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TELIPOGON MAYOI (ORCHIDACEAE), A NEW SPECIES FROM WESTERN ANDES OF COLOMBIA

Guillermo A. Reina-Rodríguez[1], Francisco López-Machado[1] & Carlos Martel[2,3]

[1]Grupo de Investigación en Orquídeas, Ecología y Sistemática Vegetal, Universidad Nacional de Colombia, Sede Palmira, Colombia

[2]Instituto de Ciencias Ómicas y Biotecnología Aplicada, Pontificia Universidad Católica del Perú, Av. Universitaria 1801, San Miguel 15088, Lima, Perú

[3]Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú

[*]Author for correspondence: reirodriguez6@gmail.com

Abstract. *Telipogon mayoi,* from the western Colombian Andes, is proposed as a new species. The species was found in "La Elvira" National Protective Forest in the Yumbo Municipality, one of the oldest protected areas in Colombia, close to the Farallones de Cali National Park, both localities in the Dapa Mountains. Specimens of *Telipogon mayoi* were previously misidentified as *Telipogon lankesteri* Ames and *T. williamsii* P.Ortiz, but detailed analysis of the floral morphology revealed that it is different. *Telipogon mayoi* is most similar to *T. lankesteri* but it is characterized by the crenulated margins of the leaves (*vs.* entire margins), the ovate oblong lip (*vs.* oblong lanceolate) and furcate setae on the column (*vs*. simple setae). We provide a description, illustrations, a plate, *in situ* photographs, a distribution map, and ecological notes.

Resumen. *Telipogon mayoi* proveniente de los Andes occidentales de Colombia, es propuesta como nueva especie. La especie fue hallada en la Municipalidad de Yumbo en la Reserva Forestal Protectora Nacional "La Elvira", una de las áreas protegidas más antiguas de Colombia, cercana al Parque Nacional Natural Farallones de Cali, ambas localidades en las montañas de Dapa. Especímenes de *Telipogon mayoi* fueron previamente identificados como *Telipogon lankesteri* Ames y *T. williamsii* P.Ortiz, pero un análisis minucioso de la morfología floral reveló que tiene una identidad distinta. *Telipogon mayoi* es más similar a *T. lankesteri* pero se caracteriza por presentar márgenes crenulados en las hojas (*vs*. márgenes enteros), un labelo ovado oblongo (*vs.* oblongo lanceolado), y setas furcadas en la columna (*vs*. setas simples). Se provee una descripción, ilustraciones, una lámina, fotografías *in situ*, un mapa de distribución y notas ecológicas.

Key Words: Andes, cloud forest, Colombia, miniature *Telipogon*, Oncidiinae

Introduction. *Telipogon* Kunth is a neotropical orchid genus, which currently contains around 260 accepted species (Martel unpublished data). Species of this genus can be found from southern Mexico to Central America, the Caribbean and in the Andes, from Venezuela to northern Bolivia between 500 and 3600 m (Martel & Nauray 2013, Collantes & Martel 2015). *Telipogon* species are usually associated as having colorful and showy flowers (see Dodson & Escobar 1987, Dodson 2004). However, some *Telipogon* species possess very small and non-showy flowers; those species were formerly included in the genus *Stellilabium*. The genus *Stellilabium* was transferred to *Telipogon* based on molecular data (Williams *et al.* 2005). Recently, Martel *et al.* (2017) proposed to use the term "miniature *Telipogon*" to distinguish the *Telipogon* species that fit with the characteristics of the former *Stellilabium*. Thus, miniature *Telipogon* are characterized as being small plants, usually less than 10 cm, and flowers of less than 2 cm diameter (Martel *et al*. 2017). Despite the difference in size, morphologically, miniature *Telipogon* are consistent with flower morphology of the genus (e.g. usually non-resupinate flowers, lip similar to the petals, a robust and short column, and a pollinarium with four pollinia) and especially they present an uncinate viscidium (Martel *et al*. 2017). Although miniature *Telipogon* present broader distribution ranges compared to other *Telipogon*, they are not well represented in herbaria, because their small size makes them easily overlooked (Martel 2016a, 2016b, Martel *et al*. 2017). In Colombia, due to the complexity and variety of ecosystems, rainfall, microclimate diversity and orographic factors, there is still great orchids gaps as many areas are waiting for botanical exploration (Reina-Rodríguez 2016, 2019). Around 70 species of *Telipogon* occur in the country (Govaerts *et al*. 2019);

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however, Betancur *et al.* (2015) recognized only 67 species, of which 38 are endemic. Nevertheless, this number would be surely increased as new *Telipogon* species are recently being described from there (e.g. Kolanowska *et al*. 2017, Perez-Escobar *et al*. 2017).

In 2018 as part of a study for evaluate the climate change on orchids, in western Colombian Andes, diverse orchid plants were marked and codded in the wild. In 2019, during the monitoring of those plants, one member of the team noticed that a specimen codded as *T. williamsii* P.Ortiz, which occurs in the area, was different from the other plants also codded as *T. williamsii*. Furthermore, a similar specimen was published as *T. lankesteri* in a nearby location (i.e. Yumbo Municipality) some years ago (see Pérez-Escobar *et al.* 2011). A detailed examination of these plants revealed that they do not belong with those afore mentioned species, but to an undescribed species of *Telipogon*. Therefore, we propose this as a new taxon and provide here a description, illustrations and a distributional map of the species.

Materials and methods. Plant specimens were collected in "La Elvira" National Protective Forest Reserve in the Arroyohondo River Basin, Western Andes of Colombia. Plant material was preserved as voucher and in spirits in the herbarium (CUVC) at the Universidad del Valle in Cali. Photographs were taken *in situ* with a Cannon EOS 60D® using a 60 mm macro. Dissections of the plant and flower were arranged according to LCDP format and were edited with Adobe Photoshop® CS4. The spirit material was used to prepare the line drawing. Location map was prepared with ArcGIS 10, module ArcMap ESRI®. The conservation assessment complies with the criteria of the IUCN (2019). To determine the weather conditions in Colombia, Ecuador and Costa Rica, the website (http://es.climate-data.org) was visited. Authors and names of plants follow the databases The International Plant Name Index (http://www.ipni.org), Tropicos (http://www.tropicos.org) and Epidendra (http://www.epidendra.org).

Taxonomic treatment

Telipogon mayoi Reina-Rodr. & C.Martel, ***sp. nov.*** (Fig. 1–3).

TYPE: Colombia. Valle del Cauca: Municipio de Yumbo, Corregimiento Dapa, Parcelación Los Morales. Parcela Familia Rubiano-Hurtado. Microcuenca El Rincón, afluente del río Arroyohondo. Bosque subandino, 3°34′40.73″N 76°34′19.12″W, 2106 m, 16.VI.2019. *fl., G. Reina-Rodríguez et al. 2982*. (CUVC-in spirit!)

Diagnosis: *Telipogon mayoi* Reina-Rodr. & C.Martel is similar to *T. lankesteri*, but differs by the crenulate margins in the leaves (vs. entire margins), the ovate oblong lip (vs. oblong lanceolate), ciliate margins of the lip (vs. entire margins), furcate setae on the column (vs. simple setae).

Plant epiphytic, 4.0–4.5 cm long, erect. *Roots* 9–16 mm long, adventitious, sinuous. *Leaf* 4, blade 4.0–8.0 × 2.0–2.5 mm, elliptical, smooth, apex acuminate, margin crenulate. *Inflorescence* 4.0–8.3 cm long, 1–2 branched, erect, flattened, racemose. *Floral bracts* 0.8–1.0 mm long, light green, decurrent, triangular-ovate, slightly winged, apiculate. *Pedicels* 0.8–1.0 mm, erect, green. *Flowers* 6–8 mm in diameter, resupinate, one or two flowers open at a time, pedicelate; *floral pedicels* 0.8–1.0 mm, erect, green. *Ovary* 1.3 mm long, light green, straight, with ribs. *Sepals* basal red wine color at the base, greenish yellow distally; *dorsal sepal* 4.0–4.2 × 1.8–2.0 mm, ovate, 1-veined, apex sub-acute, mucronate; *Lateral petals* 4.0–4.1 × 1.8–2.0 mm, ovate, 1-veined, apex acute to sub-acute, mucronate, basally red wine color, distal half greenish yellow. *Lip* 4.0–4.1 × 1.7–1.8 mm, ecallose, ovate oblong, 3-veined, ciliate margins, the hairs retorse, surface hirsute, apex sub-acute, mucronate. *Column* 1.5–1.7 × 1.0–1.2 mm, height, basally ovate, ventrally unguiculate, dorsally densely setose; *stigmatic surface* concave, lustrous; *setae* furcated, 3 tuffs. *Anther cap* 1.1 × 1.3 mm, cordate, red. *Pollinarium* 0.5 × 0.3 mm; *pollinia* 4, yellow, obovate two pairs of different size; *caudicle* 0.5 mm diam., elastic, hyaline; *viscidium* orange, uncinate. *Seed pod* sub-spherical to ovoid.

Eponomy: The species is named after Mayo Rubiano, the youngest member of the team in Dapa, an orchid enthusiast and who first noticed that the plant designed as type here was different from *T. williamsii*.

Conservation status: An assessment of the conservation status of the new species cannot be made at this time due to only two locations (i.e. Yumbo Munici-

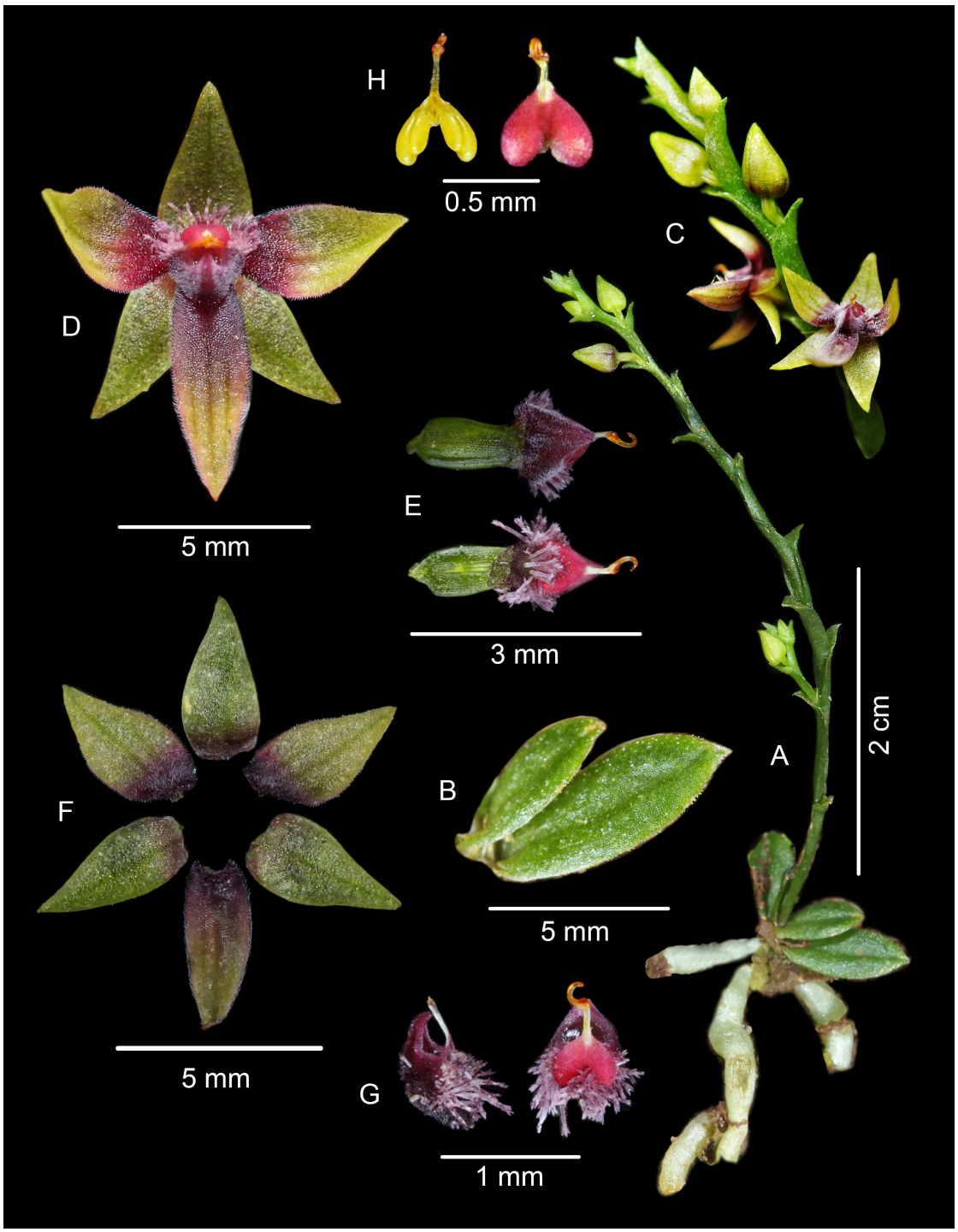

Figure 1. *Telipogon mayoi* Reina-Rodr. & C.Martel. **A**. Habit. **B**. Leaves, upper view. **C**. Inflorescence, detail of the apex. **D**. Flower, frontal view. **E**. Ovary and column, ventral and dorsal views. **F**. Perianth, dissected. **G**. Column, lateral and dorsal views. **H**. Pollinarium without and with the anther cap. Photographs by G. Reina-Rodríguez and F. López-Machado based on *Reina-Rodríguez et al. 2982* (CUVC-in spirit).

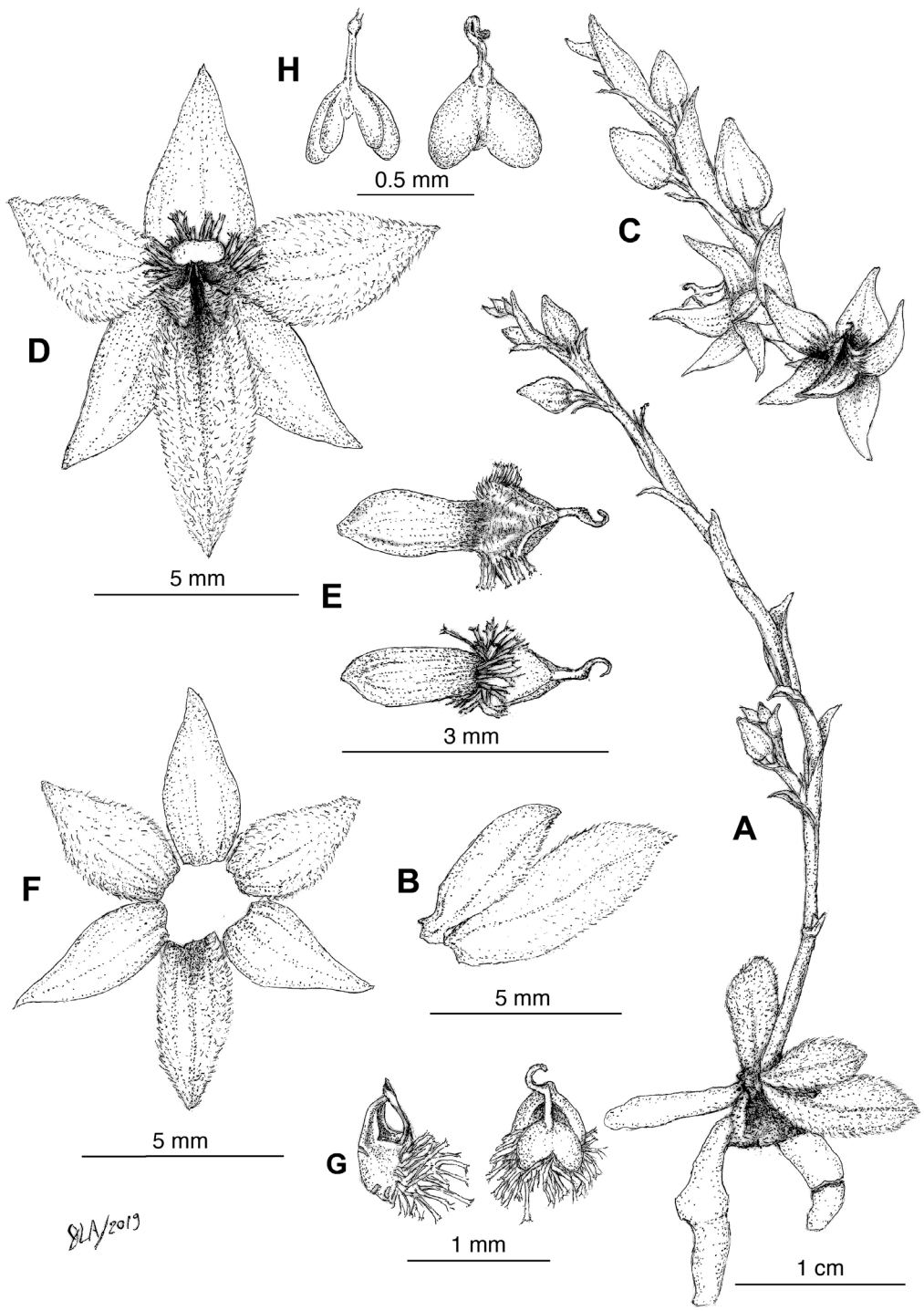

Figure 2. Line drawing of *Telipogon mayoi* Reina-Rodr. & C.Martel. **A**. Habit. **B**. Leaves. **C**. Flowers in the inflorescence. **D**. Frontal view of the flower. **E**. Column, anther cap and bristles, ventral and dorsal views. **F**. Dissected perianth. **G**. Ovary and column, lateral and dorsal views. **H**. Pollinia without and with the anther cap. Drawn by Jairo Larrahondo based on *Reina-Rodríguez et al. 2982* (CUVC-in spirit).

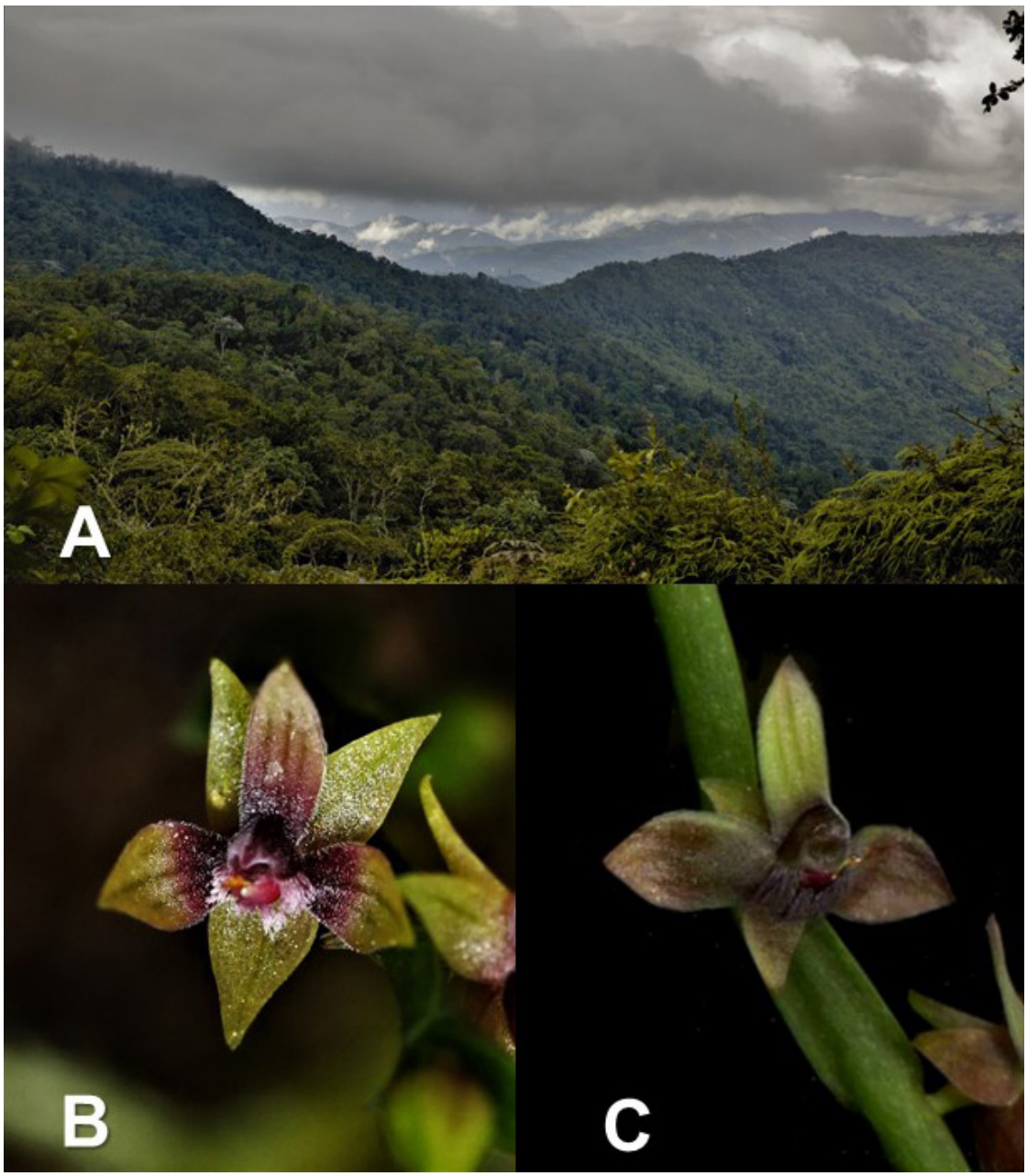

Figure 3. **A**. Dapa mountains, the type locality of *Telipogon mayoi*, in western Colombia Andes. **B**. Flower of *T. mayoi* (*Reina-Rodríguez et al*. *2982*, CUVC). **C**. Flower of *T. lankesteri* (*Bogarín 2317*, Jardín Botánico Lankester). Photographs from G. Reina-Rodríguez (A–B) and D. Bogarín (C).

pality and La Elvira Protected area) are known and there is no information available on the populations. Therefore, it must be classified as a data deficient (DD), following the IUCN Red List criteria (IUCN 2019).

Ecology and distribution: *Telipogon mayoi* is endemic to Colombia and it is known from two localities in the Corregimiento of Dapa and La Elvira protected area in the Yumbo Municipality, Valle del Cauca Department. Plants of *T. mayoi* grow in the montane for-

ests of western Colombian Andes between 2000–2100 m, which presents steep slopes and well drained soils of volcanic origin from the Cretaceous (CVC 2009). Weather conditions in the area were reported as presenting between 1900–2100 mm annual precipitation and between 15°C and 17°C annual temperature average (CVC 2009). According to Holdridge (1987), this area can be classified as Montane rain forest, more widely known as subandean forest.

The habitat, where *T. mayoi* is found, is dominated by *Brunellia comocladifolia* Bonpl., *Alchornea latifolia* Sw., *Hedyosmum bonplandianum* Kunth and *Billia rosea* (Planch. & Linden) C.Ulloa & P.Jørg. Plants of *T. mayoi* grow on shrubs of *Meriania* Sw., *Tibouchina* Aubl. and *Psidium* L. (Perez-Escobar *et al.* 2011) We observed it growing on shurbs of *Miconia cauda* DC. The community of epiphytes in Dapa is dominated by *Cyrtochilum* Kunth, *Oncidium* Sw., *Epidendrum* L., *Pleurothallis* R.Br., *Masdevallia* Ruiz & Pav. and *Lepanthes* Sw. (Baker 2019).

Additional material: Municipio de Yumbo, Corregimiento de Dapa, via Bitaco, cerca de la Hacienda "Los Españoles", 2039 m, *O. Perez & M. Kolanowska 872* (VALLE!).

Discussion. Plants of *T. mayoi* were first recorded some years ago as *T. lankesteri* by Pérez-Escobar *et al.* (2011), which came from a forest just 4.1 km far from the type locality (Fig. 4). This misidentification is understandable since *T. mayoi* and *T. lankesteri* belong to the miniature *Telipogon* group and some individuals, recorded by Pérez-Escobar *et al*. (2011), did also lose the leaves during blooming, as *T. lankesteri* does. However, there are clear morphological differences between *T. mayoi* and *T. lankesteri* (see Zambrano Romero *et al.* 2018; Table 1), and not all the plants of *T. mayoi* lose leaves during blooming. Thus, *T. mayoi* possesses leaves with crenulated margins (instead of entire margins in *T. lankesteri*), an ovate oblong lip (instead of an oblong lanceolate lip in *T. lankesteri*), with ciliate margins in the lip (instead of entire margins in *T. lankesteri*), furcate setae on the column (instead of simple setae on the column in *T. lankesteri*). To the best of our knowledge, there is no real material of *T. lankesteri* recorded from Colombia, so it seems it does not occur there. *Telipogon*

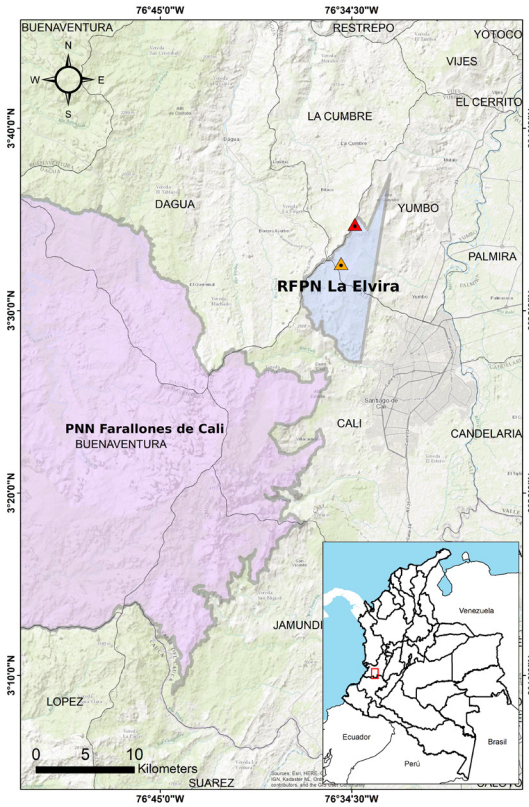

Figure 4. Distribution map of *Telipogon mayoi*. Red triangle indicates the type locality and orange triangle represents the record of Pérez-Escobar *et al.* (2011). PNN: National Natural Park Farallones de Cali (196350 ha); RFPN: National Protective Forest Reserve La Elvira (7064 ha). Base map ESRI. Map elaborated by Kevin Reyes.

mayoi is similar to *T. williamsii* in the habit; however, *T. mayoi* is easily differentiated by the simple lip (instead of the bilobed lip in *T. williamsii*) with absence of a callus (instead of a distinctive callus in *T. williamsii*) and the densely furcate setae (instead of few, simple setae in *T. williamsii*; see Table 1). Plants of *Telipogon mayoi* slightly resembles those of *T. sonia-juaniorum* Zambrano, Bogarín & Solano from Ecuador, as both species have small plants and their flowers present 3 tufts of setae on the column. However, *T. mayoi* can be recognized by the ovate oblong lip (instead of the elliptic lip in *T. sonia-juaniorum*), the half of the flower diameter in *T. sonia-juaniorum* than *T. mayoi* and the furcate setae (instead of mainly simple setae in *T. sonia-juaniorum*; Table 1).

Table 1. Differences in distributional range, abiotic and biotic characters between *Telipogon mayoi, T. lankesteri, T. sonia-juaniorum* and *Telipogon williamsii*.

	Telipogon mayoi	*Telipogon lankesteri*	*Telipogon williamsii*	*Telipogon sonia-juaniorum*
Distributional and abiotic conditions				
Distributional range	W. Colombian Andes, middle lands	Caribbean Costa Rican lowlands	Andes Colombia, Ecuador and Venezuela, middle lands	SW. Ecuadorian Andes, middle lands
Life zone (*sensu* Holdridge 1987)	Montane rain forest	Tropical moist forest	Montane rain forest	Premontane moist forest
Habitat	Secondary cloud forest	Secondary moist forest	Secondary cloud forest	Semi-deciduous montane forests
Elevation range (m)	2000–2100	800	1800–2550	1100–1300
Mean annual rainfall (mm)	1800	2800	1800–2272	1477
Annual mean temperature (°C)	14.2	22.8	17.4	22.4
Morphological and/ phenological conditions				
Habit	Epiphyte	Epiphyte	Epiphyte	Epiphyte
Flowering period	May-June	September	January, May, July	June and September
Leaf blade size (mm)	4–8 × 2–2.5	7–15 × 1–2	40 × 12	5–7 × 2.5–3.0
Leaf blade margin	serrulate	entire	entire	crenulate
Inflorescence length (cm)	ca. 4.0	ca. 20.0–23.0	ca. 4.0–8.0	ca. 5.5
Sepal size(mm)	4.0–4.1 × 1.8–2.0	2.8–3.0 × 0.8–1.0	5.0 × 2.0	2.2 × 1.5
Flower diameter (mm)	8.0	6.0	12.0	4.5
Column setae	branched	unbranched	unbranched	simple to rarely furcate

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