



Article

***Baccharis napaea* (Asteraceae, Astereae): a new species of subgen. *Tarchonanthoides* sect. *Coridifoliae* from the subtropical highlands of southern Brazil**

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Abstract

Baccharis napaea, a new species belonging to subgen. *Tarchonanthoides* sect. *Coridifoliae* is described and illustrated. The new species is compared to and distinguished from the sympatric species *B. coridifolia*, *B. erigeroides*, and *B. scabrifolia*, and from the allopatric *B. bicolor*. *Baccharis napaea* occurs in open subtropical highland grasslands and the edges and open glades of subtropical mixed forests on the south Brazilian plateau. Additionally, a distribution map and description of habitat and conservation status of the new species are presented.

Resumo

Baccharis napaea, uma nova espécie pertencente ao subgen. *Tarchonanthoides* sect. *Coridifoliae* é descrita e ilustrada. A nova espécie é comparada e diferenciada das espécies simpátricas *B. coridifolia*, *B. erigeroides* e *B. scabrifolia*, e da espécie alopatrica *B. bicolor*. *Baccharis napaea* ocorre em campos de altitude subtropicais e na orla e clareiras de florestas ombrófilas mistas subtropicais no planalto sul-brasileiro. Adicionalmente é apresentado um mapa de distribuição e considerações sobre o hábitat e estado de conservação da nova espécie.

Key words: Baccharidinae, Compositae, subtropical highland grasslands, subtropical mixed forests

Introduction

Baccharis Linnaeus (1753: 860; Asteraceae: Astereae) is a New World genus that comprises between 338 and 400 species (Bremer 1994, Müller 2010). The genus is characterized broadly by the usually tufted indumentum of the leaves and stems, with fused trichomes that have only a single adjoining basal cell, and the common occurrence of dioecy (Müller 2006). Barroso (1976) provided the most recent treatment of the genus for Brazil, encompassing about 130 species. Currently, in a checklist, 167 species of *Baccharis* are recorded for the country (Heiden & Schneider 2012).

The most recent proposal of a subgeneric classification of *Baccharis* was published by Müller (2006), who thought the subgenera *Baccharis*, *Pteronioides* Heering (1904: 15) and *Tarchonanthoides* Heering (1904: 26) were probably monophyletic, while he considered *Baccharis* subgen. *Molina* (Persoon 1807: 424) Heering (1904: 40) as a possibly paraphyletic assemblage. According to this author, *Baccharis* subgen. *Tarchonanthoides* is the morphologically best circumscribed subgenus of *Baccharis*. This subgenus is characterized by corollas of female florets with five papillose teeth, by male florets with pappus bristles rarely broadened apically and with a style apex nearly fully cleft into lanceolate or ovate branches. This subgenus is

found in the southeastern South American grasslands and savannahs, from eastern Brazil and central Bolivia south to central Argentina, with the greatest diversity found in southeastern Brazil (Müller 2006, Heiden 2008). Heiden & Pirani (2012) recently published an updated synopsis for the subgenus, accepting 21 species; during a taxonomic revision and a phylogenetic analysis of *Baccharis* subgen. *Tarchonantheoides* currently underway, we found a previously undescribed species. This species is described and illustrated in this paper, and its affinities, systematic position and area of occurrence are discussed.

***Baccharis napaea* G.Heiden, sp. nov.** (Fig. 1)

Baccharis napaea G.Heiden is characterized by its tomentose and lanate indumentum of developed shoots and leaves, differing from *B. erigeroides* DC. and *B. coridifolia* DC. which are characterized by glabrescent developed shoots and glabrescent leaves, and from *B. scabrifolia* G.Heiden that is characterized by shoots and leaves with villous and scabrous indumentum.

Type:—BRAZIL. Paraná: Palmas, Horizonte, divisa PR/SC, Campos de Água Doce e Palmas, BR 280, próximo às turbinas da Central de Energia Eólica de Palmas, 1303 m, fl., ♀, 8 February 2011, G. Heiden, J.M. da Silva & J.M. Vaz 1581 (holotype SPF!; isotypes FLOR!, ICN!, F!, JE!, K!, LP!, MBM!, MVFA!, MO!, PACA!, RB!, SP!, US!, and Herbário da Embrapa Clima Temperado, Pelotas, RS, Brasil!).

Subshrubs 1–1.5 m tall, erect; sterile lateral shoots prostrate, fertile shoots ascending, terminating in a capitulescence, greenish to greyish; indumentum tomentose, hairs filiform. *Leaves* 1–4.4 cm long, 0.14–0.28 cm wide, greenish to greyish, sessile; leaf blade chartaceous, linear, plane, apex acute, base attenuate, margins entire, ciliate; leaves 1-nerved, midrib flat on adaxial surface and slightly prominent on abaxial surface, both surfaces with a lanate indumentum (puberulous in very old leaves), filiform hairs and biseriate glandular hairs, tufted indumentum absent. *Capitulescences* paniculate, terminal; panicles conical to ellipsoid, 16–60 cm long, 6–18 cm wide. *Capitula* pedunculate; peduncles 2.2–5.3 mm long. *Male capitula* 2.2–3 mm long; florets 7–12; involucre 1.7–2.8 mm long, 2.6–3 mm wide, cup-shaped; phyllaries in 3 series, greenish, outer and median phyllaries ovate, innermost ones linear-lanceolate, margin broadly scarious, short-dentate, apex obtuse to acute; clinanthium (receptacle) convex, glabrous or with scattered biseriate glandular hairs and uniseriate hairs; corolla 1–2 mm long, tube 0.4–0.9 mm long, throat 0.1–0.3 mm, lobes 0.5–0.7 mm long, biseriate hairs on tube and throat; anthers including apical appendages 0.8–1 mm long; style 0.9–1 mm long, apex nearly fully cleft into broadly lanceolate branches with sweeping hairs of equal size; ovary abortive, puberulous with twin and biseriate glandular hairs; pappus uniseriate, 1.1–2 mm long, bristles 18–24, twisted, apically not broadened, with short-protruding, erecto-patent terminal cell apices. *Female capitula* 4.5–8 mm long; florets 5–10; involucre 4.1–4.8 mm long, 2.2–3.5 mm wide, cylindrical to campanulate, narrowed distally; phyllaries in 4–5 series, greenish, outer and median phyllaries ovate, innermost ones oblanceolate, margins scarious, short dentate, apex obtuse; clinanthium (receptacle) convex to conical, with scattered biseriate glandular hairs; corolla 2–3.1 mm long, filiform, with 5 papillose teeth; style 3.6–4 mm long, branches 0.4–0.8 mm long; cypselae 1.9–2.4 mm long, 0.7–1 mm wide, stramineous to light brown, covered with biseriate glandular hairs and twin hairs, cylindrical, slightly narrowed at base, 5–6 longitudinal ribs; pappus multiseriate, 2.6–4.3 mm long at cypselae maturity, persistent; bristles 80–140, connate basally, not broadened apically.

Distribution & habitat:—*Baccharis napaea* occurs in the highlands of the south Brazilian plateau (Planalto Sul-Brasileiro, also known as Planalto Meridional), in elevations between 750 and 1300 m a.s.l., in the states of Paraná, Santa Catarina, and Rio Grande do Sul, in southernmost Brazil (Fig. 2). It forms sparse populations, mainly across open grasslands within the subtropical highland grassland biome and along the edges or in open glades of *Araucaria angustifolia* (Bertol.) Kuntze forest thickets, in the contact zone with the subtropical mixed forest biome (Iganci *et al.* 2011). These environments occur in the transitional zone of high elevation grasslands and ombrophilous mixed forests of the Atlantic Rainforest Domain.

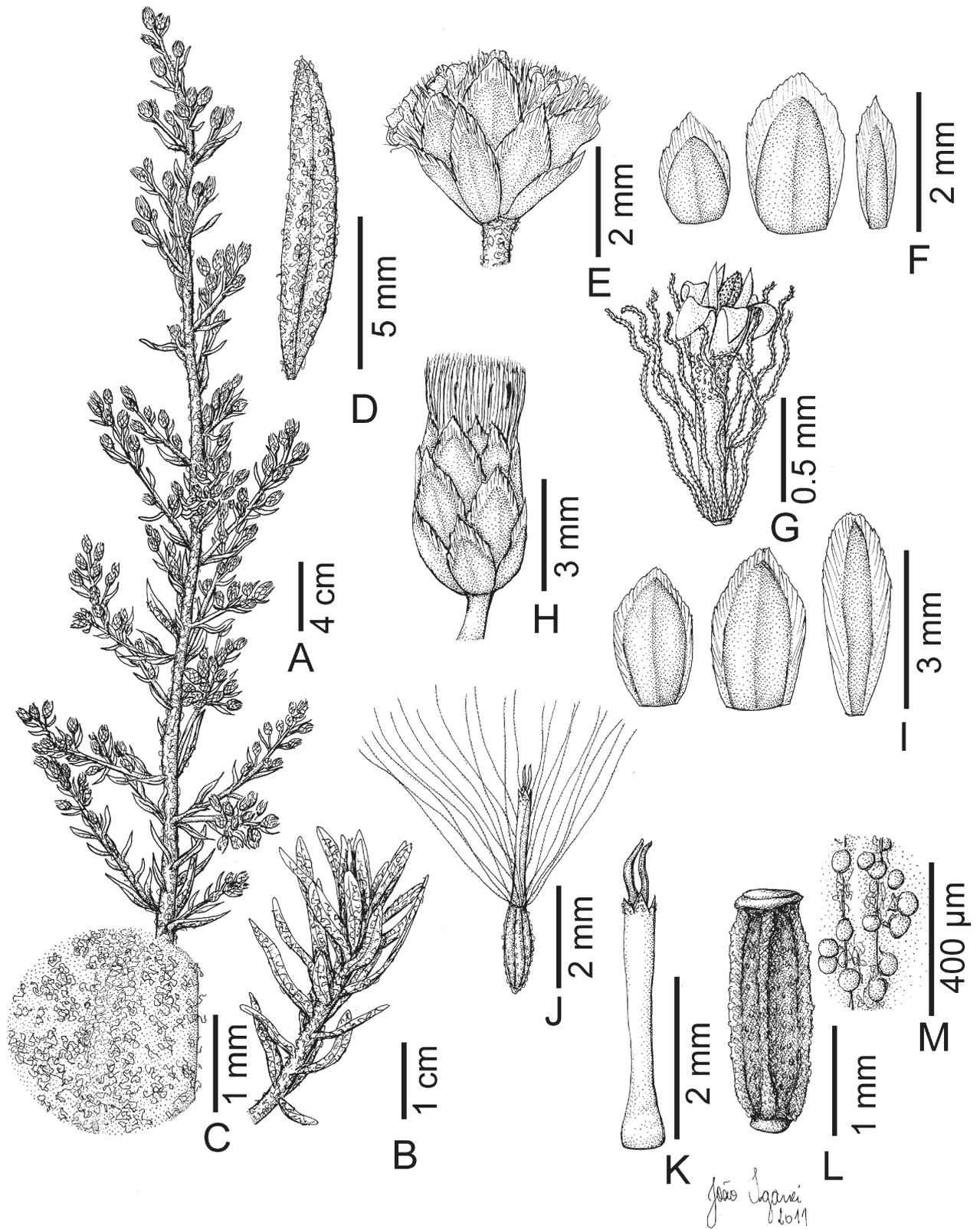


FIGURE 1. *Baccharis napaea*. **A.** Fertile shoot of pistillate plant, apical portion with capitulescence. **B.** Vegetative shoot. **C.** Stem indumentum. **D.** Leaf. **E.** Male capitulum. **F.** Phyllaries of male capitulum (outer to inner). **G.** Male floret. **H.** Female capitulum. **I.** Phyllaries of female capitulum (outer to inner). **J.** Female floret. **K.** Corolla and style of female floret. **L.** Cypselum (pappus removed). **M.** Enlarged detail of L. **A–D, H–K:** Heiden *et al.* 1581 (SPF). **E–G:** Heiden *et al.* 1580 (SPF). **L–M:** Hatschbach 7044 (MBM). Illustration by João Iganci.

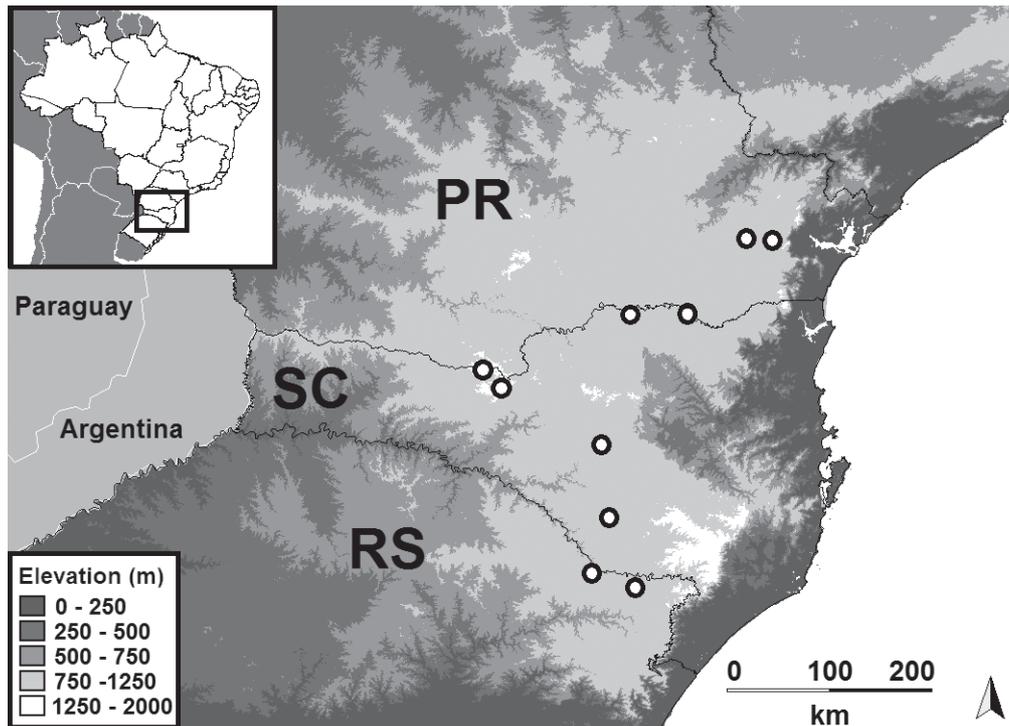


FIGURE 2. Distribution of *Baccharis napaea* in southern Brazil.

Phenology:—*Baccharis napaea* flowers from February to March and specimens setting fruits were collected from April to June.

Conservation status:—Despite many efforts during the years of 2010 and 2011 looking for populations of *B. napaea* in most of the known localities of occurrence of this species in southern Brazil, none of them were found except for a new record at the border of the municipalities of Água Doce (Santa Catarina) and Palmas (Paraná). The new species is well represented in herbaria; however, only three of these records were registered in the last 10 years (considering the authors' records to the neighboring places of Paraná and Santa Catarina Border as one record). Since a wider former distribution of the species seems likely, we suspect that its area has been reduced in recent years due to the conversion of native grasslands into extensive fields of soybean, corn, and wheat, as well as by the great increase of pine plantations, and the invasion of pine seedlings into the native environments across the southern Brazilian highland grasslands in the last years. Because of the continuing decline of the area of the native grasslands, the loss of habitat quality and the effects of *Pinus* invasion of the native vegetation the new species is assessed as Vulnerable: VU A2ce (IUCN 2011).

Etymology:—The specific epithet (a noun in singular in apposition) refers to the *Napaeae*, the nymphs of valleys in Greek mythology, and the homonymous floristic province of Martius, referring to the alternate and intermittent distribution of grasslands and forests in this region.

Additional specimens examined (paratypes):—BRAZIL. Paraná: Curitiba, fl., ♂, 25 February 1907, *P. Dusén* 3862 (R, US); fl. & fr., ♂ & fl. ♂, 16 March 1909, *P. Dusén* 7905 (NY); fl., ♀, 24 February 1912, *P. Dusén* 13867 (E, SI); fl., ♀ & ♂, *P. Dusén* 13867 (LIL, MO); 900 m, fl., ♀, 12 March 1914, *P. Dusén* 14593 (MO, NY, US); Pinheirinho, 950 m, fl., ♂, 21 March 1962, *G. Hatschbach* 8906 (MBM, RB). Palmas, Horizonte, divisa PR/SC, Campos de Água Doce e Palmas, BR 280, próximo às turbinas da Central de Energia Eólica de Palmas, 51.672°W, 26.565°S, 1303 m, fl., ♂, 8 February 2011, *G. Heiden, J.M. da Silva & J.M. Vaz* 1580 (ICN, JE, K, LP, MBM, RB, SPF). Piraquara, Pinhais, 907 m, fl., ♂, 18 February 1959, *G. Hatschbach* 5502 (HBR, LIL, MBM); fl., ♂, *G. Hatschbach* 5503 (LIL, MBM). Rio Negro, Campo do Tenente, fl. & fr., ♀, 1 April 1951, *G. Hatschbach* 2176 (MBM, SI); fr., ♀, 29 June 1960, *G. Hatschbach* 7044 (MBM). Rio Grande do Sul: Bom Jesus, rodovia Bom Jesus-São Joaquim, rio Pelotas, fl. & fr., ♀, 11 March 2005, *G. Hatschbach, E. Barbosa & E.F. Costa* 79047 (CTES, MBM). Vacaria, descida para o vale do rio

Pelotas, fl., ♂, 11 January 1978, *J. Mattos 18319* (HAS). Santa Catarina: Água Doce, Horizonte, divisa PR/SC, Campos de Água Doce e Palmas, BR 280, próximo às turbinas da Usina de Energia Eólica de Água Doce, 51.616°W, 26.589°S, 1316 m, bud, 11 January 2011, *G. Heiden & J.R.V. Iganci 1486* (FLOR, ICN, LP, MBM, RB, SPF). Capão Alto, Fazenda Pai Querê, 50.618°W, 28.354°S, fr., ♀, 28 June 2009, *R. Trevisan s.n.* (ICN 164765). Curitiba, fl., ♂, March 1877, *F. Müller 68* (R); Monte Alegre, fl., ♂, 25 February 1960, *J. Mattos 7653* (HAS). Mafra, 750 km, bud, 26 January 1953, *R. Reitz 5283* (HBR); 4 km northwest of Mafra on the road to Barracas (20 km), 800–850 m, fl., ♀, 13 March 1957, *L.B. Smith & R.M. Klein 12082* (HBR, NY, R, RB, US); fl., ♂, 13 March 1957, *L.B. Smith & R.M. Klein 12083* (HBR, NY, R, RB). Três Barras, fl., ♂, 26 February 1948, *A. Mattos & L. Labouriau s.n.* (NY 782036, RB 63243).

Baccharis napaea is placed in subgenus *Tarchonanthoides* because of the following combination of features: a conspicuous indumentum of filiform hairs and the lack of tufted indumentum, appearing as small resinous dots, typical of most *Baccharis* species of other subgenera; the cup-shaped involucre of male capitula, contrasting with the cylindrical to campanulate involucre of the female capitula; apically not broadened pappus bristles of male florets; and the corollas of female florets with five papillose teeth. The new species is also assigned to the section *Coridifoliae* Giuliano (2011) because of its sessile and 1-nerved leaves and the multiseriate and persistent pappus of female flowers, accrescent in cypsel maturity.

Most of the specimens of *B. napaea* found in herbaria were determined as *B. puberula* Candolle (1836: 401) or *B. erigeroides* DC. var. *dusenii* Heering (1910: 23); both names are synonyms of the sympatric *B. erigeroides* Candolle (1836: 418), which is endemic to Brazil and occurs north to central Goiás state and south to northeastern Rio Grande do Sul state (Heiden & Schneider 2012) in tropical savannahs (*cerrado*) and subtropical highland grasslands (*campos de cima da serra*). *Baccharis napaea* can be distinguished from *B. erigeroides* by its height (1–1.5 m vs. 0.3–0.7 m tall); the tomentose and lanate indumentum of shoots and leaves (vs. caducous filiform hairs found in leaves of young shoots that later become glabrescent); linear leaf blades (vs. narrow elliptic to narrow oblanceolate leaf blades) that are mostly smaller (1.1–4.4 × 0.14–0.28 cm vs. 4–5 × 0.3–0.7 cm), shorter peduncles (2.2–5.3 mm vs. 6–31 mm long), smaller male capitula (2.2–3 × 2.6–3 mm vs. 3–5 × 4.5–6.7 mm) with fewer florets (7–12 vs. 12–20), and fewer-flowered female capitula (5–10 vs. 12–22), with female florets with shorter pappus bristles (2.6–4 vs. 5.6–6.9 mm long).

Due to the similar habit, sessile linear 1-nerved leaves and broad paniculate capitulescences, *B. napaea* superficially resembles the widespread and sympatric *B. coridifolia* Candolle (1836: 422), which occurs in grasslands, pastures and disturbed areas from lowlands to highlands across central Argentina, north to central Bolivia and south-eastern Brazil (Müller 2006, Heiden & Schneider 2012). Despite this similarity, *B. napaea* can be differentiated by the persistent tomentose and lanate indumentum of filiform hairs present in the developed shoots and leaves respectively (vs. caducous filiform hairs found on leaves of very young shoots that later become glabrescent), fewer-flowered male capitula (7–12 vs. 15–30), shorter corolla of female florets (2–3.1 mm vs. 3.2–4.5 mm long), and shorter pappus of mature cypselae (2.6–4 vs. 5.2–7.2 mm long). *Baccharis scabrifolia* Heiden (2008: 6), an endemic highland species of the south Brazilian plateau (Santa Catarina and Rio Grande do Sul) where it is restricted to peat bogs and swampy grasslands, is another sympatric species similar to *B. napaea*. Both species can be separated by the tomentose and lanate indumentum of shoots and leaves of *B. napaea* (vs. villous and scabrous indumentum of shoots and leaves of *B. scabrifolia*); not revolute, ciliate leaf margins and attenuate leaf bases (vs. revolute, not ciliate leaf margins and obtuse to subcordate leaf bases); fewer-flowered male capitula (7–12 vs. 12–16); and longer female capitula (4.5–8 vs. 2.5–3 mm long), female florets corollas (2–3.1 vs. 1.3–1.5 mm long), cypselae (1.9–2.4 mm vs. 1–1.2 mm long) and pappus (2.6–4 mm vs. 1.8–2.2 mm long).

With respect to its morphology, *B. napaea* seems to be related to the allopatric Bolivian *B. bicolor* (Müller 2006: 276) G. Heiden (in Heiden & Pirani 2012: 45), from which it can be distinguished by its paniculate capitulescences (vs. partial capitulescences mostly racemose), few-flowered male capitula (7–12 vs. 18–30), shorter corolla of female florets (2–3.1 mm vs. 3.7–4.5 mm long), and shorter pappus of mature cypselae (2.6–4.3 vs. 5.3–6.5 mm long).

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