

FOUR NEW SPECIES OF *CLIBADIUM* FROM NORTHERN SOUTH AMERICA
(ASTERACEAE: HELIANTHEAE)

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ABSTRACT

Clibadium funkiae is described from Colombia and *C. alatum*, *C. napoense*, and *C. zakii* are described from Ecuador.

KEY WORDS: Asteraceae, Heliantheae, *Clibadium*, Ecuador, Colombia

The descriptions provided here are the result of a review of *Clibadium* for the Flora of Ecuador undertaken prior to sending the material on loan. During the study, three undescribed species have been discovered from Ecuador. Resolution of material from adjacent Colombia has shown an additional new species from Antioquia. While the new species are described below, it should be noted that two previously described species of the present author from Perú are now considered synonyms, *C. rimachii* H. Robinson (1988) is the same as *C. divaricatum* S.F. Blake, and *C. Vargasianum* H. Robinson (1979) is only an unusually hirsute variant of the widespread *C. surinamense* L.

***Clibadium funkiae* H. Robinson, sp. nov. HOLOTYPE: COLOMBIA.**

Antioquia: 3 km SE of Santa Elena on road from Medellín to Santa Elena and Río Negro, 15 km NW of Río Negro (centro), 2450 m, 30 Jul. 1979, *Stuessy & Funk 5709* (US). PARATYPES: COLOMBIA. Antioquia: Municipio Frontino, Corregimiento Nutibara, región Murri carretera hacia La Blanquita, Finca Palmera, 1700 m, 15 Jul. 1986, *Acevedo, Martínez, Orrego, Restrepo, Sánchez, & Silva 1344* (NY,US). Municipio de Yarumal, 2 km antes del alto de Ventanas, camino a Vereda Alegre, 2030 m, 20 Aug. 1986, *Callejas, Churchill, Acevedo, & Saldarriaga 2488* (HUA,NY,US). Municipio de Caldas, Vereda La Corrala, 2440 m alt., 14 Sept. 1987, *Escobar, Velásquez, & Marulanda 7911* (US). Municipio

Frontino, road to Murri, 15 km W of Nutibara (Altos de Cueva), 1850 m, 17 Oct. 1987, *Brant & Martínez 1378* (MO,US); km 17 of road Nutibara - La Blanquita, region of Murri, 1860 m, 3 Nov. 1988, *Zarucchi, McPherson, Roldán, & Escobar 7097* (MO,US) region of Murri, c. 13 road-km from Nutibara, 2000 m, 9 Dec. 1988, *McPherson 13396* (MO,US).

Plantae fruticosaes scandentes ad 2 m altae et ad 6 m longae; caules atrobrunnescentes teretes vel subhexagonales hispiduli et leniter retrorse vel antrorse appresse strigillosi, ramis ad angulum ca. 90° patentibus. Folia opposita, petiolis 1-3 cm longis; laminae ovatae plerumque 7-14 cm longae et 2.5-6.0 cm latae base acutae vel leniter acuminatae margine antrorse serrulatae apice anguste breviter acuminatae supra et subtus appresse strigillosae quinquenervatae, nervis secundariis majoribus e fere ad basem et 0.8-2.0 cm supra basem ad marginem inferiorem subparallelis. Inflorescentiae in ramis foliosis et in ramulis recte patentibus terminales subdense corymbosae, ramulis dense puberulis, in capitulis sessilibus vel subsessilibus 1-3 terminatis. Capitula 4-6 mm alta et 2-4 mm lata; bracteae involucri steriles 2-4 et bracteae feminei 3 vel 4 subcoriaceae late ovatae vel late oblongae 3-5 mm longae et 1.5-3.0 mm latae apice obtusae extus strigillosae, bracteae masculini 3 vel 4 scariosae obovatae 2-4 mm longae et 1.0-1.5 mm latae apice leniter erosae minute fimbriatae extus glabrae. Flores radii 3 vel 4; corollae albae tubulares 2.5-3.0 mm longae, lobis 0.3-0.5 mm longis extus subglabris vel pauce glanduliferis et dense argute breviter setuliferis. Flores disci 4-6; corollae albae 3.0-4.5 mm longae, tubis basilaribus 0.5-1.0 mm longis, faucibus 2-3 mm longis, lobis 0.5-0.8 mm longis et 0.3-0.7 mm latis extus dense longe argute setuliferis, ductis validis corollarum 10 ad nervos et mediolobatis; thecae antherarum nigrae 1.3-2.0 mm longae, appendicibus apicalibus nigris ovatis 0.2-0.3 mm longis. Achenia radii biconvexa obovata ca. 2.5 mm longa 1.5 mm lata distaliter dense argute pilosula, rostris apicalibus minutis deciduis; achenia disci 2.0-2.5 mm longa pilosula superne densiores. Grana pollinis in diametro ca. 25 μ m.

The Antioquian species is distinct from the widely distributed *Clibadium surinamense* L. by the appressed strigillose pubescence of the leaves, the bearing of the heads often in sessile or subsessile groups of 2 or 3, and the 10 strong ducts in the disk corollas. The specimens with branches have those branches spreading at right angles in a manner not seen in *C. surinamense*. Material of the new species shows some variation. The type and *Escobar et al. 7911* from 2450-2500 m alt. have spreading to slightly retrorse hairs on the stems and the heads are mostly 5-6 mm long with 4 sterile bracts. Most of the specimens from 1700-2000 m have antrorsely strigillose stems and smaller heads

with about 2 sterile bracts. One specimen, *Callejas et al.* 2488 from 2030 m is like the type specimen in its heads and like the lower elevation material in its stem pubescence.

The specimens were originally identified as *Clibadium pentaneuron* S.F. Blake because of the two pairs of well developed secondary veins near the base of the leaf blade, but the Blake species has a broader, divaricately branched inflorescence and is restricted to southwestern Colombia. *Clibadium pentaneuron* is closer to *C. laxum* S.F. Blake of Ecuador and southwestern Colombia.

The specimens are cited from wet montane forests, edge of primary forests and in a transition zone to subpáramo.

***Clibadium alatum* H. Robinson, *sp. nov.* HOLOTYPE: ECUADOR.**

Carchi: environs of Maldonado, wet montane forest, alt. 1450-1650 m, 3 June 1978, *Madison, Plowman, Kennedy, & Besse* 4940 (US).

Plantae suffruticosae ad 6 m altae; caules atrobrunnescentes teretes dense appresse strigillosi, ramis ad angulum 30°-50° ascendentibus. Folia opposita, petiolis 3.5-14.0 cm longis ad basem distincte anguste alatis; laminae late ovatae vel suborbiculares 17-29 cm longae et 8-23 cm latae base late subcordatae vel subtruncatae vel rotundatae abrupte in alis petiolarum acuminatae margine crenato-serratae vel dentatae apice breviter acutae breviter acuminatae supra minute strigillosae subtus appresse strigillosae e 4-7 cm supra basem valde trinervate, nervis secundariis majoribus ascendentibus, nervis secundariis inferioribus 2-4 minoribus congestis recte patentibus. Inflorescentiae in ramis foliosis terminales late corymboso-cymosae ad 20 cm latae, ramulis dense puberulis, ramulis distalibus seriate cymosis subdense sessiliter vel subsessiliter capituliferis. Capitula ca. 5 mm alta et 3.5-4.0 mm lata; bracteae involucri steriles 3 vel 4 et bracteae feminei 7-9 subcoriaceae late ovatae vel late oblongae 4-5 mm longae et 1.8-3.5 mm latae apice obtusae vel breviter acutae distaliter breviter ciliatae extus distaliter pauce appresse strigillosae; bracteae masculini 6 vel 7 scariosae ca. 3 mm longae 1-2 mm latae distaliter erosae breviter ciliatae. Flores radii 7 vel 8; corollae albae tubulares ca. 2 mm longae, lobis 0.3-0.5 mm longis glabris. Flores disci ca. 8; corollae albae 3.5 mm longae, tubis basilaribus ca. 0.8 mm longis, faucibus anguste campanulatae 2.0-2.2 mm longae, lobis 0.5-0.7 mm longis et 0.4-0.5 mm latis extus dense scabridulis, ductis 5 ad nervos sub sinibus terminatis; thecae antherarum nigrae ca. 1.5 mm longae, appendicibus apicalibus nigris ovatis ca. 0.3 mm longis. Achenia radii biconvexa submatura ca. 1.8 mm longa 1.2 mm lata distaliter

dense argute hispidula, rostris apicalibus subpersistentibus glabris 0.6-0.8 mm longis; achenia disci 2.0-2.7 mm longa inferne glabra distaliter dense argute pilosula. Grana pollinis in diametro ca. 23 μm .

The species has leaves with large blades and very long petioles, but seems to be the only member of the genus with distinct wings on the petioles. The wings reach the bases of the petioles, and the wings of adjacent leaves nearly meet at the node. The rostrum of the ray achenes is longer than those in most species of *Clibadium*.

Clibadium napoense H. Robinson, *sp. nov.* HOLOTYPE: ECUADOR.

Napo: Cantón Napo, Zatzayacu, alt. 500 m, 28 Mar. 1935, *Mexia 7110A* (US). PARATYPES: ECUADOR. Napo: Río Napo, Chiroisla, alt. 250 m, 24 Aug. 1979, *Holm-Nielsen, Jaramillo, & Coello 19785* (AAU,QCA,US). Left margin of Río San Miguel, near outlet to Río Putumayo, ca. 200 m, 1 Aug. 1980, *Andrade 33147* (AAU,QCA,QNA,US). Cantón Archidona, N bank Río Suno, 15 km NW of Loreto, 8 km W of El Progreso, 600 m, 12 Dec. 1989, *Neill, Hurtado, & Alvarado 9156* (MO,US).

Plantae fruticulosae 1.5-2.5 m altae; caules brunescens teretes vel subhexagonales dense strigillosi, ramis ad angulum 30° vel 50° patentibus. Folia opposita, petiolis 1-5 cm longis; laminae ovatae plerumque 10-18 cm longae et 3.5-8.5 cm latae base rotundatae vel obtusae interdum breviter acuminatae margine appresse antrorse serrulatae apice anguste breviter acuminatae supra minute scabridulae planae subtus appresse strigillosae inferne quinquenervatae, nervis secundariis fere ad basem et e 1-2 cm supra basem insertis ad marginem basilarem plerumque subparallis. Inflorescentiae in ramis foliosis terminales laxae corymbosae, ramulis seriate cymosis dense rigide puberulis. Capitula sessile contigua vel non contigua 3.0-3.5 mm alta et ca. 3 mm lata; bracteae involucri steriles 3 vel 4 et bracteae feminei 5 vel 6 subcoriaceae interiores aliquantum scariosae majores late ovatae vel late oblongae 3.0-3.5 mm longae et 2.5-3.5 mm latae apice obtusae vel breviter acutae margine breviter ciliatae extus distaliter scabridulae; bracteae masculini tenuiter scariosae ca. 2.5 mm longae. Flores radii 5 vel 6; corollae albae tubulares 1.8-2.2 mm longae, lobis 3 ad 0.5 mm longis extus subglabris vel breviter puberulis. Flores disci 8-11; corollae 2.8-3.0 mm longae, tubis basilaribus 0.6-0.8 mm longis, faucibus 1.5-1.7 mm longis, lobis 0.6-0.7 mm et longis 0.4-0.6 mm latis extus dense breviter argute puberulis, ductis 5 ad nervos dispositis

sub sinibus terminatis; thecae antherarum nigrae 1.0-1.2 mm longae, appendicibus apicalibus nigris ovatis ca. 0.25 mm longis et 0.2 mm latae. Achenia radii biconvexa ca. 2.5 mm longa 2 mm lata supra mediam dense argute pilosula, rostris minutis deciduis breviter lobatis; achenia disci 2.0-2.2 mm longa argute pilosula superne densius pilosula. Grana pollinis in diametro 23-25 μ m.

The new species is related to *Clibadium glabrescens* S.F. Blake, which also occurs on the eastern slopes of Andes in an area reaching farther north into southernmost Colombia and farther south to the Ecuadorian Department of Morona-Santiago. The Blake species is distinct in its glabrous stems. The new species seems to occur primarily on wooded or sandy streambanks.

Clibadium zakii H. Robinson, *sp. nov.* HOLOTYPE: ECUADOR. Bolivar: Carretera Chillanes - Bucay, en la hacienda "Tiquibuso" del Sr. Gonzalo Gómez, alt. 2100 m, 10 Sept. 1987, *Zak & Jaramillo 2881* (MO,US).

Plantae fruticulosae scandentes 2-3? m altae; caules atrobrunnescens teretes vel subhexagonales dense hispiduli, ramulis ad angulum 45°-60° patentibus. Folia opposita, petiolis 1.0-1.3 cm longis; laminae ovatae plerumque 7-8 cm longae et 4.0-4.5 cm latae base obtusae vel breviter acutae non acuminatae margine minute serrulatae apice anguste breviter acuminatae supra sparse scabridae et dense minute scabridulae subtus plerumque in nervis et nervulis hispidulae e 0.5-1.0 cm supra basem trinervatae, nervis secundariis basilaribus pertenuibus. Inflorescentiae in terminis ramis foliosis et in axiles superioribus dispositae, ramulis rotundate dense corymbosis distaliter non seriate cymosis, bracteolis lanceolatis 2-3 mm longis et ca. 0.5 mm latis hispidulis, pedunculis 0-2 mm longis dense hispidulis. Capitula subcontigua 4-5 mm alta et 3 mm lata; bracteae involucri steriles 2 vel 3 coriaceae ovatae ca. 4 mm longae et 2.5 mm latae acutae margine ciliatae extus dense strigillosae; bracteae feminei ca. 5 subcoriaceae oblongae ca. 4 mm longae et 2.2-2.5 mm latae apice obtusae margine superne in pilis brevibus argutis fimbriatae extus subglabrae; bracteae masculini 1 vel 2 obovatae scariosae ca. 2.5 mm longae et 1 mm latae. Flores radii ca. 5; corollae albae tubulares ca. 2.5 mm longae breviter puberulae et dense breviter glanduliferae supra mediam et in lobis densiores, lobis 3, 0.3-0.4 mm longis. Flores disci ca. 5; corollae albae supra mediam in pilis argutis et glandulis brevibus obsitae in lobis densiores, tubis basilaribus ca. 0.4 mm longis, faucibus ca. 1.5 mm longis, lobis ca. 0.5 mm longis et latis, ductis 5 ad nervos et 3-5 mediolobate

dispositis; thecae antherarum nigrae ca. 1.2 mm longae, appendicibus apicalibus ovatis 0.50-0.55 mm longis et 0.25-0.30 mm latis. Achenia radii biconvexa immatura ca. 1.5 mm longa, 1.2 mm lata supra mediam paucè argute pilosae et dense breviter glanduliferae, rostris deciduis ca. 0.3 mm longis late infundibularibus; achenia disci immatura ca. 1 mm longa supra mediam flexuose argute pilosula in partibus terminalibus densiores. Grana pollinis in diametro 25-27 μm .

The species was first recognized as distinct by the rounded corymbose form of its inflorescence branches. The inflorescence does not have distal branches bearing any cymose series of sessile heads of the type found in more common members of the genus, such as *Clibadium surinamense*. The new species is also distinguished from *C. surinamense* by the presence of reddish ducts in the middle of the lobes of the disk corollas. The anther appendages are longer than those seen on any other species in the study, twice as long as the appendages of some other species. The numerous, short, glandular hairs of the distal halves of the corollas and disk achenes are also rather distinctive, but similar glands have been seen on the disk achenes of one specimen of *C. surinamense* (Ecuador: Los Ríos, Dodson, Dodson, Embree, & Perry 7037 [SEL,MO,US]) and may occur more widely in that species.

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