LANKESTERIANA 26(3): 199–207. 2026. doi: http://dx.doi.org/10.15517/6xdfv530

FIRST COLOMBIAN RECORDS OF *FUNKIELLA* (ORCHIDACEAE) AND AN EXPANDED DISTRIBUTION FOR *F. MUSCICOLA*

David Lozano-Cifuentes[1,7], Juan Sebastián Moreno[2,4], Milton Rincón-González[3,4], Cristian Castro[5] & Gerardo A. Salazar[6]

[1]Parques Nacionales Naturales de Colombia–Dirección Territorial Orinoquía, Carrera 39 #26C-47, Villavicencio, Meta, Colombia.

[2]Jardín Botánico de Cali, Fundación Zoológica de Cali

[3]Herbario JBB, Subdirección Científica, Jardín Botánico de Bogotá José Celestino Mutis, Bogotá D.C., Colombia.

[4]Grupo de Investigación Schultes, Fundación Ecotonos, Carrera 72 # 13A-56, Cali, Colombia.

[5]Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia.

[6]Departamento de Botánica, Instituto de Biología, Universidad Nacional Autónoma de México, Apartado Postal 70–367, 04510 Coyoacán, Mexico City, Mexico.

[7]Author for correspondence: jdlozanoci@ut.edu.co

Abstract. During recent fieldwork conducted in the Cordilleras Central and Oriental of the Colombian Andes, plants of a species assignable morphologically to the genus *Funkiella* were discovered. A comparison with the types or digital images of types, published illustrations, and relevant taxonomic literature of all the species of this genus, showed that they correspond to *F. muscicola*, previously known only from the type locality in the Venezuelan Andes. The species is described and illustrated based on the Colombian collections, its known distribution is shown on a map, and the features that distinguish it from its morphologically closest congener, *F. intagana*, are discussed.

Resumen. Durante un reciente trabajo de campo realizado en las Cordilleras Central y Oriental de los Andes colombianos, se descubrieron plantas de una especie que, desde el punto de vista morfológico, puede asignarse al género *Funkiella*. Una comparación con los tipos o imágenes digitales de los tipos, las ilustraciones publicadas y la literatura taxonómica pertinente de todas las especies de este género mostró que corresponden a *F. muscicola*, conocida anteriormente solo de la localidad tipo en los Andes venezolanos. La especie se describe e ilustra a partir de las colecciones colombianas, su distribución conocida se muestra en un mapa y se discuten los rasgos que la distinguen de *F. intagana*, la especie morfológicamente más parecida.

Keywords / Palabras clave: Andes, bosque montano, Cordillera Central, Cordillera Oriental, montane forest, subpáramo, upper montane shrubland.

Introduction. Subtribe *Spiranthinae* Lindl. ex Meisn. encompasses over 40 genera and 520 species of predominantly geophytic orchids mainly found in the Neotropics, except for widespread *Spiranthes* Rich. (Chase *et al.*, 2015; Salazar *et al.*, 2018; Salazar *et al.*, 2025). Over the last two decades, molecular phylogenetic analyses have permitted the attainment of a clearer picture of generic limits and relationships in the subtribe, which historically have been the subject of contention as earlier taxonomists emphasized different floral morphological characters for generic distinction, resulting in conflicting taxonomic concepts (*e.g.*, Burns-Balogh, 1982, 1986; Garay, 1982). Such phylogenetic analyses robustly supported the monophyly of *Spiranthinae*, highlighted the complex patterns of floral evolution in the group, and provided a framework for a revised taxonomy based on the recognition of natural (*i.e.*, monophyletic) taxa (Salazar *et al*., 2025).

ORCID of the Author: DLC, JSM, MRG, CC, GAS
Received 17 April 2026; accepted for publication 15 October 2026. First published online: 5 November 2026.
Licensed under a Creative Commons Attribution-NonCommercial-No Derivs 3.0 Costa Rica License.

One of the genera whose circumscription has varied among classifications is *Funkiella* Schltr., originally proposed to include a single species but later variously enlarged, recircumscribed, or synonymized (a review of the tortuous taxonomic history of the genus can be found in Salazar *et al*., 2025). The most inclusive molecular phylogenetic study conducted so far on *Funkiella* (Salazar *et al*., 2025) analyzed nuclear (ITS) and plastid (*matK-trnK*, *trnL-trnF*) nucleotide sequences from nine species of *Funkiella*, including a new Mexican species described therein. Their work corroborated previous analyses based on smaller samples of species that indicated that *Funkiella* belongs in the "*Spiranthes* clade" as part of a group in which the subclade formed by *Sotoa* Salazar and *Svenkoeltzia* Burns-Bal., and then *Beloglottis* Schltr., are successive sisters of *Aulosepalum* Garay (Salazar *et al.*, 2016; Salazar *et al.*, 2025: fig. 1 therein). The variation in floral size, coloration, and details of the rostellum, the portion of the mostly sterile median stigmatic lobe that produces the viscidium, likely reflects different pollination syndromes (Salazar *et al.*, 2018; Salazar *et al.*, 2025). Nevertheless, all species of *Funkiella* share a preference for high montane habitats; they usually have one or a few short, thick tuberous roots, and the hypochile of the labellum has a thickened area that varies from yellow or brownish to red or orange, depending on the species (Salazar *et al.*, 2018: fig. 1 therein; Fig. 1D, 2A–B). As currently delimited, the genus encompasses 14 species widespread in mountainous areas of the southern USA, Mexico, Central America, the Dominican Republic, and the Andes of Ecuador and Venezuela (Salazar *et al.*, 2025), and now also Colombia (see below). However, the taxonomic diversity and distribution of *Funkiella* in South America have been poorly documented; for instance, it was known in Ecuador and Venezuela only from the type collections of *F. intagana* (Dodson & Dressler) Salazar and *F. muscicola* (Garay & Dunst.) Salazar, respectively.

Funkiella was recorded for the first time in 2018 in Colombia by Julio Betancur (Betancur *et al*., 2018), based on plants found in the Parque Nacional Natural Chingaza (hereafter PNN Chingaza), on the Cordillera Oriental of the Colombian Andes, but it was misidentified in that work as *Cyclopogon cf. peruvianus* (C.Presl) Schltr. (Salazar *et al*., 2025). Independently, in the same year, during an expedition to the western municipalities of the department of Tolima, two of the authors (MR-G and JSM) also found plants of the same species in the Cordillera Central. This genus had not been documented for the Colombian orchid flora either in the synopsis of the subtribe Spiranthinae in Colombia (Dueñas Gómez & Fernández-Alonso, 2009) or in the '*Plan para el estudio y la conservación de las orquídeas en Colombia*' (Betancur *et al.*, 2015).

A thorough study of both aforementioned Colombian collections, including dissection and measurement of dried and alcohol-preserved flowers, revealed that they are conspecific. Moreover, subsequent comparison with all other known species of the genus indicated that they correspond to *Funkiella muscicola*, previously known only from the type collection from the Cordillera de Mérida in Venezuela. Here, we provide a description and color plates based on the Colombian material and discuss the features that distinguish this species from its morphologically closest congener, *F. intagana*.

Materials and methods. The plant material studied was collected in 2016 and 2018 in the municipalities of Fómeque and Roncesvalles, departments of Cundinamarca and Tolima, respectively, in Colombia. Specimens were pressed and, for the collection from Cundinamarca, flowers were preserved in 75% ethanol. Live flowering plants from both Colombian localities were photographed with a digital camera. Descriptive terminology followed Beentje (2012), Salazar (2003), and Stearn (2004).

A morphological description was prepared based on the examination of living and preserved material of the Colombian plants, and a comparison with type specimens, digital images of types, and additional specimens of all other species of *Funkiella* housed in the herbaria AMES, AMO, ARIZ, ASU, BM, BR, CAS, CHAPA, ENCB, F, FCME, GH, IBUG, IEB, JBSD, K, LL, M, MBM, MEXU, MO, NY, P, QCNE, QMEX, SEL, SERO, SLPM, TEX, UAMIZ, US, USJ, UVAL, W, and XAL (herbarium acronyms according to Thiers, 2025). We also looked for specimens of *Funkiella* in several major Colombian herbaria, including ANDES, COL, HUA, JAUM, JBB, TOLI, UDBC, and VALLE, but failed to locate records additional to the two collections cited below. A preliminary conser-

vation assessment was made following the IUCN Red List categories and criteria (IUCN, 2025). The extent of occurrence (EOO) was calculated as the area of the minimum convex polygon enclosing all known localities, and the area of occupancy (AOO) as the combined area of the occupied cells of a 2 × 2 km grid.

TAXONOMIC TREATMENT

Funkiella muscicola (Garay & Dunst.) Salazar, Phytotaxa 702: 128. 2025. *Spiranthes muscicola* Garay & Dunst., Venez. Orchids III. 4: 280. 1966. *Stalkya muscicola* (Garay & Dunst.) Garay, Bot. Mus. Leafl. 28: 372. 1980 publ. 1982. Fig. 1–3.

TYPE: VENEZUELA. Mérida: Pregonero road above Bailadores, epiphytic among mosses on tree trunk at about 10,000 ft, *L.A. Garay s.n.* (holotype a flower in the spirit collection, AMES; drawing from the original plant published by Dunsterville & Garay, 1966, and floral analysis published by Garay, 1982).

Epiphytic, acaulescent *herb* 7.0–17.0 cm tall, including the inflorescence. *Root* single, tuberoid, 2.0–3.0 × 1.7–2.0 cm, ellipsoid, pubescent. *Leaves* 3, in a basal rosette, 1.7–4.0 × 0.5–0.7 cm, deciduous, either present but senescent or already shed at flowering time, petiolate, petiole channeled, blade elliptic-lanceolate, acute, 5-nerved, bright green adaxially, pale green abaxially. *Inflorescence* arising from the center of the leaf rosette, 6.0–16.0 cm long, racemose, erect, densely pubescent, trichomes multicellular and clavate; peduncle 2.5–9.0 cm long, pale green; *peduncle bracts* 1.1–2.0 × 0.4–0.7 cm, 2–3, lanceolate, green, glabrous; *raceme* more or less one-sided, with 4–11 flowers, most of them open at a time. *Floral bracts* 9.0–11.0 × 3.0–3.5 mm, elliptic-lanceolate, concave, acuminate, 3-veined, green, with sparse multicellular, clavate trichomes especially near the base, margins irregularly ciliate. *Flowers* ascending, resupinate, apparently odorless, sepals green with the apex cream white to completely cream white, very sparsely pubescent abaxially, petals pale brownish red with white apex and a pale brown vein, labellum hypochile mostly brownish red, epichile white with green veins. *Dorsal sepal* 5.0–6.2 × 1.5–2.0 mm, ovate-lanceolate, obtuse, concave, 3-veined. *Lateral sepals* 5.5–6.5 × 2.0–2.3 mm, obliquely ovate-lanceolate, obtuse, concave, 3-veined. *Petals* 4.5–6.0 × 0.9–1.1 mm, slightly concave-channeled, adhered for most of their length to the dorsal sepal, obliquely linear-spathulate, rounded, 1-veined. *Labellum* 5.0–6.0 × 3.0–3.5 mm, fleshy, erect with the distal third slightly deflexed, sessile, elliptic-ovate in outline, 5-veined; hypochile more or less quadrate, shortly and densely papillose, with a rounded, somewhat retrorse lobule at each side of the base, these ending in a slightly raised, papillose thickening (nectar gland); epichile semiorbicular, apex rounded to obtuse, somewhat conduplicate at apex in natural position, densely covered by digitiform papillae, margins crenulate. *Column* 2.9–3.1 mm long, shortly clavate, straight, column foot inconspicuous, *ca.* 1.0 mm long; *rostellum* abbreviated, upon removal of the pollinarium consisting of a narrow, transverse flap with a triangular central tooth and two smaller lateral teeth. *Anther cap* ovate, acute, brownish, with fleshy connective; *pollinarium ca.* 0.6 mm long, pollinia two, deeply cleft, white, viscidium oblong-ovate, white. *Ovary* 6.8–11.0 mm long × 2.7–3.0 mm in diameter, ascending, fusiform, obliquely arching at apex, slightly twisted, green, sparsely glandular-pubescent (trichomes shortly clavate, with the translucent apical cell prominent). *Capsule* not seen.

MATERIAL EXAMINED: COLOMBIA**. Cundinamarca**: Fómeque, Parque Nacional Natural Chingaza, entre Palacio y Monterredondo, en el sector hacia la cabaña de Palacio antes de llegar a la antigua mina de calizas de Palacio, 3000–3500 m, 4°16′54.71″N, 73°45′20.50″W, 13 Nov. 2016, *C. Castro, J. Betancur, R. Galindo, M. F. González & E. Hernández 649* (COL!, JAUM!). **Tolima**: Roncesvalles, vereda Portugal, cerca de la Reserva Natural Proaves, 3285 m, 3°59′30.94″N, 75°39′3.52″W, 14 Dec. 2018, *M. Rincón-González & J. S. Moreno 2346* (TOLI-32699!).

HABITAT AND ECOLOGY: *Funkiella muscicola* is known only from the northern Andes, including one record in the Cordillera de Mérida, Venezuela and one each in the Cordillera Central and the Cordillera Oriental of Colombia (Fig. 4). Plants grow as epiphytes on mossy tree trunks in montane wet forests at 3000–3500 m a.s.l. At the Tolima locality the forest is dominated by tree species such as *Billia rosea* (Planch. & Linden) C.Ulloa & P.M.Jørg., *Gaiadendron punctatum*

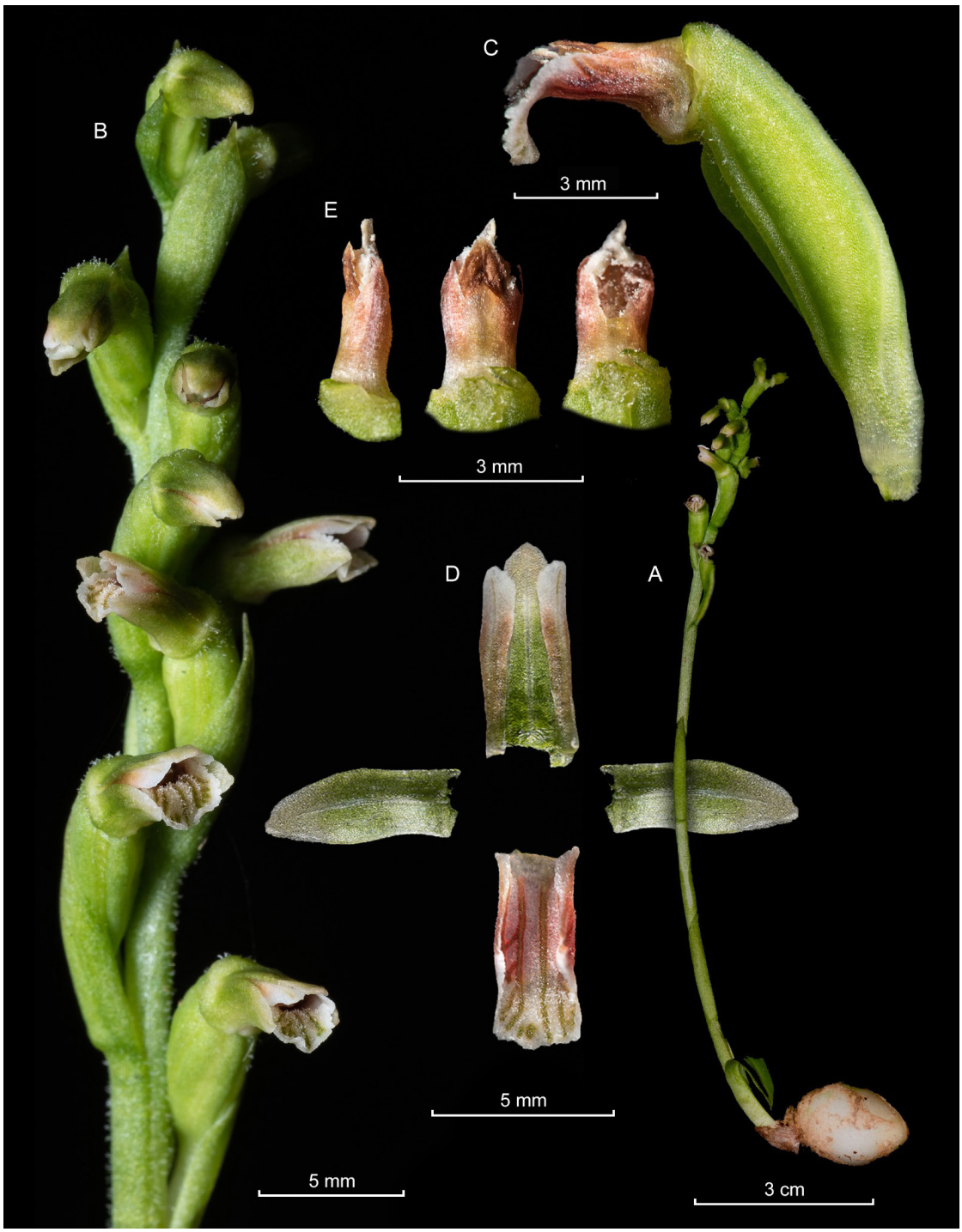


FIGURE 1. *Funkiella muscicola*. **A**. Habit. **B.** Detail of the inflorescence. **C.** Flower, lateral view. **D.** Dissected perianth; the petals are adnate to the dorsal sepal for most of their length, as they are in the intact flower, and are shown here in that condition. **E.** Column, dorsal, frontal, and lateral views. Based on *M. Rincón-González & J. S. Moreno 2346* (TOLI-32699). Photographs by J. S. Moreno.

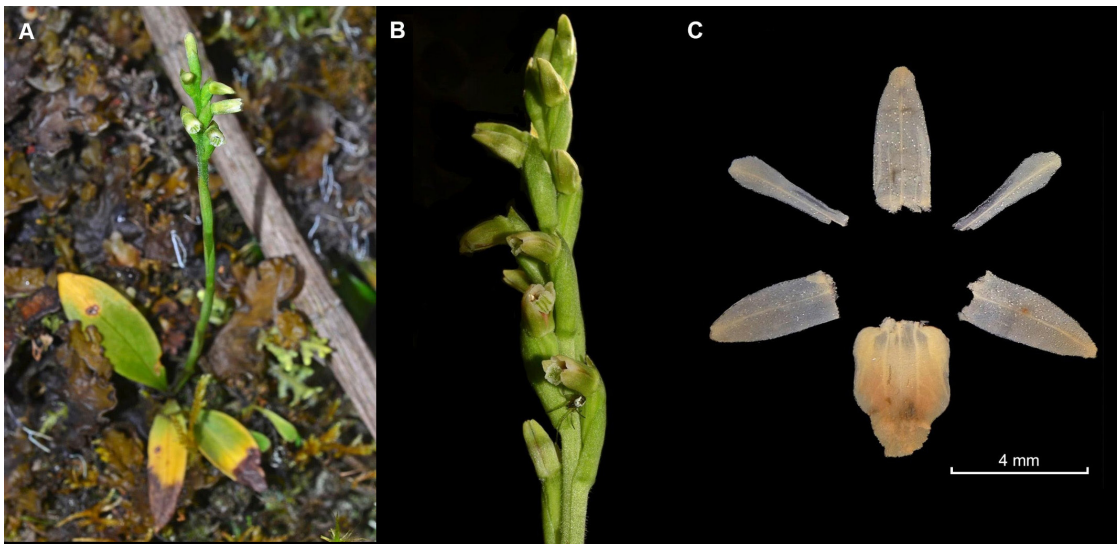


FIGURE 2. *Funkiella muscicola*. **A**. Flowering plant *in situ*. **B**. Close-up of the raceme of another plant. **C**. Dissected perianth. Based on Castro *et al*. 649 (COL, JAUM). Photographs by C. Castro (A, C) and S. Moreno (B).

(Ruiz & Pav.) G.Don, *Weinmannia tomentosa* L.f., and *Polylepis* sp., and the epiphytic orchids recorded there include *Epidendrum* sp., *Fernandezia myrtillus* (Rchb.f.) Garay & Dunst., and *Lepanthes intonsa* Luer. At the Cundinamarca locality there is a transition from subpáramo to páramo (Fig. 5); the most conspicuous arboreal elements there include *Buddleja bullata* Kunth, *Hesperomeles obtusifolia* (Pers.) Lindl., *Meriania brachycera* (Naudin) Humberto Mend. & Fern.-Alonso, *Oreopanax bogotensis* Cuatrec., *O. discolor* (Kunth) Decne. & Planch., *Symplocos theiformis* (L.f.) Oken, *Vallea stipularis* L.f., *Weinmannia fagaroides* Kunth, and *W. tomentosa* L.f.; shrubs such as *Aetanthus mutisii* (Kunth) Engl., *Cavendishia bracteata* (Ruiz & Pav. ex J.St.-Hil.) Hoerold, *Gaultheria anastomosans* (Mutis ex L.f.) Kunth, *Hypericum myricariifolium* Hieron., *Linochilus phylicoides* (Kunth) Saldivia & O.M.Vargas, *Macleania rupestris* (Kunth) A.C.Sm., *Miconia latifolia* (D.Don) Naudin, *M. stipularis* Naudin, *Monochaetum myrtoideum* (Bonpl.) Naudin, *Myrcianthes rhopaloides* (Kunth) McVaugh, and *Myrica parvifolia* Benth.; caulirosulate shrubs and treelets such as *Espeletia grandiflora* Bonpl. and *E. uribei* Cuatrec.; terrestrial orchids such as *Aa leucantha* (Rchb.f.) Schltr., *Cranichis asplundii* Garay; and epiphytic orchids such as *Epidendrum baryanthum* Hágsater & Salas Guerr., *E. cylindraceum* Lindl., *E. erosum* Ames & C.Schweinf., *E. oxysepalum* Hágsater & E.Santiago, *E. scutella* Lindl., *E. stenobractistachyum* Hágsater & E.Santiago, *Stelis calceolaris* Garay, *S. laevigata* (Lindl.) Pridgeon & M.W.Chase, *S. lanceolata* (Ruiz & Pav.) Willd., *S. parvilabris* Lindl., *S. pulchella* Kunth, *Oncidium ornithorhynchum* Kunth, and *Telipogon yolandae* P.Ortiz, among others. The Cundinamarca locality is close to a natural restoration area that was previously a limestone quarry, as well as to a property within the protected area occupied by settlers who practice cattle ranching in the páramo.

CONSERVATION NOTES: The two Colombian records reported here expand the known distribution of *F. muscicola* well beyond its type locality in Venezuela (Fig. 4). The three known localities span about 635 km along the northern Andes, and their extent of occurrence is *ca.* 42,800 km², above the 20,000 km² threshold of subcriterion B1 for a threatened category. The area of occupancy on a 2 × 2 km grid is 12 km², but with only three records this value reflects collecting effort rather than the area the species actually occupies. Two of the three localities lie inside national parks. The Cundinamarca population is within PNN Chingaza, and the Venezuelan type locality apparently falls within the Juan Pablo Peñaloza National Park, shared by the states of Mérida and Táchira, although no information on the status of the Venezuelan population is available. The Tolima population

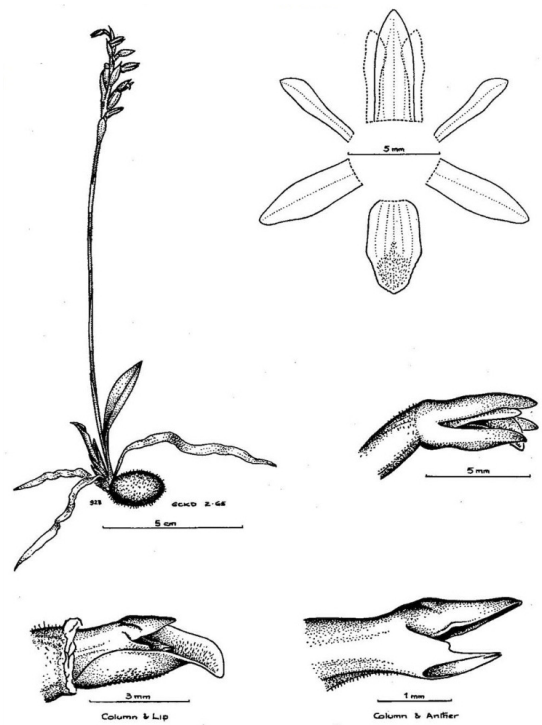


FIGURE 3. *Spiranthes muscicola* (= *Funkiella muscicola*), illustration by G. C. K. Dunsterville originally published in Dunsterville & Garay (1966: 281), reproduced by courtesy of the Orchid Herbarium of Oakes Ames, Harvard University Herbaria.

lies next to a reserve of the Fundación Proaves, and the species is likely to occur within it. The montane forest, subpáramo and páramo belts the species occupies remain extensive on the three cordilleras, and no site-specific decline in habitat area or quality has been documented, although the Cundinamarca population is exposed to disturbance from cattle raising inside the protected area. These orchids seem to be uncommon, but the small, greenish plants and flowers go easily unnoticed unless specifically searched for; hence, the paucity of records might reflect both insufficient collecting effort and biological rarity. On the available evidence *F. muscicola* meets none of the thresholds for a threatened category, and it is here assessed as Least Concern (LC).

PHENOLOGY: Flowering from December to February, corresponding to the driest part of the year. Mature capsules were not observed.

NOTES: *Funkiella muscicola* is similar to Ecuadorian *F. intagana* in the small size and epiphytic habit of the plants and in the relatively short and broad labellum, only slightly longer than wide, but it can be distinguished from the latter by the single tuberoid root (*vs.* about 5 tuberoid roots), floral bracts equaling the length of the ovaries (*vs.* floral bracts notoriously surpassing the ovaries), proportionally shorter, campanulate flowers (*vs.* long and narrow tubular flowers), showy green veins on the labellum epichile (*vs.* no colored veins), and the elliptic-ovate labellum (*vs.* obovate; Dodson, 1994). As noted by Salazar *et al.* (2025), the original illustration of *F. intagana* (as *Ecuadoria intagana* Dodson & Dressler; Dodson, 1994) portrayed five slender, cylindrical roots, but in the type specimen (*Dodson & Hirtz 16413*, MO ex RPSC, digital image!) the roots are short, thick, and more or less ellipsoid, *i.e.*, typical tuberoid roots of *Funkiella*.

The Colombian records agree with the description and illustration included in the protologue of *Spiranthes muscicola* (illustration reproduced here as Fig. 3; Dunsterville & Garay, 1966). Subsequently, upon proposing the new genus *Stalkya*, Garay (1982: pl. 53) published a new figure that reproduced some of the views of Dunsterville's original drawing but replaced the labellum and column views with drawings of his own, made from the single flower in spirit that constitutes the holotype and apparently the only material preserved of the plant that Dunsterville collected and drew alive. In Garay's new illustration the labellum is depicted as ovate, slightly constricted above the base, with a basal cavity and a distal cavity separated by a transverse ridge, and with a tuft of trichomes restricted to the center of the inner surface of the epichile, although the diagnosis of *Stalkya* merely described it as "*Labellum sessile, carnosum, margine supra basin utrinque lateris columnae agglutinatum, apice recurvum"* (Garay, 1982: 372). In contrast, in the protologue of *Spiranthes muscicola* the labellum is depicted as elliptic-ovate, with most of the inner surface of the epichile indumented and no indication whatsoever of either cavities or a keel; it was described as "*labello subquadrato, obtuso, intus hirsuto*" (Dunsterville & Garay, 1966: 280). We based our identification of the Colombian specimens on a comparison with Dunsterville's drawing, in which the labellum is very similar to that of the Colombian plants

(Fig. 1–3). The apparent discrepancies between the drawings of the labellum of this species made from fresh and liquid-preserved flowers of the same plant are puzzling, but reminiscent of a situation noted for *Cleistes tenuis* (Rchb.f. ex Griseb.) Schltr. by Romero-González *et al.* (2013). These authors documented the "double personality" of *C. tenuis*, *i.e.*, the different conclusions about its taxonomic identity that would be attained when either fresh or preserved material is studied, although in that case the problem seemed to result from distortion caused by pressing and drying.

The Colombian specimens substantially enlarge the known distribution of *Funkiella muscicola*, contributing to a better understanding of the distribution patterns of this genus in the Andes. Its occurrence in similar habitats on different Andean ranges agrees with a dynamic scenario of connections and disconnections of the páramo and associated biomes among and within all mountain ranges in the northern Andes over the past one million years (Flantua *et al.*, 2019). It also reveals a more or less continuous distribution of *Funkiella* throughout the major mountain ranges from southern North America, Central America, and the northern Andes south to northern Ecuador (Salazar *et al.*, 2025). Consistent with this pattern, a relationship at the generic level between the "alpine" flora of Mexico and that of the Andes has been noted by several authors (Rzedowski, 1975; Steinmann *et al*., 2021).

Several other orchids of the páramos and subpáramos of the northern Andes are distributed across two or more of the Colombian cordilleras, including *Cranichis asplundii*, *Cyrtochilum auropurpureum* (Rchb.f.) Dalström, *C. ramosissimum* (Lindl.) Dalström, *Draconanthes aberrans* (Schltr.) Luer, *Epidendrum borealistachyum* Hágsater, E.Santiago & C.F.Fernández, *E. erosum*, *E. fimbriatum* Kunth, *E. megalospathum* Rchb.f., *E. rugulosum* Schltr., and the recently published *E. baryanthum*, initially recorded in Peru but subsequently found in the same locality in Cundinamarca as *F. muscicola* (C. Castro, *pers. obs.*). Broad distributions across these ranges are therefore common among high-Andean orchids, and the previous restriction of *F. muscicola* to its type locality is better explained by the scarcity of collections from the corresponding elevational belt than by narrow endemism.

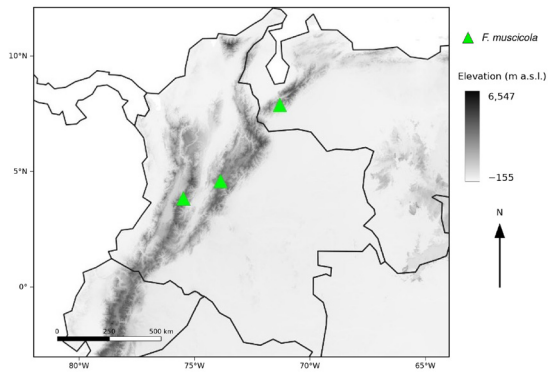


Figure 4. Known geographic distribution of *Funkiella muscicola* in northern South America. Green triangles indicate the three documented localities in Colombia and Venezuela.

Acknowledgements. The authors thank the Curators and staff of the herbaria AMES, AMO, ANDES, ARIZ, ASU, BM, BR, CAS, CHAPA, COL, ENCB, F, FCME, GH, HUA, IBUG, IEB, JAUM, JBB, JBSD, K, LL, M, MBM, MEXU, MO, NY, P, QCNE, QMEX, SEL, SERO, SLPM, TEX, TOLI, UAMIZ, UDBC, US, USJ, UVAL, VALLE, W, and XAL for courtesies extended during our study of the collections in their charge; Gustavo A. Romero-González (AMES) for the authorization to reproduce the original drawing of *F. muscicola* in our Fig. 3; Alejandra Rodríguez-González for help in the revision of herbarium collections; the late Gonzalo Cardona Molina for his collaboration in the fieldwork; Robinson Galindo Tarazona, head of PNN Chingaza from 2015 to 2018, who allowed and promoted scientific expeditions in the protected area, the officers and park rangers of the protected area, and the team of botanists of the Flora of Chingaza project of the Universidad Nacional de Colombia.

Author contributions. Conceptualization, formal analysis, writing - original draft, writing - review and editing: DLC, CC, GAS, MR, JSM. Data curation: DLC, GAS, MR. Investigation: DLC, JSM, MR. Validation: GAS, CC, MR.

Funding. This research did not receive funding.

Conflict of interest. The authors declare that they have no conflict of interest.

Permits. The ethical guidelines for plants and plant materials are followed in the study for sample collection and identification. Collecting was authorized by resolution ANLA 001971 of 9 September 2024, which grants the Jardín Botánico de Bogotá José Celestino Mutis permission to collect specimens of wild species for research and non-commercial purposes.



FIGURE 5. Habitat of *Funkiella muscicola* in the Parque Nacional Natural Chingaza, Cundinamarca, Colombia. **A.** View from Golillas towards the Palacio mine, in the background, with the transition from subpáramo to páramo. **B, C.** Vegetation characteristic of the Palacio subpáramo sector, with trees, shrubs, and tall caulirosulate Asteraceae of the genus *Espeletia*. **D.** Locality where *F. muscicola* was collected; the plants were found on the short trees and tall shrubs. Photographs by C. Castro.

Literature cited

Beentje, H. (2012). *The Kew plant glossary–An illustrated dictionary of plant terms. Richmond*: Kew Publishing, Royal Botanic Gardens Kew.

Betancur, J., Sarmiento-L., H., Toro-González, L., & Valencia, J. (2015). *Plan para el estudio y la conservación de las orquídeas en Colombia*. Bogotá D.C.: Ministerio de Ambiente y Desarrollo Sostenible & Universidad Nacional de Colombia.

Betancur, J., González, M. F., Hernández-Aldana, E., Castro, C., Gómez-Suescún, F., Hernández-Rodríguez, D. E., Jaimes-R, M. S., & Galindo-Tarazona, R. (2018). *Los colores del páramo de Chingaza. Guía de plantas.* Serie Guías de Campo del Instituto de Ciencias Naturales N.° 20. Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá.

Burns-Balogh, P. (1982). Generic redefinition in subtribe Spiranthinae (Orchidaceae). *American Journal of Botany*, *69*(7), 1119–1132.

Burns-Balogh, P. (1986). Sinopsis de la tribu [*sic*] Spiranthinae en México. *Orquídea (Mexico)*, *10*, 47–96.

Chase, M. W., Cameron, K. M., Freudenstein, J. V., Pridgeon, A. M., Salazar, G. A., van den Berg, C., & Schuiteman, A. (2015). An updated classification of Orchidaceae. *Botanical Journal of the Linnean Society*, *177*(2), 151–174.

Dodson, C. H. (1994). New orchid species and combinations from Ecuador 2. *Orquideologia*, *19*, 123–149.

Dueñas Gómez, H., & Fernández-Alonso, J. L. (2009). Sinopsis de la subfamilia Spiranthoideae (Orchidaceae) en Colombia, parte II. *Revista de la Academia Colombiana de Ciencias*, *33*(127), 157–181.

Dunsterville, G. C. K., & Garay, L. A. (1966). *Venezuelan Orchids Illustrated*, vol. 4, 280 pp. Londres: Editorial Andre Deutsch.

Flantua, S. G. A., O'Dea, A., Onstein, R. E., Giraldo, C., & Hooghiemstra, H. (2019). The flickering connectivity system of the north Andean páramos. *Journal of Biogeography*, *46*(8), 1808–1825.

Garay, L. A. (1982). A generic revision of the Spiranthinae. *Botanical Museum Leaflets, Harvard University*, *28*(4), 277–425.

IUCN. (2025). The IUCN Red List of Threatened species. Version 2025-1. Retrieved from: https://www.iucnredlist.org/.

Romero-González, G. A., Henao, H., Gómez, C., & Carnevali, G. (2013). Novelties in the orchid flora of Venezuela VI. Vanilloideae, Pogonieae. Notes on *Cleistes tenuis*, a double personality species. *Harvard Papers in Botany*, *18*(2), 225–235.

Rzedowski, J. (1975). An ecological and phytogeographical analysis of the grasslands of Mexico. *Taxon*, *24*(1), 67–80.

Salazar, G. A. (2003). *Funkiella*. In A. M. Pridgeon, P. J. Cribb, M. W. Chase & F. N. Rasmussen (Eds.), *Genera Orchidacearum vol. 3: Orchidoideae part 2, Vanilloideae* (pp. 207–210). Oxford: Oxford University Press.

Salazar, G. A., Hernández-López, T. J., Sharma, J., Jiménez-Machorro, R., Cabrera, L. I., & Treviño-Carreón, J. (2016). *Greenwoodiella*, a New Genus of Spiranthinae (Orchidaceae) from North and Central America and the Greater Antilles, with a New Species from the Chihuahuan Desert. *Systematic Botany*, *41*(4), 823–838.

Salazar, G. A., Batista, J. A., Cabrera, L. I., van den Berg, C., Whitten, W. M., Smidt, E. C., Buzatto, C. R., Singer, R. B., Gerlach, G., Jiménez-Machorro, R., Radins, J. A., Insaurralde, I. S., Guimarães, R. S., Barros, F. D., Tobar, F., Linares, J. L., Mújica, E., Dressler, R. L., Blanco, M. A., Hágsater, E., & Chase, M. W. (2018). Phylogenetic systematics of subtribe Spiranthinae (Orchidaceae: Orchidoideae: Cranichideae) based on nuclear and plastid DNA sequences of a nearly complete generic sample. *Botanical Journal of the Linnean Society*, *186*(3), 273–303.

Salazar, G. A., Fortanelli-Martínez, J., Castillo-Lara, P., & Cabrera, L. I. (2025). A new species, four new combinations, a lectotypification, phylogenetic analysis, and a key to the species in *Funkiella* (Orchidaceae, Cranichideae, Spiranthinae). *Phytotaxa*, *702*(2), 117–134.

Stearn, W. T. (2004). *Botanical Latin*, ed. 4. Portland: Timber Press.

Steinmann, V. W., Arredondo-Amezcua, R., Hernández-Cárdenas, R. A., & Ramírez-Amezcua, Y. (2021). Diversity and origin of the central Mexican alpine flora. *Diversity, 13*(1), 31.

Thiers, B. (2025; continuously updated). Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Retrieved September 2026, from: http://sweetgum.nybg.org/science/ih/.