

**TWO NEW HIGH ELEVATION SPECIES OF GAMOCHAETA  
(ASTERACEAE, GNAPHALIEAE)  
FROM COLUMBIA AND ECUADOR  
AND GAMOCHAETA COLUMBIANA COMB. NOV.**

**GUY L. NESOM**

Research Associate

Academy of Natural Sciences of Drexel University

Philadelphia, Pennsylvania

guynesom@sbcglobal.net

**ABSTRACT**

***Gamochaeta columbiana*** (Hieron.) Nesom, **comb. nov.**, is recognized as a distinctive species. The type is from Prov. Cauca, Colombia, and another collection is documented here from Prov. Carchi, Ecuador. It is similar in habit to the North American *G. sphacelata* but similarities appear to be convergent. ***Gamochaeta elibatantha*** Nesom, **sp. nov.**, is similar to *G. columbiana* but is relatively more widespread – it occurs in Columbia and Ecuador in paramo habitats and slightly below, at (2600-) 2800-3600 meters. ***Gamochaeta miniviridis*** Nesom, **sp. nov.**, occurs on disturbed sites of grass paramo in Colombia and Ecuador. Illustrations of representative specimens and distribution maps are provided.

A distinctive high-elevation species was named by Hieronymus (1894) from Colombia but has been unrecognized since. *Gnaphalium columbianum* Hieron. was not included in the preliminary synopsis of *Gamochaeta* by Freire and Iharlegui (1997), but it was placed by Anderberg (1991) and Dillon and Sagastegui (1991, following Anderberg) as a synonym of *Gamochaeta purpurea* (L.) Cabr. It is recognized in synonymy of *G. purpurea* in Plants of the World Online (2024).

The species is distinctive in its linear leaves with silvery-white vestiture, strongly interrupted inflorescence, small, few-flowered heads with erect, narrowly triangular phyllaries sharply acute at the apex, and high-elevation habitats. A collection at US is identified here as a representative of this rarely collected species.

**GAMOCHAETA COLUMBIANA** (Hieron.) Nesom, **comb. nov.** *Gnaphalium columbianum* Hieron., Bot. Jahrb. Syst. 19: 52. 1894. **TYPE: COLOMBIA.** [Cauca], Popayán, Páramo de Guanacas, 3000-3400 m, Aug [1880], *F.C. Lehmann 5232* (B-destroyed, F-photo). Figures 4-5.

*Gamochaeta americana* var. *linearifolia* Wedd., Chlor. Andina 1: 152. 1856. **TYPE: ECUADOR.** Pichincha, Andes de Quito, 1856, *Jameson 478* (as cited by Freire & Iharlegui 1997, not seen, K or BM?).

Weddell cited *Gnaphalium sphacelatum* Kunth in synonymy of var. *linearifolia*. Jameson's synopsis of Ecuadorian plants (1865) included *Gamochaeta americana* but did not recognize infraspecific taxa.

**Additional collection. ECUADOR.** Carchi, 11.4 km NE of El Angel on road toward Tulcán, grassland with scattered *Espeletia*, 3240 m, 13 May 1990, *King et al. 10,091* (US-Fig. 6).

In its linear leaves, interrupted inflorescence, and small heads with sharp-pointed phyllaries, *Gamochaeta columbiana* is similar to *Gamochaeta sphacelata* (Kunth) Cabr. (1961) of North America (southwestern Texas, Mexico as far south as Oaxaca, but not to Central America, the type from Edo. México) (Figs. 7-10). The North American plants, however, differ from *G. columbiana* in their taprooted (vs. fibrous-rooted) habit, closely subtending inflorescence bracts (vs. subtending leaves), outer and middle phyllaries with acute-acuminate, recurving tips with inrolled margins, and bisexual florets 3–5 (vs. 2–3 in *G. columbiana*, from the protologue and *King et al. 10,019*). In addition to the

continental disjunction, *G. sphacelata* characteristically grows in arid habitats at elevations of 2000–2800 meters. Similarities probably are convergent.

Cabrera (1978), Dillon and Sagastegui (1991), and Freire and Iharlegui (1997) have included *Gamochoaeta sphacelata* among the South American species. Perhaps the first to include it was deCandolle (1838, p. 234-235), who listed *Gnaphalium sphacelatum* "γ.? Chilense" ... "in Chili, Gn retusum? Poepp.! pl. exc. chil. I, p. 214. diar. n. 287 et forte n. 215. An species propria? (v.s.)." In documentation of the occurrence of *G. sphacelata* in South America, Freire and Iharlegui (1997) cited a collection from Argentina (Cabrera *et al.* 16943, LP-not seen in my study) and the type of *Gamochoaeta americanum* var. *linearifolia* Wedd., treated here as a synonym of *G. columbiana*. In synonymy of his new combination *Gamochoaeta sphacelata*, Cabrera (1961) included *Gamochoaeta americanum* var. *linearifolia* Wedd.

King *et al.* made two collections of *Gamochoaeta* in 1990 at the Carchi locality in northern Ecuador, presumably seeing them in the field as different species — (1) *G. columbiana* and (2) King *et al.* 10,104, identified here as *Gamochoaeta elibatantha* (sp. nov.), similar in overall appearance to *G. columbiana* in its silvery-white, linear leaves, and small heads, but with a compact inflorescence and phyllaries with a rounded apex. It occurs at high altitudes in Colombia and northern Ecuador.

**GAMOCHAETA ELIBATANTHA** Nesom, **sp. nov.** **TYPE: COLOMBIA.** Dept. Putumayo, Sibundoy, Valle de Sibundoy, páramo 2800 m, 30 Jun 1953, *Schultes & Cabrera 20081* (holotype: US). Figure 11.

Distinct as short-lived perennials without basal leaves, the cauline linear-oblong to linear-oblongate and strongly bicolor (densely silvery-gray-tomentose abaxially), small, golden-brown heads in a dense cluster, and páramo habitats.

Short-lived perennial **herbs**, fibrous-rooted, sometimes with decumbent, fibrous-rooted caudex branches. **Stems** often numerous from the base, mostly (5–)20–30(–40) cm tall, erect to basally ascending, usually unbranched, persistently white-tomentose-sericeous, eglandular. **Leaves** all cauline, linear-oblong to linear-oblongate, 2–6(–7) cm long, 2–5 mm wide, usually densely arranged, even-sized, sometimes continuing into the inflorescence as bracts. **Heads** in a dense, compact cluster 2–26(–12) cm long, usually with a few short bracts, sometimes slightly interrupted. **Involucres** 3–3.5 mm high, 2–2.5 mm wide; phyllaries in 4–5 series, oblong-ovate, golden-brown, sometimes purple-tingued. **Pistillate florets** 27–45(–53), corollas 2–2.2 mm long. **Bisexual florets** 3–4, corollas 1.8–2.3 mm long, yellow, lobes orangish. **Achenes** 0.6–0.8 mm long; pappus bristles 12–15. Figures 11-16.

Flowering (June-) July-October (-December, March). Páramo and slightly below, cloud forest, forest margins, high pastures, cultivated fields, river gravel, (2600-) 3200-3700 meters.

**Additional collections. COLOMBIA.** Santander, Páramo de Santurbán, ca. 3600 m, 27 Aug 1948, *Araque & Barkley 330* (US); Cundinamarca, carretera Páramo de Palacio a Río Chuza, cabeceras Valle Chcolatál, 3670 m, 9 Sep 1972, *Cleef 5407* (US); Cauca, Páramo of Purace, Oct 1944, *Core 1434*-collected by Hurtado (US); Valle del Cauca, Los Farallones, extremo N en el cerro Alto del Buey, filo de la cordillera, páramos, 3500-3600 m, 12 Oct 1944, *Cuatrecasas 17978* (US); Cauca, E slopes of Páramo del Purace on Paramo de San Rafael, headwaters of Río San José, 3200-3350 m, 10 Oct 1961, *Cuatrecasas 26252* (US); Cauca, Páramo de Juntas (extension of Páramo de Guanacas, KM 53), 3300 m, 12 Oct 1961, *Cuatrecasas 26355* (US); Valle del Cauca, Páramo Pan de Azúcar, 23 Aug 1968, *Espinal T. 2448* (US); Cundinamarca, Río Arroz, Páramo de Sumapaz, common weed in pasture and potato patch, páramo character, 3500 m, 16 Aug 1943, *Fosberg 20822* (US); Caldas, Manizales - Honda [near Nevado del Ruiz], Jun 1952, *Køie 5335* (US); Santander, Páramo de las Vegas, 3700-3800 m, 20-21 Dec 1926, *Killip & Smith 15615* (US); Caldas, Cerro Tatama, dry grassy páramo, 3400-3700 m, 8-10 Sep 1922, *Pennell 10587* (US); Tolima, Páramo de Ruiz, open slope below páramo, 3000-3500 m, 16-17 Dec 1917, *Pennell 3094* (US); Dept. Putumayo, Sibundoy, Valle de Sibundoy, páramo 2800 m, 30 Jun 1953, *Schultes & Cabrera 20081* (US). **ECUADOR.** Imbabura, Lago San Marco, Cayambe,

11,200 ft [3400 m], river gravel, 25 Nov 1961, *Cazalet & Pennington 5321* (US); Chimboraza, vicinity of Nevado El Altar, near Rio Blanco, 3370-3400 m, 31 Mar 1983, *Juncosa 837* (US); Carchi, 11.4 km NE of El Angel on road toward Tulcan, grassland with scattered *Espeletia*, 3240 m, 13 May 1990, *King 10,104* (US); Sucumbias, 11 km W of El Playon de San Francisco on road to Jullo Andrade 5 km up the Rio Chingual, 3200 m, margins of *Clusia* forest near clearing, 3200 m, 15 May 1990, *King 10,138* (US); Pichincha, Volcan Cayambe, above 4000 m, 22-23 Jul 1943, *Little & Paredes 6914* (US); Pichincha, 18 km S of Quito, INTAP Estacion Experimental "Santa Catalina," NW of main buildings, cultivated fields near dirt road, 3050 m, 2 Mar 1972, *MacBryde 1158* (US); Pichincha, Dos Novias, KM 16 on road Alog-Sto. Domingo, cloud forest at the waterfalls, 2600 m, 21 Mar 1967, *Sparre 14921* (US).

A distinct species in morphology and ecology is represented by four US collections from Colombia and Ecuador. These are small annuals with strongly bicolor leaves (glabrous and bright green adaxially) and a few-flowered, racemoid inflorescence. Three of the collections were made from burned and grazed paramo, the other from disturbed soil along a drainage ditch cutting through paramo.

**GAMOCHAETA MINIVIRIDIS** Nesom, **sp. nov.** TYPE: **ECUADOR**. Pichincha, Nevado Cayambe, W side of the volcano, 00° 01' N, 78° 01' W, grazed and burned grass páramo with scattered *Gynoxys* trees, 4200 m, 3 Jul 1995, *P. Sklenar and V. Kostekova 66-1* (holotype: US). Figure 17.

Distinct in its annual duration, small size, bicolor leaves adaxially glabrous, and racemoid inflorescence with solitary heads on bracteate pedicels.

**Annual herbs**, fibrous-rooted or from a short, slender taproot, eglandular. **Stems** erect, 4–15 cm tall, sparsely tomentose. **Leaves** strongly bicolor, green and completely glabrous adaxially, persistently white-tomentose abaxially with tightly matted hairs, basal and lower cauline narrowly oblanceolate to oblong-obovate, 1–3.5 cm long, 3–9 mm wide, margins entire, not revolute, cauline gradually diminishing in size, sessile, not clasping or decurrent. **Inflorescence** racemoid, individual heads on bracteate pedicels elongating to 25 mm (proximal) to 5 mm (distal). **Involucre** 6 mm high; phyllaries oblong-lanceolate to oblong-elliptic, in 3–4 series. **Pistillate florets** 105 (holotype), corolla lobes and style branches purple. **Bisexual florets** 10 (holotype), corollas 3.5 mm long, lobes and distal throat purple, turning brown. **Achenes** 0.8–0.9 mm long, oblong, tan, glandular-papillate; pappus bristles ca. 20–40, basally connate and deciduous as a unit. Figures 17-18.

Flowering May-October. Burned and grazed grass paramo or otherwise disturbed paramo soil; 3140-4200 meters.

**Additional collections.** **COLOMBIA.** Cauca, Valle de las Papas, alrededores de Valencia Los Andes, near Hacienda Los Andes, Sta. 2, disturbed soil along drainage ditch which cuts through extensive *Espeletia*-grass cienega, ca. 3140 m, 28 Sep 1958, *Barclay & Juajibioy 5841* (US). **ECUADOR.** Pichincha/Cotopaxi, E slope of Iliniza Sur, 00° 40' S, 78° 42' W, burned and grazed grass paramo, 4200 m, 27 May 1995, *Sklenar and Kostekova 13-12* (US); Chimborazo, Chimborazo volcano, 01° 28' S, 78° 46' W, transition from the bunchgrass páramo of *Calamagrostis intermedia* to the cushion páramo of *Plantago rigida* and *Azorella* spp. on the E slope of the mountain, vegetation burned and grazed, 4200 m, 2 Jul 1997, *Sklenar & Sklenarova 2102* (US).

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Figure 1. Distribution of *Gamochoaeta columbiana*. Colombia and Ecuador.

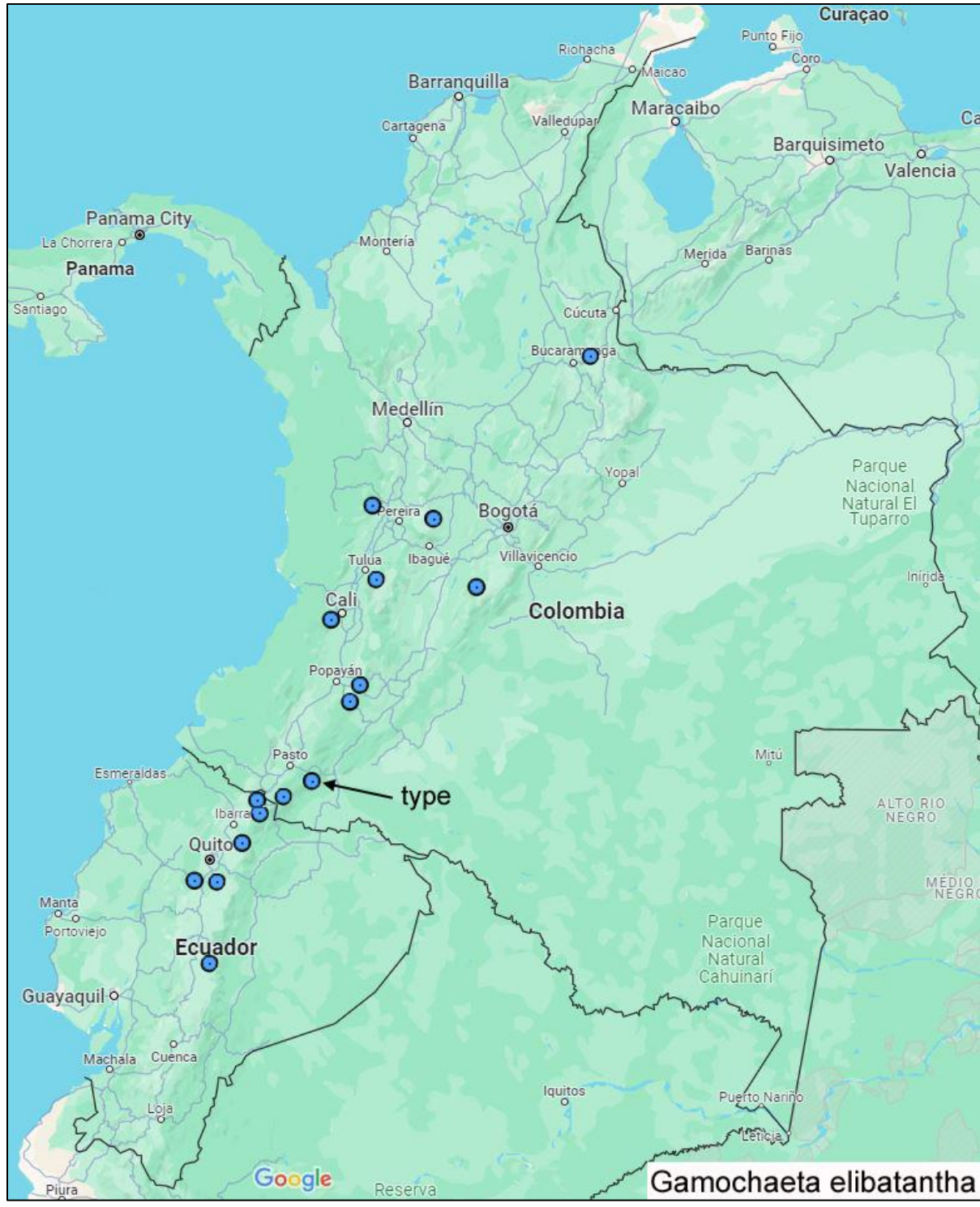


Figure 2. Distribution of *Gamochoaeta elibatantha*. Colombia and Ecuador.



Figure 3. Distribution of *Gamochoeta miniviridis*. Colombia and Ecuador.



Figure 4. *Gnaphalium columbianum*, photo at F of the holotype (B).

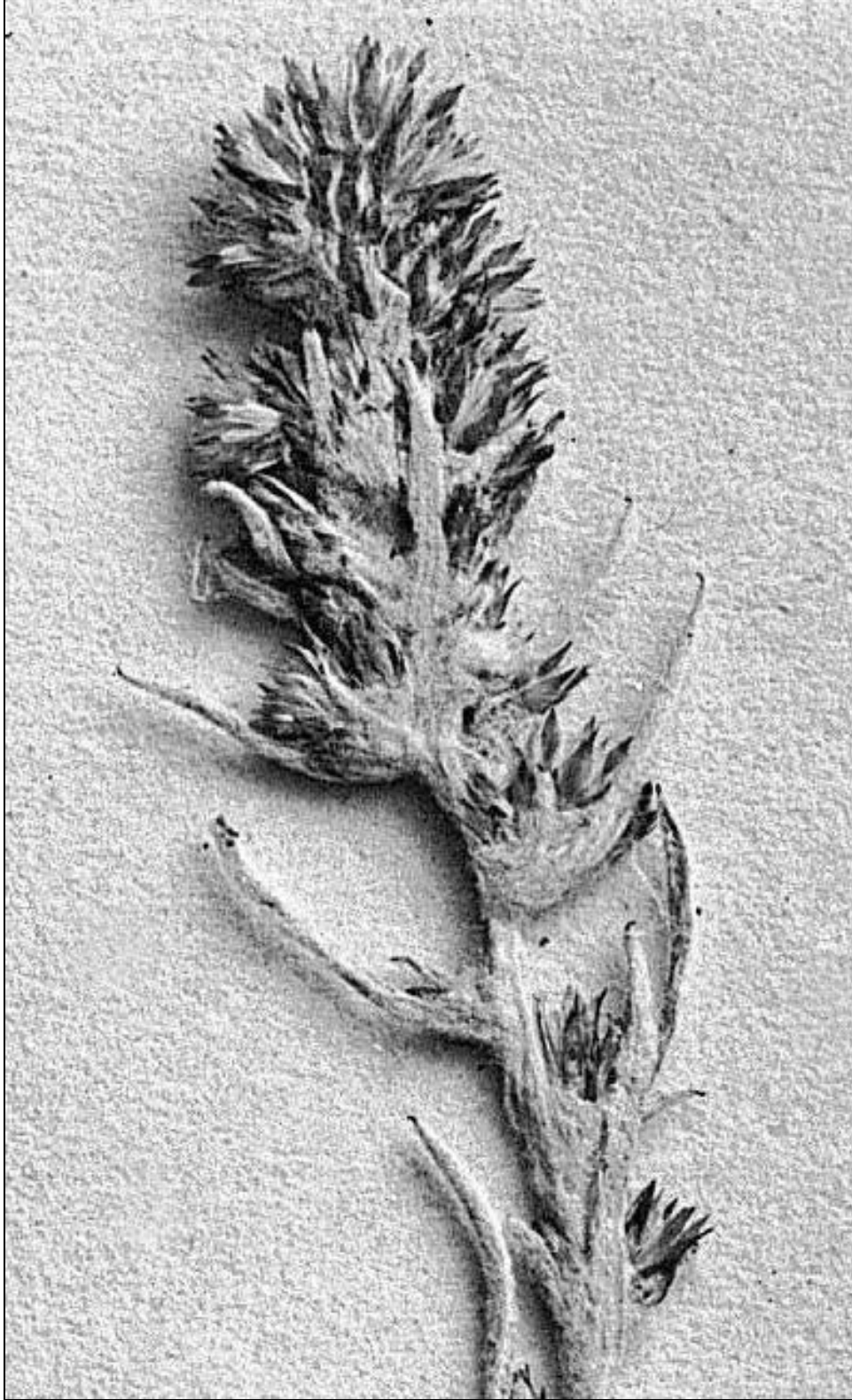


Figure 5. *Gnaphalium columbianum*, detail from the holotype (B).





Figure 6. *Gamochaeta columbiana*, representative collection. Ecuador, King et al. 10,091 (US).



Figure 7. *Gamochaeta sphacelata*, representative collection, Oaxaca, Mexico. Salinas T. 4353 (NO).



Figure 8. *Gamochaeta sphacelata*, representative collection, Texas, USA. Worthington 14344 (TEX).



Figure 9. *Gamochaeta sphacelata*, representative collection, Texas, USA. Turner 15546A (TEX).



Figure 10. *Gamochaeta sphacelata*. Details from isotypes of *Gnaphalium pedunculatum* I.M. Johnston (synonym of *G. sphacelata*) — left, F; right, K.



Figure 11. *Gamochoeta elibatantha*, Colombia. Schultes 20081 (US), holotype.



Figure 12. *Gamochaeta elibatantha*. Ecuador, detail from King et al. 10104 (US).



Figure 13. *Gamochaeta elibatantha*, representative collection, Colombia. Cuatrecasas 17978 (US).





Figure 14. *Gamochaeta elibatantha*, representative collection, Ecuador. Fosberg 20822 (US).



Figure 15. *Gamochaeta elibatantha*, representative collection, Ecuador. Sparre 14921 (US).



Figure 16. *Gamochoaeta elibatantha*, representative collection, Ecuador. King et al. 10104 (US).



Figure 17. *Gamochoeta miniviridis*. Ecuador, Sklenar & Kosteczkova 66-1 (US). Holotype.



Figure 18. *Gamochoaeta miniviridis*. Ecuador, Sklenar & Kosteczkova 13-12 (US).