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## Introduction

The neotropical genus *Pentacalia* Cass. (Compositae, Senecioneae) comprises c. 162 species distributed from southern Mexico to northwestern Argentina, plus two disjunct species occurring in the Brazilian Atlantic Forest. The northern Andes are considered the center of diversity of the genus, Colombia having the foremost number of species, followed by Peru and Ecuador (CALVO & BUIRA, 2018).

Species belonging to genus *Pentacalia* are scandent woody plants with alternate (very rarely opposite), simple leaves, usually corymbiform, thyrsoid-paniculiform or racemiform synflorescences, involucre with supplementary bracts at the base (calycle), radiate, disciform, or discoid capitula with yellow or white corollas, stamens with balustriform filament collar and caudate anther bases, styles with truncate to obtuse branches that usually have a crown of sweeping trichomes (sometimes with a tuft of longer trichomes, but not strictly penicillate), and glabrous or pubescent achenes with a capillary pappus composed of barbellate bristles.

*Pentacalia* was established by CASSINI (1827) to exclude the Colombian species *Cacalia arborea* Kunth from the genuine *Cacalia* L., based on its 5-ribbed achenes. However, Cassini's genus was not recognized by CANDOLLE (1838) or later botanists who worked on the neotropical *Senecioneae* (e.g. BENTHAM & HOOKER, 1839; HIERONYMUS, 1900, 1901; GREENMAN, 1923, 1938). *Pentacalia* was finally retrieved by ROBINSON & CUATRECASAS (1978) when revising the species of *Senecio* sect. *Streptothamni* Greenm. from Central America. Its recognition as a genus distinct from *Senecio* L. was supported by the following morphological characters: fruticose to scandent habit with woody stems, distinctly petiolate usually non-stipitate leaves, minutely fistulose or non-fistulose receptacles, tails on the anthers, and the rather stout 5-ribbed achenes. Such circumscription was later broadened by CUATRECASAS (1981) to also embrace the rather erect species with shrubby habit originally treated in *Microchaete* Benth. These species were accordingly placed in *Pentacalia* subg. *Microchaete* (Benth.) Cuatrec., and the lianoid ones retained to the typical subgenus. JEFFREY (1992) did not adopt CUATRECASAS (1981)'s broad sense of *Pentacalia* and elevated to generic rank the subgenus *Microchaete* (under the replacement name *Monticalia* C. Jeffrey) and restricted *Pentacalia* to the lianoid species recovering the narrow concept of the genus established by ROBINSON & CUATRECASAS (1978). Afterward, this criterion has been adopted by most taxonomists working on these groups (NORDENSTAM, 1999; PELSER et al., 2007; BECK & IBÁÑEZ, 2014; PRUSKI, 2018a, b; CALVO, 2021).

## Historical overview in Ecuador

Georg H.E.W. Hieronymus (1846–1921) can be considered the first botanist to contribute to the taxonomy of the group in Ecuador, describing four species currently accepted under the genus *Senecio*. Hieronymus received at Berlin material sent by

Jesuit Father Luis [Luigi] Sodiro (1836–1909), Italian botanist established in Quito who intensively collected in the province of Pichincha (JØRGENSEN, 1999). In 1938, the American synantherologist Jesse M. Greenman (1867–1951) described three new species as part of a broad study of the South American *Senecio*. However, it was in the mid-20th century when the number of species belonging to this group notably increased, due to the collections made by Wendell H. Camp (1905–1963), American botanist at the New York Botanical Garden. Camp collected in Ecuador between May 1944 and September 1945 for the United States *Cinchona* missions searching species of that genus with high quinine content (RICKETT, 1963; BALSLEV & JOYAL, 1980). Although the mission was focused on the species of *Cinchona*, Camp and his assistants made general collections of c. 5,800 numbers (c. 26,000 sheets including numerous duplicates). Most of these collections were made in southern Ecuador, in the provinces of Azuay, Morona-Santiago, and Loja. They are of a very high quality and from areas that were barely explored at that time, hence, many of them served as type material (BALSLEV & JOYAL, 1980). The *Compositae* were later studied by Catalan Josep [José] Cuatrecasas (1903–1996) when he worked at the Field Museum before moving to Washington D.C. in 1955 (ROBINSON et al., 1996; LÓPEZ SÁNCHEZ, 2022). He described several new species, five of them treated herein (CUATRECASAS, 1954). Cuatrecasas devoted part of his career to the study of the tribe *Senecioneae* in the Northern Andes (Colombia, Ecuador) becoming the foremost specialist of this group in the region (CALVO & BELTRÁN, 2022). At the U.S. National Herbarium, Cuatrecasas collaborated with synantherologist Harold E. Robinson (1932–2020) and together they published 12 new species from Ecuador (one currently accepted as a member of *Dendrophorbium* (Cuatrec.) C. Jeffrey) and provided the first identification key for the Ecuadorian *Pentacalia*. After them, Swedish botanist Bertil Nordenstam prepared the genus *Pentacalia* for the *Catalogue of the vascular plants of Ecuador* [hereafter *Catalogue*] accepting 33 species, 24 of them endemic (NORDENSTAM, 1999); see Table 1. Since Nordenstam, two new species have been described (CALVO & BUIRA, 2018; CALVO & PÉREZ, 2023) and two names synonymized (CALVO et al., 2019). The work presented in the following contribution represents the first comprehensive treatment of this genus for Ecuador. Twenty-seven (27) species are recognized (Table 1), eight names are newly synonymized, two names are lectotypified, four new taxa are described, and 15 species are illustrated.

## Discussion of characters

**Habit** – *Pentacalia* species are scandent, woody plants with long dangling branches. While most species are strictly lianoid, *Pentacalia arborea* (Kunth) Cass. and *P. theifolia* (Benth.) Cuatrec. sometimes display a suberect habit leaning over adjacent vegetation.