

Succulent endemic Crassulaceae from Argentina

including three new taxa

Abstract. The succulent endemic species of Crassulaceae in Argentina are reviewed and three new taxa are described. *Echeveria argentinensis* is a new species already collected 80 years ago in the Quebrada of Humahuaca at Jujuy between 2700 and 3600 m, determined primarily as *E. peruviana*. Hutchison recognized it as a new species 50 years ago and recorded this epithet in the herbarium sheets, but he never described it. Both species are close and belong to series Racemosae, they share having tuberous roots, but the new species has smaller rosettes and leaves than *E. peruviana*, a longer stem but smaller scapes and less flowers with erect or adpressed sepals and an opposite petal color pattern, red proximally and yellow distally. Populations from Salta are described as *E. argentinensis* var. *kieslingii*. They are smaller, lighter or glaucous in color, leaves are obovate and cuspidate when young, scapes are shorter with less but slightly larger flowers that have a constriction near the middle and are mostly yellow in color. They are distributed along the Quebrada del Toro between 2050 to 2350, in more exposed situations. Also from Salta, but further South, near the border with Tucumán, *E. saltensis* is described. It resembles *E. chilensis* var. *cantaensis* from Perú, with narrow oblong to linear leaves, in this case with a very interesting multicolored raster on its surface, less tuberous roots, shorter sepals and longer but wider petals, more yellowish than the Peruvian species. This is perhaps the southernmost and lowest growing *Echeveria* in South America. An extended description of *Sedum jujuyense*, the only endemic *Sedum* of Argentina together with some photographs of it are also given.

Keywords: Crassulaceae, *Echeveria*, *Sedum*.

I. Genus *Echeveria*

1. *Echeveria argentinensis* Hutchison ex Pino, R. Kiesling, W. Ale & D. Marqueigui **sp. nov.** Fig. 1a

Introduction: This plant was discovered by British plant hunter Edward Kent Balls, (1892–1984) a horticulturalist who collected ornamental plants for private subscribers, specimens for museum herbaria and wild potatoes for agricultural research. In 1939 he started an expedition from Lima and Arequipa, Perú, via La Paz, Bolivia, reaching Jujuy, Argentina and there he collected this plant at Tilcara, a place where it is abundant. He then returned to Bolivia, crossed again Peru to explore Cusco and other provinces, Ecuador and finally Colombia, where he located *Echeveria ballsii* (Walther, 1958). His Argentinian plant was first determined at Kew to be *E. peruviana* Meyen. Paul Hutchison, who had already found the true *E.*

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1a. *Echeveria argentinensis* in habitat at Cerro Negro. (D.M.)



1b. Detail of the roots of *Echeveria argentinensis* from Humahuaca.

peruviana near its type locality in 1964, examined herbarium specimens of this taxon and its closely related variety from Salta (see below), and coined the epithet "*E. argentinensis*" (*nomen herbariorum*), being totally sure it was a new, undescribed species. He never described it, though, and until now it has continued to be identified as *E. peruviana*. The recent publication of an update of this last species (Pino, 2019) enables us to compare both taxa and support the description of it as a new taxon.

Holotype: ARGENTINA: Prov. Jujuy, Dpto. Tilcara, Above Tilcara, growing on sunny rocks and among harsh, spiny shrubs and cacti. Steep, open hills with probably no lime in the rocks or soil. Flowers scarlet and orange, narrow mouthed bells to 0.5" long, on curved, upright stems to 10" tall. Basal rosettes rather untidy and irregular, of a dark, glossy green, many fanged, fleshy roots, 2900 m, Feb 09, 1939, *Balls E.K. 5960*. (K 000486303, determined by Hutchison as *E. argentinensis* n.n. in 1968).

Description: A succulent glabrous herb. **Roots** widely tuberous; **Main root** a taproot, (3–) 6–8 (–15) mm diam., abruptly tapering distally to 1–2 mm diam., 2.5–5 cm long. 1–4 **secondary tuberous roots**,



1c. *Echeveria argentinensis* ex situ from Tilcara. (W.A.)

4–6 mm diam., 2–4 cm long, light cream to greenish white. **Fibrous roots** abundant around tuberous roots, 5–7 cm long × 0.2–0.5 mm diam., brown (Figs. 1b, c). **Stem** short, simple, erect, covered with dry leaves near rosette, 0.3–0.8 (–2.5) cm long, 0.2–1 cm diam., light cream. **Rosette** generally simple, 3.5–7.5 (–10) cm diam. **Leaves** 8–14, narrow ovate to sublanceolate, wider when young (Fig. 1d), sessile, inserted erect or in 45°, 2–4 (–6) cm long, 0.5–0.8 cm wide at base, 0.8–1.2 cm wide at proximal third, 0.9–1.8 cm wide at middle, 0.6–1.2 cm wide at distal third, 3–4 mm thick, upper side slightly concave to subcanaliculate, light to dark green, margins slightly reddish at distal 2/3, lower side subcarinate, reddish at keel and near tip, apex acute to cuspidate or mucronate: mucro, when present, reddish, 1 × 1 mm; base whitish (Fig. 1e).

Flowering stem a lateral subterminal raceme, rachis 25–45 (–65) cm long, 3–4 mm diam. at base, slowly tapering to 1–2 mm diam. at apex dark red (Figs. 1f, g). **Peduncular bracts** 14–18, erect or inserted in a very acute angle, alone at proximal two thirds of stem, then one at the base of each pedicel, spaced 1.5–2 cm apart at base and 0–1 cm apart towards apex, very narrowly ovate or narrowly lanceolate, straight,



1d. Young plants of *Echeveria argentinensis* from Humahuaca.



1e. Detail of the leaves of *Echeveria argentinensis*.



1f. Start of anthesis of *Echeveria argentinensis* in habitat



1g. *Echeveria argentinensis* at Humahuaca with mature scape. (D.M.)



1h. Detail of the bracts of *Echeveria argentinensis*.



1i. From left to right: *Echeveria argentinensis* sepals (4), petals (4), gynoecium, sectioned flower showing gynoecium, bud, single flower, dry fruit. (W.A.)

1–2.5 cm long, 5–6 mm wide, 1–1.5 mm thick, inner side flat to slightly concave, light to bright green, outer side convex or subcarinate, tips and 2/3 distal of margins and keel reddish, apex acuminate, base hyaline pink purplish (Fig. 1h). **Flowers** 9–15, appearing from January to beginning of March, at distal third of the scape, 1.2–1.5 cm long and 0.7–0.8 cm diam. **Pedicels** 0.6–1.5 cm long, curved upwards, 1–1.5 mm diam., dark red, with 1–2 small 3–4 mm long, 1–1.2 mm wide bractlets at the middle. **Calyx lobes** united at base, sepals erect at first then inserted at 45° and later at a right angle, incurved, unequal, oblong to ovate or triangular, acute, reddish at tips, dark green, inner side concave, outer side convex, 4–6 mm long, 2–3 mm wide. **Flower buds** wide ovoid, 0.6–0.7 cm long, 0.6–0.9 cm diam., salmon pink, redder at apex and keels. **Corolla** urceolate, subprismatical to narrow pyramidal, 0.7–0.8 cm thick near base, 0.4–0.5 cm thick near apex, 1.2–1.5 cm long, petals oblong, acute, 1.2–1.6 cm long, 3.5–5 mm wide, outer surface keeled, salmon red at proximal 2/3, orangish yellow at distal 1/3, apex slightly recurving and redder, inner surface orangish yellow, reddish at margins. **Stamens** 10, the 5 epipetalous 6–9 mm long, the antepetalous 9–11 mm long, filaments cream, 1–1.4 mm thick at base, gradually tapering to 0.2 mm. **Anthers** ovoid, yellow, 1.1–1.2 mm long and 0.7–0.8 mm wide. **Gynoecium** ovoid, 7–10 mm long, 4–6 mm thick. **Carpels** 5, cream yellow. **Styles** 3–4 mm long, parallel, almost touching each other, greenish yellow, greenish at the tip. Stigma reddish. **Nectaries** narrow reniform, greenish yellow 1.5–2.5 × 0.5–0.8 mm. **Fruit** a dehiscent capsule 1–1.2 cm long, 0.6–0.7 cm diam., brown.

Other localities: ARGENTINA: **Prov. Jujuy, Dpto. Tilcara,** Pedestrian road to Alfarcito (La Garganta del Diablo, gorge of the Huasamayo river), 2750 m, Mar 14, 1994, *M. Múlgura, N. Deginani, C. Taylor & P. Careno* 1243. (SI 176396) **Dept. Tumbaya:** West of San José del Chañi (El Angosto), El Moreno, 3350 m, cultivated at Huntington Botanical Gardens as HNT 54251 Aug 1987 (HNT). Route 79, road from El Moreno to Pueblo Viejo, 3610 m, S 23°55'03", W 65°49'21", Feb 12, 2007, *F.O. Zuloaga, L. Aagesen, S. Nomdedeu & D. Salariato* 9291 (SI 77203). Same route from El Moreno to Pueblo Viejo, 3575 m, S 23°57'08", W 65°49'19", Feb 14, 2010, *F.O. Zuloaga, L. Aagesen F., Biganzoli, D. Salariato & C.A. Zanotti*, 11785. (SI 178406). **Dept. Valle Grande:** Without location, on very high cliffs of reddish sand, glaucous rosette, orangish flowers, Feb 26, 1940. *A. Burkart & N. Troncoso* (SI 11455). **Dept. Humahuaca:** La Soledad, *Venturi* 29/8860 (US). Celato Gorge, 3 km Northeast

of Humahuaca, 2900 m. No collector. (UC). Cerro Negro, North of Humahuaca city, on rocks, half shaded. Sept 22, 1998. *R. Kiesling* 8922 (SI 176395). Same place, after crossing bridge east of Humahuaca, road to the North and then to the East towards Coctaca, gorge at the North side of road, after about a 20 minute walk, vertical rocky walls, on hard rock, 3137 m, S 23° 10' 28.3", W 65° 19' 30.9", Dec 15, 2018, *G. Pino, M. Toffoli, W. Ale & D. Marquiegui* 3019 (Fig. 1j).

Discussion: All authors before this publication have determined these plants to be *Echeveria peruviana*, and have even based their detailed descriptions of this species from Argentinian plants. (Walther 1972, Pilbeam 2008) Its closest species is indeed *E. peruviana* and both have tuberous roots, a feature of many Peruvian species belonging to Series Racemosae, a fact that complicates their culture ex-situ. However, the rosettes of *E. peruviana* can reach larger diameters, its leaves are more numerous, wider and longer, sometimes faceted and frequently keeled at the underside, with a more greyish or dark green color. *E. argentinensis* develops a longer but thinner stem than *E. peruviana*, perhaps due to their quest for light among the cracks of the rocks or the bromeliad cushions where they grow, while the latter grows in more exposed habitats but among mosses. Flowering scapes of *E. peruviana* are longer, thicker at the base, lighter in color, with more and slightly larger bracts, almost always adpressed to the stem. Its flowers are more numerous, more or less the same size, sepals are longer, grayish and they remain erect or adpressed to the corolla unlike *E. argentinensis*. Petals in *E. peruviana* have an opposite color pattern, lighter (pink or light cream) proximally and salmon to bright red distally (See Table 1). Among the different populations along the overall distribution of var. *argentinensis*, plants from Tilcara are somewhat larger than those found in Humahuaca. Flowers are slightly larger, sepals are more oblong than triangular, and petals and gynoecium are slightly longer but of exactly the same color, but they all fall within the normal variation for this species.

Distribution: To date, *E. argentinensis* var. *argentinensis* has been found only in the Northern range of the Cordillera Oriental of the Andes of Northwestern Argentina, mainly around the Quebrada of Humahuaca in Jujuy, growing on cracks of massive rocks almost always at considerably higher elevations than the other variety from Salta, between 2700 and 3600 m, always half-shaded or protected from exposure to strong sunlight.