



## Two new species of *Baccharis* subgen. *Baccharis* (Asteraceae, Astereae) with single-flowered female capitula from the Serra do Cipó, Minas Gerais, Brazil

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### Abstract

Two new species of *Baccharis* subgen. *Baccharis* endemic to the Serra do Cipó, south-eastern Brazil, are described and illustrated. *Baccharis obdeltata* is morphologically similar to the allopatric obdeltate-leaved *B. truncata* but is distinguished by its leaves with 3(–5)-dentate apex, fewer-flowered sessile capitula, the male capitula bearing 5–7 florets and the female capitula with solitary florets. *Baccharis simplex* resembles the sympatric *B. concinna*, from which can be differentiated by its oval to oblong leaves, with obtuse base and rounded to obtuse apex, and shorter female capitula, florets and cypselae. Illustrations, distribution map, habitat and conservation assessments are provided for the new species.

### Resumo

Duas novas espécies de *Baccharis* subgen. *Baccharis* endêmicas da Serra do Cipó, Sudeste do Brasil, são descritas. *Baccharis obdeltata* é morfologicamente similar a espécie alopatrica de folhas obdeltadas *B. truncata*, sendo distinta pelas folhas com ápice 3(–5)-dentado e capítulos femininos sésseis e com menos flores, o masculino portando 5–7 flores e o feminino uma única flor. *Baccharis simplex* se assemelha à *B. concinna*, espécie simpátrica com capítulos femininos também unifloros, da qual pode ser diferenciada pelas folhas ovais a oblongas, base obtusa e ápice arredondado ou obtuso com dentes suaves e capítulo feminino, flores e cípselas menores. Ilustrações, mapa de distribuição, considerações sobre habitat e conservação são também fornecidos para as novas espécies.

**Key words:** Baccharidinae, Campos rupestres, Compositae, Espinhaço

### Introduction

The Serra do Cipó, a section of the Cadeia do Espinhaço, is recognized as a center of species richness and endemism in south-eastern Brazil (Giulietti *et al.* 1997, Echternacht *et al.* 2011). A revision of herbarium specimens and field work are being conducted by the authors aiming at the completion of the tribe Astereae treatment for the Flora of the Serra do Cipó project. Current records for this area include 26 species of *Baccharis* Linnaeus (1753: 860; Asteraceae: Astereae), a New World genus broadly characterized by the tufted indumentum of the leaves and stems, with adjoining basal cells of the trichomes, and the common occurrence of dioecy (Müller 2006). Two of the species recorded from the Serra do Cipó were recently collected by the authors and recognized as new to science. These species are described and illustrated, and their affinities and areas of occurrence are discussed below.

## New species

*Baccharis obdeltata* G.Heiden, *spec. nov.* (Figures 1 and 2)

**Type:**—BRAZIL. Minas Gerais: Santana do Riacho, Serra do Cipó, Lapinha da Serra, trilha para o Pico do Breu, trilha secundária adjacente à encosta, 19°6'27" S, 43°40'20" W, elevation 1281 m a.s.l., 16 June 2010, fl., fr., ♀, *G. Heiden, L.M. Borges, C.M. Siniscalchi & G. Müller 1385* (holotype SPF!; isotypes JE!, K!, RB!, Herbário da Embrapa Clima Temperado, Pelotas, RS, Brasil!).

*Shrubs* 0.3–0.7 m tall, erect, and strongly resinous; bark light brown. *Leaves* with petioles 1.2–2 mm long, leaf blade coriaceous, 4.2–10 mm long, 3.5–8 mm wide, strongly resinous, obdeltate, apex 3(–5)-dentate, base cuneate, margin entire or rarely with 2 teeth, venation pinnate, craspedodromous, with 1–2 pairs of major lateral veins, midrib prominent on abaxial surface, glandular-punctate on both surfaces. *Capitula* solitary, in leaf axils of younger shoots. *Male capitula* sessile, 2.6–2.9 mm long; florets 5–7; involucre 2.2–2.5 mm long, 1–1.7 mm in diam., campanulate; phyllaries 3-seriate, outermost phyllaries ovate, median narrow elliptic, innermost lanceolate, stramineous, margins slightly dentate, scarious, apices acute; clinanthium flat, glabrous; corolla 1.4–1.6 mm long, tube 0.9–1.1 mm long, throat 0.1–0.2 mm long, lobes 0.4–0.5 mm long; style 1.4–1.7 mm long, apex slightly cleft, distally dilated; ovary abortive, glabrous; pappus uniseriate, 1–1.4 mm long, bristles 14–16, apically broadened, short-protruding, erect terminal cell ends. *Female capitula* sessile, 3.1–3.3 mm long; involucre 3.1–3.4 mm long, 0.8–1 mm in diam., cylindrical, narrowed at distal end; phyllaries 3–4 series, stramineous, outer and median ovate, innermost linear-lanceolate, margins slightly dentate, scarious, apices acute; clinanthium slightly convex, glabrous; florets 1; corolla 0.6–0.85 mm long, filiform, with 5 obtuse apical teeth; style 0.85–0.95 mm long, branches 0.2–0.25 mm long; *cypselae* 1.1–1.4 mm long, 0.3–0.4 mm in diam., brown, glabrous, oblong, slightly narrowed at bases, with 12–14 strong longitudinal ribs, *pappus* biseriate, 0.65–0.8 mm long, bristles 40–60, apically not broadened, not elongated at cypselae maturity, deciduous.

**Distribution:**—Known only from elevations between 1100–1400 m a.s.l. along the trail from Lapinha da Serra to Pico do Breu and in the private reserve of Brumas do Espinhaço (Figure 3) within the Serra do Cipó range, a portion of the Cadeia do Espinhaço, the latter extending from central Bahia to Southern Minas Gerais states (Giulietti *et al.* 1997).

**Habitat:**—*Baccharis obdeltata* forms dense populations along steep quartz outcrops in the rocky grasslands (*campos rupestres*) vegetation.

**Phenology:**—Fertile specimens, flowering and setting fruit, have been collected between May and June.

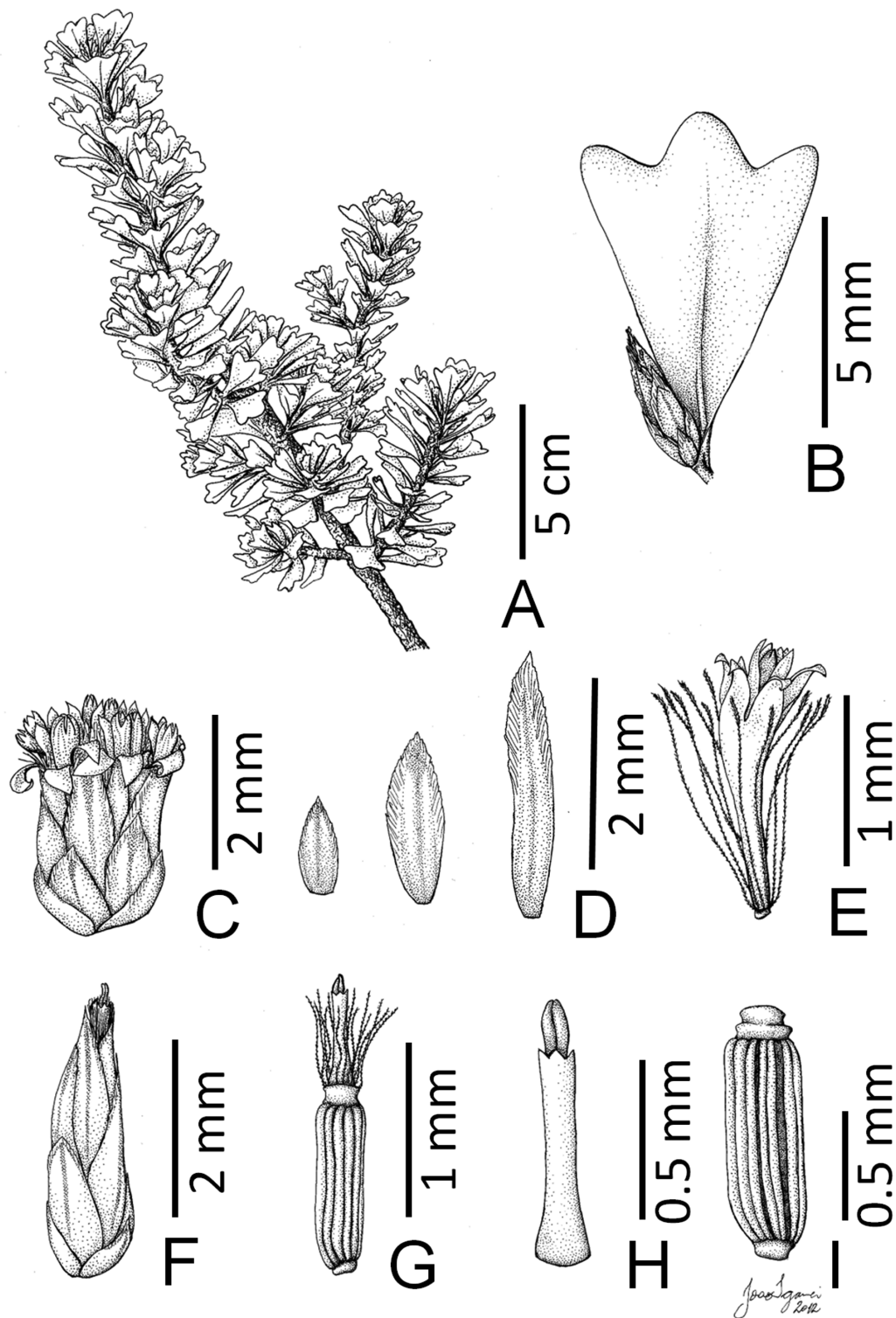
**Conservation status:**—Because of the limited extent of occurrence, known populations recorded from only three locations, and the increasing loss of quality of the *campos rupestres* ecosystem due to anthropogenic pressure (Burman 1991, Giulietti *et al.* 1997), the new species is assessed as Vulnerable: VU B1ab(iii) (IUCN 2011).

**Etymology:**—The specific epithet refers to the unusual obdeltate leaf shape.

**Additional specimens examined (paratypes):**—BRAZIL. Minas Gerais: Santana do Riacho, RPPN Brumas do Espinhaço, Brumoso, 1414 m, 12 July 2012, fl., ♂, *M.G.C. Fernandes, F.M. Fernandes & C.A. Ferreira Júnior 1648* (BHCB, SPF); Serra do Cipó, Lapinha da Serra, trilha para o Pico do Breu, trilha secundária adjacente à encosta, 19°6'27" S, 43°40'20" W, 1281 m, 16 June 2010, fl., ♂, *G. Heiden, L.M. Borges, C.M. Siniscalchi & G. Müller 1386* (BHCB, RB, SPF); subida para o falso Morro do Breu, subida em zigue-zague no primeiro trecho da trilha, 19°6'58.8" S, 43°40'10.7" W, 1110 m, 23 May 2011, fl., fr., ♀, *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 225* (BHCB, RB, SPF); fl. ♂, *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 226* (BHCB, RB, SPF); vertente na encosta da montanha, 19°6'29.9" S, 43°40'12.8" W, 1217 m, fl., fr., ♀, *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 227* (JE, SPF); ♂, *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 228* (JE, SPF); 19°6'26.1" S, 43°40'16.1" W, 1256 m, ♀ *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 231* (K, NY, SPF); ♂, *C.M. Siniscalchi, C.R.M. Siniscalchi & R. Siniscalchi 232* (K, NY, SPF).

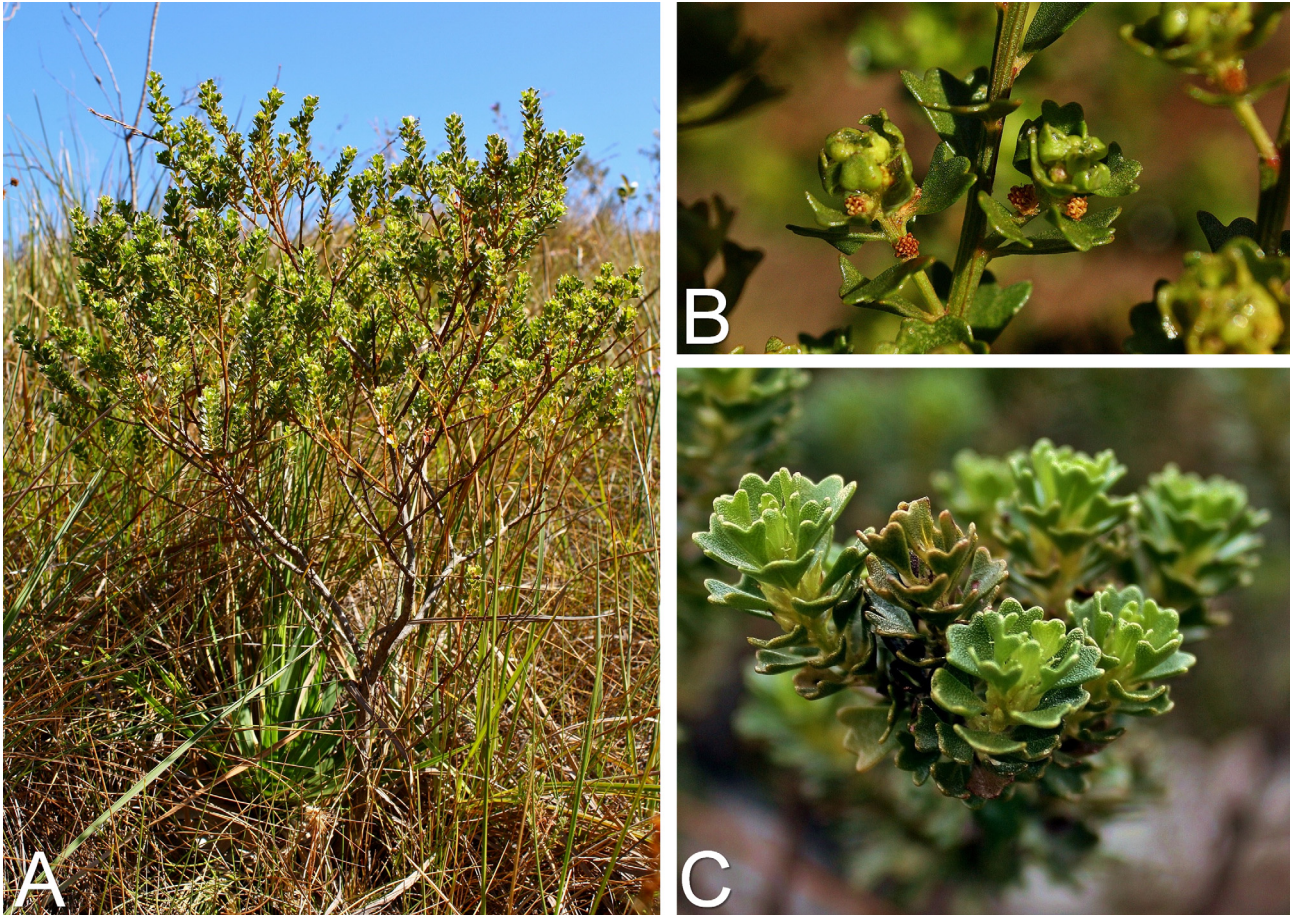
**Taxonomic position and affinity:**—*Baccharis obdeltata* belongs to subgenus *Baccharis* on the basis of the style apex of its male florets bearing sweeping hairs of unequal size, female florets with 5-dentate corolla apex and glabrous >8-costate cypselae with deciduous biseriate pappus. The new species superficially resembles the allopatric *B. truncata* Gardner (1848: 82) occurring in the Espinhaço range from the northerly Chapada Diamantina south to the Serra do Ouro Branco range in ironstone vegetation (*canga*) but not hitherto recorded from the Serra do Cipó. Both species are characterized by the obdeltate leaves with cuneate basis. However, *B. obdeltata* can be

distinguished by the smaller leaves (4.2–10 mm long and 3.5–8 mm wide) with 3(–5)-dentate apex, sessile male capitula bearing fewer florets (5–7) and single-flowered sessile female capitula, while *B. truncata* has larger leaves (1–2 cm long and 0.8–1 cm wide) with truncate apex, pedunculate male capitula bearing more florets (10–16) and pedunculate female capitula bearing 3–7 florets.



**FIGURE 1.** *Baccharis obdeltata*. **A.** Fertile shoot. **B.** Leaf and female capitulum. **C.** Male capitulum. **D.** Phyllaries of male capitulum. **E.** Male floret. **F.** Female capitulum. **G.** Female floret. **H.** Corolla and style of female floret. **I.** Cypsela (pappus removed). **A–B, F–I:** Heiden *et al.* 1385 (SPF). **C–E:** Heiden *et al.* 1386 (SPF). Illustration by João Iganci.





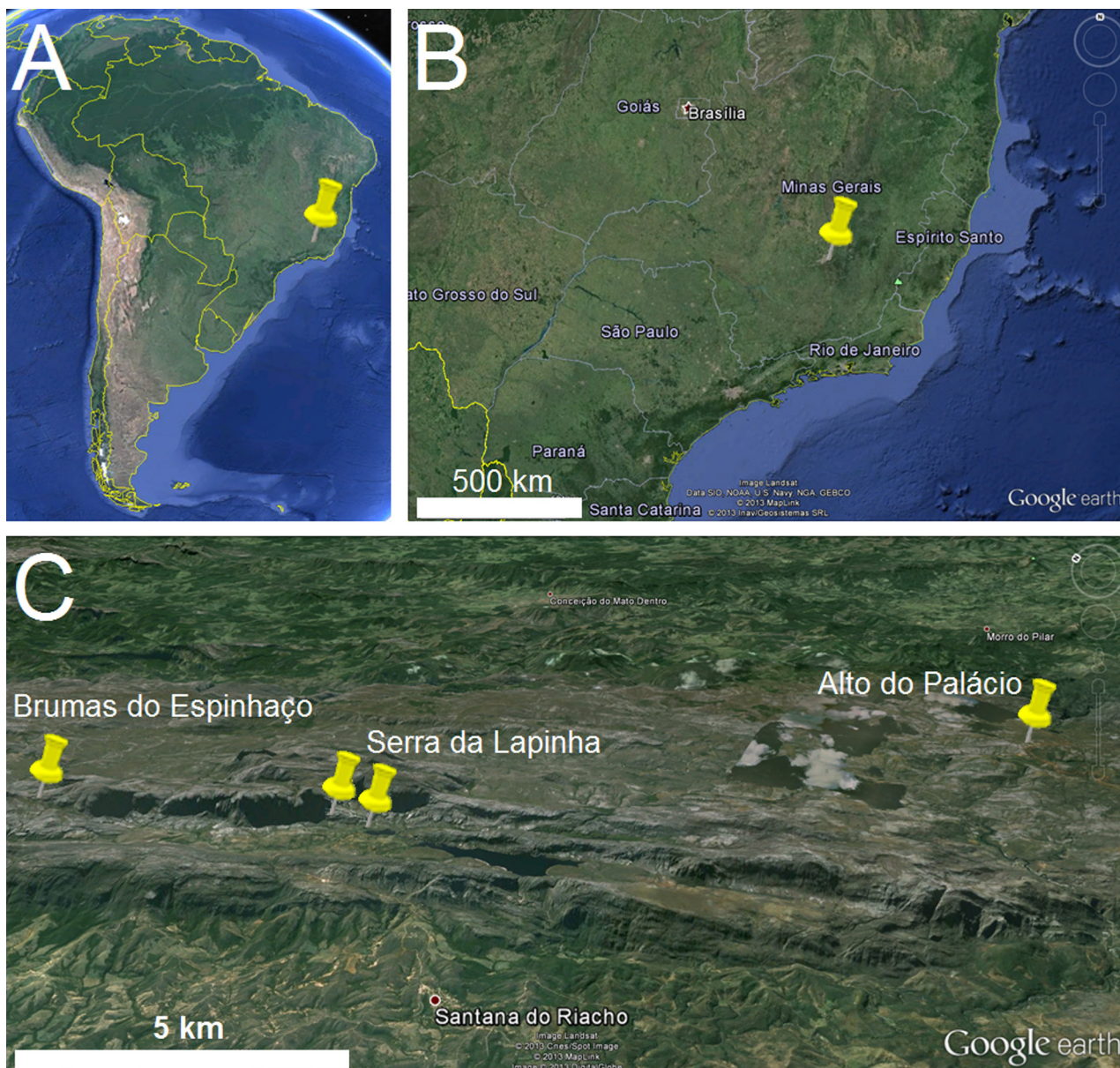
**FIGURE 2.** *Baccharis obdeltata*. **A.** Habit. **B.** Flowering shoot of a male plant. **C.** Flowering shoot of a female plant. Photos by C.M. Siniscalchi.

*Baccharis simplex* G.Heiden, *spec. nov.* (Figures 4 and 5)

**Type:**—BRAZIL. Minas Gerais: Jaboticatubas, Serra do Cipó, APA Morro da Pedreira, Rodovia Belo Horizonte – Conceição do Mato Dentro (MG010), km 116, Alto do Palácio, topo das elevações com escarpas voltadas para o vale do Córrego Palácio, 19°15' S, 43°32' W, elevation 1250 m a.s.l., 17 February 2011, fl., fr., ♀, G. Heiden, J.R. Pirani, C.M. Siniscalchi & M.F. Devecchi 1611 (holotype SPF!; isotypes BHCB!, JE!, RB!, Herbário da Embrapa Clima Temperado, Pelotas, RS, Brasil!).

*Shrubs* 0.3–0.5 m tall, erect; strongly resinous; bark light brown. *Leaves* with petioles 1–2 mm long, leaf blade coriaceous, 6.8–11 mm long, 3–6 mm wide, strongly resinous, broadly elliptic to oblong, apex rounded to obtuse, base obtuse, margins with 1–4 smooth teeth on distal half of each side, venation pinnate, craspedodromous, with 3–5 pairs of major lateral veins, midrib prominent on abaxial surface, glandular-punctate on both surfaces. *Capitula* solitary, in the leaf axis of the younger shoots. *Male capitula* with peduncles 1.2–2.5 mm long; capitula 2.5–2.7 mm long; florets 2–7; involucre 1.9–2.2 mm long, 1.2–2.7 mm in diam., cup-shaped; phyllaries 3-seriate, outermost phyllaries lanceolate, median ovate, innermost ovate-lanceolate, stramineous, margins entire, scarios, apices acute; clinanthium plane, glabrous; corolla 1.9–2.3 mm long, tube 1.1–1.3 mm long, throat 0.2–0.3 mm long, lobes 0.6–0.8 mm long; style 2.3–2.4 mm long, apex slightly cleft, distally dilated, ovary abortive, glabrous; pappus uniseriate, 2–2.3 mm long, bristles 14–18, apex broadened, short-protruding, erect terminal cell apices. *Female capitula* sessile, 3.5–4.1 mm long; involucre 3.5–4 mm long, 1–1.3 mm in diam., cylindrical, narrowed at distal end; phyllaries 3–4-seriate, stramineous, outer lanceolate, median ovate, innermost linear-lanceolate, margins entire, scarios, apices acute; clinanthium slightly convex, glabrous; florets 1; corolla 1.4–1.5 mm long, filiform, with 5 obtuse apical teeth; style 1.4–1.6 mm long., branches 0.2–0.3 mm long; *cypsela* 1.5–1.7 mm long, 0.55–0.6 mm in diam., brown, glabrous, oblong, slightly narrowed at bases, with 12–14 strong longitudinal ribs; *pappus* biseriate, 1.2–1.4 mm long, bristles 60–80, apically not broadened, not elongated at cypsela maturity, deciduous.





**FIGURE 3.** Distribution of *Baccharis obdeltata* and *B. simplex*. **A.** Overview map of South America pinpointing the position of the Serra do Cipó in south-eastern Brazil. **B.** A highlight in south-eastern Brazil depicting the boundaries of Minas Gerais state and the position of Serra do Cipó. **C.** Three-dimensional map showing part of the Serra do Cipó range, plotting the known distribution of *B. obdeltata* (Brumas do Espinhaço and Serra da Lapinha) and *B. simplex* (Alto do Palácio and Brumas do Espinhaço).

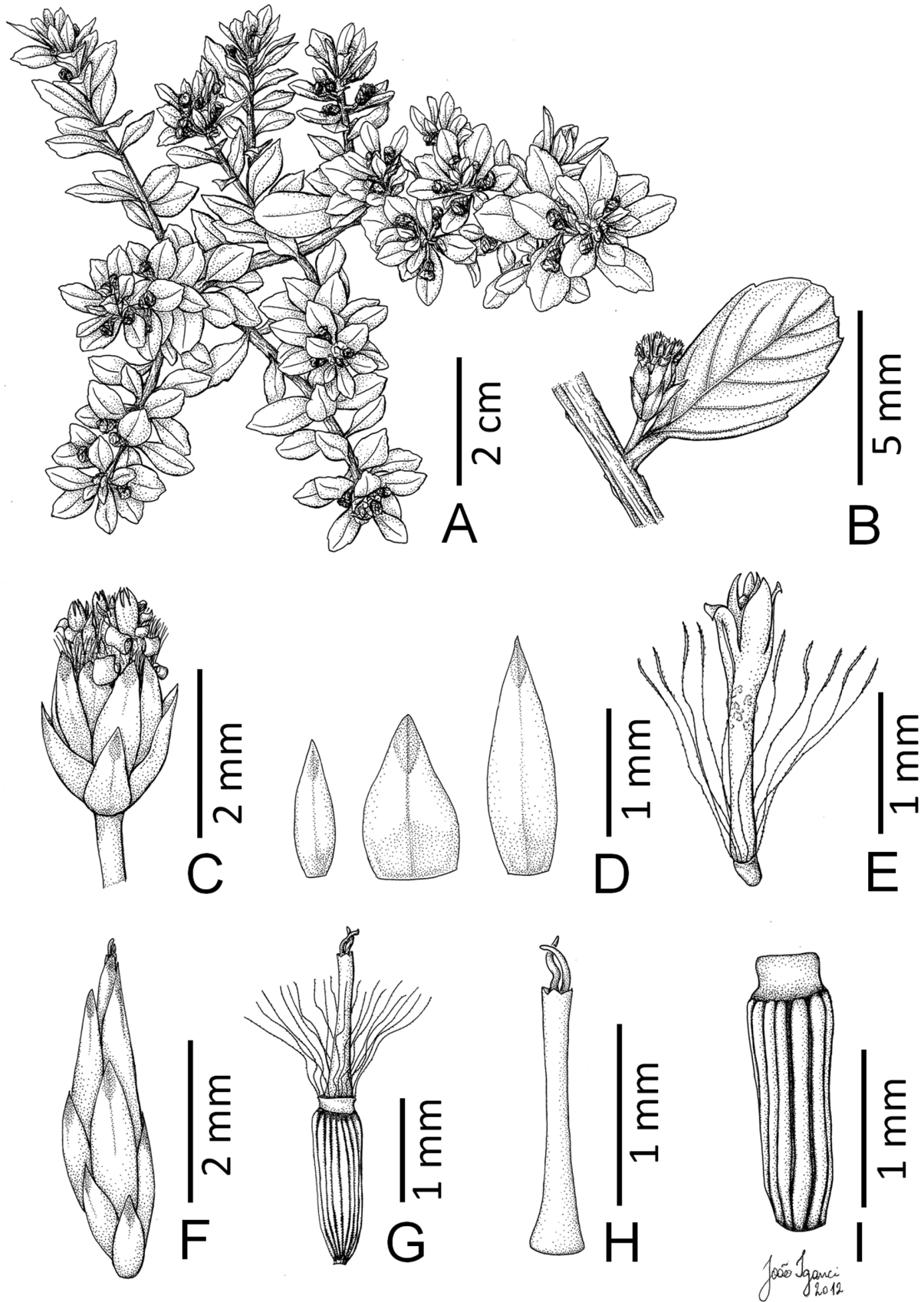
**Distribution:**—Known only from elevations between 1250–1400 m a.s.l. with two precise records at Alto do Palácio and in the private reserve of Brumas do Espinhaço (Figure 3) within the Serra do Cipó range, a portion of the Espinhaço ridge, the latter extending from central Bahia to Southern Minas Gerais states (Giulietti *et al.* 1997).

**Habitat:**—*Baccharis simplex* grows in areas of exposed fine quartzite sediments found at the very top of elevations amidst the rocky grasslands (*campos rupestres*) vegetation.

**Phenology:**—Fertile specimens, flowering and setting fruit, have been collected in February and July.

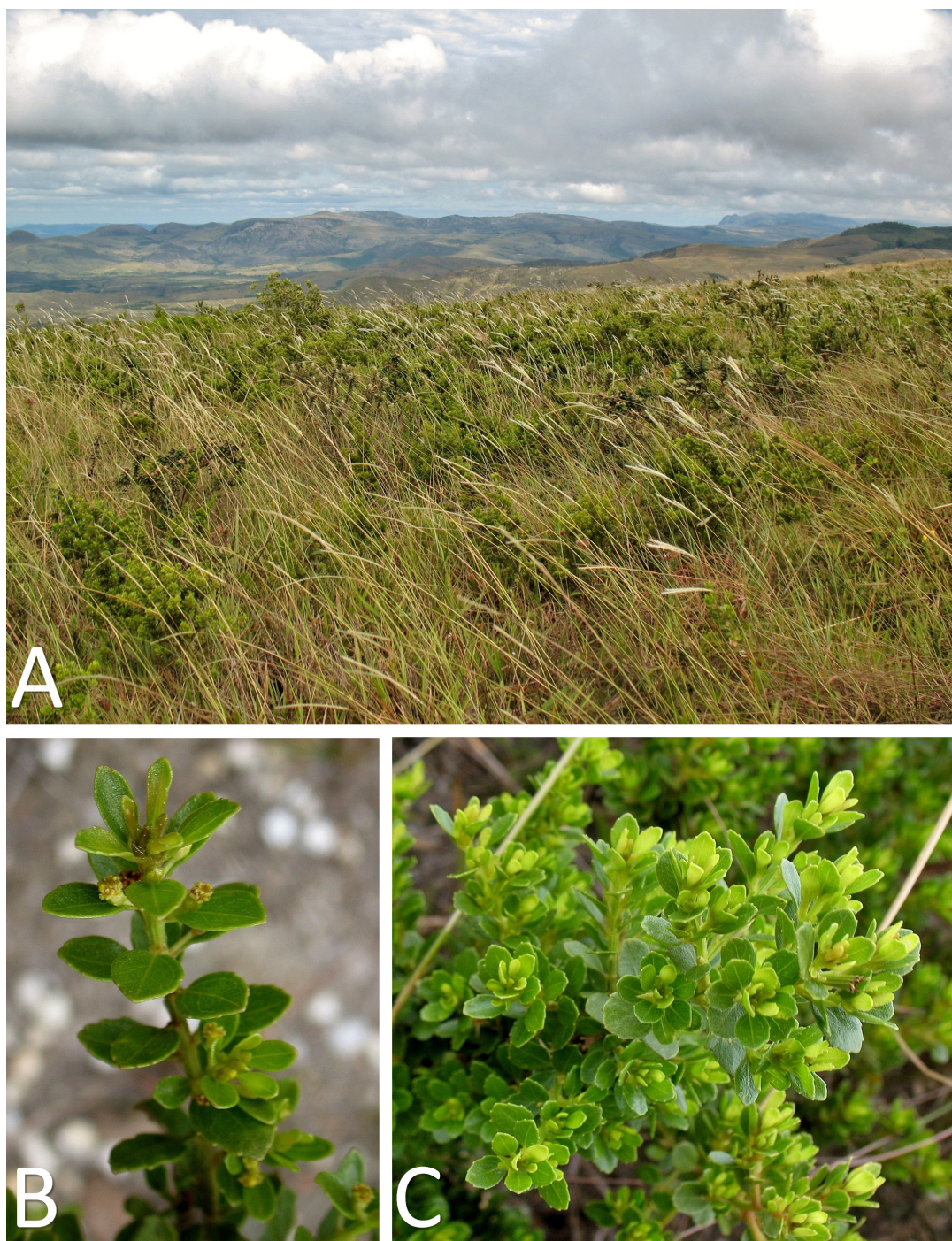
**Conservation status:**—Because of the limited extent of occurrence, known only for small populations recorded from two, maybe three localities, and the loss of quality of the *campos rupestres* ecosystem due to anthropogenic pressure (Burman 1991, Giulietti *et al.* 1997), the new species is assessed as Endangered: EN B1ab(iii) (IUCN 2011).

**Etymology:**—The specific epithet refers to the single-flowered female capitula and to the ordinary overall aspect of the plants, which share habit and leaf characters that are quite common to several other species of *Baccharis* subgen. *Baccharis*.



**FIGURE 4.** *Baccharis simplex*. **A.** Fertile shoot. **B.** Leaf and male capitulum. **C.** Male capitulum. **D.** Phyllaries of male capitulum. **E.** Male floret. **F.** Female capitulum. **G.** Female floret. **H.** Corolla and style of female floret. **I.** Cypsel (pappus removed). **A–E:** *Heiden et al. 1610* (SPF). **F–I:** *Heiden et al. 1611* (SPF). Illustration by João Iganci.





**FIGURE 5.** *Baccharis simplex*. **A.** Habitat and habit. **B.** Flowering shoot of a male plant. **C.** Flowering shoot of a female plant. Photos by G. Heiden.

**Additional specimens examined (paratypes):**—BRAZIL. Minas Gerais: Jaboticatubas, Serra do Cipó, APA Morro da Pedreira, Rodovia Belo Horizonte – Conceição do Mato Dentro (MG010), km 116, Alto do Palácio, topo das elevações com escarpas voltadas para o vale do Córrego Palácio, 19°15' S, 43°32' W, 1250 m, 17 February 2011, fl., ♂, G. Heiden, J.R. Pirani, C.M. Siniscalchi & M.F. Devecchi 1610 (BHCB, JE, RB, SPF, Herbário da Embrapa Clima Temperado, Pelotas, RS, Brasil!). Santana do Riacho, RPPN Brumas do Espinhaço, 1414 m, 11 July 2012, fl., ♂, M.G.C. Fernandes, F.M. Fernandes & C.A. Ferreira Júnior 1570 (BHZB, HUFU, SPF); Serra do Cipó, 1400 m, 11 May 1974, fl., ♂, G. Martinelli 315 (RB).

**Taxonomic position and affinity:**—*Baccharis simplex* belongs to *Baccharis* subgenus *Baccharis* based on style apex of male florets bearing sweeping hairs of unequal size, female florets with 5-dentate corolla apex and

glabrous >8-costate cypsela with deciduous biseriate pappus. The new species is similar to the sympatric *B. concinna* Barroso (1976: 162), also endemic to the Serra do Cipó. The two species possess leaves with dentate margins and axillary few-flowered male capitula and single-flowered female capitula, being distinguished by habit, leaf shape and female capitula length. While *B. simplex* is a small shrub (0.3–0.5 m tall) with oval to oblong leaves, obtuse base and rounded to obtuse apex with small teeth and shorter female capitula (3.5–4.1 mm long), floret (1.4–1.5 mm long) and cypsela (1.5–1.7 mm long), *B. concinna* is a taller shrub (0.5–1 m tall) with obovate to lanceolate leaves, attenuate base and rounded apex with coarse teeth and longer female capitula (4.5–5 mm long), floret (2–2.2 mm long) and cypsela (2–2.2 mm long).

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