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The genus *Echeveria* in Bolivia. Part 2.

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Summary

We have recently recognized seven species of *Echeveria* for Bolivia: *E. bakeri, E. buchtienii*, *E. chilonensis*, *E. krahnii, E. rauschii, E. vanvlietii* and *E. whitei.* Here we propose six new taxa for Bolivia: five species and one variety: *Echeveria carrii* from Miraflores and Betanzos, Prov. Tomás Frías, Dept. Potosí, *Echeveria cochabambensis* from Aiquile, Prov. Campero, Dept. Cochabamba, *Echeveria fossilicola* from Torotoro, Prov. Charcas, Dept. Potosí, *Echeveria lowryi* from Villa Alcalá, Prov. Tomina, Dept. Chuquisaca, *Echeveria undulatifolia* from Mina Asientos, Prov. Mizque, Dept. Cochabamba, and *Echeveria whitei* var. *tunariensis* from the surroundings of the city of Cochabamba. They all belong to series *Racemosae* (Baker) Berger.

Key words: Bolivia, *Crassulaceae*, *Echeveria,* Series *Racemosae,* South America.

Resumen

Recientemente hemos reconocido siete especies de *Echeveria* para Bolivia: *E. bakeri, E. buchtienii*, *E. chilonensis*, *E. krahnii, E. rauschii, E. vanvlietii* y *E. whitei.* Aquí proponemos seis nuevos taxones, cinco especies y una variedad: *Echeveria carrii* de Miraflores y Betanzos, Prov. Tomás Frías, Dept. Potosí, *Echeveria cochabambensis* de Aiquile, Prov. Campero, Dept. Cochabamba, *Echeveria fossilicola* de Torotoro, Prov. Charcas, Dept. Potosí, *Echeveria lowryi* from Villa Alcalá, Prov. Tomina, Dept. Chuquisaca, *Echeveria undulatifolia* de Mina Asientos, Prov. Mizque, Dept. Cochabamba, y *Echeveria whitei* var. *tunariensis* de los alrededores de la ciudad de Cochabamba. Todas pertenecen a la serie *Racemosae* (Baker) Berger.

Palabras clave: Bolivia, *Crassulaceae*, *Echeveria,* Serie *Racemosae,*Sudamérica.

Introduction

In the first part of our study on the genus *Echeveria* in Bolivia (Pino et al., 2026), we have presented a thorough revision of the seven species of *Echeveria* described for this country up to

2025, namely: *E. bakeri, E. buchtienii*, *E. chilonensis*, *E. krahnii, E. rauschii, E. vanvlietii* and *E. whitei.* A precise knowledge of these taxa, especially their current locations and distribution, is the basis on which we describe 6 new taxa in this second part.

The original species were described mainly from the vicinity of the main cities La Paz, Cochabamba and Sucre. We have found many other taxa in the departments of Cochabamba, Chuquisaca, Santa Cruz and Potosí.

Material and Methods

Herbarium sheets of Bolivian (BOLV, HSB, LPB, USZ) and international herbaria (B, HNT, K, MO, NHA, NY, PH, US, USM) were examined (Acronyms according to Thiers, 2019). Collections were deposited at HSB, registered as Scientific Institute at national level (ICA), through resolution N° 026/09 of the Plurinational State of Bolivia, that enabled the collection. The project: "Taxonomical and Phylogenetic revision of genus *Echeveria* in Bolivia" was approved by the Ministry of Planification of Development and Environment through authorization MPDyMA/VMABCCGDF/DGBAP/UGCE-NE 00485/2026 to be conducted by San Francisco Xavier University. Field trips were conducted by Hibert Huaylla since 2015, by John Carr since 1998, especially in 2015 and 2023, William Ale in 2022 and by Daniel Marquiegui in 2022, 2023 and 2026. Morphological and floral characteristics were analyzed in their natural habitat and in the laboratory, and a collection of photographs was assembled. The preliminary categorization of the species of Bolivian *Echeveria* was carried out according to the IUCN categories and criteria (2024). Photos were made by Guillermo Pino except otherwise mentioned (DM = Daniel Marquiegui, HH = Hibert Huaylla).

New taxa described:

1. *Echeveria carrii* Pino, Huaylla, Marquiegui & W.Ale, sp. nov. Fig. 1, a–j.

Type: Bolivia, Dept. Potosí, Prov. Tomás Frías, Munic. Tarapaya, Miraflores Thermal Baths, NW Potosí, 19°27'23.7"S 65°46'58.5"W, 3445 m, 28 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5200* (Holotype: HSB 000-12427!).

Diagnosis: *Echeveria carrii* is close to *Echeveria chilonensis* (Kuntze) Walther, from which it differs by the following characters: Shorter plants in blossom (15–28 cm *vs.* 26–38 cm). Stems are shorter, (1.5–6 cm *vs.* 3–10 cm), narrower in diameter (0.5–0.8 cm *vs.* 0.6–2.5 cm) and more evenly cylindrical. Rosettes are about the same diameter (5–16 cm *vs.* 7–15 cm diameter). Leaves are narrowly obovate to oblong or lanceolate, not oblong to subrhomboidal as in *E. chilonensis,* slightly longer (3.5–10 cm *vs.* 2.3–8.5 cm), similar in width (0.9–1.85 cm *vs.* 0.9–1.9 cm wide at the middle) but thicker (3–5 mm *vs.* 2.5–3.5 mm). Leaf color is olive green in some plants, sometimes with a reddish margin, but light mauve to purplish red in most plants, compared to the bright light green color of *E. chilonensis*. The scape and bract features are similar, but pedicels are

shorter (0.2–0.8 cm *vs.* 0.7–2.6 cm long), sepals are oblong, acute, ascending, dull green, reddish at the base and apex, with a redder, acute apex compared to the bright green, uniformly colored sepals of *E. chilonensis*. Petals are longer (1.2–1.9 cm *vs.* 1.1–1.55 cm long), light coral red, not golden yellow to coral orange as in *E. chilonensis.*

Description: A succulent glabrous herb 4–10 cm tall, up to 15–28 cm in blossom. **Roots** tuberous, 0.4–0.5 cm diameter, conical, 4–8 cm long, growing from the base of the stem. **Stem** buried, erect, stumpy, rarely branched from the base, 0.6–2.5 cm diam, 1.5–6 cm long, light brown. **Rosettes** one at the end of stem, 5–16 cm diam. **Leaves** 7–16, ovate to lanceolate, acute to acuminate when young, then narrowly obovate to narrowly oblong, sessile, closely attached at every 0.2–0.4 cm, mostly at right angle or incurved upwards, 3.5–10 cm long, 0.5–0.9 cm wide at base, 0.6–1.24 cm wide at proximal third, 0.9–1.85 cm wide at middle, 0.7–1.5 cm wide at distal third, 3–5 mm thick, upper side flat to canaliculate, dull light green to glaucous (in culture) or light mauve to purplish red, margin sometimes reddish, lower side subcarinate, mauve to bright red towards apex, base sometimes light green, apex acute, reddish, rarely mucronate in old leaves, base hyaline whitish.

Flowering stem 1–2 oblique lateral subterminal racemes, erect, rachis 15–25 cm long, 4.5–7 mm diam. at base, 2.5–3.5 mm diam. at apex, light green, pinkish distally. **Peduncular bracts** 12–16, semideciduous, at proximal two thirds of stem, oblong, inserted oblique upwards every 0.8–1.6 cm, 0.9–2.3 cm long, 0.36–0.77 cm wide, 4–6 mm thick, inner side flat, outer side slightly convex to subcarinate, light green inside, light green to mauve outside, redder at distal half, apex acute, mucronate, dark red. **Flowers** 8–12, present at the distal third of the scape, 1.45–1.8 cm long and 0.8–0.9 cm diam. **Pedicels** oblique, short, 0.2–0.8 cm long, 2–2.5 mm diam., pink, with a bracteole similar to bracts at the base, 8–14 mm long, 4–6 mm wide. **Calyx** lobes united at base, sepals unequal, oblong, ascending, spreading at very acute angle, flat to concave inside, convex and incurving outside, 5–9 mm long, 2.5–3.5 mm wide, green, reddish at the base and apex, apex acute, redder. Flower buds ovoid, 0.6–0.8 cm diam. × 0.8–1 cm long, pale yellow in non-exposed areas, coral red elsewhere. **Corolla** subprismatical, 0.7–1 cm thick near base, 0.4–0.8 cm thick near apex, petals oblong, acute, 1.2–1.9 cm long, 3–3.5 mm wide, outer surface keeled, light coral red, apex slightly recurving, inner surface pink. Stamens 10, the 5 epipetalous 6–7 mm long, the antesepalous 7–12 mm long, filaments pink, 1–1.1 mm thick at base, gradually tapering to 0.3 mm. Anthers ellipsoid, yellow, 2.5–3 mm long and 1–1.1 mm wide. Gynoecium ovoid, 6–7 mm long, 5–6 mm thick. Carpels 5, white. Styles 4–5 mm long, parallel, almost touching each other, pink. Stigma reddish. Nectaries reniform, light yellow, 0.7–0.9 × 2.1–2.5 mm. **Fruit** a dehiscent campanulate polyfollicle, 1– 1.1 cm long, 0.7 –0.9 cm diam., brown.

Distribution and habitat: This species is restricted to the municipalities of Tarapaya and Betanzos in the department of Potosí between 3440 and 3540 m asl. It grows in reddish and white sandstone rock with dry puna vegetation in the narrow and flat valleys, along with *Polylepis tomentella* Wedd, *Puya humilis* Mez, *Puya herzogii* Wittm., *Echinopsis tarijensis* (Vaupel) H. Friedrich & G. D.

Rowley, *Oreocereus celsianus* (Jacques & Hérincq) A.Berger ex Riccob. and *Hemionitis pruinata* (Kaulf.) Christenh.

Phenology: It flowers all through the rainy season from January to March.

Conservation status: *E. carrii* has a dispersed distribution in the mountains surrounding the towns of Betanzos and Miraflores. It is considered Least Concern (LC) according to the IUCN.

Other specimens examined: Bolivia, Dept. Potosí, Prov. Cornelio Saavedra, Munic. Betanzos, slopes West of the town of Betanzos, 19°33'24.0"S, 65°27'19.4" W, 3440 m, 10 Jan 2022, *G. Pino, D. Marquiegui & W. Ale 3347* (USM 363342)*/3348*; same place, 28 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5201* (HSB 000-12428); in front of the abandoned Mojotorillo mill, 19°34'11.1"S, 65°24'57.4"W, 3224 m, 19 Jan 2023, *H. Huaylla 5029*. **Prov. Tomás Frías, Munic. Tarapaya,** Serranía de Miraflores, Puna forest of Churqui [*Strombocarpa ferox* (Griseb.) C.E.Hughes & G.P.Lewis] in humid gorge, with sandstone outcrops, 19°27'25"S, 65°46'52"W, 3540 m, 27 Feb 2006, *M. Zárate 2195*, (MO 6378505); Miraflores, NW Potosí, 19°27'23.7"S, 65°46'58.5"W, 3445 m, 9 Jan 2022, *G. Pino, D. Marquiegui & W. Ale 3345.*

Etymology: The name honors John Carr, British explorer and member of the BCSS, who started collecting cacti in 1956, specialized in *Sulcorebutia* around 1986, collected *Echeveria* in Bolivia since 1998, especially in 2015 and 2023, and discovered this plant in Betanzos in 2006. He noticed that *Echeveria* in Bolivia always grow near or on slopes opposite *Sulcorebutia*.

Taxonomical notes: This is the most isolated species in the department Potosí, the nearest species are *E. vanvliettii* and *E. rauschii* about 50 km to the north in department Chuquisaca close to the city of Sucre.


a


b

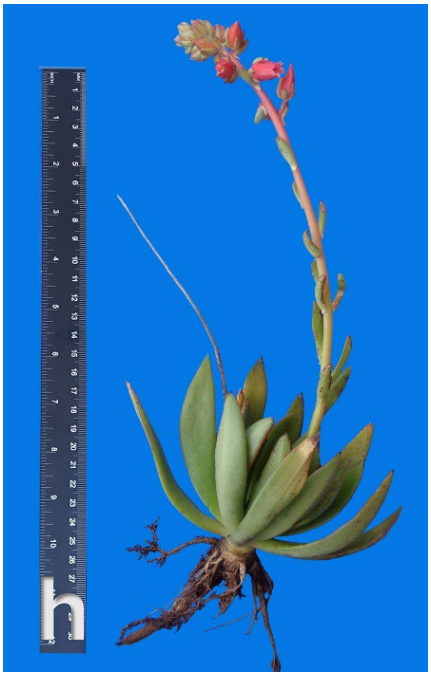

c


d


e


f
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15


g
MM 1 2 3 4 5


h


i
1 2 3 4 5 6 7 8
MM


j
MM

Fig. 1 a. *Echeveria carrii in habitat* at Miraflores (DM). **b**. Plant *in habitat* at Betanzos (HH). **c.** Plant *in habitat* at Miraflores (DM). **d**. Plant *in habitat* at Betanzos with reddish color (DM). **e.** Detail of flowers *in habitat* (DM). **f.** Details of the leaves. **g.** Details of the bracts. **h.** Plant *ex situ* from Miraflores. **i.** Detail of inflorescence at the beginning of anthesis. **j.** Details of the flowers.

2. *Echeveria cochabambensis* Pino, Huaylla & Marquiegui, sp. nov. Fig. 2, a–j.

Type : **Bolivia, Dept. Cochabamba, Prov. Campero, Munic. Aiquile**, 7 km West of Aiquile, 18°11'52.3"S, 65°16'11.5"W, 12 Feb 2026, 2940 m, *H. Huaylla, D. Marquiegui & G. Pino 5188* (Holotype: HSB 000-12424!).

Diagnosis: *Echeveria cochabambensis* is very close to *E. chilonensis*, from which it is almost indistinguishable without flowers. However, leaves are more frequently narrowly obovate than narrowly oblong and even subspatulate, slightly more yellowish in color. Bracts are the same color but lanceolate to narrowly obovate compared to oblong as in *E. chilonensis*, inserted almost erect at a narrower angle, lacking the reddish apex, longer and wider (2.4–4 cm long and 0.9–1.4 cm wide *vs.* 1.4–2.7 cm long and 0.5–1 cm wide). Flowers are more numerous (12–17 *vs.* 5–10), appearing from the distal half compared to the distal third in *E. chilonensis*. Pedicels are much shorter (0.25–0.7 cm *vs.* 0.7–2.6 cm long), recurved to reflexed compared to the erect, almost infundibuliform pedicels of *E. chilonensis*. Sepals are erect, ovoid to oblong, acute, flatter, compared to the oblong, subacute to obtuse sepals of *E. chilonensis,* inserted at acute angle, shorter and narrower (7–10 mm long and 3.5–4 mm wide *vs.* 6–12 mm long and 3–4.5 (–12) mm wide). Flowers are about the same size, but coral red outside and pink inside, compared to the golden yellow to coral orange outside and pale orange inside of the petals of *E. chilonensis*.

Description: A succulent glabrous **herb** 6–7 cm tall, up to 25–35 cm in blossom. **Stem** buried, erect, stumpy, rarely branched from the base, 1.2–2.5 cm diam., 3–5 cm long, light brownish gray. **Rosettes** one at the end of stem, 6–9 cm diam. **Leaves** 10–18, obovate, obtuse with a 1 mm reddish mucro when young, then narrowly obovate to narrowly oblong or subrhomboidal, sessile, closely attached, mostly oblique upwards, 3–8 cm long, 0.7–1.2 cm wide at base, 0.8–1.5 cm wide at proximal third, 1.3–2.6 cm wide at middle, 1.2–2.4 cm wide at distal third, 2.5–3.5 mm thick, upper side flat to canaliculate, light yellowish green, lower side subcarinate, paler light green, apex acute, sometimes mucronate, base hyaline whitish.

Flowering stems 1–2 oblique lateral subterminal racemes, erect, rachis 20–30 cm long, 4–7 mm diam. at base, 3–6 mm diam. at apex, light green, somewhat pinkish. **Peduncular bracts** 13–16, persistent, at proximal half of stem, lanceolate to narrowly obovate, inserted erect at a very narrow angle every 0.6–1 cm, 2.4–4 cm long, 0.9–1.4 cm wide, 3–5 mm thick, inner side flat, outer side slightly convex to subcarinate, light green, apex acute. **Flowers** 12–17, present at distal half of the scape, 1.3–1.6 cm long and 0.9–1.1 cm diam. **Pedicels** recurved to reflexed, 0.25–0.7 cm long, 2.5–3.6 mm diam., light green to pink, bracteoles not seen. **Calyx** lobes united at base, sepals

unequal, ovoid to oblong, erect, adpressed, convex outside, concave inside, 7–10 mm long, 3.5–4 mm wide, bright green, apex acute. Flower buds ovoid, 0.9–1.1 cm diam. × 0.8–0.9 cm long, coral red. **Corolla** subprismatical to urceolate, 0.9–1.1 cm thick near base, 0.3–0.5 cm thick near apex, petals oblong, acute, 1.3–1.67 cm long, 3–4 mm wide, outer surface keeled, coral red, apex slightly recurving, inner surface pink. Stamens 10, the 5 epipetalous 6–8 mm long, the antesepalous 7–11 mm long, filaments cream, 0.8–1 mm thick at base, gradually tapering to 0.3 mm. Anthers ellipsoid, yellow, 1.3–2 mm long and 0.7–0.9 mm wide. Gynoecium ovoid, 7–8 mm long, 6–7 mm thick. Carpels 5, white. Styles 2.5–3 mm long, parallel, almost touching each other, white. Stigma reddish. Nectaries reniform, white, 0.6–0.8 × 1.6–2 mm. **Fruit** a dehiscent campanulate polyfollicle, 1.1– 1.5 cm long, 1.2 –1.3 cm diam., brown.

Distribution and habitat: *E. cochabambensis* grows in semi-deciduous forests in the Aiquile valley in Cochabamba in the Bolivian-Tucuman forest formation. The species observed on the slopes are: *Alnus acuminata* Kunth, *Myrcianthes callicoma* McVaugh, *Prunus tucumanensis* Lillo and *Puya sp.*

Phenology: It flowers at the end of the rainy season from February to March.

Conservation status: This species is distributed in the municipalities of Aiquile and Mizque in the department of Cochabamba. It should be considered of Least Concern (LC) according to the IUCN red list.

Other specimens examined: Bolivia, Dept. Cochabamba, Prov. Campero, Munic. Aiquile, between Aiquile and Comunidad Santiago, 18°11'49.8"S, 65°16'12.8"W, 2963 m, 13 Jan 2023, *G. Pino, J. Carr & D. Marquiegui* 3753; 5 km W of Aiquile, 18°12'10.8"S, 65°14'56.4"W, 2700 m, 25 Dec 1996, *M. Lowry 0035*; along road from Aiquile to Mizque, 1985, *Mario Arandia 485* (HNT 54025, MO) [mentioned by Kimnach (1991) as *E. bakeri*]. **Munic. Mizque,** road to Santiago K'aspi Cancha, xerophytic slopes, quart sandstone, 18°10'45.4"S, 65°18'31.5"W, 2800 m, 15 Mar 1994, *E. Saravia & A. López 1069* (BOLV 09159), pinkish flowers; Chamaca, 18°17'50.3"S 65°25'27.1"W, 3034 m, 22 Nov 2012, *M. Lowry 0746*.

Etymology: The species is named after the department of Cochabamba, the country's third most populous and economically important department, located in the center of Bolivia. In this region, Quechua is widely spoken, and the name Cochabamba derives from the Quechua words "qucha" (lake) and "pampa" (plain), meaning "the plain of the lake." Its capital, Cochabamba, is also Bolivia's third's largest city in terms of population.

Taxonomical notes: We initially considered this species to be *E. chilonensis*. However, Aiquile lies about 60 km southwest of Chilón and Comarapa, both in Santa Cruz, and there are virtually no other species between these localities. The two species can easily be confused in the absence of flowers, although *E. cochabambensis* tends to have somewhat flatter leaves. In flower, however, *E. cochabambensis* is distinguished by its flatter, broader, and longer bracts, which are narrowly

obovate and inserted almost erect; its more numerous flowers with shorter, recurved pedicels; and its similarly sized flowers bearing more erect, flatter sepals and coral-red petals.

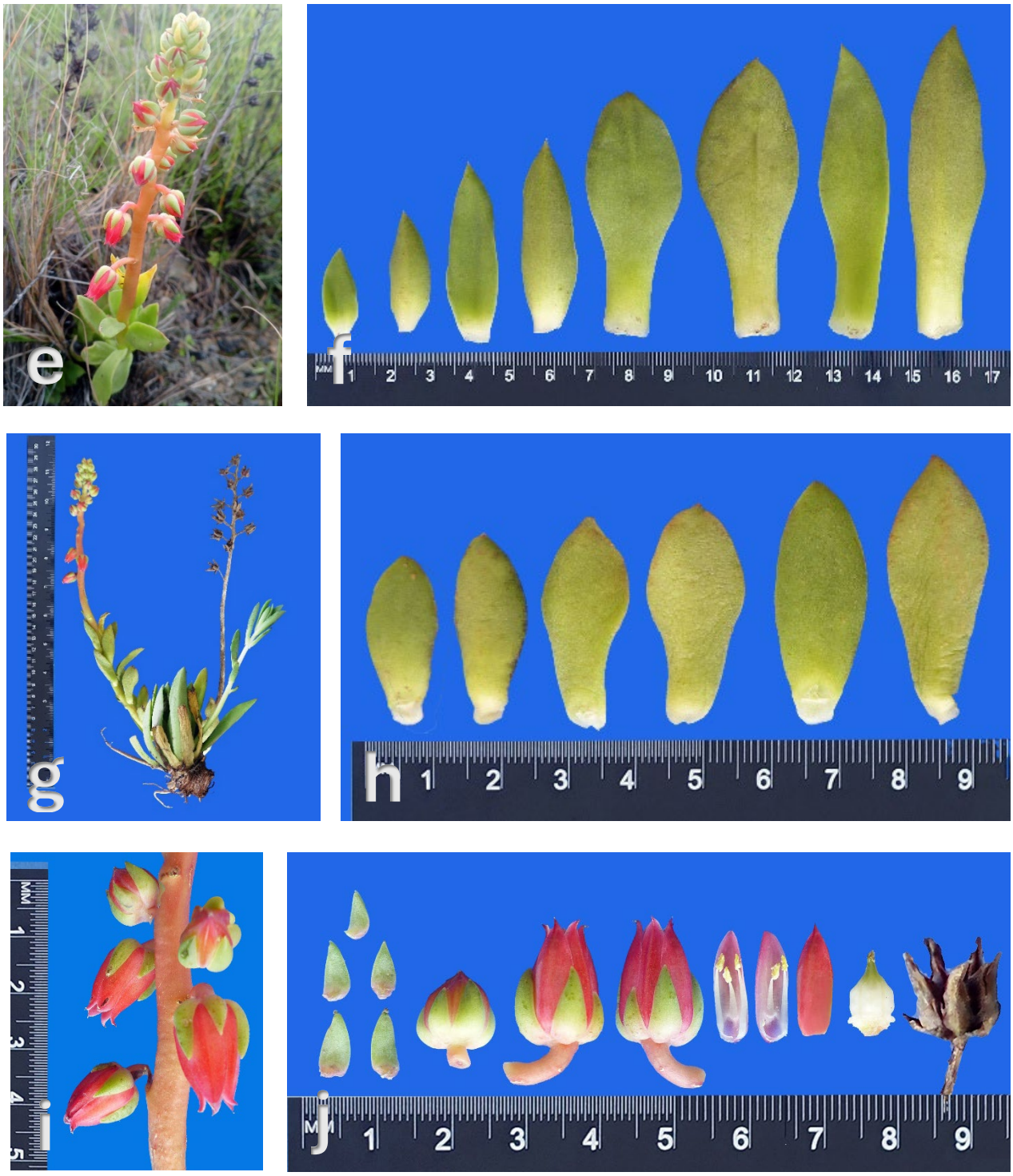


Fig. 2 a. Young *Echeveria cochabambensis in habitat* (DM). **b**. Plant *in habitat* (DM) **c.** Plant *in habitat* starting anthesis (DM). **d**. Plant *in habitat* with immature scape (DM). **e.** Detail of flowers *in habitat* (DM). **f.** Details of the leaves. **g.** Plant *ex situ.* **h.** Details of the bracts. **i.** Details of the inflorescence. **j.** Details of the flowers.

3. ***Echeveria fossilicola* Pino, Huaylla & Marquiegui, sp. nov. Fig. 3 a–j.**

Type: Bolivia, Dept. Potosí, Prov. Charcas, **Munic. Torotoro,** Torotoro Park, Trail 700 m S of entrance, after Tortoise cemetery, 18°09'43.5"S, 65°45'12.1"W, 2800 m, 22 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5196* (Holotype: HSB 000-12437!)**.**

Diagnosis: *Echeveria fossilicola* is reminiscent of *E. rauschii*, slightly smaller vegetatively (3–7 cm *vs.* 4–9 cm tall), but with larger rosettes (5.5–18 cm *vs.* 4–13 cm diam.) and taller in blossom (30–70 cm *vs.* –45 cm), being one of the tallest *Echeveria* observed in Bolivia. Leaves in both are oblong to spatulate with a cuspidate apex, sometimes obovate in *E. fossilicola*, but longer (3–10 cm long *vs.* 3.5–6.8 cm long), narrower at the middle (1.5–1.6 cm *vs.* 1.1–1.8 (–2.2) cm wide), and wider at the distal third (0.8–2.3 cm *vs.* 1–1.6 cm wide), light green, somewhat glaucous, faceted in young leaves and with a noticeable white margin in adult leaves, compared to the light olive green to brownish leaves of *E. rauschii*. Bracts are also much longer (1.8–5.5 cm *vs.* 0.6–3.7 cm long), and wider (0.8–1.8 cm *vs.* 0.6–1.2 cm wide) Pedicels are shorter (0.4–1.6 cm *vs.* 0.8–2 cm long), horizontal to recurvate. Flowers are similar in length and shape, coral red with sometimes orangish borders, compared to the coral red, orange or yellow petals of *E. rauschii*.

Description: A succulent glabrous **herb** 3–7 cm tall, up to 30–70 cm in blossom. **Roots** tuberous, secondary taproots gradually tapering from the base, 5–10 cm long, 0.4–0.6 cm diam. at base. **Stem** buried, erect and stumpy, continuing to a slightly decumbent taproot, 1.2–2.3 cm diam., 1.5–10 cm long, brownish gray. **Rosettes** one at the end of stem, 5.5–18 cm diam. **Leaves** 16–22, lanceolate or oblong, acute with a 1 mm mucro when young, when older spatulate to narrowly obovate, sessile, attached at every 0.5–0.7 cm, oblique upwards or horizontal, 3–10 cm long, 0.5–1.2 cm wide at base, 1–1.3 cm wide at proximal third, 1.5–1.6 cm wide at middle, 0.8–2.3 cm wide at distal third, 2–2.5 mm thick, upper side flat to slightly canaliculate, dark bright green or sometimes glaucous, with a whitish margin, sometimes faceted 2–3 mm from margin in distal third, lower side subcarinate, paler green, apex obtuse to cuspidate, with a 2 mm mucro, base hyaline whitish.

Flowering stems 1–3 oblique lateral subterminal racemes, erect, curved distally, rachis 30–70 cm long, 4.5–6.5 mm diam. at base, 3–4.5 mm diam. at apex, light green, somewhat pinkish, redder towards apex. **Peduncular bracts** 14–20, deciduous, at proximal three fourths of stem, lanceolate to narrowly ovate, inserted at 45º or more every 0.8–2.2 cm, 1.8–5.5 cm long, 0.8–1.8 cm wide, 1.5–2.5 mm thick, inner side flat, outer side slightly convex to subcarinate, dark green above, paler below, with a faint whitish margin, apex obtuse to cuspidate with a less than 1 mm mucro. **Flowers** 10–22, appearing from February to March, present at the distal fourth of the scape, 1.6–1.7 cm long and 0.9–1 cm diam. **Pedicels** horizontal or recurvate, 0.4–1.6 cm long, 2–3 mm diam., reddish green to orange, with a bracteole, similar to bracts, at the base of pedicel, 8–12 mm long, 2–3 mm wide. **Calyx** lobes united at base, sepals unequal, oblong to triangular, adpressed, concave inside, convex outside, 4–9 mm long, 2.5–4 mm wide, dark green, apex acute, base reddish. Flower buds ovoid, 0.7–0.8 cm diam. × 0.9–1 cm long, yellow with coral red distally. **Corolla** subprismatical,

0.8–1 cm thick near base, 0.4–0.7 cm thick near apex, petals oblong, acute, 1.4–1.6 cm long, 4–4.5 mm wide, outer surface keeled, coral red with orangish borders, apex slightly recurving, inner surface coral pink. Stamens 10, the 5 epipetalous 5–5.5 mm long, the antesepalous 8–10.5 mm long, filaments cream, 0.8–1 mm thick at base, gradually tapering to 0.3 mm. Anthers ellipsoid, yellow, 1.6–1.8 mm long and 0.6–0.9 mm wide. Gynoecium ovoid, 6.5–7 mm long, 5–6.5 mm thick. Carpels 5, cream. Styles 2–3.5 mm long, parallel, almost touching each other, pink. Stigma reddish. Nectaries reniform, cream, 0.5–0.6 × 1.8–2.2 mm. **Fruit** a dehiscent campanulate polyfollicle, 0.8–1.2 cm long, 0.7–0.8 cm diam., brown.

Distribution and habitat: *E. fossilicola* is present on slopes and ravines of the mountains surrounding the flat valley of Torotoro in the province of Charcas in the department of Potosí. It grows in the valleys and headwaters of the Bolivian-Tucuman forest formation at 2800 m asl, and is associated with *Polylepis tomentella* Wedd., *Roupala fiebrigii* Perkins, *Puya humilis* Mez and *Puya herzogii* Wittm.

Phenology: It flowers at the end of the rainy season from February to March.

Conservation status: This species has a scattered distribution on the rocky slopes of Torotoro National Park, but it is relatively abundant and it is conserved inside it. It is considered as of Least Concern (LC) according to the IUCN.

Other specimens examined: Bolivia, Dept. Potosí, Prov. Charcas, **Munic. Torotoro,** Torotoro Park, Ciudad de Itas, 18°06'11.4"S, 65°52'55.0"W, 3610 m, 23 Mar 2025, *B. Espinoza s.n.* (iNaturalist); Torotoro Park, 18°09'57.2"S, 65°45'13.6"W, 2840 m, 22 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5196a*.

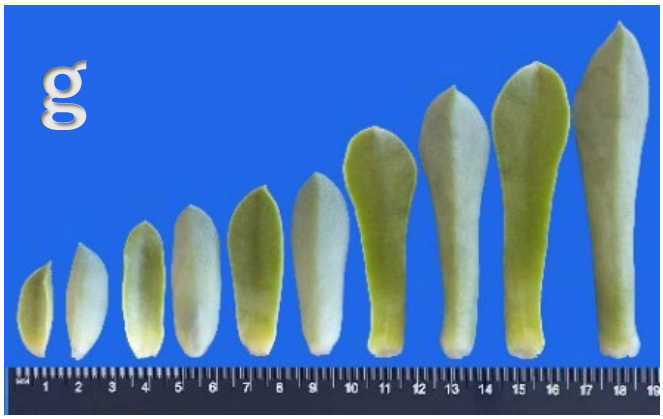
Etymology: The epithet comes from the Latin “fossilis”, (perfect passive participial of fodiō (“to excavate”) + -ilis (suffix forming adjectives), and the termination “-cola” (inhabitor), meaning “that dwells among fossils”, and is coined after the type locality, Torotoro, an area full of fossils.

Taxonomical notes: As already mentioned, *E. fossilicola* is close to *E. rauschii*, but it is also reminiscent of *E. chilonensis* from which it differs vegetatively by its slightly longer, distally broader oblong to spatulate leaves with cuspidate apices and whitish margins. *E. fossilicola* is the second *Echeveria* species described as endemic to the department of Potosí, Bolivia, the other one is the much further south: *E. carrii*. It occurs in the northern part of the department, very near the Cochabamba border—about 20 km west of *E. undulatifolia*, 40 km west of *E. cochabambensis*, and nearly 80 km northwest of *E. rauschii*.


a
b
c
d


e


f


g


h


i


j

Fig. 3 a. Young *Echeveria fossilicola in habitat* (DM). **b**. Plant *in habitat* (DM) **c.** Plant *in habitat* (DM). **d**. Plant *in habitat* starting anthesis (DM). **e.** Detail of flowers *in habitat*. **f.** Plant *ex situ*. **g.** Details of the leaves. **h.** Details of the bracts. **i.** Detail of the flowers *in habitat*. **j.** Details of the flowers.

4. *Echeveria lowryi* Pino, Huaylla & Marquiegui, sp. nov. Fig. 4 a–i.

Type : **Bolivia, Dept. Chuquisaca, Prov. Tomina, Munic. Villa Alcalá,** Alcalá, 15 Feb 2026. 19°22'08.3"S, 64°23'57.8"W, 2120 m, *H. Huaylla, D. Marquiegui, G. Pino & B. Bates 5190* (Holotype: HSB 000-12433!).

Diagnosis: *Echeveria lowryi* is related to *E.krahnii*, but its stems in the aerial part can be much longer: 5–20 (–30 cm) *vs.* 10 cm long. Rosettes are relatively smaller (6–9 cm *vs.* 4–12 cm diam.). Leaves are similar in shape and length, but narrower (1.8–2 cm *vs.* 1.8–2.3 cm at the middle; 1.2–1.6 cm *vs.* 1.3–1.8 cm at the distal third) and therefore not so markedly subrhomboidal as in *E. krahnii*, their color is olive green to brownish with red slightly undulate margins, compared to the light yellowish green, straight entire margins of the leaves of *E. krahnii*. Scapes are longer: (20–40 cm *vs.* 15–30 cm long). Sepals are inserted at 45º, not at right angle, they are shorter and narrower (4.5–6.5 mm long and 1.5–3 mm wide *vs.* 5–11 mm long and 2–4 mm wide in *E. krahnii*. Petals are pale orange to coral orange, compared to yellow to light orange in *E. krahnii*.

Description: A succulent glabrous **herb** 5.5–10 cm tall, up to 20–50 cm in blossom. **Stem** buried, decumbent or pendent, branched, 0.5–1 cm diam., 5–20 (–30 cm) long, light brownish gray. **Rosettes** one at the end of stem, 6–9 cm diam. **Leaves** 10–14, oblong to acute when young, then narrowly obovate or subrhomboidal, sessile, closely attached, mostly at right angle or oblique upwards, 2–8.8 cm long, 0.4–1 cm wide at base, 1.1–1.4 cm wide at proximal third, 1.8–2 cm wide at middle, 1.2–1.6 cm wide at distal third, 2.5–3.5 mm thick, upper side flat to subcanaliculate, olive green to brownish, margins red, slightly undulate, lower side subcarinate paler olive green, apex acute, slightly recurvate, not mucronate, redder than lamina, base hyaline whitish.

Flowering stem an oblique lateral subterminal raceme, erect or recurving, rachis 20–40 cm long, 4–6 mm diam. at base, 2.5–3 mm diam. at apex, light green to orange. **Peduncular bracts** 10–16, deciduous, at proximal two thirds of stem, oblong to lanceolate, inserted oblique upwards every 1–1.5 cm, 1.4–2.4 cm long, 0.6–1 cm wide, 3–5 mm thick, inner side canaliculate, outer side slightly convex to subcarinate, light green, apex obtuse, margin slightly reddish. **Flowers** 6–16, present at distal third of the scape, 1–1.2 cm long and 0.55–0.65 cm diam. **Pedicels** at acute angle, rarely recurvate, 0.5–1.5 cm long, 1.6–2 mm diam., pinkish to reddish green. **Calyx** lobes united at base, sepals unequal, oblong to narrowly ovate, most frequently spreading at 45º, convex both sides, 4.5–6.5 mm long, 1.5–3 mm wide, bright green, apex subacute to obtuse. Flower buds ovoid, 0.4–0.5 cm diam. × 0.6–0.8 cm long, yellow, then coral orange. **Corolla** subpyramidal, 0.7–0.8 cm thick near base, 0.3–0.35 cm thick near apex, petals oblong, acute, 1–1.2 cm long, 3.5–4 mm wide, outer surface keeled, pale orange to coral orange, with redder stripes near the base, apex

slightly recurving, inner surface yellow. Stamens 10, the 5 epipetalous 6–7 mm long, the antesepalous 7–8 mm long, filaments cream, 0.7–0.8 mm thick at base, gradually tapering to 0.3 mm. Anthers ellipsoid, yellow, 1.5–2 mm long and 0.7–1 mm wide.

Distribution and habitat: It grows in the valleys of Tomina and Padilla of the department of Chuquisaca, between 2090 and 2150 m asl in the Bolivian-Tucuman forest formation. It is associated with *Tillandsia sp., Berberis boliviana* Lechl.*, Puya humilis* Mez, *Puya herzogii* Wittm. and *Mutisia orbignyana* Wedd.

Phenology: It flowers in the rainy season from January to February.

Conservation status: *Echeveria lowryi* grows between the cracks in steep slopes in the Tomina and Padilla mountains. As few localities exist, it is considered as Vulnerable (VU) according to the IUCN.

Other specimens examined: **Bolivia, Dept. Chuquisaca, Prov. Tomina, Munic. Villa Alcalá,** Villa Alcalá, 19°22'39.5"S, 64°23'39.4"W, 2150 m, 08 Jan 2023, *G. Pino, D. Marquiegui & J. Carr 3744*; Alcalá, W facing cliff above river, growing with *Cleistocactus tominensis, Aylostera fiebrigii, Pfeiffera ianthothele,* 19°22'12.0"S, 64°23'57.5"W [19°22'08.3"S, 64°23'57.8"W], 2090 m, 25 Nov 2009, *M. Lowry 0638.06 (0780)*; **Munic. Padilla,** near Padilla [19°18'S, 64°18'W], *Philippe Richaud s.n.*.

Etymology: The species is named after Martin Lowry, Member of IOS Executive Board, who discovered the species in 2009. He is the author of more than 12 publications of Bolivian cacti, mainly *Trichocereus, Lobivia* and *Cleistocactus*, and the discoverer of *E. ayacuchoensis* from Peru. He has made more than 45 observations of *Echeveria* in Bolivia.

Taxonomical notes: Like *E. krahnii*, this species has stems that branch profusely from the base, although they may be longer. Compared with *E. chilonensis*, *E. lowryi* has larger plants with longer, decumbent stems, darker leaves, and longer scapes. *E. lowryi* occurs in the department of Chuquisaca about 70 km northwest of the type locality of *E. krahnii* (in the department of Santa Cruz), and grows between 2000 and 2100 m asl, whereas the latter occurs at 1300–1900 m asl.


a


b


c


d

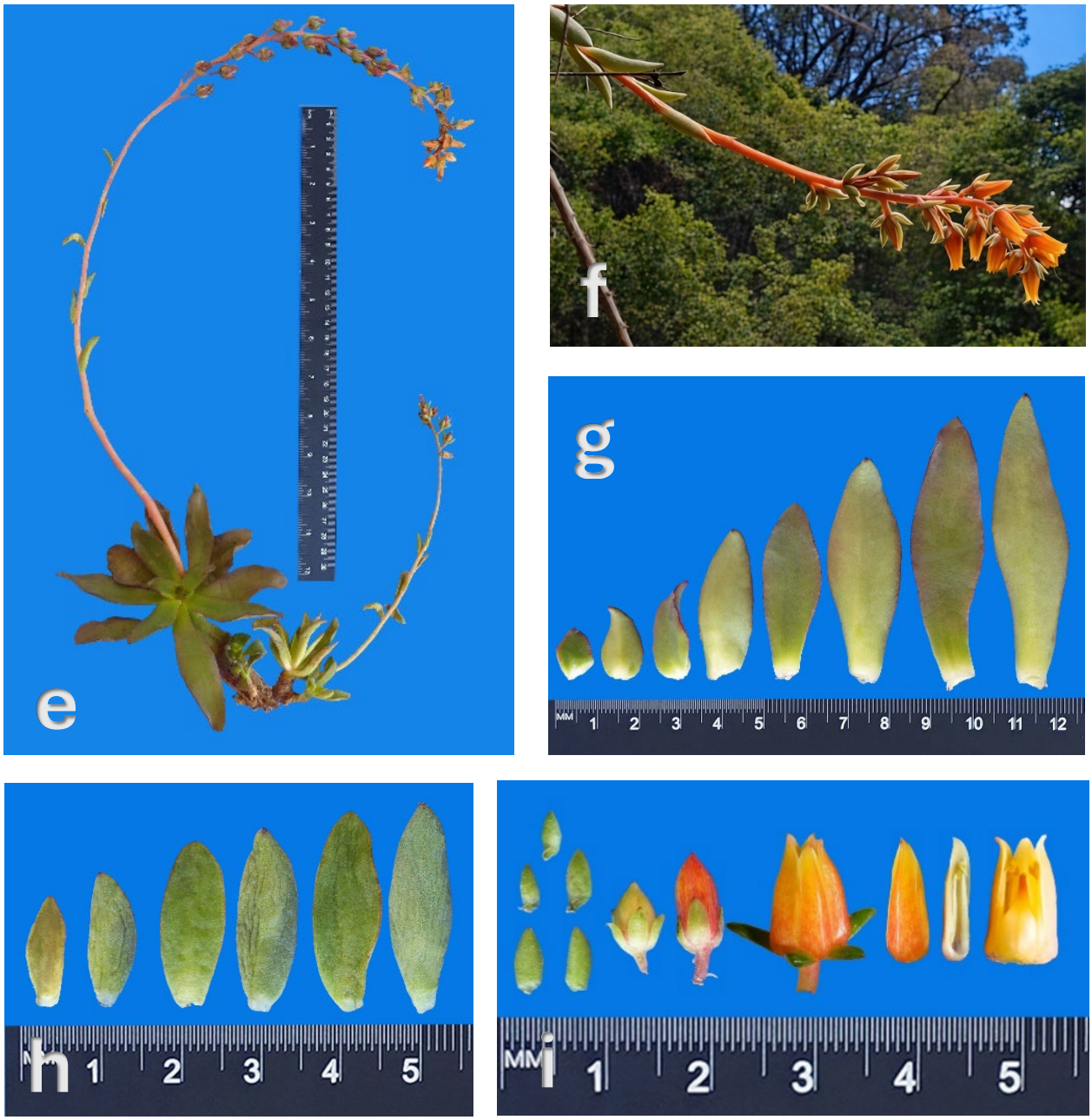


Fig. 4 a. A cluster of young *Echeveria lowryi in habitat* (DM). **b**. Plant *in habitat* starting anthesis (DM) **c.** Plant *in habitat* with flowers showing aerial stems (DM). **d**. Plant *in habitat* starting anthesis (DM). **e.** Plant *ex situ*. **f.** Detail of flowers *in habitat*. (DM) **g.** Details of the leaves. **h.** Details of the bracts. **i.** Details of the flowers.

5. ***Echeveria undulatifolia*** **Pino, Huaylla & Marquiegui, sp. nov. Fig. 5, a–i.**

Type: Bolivia, Dept. Cochabamba, Prov. Mizque, Munic. Mizque, San Vicente to Mina Asientos, 18°11'00.8"S, 65°32'43.6"W, 2540 m, 17 Feb 2026, *H. Huaylla, D. Marquiegui & Pino 5192* (Holotype: HSB 000-12426!).

Diagnosis: *Echeveria undulatifolia* is reminiscent of *E. chilonensis*, but vegetative plants are larger (5–14 cm *vs.* 3–7 cm tall). Stems have defined buried and aerial parts, more irregular and narrower (1–1.5 cm *vs.* 1.2–2.7 cm diam.). Rosettes are larger (6–20 cm *vs.* 7–15 cm diam.). Leaves are longer (3–13 cm *vs.* 2.3–8.5 cm long), slightly wider (1.5–2.2 cm *vs.* 0.9–1.9 cm wide at middle), and not as thick, (1.5–2.5 mm *vs.* 2.5–3.5 mm thick), what gives them a flatter appearance, their shape is more constantly rhomboidal, light olive green, reddish near margins, pruinose in the dry season, margins very undulate, compared to the bright light green leaves of *E. chilonensis*, with straight entire margins. Bracts of the scape are more numerous: (20–26 *vs.* 12–15), much longer (2.6–6 cm *vs.* 1.4–2.7 cm long) and wider (1–1.8 cm *vs.* 0.5–1 cm wide), flat, floppy and frequently recurved, only 1–2 mm thick. Bracts can be as long as the leaves. Pedicels are longer (0.7–3.5 cm *vs.* 0.7–2.6 cm long), sepals are ascending or inserted at an acute angle, not adpressed, longer (9–15 mm *vs.* 6–12 mm long), but comparatively very flat, petals are similar in length, salmon red, compared to the golden yellow to coral orange flowers of *E. chilonensis*.

Description: A succulent glabrous **herb** 5–14 cm tall, up to 25–40 cm in blossom. **Stem** semiburied, erect to curved, rarely branched from the base, buried part 1–1.5 cm diam., 1–5 cm long, light brownish gray, aerial part light green, up to 5 cm long. **Rosettes** one at the end of stem, 6–20 cm diam. **Leaves** 12–20 (–30), ovate to oblong, acute to acuminate when young, then narrowly obovate to spatulate or subrhomboidal, sessile, attached every 0.3–0.7 cm mostly at right angle or oblique upwards, 3–13 cm long, 0.6–1.2 cm wide at base, 0.8–1.1 cm wide at proximal third, 1.5–2.2 cm wide at middle, 1.5–2 cm wide at distal third, 1.5–2.5 mm thick, upper side flat to canaliculate, light green in the rainy season, otherwise light olive green, pruinose, reddish near margins in the dry season; lower side subcarinate paler light green in the rainy season, olive green to purplish in the dry season, apex acute, not mucronate in old leaves, sometimes recurved, margins very undulate when dry, base hyaline whitish.

Flowering stem an oblique lateral subterminal raceme, erect, rachis 25–40 cm long, 7–8 mm diam. at base, 4.5–5 mm diam. at apex, light green, pinkish near apex. **Peduncular bracts** 20–26, persistent, at proximal two thirds of stem, oblong to narrowly obovate, inserted at 45º every 1.2–3 cm, 2.6–6 cm long, 1–1.8 cm wide, 1–2 mm thick, both sides flat, light green, apex acute to obtuse, base hyaline, spurred. **Flowers** 12–16, present at the distal third of the scape, 1.6–1.7 cm long and 0.95–1.1 cm diam. **Pedicels** ascending at 45º, 0.7–3.5 cm long, 2.8–3.2 mm diam., light green pinkish, with 1–2 bracteoles similar to bracts, one at the base of the flower and the other sometimes at the middle of pedicel, 4.5–7.5 mm long, 1–2.5 mm wide. **Calyx** lobes united at base, sepals unequal, oblong to narrowly ovoid and even triangular, spreading at acute angle, not adpressed, both sides flat, 9–15 mm long, 3–5 mm wide, bright green, apex acute. Flower buds ovoid, 0.9–1

cm diam. × 1.2–1.3 cm long, greenish yellow to salmon red. **Corolla** subprismatical, 0.8–0.9 cm thick near base, 0.3–0.6 cm thick near apex, petals oblong, acute, 1.5–1.6 cm long, 3.5–4 mm wide, outer surface keeled, salmon red, apex slightly recurving, inner surface pink. Stamens 10, the 5 epipetalous 7–8 mm long, the antesepalous 10–11 mm long, filaments cream, 1–1.1 mm thick at base, gradually tapering to 0.3 mm. Anthers ellipsoid, yellow, 2–2.2 mm long and 1–1.2 mm wide. Gynoecium ovoid, 7–8 mm long, 5–6 mm thick. Carpels 5, white. Styles 3.5–4 mm long, parallel, almost touching each other, white. Stigma reddish. Nectaries reniform, white, 0.8–1 × 2–2.4 mm. Fruit a dehiscent campanulate polyfollicle, 0.85– 0.9 cm long, 0.6 –0.7 cm diam., brown.

Distribution and habitat: It grows in the Río Molinero valley in the Bolivian-Tucuman forest formation and semi-humid puna with hillside grasslands between 2900 and 3510 m asl, it is associated with *Polylepis subtusalbida* (Bitter) M. Kessler & Schmidt-Leb., *Begonia baumannii* Lemoine, *Hemionitis pruinata* (Kaulf.) Christenh., *Selaginella sellowii* Hieron. and *Cystopteris fragilis* (L.) Bernh.

Phenology: It flowers at the end of the rainy season from February to March.

Conservation status: *Echeveria undulatifolia* grows in the crevices of steep mountains of province Mizque, department of Cochabamba. As very few localities have been observed, it is considered Vulnerable (VU) according to the IUCN.

Other specimens examined: Bolivia, Dept. Cochabamba, Prov. Mizque, Munic. Mizque, San Vicente to Mina Asientos, 18°11'00.8"S, 65°32'43.6"W, 2540 m, 12 Jan 2023. *G. Pino, D. Marquiegui & J. Carr 3752*; 2 km N of Mina Asientos, on unreachable vertical rock walls, 18°11'48.4"S 65°32'57.3"W, 17 Feb 2026, *H. Huaylla, D. Marquiegui & G.Pino 5192 a*.

Etymology: The specific epithet is derived from the most notable and distinguishing characteristic of this species—the undulate, or wavy, margins of its leaves. The adjective “undulātus, -a, -um” is the diminutive of “undātus, -a, -um”, and comes from Latin “unda” = wave. It refers to the sinuous margin of the leaves, as with “small waves”. This feature sets it apart from related species and is reflected directly in the name, emphasizing the uniqueness of the plant's leaf edges.

Taxonomical notes: This species occurs in the department of Cochabamba, very near the border with Potosí, about 20 km east of *E. fossilicola* and 20 km west of *E. cochabambensis*.


a


b


c


d

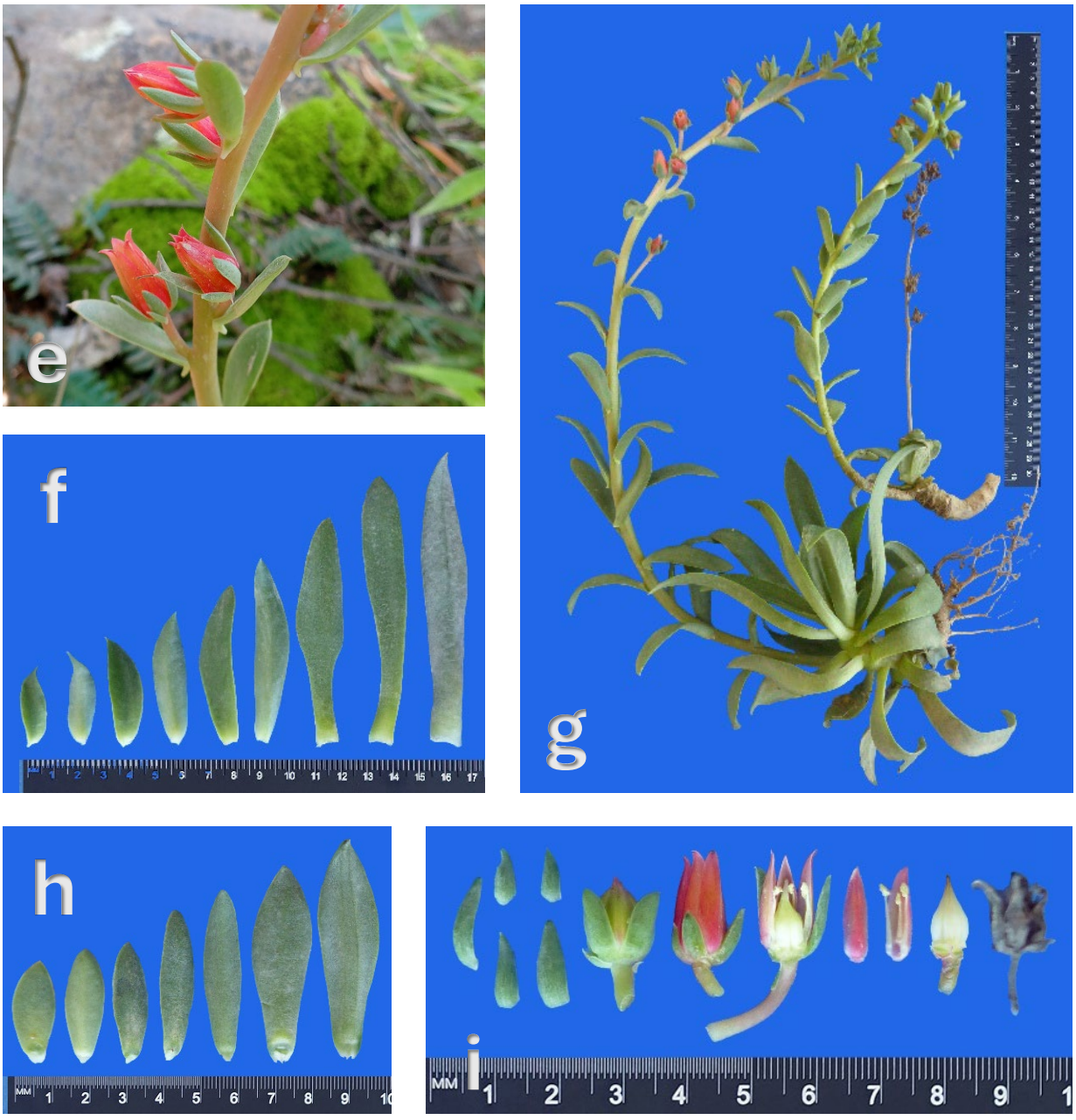


Fig. 5 a. Young *Echeveria undulatifolia in habitat* (DM). **b**. Plant *in habitat* starting anthesis (DM) **c.** Plant *in habitat* with undulate margins and two scapes (DM). **d**. Plant *in habitat* starting anthesis (DM). **e.** Detail of flowers *in habitat*. (DM). **f.** Details of the leaves. **g.** Plant *ex situ*. **h.** Details of the bracts. **i.** Details of the flowers.

6. ***Echeveria whitei* Rose var. *tunariensis.* Pino, Huaylla, Marquiegui & W.Ale, var. nov. Fig. 6 a–i.**

Type : **Bolivia, Dept. Cochabamba, Prov. Cercado, Munic. Cochabamba,** Parque Tunari, 17°19'54.1"S, 66°09'31.9"W, 3070 m, 2 Mar 2026, *H. Huaylla, D. Marquiegui & G. Pino 5202* (Holotype: HSB 000-12429!)

Diagnosis: *Echeveria whitei* var. *tunariensis* is similar to *E. whitei* var. *whitei,* but differs in the following: Plants are slightly vegetatively shorter, (2–7 cm *vs.* 3–8 cm) and rosettes are generally smaller in diameter (2–6 cm *vs.* 2.8–9 cm), however it is more branched from the base and forms larger clumps. Both have obovate leaves but they can be relatively wider in var. *tunariensis* and narrower in var. *whitei*, (0.6–1.8 cm *vs.* 0.8–1.4 cm wide at middle; 0.6–1.8 cm *vs.* 0.95–1.35 cm wide at distal third), usually shorter (1.4–3.6 *vs.* 2.1–4.5 cm long), and thicker (2–4 mm *vs.* 1–2 mm thick), bright green to brownish mauve instead of dull olive green-purplish, with a constant cuspidate apex and a larger mucro. The scape is shorter (3–15 cm in var. *tunariensis* compared to 10–30 cm in var. *whitei*), with oblong to narrowly obovate (rarely lanceolate) bracts, inserted at 45º, convex in both sides, with obtuse to cuspidate apex, compared to the lanceolate, acute bracts in var. *whitei* that are slightly recurved, with their inner side flat or canaliculate. Bracts are also wider (0.4–1 cm *vs.* 0.35–0.6 cm wide) and thicker (2–3 mm *vs.* 1–2 mm thick). Flowers are similar, but petal color varies from crimson to flamingo red, coral red with pink borders, coral orange or yellow, compared to petals of *E. whitei* that are mostly crimson red, sometimes orangish at the base.

Description: A succulent glabrous **herb** 2–7 cm tall, up to 5–15 cm tall in blossom, sometimes forming clumps. **Stem** buried, erect to decumbent, 0.6–2 cm diam., 1–5 cm long, dark brown, branching readily from base, 1–5 branches, forming small clumps. Roots 1–6, fibrous, secondary taproots gradually tapering from the base, 5–12 cm long, 0.3–0.6 cm diam. at base, light brown. **Rosettes** one at the end of stem or branch, 2–6 (rarely –14) cm diam. **Leaves** 14–34, ovate when young, then narrowly obovate to subspatulate, sessile, loosely attached, erect, slightly incurved to horizontal, 1.4–3.6 (rarely –6) cm long, 0.3–0.8 (rarely –1.2) wide at base, 0.4–1.1 cm wide at proximal third, 0.6–1.8 cm wide at middle, 0.6–2 cm wide at distal third, 2–4 mm thick, upper side flat to subcanaliculate, dark bright green to brownish mauve, lower side subcarinate, light olive green, apex cuspidate with a wide same colored 1–1.5 mm mucro, base hyaline whitish.

Flowering stems 1–3 erect lateral subterminal racemes, rachis erect when short, curved if longer, 3–15 cm (rarely –50 cm) long, 3–5 mm diam. at base, 1.5–2.8 mm diam. at apex, light green, slightly pinkish distally. **Peduncular bracts** 5–18 at proximal half of stem or two thirds, persistent, oblong to narrowly obovate or lanceolate, straight, inserted at 45º every 0.8–1.4 cm, 0.6–1.9 cm long, 0.4–1 cm wide, 2–3 mm thick, both sides very convex, light green, base pinkish, apex obtuse to cuspidate. **Flowers** 3–15, present at distal half to fourth of the scape, 1.1–1.8 cm long and 0.75–0.9 cm diam. **Pedicels** 0.3–2.1 cm long, 1.2–2.2 mm diam., terete, pink to coral red, sometimes recurvate, 1–3 bracteoles along pedicel, 0.25– 3 cm long. **Calyx** lobes united at base, sepals

unequal, narrowly ovate to oblong or triangular, acute, ascending but not adpressed, flat inside, convex outside, 3–8.5 mm long, 1.6–3.5 mm wide, bright to olive green or reddish. Flower buds ellipsoid, 0.6 cm diam. × 0.9 cm long. **Corolla** subpyramidal to slightly urceolate, 0.7–1 cm thick near base, 0.4–0.6 cm thick near apex, petals oblong, acute, 1.1–1.4 cm long, 2.5–4 mm wide, outer surface keeled, crimson to flamingo red, coral orange or yellow (northern localities), coral red with pink edges (southern and western localities), apex slightly recurving, inner surface pink to orange. Stamens 10, the 5 epipetalous 6–8 mm long, the antesepalous 9–10 mm long, filaments cream, 0.4–0.9 mm thick at base, gradually tapering to 0.2 mm. Anthers ovoid, yellow, 1.4–1.8 mm long and 0.5–0.7 mm wide. Gynoecium ovoid, 6–7 mm long, 4–5 mm thick. Carpels 5, greenish cream. Styles 2–3.5 mm long, parallel, almost touching each other, cream to pink. Stigma reddish. Nectaries reniform, light cream to greenish yellow, 1.4–2.2 × 0.6–1 mm. **Fruit** a campanulate dehiscent polyfollicle, 1.1–1.4 cm long, 0.6–0.9 cm diam., brown.

Distribution and habitat: *Echeveria whitei* var. *tunariensis* grows on the slopes of the Andes in the north of the city of Cochabamba, including the Tunari National Park, extending to the west in the localities of Kami near the department of La Paz and southwards to the Municipality of Tapacarí from 3070 to 3871 m asl, on slopes and ravines in the semi-humid Puna with grasslands and forests of *Polylepis sp*.

Phenology: It flowers in the rainy season from January to February.

Conservation status: This species is abundant in the localities mentioned except at Tunari National Park where a decrease has been observed in the last years, possibly due to human intervention in the area. It is considered as of Least Concern (LC) according to the IUCN.

Other specimens: Bolivia, Dept. Cochabamba, Prov. Cercado, Munic. Cochabamba, Parque Tunari, 17°19'54.1"S, 66°09'31.9"W, 3070 m, 16 Jan 2022. *G. Pino, D. Marquiegui, W. Ale 3351* (USM 363343); **Prov. Quillacollo**, **Munic. Quillacollo,** San Miguel, Puna supratropical pluvistational subhumid zone, forests of *Polylepis besseri* ssp. *subtusalbida*, NW facing slopes, 45º slant, 17°16'16.3"S, 66°20'09.8"W, 3870 m, 5 April 2002, *M. Carmen Ramírez 354* (BOLV 29519); **Munic. Tiquipaya,** Cruzani, ca. 13 km ascending from Tiquipaya, Puna forest, *Pinus radiata* plantation, with some *Polylepis subtusalbida*, red-orange flowers, 17°17'54"S, 66°12'57"W, 3530 m, 3 Feb 2006, *N. Vargas & E. Rodríguez 476* (LPB); **Munic. Vinto,** road from Quillacollo to Morochata, crevices in accumulated soil, on a large rock outcropping, petals rose, [17°21'25.5"S, 66°22'44.2"W], 3150 m, Jan 27 1996, *N. Ritter & J. Wood 2817* (BOLV 14036, NHA); **Prov. Ayopaya, Munic. Independencia,** Kami, 17°23'06.1"S, 66°48'05.7"W, 3890 m, 25 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5199* (USM 363364); Kami, 17°22'52.5"S, 66°48'31.9"W, 3871 m, *Alex Céspedes s.n.*; **Prov. Tapacarí, Munic. Tapacarí,** between Caracollo and Cochabamba, Pongo, Kulku Mayu, 3800 m, on vertical rocks, *Polylepis* forest, 24 Dec 1982, *J. Fernández Casas 7688* (MO 3030235, NY 04107157); road from Cochabamba to Oruro, after Pongo, 17°43'02.5"S, 66°33'53.1"W, 3871 m, 13 Jan 2023, *G. Pino, D. Marquiegui, J. Carr & B. Bates 3754* (USM 363359); Pongo to Lacayani Bridge, 1 km W of Pongo, 17°43'03.6"S,

66°33'50.5"W, 3947 m, 20 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5193* (HSB 000-12434, USM 363360); Pongo Kasa, 17°43'07.2"S, 66°33'51.5"W, 3936 m, 24 Nov 2023, *M. Lowry 1623*; Pongo Kasa, 17°42'39.0"S, 66°34'55.5"W, 3754 m, 24 Nov 2023, *M. Lowry 1624*; Chuñu Chuñuni, between Pongo and Cruce Tacopaya, road to Oruro, 17°42'39.48"S, 66°34'55.04"W, 3752 m, 18 Dec 2023, *John Carr s.n.*; Lacayani Bridge, 60 m to the N, 17°42'38.2"S, 66°34'55.9"W, 3780 m, 20 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5194* (HSB 000-12435, USM 363361); 150 m NE of Tacopaya cross, 17°42'53.9"S, 66°36'25.8"W, 3830 m, 20 Feb 2026, *H. Huaylla, D. Marquiegui & G. Pino 5195* (HSB 000-12436, USM 363362); **Prov. Arque, Munic. Arque,** road from Cochabamba to Oruro, detour S about km 86, Viacha gorge, near Huancani [17°44'57.3"S 66°29'40.5"W], 3600 m. 11 Aug 1991, *P. Ibisch & P. Rojas 0327,* (BOLV 06807). **Prov. Tiraque, Munic. Tiraque**, 17°23'55.4"S 65°48'59.6"W, 18 Dec 2022, *Nolan Exe s.n*.

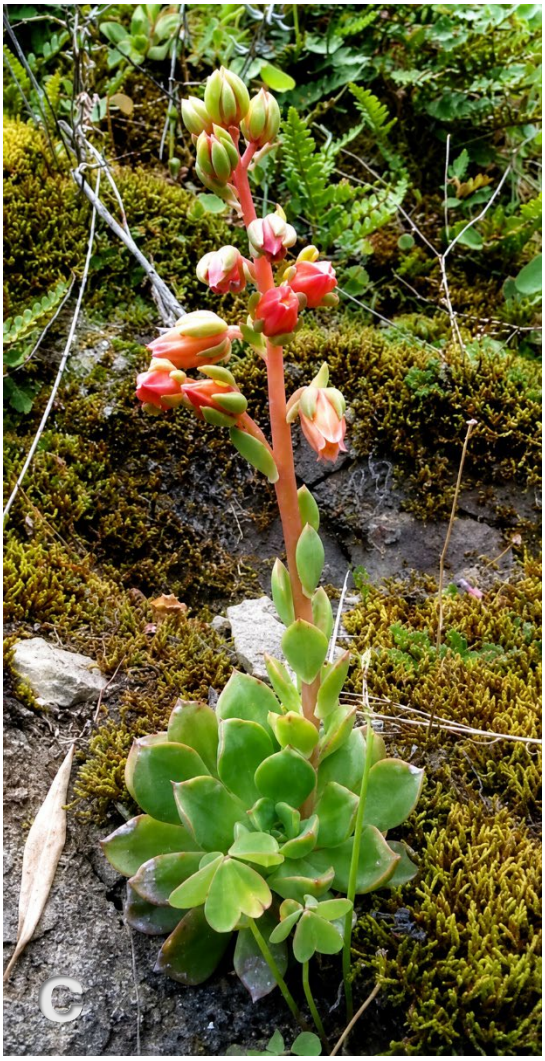
Etymology: The epithet refers to the Tunari mountain range (Cordillera Tunari), a major Andean system northwest of the city of Cochabamba, Bolivia's fourth-largest city. The range extends through the provinces of Quillacollo, Cercado, and neighboring areas within Tunari National Park. Its highest peak, Pico Tunari, reaches approximately 5030 m asl.

Taxonomical notes: *E. whitei* var. *tunariensis* starts growing approximately 40 km southeast of Quime, where the type variety was described. No intermediate collections are known. Whereas var. *whitei* is restricted to a few localities confined in the department of La Paz, var. *tunariensis* is abundant from Kami—where miniature plants as small as 2 cm tall occur—along the northern mountain range north of the city of Cochabamba, including Quillacollo, Cruzani, Tunari Park, and Tiraque. From Kami it also extends southeast through the municipality of Tapacarí, reaching and crossing the Cochabamba–Oruro Road at Pongo, Lacayani Bridge, and Tacopaya Cross. In this area it grows near *E. bakeri* and has been misidentified as that species, even in recent publications. However, they are clearly distinct in size and indument. *Echeveria whitei* var. *tunariensis* has sometimes been misidentified on social media and iNaturalist as *E. decumbens*, a species from Cusco, Peru, that grows about 750 km far away (Pino et al., 2017). The two taxa can be distinguished by several characters. In *E. whitei* var. *tunariensis*, the leaves are bright dark green to brownish, whereas those of *E. decumbens* are light olive green and become reddish when exposed. The scapes of var. *tunariensis* are erect, in contrast to the decumbent flowering stems of *E. decumbens*, a feature reflected in that species' name. The flowers also differ: var. *tunariensis* has subpyramidal flowers with longer petals (1.1–1.4 cm *vs*. 0.9–1 cm in *E. decumbens*) and a wider range of colors, whereas *E. decumbens* has urceolate flowers that are consistently coral red, sometimes slightly yellowish along the keel.

Kimnach (2003) indicated the cytology of *E. whitei* as n = ± 96. Bischofberger in ICN clarifies that this is useless because the chromosome number does not refer to a plant at or near the type locality of *E. whitei* in department La Paz but belongs to a plant cultivated at Les Cèdres (Monaco) from "Cochabamba-Chidro" at 3300 m asl (Uhl, 2007), a locality which may well correspond to *E. whitei* var. *tunariensis*.


a


b


c


d


e
1
2
3
4

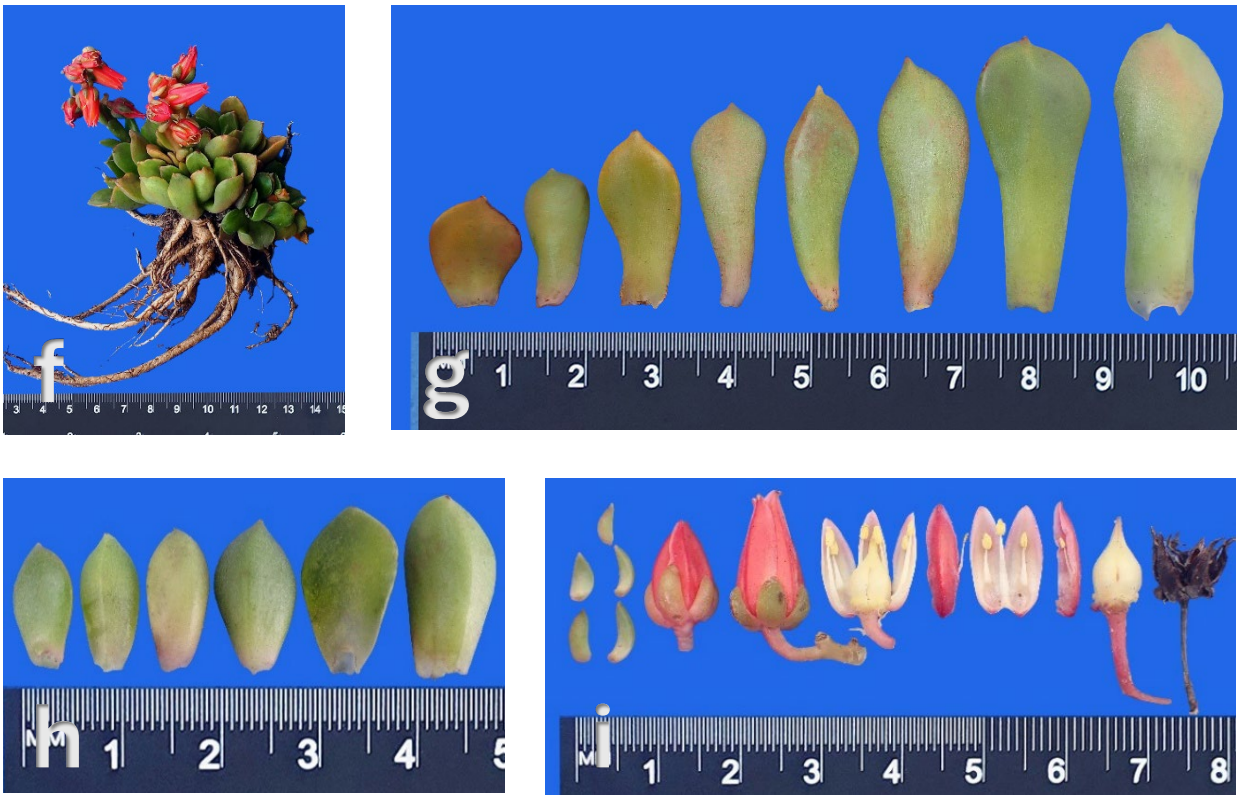


Fig. 6 a. *Echeveria whitei* var. *tunariensis in habitat* at Pongo (DM). **b**. Plant *in habitat* at Lacayani Bridge (DM). **c.** Plant *in habitat* at Tunari (DM). **d**. Miniature plant *in habitat* at Kami (DM). **e.** Flowers of different colors from Tunari. **f.** Plant *ex situ* from Pongo. **g.** Details of the leaves. **h.** Details of the bracts. **i.** Details of the flowers.

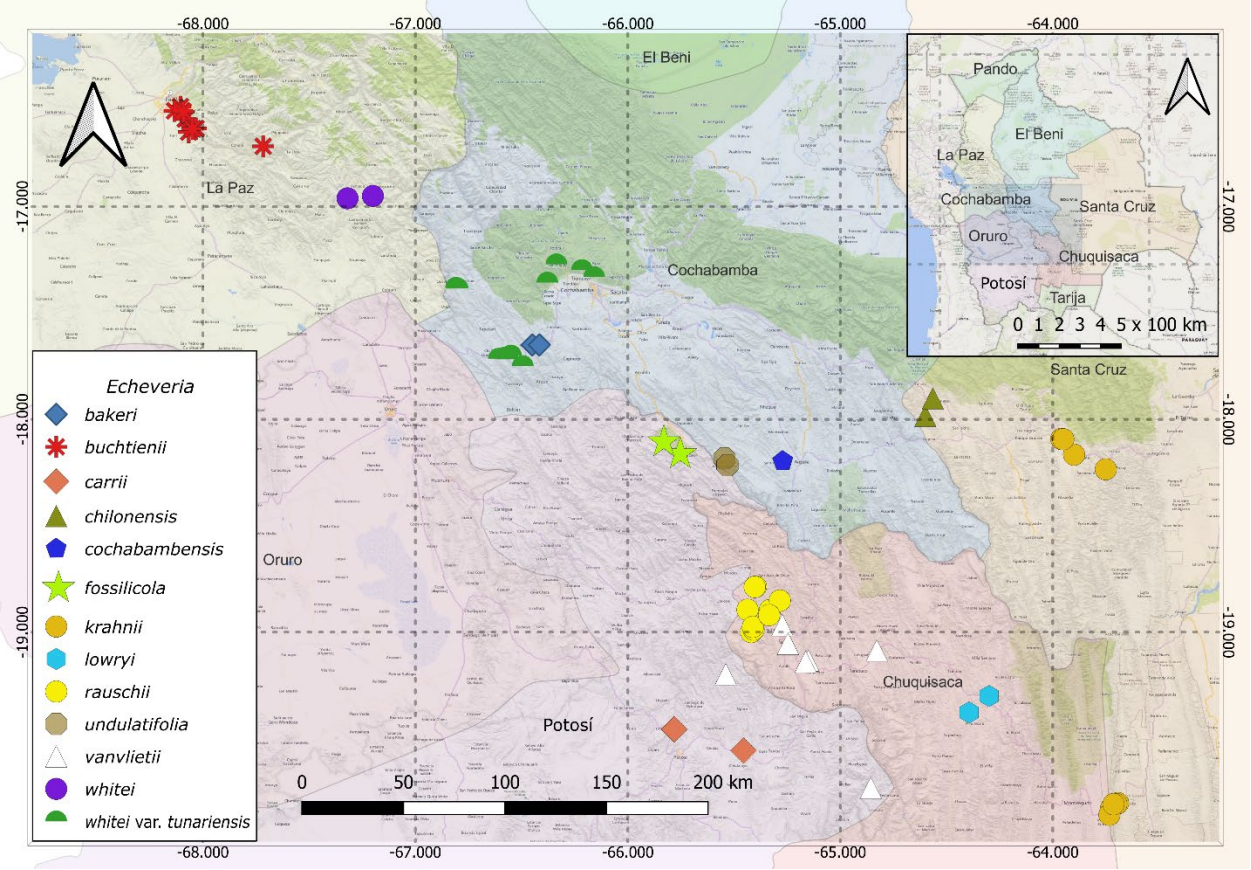


Fig. 7. Map of the distribution of *Echeveria species* in Bolivia. Top right: Map of Bolivia, in darker rectangle: Overview of amplified area. **Bottom left:** Legend of the different taxa of *Echeveria* mentioned in this article.

Conclusions: We hereby present, describe and illustrate six new taxa of *Echeveria* from Bolivia. *Echeveria carrii* is a new species from Miraflores and Betanzos, Dept. Potosí, compared to *E. chilonensis*, it has slightly longer leaves, reddish or olive green with a reddish margin, shorter pedicles, reddish sepals and light coral red flowers with longer petals. *Echeveria cochabambensis* is a new species from Aiquile, Dept. Cochabamba, similar to *E. chilonensis* without flowers, with longer bracts, lanceolate instead of oblong, shorter pedicels, erect and shorter sepals, coral red flowers. *Echeveria fossilicola* is a new species from Torotoro, Dept. Potosí, resembling *E. rauschii* but taller in blossom, with longer leaves, narrower in the middle but wider distally, light green with a white margin instead of reddish, larger bracts, shorter pedicles, coral red flowers with orangish borders. *Echeveria lowryi* is a new species from province Tomina, Dept. Chuquisaca, compared to *E. krahnii* it has longer aerial stems, narrower leaves, olive green to brownish with red slightly undulate margins, similar flowers with not so wide spreading smaller sepals. *Echeveria undulatifolia* is a new species from Mina Asientos, Dept. Cochabamba, with plants that are somewhat related to *E. chilonensis* but with larger rosettes, longer and wider leaves but not as thick, more constantly rhomboidal in shape, light olive green, reddish near margins, pruinose in

the dry season, very undulate margins, flat and floppy longer and wider bracts, longer pedicels and salmon red flowers. Finally, *Echeveria whitei* var. *tunariensis* is a new variety that differs from var. *whitei* in being relatively shorter, smaller in diameter, more branched from the base and growing in clumps, with shorter and thicker, relatively wider leaves, bright green to brownish mauve instead of dull olive green-purplish, shorter scape with oblong to narrowly obovate wider and thicker bracts, flowers with a wider color range from intense red to yellow. All the taxa here described belong to series *Racemosae* (Baker) Berger.

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