

# Botanical explorations and description of four new species of the genus *Echeveria* (Crassulaceae) in the Eastern Andes (Cordillera Oriental) of Boyacá and Santander, Colombia

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## Abstract

Four new species of the genus *Echeveria* (Crassulaceae) from the mountains of northern Colombia are described and illustrated: *E. oswaldiana* sp.nov., *E. adrianae* sp.nov., *E. mutisii* sp.nov., and *E. boyacaensis* sp.nov. Botanical explorations were carried out mostly in the department of Santander in the province of García Rovira at eight different localities, and in the department of Boyacá, in two different localities, one in the province of Tipacoque and another one in the province of Tundama. This discovery and contribution to the genus *Echeveria* is significant for two main reasons: on the one hand, this is the first time in almost 70 years to register new *Echeveria* species in Colombia since the publication of *Echeveria ballsii* E. Walther in 1958, the only endemic Colombian species registered so far. On the other hand, our findings made evident the great diversity of *Echeveria* species in Colombia, as we have found potentially ten new species besides the ones described in this work. Therefore more botanical explorations are expected to contribute to the understanding of the genus *Echeveria* as a whole, and in particular to the inventory of *Echeveria* species in Colombia. (2)

## Keywords

*Echeveria*, Crassulaceae, Colombia, Santander, Boyacá, Málaga, Chupahuevo.

## Introduction

The genus *Echeveria* De Candolle (Crassulaceae) is endemic to the American continent and is constituted by approximately 175 species, distributed from southern Texas (USA) to South America, except the Antilles, Brazil, Uruguay, Paraguay, and Chile (Walther, 1972, Meyrán and López 2003; Kimnach, 2003; Pilbeam, 2008; Pino et al, 2019). This genus has a possible centre of diversification in Mexico with approximately 140 species. Peru accounts for 21 recorded species, Venezuela and Bolivia for six species, and other Central and South American countries for five or less recorded species (1). Regarding the distribution of the South American species of the genus *Echeveria*, records exist from Colombia, Venezuela, Ecuador, Peru, Bolivia and Argentina.

The history of the genus *Echeveria* in South America begins with the collections made by the explorers and naturalists Alexander von Humboldt and Aimé Bonpland when they arrived in "New Granada" in 1799, in present-day Venezuela. During their stays at the hacienda of Mr Bartolomé Blandin, they collected a plant that the botanist Karl S. Kunth described and published as *Sedum bicolor* Kunth (Humboldt et al, 1823). It would take more than a century (112 years) from the publication of *Sedum bicolor* Kunth for the American botanist & specialist Eric Walther to recognise it as *Echeveria bicolor* (Kunth) E. Walther (Walther, 1935). However, before Walther named it as *Echeveria bicolor*, Link, Klotzsch and Otto had already described plants collected in Caracas, Venezuela, as *E. bracteolata* (Link et al, 1844, Uhl, 1992). At the same time, *Sedum quitense* Kunth was published from collections made by Humboldt and Bonpland at the ruins near Guallabamba (Guayllabamba, Ecuador) and in the city walls of Quito, exactly five years before the famous Swiss botanist Agustin Pyramus De Candolle named the genus *Echeveria* (Candolle, 1928). In 1852, the British botanist, gardener, and orchidologist John Lindley

changes the status of *Sedum quitense* Kunth to *Echeveria quitensis* (Kunth) Lindley after receiving live plants from Mr Isaac Anderson of Edinburgh in 1851, which helped to prove that it was indeed an *Echeveria* (Lindley, 1852).

It would take another six years after the creation of the genus *Echeveria* DC before the German anatomist, physiologist, and botanist Franz J.F. Meyen published *Echeveria peruviana* Meyen in 1834 (Meyen, 1834) from a dried specimen from the Cordilleras of Peru and from a collection recorded as "Lechler, 1775. J.G.B." (Tropicos, 2025). (1)

In 1892, the German naturalist and botanist Carl Ernst Otto Kuntze collected a specimen in Chilón (Bolivia), which he named *Sedum chilonensis* Kuntze (Kuntze, 1893) [= *Echeveria chilonensis* (Kuntze) E. Walther]. In 1906, the German botanist Friedrich Ludwig Emil Diels described and published *Cotyledon excelsa* Diels (Diels, 1906) (= *Echeveria excelsa* (Diels) A. Berger) from a plant collected by August Weberbauer, W 3149, B (Pino, 2006), which Alwin Berger later recognised as an *Echeveria* species (Berger, 1930).

Around 1958, botanical explorations decreased considerably in Argentina, Ecuador, Bolivia and Colombia, thus there were no more new records of species of the genus *Echeveria*. Peru on the contrary increased its records of new species as well as Venezuela but to a lesser extent.

In the case of Colombia, only three species had been recorded until 2024: *E. bicolor* (Kunth) Walther, *E. quitensis* (Kunth) Lindl. and *E. ballsii* E. Walther. The only species endemic to Colombia known to date is *E. ballsii* described by E. Walther from specimens grown at the Strybing Arboretum and received from the British collector Edward Kent Balls (collection number 7587, a label with the legend *Echeveria columbiana* Poelln., material deposited at the Herbarium of the (2)



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