

Additions to *Neocuatrecasia* (Eupatorieae: Asteraceae)

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ABSTRACT. *Neocuatrecasia sandiensis* H. Robinson and *N. yungasensis* H. Robinson from high elevations in Peru and Bolivia and *N. tysonii* H. Robinson from lower elevations in Bolivia are described as new. A key is furnished to the 12 species of the as yet inadequately collected genus.

Key words: Asteraceae, Bolivia, Eupatorieae, *Neocuatrecasia*, Peru.

The genus *Neocuatrecasia* was described by King and Robinson in 1970 on the basis of four species from the eastern slopes of the Andes in Peru and Bolivia that had superficial resemblance to small members of the widespread genus *Ageratina* Spach. *Neocuatrecasia* can be distinguished from *Agerati-*

na by the hairs on the base of the style. This character, along with the ornamented cell walls of the anther collar and the usually stipitate bases of the achenes, places the genus far from *Ageratina* and in the subtribe Gyptidinae (King & Robinson, 1987). A fifth species was transferred and four additional species were described in following years (King & Robinson, 1972, 1974, 1986, 1988), but no key has been provided since 1972 when there were only six known species in the genus. Since new collections of the genus have often proved to be new species, one presumes that many further species remain to be discovered. Three more new species are described herein, and a key is provided for the 12 species now known in this Peruvian and Bolivian genus.

KEY TO THE SPECIES OF *NEOCUATRECASIA*

- 1a. Peduncles with numerous long-stipitate glands longer than any non-glandular hairs.
 - 2a. Leaves sessile; pappus of ca. 20 long fragile very slender setae not contiguous at bases (Peru) *N. sessilifolia* R. M. King & H. Robinson
 - 2b. Leaves distinctly short-petiolate or petioliform at base; pappus of 25 to 35 persistent setae that are short or with nearly contiguous bases.
 - 3a. Inflorescence broadly cymiform, with alternate branching; involucre bracts mostly narrowly elliptical, outer bracts bicostate in basal half or more; corollas with throats less than twice as wide as basal tube; base of style enlarged; style branches scarcely twice as wide as shaft; pappus bristles a third or less as long as the corolla; plants occurring at elevations of 500 m or less (Bolivia) *N. tysonii* H. Robinson, sp. nov.
 - 3b. Heads few or single, terminal, with subtending leaves opposite; involucre bracts broadly oblong, only weakly veined, not costate; corollas with throats nearly three times as wide as basal tubes; base of style not broadened except by hairs; style branches three or more times as broad as shaft; pappus bristles half as long as corolla or longer; plants occurring at elevations of 2000–3500 m (Bolivia) *N. yungasensis* H. Robinson, sp. nov.
- 1b. Stipitate glands of peduncles, when present, scarcely longer than non-glandular hairs.
 - 4a. Corolla throat 3 or more times as long as lobes.
 - 5a. Leaf blades deeply lobed or dissected (Bolivia) *N. lobata* (B. L. Robinson) R. M. King & H. Robinson
 - 5b. Leaf blades not deeply lobed or dissected.
 - 6a. Heads with ca. 50 florets, with 15 or more involucre bracts (Peru) *N. weddellii* (B. L. Robinson) R. M. King & H. Robinson
 - 6b. Heads with ca. 25 to 30 florets, with 10–12(–14) involucre bracts.
 - 7a. Involucre bracts with acute tips; veins of leaves densely hirtellous abaxially (Bolivia) *N. feuereri* R. M. King & H. Robinson
 - 7b. Involucre bracts broadly rounded at tips; veins of leaves puberulous with small hairs abaxially (Peru) *N. sandiensis* H. Robinson, sp. nov.
 - 4b. Corolla throat 2 or less times as long as the lobes.
 - 8a. Stems and peduncles hirsute to hispidulous with spreading pale hairs; sessile glandular dots red; petioles of main leaves to 15 mm long; achenes with small setulae or scabrae along ribs (Peru) *N. dispar* (B. L. Robinson) R. M. King & H. Robinson
 - 8b. Stems and peduncles hirtellous to puberulous with often darkened hairs; glandular dots yellowish to brownish; petioles of leaves only 1–5 mm long; achenes with distinct elongate setulae.

- 9a. Corolla throats abruptly expanded at base to twice or more as wide as constriction of basal tube; style with pubescence restricted to base.
- 10a. Corollas with few or no hairs on lobes; leaves with few coarse serrations, with few hairs adaxially, abaxial puberulence of main veins not coarser than pubescence on remainder of surface (Peru) *N. cuzcoensis* R. M. King & H. Robinson
- 10b. Corollas with numerous hairs on lobes; leaves entire or with shallow crenations, minutely puberulous adaxially, abaxial hairs of midvein and proximal secondary veins larger than those of remainder of surface (Bolivia) . . . *N. thymifolia* (Britton) R. M. King & H. Robinson
- 9b. Corolla throats less than twice as wide as constriction of basal tube; style with pubescence continuing on to lower part of shaft.
- 11a. Leaf blades elliptical, subsessile; peduncles with short-stipitate glands among the non-glandular hairs (Peru) *N. mancoana* (B. L. Robinson) R. M. King & H. Robinson
- 11b. Leaves blades broadly ovate with subtruncate bases, petiolate; peduncles without stipitate glandular hairs (Peru) *N. hirtella* R. M. King & H. Robinson

The following species are described as new.

Neocuatrecasia tysonii H. Robinson, sp. nov.
TYPE: Bolivia. Beni: Mamore, frequent in tree margin of lagoon, spreading 1 mi. SW San Joaquin, 19 Mar 1964, *E. L. Tyson & M. Kuns* 997 (holotype, MO). Figure 1A–D.

A speciebus aliis in inflorescentiis laxe cymiformibus et in bracteis involucri anguste ellipticis externe ad medium bicostatis et in ramis stylosum angustioribus et in setis pappi perbrevioribus et in basibus stylosum inflatis et in distributio non andina differt.

Herbs to 1 m tall, moderately branched at ca. 45° angles; stems brown, covered with dense felt of stipitate glands; internodes mostly 2–7 cm long. Leaves opposite; petioles 2–5 mm long; blades narrowly ovate to lanceolate, 1.5–7.5 × ca. 0.5–1.5 cm, base broadly acute to narrowly acuminate, margins with 5 to 15 often irregularly sized and irregularly spaced serrations, apex narrowly acute, adaxial surface pilose with slender pale hairs, abaxial surface paler green, pilosity mostly on veins, with numerous dark glandular dots; trinervate with slender ascending lateral veins from near base. Inflorescence laxly cymiform with alternate branching; peduncles 2–22 mm long, covered with slender stipitate glands. Heads broadly campanulate, ca. 5 mm high and wide; involucre bracts ca. 20, most narrowly elliptical, innermost ones linear-lanceolate, bicostate in basal half or more, ca. 3 mm long, ca. 0.5 mm wide, acute, puberulous with non-glandular hairs abaxially, few stipitate glands at base and along costae. Florets 25 to 30; corollas white to pale violet, 2.0–2.4 mm long, tube 0.3–0.4 mm long, throat cylindrical to narrowly funnelform, scarcely twice as wide as basal tube, 1.2–1.5 mm long, lobes narrowly triangular, 0.4–0.5 mm long, with glandular dots and no hairs outside; anther thecae ca. 1 mm long; style base inflated, with hairs, no hairs on shaft; style branches narrow, scarcely twice as wide as shaft. Achenes 1.8–2.5 mm long, with short basal stipe ca. 0.3 mm long,

with scattered short setulae on ribs and surfaces; pappus bristles usually 10 to 12, length ca. 0.3–0.8 mm, very slender and often not contiguous at base.

Neocuatrecasia tysonii is the most phylogenetically divergent member of the genus with its broadly cymiform inflorescence, its narrow more strongly bicostate involucre bracts, and its occurrence at low elevations in Bolivia. The narrow style branches and distinctly broadened style base are also distinctive. Still, all essential characteristics are those of *Neocuatrecasia*. There is alternate branching in the inflorescences of other species of the genus, but the inflorescences are not as large or spreading as in *N. tysonii*. The pappus is short in some specimens of a number of the other species, but usually not less than half as long as the corolla. The achenes of the present species have a basal stipe, although it is very short compared to most of those in the genus. The higher elevation *N. feuereri* of Bolivia, which lacks stipitate glands, may be the closest relative on the basis of its pointed involucre bracts and comparatively narrow style branches.

The species occurs at elevations of 150–500 m in flat grasslands, grazed natural savanna with scattered shrubs and small tortuous trees, in areas bordering on granitic outcrops, and in semideciduous forests.

Paratypes. BOLIVIA. **Beni:** Itenez, S side of Río Guapore, “Campo Verde,” ca. 15 km ESE of Costa Marques [Edo. Rondonia, Brazil], 150 m, 31 Mar. 1987, *M. Nee* 34624 (MO, NY, US). **Santa Cruz:** Velasco, Reserva Forestal Bajo Paragua, Cero Diamantina, 10 km al S del Aserradero Cero Pelado, laja granítica grande (inselberg), 350 m, 13 May 1994, *T. Killeen & Wellens* 6368 (MO, US, USZ); Prov. Nuflo de Chavez, Lomerio, comunidad Las Trancas, 500 m, 11 Nov. 1994, *T. Killeen, Jardim, Freire, Vriesendorp & Medina* 7124 (US, USZ); area de estudio del proyecto “BOLFOR,” Las Trancas-95, 450 m, 12 Dec. 1994, *F. Mamani & A. Jardim* 404 (MO, USZ).

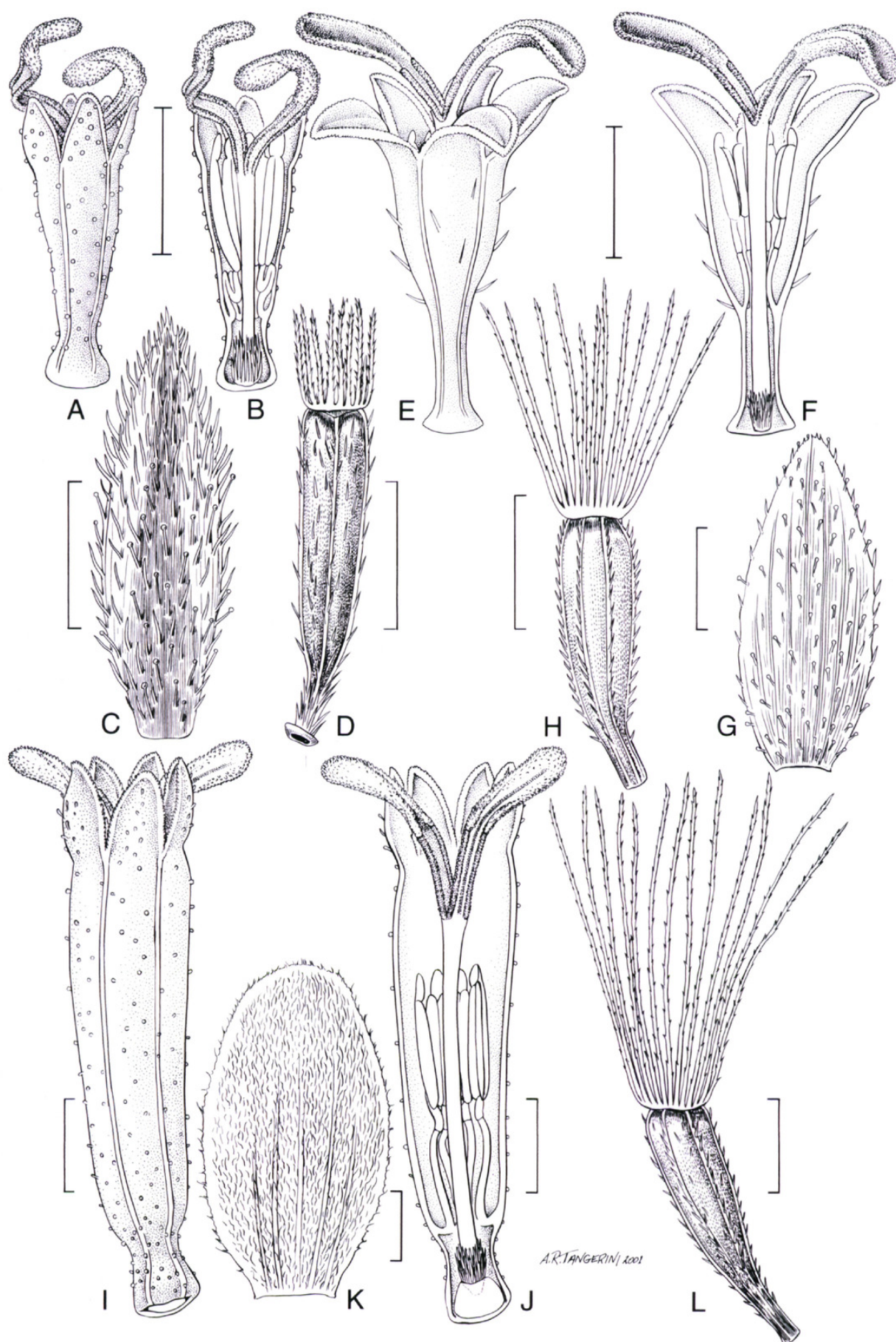


Figure 1. *Neocuatrecasia*. A–D. *N. tysonii* H. Robinson, drawn from Killeen & Wellens 6368 (US). —A. Corolla with style branches. —B. Corolla in longitudinal section with stamens and style. —C. Involucral bract. —D. Achene.

Neocuatrecasia yungasensis H. Robinson, sp. nov. TYPE: Bolivia. Dpto. La Paz: Prov. Sud Yungas, Nor-Oeste de Chojlla valle del Río Pongo Pampa 2230 m, exposición SO, ladera rocosa vertical, hierba –8 cm, flores blancas, 7 Sep. 1987, *E. Vargas & R. Seidel* 505 (holotype, US; isotype, LPB). Figure 1E–H.

Ad *N. feuererii* similis sed in caulibus et foliis et pedunculis et bracteis involucri longe stipitate glanduliferis et in faucibus corollarum late infundibularibus distincta.

Erect herbs over 8 cm tall (only a piece of stem seen, branching not seen); stems, petioles, leaf blades, peduncles, and involucre bracts with slender stipitate glands. Leaves opposite; blades membranaceous, ovate, $0.7\text{--}1.5 \times 0.6\text{--}1.0$ cm, base subtruncate, margins with usually 3 blunt teeth, apex short-acute with extreme tip blunt, with scattered stipitate glands adaxially, stipitate glands on margins and abaxially on main veins, glandular dots on lamina abaxially; weak trinervation from near base. Inflorescence (as seen) a single terminal pedunculate head; peduncle ca. 14 mm long, densely covered with stipitate glands. Heads ca. 6 mm high, ca. 4.5 mm wide; involucre bracts ca. 12, subequal, oblong, weakly veined, non-costate, $3.0\text{--}3.5 \times 1.2\text{--}1.5$ mm, apices rounded, outer bracts with stipitate glands abaxially. Florets 20 to 25; corollas white, ca. 3.5 mm long, basal tube ca. 1.3 mm long, slender, throat broadly funnelform, ca. 1.3 mm long, lobes oblong-ovate, ca. 0.8 mm long, with few short hairs outside; anther thecae ca. 0.8 mm long; style with hairs restricted to base; style branches 5–6 times as broad as shaft when fully expanded. Achenes 2.5–3.0 mm long, with basal stipe ca. 0.5 mm long, with distinct setulae; pappus of 25 to 30 bristles 1.5–1.8 mm long, bases contiguous or nearly so.

The small piece from which *Neocuatrecasia yungasensis* is described is thoroughly distinctive in its stipitate glands on all stemlike or foliiform parts, in the distinctly petiolate leaves, and in the broad corolla throats. The corollas are particularly distinct from those of the possible near relative from the same area, *N. feuereri*, which has long cylindrical corolla throats much longer than the lobes or the small anthers.

Neocuatrecasia sandiensis H. Robinson, sp. nov. TYPE: Peru. Dept. Puno: Prov. Sandia, Uraayllu, trail on W-facing slope above quarry, $14^{\circ}08'S$, $69^{\circ}32'W$, 3510 m, high elevation grassland, plant to 40 cm, suffrutescent, flower disc only, white, 25 Jan. 1986, *B. Bennet* 1994 (holotype, NY). Figure 1I–L.

A *N. hirtella* aspectu simili sed in faucibus corollarum longioribus et in pilis stylorum omnino basilaribus differt.

Small subshrubs to 40 cm tall, with many lateral branches ascending at ca. $25\text{--}30^{\circ}$ angles; stems reddish, densely puberulous to hispidulous with often reddish hairs, with interspersed dark to sometimes reddish glandular dots; internodes 0.4–2.0 (–6.0) cm long. Leaves opposite; petioles 0.2–1.0 cm long; blades ovate, $1\text{--}2 \times 0.4\text{--}1.0$ cm, bases abruptly obtuse, margins with 3 to 5 shallow blunt teeth, apex short-acute, densely gland-dotted on both surfaces, densely minutely puberulous adaxially, densely puberulous on veins abaxially; trinerate with strongly ascending proximal secondary veins from near base of blade. Inflorescence terminal on stems and branches, with 1 to 3 pedunculate heads; peduncles to 2.5 cm long, slender, puberulous with dark hairs and with glandular dots. Heads broadly campanulate, 8.0–9.5 mm high; involucre bracts 12 to 14, broadly oblong, non-costate, $5.5\text{--}8.0 \times 2.2\text{--}3.0$ mm, outer bracts with rounded tips, densely puberulous with dark hairs and with pale glandular dots abaxially, inner bracts paler, mostly glabrous, more scarious and gland-dotted toward erose tips. Florets 20 to 25 in a head; corollas white, ca. 6.5 mm long, basal tube ca. 0.8 mm long, throat ca. 5 mm long, cylindrical, scarcely twice as broad as tube, lobes ca. 0.8 mm long, oblong-ovate; anther thecae ca. 1.3 mm long; style with hairs only at base, style branches when fully expanded 5–6 times as broad as shaft. Achenes 3.0–3.5 mm long, basal stipe ca. 1 mm long, setulae short and widely spreading; pappus of 29 to 32 bristles, ca. 3.5 mm long, contiguous or nearly so at base.

The corollas of *Neocuatrecasia sandiensis* are very similar to those of *N. feuereri* of Bolivia, with the long cylindrical throats and the much shorter anther thecae. The present species differs most ob-

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E–H. *N. yungasensis* H. Robinson, *Vargas & Seidel* 505 (holotype, US). —E. Corolla with style branches. —F. Corolla in longitudinal section with stamens and style. —G. Involucre bract with stipitate glands. —H. Achene. I–L. *N. sandiensis* H. Robinson, *Bennet* 1994 (holotype, NY). —I. Corolla with tips of style branches. —J. Corolla in longitudinal section with stamens, style, and nectary. —K. Involucre bract. —L. Achene. Scale bars all = 1 mm.

viously by the smaller non-velvety leaf blades and the broader non-pointed involucral bracts.

Paratype. PERU. **Dept. Puno:** Sandia, trail on W-facing slope beginning at slate quarry in Ura-ayllu, 14°08'S, 69°32'W, 3470 m, 22 Feb. 1986, *Bennet 2261* (NY).

Acknowledgments. Alice Tangerini is thanked for the illustrations, and Marjorie Knowles is thanked for many details regarding the preparation of the paper.

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Robinson, Harold Ernest. 2002. "Additions to Neocuatrecasia (Eupatorieae: Asteraceae)." *Novon a journal of botanical nomenclature from the Missouri Botanical Garden* 12, 388–392.

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