

New records for the flora of Colombia: *Baskervilla auriculata* Garay, *Brassia whewellii* J.M.H.Shaw, and *Epidendrum pucunoense* Hágsater & Dodson (Orchidaceae, Epidendroideae)

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Abstract. The Andean-Amazonian Foothills is a biodiverse ecotone threatened by legal and illegal anthropogenic activities. We report for the first time three orchid species from this ecotone in Colombia. We propose that *Baskervilla auriculata* Garay and *Brassia whewellii* J.M.H.Shaw each have a conservation status of Least Concern, and that *Epidendrum pucunoense* Hágsater & Dodson is Vulnerable. We propose that all three species are Critically Endangered in Colombia, as each species is known from only a single population and each location exhibits habitat degradation. Our findings highlight the local biodiversity and the need for its conservation.

Keywords. Chorological novelty, conservation, El Doncello, foothills, orchids, extinction risk

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Introduction

Orchids are a highly species-rich group of flowering plants, with estimates ranging from 20,000–30,000 species and nearly 800 genera distributed worldwide, except in Antarctica (Chase et al. 2015; Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015). The Colombian orchid flora is one of the richest in the tropics, and this richness is especially evident in the Andean region, where most floristic studies have been conducted. Nevertheless, the list of Colombian orchids is continuously increasing, and several new species, new country records, and geographical range expansions are constantly being published (e.g. Moreno et al. 2022; Rodríguez-S et al. 2023; Rojas-P et al. 2023; López-Florianio et al. 2024; Perdomo et al. 2024a).

The department of Caquetá is divided into three subregions: the Amazonian lowlands (<250 m), the Andean-Amazonian Foothills (AAF; 250–800 m), and the Andean Amazonian (>800 m). The department harbours exceptional biodiversity due to evolutionary, biogeographical, and ecological processes that have shaped its diverse landscapes (Etter et al. 2006a; Hoekstra et al. 2010). The biodiversity of the AAF in Caquetá is threatened by deforestation caused by legal and illegal logging, cattle ranching, and mining (Hoffmann et al. 2018; Sierra et al. 2022; Galarza et al. 2023). The orchids of this ecotone represent a remarkable component of the floral diversity of Colombia, with this department ranking eighth nationally in terms of number of genera and ninth in species richness. Among the 98 genera reported from Caquetá, the most species-rich genera are *Epidendrum* L. and *Maxillaria* Ruiz & Pav., which together account for 30% of the orchid diversity (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015; Arias et al. 2023).



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Although national parks safeguard about 65% of the remaining protected areas, Caquetá faces severe deforestation due to illegal logging and agricultural expansion, particularly for livestock and illicit crops (Armenteras et al. 2006; Etter et al. 2006b). As a result, the region has lost over 30% of its forest cover, threatening biodiversity and the habitats of numerous species (Hoffmann et al. 2018; Sierra et al. 2022). To date, no studies have been conducted on assessing the conservation status or extinction risk categorization for the Orchidaceae species in this department. Only a few species have proposed categorization following the IUCN categories and criteria (Lizcano et al. 2024; Ministerio de Ambiente y Desarrollo Sostenible 2024; Cuellar et al. 2024; Perdomo et al. 2024b).

Global and national conservation assessment scales are at different but complementary levels in biodiversity decision-making. At the global level, the International Union for the Conservation of Nature (the Red List), provides the most authoritative assessments of the risk of extinction for orchid species and serves as a foundation for international conservation policy, priority setting, and funding allocation (Betts et al. 2020; Brodsky et al. 2023; Cazalis et al. 2024). The IUCN Red List is widely used by governments, researchers, and major funders to guide conservation investment and to inform long-term strategies for biodiversity protection (Betts et al. 2020). At the same time, national Red Lists have become indispensable for informing conservation planning at the country level, where most management decisions are implemented. However, national assessments frequently differ from global classifications due to differences in information used, data availability, and local population trends, generating inconsistencies that may hinder coordinated conservation actions across regions (Brodsky et al. 2023). Recognizing the complementary nature of these assessment scales is, therefore, crucial for integrating newly documented species into both global conservation frameworks and national planning efforts.

Documenting orchid diversity in Caquetá is highly important due to its location in the Andean–Amazon transition zone, a biodiversity hotspot (Hoffman 2018; Sabatini et al. 2022). Comprehensive orchid inventories can fill knowledge gaps and provide a scientific foundation for conservation planning, sustainable land-use management, and the protection of endemic and threatened species. Such efforts are especially urgent given the ongoing threats from deforestation, habitat degradation, and climate change. In this study (1) report three orchid species for the first time from Colombia belonging to the genera *Brassia* R. Br., *Baskervilla* Lindl., and *Epidendrum*, and (2) to establish the conservation status of the habitat and the Red List category of these species.

Methods

Specimens were collected during botanical expeditions carried out in the Andean-Amazonian Foothills, in the municipality of El Doncello, Caquetá department, Colombia (Figure 1). At each collecting site, we photographed plants and recorded geographic coordinates, elevation, and habitat. Photographs of living material were captured with a Canon 7D Mark II camera and a 100 mm f/2.8 USM macro lens. The herbarium specimens were deposited at JBB and HUAZ (Thiers 2025). We identified our specimens to species and determined the novelty of their chorological records for Colombia by reviewing online databases, catalogues, and original protologues (*Baskervilla*: Garay 1978; *Epidendrum*: Hágsater and Dodson 2001; and *Brassia*: Bennett and Christenson 2001). The original protologues were consulted and used as the comparative baseline, and the diagnostic characters from the original descriptions were incorporated and contrasted with observations obtained from our newly collected material. We ensured consistency with established species concepts while accounting for potential expansions or reinterpretations since their initial publication (Garay 1978; Bennett and Christenson 2001; Hágsater and Dodson 2001).

To assess the Red List category of these species, we relied on Criterion B, which is based on geographic distribution (IUCN 2024). We began by retrieving all recorded occurrences of the species available on GBIF, Tropicos.org, SpeciesLink, Biovirtual, the Catalogue of Plants and Lichens of Colombia, and the Virtual Herbarium of the Amazonian Institute for Scientific Research (SINCHI). We also did a literature search for scientific articles and other documents reporting the species through Google Scholar).

We used geographic coordinates to estimate the Extent of Occurrence (EOO), which is equivalent to the area within the convex polygon encompassing all occurrences, and the Area of Occupancy (AOO) using GeoCAT (RBG 2024). Deforestation within the EOO (2001–2024) was estimated using Global Forest Change data, analyzed in R (R Core Team 2024) via RStudio (Posit PBC 2024), and interpreted as a proxy for habitat conservation (Hansen et al. 2013). We then used the AOO squares (2

Figure 1. Known populations of *Brassia whewellii* J.M.H.Shaw, *Baskervilla auriculata* Garay and *Epidendrum pucunoense* in Bolivia, Peru, Ecuador, and the municipality of El Doncello, department of Caquetá, Colombia.



× 2 km) generated for each species to estimate deforestation within each area, applying the same methodology. Additionally, we delineated circular buffers of 4 km², 10 km², and 100 km² around each Colombian population to assess habitat conservation (Parra-Sánchez et al. 2024b; Rojas-P et al. 2025). These buffers represent the AOO for each population (4 km²), the maximum AOO (10 km²) and EOO (100 km²) for the Critically Endangered category of the (IUCN 2024). Finally, we applied the IUCN Criterion B to determine the applicability of the Red List category for each species, considering the number of populations, AOO, EOO and habitat conservation status.

Results

Three species are reported for the first time from the Andean-Amazonian Foothills and Amazonian forest in El Doncello municipality, department of Caquetá, Colombia.

***Baskervilla auriculata* Garay**, Flora of Ecuador 9: 208. 1978.

Figure 2

Materials examined. COLOMBIA — CAQUETÁ • El Doncello municipality, Vereda las Américas, finca La Sierra Nevada; 01°44'31"N, 075°20'09"W; 1436 m elev.; 14.X.2024; E. Trujillo, J. Cuellar, A. Rojas-P 8241 (HUAZ! [25913]).

Identification. This terrestrial plant species is recognized by its broadly ovate basal leaves; erect inflorescence; non-resupinate, green to whitish flowers with a concave dorsal sepal; ovate lateral sepals; petals that are adnate to the column; trilobed lip, adnate to the middle of the column; and cylindrical column with an erect rostellum.

Description. Terrestrial herb, to 65 cm tall. Rhizome ascending, with sparse roots. Roots spreading, fleshy, villous. Leaves basal, rosulate, up to 7, long-petiolate; petiole to 10 cm long, broadly ovate, rounded at base, acute or abruptly acuminate at apex; blades 15.0–23.0 × 7.0–7.7 cm. Peduncle erect, ca. 16.7 cm long, glabrous, with 4 or 5 distant sheaths, ending in a cylindrical, subdensely flowered spike, 14.3–24 cm long. Bracts ovate-lanceolate, acuminate, to 15 mm long, decreasing in size upwards. Flowers greenish white. Dorsal sepal narrowly lanceolate, acuminate, concave, 10.0–12.0 × 3.1 mm; lateral sepals obliquely ovate, unequally cordate at base, acute, 7.4–12.0 × 4.7–5.0 mm. Petals highly adnate to column; free portion reflexed, unguiculate, auriculate-dolabriform, obtuse to rounded at apex, 1-nerved, 8.0–9.0 × 4.0 mm. Lip adnate to middle of column, 3-lobed; lateral lobes falcate, acuminate, 4.0–6.0 mm long; median lobe ovate, concave, obtuse, basally produced into a

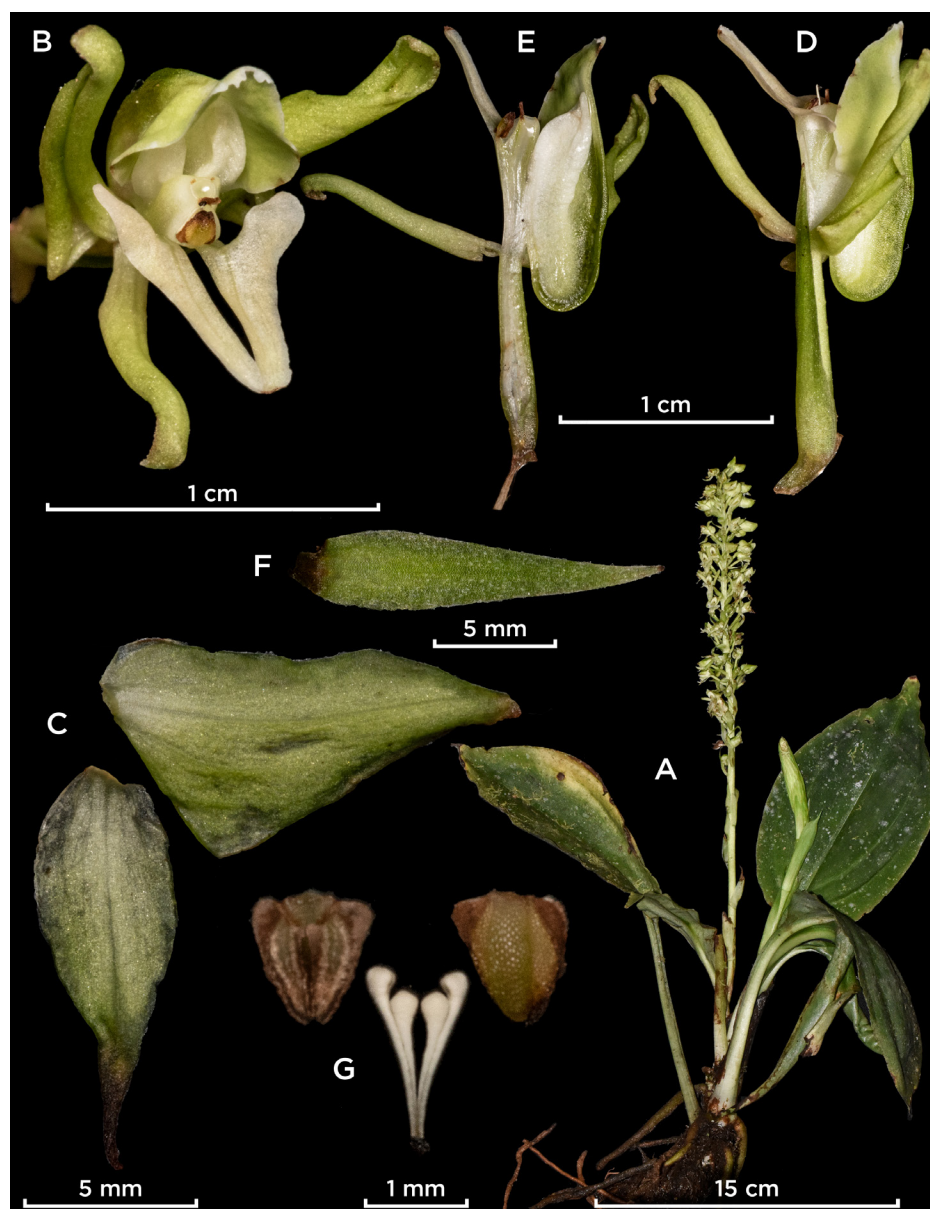


Figure 2. Composite plate of *Baskervilla auriculata* Garay. **A.** Plant habit. **B.** Flower in 3/4 view. **C.** Dissected perianth. **D.** Flower, lateral view. **E.** Flower longitudinal section. **F.** Floral bract. **G.** Anther cap and pollinia.

subcylindrical sac; entire lip to 11.0×6.0 – 6.5 mm. Column cylindrical, with erect rostellum, 5.3 – 6.0 mm long. Ovary cylindrical, sessile, 7.0 – 10.0 mm long.

Type. ECUADOR — ZAMORA-CHINCHIPE • Valley of Río Zamora, E of Loja; CAMP E-40! (AMES).

Other previously known records. PERU — OXAPAMPA • Distrito Chontabamba, Sector la Suiza Vieja; Bosque premontano, secundario; $10^{\circ}22'S$, $075^{\circ}18'W$; 2067 m elev.; 15.VIII.2006; C. Arias 0344; USM.

Distribution. This species has two varieties: var. *auriculata* in Ecuador and var. *yungasensis* in Bolivia. The population reported here belongs to var. *auriculata* and extends the known geographic distribution 365 km to the northeast.

Brassia whewellii J.M.H.Shaw, Orchid Rev. Suppl., 122(1305): 16 (2014)

Figure 3

Synonyms. *Ada peruviana* D.E.Benn. & Christenson, Icon. Orchid. Peruvianum t. 603 (2001).

Materials examined. COLOMBIA — CAQUETÁ • El Doncello, Vereda las Américas; $01^{\circ}44'30''N$, $075^{\circ}20'10''W$; 1430 m elev.; 2.III.2024 (fl.); E. Restrepo, J. Cuellar 176 (JBB![43545]).

Identification. This species is easily identified as an epiphytic to slightly creeping plant with fleshy, flexuous roots; ovoid, laterally compressed pseudobulbs with a bifoliate apex, enclosed in sheaths; oblanceolate, acuminate, subcoriaceous leaves; a lateral, racemose, erect inflorescence with flowers decreasing in size toward the apex; sepals and petals pale green with sparse brown or purple spots;

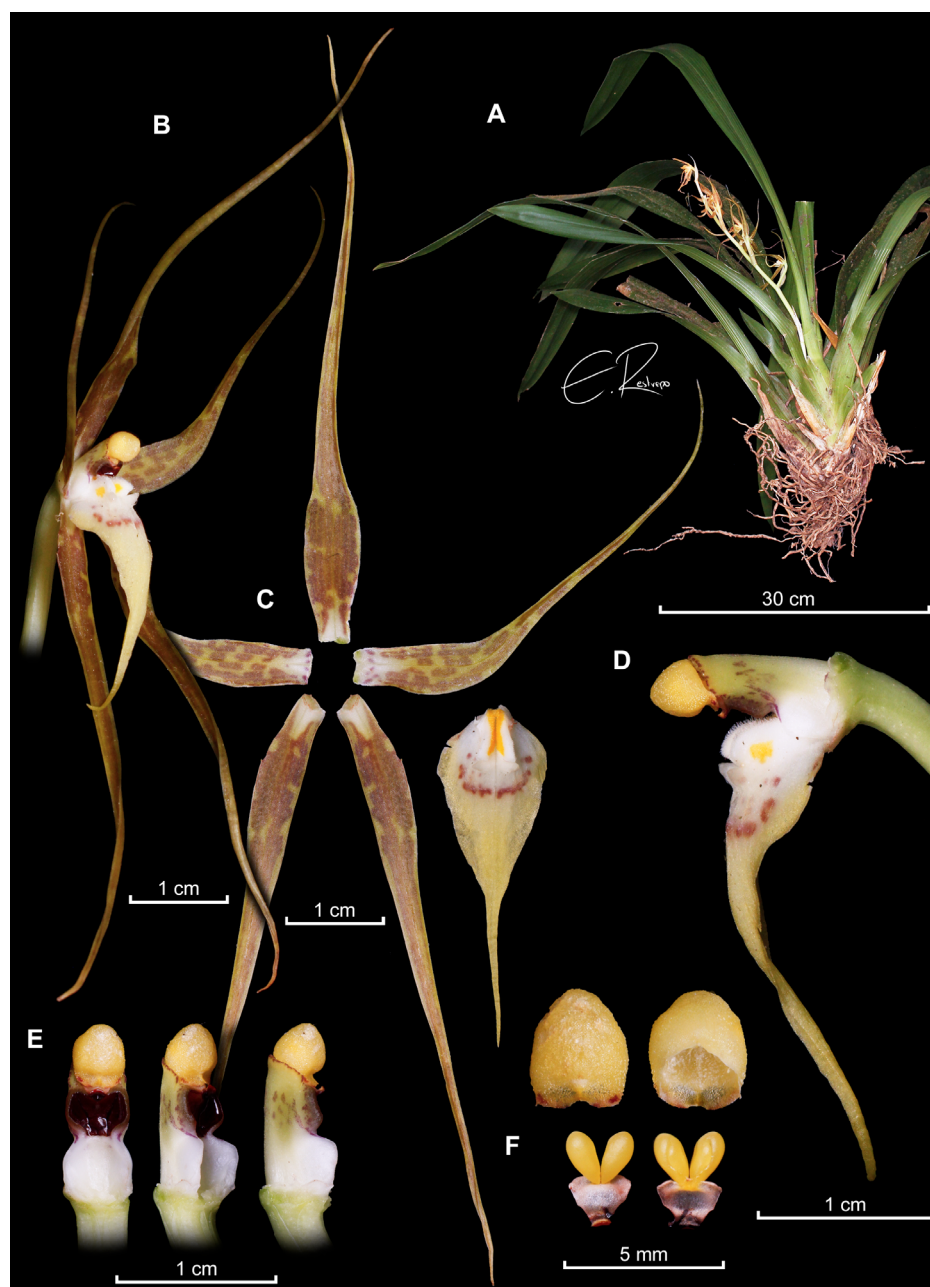


Figure 3. Composite plate of *Brassia whewellii* J.M.H.Shaw. **A.** Plant habit. **B.** Flower in 3/4 view. **C.** Dissected perianth. **D.** Column and lip, lateral view. **E.** Column in frontal, 3/4 and lateral view. **F.** Anther cap and pollinia.

a lip white at the base, turning green toward the apex, with purple-brown spots and a bright yellow callus; narrowly lanceolate, long-acuminate sepals; lanceolate petals curved upward; an entire, ovate-rhomboid lip with two fleshy keels; and a robust column, winged at its basal half.

Description. Plant epiphytic, caespitose to shortly creeping, up to 66 cm tall. Roots fleshy, flexuous, ca. 4 mm in diameter. Pseudobulbs ovoid, compressed, to 10.2–11.2 × 2.0–2.8 cm, ca. 1.5 cm thick, apically 2-foliate, subtended at base by 7–9 sheaths; lower sheaths triangular, acute, scarious and upper ones foliaceous, subequal to leaves. Leaves narrowly oblanceolate, acuminate, acute, subcoriaceous, 49.0–55.0 × 3.4–4.2 cm, constricted at base into a conduplicate petiole ca. 3.4 cm long. Inflorescences a lateral, pedunculate raceme, erect, up to 34.4 cm long; peduncle terete, to 18.5 cm long, provided with 3–5 lanceolate, acuminate, acute bracts, to ca. 3.2 × 0.7 cm, slightly longer than ovaries. Ovary pedicellate, terete to subclavate, ca. 2.7 cm long including pedicel. Flowers 7–9, progressively smaller toward inflorescence apex; sepals and petals pale green with sparse, brown or purple spots; lip white at base, grading to pale green toward apex, with a transverse row of 5 or 6 reddish-purple-brown spots; callus bright yellow at longitudinal centre; column white at base, greenish at distal half; stigma dark purple; anther cap yellow. Dorsal sepal narrowly lanceolate-elliptical, long acuminate, acute, 4.5–6.1 × 0.6–0.8 cm; lateral sepals linear-lanceolate, long-acuminate, 4.5–6.4 × 0.4–0.6 cm; petals elliptic-lanceolate, long-acuminate, 2.8–5.0 × 0.4–0.8 cm, falcate upwards. Lip unlobed, entire,

ovate-rhombic, sessile, long-acuminate, convex, $2.2\text{--}3.4 \times 0.9\text{--}1.2$ cm, disc consisting of two fleshy, parallel, erect, densely short-pubescent ridges, and two apical, low, distinct, rounded teeth. Column stout, winged at the basal half, terete, column-foot absent, $0.9\text{--}1.1$ cm long. Anther cap cucullate, ovate, papillose, ca. 3.8×3.2 mm. Pollinia 2, obovate, on a small widely obtriangular stipe, convex; viscidium ovate-triangular, brown.

Type. PERU — JUNÍN • Chanchamayo, nd; Bennett 7770 (HT).

Other previously known records. PERU — Pasco • Oxapampa, Jardín de Orquídeas del JBM; $10^{\circ}34'54''\text{S}$, $075^{\circ}24'25''\text{W}$; 1800 m elev.; 23.III.2013; Luis Valenzuela G.; HOXA 22348 — Huánuco • Distrito Pucayacu, Nueva Esperanza, Parque Nacional Cordillera Azul; $08^{\circ}29'28''\text{S}$, $076^{\circ}05'35''\text{W}$; 1340 m elev.; 28.II.2022; G. Luis Valenzuela, M. Pardo, E. Pardo, R. Nuñez 41337; USM.

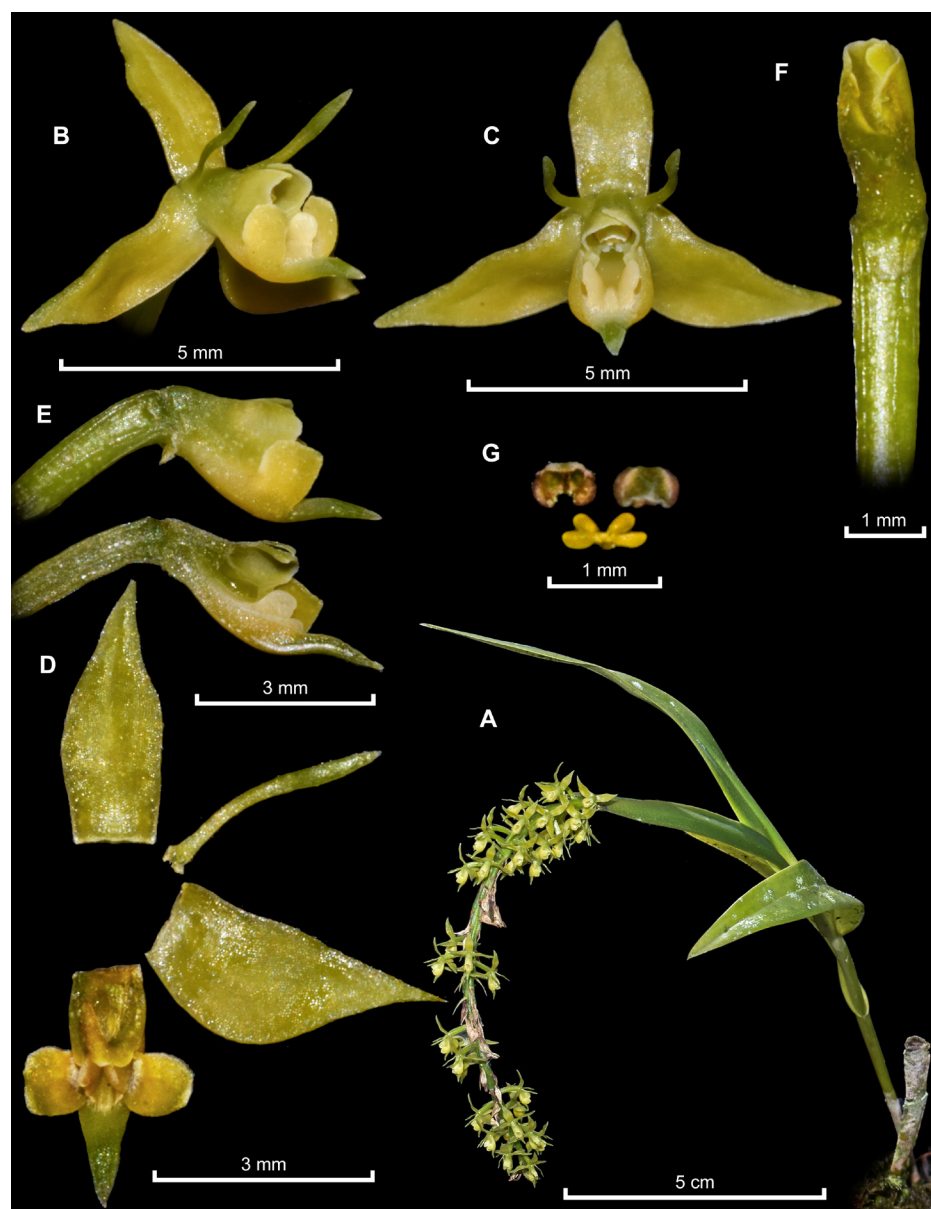
Distribution. Previously known from two localities in Huánuco and Pasco departments in central Peru, the Colombian population extends the range by approximately 1,100 km northward.

Epidendrum pucunoense Hágsater & Dodson, Icones Orchidacearum 4: [156], t. 476. 2001

Figure 4

Materials examined. COLOMBIA — CAQUETÁ • El Doncello, Vereda las Américas, finca La Sierra Nevada; $01^{\circ}42'54''\text{N}$, $075^{\circ}19'04''\text{W}$; 1151 m elev.; 14.X.2024; E. Trujillo, A. Rojas-P., J. Cuellar 8242 (HUAZ [25914]).

Figure 4. Composite plate of *Epidendrum pucunoense* Hágsater & Dodson. **A.** Plant habit. **B.** Flower in 3/4 view. **C.** Flower in front view. **D.** Dissected perianth. **E.** Column with labellum in lateral view and longitudinal section. **F.** Column in front view, and lateral view. **G.** Anther cap and pollinia.



Identification. This species is recognized as a caespitose epiphytic orchid with a short rhizome; thick, fleshy basal roots; stems cane-like, slightly flexuous and ancipitous; leaves articulated and distributed along the stem, with narrowly elliptic blades and acute apex; apical, racemose, arching inflorescence; small, simultaneous flowers, white or green, with the lip always oriented toward the rachis; reflexed, ovate sepals, the dorsal acute and the laterals acuminate; acute petals; a trilobed, acute lip fused to the column; and a short, thick column.

Description. Epiphytic, caespitose herb, 12.6–86 cm tall. Rhizome short. Roots basal, thick, fleshy, 1–2 mm in diameter. Stems cane-like, slightly flexuous, ancipitose, 17.0×0.2 – 0.5 cm. Leaves 3, articulated, distributed along the stem; sheaths ancipitose, smooth, with lower one non-foliar, 26 – 31×10 – 25 mm; blade narrowly elliptical, apex acute, grass-like, with a prominent dorsal keel, unequal, progressively longer, 72 – 92×10 – 15 mm. Spathes 1 or 2, with almost parallel sides, acute, covering the peduncle, 55 – 62×4 – 6 mm. Inflorescence apical, arising from mature growth, racemose, arching, foxtail-like, few-flowered, with 30–40 flowers, raceme 8.6 cm $\times$ 1.18 – 1.63 cm, peduncle, 3.5 – 5 cm long. Floral bracts very thin, linear-triangular, acuminate, as long as or slightly longer than ovary, 3 – 7×0.7 mm. Ovary terete, 3 – 4 mm long. Flowers small, with lip always facing rachis, simultaneous, creamy-yellow or white, fragrance not recorded. Sepals reflexed, ovate, thickened near apex, 3-veined, central vein prominent when dry; dorsal sepal acute, ca. 3.6×1.3 mm; lateral sepals acuminate, with prominent dorsal apical keel, ca. 4.2×1.7 mm. Petals slightly spreading, linear, slightly narrower near base, acute, 1-veined; vein prominent when dry, ca. 3.4×0.3 mm. Lip united to column, trilobed, ca. 3.35×2.35 mm; bicallose; calli laterally compressed, with a short keel between them; lateral lobes orbicular, entire margin, 0.92 – 1.02 mm in diameter; mid-lobe triangular, acute, 1.8×0.5 – 0.7 mm. Column short, thick, ca. 2.4 mm long including the clinandrium. Clinandrium prominent, straight, occupying $\frac{1}{2}$ length of column, funnel-shaped, emarginate, entire. Anther reniform, blunt at front, 4-locular. Pollinia 4, ovoid, laterally compressed, subequal, 0.25 – 0.31×0.15 – 0.17 mm. Rostellum positioned at $\frac{1}{2}$ column length including clinandrium, cleft. Lateral lobes of stigma small. Nectary shallow, penetrating slightly behind the perianth, broad at base, smooth inside. Anther cap 0.38 – 0.42×0.62 – 0.64 mm.

Type. ECUADOR — NAPO • Entre el río Pucuno y el río Guamaní, carretera Hollín-Loreto-Coca; $00^{\circ}46'S$, $077^{\circ}26'W$; 1100–1200 m elev.; 11.XII.1987; C.E. Cerón M. 2884 (holotype: QCNE! Isotype: RPSC!).

Other previously known records: ECUADOR — ZAMORA-CHINCHIPE • El Panguí, Cordillera de Shagmí; $03^{\circ}37'S$, $078^{\circ}32'W$; 802 m elev.; 28.X.2020; L. Vélez-Abarca 64; ECUAMZ.

Distribution. Previously known from two localities in Napo and Zamora-Chinchipe departments in Ecuador, the Colombian population extends the range by approximately 335 km to the northeast.

Red List Assessments

We propose the Red List category Least Concern for *B. auriculata*, as this species does not meet the criteria to be classified as threatened with extinction. Although its AOO is less than 500 km² with 4.5% deforested and falls within the Endangered category, its EOO is nearly 1 million square kilometres, with only 2.42% of forest cover lost in the last two decades (Table 1). Given the vast EOO, the likelihood of finding additional populations is high and expected to increase with further surveys, which would reduce the likelihood that this species is threatened.

For *B. auriculata* in Colombia we propose that this species is Critically Endangered [B2ab(i,ii,iii)] because it is only one known population is known, the AOO is less than 10 km² with 9.3% deforested, and habitat is degraded throughout its EOO, where forest cover loss has reached 19%. Additionally, within buffer zones of 4 km², 10 km², and 100 km², we determined a loss of forest cover of 30–50% (Table 2). In Ecuador, Peru, and Bolivia, where the species also occurs, we recommend a status of Least Concern, as it does not meet the criteria of any of the threatened categories.

We propose the conservation status of Least Concern for *B. whewellii*, as the species does not meet any criteria for threatened. Although its AOO is estimated at 12 km², with 2.45% of this deforested—a value that suggests Endangered status—its EOO is large, reaching 53,526 km² and only 5.95% of the forest cover has been lost within this area over the past two decades (Table 1). The wide EOO indicates a high probability of discovering new populations with additional fieldwork.

We propose that the Colombian population of *B. whewellii* is Critically Endangered [B2ab(i,ii,iii)] due to the existence of a single known population, an AOO of less than 10 km² with 4.74% of this area deforested, and ongoing habitat degradation across its EOO, where loss of forest cover has exceeded 18%. Moreover, within buffer zones of 4 km², 10 km², and 100 km², forest-cover loss is 10–30% (Table 2). In Peru we propose that this species is Least Concern, as it does not meet the criteria of any of the threatened categories.

Table 1. Data and proposal of categorization of the risk of extinction at national and global level for *Baskervilla auriculata*, *Brassia whewellii*, and *Epidendrum pucunoense* following IUCN categories and criteria. AOO = Area of Occupancy, EOO = Extent of Occurrence, % loss = percentage of forest cover loss from 2001 to 2024.

<i>Baskervilla auriculata</i>					<i>Brassia whewellii</i>				<i>Epidendrum pucunoense</i>			
					Populations, AOO, and % habitat loss							
	# popula- tions	AOO (km ²)	Def area (km ²)	% loss	# popula- tions	AOO (km ²)	Def area (km ²)	% loss	# popula- tions	AOO (km ²)	Def area (km ²)	% loss
Colombia	1	4	0.37	9.34	1	4	0.19	4.75	1	4	0.17	4.16
Ecuador	11	44	0.23	5.68	0	0	0.00	0.00	2	8	0.95	23.72
Peru	2	8	0	0.06	3	8	0.10	2.59	0	0	0.00	0.00
Bolivia	1	4	0.05	1.13	0	0	0.00	0.00	0	0	0.00	0.00
Total	15	60	0.65	16.21	4	12	0.29	7.34	3	12	1.12	27.88
					EOO, deforested area, and % habitat loss							
	EOO (km ²)	Def area (km ²)	% loss		EOO (km ²)	Def area (km ²)	% loss		EOO (km ²)	Def area (km ²)	% loss	
Colombia	33,161	6,579	19.8		1,434	282	19.6		1139	214	18.8	
Ecuador	132,108	7,101	5.4		1,784	24	1.3		7160	840	11.7	
Peru	632,961	4,594	0.7		50,309	3,017	6		—	—	—	
Bolivia	14,654	263	1.8		—	—	—		—	—	—	
Brazil*	107,449	—	—		—	—	—		—	—	—	
Total	920,333	18,537	27.7		53,527	3,323	26.9		8,299	1,054	30.5	
IUCN Red List category												
Colombia	Critically Endangered: B2ab(I,ii,iii)				Critically Endangered: B2ab(i,ii,iii)				Critically Endangered: B2ab(i,ii,iii)			
Ecuador	Least Concern				—				Least Concern			
Peru	Least Concern				Least Concern				—			
Bolivia	Least Concern				—				—			
Global	Least Concern				Least Concern				Endangered: B2ab(i,ii,iii)			

* The EOO was estimated, but no category was assigned due to the absence of species records in the country.

Finally, for *E. pucunoense* we suggest that this species is Endangered [B2ab(i,ii,iii)]: three populations are known, and the AOO is 12 km², with 17.2% of this area deforested. Additionally, the EOO is not so large, at 8,299 km² and has experienced a 12.70% loss of forest cover over the past two decades (Table 1).

We propose that the Colombian population of *E. pucunoense* is Critically Endangered [B2ab(i,ii,iii)], as only one population is currently known and its AOO is less than 10 km², with 4.2% of this area deforested. Habitat degradation across its EOO has resulted in a forest-cover loss of 213 km², representing more than 18% of the EOO. Furthermore, within buffer zones of 4 km², 10 km², and 100 km², we observed a reduction in forest cover of 60–70% (Table 2). Given the current EOO, available data suggest that deforestation processes will likely continue and it is unlikely that additional populations will be found. We recommend the status of Least Concern for Ecuador, as *E. pucunoense* does not meet the thresholds of any threats.

Deforestation and forest fragmentation threaten epiphytic and terrestrial orchids by altering essential habitat conditions, such as canopy cover and microclimate (Besi et al. 2023; Parra-Sánchez et al. 2024a). The elimination of canopy structure and leaf litter during wood extraction, along with reduced soil moisture and disrupted microbial symbioses, are key factors driving the decline of terrestrial orchid populations (Pierce and Belotti 2011; Besi et al. 2019, 2023).

Table 2. Forest cover in 2000 (FC00), deforestation from 2001 to 2023 (Def) for the three buffers (data in km²), deforestation in the buffer (%Def), forest cover in 2025 (FC25), and remaining forest in 2024 (%FC) around Colombian populations of *Baskervilla auriculata* Garay, *Brassia whewellii* J.M.H.Shaw and *Epidendrum pucunoense* Hágsater & Dodson.

Species	Buffer (km ²)	FC00 (km ²)	Def (km ²)	% Def	FC25 (%)	% FC
<i>Baskervilla auriculata</i>	4	3.10	0.33	8.25	2.77	69.25
	10	7.71	0.72	7.26	6.98	69.85
	100	58.21	5.86	5.86	52.34	52.34
<i>Brassia whewellii</i>	4	1.49	0.18	4.65	1.35	32.66
	10	3.97	0.38	3.83	3.58	35.86
	100	37.4	4.54	4.54	32.85	32.85
<i>Epidendrum pucunoense</i>	4	1.38	0.14	3.71	1.23	30.78
	10	3.99	0.39	3.96	3.59	35.94
	100	41.0	4.64	4.64	36.35	36.35

Discussion

Each of the three orchid species reported here is known in Colombia from a single locality, with an AOO of only 4 km² and occurs in landscapes undergoing active habitat loss, which lead to our proposed categories using IUCN criteria. Highly restricted distributions, and intense anthropogenic pressure mirror those reported for other orchids Red List assessments in similarly threatened ecosystems (Lizcano et al. 2020; Lughadha et al. 2020; Rojas-P et al. 2023; Lopez-Gallego et al. 2024). Because these findings directly reflect the severe anthropogenic pressures acting upon the Andean-Amazonian foothills, we emphasize that the central contribution of this study rests not only in documenting new occurrences but in providing the first assessments of extinction risk for these poorly known taxa in one of the most threatened ecotones of Colombia.

The genus *Baskervilla* comprises 11 species distributed mainly in montane forests of Central and South America from Nicaragua to south Brazil (GBIF 2023). This genus comprises terrestrial plants with non-resupinate flowers and two pairs of pollinia, where the caudicles of the outer pair being shorter than those of the inner pair, the labellum features calli that create a tubular entrance to the spur, the petals are oblique and not bipartite, while the labellum is basally fused to the column, both the petals and sepals exhibit asymmetry (Dressler 1993; Macagnan et al. 2011).

Three species are known from Colombia: *Baskervilla asplundii* (Garay) Szlach. & Kolan., *B. colombiana* Garay and *B. venezuelana* Garay & Dunst. However, no species of this genus has been previously reported from Caquetá (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015; Arias et al. 2023). This report of *B. auriculata* is therefore the first record of the genus in the Colombian Amazon.

Brassia comprises approximately 70 species distributed throughout the Neotropics, with its probable centre of diversity in the humid forests of the Andes (Pupulin and Bogarín 2005; POWO 2025). Most of these plants are epiphytic, although some are terrestrial. They are characterized by their large size, prominent pseudobulbs bearing one or two leaves, and lateral inflorescences with small floral bracts. Their flowers exhibit a spider-like shape, with long, spreading sepals, a lip that is not fused to the column, and a pollinarium that includes a narrow stipe, which is why they are commonly known as “spider orchids” (van der Pijl and Dodson 1966; Pupulin and Bogarín 2005; Ospina-Calderón et al. 2007).

In Colombia, 28 species have been recorded, six of which are considered endemic to the country: *Brassia bowmanii* (Rchb.f.) M.W.Chase, *B. cochlearis* (H.R.Sweet) M.W.Chase, *B. cyrtopetala* Schltr., *B. diphylla* (H.R.Sweet) M.W.Chase, *B. escobariana* Garay, and *B. minutiflora* (Kraenzl.) M.W.Chase. Additionally, eight other species have been reported without supporting voucher specimens (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015). Only *B. caudata* (L.) Lindl. has been documented in the Department of Caquetá, specifically in the municipality of Belén de los Andaquíes (Arias et al. 2023). Our record of *B. whewellii* highlights the largely undocumented biodiversity of the region and underscores the importance of continued exploration and documentation of the orchids from these forests. The presence of this taxon in degraded foothill forests underscores how habitat transformation may be affecting species that have not even been fully documented.

Epidendrum is one of the richest orchid genera, with nearly 2,400 species distributed throughout the Neotropics from sea level to an elevation of 4,200 m (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015; Hágsater et al. 2016). Plants of this genus are characterized by terete stems, infrequently bearing pseudobulbs, distichous leaves, flowers typically bearing a single pair of anthers, although up to four pairs may be present, and a distinctive floral trait: the lip fused to the base of the column (Stancik et al. 2009).

Approximately 527 *Epidendrum* species have been reported for Colombia, of which 70 have been recorded in the department of Caquetá (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015; Arias et al. 2023). Nearly 190 endemic species are known from Colombia, including *E. clinidiodontum* E.Santiago et al., *E. fernandoi* Edwin Trujillo, A.Rojas-P & Hágsater and *E. mambe* O.Perdomo, A.Lizcano & Hágsater, recently described from Caquetá (López-Florian et al. 2024; Rojas-P et al. 2025). Of the species recorded in Colombia, 44 lack voucher specimens deposited in herbaria (Ministerio de Ambiente y Desarrollo Sostenible and Universidad Nacional de Colombia 2015; López-Florian et al. 2024). The discovery of the first population of *E. pucunoense* in Colombia supports the perception of the limited knowledge and the lack of enough systematic efforts to document the biodiversity of this department. This scarcity of information highlights the necessity of integrating threat assessment tools, such as the IUCN criteria applied here, to guide the prioritization of further research and conservation measures in data-poor regions.

The Amazon is the primary source of Neotropical biodiversity, contributing over 2,800 lineages to other regions (Antonelli et al. 2018). Its biodiversity is closely linked to the Andean uplift, with phylogenetic studies revealing significant species exchange between Amazonia and the Andes (Hoorn et al. 2010). Most Andean orchid lineages originated within the last 20–15 million years, primarily derived from lowland Amazonian ancestors, with additional inputs from Central America and the Antilles (Pérez-Escobar et al. 2017). In the Andean foothills, where the new records were found, non-woody life-forms represent nearly half of the species and three-quarters of the individuals (Gentry and Dodson 1987; Linares-Palomino et al. 2009).

We emphasize the need for enhanced inventories of non-woody plant groups, such as bromeliads, ferns, and orchids, to improve knowledge of biodiversity and ensure more effective assessment and other conservation measures (Linares-Palomino et al. 2009; Alba-Patiño et al. 2021). There is a need for conservation initiatives beyond established protected areas, especially in the Andean-Amazonian foothills, where orchid biodiversity remains underdocumented (Lopez-Gallego et al. 2024). However, habitats in this ecotone are undergoing rapid deterioration, and there is an urgent need to quantify and respond to anthropogenic pressures rather than solely expanding floristic knowledge.

Assessments of the extinction risk of species are essential for identifying species at risk and guiding their conservation (Lughadha et al. 2020) and the Red List has become a fundamental tool worldwide (Bachman et al. 2019; Zizka et al. 2021; Lopez-Gallego et al. 2024). Despite significant progress in assessing species, nearly 90% of the Orchidaceae of Colombia remain unassessed; over half of those assessed are classified as threatened (Ministerio de Ambiente y Desarrollo Sostenible 2024). By applying IUCN criteria, we highlight the threats to these species and conservation priorities for the Andean-Amazonian foothill flora. We propose that three species reported here should be classified as Critically Endangered in Colombia, each based on a single population, an AOO of 4 km², and continuing decline in the area, extent, and quality of habitat due to forest cover loss.

The main threat to these species is continuing decline in area, extent and/or quality of habitat, as all were found in the Andean-Amazonian foothills, one of the most biodiverse and endangered ecosystems due to extensive livestock farming, deforestation, and other anthropogenic activities (Hoffman et al. 2018; Murillo-Sandoval et al. 2022; Sierra et al. 2022). Undisturbed forests, due to their complex canopy and biodiversity structure, provide ideal habitats for orchids (Besi et al. 2023), but deforestation increases ambient temperatures and decreases humidity compared to areas with closed canopy (Werner and Gradstein 2009), and the richness and diversity of orchids is reduced. These changes negatively affect orchid growth, seed germination, and seedling development, as orchids are highly sensitive to their microclimate and to anthropogenic disturbance (Crain and Tremblay 2017; Zhang et al. 2018). Moreover, the reproduction and survival of most orchids depend on specialized pollination mechanisms, symbiotic relationships with mycorrhizal fungi, and the production and dispersal of large quantities of seeds—processes closely linked to the forest health (Gravendeel et al. 2004; Li et al. 2021; Besi et al. 2023). These ecological dependencies underscore why small, isolated populations in degraded habitats, as documented here, are at extreme high risk.

At the global level, we assess one species reported as Least Concern and the others as Endangered mainly on account of having few populations and ongoing habitat degradation. Deforestation within the EOO and AOO also implies the loss of ecosystem services provided by orchids, including cultural services (aesthetic value and inspiration), provisioning services (food and medicine), supporting services (genetic resources and ecosystem connectivity), and regulating services (pollination and air quality regulation) (Swarts and Dixon 2009; Hernández-Mejía et al. 2024). Thus, orchid conservation should encompass the valuation and promotion of these ecosystem services to enhance their perceived importance beyond commercial exploitation and gain broad public support for conservation initiatives (Orejuela 2005; Cuoco and Cronan 2009).

Baskervilla auriculata, *Brassia whewellii*, and *Epidendrum pucunoense* were recorded for the first time in Colombia, expanding the known orchid richness of the country and the department of Caquetá. The Red List assessments proposed for the three species highlight the degradation of their habitat, the urgent need for botanical expeditions to enhance knowledge of orchid diversity, and the importance of investing in diverse conservation strategies.

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