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Research Article

Checklist of the genus *Dendrophorbium* (Senecioneae: Compositae) in Peru including a new combination and a new species

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The genus *Dendrophorbium* occurs in South America with one species known from the Caribbean. Despite recent advances in taxonomy and phylogeny, there is a still lack of molecular studies on the delimitation and identification of the genus. *Dendrophorbium* is known to occupy a wide range of ecosystems mostly restricted to subtropical montane forests and montane scrub vegetation of the central Andes. In this study, a review of the species occurring in Peru is presented, in addition to material examined at different herbaria. The new combination *D. ligulatum* which is separated from *D. yalusay*, and the new species, *D. arachnoideum* is described from the department of Huánuco in central Peru. The species are assessed using the standards of the IUCN and additional notes are given.

Keywords: Andes, compositae, *Dendrophorbium*, Peru, Senecioneae, taxonomy

Introduction

The genus *Dendrophorbium* (Cuatrec.) C. Jeffrey (Senecioneae, Compositae) comprises 19 species in Peru from the approximately 60 known taxa (Jeffrey 1992, Nordenstam 1996, Díaz-Piedrahita and Cuatrecasas 1999, Teles et al. 2006). The plants have an arborescent habit and are distributed across the Peruvian Andes in tropical and subtropical environments. The genus is known to occur from northern Argentina and Brazil to Colombia, with one species in the Caribbean (Jeffrey 1992, Pennington et al. 2004, Nordenstam et al. 2009). This genus was originally described as a section of *Senecio* by Cuatrecasas (1951), who included 14 species characterized by their arborescent habit, large leaves with dentate margins, synflorescences in large panicles, radiate capitulae, truncate stigmas, and short involucres. Jeffrey (1992), Beltrán (1999), Hind (2008) and Pruski (2018) transferred ca 50 species from *Senecio* to *Dendrophorbium*, and Montesinos-Tubée (2017) added a new taxon for the flora of northern Peru.

The section *Dendrophorbium* Cuatrec. is categorized by plants with arbuscular herbaceous or suffruticose habit, bearing large leaves with denticulate or dentate margins and synflorescences disposed in compound cymes. A few species of *Pentacalia* Cass.

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were included here. With this concept the genus *Pentacalia* Cass. would remain restrained to the species that have a scandent habit whereas *Dendrophorbium* is recognized by its arborescent habit, large and serrate or dentate leaves, and corymbiform to paniculiform synflorescences with radiate heads (Nordenstam 1996, Díaz-Piedrahita and Cuatrecasas 1999, Pennington et al. 2004, Teles et al. 2006).

Moreover, Pruski (2018) indicates that *Dendrophorbium* was characterized by Jeffrey (1992), Bremer (1994), and Díaz-Piedrahita and Cuatrecasas (1999) by having cypselae with five ridges, but Nordenstam (2007) defines these as cypselae with 8–10 ribs and in agreement with this status, the cypselae at maturity become subterete and bearing 8–10 striate ridges. Nordenstam et al. (2009) states that the generic delimitation of *Dendrophorbium* should be revised because its monophyly remains doubtful.

A total of nineteen species are accepted for the Peruvian flora in addition to a new combination and a new species, resulting in a total of 21 species of *Dendrophorbium* for Peru.

Material and methods

A detailed herbarium analysis was undertaken since 2015 at different institutions with the objective to identify entities of *Dendrophorbium* occurring in Peru. Over 300 specimens were evaluated in addition to numerous collections done by the author across the country. An anatomical analysis was undertaken following the standard protocols to identify each specimen based on the original protologues and type observations, the different collections were observed using stereo microscopes. For the newly described species, zoom magnified photos were taken in addition to the verbal description. Flower and achene morphology was evaluated under a Hitachi FE-SEM (Field Emission Scanning Electron Microscope) at the Botanical Garden and Botanical Museum Berlin-Dahlem. The following herbaria were visited: B, CUZ, F, GOET, HSP, HOXA, HUT, K, LP, LPB, LPZ, MO, MOL, NY, P, PRC, SI, US and USM. The categorization for conservation was assessed following the IUCN (2024).

Taxonomic overview

Dendrophorbium (Cuatrec.) C.Jeffrey (1992, p. 65)

= *Senecio* sect. *Dendrophorbium* Cuatrec. (Cuatrecasas 1951, p. 72).

Dendrophorbium argutidentatum (Cuatrec.) H.Beltrán (1999, p. 65)

Basionym: *Senecio argutidentatus* Cuatrec. (Cuatrecasas 1953, p. 281).
Holotype: Peru, Cusco, Urubamba, entre Puyupata y Sayacamarca, 5 Aug. 1942, C. Vargas 2916a (LP-002330, image avaliable at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.lp002330, designated by Beltrán 1999, p. 51).

Notes

In 1953, Cuatrecasas proposed the classification of *Senecio argutidentatus* from Urubamba, Cusco, based on the collection by Vargas (2916a). Beltrán (1999) did the transfer of the species to *Dendrophorbium*. An additional duplicate from Vargas (2916a) is available at F and cited as isotype, https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.f0075436f.

Additionally, Beltrán et al. (2006) categorize the species as 'Near threatened' (NE) according to the IUCN (2001). While reviewing five specimens from CUZ and one from F, the species identity was confirmed and its presence in the higher mountain slopes of department of Cusco department and therefore, indicating that six specimens correspond to this taxon, thus slightly expanding its distribution towards the Vilcabamba Cordillera in Cusco, Peru.

Specimens examined

Peru, Cusco: Urubamba, Machu Picchu, Microcuenca Camino Inka Phuyupatamarca tunel, 3600 m a.s.l., 25 June 2001, A. Tupayachi et al. 4967 (CUZ-33641); Urubamba, cerca de Habaspampa, 3350 m a.s.l., 14 July 1965, C. Vargas 016341 (CUZ-026112!); Urubamba, cerca de Habaspampa, 3350 m a.s.l., 14 July 1965, C. Vargas 016344 (CUZ-33657); Urubamba, Machu Picchu, 2000–2800 m a.s.l., Nov. 1989, B. Peyton 122 (CUZ-026133!); Urubamba, Machu Picchu, 2000–2800 m a.s.l., Nov. 1989, B. Peyton 310 (CUZ-33644!); La Convención, Cordillera Vilcabamba, río Ene, near summit department division with Junín, 3350 m a.s.l., 7 June 1997, M. Arakaki & H. Beltrán 4139 (F-2183920).

Dendrophorbium biserrifolium (Kuntze) D. J. N. Hind (2008, p. 515).

Basionym: *Senecio biserrifolius* Kuntze (1898, p. 171),
Syntype: Bolivia, 1892/04/13–1892/04/21, C. E. O. Kuntze s.n. (NY00077399, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.ny00077399, designated by Hind 2008, p. 515).

Notes

In 1898, Kuntze described *Senecio biserrifolius* with a brief Latin diagnosis, indicating its origin as 'Bolivia: 2600 Ostseite der Cordillere nach Rio Juntas zu.' Later, Hind (2008) transferred it to *Dendrophorbium*, selecting the type specimen from Bolivia by Kunze and citing it as 'Bolivia: 2600 m Ostseite der Cordillere nach Rio Juntas zu. [Kuntze]' – the holotype is confined to NY00077399. Two specimens, one from MO and one from HUT, were identified as belonging to this species, which is exclusively found in Cusco (Peru), and W of Bolivia according to the holotype.

Specimens examined

Peru, Cusco: Urubamba, Machu Picchu, 2200 m a.s.l., 24 June 1936, J. West 6457 (MO-714687); Paucartambo, Tres Cruces, Valle Kosñipata, 1900–3260 m a.s.l., 5 Oct. 1995, A. López et al. 9283 (HUT-029205).

Dendrophorbium castaneifolium (DC.) Pruski (2018, p. 97)

Basionym: *Senecio castaneifolius* DC. (1837, p. 425).
Syntype: Peru, presumably Cusco, 'America meridionalis montibus Oronocensibus' in protologue, 'Peruano montano oronocenses' [sic] on holotype label, no date [1790s–1810s], Haenke s.n. (PR377362, image available at: https://tropicos.org/name/100474388, designated by Pruski (2018, p. 97).

Notes

According to Pruski (2018), *D. castaneifolium* is not known to exist in Bolivia, and Cabrera (1985) did not list it as a Bolivian species. In line with Pruski's findings, *D. castaneifolium* is regarded as an endemic species of Peru. Four specimens were examined – one from MO and three from CUZ – all identified as part of this taxon and found in the department of Cusco. Based on IUCN standards (IUCN 2024), the species should be classified as 'Near Threatened' (NT) because multiple populations are located within an area less than 200 km^2.

Specimens examined

Peru, Cusco: La Convención Santa Ana, Subcuenca Chuyapi Poromate, 1800–2300 m a.s.l., 17 Sept. 2002, L. Valenzuela et al. 487 (MO-6642285); Calca Mejoranayoc, 2800 m a.s.l., 26 July 1954, C. Vargas 10999 (CUZ-33683); Calca, bajando de Amparaes a Churiwayra, 3000 m a.s.l., 8 Sept. 1977, C. Vargas 23068 (CUZ-33682); La Convención, Quellouno a Lucumayo, 3000–2600 m a.s.l., 26 July 1944, C. Vargas 4522 (CUZ-33684).

Dendrophorbium chopinii Montesinos (2017, p. 211)

Holotype: Peru, Amazonas, Chachapoyas, Leymebamba, near La Joya archaeological site located in Cerro La Petaca, 1.5 km north of La Joya town, 3468 m a.s.l., 15 Aug. 2016, D. Montesinos & L. García 5010 (HSP-005587), isotypes (HUT, F, B-100843087, image available at http://herbarium.bgbm.org/object/B100843087, designated by Montesinos-Tubée 2017, p. 211).

Notes

Montesinos-Tubée (2017) described this species from the uppermost tributaries of the Utcubamba River, where it is relatively common at altitudes above 3000 m a.s.l. The species is easily recognizable by its dense indumentum on the undersides of its coriaceous leaves. Based on herbarium material observations, this species appears to be confined to the Utcubamba River basin and does not extend westward towards the Marañón River. Five specimens from B, CUZ, HUT and USM have been identified for this taxon. Montesinos-Tubée (2017) suggested that, based on the IUCN Red List categories (IUCN 2001), it should be classified as 'Endangered' (EN) due to an estimated population size of fewer than 250 mature individuals. According to IUCN (2024) our most recent survey of the region in 2023 and 2024, ongoing deforestation and fires have resulted in the continuous loss of vegetation on the slopes. Therefore, there is an urgent need to prioritize the conservation of the species.

Specimens examined

Peru, Amazonas: Chachapoyas, Chuquibamba, Atuén, 3800 m a.s.l., 18 July 1995, V. Quipuscoa & S. Bardales 177 (HUT-031163); Chachapoyas, Huancas, 2800 m a.s.l., June 2015, D. Montesinos & R. Dover 5714 (MOQ); Chachapoyas, Leymebamba, terrestrial on clay soils in dense scrublands, near the path named Camino Inca to Tajopampa, 3490 m a.s.l., 14 Aug. 2016, D. Montesinos & L. García 4975 (USM, CUZ); Chachapoyas, Leymebamba, Zona 1. Depresiones origen kárstico, pajonales densos, 3672 m a.s.l., 18 June 2018, D. Montesinos 6834 (USM); Chachapoyas, Leymebamba, Construcciones de piedra, vegetación densa (jalca), 3668 m a.s.l., 22 June 2018, D. Montesinos 7122 (HUT).

Dendrophorbium cosnipatense (Cabrera) H. Beltrán (1999, p. 51)

Basionym: *Senecio cosnipatense* Cabrera, Notas del Museo de la Plata, Botánica 18: 236. 1955.
Holotype: Peru, Cusco, Paucartambo, valle de Cosñipata, Yanamayo, 2200 m a.s.l., 3 July 1948, O. Velarde 1179 (LP-000447, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.lp000447, designated by Beltrán 1999, p. 51).

Notes

Cabrera (1955) initially published the species as *Senecio cosñipatense*, later revised to *S. cosnipatense*. The type specimen, collected by Velarde Núñez in 1948, originates from Cosñipata in Cusco. Subsequently, Beltrán (1999) transferred it as *Dendrophorbium cosnipatense* without additional distribution notes, though it was later classified as 'Near Threatened' (NT) by the IUCN (2001) in Beltrán et al. (2006). Herbarium evaluations indicate that four examined specimens correspond to *D. cosnipatense*, found at CUZ and HUT respectively.

Specimens examined

Peru, Cusco: Paucartambo 1800 m a.s.l., 18 June 1940, C. Vargas 1904 (CUZ-33680); Paucartambo, Caicay-Huancarani, 3150–3450 m a.s.l., 4 Oct. 1995, A. López et al. 9276 (HUT-029198); Paucartambo, Tres Cruces Valle Kosñipata, 1900–3260 m a.s.l., 5 Oct. 1995, A. López et al. 9284 (HUT-029206); Quispiccanchis, hacia Tunquimayo, 700 m a.s.l., 26 July 1957, C. Vargas 011775 (CUZ-33660).

Dendrophorbium curvidens (Sch. Bip.) C. Jeffrey (1992, p. 66)

Basionym: *Senecio curvidens* Sch. Bip. (Schultz and Hohenacker 1856, p. 52, 55)

Lectotype: Peru, Tatanara [possibly misspelled and referring to Tantara, Castrovirreyna, Huancavelica] Aug. 1854, W. Lechler 2658 (BR0000005527410, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.br0000005527410, designated by Jeffrey 1992, p. 66). Isotype: (GOET002029, S04-478, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.goet002029).

Notes

Senecio curvidens was originally published by Schultz and Hohenacker in Bonplandia 4 (1856), providing a brief Latin diagnosis. Jeffrey (1992) designated the type as Lechler (2658), noting the location as Tatanara, Peru. However, it is worth noting that this location may be a misspelling, and Jeffrey suggested Tantara in Huancavelica. Despite this uncertainty, I maintain this location as dubious. A single specimen from Paucartambo, Cusco, found at the CUZ herbarium, was identified based on the morphological characters resembling the isotype evaluated at GOET. Notably, Beltrán et al. (2006) did not assess this species, and it is recommended to categorize it as DD ('Data Deficient') according to the IUCN (2024).

Specimens examined

Peru, Cusco: Paucartambo, km 130 hacia Kosñipata parte alta del Parque Nacional del Manu, 2600 m a.s.l., 30 Oct. 1987, P. Núñez et al. 8532 (CUZ-33669).

Dendrophorbium dolichodoryium (Cuatrec.) C. Jeffrey (1992, p. 66)

Basionym: *Senecio dolichodoryius* Cuatrec. (Cuatercasas 1985, p. 623–625)
Holotype: Peru, Amazonas, Prov. Chachapoyas, middle eastern Calla-Calla slopes, near kms 411–416 of Leymebamba-Balsas Road, 3100–3250 m a.s.l., 11 July 1962, Wurdack 1306 (US00123401, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.us00123401, designated by Jeffrey 1992, p. 66).

Notes

In 1985, Cuatrecasas described the species *Senecio dolichodoryius* in great detail, primarily based on the collection by Wurdack (1306), along with three additional duplicates from Amazonas, northern Peru. Subsequently, Jeffrey (1992) transferred the species to *Dendrophorbium*, citing the holotype at US and the isotype at K. In addition to these, four specimens related to Wurdack (1306) are available on JSTOR Plants Online, distributed at F, NY, UC, and one more at US. A total of six specimens of this species were evaluated, housed at the herbaria B and HUT. Beltrán et al. (2006) categorized the species as EN (Endangered) according to the IUCN (2001).

Specimens examined

Peru, Amazonas: Chachapoyas, Atuén, Chuquibamba, 3900 m a.s.l., 18 July 1995, V. Quipuscoa & S. Bardales 188 (HUT-031159); Rodríguez de Mendoza, Omia, construcciones de Ipapuy cerca de Nueva Mendoza, 1604 m a.s.l., 25 Sept. 2008, V. Quipuscoa et al. 4424 (HUT-47949); Rodríguez de Mendoza, alrededores de Rodríguez de Mendoza, 2200 m a.s.l., 28 July 1991, J. Mostacero et al. 2519 (HUT-027450); Bongará, Valera, San Jerónimo, 2474 m a.s.l., 24 May 2017, D. Montesinos 5682 (B-100843099); San Martín, Mariscal Cáceres, 3350 m a.s.l., 22 Nov. 1985, K. Young 2074 (HUT-025661); Chachapoyas, Leymebamba, Laguna de los Cóndores track, antes de Abra el Rayo, 2991 m a.s.l., 21 Sept. 2023, D. Montesinos, C. E. Dasher & E. Chávez 9665 (HUT, B).

Dendrophorbium elatum (Kunth) Pruski (2018, p. 99)

Basionym: *Senecio elatus* Kunth (1820, p. 141).
Syntype: Peru, Crescit in andibus Peruvianorum (Paramo de Yamoca), inter pagos Colasey et Chontaly, alt. 1350 hex. Floret Augusto, Humboldt & Bonpland 3572 (P00320162, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.p00320162, designated by Pruski 2018, p. 99).

Notes

The species was originally described by Kunth (1820) as *Senecio elatus* Kunth with a Latin diagnosis and description. Later, Pruski (2018) provided a transfer to *Dendrophorbium* with a description , considering that the species occurs in Ecuador and northern Peru. A total of four specimens, deposited at HUT, were examined.

Specimens examined

Peru, Áncash: Bolognesi, alrededores de Chiquián, 3150 m a.s.l., 8 Aug. 1986, J. Mostacero et al. 1345 (HUT-022422); Bolognesi, Chiquián, Usgor, 3250–3300 m a.s.l., 19 May 1950, R. Ferreyra 7565 (LP-303481); Bolognesi, Aquia, 3200 m a.s.l., 5 Oct. 1973, Z. Amado s/n (HUT-12723); Bolognesi, alrededores de Chiquián, 3150 m a.s.l., 8 Aug. 1986, J. Mostacero et al. 1345 (HUT-022422).

Dendrophorbium fortunatum (Cuatrec.) C. Jeffrey (1992, p. 66)

Basionym: *Senecio fortunatus* Cuatrec. (Cuatrecasas 1951, p. 47)
Holotype: Peru, Cusco, Urubamba, Urubamba valley, 10 Sept. 1928, F. L. Herrera 2096 (US00512833, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.us00512833, designated by Jeffrey 1992, p. 66).

Notes

Senecio fortunatus was described by Cuatrecasas (1951) based on the collection by Herrera (2096) found in the Urubamba valley, Cusco, S Peru. Jeffrey later transferred it to *Dendrophorbium*, selecting the lectotype at US. A single specimen was located at the CUZ herbarium. Despite not being evaluated by Beltrán et al. (2006), this species, characterized by its narrow endemism, should be categorized according to the IUCN (2024).

Specimens examined

Peru, Cusco: Urubamba, a 110 km de Cusco, en el camino y atrás de las aguas termales con plantaciones de palta en Aguas Calientes, S. H. Machu Picchu, 2050 m a.s.l., 21 May 1988, P. Núñez et al. 9140 (CUZ-33667).

Dendrophorbium goodspeedii (Cuatrec.) H. Beltrán (1999, p. 51)

Basionym: *Senecio goodspeedii* Cuatrec. (Cuatrecasas 1951, p. 51)
Holotype: Peru, Huánuco, Pillao, 2700 m a.s.l., 17 Feb. 1946, D. Tuesta Diar & F. Woytkowski 34097 (UC1031375, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.uc1031375, designated by Beltrán 1999, p. 51).

Notes

In 1951, Cuatrecasas described the species *Senecio goodspeedii* based on the collection by D. Tuesta Diar & F. Woytkowski (34097) located at UC. Later, Beltrán (1999) made the transfer to *Dendrophorbium*. The evaluation revealed two additional specimens from the same collection at F and UC, which can be found on JSTOR Plants Online. Despite analyzing the herbarium material extensively, no additional duplicates for this collection were found, suggesting it as a narrow endemic. Beltrán et al. (2006) initially considered the species as NE (Near Threatened) (IUCN 2001), it is proposed to elevate its category to CR ('Critically Endangered') according to the IUCN (IUCN 2024) since a single specimen is known so far and thus derived from a potential single population.

Dendrophorbium huasense (Cuatrec.) Pruski (2018, p. 102)

Basionym: *Senecio huasensis* Cuatrec. (Cuatrecasas 1956, p. 187).
Holotype: Peru, Junín, Tarma, Huasahuasi, 1778–1784, J. Dombey s.n. (P01816921, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.p01816921, designated by Pruski 2018, p. 102).

Notes

In 1956, Cuatrecasas described the species based on the collection by J. Dombey, which has a single duplicate located at P. Pruski (2018) and was later transferred to *Dendrophorbium* based on the type species and provided a brief description. Despite an intensive search across various herbaria, no additional specimens have been located, making this species challenging to categorize for its conservation status. According to Beltrán et al. (2006), it has not been possible to evaluate or assign a category to it. Therefore, it is suggested to include this species as DD ('Data Deficient') according to the IUCN (2024).

Dendrophorbium llewelynii (Cuatrec.) H. Beltrán (1999, p. 51)

Basionym: *Senecio llewelynii* Cuatrec. (Cuatrecasas 1951, p. 45).
Holotype: Peru, Amazonas, Chachapoyas, Central Cordilleras of the Andes, 20 Jan. 1930, L. I. Williams 7589 (F0093010F, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.f0093010f, designated by Beltrán 1999, p. 51).

Notes

Senecio llewelynii was described by Cuatrecasas (1951) in a detailed account based on the collection by L. I. Williams (7589). Later, Beltrán (1999) transferred the species to *Dendrophorbium*. In the evaluation by Beltrán et al. (2006), the species was categorized as NE ('Near Endangered') according to the IUCN (2001). An additional specimen was discovered at CPUN, sharing high morphological similarity with *Dendrophorbium llewelynii*. Despite its distribution being in Piura (northern Peru), approximately 250 km NW of the type collection, the morphological characters align with the description of *D. llewelynii*.

Specimens examined

Peru, Piura: Morropón, Chalaco, Bosque relicto de Mijal al NE de la localidad de Chalaco, 2920 m a.s.l., 3 Sept. 2009, I. Sánchez Vega & M. Sánchez Montoya 14013 (CPUN-22079).

Dendrophorbium longilinguae (Cuatrec.) C. Jeffrey (1992, p. 67)

Basionym: *Senecio longilinguae* Cuatrec. (Cuatrecasas 1992, p. 67).
Holotype: Bolivia, Bolivia, M. Bang 2495 (US00512832, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.us00512832, designated by Jeffrey 1992, p. 67).

Notes

Senecio longilinguae was described by Cuatrecasas (1951) based on the collection Bang (2495), with a detailed description. Subsequently, Jeffrey (1992) made the new combination *Dendrophorbium longilinguae*, citing the type specimen at US. The isotype, located at F, contains only fragments of the collection. Numerous collections are available in the Tropicos database, primarily from Bolivia, with the remaining ones from Cusco, Peru. Two specimens from CUZ, F, and K were examined.

Specimens examined

Peru, Cusco: Paucartambo, Marcachea, Achirani, 3750 m a.s.l., 30 July 1939, C. Vargas 11151 (F-1205264, K); Paucartambo, Marcachea, Achirani, 2600 m a.s.l., 30 July 1939, C. Vargas 1582 (CUZ-33654).

Dendrophorbium storkii (Cuatrec.) C. Jeffrey (1992, p. 68)

Basionym: *Senecio storkii* Cuatrec. (Cuatrecasas 1954, p. 204)

Holotype: Peru, Cajamarca, Chota, 6 Dec. 1938, H. E. Stork & O. B. Horton 10052 (F0092769F, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.f0092769f, designated by Jeffrey 1992, p. 68).

Notes

Cuatrecasas (1954) described *Senecio storkii* based on the collection by H. E. Stork and O. B. Horton 10052, housed at F. Later, Jeffrey (1992) transferred the species to *Dendrophorbium*. The specimen at F is accessible through JSTOR Plants Online, but the specimen cited at P by Jeffrey (1992) could not be located. A specimen deposited at HUT was evaluated and identified as *D. storkii*. According to Beltrán et al. (2006), the species was categorized as NE ('Not Evaluated') according to the IUCN (2001). To this date and knowing the ecological conditions of the type locality, it is suggested to elevate the categorization to CR ('Critically Endangered') following the IUCN (2024).

Specimens examined

Peru, Cajamarca: Celendín, alrededores de Sendamal, 3350 m a.s.l., 30 July 1991, J. Mostacero & F. Mejía 2666 (HUT-027567).

Dendrophorbium trigynum (Cuatrec.) H. Beltrán (1999, p. 51)

Basionym: *Senecio trigynus* Cuatrec. (Cuatrecasas 1956, p. 189).
Holotype: Peru, Cusco, Oct. 1839, C. Gay 2051 (P01816576, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.p01816576, designated by Beltrán 1999, p. 51).

Notes

Originally described as *Senecio trigynus* Cuatrec. by Cuatrecasas (1956) based on the collection by C. Gay (2051), located at P and known from a single specimen so far, this taxon was later transferred to *Dendrophorbium* by Beltrán (1999) citing the same collection. Despite being listed in Beltrán et al. (2006), the species was not categorized. Therefore, no categorization is assigned, and it is suggested to elevate its status to DD ('Data Deficient') according to the IUCN (2024), as only one specimen was found in the consulted herbaria, and its population is at high risk due to conservation issues.

Specimens examined

Peru, Cusco: Urubamba, Pumawanca, 72 km de Cusco al norte, 3100 m a.s.l., 11 Mar. 1987, P. Núñez 7436 (CUZ-33668)

Dendrophorbium usgorense (Cuatrec.) C. Jeffrey (1992, p. 69)

Basionym: *Senecio usgorensis* Cuatrec. (Cuatrecasas 1954, p. 244).

Holotype: Peru, Ancash, Chiquian, Usgor, abajo de Chiquian, 19 May 1950, R. Ferreyra *7565* (F0093009F, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.f0093009f, designated by Jeffrey 1992, p. 69).

Notes

Cuatrecasas (1954) described *Senecio usgorensis* Cuatrec. based on the specimen collected by R. Ferreyra (7565) in Ancash, C Peru. Later, Jeffrey (1992) transferred the species to *Dendrophorbium*. An additional specimen is available at JSTOR Plants Online from LP, collected by the same collector. Despite the wide material available at different herbaria, *Senecio usgorensis* was not evaluated by Beltrán et al. (2006). The species has not been found in other neighboring countries, thus still considered an endemic.

Specimens examined

Peru, Amazonas: Chachapoyas, Leymebamba, Rio Atuén, 2554 m a.s.l., 15 Aug. 2016, D. Montesinos & L. García Llatas 5024 (B-100843195); Chachapoyas, Leymebamba, Sicsi-Atuén, 2806 m a.s.l., 18 Sept. 2023, D. Montesinos and C. E. Dasher 9553 (HUT). Luya, Tingo, east to Kuelap, 2716 m a.s.l., 12 Aug. 2016, D. Montesinos and L. Garcia Llatas 4944 (B-100843190); Ancash: Caraz, km 27 Caraz Laguna Parón, 3750 m a.s.l., 26 Aug. 1978, J. Mostacero et al. 579 (HUT-5332); Huaraz, Bosque de *Polylepis* de Ichinca, 4075 m a.s.l., 17 June 1998, W. Mendoza and G. Servat 196 (CUZ-33646); Huaraz, Cerro San Cristóbal, 3800 m a.s.l., 8 July 1977, M. Evangelista s/n (HUT-14854); Huari, Chavín de Huantar, 15 Dec. 1986, F. Castillo and V. Núñez s/n (HUT); Huari, road ascending from Rio Mosna valley into the mountains to Aczo, Llamellin and Mirgas, between Aczo and Llamellin, 3200 m a.s.l., 26 June 2018, D. Montesinos et al. 6636 (B-10109864); Huaylas, Quitaracsa, 3300 m a.s.l., 14 Sept. 2012, H. Beltrán 7511 (USM-270502); Recuay, alrededores del Túnel de Cahuish, 4400 m a.s.l., 21 June 1991, F. Mejía and D. Medina 2268 (HUT-027246); Recuay, San Nicolas, 3500 m a.s.l., 14 Dec. 1986, E. Cadillo Moreno 2 (HUT); Yungay, subiendo a Llanganuco, 3350 m a.s.l., 31 July 1963, C. Vargas 014777 (CUZ-33647); Cajamarca: Cajabamba, Huamachuco-Cajabamba, 2800 m a.s.l., 16 Nov. 1983, A. Sagástegui et al. 11146 (HUT-18559); Celendín, Celendín, 2850 m a.s.l., 24 July 1967, H. Aguado 631 (HUT-8813); Contumazá, 2760 m a.s.l., 12 June 1961, A. Sagástegui 9961 (HUT-16357); Hualgayoc, de Hualgayoc a Bambamarca, 3150 m a.s.l., 23 May 2013, I. Sánchez et al. 3500 (USM-291931); San Miguel, Cerro Quillón Agua Blanca, 3100 m a.s.l., 21 June 1980, A. Sagástegui et al. 9575 (HUT-15730); Huánuco: Huamalies, Arancay, Archaeological site of Maganpatay, 2724 m a.s.l., 17 July 2016, D. Montesinos 4706 (B-100843204); Huamalies, Jircán, Tarapampa archaeological site, 3000 m a.s.l., 19 Oct. 2023, D. Montesinos 9922 (HUT); Huamalies, Jircán, Portachuelo, 3362 m a.s.l., 17 July 2016, D. Montesinos 4699 (B100843205); Huamalies, Jircán, road from Huancash to Tarapampa, 2843 m a.s.l., 16 May 2017, D. Montesinos 5631 (B-100745171); Huamalies, Singa, abandoned house in Bellas Flores,

3409 m a.s.l., 20 may 2018, D. Montesinos et al. 6595 (B-101098478); Huamalies, road from Tingo Chico to Tantamayo, 3400 m a.s.l., 26 July 2016, D. Montesinos 4843 (B-100843207); Huánuco, from Corona del Inca to Tingo Chico, 3050 m a.s.l., 20 May 2018, D. Montesinos et al. 6589 (B-101098484); La Libertad: Otuzco, Agallpampa, 3200 m a.s.l., 3 June 1949, A. López 1053 (HUT); Otuzco, Motil-Chota, 2750 m a.s.l., 23 Sept. 1973, A. López and A. Sagástegui 8027 (HUT-12600); Huamachuco, Cochabamba, Munmalca, 3200 m a.s.l., 26 June 1958, A. López & A. Sagástegui 2811 (HUT); Huamachuco, Janazara-Huaguil, 3600 m a.s.l., 18 July 1967, H. Aguado 6757 (HUT); Pataz, Huancaspata, 3100 m a.s.l., 27 June 1974, A. López and A. Sagástegui 8233 (HUT-12976); Sánchez Carrión: Huamachuco, 10 km NO de ciudad de Huamachuco, complejo arqueológico Markawamachuko, 3597 m a.s.l., 1 May 2008, S. Arroyo et al. 346 (HUT-48070); Sánchez Carrión, Markawamachuko, 3597 m a.s.l., 17 May 2008, J. Ruiz & E. Rodríguez 10453 (HUT-47312); Santiago de Chuco, Cayorgán, 9 Aug. 1951, E. Paredes 1586 (HUT); Piura: Ayabaca, Tacupampa, 2600 m a.s.l., 26 May 1971, A. López et al. 7753 (HUT-9790); Piura, Huancabamba, Talanco, 2900 m a.s.l., 5 Sept. 1976, A. Sagástegui & J. Cabanillas 8636 (HUT-14551); Huancabamba, ruta Canchaque a Huancabamba, 2400 m a.s.l., 20 July 1975, A. Sagástegui et al. 8154 (HUT-14116, HUT-13418); San Martín: Mariscal Cáceres, NW Rio Abiseo, 3425 m a.s.l., 31 May 1986, K. Young and F. Watson 3492 (HUT-026894).

Dendrophorbium vanillodorum (Cabrera) H. Beltrán (1999, p. 51)

Basionym: *Senecio vanillodorus* Cabrera (1955, p. 238).
Holotype: Peru, Cajamarca, Celendín, Macash, Quebrada cerca de Cungat, 7 June 1948, C. A. Ridoutt 0512 (LP000698, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.lp000698, designated by Beltrán 1999, p. 51).

Notes
Cabrera (1955) described *Senecio vanillodorus* based on the specimen from Cajamarca (northern Peru) collected by C.A. Ridoutt (0512). Beltrán (1999) transferred the species to *Dendrophorbium*, citing the collection at LP as the type. Moreover, Beltrán (2006) categorized the species as NT ('Near Threatened') according to the IUCN (2001). A total of three specimens were identified from the herbaria CPUN and HUT.

Specimens examined
Peru, Cajamarca: Celendín, Choctapampa ruta a Celendín, 2780 m a.s.l., 3 July 1975, I. Sánchez Vega et al. 1644 (CPUN-10683); Celendín, Gelig, 3000 m a.s.l., 27 July 1985, J. Mostacero et al. 0895 (HUT-2085); Cajamarca: Hualgayox, al sur de Bambamarca, Las Ventanillas Frutillo Pampa, 2850 m a.s.l., 3 May 1991, I. Sánchez Vega et al. 5703 (CPUN-21889).

Dendrophorbium vargasii (Cabrera) H. Beltrán, (1999, p. 51)

Basionym: *Senecio vargasii* Cabrera (1944, p. 225).
Holotype: Peru, Cusco, Vilcabamba, Inkahuasi, Amaybamba, 28 July 1943, C. Vargas 3481 (LP000700, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.lp000700, designated by Beltrán 1999, p. 51).

Notes
Senecio vargasii was originally described by Cabrera (1944) based on the collection by Vargas (3481). The species was later transferred to *Dendrophorbium* by Beltrán (1999). The specimen originates from Vilcabamba in Cusco, though additional collections have been found from the province of Paucartambo, listed here as examined specimens. Beltrán et al. (2006) categorized the species as NE ('Near Threatened') following the standards of the IUCN (2001). Three specimens belonging to this taxon were identified at CUZ.

Specimens examined
Peru, Cusco: Paucartambo, Acjanacu, 3500 m a.s.l., 25 may 1960, C. Vargas 13275 (CUZ-33652); Paucartambo, Cuesta Pillahuata, 2200 m a.s.l., 20–26 July 1936, C. Vargas 56 (CUZ-33650); Paucartambo, Kosñipata, Acjanoca, 3550–3500 m a.s.l., 5 Aug. 1956, C. Vargas 11336 (CUZ-33651).

Dendrophorbium yalusay (Cabrera) C. Jeffrey (1992, p. 69)

Basionym: *Senecio yalusay* Cabrera (1950, p. 112).
Holotype: Peru, Junín, Jauja, Chaca, Comas, 8 June 1948, C. Ochoa 542 (LP0751991-000673), image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.lp000673, designated by Jeffrey 1992, p. 69).

Notes
Originally described as *Senecio yalusay* by Cabrera (1950), the type specimen is available on JSTOR Plants Online. Three specimens, indicated as isotypes (MOL, US), all belong to the same collection C. Ochoa (542). Later, Jeffrey (1992) transferred the species to *Dendrophorbium*, citing the holotype at LP and the isotype at K, though only the LP type has been located. *D. yalusay* was examined by Montesinos-Tubée (2017) for the comparison with *D. chopinii,* an endemic from northern Peru. In total, nine specimens from CUZ, LP, MO and USM were evaluated for *D. yalusay*.

Specimens examined
Peru, Apurimac: 22 km E of Abancay, 3500–3600 m a.s.l., 26 June 1978, A. H. Gentry 23382 (MO-1963515); Cusco: Anta, Choque Chuco Mollepata, 2450 m a.s.l., Aug. 1938, C. Vargas 1164 (CUZ-33661); Anta, Mollepata, 3024 m a.s.l., 9 May 2013, H. Beltrán 7617 (USM-186216); La Convención, Potrero, Sapan Sachapoco, 2300 m a.s.l., 9 Dec. 1964, C. Vargas 13641 (CUZ-33679); Urubamba, Ollantaytambo, Miski Puquio, 3400 m a.s.l., 16 Feb. 1993,

A. Tupayachi 2075 (CUZ-33655); Urubamba, Machu Picchu, 2000–2800 m a.s.l., B. Peyton 513 (CUZ-33682); Urubamba, 3800 m a.s.l., 28 Mar. 1963, H. Zamalloa 1471 [illegible] (LP); Urubamba, Machu Picchu, Microcuenca Cusichaca Sisaypampa Abra Palkay, 3700 m a.s.l., 29 June 2001, A. Tupayachi et al. 5176 (CUZ-33659); Urubamba, Puente de Peñas, 3650 m a.s.l., 29 June 1967, C. Vargas 19881 (CUZ-33662).

New combination

***Dendrophorbium ligulatum* (Cuatrec.) Montesinos, comb. et stat. nov. ≡ *Dendrophorbium yalusay* Cabrera f. *ligulata* Cuatrec. (*Cuatrecasas 1960*, p. 194)**

Holotype: Peru, Junín, Carpapata, above Huacapistana, 7 June 1929; E. P. Killip & A. C. Smith 24425 (US00512819), image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.us00512819, designated here).

Notes

Dendrophorbium yalusay Cabrera fo. *ligulata* Cuatrec. was initially described as a form by Cuatrecasas (1960), based on the collection E. P. Killip and A. C. Smith (24425) deposited at US. After a detailed examination, it was concluded that this taxon is an endemic species with a known distribution area in northern and central Peru. In this proposal, the form described by Cuatrecasas (1960) is suggested to be treated as a separate species. Two specimens found at LP and P allowed to support this nomenclatural change. *Dendrophorbium ligulatum* can be distinguished from *D. yalusay* by its elliptic-oblong female ray florets (lanceolate in *D. yalusay*), ovate to subcordate leaf base (attenuate to subrounded in *D. yalusay*), and larger size of the ray florets (shorter in *D. yalusay*). Furthermore, it differs from *D. chopinii* by the larger size of the pedicels, denser pubescence on the leaf underside, more prominent triangular denticles on the leaf margin, a reduced number of denticles per margin, larger size of the ray florets (10–18 mm long × 3–4 mm wide versus 7 mm long × 2 mm wide in *D. chopinii*), larger size of the involucre bracts (phyllaries) (5–9 versus 5 mm in *D. chopinii*), and by the glabrous achenes (scarcely pubescent in *D. chopinii*). Following the IUCN (2024), we asses this species as NT ('Near Threatened') for the species since its populations are known to occur in less than 10 km^2.

Specimens examined

Peru, Ancash: Yungay, Llanganuco, Parque Nacional Huascarán, 2800 m a.s.l., 11 July 1982, E. M. Zardini 1542 (LP); Cajamarca: Hualgayoc, Hacienda Taulis, Río La Quinua above La Playa, 1850 m a.s.l., 4 Sept. 1964, P. C. Hutchinson & K. von Bismarck 6501 (P03730675).

New species

Dendrophorbium arachnoideum Montesinos, sp. nov. (Fig. 1–3)

Diagnosis

A species easily distinguished from other *Dendrophorbium* species by its arachnose pubescence that scarcely covers the upper side of the leaves, a character absent in other species of the group. Additionally, the species is distinguishable by a reduced number of involucre bracts, as well as ray and floret cypselae (achenes) covered with a fine pubescence layer.

Type: Peru, Huánuco, Huamalies, Jircán, road between Monzón and Urpish, growing in dense subtropical forests with continuous rain, 3750 m a.s.l., 4 May 2022, D. Montesinos & O. Chanta García 9461 (holotype: HOXA-00080382, isotypes: B-101228101, http://herbarium.bgbm.org/object/B101228101, designated here).

Etymology

The specific epithet *arachnoideum* comes from the Latin word *arachnis*, spider, for the spidery pubescence of the stems, leaves, pedicels, bracts and achenes.

Description

Perennial herb, arborescent, erect, 40–90 cm tall, reaching 1.5 m in diameter. Stems woody, 5–10 mm wide, densely covered with arachnose pubescence, irregularly formed, and bearing small whitish-blackish 0.1 mm long protuberances, bark atropurpureous to dark red in young stems, turning pale brown with age. Trichomes arachnose, irregularly shaped, multicellular, about 4–12 mm long, densely covering all parts of the plant, including leaves, stems, and pedicels. Internodes 1–3 cm long. Basal leaves absent. Cauline leaves subcoriaceous, 7–9 cm long, 2.5–3.0 cm wide, alternate, ovate to lanceolate, not conduplicate, apex acuminate to apiculate at apex, base cuneate at the base; leaf margin covered by a set with 20–30 denticles at each side of the lamina, denticles triangular, 1-2 mm long and separated by 2.0–2.5 mm, acute or acuminate, distributed upwards, usually glabrous at the tip; leaf lamina upperside dark green, partially glabrous, shiny and bearing a rough cover of whitish arachnose pubescence mixed with inconspicuous whitish-brown ciliate hairs; adaxial leaf surface pale green turning brown with age, surface densely covered with a thin layer of greyish-white arachnoid pubescence, finely divided (ca 1 cm long) and scarcely covered with thin blackish glands of less than 0.2 mm wide; leaf margin glabrous to rarely arachnoid pubescent. Central nerve prominent on the underside, sulcate on the upperside, densely covered by thin arachnoid pubescence on both sides, less common in the upperside; petioles 1.0–1.5 cm long, densely covered by arachnoid pubescence, partially winged at the base. Synflorescence composed in terminal cymes of 10–20 cm in height by 10–12 cm in wide, bearing 50–60 capitulae in total, each flowering stem bearing between 10 and 16 capitulae. Pedicels of about 6–10 cm in length, densely covered by a combination of whitish arachnose pubescence and brownish hirsute hairs. Bracts with a lanceolate form, densely arachnoid pubescent, linear-lanceolate, 1.2–2.0 cm long. Calycle bracts 10–12, verticillate, linear-lanceolate, densely covered at the base with arachnose pubescence; lamina pale green turning dark red towards the tip, about 1 cm long, margins covered with hirsute hairs. Involucre cylindrical to campanulate when mature, 1.0–1.2 cm long and 1.0–1.5 cm wide. Involucral bracts 8–10, 8–9 mm long by 3.0–3.5 mm wide, glabrous on

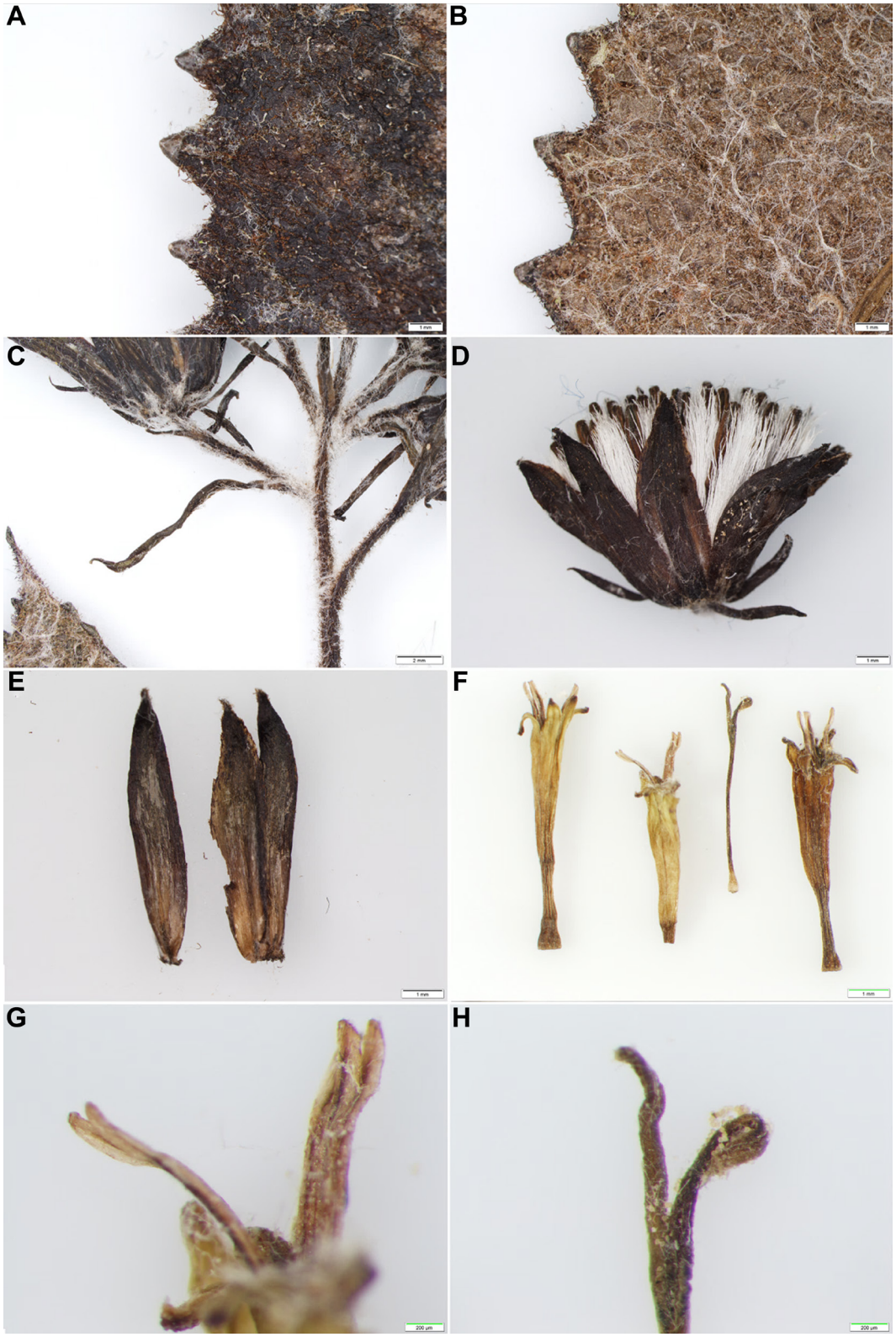

Figure 1. Morphological features of *Dendrophorbium arachnoideum* sp. nov. (A) Adaxial side of the leaf margin, (B) baxial side of the leaf with dense arachnoid pubescence, (C) pedicels and calycular bracts, (D) capitule, (E) involucral bracts, (F) ligulate and discoid flowers, (G) stamens with their appendices, (H) style bifurcated. Based on the holotype specimen D. Montesinos & O. Chanta García 9474 (HOXA-00080382).

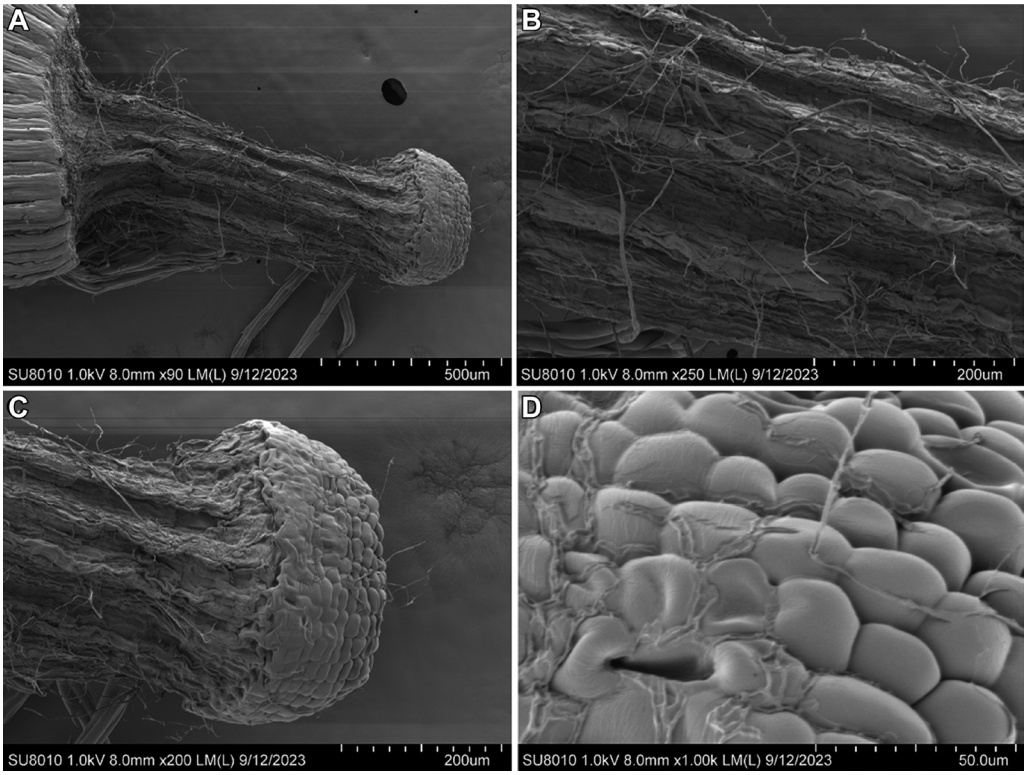

Figure 2. SEM images of *Dendrophorbium arachnoideum* sp. nov. taken from the achene (cypselae). (A) Cypselae complete view, (B) cypselae ridges and surface composed by a fine arachnoid pubescence, (C) base of the cypselae, (D) detail of the protuberances that compose the base of the cypselae. Based on the isotype specimen D. Montesinos & O. Chanta García 9474 (B101228097).

Figure 3. Habit images of *Dendrophorbium arachnoideum* sp. nov. (A) Humid montane forest ecosystem where the species grows, (B) immature synflorescence with visible arachnose pubescence on petioles, leaves and pedicels, (C) denticulate leaf margin seen from the underside, (D) capitules with calycular and involucral bracts scarcely covered by arachnose pubescence. Photographs by the author taken in Monzón, Huamalies, Huánuco. Images belong to the collection D. Montesinos & O. Chanta García 9461 (HOXA-00080382).

the upperside, sparsely arachnose-pubescent at the underside, dark green turning dark red towards the hirsute acuminate tip. Ray florets female, rays 7–9, oblong, 15–18 mm long and 0.5–1.0 mm wide, bifid or trifid (slightly curved towards the tip); limb surface bright yellow; tube about 5 mm long; style deeply bifurcated, forming yellowish coils. Disc florets hermaphrodite, 25–30, bright yellow, tubulose, 6–7 mm long, with lobes 5, ca 1 mm long, acute at apex; anthers united, crowned by an oblong, blunt membranous appendage; style 6–7 mm long, bifurcated at the tip, thickened at the base; stigma papillose, whitish yellow. Cypselae slightly compressed. Ray achenes slightly shorter than the disk achenes, 1.4–1.6 mm long, 0.5–0.7 mm wide, with 8–9 longitudinal ridges, scarcely papillose or arachnose. Pappus scabrous, 6–8 mm long.

Distribution and ecology

Dendrophorbium arachnoideum grows in dense subhumid tropical forest in central Peru and is restricted to the Monzón area in the uppermost tributaries of the Marañón and Huallaga rivers, in the province of Huamalies, of the department of Huánuco. The species was seen in different populations at an altitude of 3600–3750 m a.s.l. The species tends to grow in shadow caused by larger woody plants in more or less open slopes or rocky crevices, with dense vegetation cover by plants of the genera *Ribes* (Grossulariaceae), *Gynoxys* (Asteraceae), *Solanum* (Solanaceae), *Weinmannia* (Cunoniaceae), and other taxa. The species grows constantly with flowering during the months of May and July and fructifying from June on.

Conservation status

Following the IUCN red list category (IUCN 2024) this new species is considered 'Endangered' (EN) subcriterium D – population size estimated to number fewer than 250 mature individuals) as it grows in a highly specialized habitat, and it is only known from only three populations. The environments where the species grows are in present times at high risk of deforestation and fires for conversion to agriculture.

Discussion

In the framework of this study, 21 species of *Dendrophorbium* are presented for Peru (Fig. 4). The new species *Dendrophorbium arachnoideum* is easily distinguishable by the arachnose pubescence that covers different parts of the

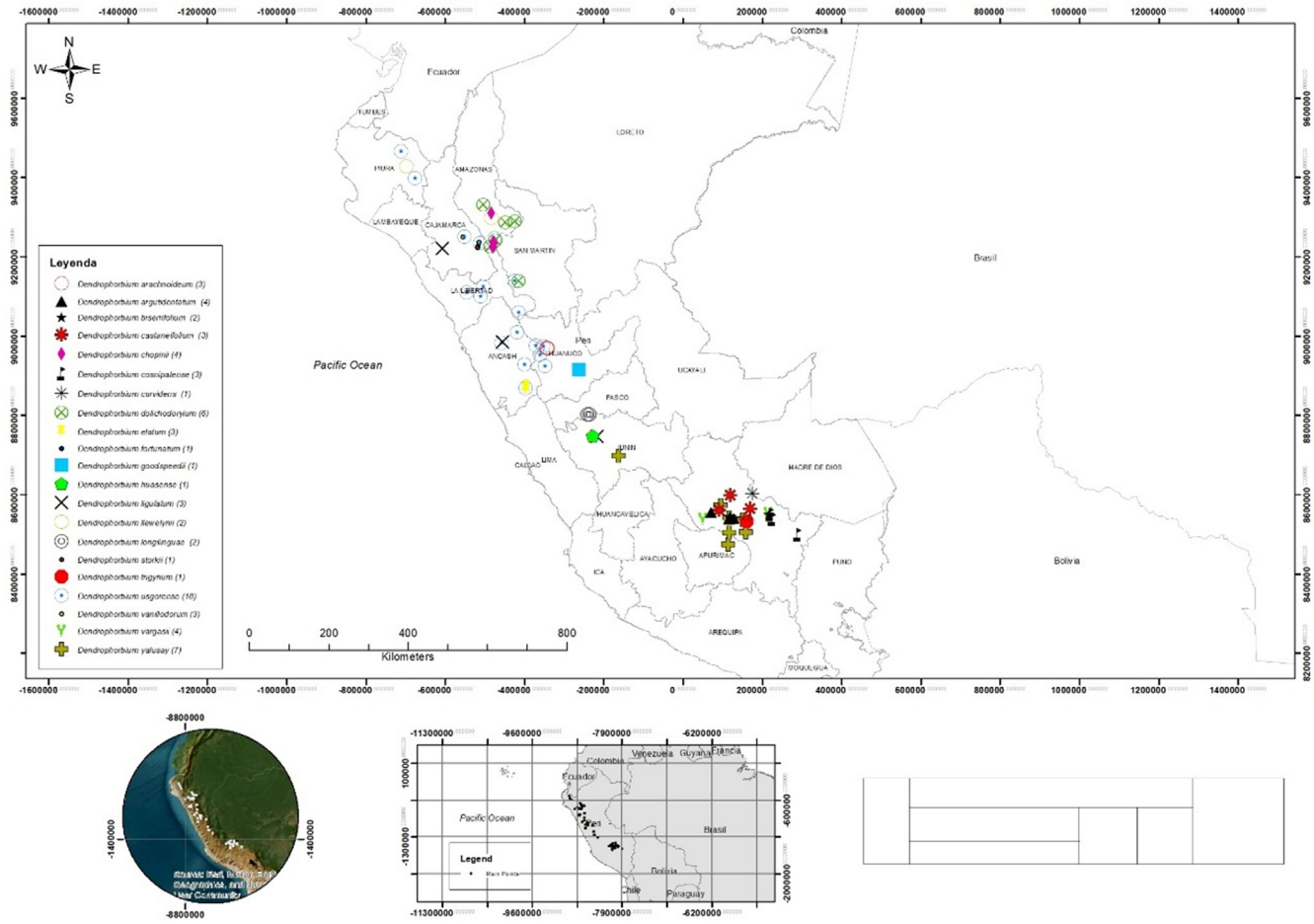

Figure 4. Map indicating the exact or approximate location of the specimens evaluated per species including the type collections.

plant even scarcely on the upperside of the leaves, the reduced number of involucrale bracts, and ray and floret cypselae covered with fine pubescence. Moreover, it is distinguished from *D. curvidens* by the larger size of the leaves (6–8 cm long and by 3–4 cm wide versus 2–5 cm long and 2 cm wide in *D. curvidens*), the presence of arachnose hairs on the plant (glabrous in *D. curvidens*), the shortly distant denticles along leaf margin (each separated by 2.0–2.5 versus 3–5 mm in *D. curvidens*), the lower number of involucral bracts (8–9 versus 10 in *D. curvidens*), and the achene surface (scarcely pubescent versus glabrous in *D. curvidens*). The new species differs from *D. elatum* by the presence of a true petiole of about 10–15 mm long (versus absent or inconspicuous in *D. elatum*), denticulate leaf margin (versus crenate in *D. elatum*), lower number of ray florets (7–9 versus 12–15 in *D. elatum*), lower number of involucral bracts (8–10 versus 12 in *D. elatum*) and by the cypsela texture (scarcely pubescent versus glabrous in *D. elatum*). It is further differentiated from *D. yalusay* by the shorter size of the leaf lamina (6–8 versus 13–20 cm long in *D. yalusay*), lower number of leaf margin denticles (20–30 per leaf lamina side versus 60–80 leaf denticles per side in *D. yalusay*), lower number of involucral bracts (8–10 versus 13 in *D. yalusay*), and the achene surface (scarcely pubescent versus glabrous in *D. yalusay*). Finally, it differs from *D. chopinii* by the shorter leaves (6–8 cm long versus 10–18 cm long in *D. chopinii*), larger pedicel (7–10 cm long versus 0.8–4.5 cm long in *D. chopinii*), lower number of involucral bracts and ray florets (8–10, 7–9 versus 12–14, 12–14 in *D. chopinii*) and by the cypsela texture (scarcely pubescent versus glabrous in *D. chopinii*).

Additional specimens examined (paratypes)

Peru, Huánuco: Huamalies, Jircán, road between Monzón and Urpish, 3750 m a.s.l., 4 May 2022, D. Montesinos & O. ChantaGarcía9474(HOXA-00080387,B101228097,http://herbarium.bgbm.org/object/B101228097); Huamalies, Jircán, road from Urpish to Monzón, 3610 m a.s.l., 14 Oct. 2023, D. Montesinos 9828 (HUT).

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Permits – The botanical collections made by the author belong to the collection permits granted by the Peruvian State: no. 283-2012-AG- DGFFS-DGEFFS, no. 061-2015-SERFOR-DGGFSPFFS, no. 056–2016-SERFOR/DGGSPFFS, no. 045–2017-SERFOR/DGGSPFFS, no. 133-2018-MINAGRI-SERFOR/DGGSPFFS, no. 437-2019-MINAGRI-SERFOR/DGGSPFFS, no. D0000 81-2020-MINAGRI-SERFOR-DGGSPFFS y Carta no. D0003 75-2023-MIDAGRI-SERFOR-DGGSPFFS-DGSPF.

Data availability statement

This article has no additional data.

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