

# ROBINSONECIO (ASTERACEAE: SENECTIONEAE) A NEW GENUS FROM MEXICO AND GUATEMALA

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## ABSTRACT

*Robinsonecio*, gen. nov., is a distinctive genus of two species from high elevations in Mexico and Guatemala. The plants are subscapose herbs with ovate to lanceolate or spatulate basal leaves and tussilaginoïd microcharacters. Two new combinations are proposed: *Robinsonecio gerberifolius* (Sch.Bip.) T.M. Barkley & J.P. Janovec, and *Robinsonecio porphyresthes* (T.M. Barkley) T.M. Barkley & J.P. Janovec.

## RESUMEN

*Robinsonecio*, gen. nov., es un género con dos especies que viven en lugares elevados de México y Guatemala. Las plantas son herbáceas, subscaposas, con hojas basales de ovadas a lanceoladas o espatuladas y microcaracteres tussilaginoïdes. Se proponen dos nuevas combinaciones: *Robinsonecio gerberifolius* (Sch.Bip.) T.M. Barkley & J.P. Janovec, y *Robinsonecio porphyresthes* (T.M. Barkley) T.M. Barkley & J.P. Janovec.

A combination of new information and revised taxonomic theory has led to the notions that the traditional, encompassing concept of the super-genus *Senecio* is no longer tenable and that instead, numerous segregate genera are justified. The relevant thinking was presented in a series of papers by C. Jeffrey, B. Nordenstam, H. Robinson, and others, and it is summarized in the monumental review of the Asteraceae by Bremer (1994, q.v. for references). A catalog and justification of the segregate genera for Mexico and Central America are presented by Barkley et al. (in press). Our studies have shown that the Mesoamerican *Senecio gerberifolius* and *S. porphyresthes* clearly are related to each other but that they do not belong to any of the currently recognized segregate genera. Therefore, the purpose of this paper is to erect a new genus, *Robinsonecio*, to accomodate these two species.

The tribe *Senecioneae* includes two phyletic lineages that are recognized formally as the subtribes *Senecioninae* Dumortier and the *Tussilagininae* Dumortier, or the "senecionoids" and "tussilaginoids." The latter lineage was known in the older literature as the "tephroseroids" or the "cacalioids." Species that were referred to *Senecio*, s.l., in the traditional, super-genus sense are found in each of these phyletic lineages, i.e., "*Senecio*, s.l." is clearly polyphyletic (Barkley et al., in press; Bremer 1994). A third subtribe,

the distinctive *Blennospermatinae* Rydb., includes no species referable to *Senecio*, s.l., and its taxonomy is not relevant to this paper.

The senecionoid lineage is characterized by having style branches with separate stigmatic lines, the upper ends of the stamen filaments with swollen collars ("balusterform"), the anthers often with distinctive thickenings in the lateral walls of the endothelial cells ("radial" thickenings), and chromosome numbers based on  $x = 10$  or  $20$  or numbers derived therefrom (including  $22$  or  $23$ ). In the tussilaginoïd lineage, the stigmatic surface is entire or nearly so across the inner face of the style branch, the filaments are cylindrical and not typically swollen, the anthers often have distinctive thickenings in the transverse (end) walls of the endothelial cells ("polarized" thickenings), and the chromosome numbers are based mostly on  $x = 30$  or numbers derived therefrom, including numbers down to  $n = 24$  (Bremer 1994).

The species that we call *Robinsonecio gerberifolius* was among the herbaceous senecios of the informal assemblage "Lugentes" in the scheme of Barkley (1985), which recognized *Senecio*, s.l., as a single, encompassing genus. Its inclusion there merely reflected superficial similarity, but the description of the segregate *Senecio (Robinsonecio) porphyresthes* noted that the two species were different from the other members of the "Lugentes" assemblage (Barkley 1989).

Specimens were borrowed for study (cited with the species descriptions below) and slides made to observe the microcharacters, using the techniques developed by Dr. H. Robinson of the Smithsonian Institution (pers. comm.). Slides were made for *R. gerberifolius* from the collections Beaman 2535 (GH) and Morales A. 164 (WIS) and for *R. porphyresthes* from Stanford *et al.* 679 (NY). The permanent slides are deposited in herb. KSC.

The slides indicate that both *Robinsonecio gerberifolius* and *R. porphyresthes* have the entire stigmatic areas and cylindrical stamen filaments of the tussilaginoïd lineage. In addition, *R. gerberifolius* has a chromosome number of  $n = 30$ , vouchered by: Beaman 1948 (Stoutamire & Beaman 1960) and it has "polarized" thickenings in the endothelial cells of the anther. The chromosome number for *R. porphyresthes* is unknown, and it seems to have radial thickenings in the endothelial cells, but in our experience, this character is rather variable. The achenes of *R. gerberifolius* have a pronounced and perhaps a distinctive carpodium; the achenes in-hand for *R. porphyresthes* are immature, and so the nature of the carpodium is unknown. The two species of *Robinsonecio* resemble each other in gross aspect and habitat and are unlike any other species of the tussilaginoïd lineage. The species of the "Lugentes" group of *Senecio* are typically senecionoid in microcharacters and chromosome numbers and are comfortably similar to each other in gross aspect.

*Robinsonecio* is distinctive in that it is the only tussilaginoïd segregate of

*Senecio*, s.l., that consists of subscapose herbs with leaf blades ovate to spatulate and tapering to a winged petiole, and which has radiate heads with yellow corollas. *Robinsonecio* is keyed and its presumed taxonomic placement is noted among its Mexican and Central American relatives in Barkley et al. (in press).

The geographically restricted, subscapose *Senecio cuchumatanes* Williams & Molina (Phytologia 31:431. 1975) of Guatemala has a gross aspect similar to that of *Robinsonecio* and it may prove to belong there, but the taxonomic disposition of this distinctive species must await further information.

**Robinsonecio** T.M. Barkley & J.P. Janovec, gen. nov. TYPE SPECIES: *Robinsonecio gerberifolius* (Sch.Bip.) T.M. Barkley & J.P. Janovec.

Herbae perennes subscaposae e rhizomate radices fibrosas emittenti ortae. Folia majora in caespitem conferta, caulina bracteiforma. Capitula 1–7; phyllaria (plus/minus) aut 13 aut 16–20, inter se aequilonga sed in series exteriorem at interiorem ordinata; flosculorum microstructura cum tribu *Senecioneis* subtribu *Tussilagininis* conformis, superficeibus stigmatis trans styli ramulorum faciem interiorem continuis staminumque filamentis cylindricis.  $n = 30$ .

Subscapose herbs 10–30(+) cm tall, herbage variously tomentose to arachnoid or lanate, unevenly glabrate in age. Stems single or rarely 2, arising from a thick, fibrous-rooted rhizome. Basal leaves in a prominent rosette, blades ovate to lanceolate or spatulate and tapering to a weakly winged petiole, margin revolute or flat and with callose denticles; cauline leaves few and reduced. Capitula 1–7(+); principal phyllaries ca. 13 or ca. 16–20, about equal in length but in an inner and an outer series; ray florets ca. 12–13(+), pistillate, and apparently fertile; disk florets bisexual and fertile; stigmatic surfaces continuous across the inner faces of the style branches; upper stamen filaments cylindrical and without expanded collars. Achenes glabrous or with appressed hyaline hairs; pappus of both ray and disk florets of abundant, white, minutely barbellate bristles that are about as long as the disk corollas.  $n = 30$ .

The genus name is derived from Robinson and *Senecio* to honor Dr. Harold Robinson, an intrepid explorer of the highways and byways of systematic botany.

#### KEY TO SPECIES

1. Capitula (1–)3–7(+); principal phyllaries greenish or yellowish to lightly anthocyanic; calyculate bracts linear and nearly as long as the principal phyllaries; achenes glabrous. .... 1. *Robinsonecio gerberifolius*
1. Capitula 1(–2); principal phyllaries with margins and apex pinkish-purple to magenta; calyculate bracts few and reduced; achenes apparently with appressed, hyaline hairs. .... 2. *Robinsonecio porphyresthes*

1. *Robinsonecio gerberifolius* (Sch.Bip. in Hemsley) T.M. Barkley & J.P. Janovec, comb. nov. BASIONYM: *Senecio gerberifolius* Sch.Bip. in Hemsley, Biol.

Centr. Amer. Bot. 2:240. 1881. TYPE: MEXICO. VERACRUZ: pic d'Orizaba, 1838, *J. Linden* 487 (ISOTYPES: GH!, K, KSC-photo of K!, MICH!).

Subscapose perennial herb 1.5–2.5(–3+) dm tall; herbage densely to loosely floccose-tomentose to arachnoid or lanate, unevenly glabrate in age, especially on the upper sides of the leaves. Stems 1(–2), arising from a thick, fibrous-rooted creeping rootstock. Basal leaves in a prominent rosette, blades ovate to ovate-lanceolate or spatulate, tapering to a weakly winged petiole, 4–18 cm long overall and 1–3(–4) cm wide, coriaceous, margin minutely toothed, weakly revolute; cauline leaves few, reduced to mere bracts. Capitulescence a corymbiform cyme of 3–7(+) heads; principal phyllaries ca. 13, broadly ovate and of equal length, in an inner and an outer series, (8–)10–15 mm long, the tips greenish or yellowish to but lightly anthocyanic; calyculate bracts linear, 4–7 and nearly as long as the phyllaries; ray florets ca. (8?–)13, the ligule 12–16 mm long. Achenes glabrous, 3.5–4 mm long.  $n = 30$ .

Alpine and subalpine grasslands and open woodlands at high elevations in selected sites in the Trans Mexican Volcanic Region of Mexico and in the Sierra de los Cuchumatanes in Guatemala.

Specimens examined: MEXICO. DISTRITO FEDERAL: Telapón, Sep 1937, *E. Lyonnet* 1653 (NY). MEXICO (Edo.): Ixtaccihuatl, 30 Jul 1958, *J.H. Beaman* 1948 (GH, MEX, MO, NY, WIS, UC); Tlaloc, 22 Aug 1958, *J.H. Beaman* 2303 (GH); Telapón, 20 Nov 1965, *W. Boege* 23 (CAS); Contrafuertes de la Joya, 13 Aug 1955, *R.T. Clausen s.n.* (NY); cerca Paso de Cortes, 10 Sep 1966 *R. Cruz Cisneros* 1170 (WIS); Ixtaccihuatl, 23 Oct 1976, *J. García P.* 171 (CAS, F, MICH, NY); Ixtaccihuatl, 27 Jul 1984, *J. García P. & M. Bonzales L.* 1810 (CAS, KSC); Ixtaccihuatl, 16 Aug 1960, *H. Iltis, F. Iltis, & R. Koeppen* 989 (MICH, WIS); Telapón, Dec 1928, *E. Lyonnet* 395 (GH, MO, NY); Ixtaccihuatl, 13 Sep 1953, *E. Matuda* 29036 (NY); La Joya de Alcalican, 14 Nov 1976, *R.A. Morales A.* 164 (WIS); Ixtaccihuatl, Oct 1905, *C.A. Purpus* 1516 (F, GH, MO, NY); Ixtaccihuatl, 30 Dec 1965, *J. Rzedowski* 22773 (MICH); Ixtaccihuatl, Dec 1968, *R. Weber, s.n.* (CAS). PUEBLA: Ixtaccihuatl, 12 Sep 1958, *J.H. Beaman* 2535 (MICH). VERACRUZ: Orizaba, 16 Aug 1958, *J.H. Beaman* 2290 (GH); Cofre de Perote, 27 Sep 1973, *C. Delgadillo & J. Dorantes* 3085 (F); Cofre de Perote, 27 Jun 1982, *G. Diggs, M. Nee, & G. Schatz* 2594 (F); Cofre de Perote, 28 Aug 1971, *J. Dorantes* 324 (GH, MO); Cofre de Perote, 20 Aug 1972, *J. Dorantes et al.* 01560 (MO); Cofre de Perote, 2 Oct 1984, *J. García et al.* 1901 (CAS, KSC); peak of Orizaba, Aug 1840, *H. Galeotti* 2170 (K, photo-KSC!, paratype); Pic Orizaba, 1867, *Liebman* 140 (K, photo-KSC!, paratype); Citlaltepētāl (Pico de Orizaba), 30 Jun 1949, *L.W. Swan, s.n.* (CAS). GUATEMALA. HUEHUETANANGO: cumbre de la Sierra de los Cuchumatanes, 28 Dec 1940, *P.C. Standley* 81489 (F); between Tojquiá and Caxín, Sierra de los Cuchumatanes, 6 Aug 1942, *J.A. Steyermark* 50178 (F, MO).

2. *Robinsonecio porphyresthes* (T.M. Barkley) T.M. Barkley & J.P. Janovec, comb. nov. BASIONYM: *Senecio porphyresthes* T.M. Barkley, *Phytologia* 67:243. 1989. TYPE: MEXICO. TAMAULIPAS: on mountain top 7 km SW of Miquihuana in forest of large pines, forest floor of low vegetation, elev 3430 m (23°40'N 99°45'W), 5 Aug 1941, *L.R. Stanford, L. Rutherford, & R.D. Northcraft* 679 (HOLOTYPE: NY!; ISOTYPES: GH!, MEXU!, MO!, NY!, WIS!).

Subscapose herb 1.0–1.5 dm tall, herbage closely lanate- tomentose, but loosely tomentose toward the base with long, arachnoid hairs, unevenly glabrate in age, upper side of leaves glabrescent, lower side persistently felted-lanate. Stem 1, arising in a cluster of basal leaves at the end of a rhizome. Rhizome creeping, simple, nearly 1 cm in diameter, covered by exfoliating bases of old leaves and producing abundant fibrous branching roots. Basal leaves with blades narrowly oblanceolate to subspatulate, tapering to a winged petiole, 4–10(–12) cm long overall and (0.8–)1–1.5 cm wide, subcoriaceous, margin denticulate with callose denticles, weakly revolute or flat; cauline leaves 2–5, reduced to mere linear bracts to 15 mm long. Capitula 1(–2), principal phyllaries ca. 16–20, linear-lanceolate and of equal length, in an inner and an outer series, 12–14 mm long, the margins and tip permanently and prominently pinkish-purple or magenta; calyculate bracts few and reduced; ray florets 12(+?), the ligule 10+ mm long. Achenes with flat, hyaline hairs that presumably persist, 2 mm long (immature).

A distinctive entity known to us only from the type collection, cited above. If it has been collected again in the intervening years, the specimens have escaped our attention.

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