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# *Jessea* and *Talamancalia*, Two New Genera of the Senecioneae (Asteraceae) from Costa Rica and Panama

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**ABSTRACT.** Two new genera from Costa Rica and Panama, *Jessea* and *Talamancalia*, are described. Both genera have elongate corolla lobes, styles with paired stigmatic lines and narrowly rounded penicillate-haired tips, small papillose cells on the achene surface, and neither has tails on the anthers. *Jessea* has a spiciferous receptacle and carpodia with many rows of cells. *Jessea* includes *Senecio cooperi*, *S. megaphyllus*, and *S. multivenius*, with the last as type; the appropriate new combinations are made herein. *Talamancalia* has mucilage hairs on the achene and carpodia nearly obsolete. The genus includes *Talamancalia boquetensis* (Standley) H. Robinson & J. Cuatrecasas and the new species, *T. westonii*, with the latter as type.

Two new genera are established for species of Senecioneae from Panama and Costa Rica that have some of the general appearance of true *Senecio* L., and have some aspects of *Pseudogynoxys* (Greenman) Cabrera and *Jacmaia* B. Nordenstam, but differ in details of the style tips, stigmatic surfaces, corolla lobes, and the setulae of the achene. The first genus, *Jessea*, includes *Senecio multivenius* and two other species that in some characters resemble the genus *Jacmaia* of Nordenstam. The other genus, *Talamancalia*, includes *Senecio boquetensis* Standley and a second species, *Talamancalia westonii*, which is described here as new.

*Senecio multivenius* Bentham ex Oersted of Costa Rica was described almost 150 years ago, and is the best known of the series of superficially similar, but poorly understood species in southern Central America. The group includes the more recently described and closely related *S. cooperi* Greenman and *S. megaphyllus* Greenman. The superficially similar *Senecio boquetensis* was described about 50 years ago from the province of Chiriquí in Panama. All the species mentioned have elongate corolla lobes, style tips rather rounded and bearing an apical pencil of hairs, and small papillose cells on the surface of the achene. In contrast, *Senecio* sensu stricto has short corolla lobes, truncate style tips without apical hairs, and usually narrow smooth cells on the surface

of the achene. The species all require transfer from *Senecio* sensu stricto to other genera.

The first of the Central American species listed above to be removed from *Senecio* was the Panamanian endemic *S. boquetensis*, one of two species transferred by Turner (1991) to the widely distributed neotropical genus *Pseudogynoxys* (Greenman) Cabrera. The position of the species in *Pseudogynoxys* was accepted by Jeffrey (1992). Jeffrey (1992) also transferred the Costa Rican *S. cooperi*, *S. megaphyllus*, and *S. multivenius* to the previously exclusively Jamaican genus *Jacmaia* of Nordenstam (1978). The latter transfer reflected a similarity in habit and the presence of subulate processes in the receptacle in *Jacmaia* and the *S. multivenius* group. Of these treatments, the present study accepts the conclusion by Jeffrey that the primarily Costa Rican *S. multivenius* group and the Panamanian *S. boquetensis* are not directly related to each other. However, the present study rejects Jeffrey's (1992) placement of the *S. multivenius* group in *Jacmaia* and rejects Turner's (1991) and Jeffrey's (1992) placement of *S. boquetensis* in *Pseudogynoxys*. Both elements are named here as new genera.

The Central American species listed above all fall among the senecionoid genera of the tribe Senecioneae in the list by Jeffrey (1992) although they are placed in different subgroups. *Jacmaia*, including the *S. multivenius* series, is placed by Jeffrey in his Neotropical Group, with mostly woody genera such as *Pentacalia*. Jeffrey's *Jacmaia* sensu lato is described as having scalelike processes on the receptacle, style-arms appendaged, a massive carpodium with 10–12 or more rows of cells, and leaves pinnately lobed. *Pseudogynoxys*, with *S. boquetensis*, is placed by Jeffrey in his senecionoid group closer to *Erechtites* Rafinesque and *Emilia* (Cassini) Cassini and *Senecio* L. sensu stricto. Jeffrey states that the styles have trullate appendages, the carpodia are obscure, and the genus does not have processes on the receptacle.

Some of the differences between *Jacmaia* and *Pseudogynoxys* noted by Jeffrey (1992) are retained here to distinguish the two new genera, but

the new genera are not considered as distant from each other in relationship as suggested by Jeffrey, and they do not belong to the genera in which they are placed by Turner (1991) and Jeffrey (1992). The *Senecio multivenius* group differs from *Jacmaia* by three striking features. The style appendage in the Jamaican type species of *Jacmaia*, *J. incana* (Swartz) B. Nordenstam, is sharply acute, the stigmatic surface is continuous over the inner surface of each branch, and anther bases have long tails. The style tip of the *S. multivenius* group is rounded and ends in a pencil of long hairs, the style branch has separated paired stigmatic lines, and the anthers have no tails. In *Jacmaia* the continuous stigmatic surface is correlated with a greatly enlarged resin duct in the style branch. The style branches of the *S. multivenius* group and *S. boquetensis* have only a slender duct. The *S. multivenius* group is here named as a new genus, *Jessea*, in honor of the well-known authority in the Senecioneae, Jesse M. Greenman (1867–1951).

The comparative similarity of *Senecio boquetensis* to *Pseudogynoxys* is not considered sufficient to include the species in that genus. The Panamanian endemic and the related undescribed Costa Rican species are erect herbs or subshrubs, while species of *Pseudogynoxys* are scrambling subshrubs or vines. The difference in habit from *Pseudogynoxys* is particularly marked in the previously undescribed shrubby Costa Rican relative of *S. boquetensis*. The leaves of the new genus are deeply, pinnately lobed at the base of the blade, while those of *Pseudogynoxys* are unlobed. The leaf bases have stipulelike continuations of the petiolar wing that clasp the stem, but isolated stipulelike lobes at the bases of unwinged petioles are found in only a few species of *Pseudogynoxys* (Robinson & Cuatrecasas, 1977). An additional useful feature of the new genus is the fattened and often obviously mucilaginous setulae on the achene wall. The setulae of *Pseudogynoxys* are smaller and not mucilaginous. The tips of the styles of the new genus are narrowly rounded with an abruptly delimited apical penicillate tuft of hairs, while the style tips of *Pseudogynoxys* are distinctly pointed and hairs are often continuous along the margins of the tapering tip. The anther appendages of the new genus have thicker-walled inner cells and a channeled center, but the appendages of *Pseudogynoxys* have more uniformly thickened cells throughout with no central channel. The new genus, with two species, is here named *Talamancalia* after the Talamanca Mountains of Costa Rica and Panama where it occurs.

A comparison of the two new genera shows that in addition to having an armed receptacle and a

carpopodium with many rows of cells, *Jessea* differs from *Talamancalia* by having the narrow heads clustered in dense corymbiform cymes, in having only eight involucre bracts in each head, and in the less complex and less polarized thickenings of its median endothelial cells.

One additional element of interest in the *Jessea* and *Talamancalia* relationship is the second species transferred to *Pseudogynoxys* by Turner (1991), *Senecio telembinus* Cuatrecasas of the Río Maldonado on the border of Ecuador and Colombia. The South American species is like *S. boquetensis* in superficial aspect, having similar enlarged leaf bases, and close-set, ascending secondary veins. The Maldonado species differs from the Panama species, and from much of *Senecio* sensu stricto, by the lack of lobes on the leaves, by the lack of setulae on the achenes, by the presence of only eight ribs in the achene, and by the short-triangular style tip with a long apical pencil of hairs and strong subapical fringe. The South American species has no woolly pubescence. The species differs more importantly from all the discussed elements by the base of the leaf forming a sheath completely surrounding the stem. The Maldonado species was the basis of a separate genus, *Garcibarrigoa*, by Cuatrecasas (1986). In spite of the differences, it seems likely that *Garcibarrigoa* is a rather close relative of *Talamancalia*.

The five genera, *Garcibarrigoa*, *Jacmaia*, *Jessea*, *Pseudogynoxys*, and *Talamancalia*, differ from almost all species of *Senecio* sensu stricto by having long and narrow lobes on the corolla. The lobes in *Jacmaia* and all of *Jessea* except the type species are about as long as the throat. The limbs and the lobes of the corolla of *Garcibarrigoa* are comparatively short with the lobes narrowly triangular rather than narrowly oblong.

The new genus *Jessea* is characterized as follows:

***Jessea*** H. Robinson & J. Cuatrecasas, gen. nov.  
TYPE: *Jessea multivenia* (Bentham ex Oersted) H. Robinson & J. Cuatrecasas.

In receptaculis armatis *Jacmaiae* similis sed in apicibus stylorum rotundatis et penicillate pilosis in lineis stigmaticis binis et in thecis antherarum base non caudatis differt.

Erect, coarse subshrubs to 5 m tall, sparingly branched; stems, leaves, and inflorescence minutely puberulous to subglabrous; stems often deflected at nodes, with longer internodes above, with solid pith. Leaves alternate, with base clasping but not completely surrounding stem; petioles distinctly winged to partially unwinged; blade narrowly ovate to elliptical, usually pinnately lobed near base, serrate above,

apex acute, secondary veins closely pinnate, widely spreading at 80–90°. Inflorescence terminal, with ascending branches, bearing numerous heads in dense corymbiform cymes; peduncles slender, minutely puberulous. Heads heterogamous, radiate, narrowly campanulate, with ca. 6 filiform calycular bracts in 1–2 series, involucre bracts usually 8, subequal; receptacle with scalelike processes. Ray florets 3–8; corollas yellow, glabrous, limbs with oblong cells above, not papillose. Disk florets 8–18; corollas yellow, glabrous, basal tube narrow, elongate, lobes narrowly triangular to linear,  $\frac{1}{2}$ –3 times as long as throat, with weak resin ducts along margins and sometimes in center; anther collars with basal cells inflated; thecae with rounded bases, median endothelial cells with numerous thickenings on vertical walls, with few small thickenings on transverse walls; apical appendage oblong, with central channel inside, slightly concave outside, cells elongate, with thickened walls except at appendage margin; style base with distinct node; style shaft with 2 weak resin ducts outside of veins; style branches with separate paired stigmatic lines, a single central resin duct, short apical appendage prominently rounded with basal fringe of hairs, and isolated long apical tuft. Achenes cylindrical with 8 ribs, with short and mamillate surface cells, setulae slender and narrowly pointed or lacking; raphids seen only in ovule, oblong; carpopodium annuliform with 4–12 series of sclerified cells; pappus with slender easily deciduous bristles in ca. 3 series, without broadened tips. Pollen grains 30–40  $\mu\text{m}$  diam.

The genus contains three species.

#### KEY TO THE SPECIES OF *JESSEA*

- 1a. Achenes covered with slender setulae . . . *J. cooperi*
- 1b. Achenes glabrous.
  - 2a. Petiole at least partially unwinged; lobes of disk corolla distinctly shorter than corolla throat . . . . . *J. multivenia*
  - 2b. Petiole winged throughout; lobes of disk corolla about as long as the throat . . . . . *J. megaphylla*

***Jessia cooperi*** (Greenman) H. Robinson & J. Cuatrecasas, comb. nov. Basionym: *Senecio cooperi* Greenman, Publ. Field Columbian Mus., Bot. Ser. 2: 284. 1907. *Jacmaia cooperi* (Greenman) Jeffrey, Kew Bull. 47: 63. 1992.

*Distribution.* Costa Rica, Panama.

***Jessia megaphylla*** (Greenman) H. Robinson & J. Cuatrecasas, comb. nov. Basionym: *Senecio megaphyllus* Greenman, Publ. Field Colum-

bian Mus., Bot. Ser. 2: 284. 1907. *Jacmaia megaphylla* (Greenman) Jeffrey, Kew Bull. 47: 63. 1992.

*Distribution.* Costa Rica, Panama.

***Jessia multivenia*** (Bentham ex Oersted) H. Robinson & J. Cuatrecasas, comb. nov. Basionym: *Senecio multivenius* Bentham ex Oersted, Vidensk. Meddel. Dansk. Naturalist. Føren., Kjøbenhavn 1852: 109. 1853. *Jacmaia multivenia* (Bentham ex Oersted) Jeffrey, Kew Bull. 47: 63. 1992.

*Distribution.* Costa Rica.

The new genus *Talamancalia* is characterized as follows:

***Talamancalia*** H. Robinson & J. Cuatrecasas, gen. nov. TYPE: *Talamancalia westonii* H. Robinson & J. Cuatrecasas.

*Pseudogynoxys* similis sed in habitu non volubilis in foliis lobatis et base anguste alatis et amplexicaulis in apicibus stylosum rotundatis penicillate pilosulis et in setulis acheniarum mucilaginis differt.

Erect or spreading subshrubs or shrubs to 2 m tall, unbranched or branching from near base; stems with short internodes and slightly deflected nodes below, with longer internodes above, hirsute to lanuginose, glabrescent with age, partially fistulose or with solid pith. Leaves alternate, with base clasping but not completely surrounding the stem; petioles scarcely to distinctly winged below lowest lobes; blade ovate to ovate-lanceolate, pinnately lobed mostly near base, serrate above, apex acute to acuminate, surfaces pilose to lanuginose, lower surface paler, secondary veins closely pinnate, somewhat to strongly ascending. Inflorescence terminal, in loose, elongate, rounded cyme, with ascending branches or with few heads on short branches; branches subglabrous to lanuginose. Heads heterogamous, radiate, broadly campanulate, with numerous filiform to broadly ovate calycular bracts in 2–3 series, involucre bracts 15–20, subequal; receptacle nonfistulose, without pales or spines. Ray florets 8–15; corollas orange, glabrous, limbs with short-oblong cells above, not papillose. Disk florets 20–90; corollas orange, glabrous, basal tube narrow, lobes narrowly oblong, slightly longer than throat, with resin ducts central and marginal; anther collars with basal cells inflated; thecae with rounded bases, inner median endothelial cells elongate with thickenings along vertical walls, outer median endothelial cells elongate with single thickenings on transverse walls; apical appendage oblong-ovate, with central chan-



Figure 1. *Talamancalia westonii* H. Robinson & Cuatrecasas, living plant. Photo by Weston.

nel, channel sometimes reddish, cells elongate, with thickened walls except at appendage margin; style base with distinct node; style shaft with 2 resin ducts outside of veins; style branches with separate paired stigmatic lines, a single central resin duct, short appendage prominently rounded with basal fringe of hairs and isolated short apical tuft. Achenes cylindrical with 10 ribs, with short and mamillate surface cells, setulae short and somewhat broadened, sometimes obviously mucilaginous; raphids seen only in ovule, oblong; carpopodium obsolete with a sometimes incomplete single series of sclerified cells; pappus with slender easily deciduous bristles in ca. 4 series, without broadened tips. Pollen grains ca. 37  $\mu\text{m}$  diam.

The genus contains two species.

KEY TO THE SPECIES OF *TALAMANCALIA*

1a. Heads 8–15 in each corymbiform cyme, ca. 1.0–1.3 cm high, with numerous filiform calycular bracts at base; leaves lobed only below

basal fifth of blade, scarcely or thinly lanuginose on lower surface; secondary veins 1.5–4.0 cm long, mostly parallel and close nearly to margin, ascending at ca. 45°; limbs of rays with ca. 8 longitudinal veins . . . . . *T. boquetensis*

1b. Heads 2–4, ca. 2 cm high, with large ovate calycular bracts covering involucre; leaves lobed below from near middle of blade, with dense whitish tomentum or wool on lower surface; secondary veins less than 1.5 cm long, mostly somewhat diverging, mostly spreading at more than 45°; limbs of rays with 10–15 longitudinal veins . . . . . *T. westonii*

***Talamancalia boquetensis*** (Standley) H. Robinson & J. Cuatrecasas, comb. nov. Basionym: *Senecio boquetensis* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 394. 1940. *Pseudogynoxys boquetensis* (Standley) B. Turner, Phytologia 71: 206. 1991.

*Distribution.* Panama.

The specimens seen seem to have two forms. One specimen (*Grant & Rundell* 92-02090) has hirsute,

nonlanuginose stems, leaf undersurfaces without obvious wool, fistulose stems, and distinctly winged petioles. In contrast, the type (*Pittier 5382*) and a collection bearing the unpublished name "Senecio whiteae" Greenman (*Dwyer 353*) have a distinct thin wool on the leaf undersurfaces and a petiole that is scarcely winged in the part just above the base. Of the two specimens, the type has nonfistulose stems and acute leaf tips, while the Dwyer specimen has fistulose stems and leaf tips acuminate. The Grant and Rundell specimen is from 4 km southwest of Las Mellizas near the Costa Rican border. The type and the Dwyer collection are from near Boquete.

Barkley (1975) stated that heads sometimes lack rays, and they seem to be lacking in some heads of the type specimen. Close examination shows that abraded remnants of rays are usually present in these heads.

***Talamancalia westonii*** H. Robinson & J. Cuatrecasas, sp. nov. TYPE: Costa Rica. San José: Cerro Lohmann, Chirripó National Park, ca. 3,100 m, 11 Feb. 1981, *A. S. Weston 12373* (holotype, US). Figure 1.

In habitu fruticoso in internodiis brevibus in foliis submediis lobatis et subtus dense albo-tomentosis in nervis secundariis brevibus leniter divergentibus in capitulis paucis magnis et in bracteis calyculis magnis late ovatis differt.

Shrub ca. 30 cm high, with 2 or 3 branches from base; stems with white wool, less wool when old, internodes 0.5–1.0 cm long, with solid pith. Leaves alternate, bases expanded, clasping part on each side of stem to 5 mm wide; petioles ca. 1 cm long, scarcely winged near base, bearing lobes above; blades narrowly ovate, 5.0–5.5 cm long, 1.7–2.5 cm wide, basal  $\frac{1}{4}$ – $\frac{1}{2}$  lobed, margin above middle irregularly serrate, apex narrowly acute, upper surface densely hirsute with hairs bearing white-flagellate tips, lower surface densely white-tomentose, secondary veins 8–10, spreading mostly at more than 45° angle, 1.5 cm or less long, somewhat diverging toward margin. Inflorescence terminal, branches 4–5 cm long, thinly lanuginose, bearing 2–4 heads; bracts foliiform, sessile, ovate, 2.5–3.5 cm long, ca. 1.5 cm wide; peduncles 0.5–1.0 cm long. Heads broadly campanulate, 2.0–2.3 cm high; calycular bracts covering involucre, ca. 7, broadly

ovate to oblong-ovate, 10–12 mm long, 7–9 mm wide, apex acute to short acuminate, outer surface thinly lanuginose; involucral bracts ca. 13, 10–11 mm long, 1.5–2.0 mm wide, narrowly acute, thinly lanuginose outside; ray florets ca. 15; corollas orange, glabrous, basal tube ca. 9 mm long, limb ca. 19 mm long, 5.5–6.0 mm wide, with 10–15 longitudinal veins, minutely trilobed at tip, staminodea present; disk florets 80–90; corollas orange, glabrous, basal tube 12–13 mm long, throat 2.5–3.0 mm long, lobes ca. 4 mm long, 0.7 mm wide; anther collars ca. 0.5 mm long; anther thecae ca. 3.5 mm long, apical appendage ca. 0.7 mm long. Achenes ca. 3 mm long, covered with broadened setulae; pappus bristles ca. 7 mm long.

The label indicates the plant is a shrub 30 cm tall, with 2 or 3 branches from the base, the heads are radiate and bright orange, and the plants were very rare on an east-facing cliff of Cerro Lohmann. Weston mentioned on his label that the plant somewhat resembled, in a gross way, *S. boquetensis* Standley.

Actual mucilage has not been seen issuing from the setulae of the achenes of *Talamancalia westonii*. However, the setulae are somewhat broadened like those of the type specimen of *Talamancalia boquetensis*, where mucilage has been seen.

*Acknowledgment.* The photograph of *Talamancalia westonii* was copied by Victor E. Krantz, Staff Photographer, National Museum of Natural History, Smithsonian Institution.

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