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Neotypifications and new synonyms of the Ecuadorian *Senecio* (*Compositae*, *Senecioneae*) species described by F. W. Domke

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Abstract: F. W. Domke described three *Senecio* species (*Compositae*, *Senecioneae*) from Ecuador on the basis of Diels's collections. Since the type material at B was apparently destroyed in 1943, the names *Senecio angelensis*, *S. dielsii* and *S. tipocochensis* are neotypified. The nomenclature of each taxonomic entity is updated, and new synonyms are provided for the first time. A lectotype for the name *S. sotarensis* is also designated. Taxonomic notes are provided when appropriate.

Key words: *Asteraceae*, *Compositae*, *Dendrophorbium*, Diels, Ecuador, nomenclature, *Senecio*, *Senecioneae*, typification

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Introduction

The German botanist F. W. Domke (1899–1988) described three species of *Senecio* L. from Ecuador based on material collected by his compatriot F. L. E. Diels (1874–1945), who undertook a journey to Ecuador during July–September 1933 (Acosta-Solís 1982). This expedition resulted in his work *Beiträge zur Kenntnis der Vegetation und Flora von Ecuador* (Diels 1937), which includes the new *Senecio* species authored by Domke (i.e. *S. angelensis*, *S. dielsii* and *S. tipocochensis*).

The material collected by Diels in Ecuador was deposited in the herbarium at Berlin-Dahlem (B), and most specimens – many of them being holotypes – were destroyed in an air strike on the night of 1–2 March 1943 (Hiepko 1987). The types of the three *Senecio* names appear to be among the lost material since they are no longer extant at B (R. Vogt, pers. comm.).

Whereas the original material is missing, the three taxa have been recognized as accepted species (Cuatrecasas 1950) and were subsequently transferred to the genus *Dendrophorbium* (Cuatrec.) C. Jeffrey (Jeffrey 1992; Nordenstam 1996, 1999). However, these decisions were vaguely justified and adopted without settling the taxonomic identity of these taxa. The case of *Senecio dielsii* is noteworthy. In 1950, Cuatrecasas described the arborescent species *S. silvani* Cuatrec. [*D. silvani* (Cuatrec.) C. Jeffrey] and *S. pururu* Cuatrec. [*D. pururu* (Cuatrec.) C. Jeffrey] and discussed the differences between them and *S. dielsii*, assuming their similarity. In contrast, two years later Cuatrecasas identified as *S. dielsii* a herbarium specimen depicted on the label as a perennial plant up to 0.75 m tall, which substantially differs from the aforementioned arborescent species with larger leaves and rectipinnate venation. Furthermore, herbarium identifications demonstrate that the names *D. tipocochense*

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(Domke) B. Nord. and *D. lloense* (Hieron.) C. Jeffrey have both been indiscriminately applied to populations of the same species from N Ecuador that correspond to *D. lloense*. Even so, *D. tipocochense* has been recently included by Ávila & al. (2016) in their *Catalogue of the plants and lichens of Colombia*, whereas it was not mentioned in the treatment of *Dendrophorbium* proposed by Díaz-Piedrahita & Cuatrecasas (1999), which represents the most complete survey of the Colombian species so far.

These examples highlight the need to firmly settle the application of three names that, despite uncertainty on their exact identity, are currently used and have been accepted by botanists working on the *Compositae* of the N Andes. For this purpose, and according to ICN Art. 9.11 and 9.13 (McNeill & al. 2012), I am designating a neotype for each of the names *Senecio angelensis*, *S. dielsii* and *S. tipocochensis*. The neotypifications are in conformity with the detailed original descriptions and statements of provenance provided by Domke in the protologues. As a result of this nomenclatural action, new synonyms are provided for the first time.

Material and methods

Digital images of specimens kept at BM, F, GH, MO, NY, P and S were studied. Additional information from other institutions (A, B, K, TRT and Z) was obtained in my attempt to locate surviving original material. The neotypifications of Domke's three species names are discussed, and observations on their synonyms are provided if necessary. In some cases taxonomic notes are added.

Results and Discussion

1. *Senecio angelensis* Domke

This species was described from material collected "above El Angel", in Carchi Province. I found a Benoist specimen from the same locality ("páramos de el Angel") that matches the information provided in the protologue: ovate to ovate-elliptic leaves, arachnoid-tomentose beneath, heterogamous capitula, and campanulate to subturbinate involucres of 8–10 involucral bracts. The specimen P 01816547 is designated as the neotype of the name *Senecio angelensis*, which thereby becomes a heterotypic synonym of *Dendrophorbium sotarense* (Hieron.) C. Jeffrey. The latter species was described under *Senecio* from the Sotará Volcano in Colombia, on the border between Cauca and Huila provinces. It is known from the Colombian Quindío Province southward approximately until Pichincha Province in Ecuador. Fieldwork carried out around El Ángel allowed me to ascertain that *D. sotarense* grows, and is quite common, in the environs of this village. On the other hand, Nordenstam (1999) accepted *D. angelense* (Domke) B. Nord. as endemic to N Ecuador (Carchi and Imbabura) on the basis of *Asplund 7173* (MO 1963501, S 16-46360); I have also identified these specimens as *D. sotarense*.

In the protologue, Domke had already identified *Senecio sotarensis* Hieron. as the closest relative of *S. angelensis*. The differences adduced by this author as diagnostic are here considered to fall within the variability of *Dendrophorbium sotarense*. As stated in the protologue, the information on the label of the destroyed type read "stems and leaves purple". Indeed, the purple colour of both the stem and lower leaf surface is a striking feature that can be observed on several specimens of *D. sotarense*.

Senecio solisii Cuatrec., described from Carchi and with the holotype kept at F, is also synonymized here with *Dendrophorbium sotarense*.

Dendrophorbium sotarense (Hieron.) C. Jeffrey in Kew Bull. 47: 68. 1992 ≡ *Senecio sotarensis* Hieron. in Bot. Jahrb. Syst. 21: 360. 1895 ≡ *Pentacalia sotarensis* (Hieron.) Cuatrec. in Phytologia 49: 259. 1981. – Ind. loc.: "Columbia: crescit ad limites supremos silvarum in monte Volcan Sotará, ubi floret mense Junio (coll. columb. n. 339a); loco non indicato collecta est a cl. J. Triana (n. 1461 et 1462)." – **Lectotype (designated here):** Colombia, Prov. de Pasto [Nariño], plateau de Túquerres, 3100 m, May 1853, *J. J. Triana 1462 (2811.2)* (P 01816546 digital image!; isolectotypes: BM 001209316 digital image!, BM 001209318 digital image!). – Other syntypes: Colombia, Prov. del Cauca [Quindío], Portachuelo en el Quindío, 2000 m, Jul 1853, *J. J. Triana 1461 (2811.1)* (BM 001209317 digital image!, BM 001209319 digital image!, P 01816545 digital image!).

= *Senecio angelensis* Domke in Biblioth. Bot. 116: 171. 1937 ≡ *Dendrophorbium angelense* (Domke) B. Nord. in Compositae Newslett. 29: 47. 1996, **syn. nov.** – Ind. loc.: "Mittel-Ecuador: Interandines Hochland: Prov. Carchi: oberhalb El Angel. Saum des oberen Bergwaldes; c. 3200 m ü. M. Blühend am 2 Sep 1933 (Diels 785 – Typus speciei!)." – **Neotype (designated here):** Ecuador, Carchi, páramos del Ángel, 1 Jan 1931, *R. Benoist 3628* (P 01816547 digital image!).

= *Senecio solisii* Cuatrec. in Feddes Repert. Spec. Nov. Regni Veg. 55: 146. 1953 ≡ *Dendrophorbium solisii* (Cuatrec.) B. Nord. in Compositae Newslett. 29: 48. 1996, **syn. nov.** – Holotype: Ecuador, Carchi, entre Paja Blanca y El Cucho, 2900–3200 m, 18 Jul 1945, *M. Acosta Solís 10504* (F 0092646F digital image!).

2. *Senecio dielsii* Domke

Senecio dielsii is a later homonym and hence illegitimate. *Dendrophorbium dielsii* C. Jeffrey is not a new combination but a replacement name, based on the same type. Jeffrey (1992) could not study the original material, which

at that time was no longer extant, nor did he resolve the precise application of the name.

The destroyed type was collected at Tipococha, a hill near the parish of General Morales, in the N of Cañar Province next to Chimborazo Province. Domke's description depicted it as a suffrutescent plant up to 1.5 m tall, with oblong-elliptic leaves with a dense ash-grey, lanate-tomentose indumentum beneath ("subtus dense cinereo-lanuginoso-tomentosae"), heterogamous capitula and involucres of 13–14 involucral bracts c. 7 mm long; stems, petioles, synflorescences branchlets, pedicels and involucral bracts covered with lanate indumentum. On this basis, I have selected as the neotype a Camp collection that displays the above-mentioned characters. It was collected near Pimo, a hill close to Tipococha, and was identified as *Senecio dielsii* by Cuatrecasas in 1952.

It has to be mentioned, however, that the size of the leaves as described by Domke (i.e. "c. 23 cm longae, 8 cm latae") is much longer than that of Camp's collection. Besides, it is also curious that the habit description stated on the labels of the specimens studied by Domke was dissimilar. While the type material was described as a suffrutescent plant, the specimen "Schimpff in Diels 713" (cited as a paratype in the protologue) appeared to be a tree. Since Schimpff's collections were more widely distributed than Diels's, I asked for possible duplicates of it at A, B, BM, TRT and Z, according to Index of Botanists (Harvard University Herbaria 2001+). Unfortunately, the efforts to locate them were in vain.

In spite of the mentioned discrepancy in the leaf length, the specimen designated here to serve as neotype is not in serious conflict with the protologue. Moreover, the good condition of the material will allow anyone to critically identify the diagnostic characters assuring a precise application of the name.

Dendrophorbium dielsii C. Jeffrey in Kew Bull. 47: 66. 1992 [replacement name, Art. 58.1] ≡ *Senecio dielsii* Domke in Biblioth. Bot. 116: 172. 1937, nom. illeg. [Art. 53.1, non *Senecio dielsii* Muschl. in Bot. Jahrb. Syst. 43: 62. 1909]. – Ind. loc.: "Mittel-Ecuador: Interandines Hochland: Prov. Chimborazo: Tipococha. Oberer Bergwald; c. 3200 m ü. M. Blühend am 16. August 1933 (Diels 559 – Typus speciei!)." – **Neotype (designated here):** Ecuador, Cañar, Chimborazo-Cañar border, near Pimo, 3110–3170 m, 9 Jul 1945, *W. H. Camp E-4121* (NY 02684285 digital image!; isoneotypes: K 000373790 not seen, P 03749418 digital image!).

3. *Senecio tipocochensis* Domke

The *indicatio locotypica* of *Senecio tipocochensis* is imprecise; it only indicates "Prov. Chimborazo". However, it can be deduced that the provenance of the type material was Tipococha, not only because the choice of the epithet but also because Diels's adjacent numbers were collected at this locality on the same day (*Diels 593*, *Solanum chrysasteroides*; *Diels 595*, *Tillandsia* sp.; see Diels 1937).

Senecio tipocochensis was described as an arborescent plant up to 7 m tall, displaying large leaves with laminas c. 25 cm long × 10.5 cm wide, petioles c. 6 cm long, heterogamous capitula with 9–12 ray florets and 12–14 involucral bracts 2.5 mm long. In the discussion the author stressed the morphological similarity with *S. lloensis* (*Dendrophorbium lloense*).

I found a Camp collection from Pimo, a locality next to Tipococha, which fits well with the original description. On this basis, the specimen NY 02684289 is designated as the neotype of the name *Senecio tipocochensis*. Duplicates are located at K and P, although the former has not been studied. These specimens were identified as *S. pururu* by Cuatrecasas in 1952, a species included here in synonymy since *S. tipocochensis* has priority. From the other arborescent *Dendrophorbium* species occurring in the N Andes, this species differs by its glabrescent and slightly shiny adaxial leaf surface and by its significantly small involucres. Based on the study of specimens, this species grows in S Ecuador, namely the provinces of Cañar (*Jaramillo 9776*, MO 1961779), Azuay (*Camp E-4406*, GH 00012188) and Morona-Santiago (*Steyermark 53544*, F 0092647F, NY 00259373, see below). Further material is needed to delimit its exact distribution area. The morphological separation between this species and its close relative *D. balsapampae* (Cuatrec.) B. Nord. has also to be disentangled. For that purpose, more collections of the latter species are needed.

Dendrophorbium tipocochense (Domke) B. Nord. in Compositae Newslett. 29: 48. 1996 ≡ *Senecio tipocochensis* Domke in Biblioth. Bot. 116: 173. 1937. – Ind. loc.: "Mittel-Ecuador: Interandines Hochland: Prov. Chimborazo: Oberer Bergwald, 3200 m ü. M. Blühend am 17 Aug 1933 (Diels 594 – Typus speciei!)." – **Neotype (designated here):** Ecuador, Cañar, Chimborazo-Cañar border, near Pimo, 3110–3170 m, 9 Jul 1945, *W. H. Camp E-4155* (NY 02684289 digital image!; isoneotypes: K 000373791 not seen, P 03771422 digital image!).

= *Senecio pururu* Cuatrec. in Fieldiana, Bot. 27: 19. 1950 ≡ *Dendrophorbium pururu* (Cuatrec.) C. Jeffrey in Kew Bull. 47: 68. 1992, **syn. nov.** – Holotype: Ecuador, Santiago-Zamora, between Campanas and Arenillas, along Río Tintas, 10 leagues SE of El Pan, 2195 m, 13 Jul 1943, *J. A. Steyermark 53544* (F 0092647F digital image!; isotype: NY 00259373 digital image!).

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