mm, outer shorter, brownish. *Pappus* 2-aristate, aristae acicular, smooth or antrorsely hispid at the base, 1-1.5 mm long.

Distribution and habitat. – Occurs in central-western Brazil (Mato Grosso), in the biogeographic province of Cerrado (Fig. 11). Grows in open fields, subhumid, among grasses; on sandy-rocky soils.

Flowering period. – April-May.

Iconography. – SHERFF (1926: plate 23, fig. g, h).

Examined specimens. – **BRAZIL. Edo Mato Grosso:** Cuiabá, 26.IV.1903, *Malme 3136* (GH).

Excluded name

Bidens megapotamica Spreng., Syst. Veg. 3: 454. 1826.

≡ *Isostigma megapotamicum* (Spreng.) Sherff in Bot. Gaz. 81: 252. 1926. ≡ *Thelesperma megapotamicum* (Spreng.) Kuntze in Proc. Biol. Soc. Wash. 41: 148. 1928. **Typus: BRAZIL:** Rio Grande, *Sello s.n.* (holo-: P).

Due to a misinterpretation of the type material of *B. megapotamica,* SHERFF (1926) considered it as a synonym of *Isostigma peucedanifolium.* SHERFF (1927) reduced *Thelesperma scabiosoides* Less. to a synonym of *T. megapotamicum.* Thus, the specific epithet is not related with *Isostigma,* and it is excluded in the present treatment (see PETER, 2005).

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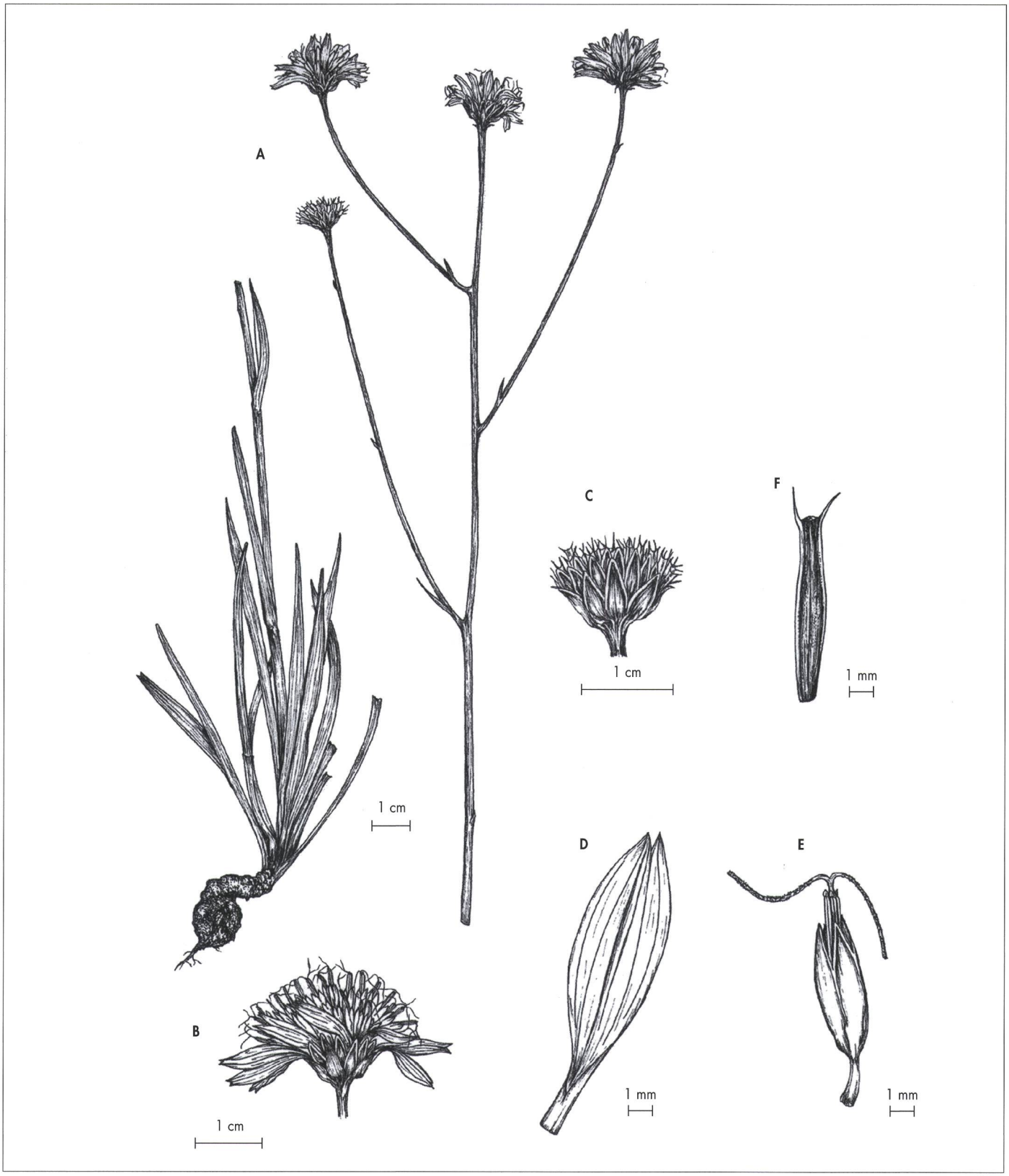

Fig. 13. – *Isostigma scorzonerifolium* (Baker) Sherff. **A.** Plant; **B.** Flowering capitulum; **C.** Capitulum in fruit; **D.** Corolla of the ray floret; **E.** Disc floret; **F.** Cypsela. [**A:** *Malme 3136*, US; **B-F:** *Malme 1584*, G] [Drawn by Guadalupe Peter]

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