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DRYMONIA SQUAMOSA (GESNERIACEAE), A NEW SPECIES FROM LAS ORQUÍDEAS NATIONAL NATURAL PARK (ANTIOQUIA, COLOMBIA)

Drymonia squamosa (Gesneriaceae), una especie nueva del Parque Nacional Natural Las Orquídeas (Antioquia, Colombia)

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ABSTRACT
A new species of *Drymonia* (Gesneriaceae) from the Cordillera Occidental of the Colombian Andes in the department of Antioquia is described and illustrated. The new species, *Drymonia squamosa*, is distinguished by dense clusters of scales on the petioles, glabrate leaf blades with minute punctations on the lower surface, calyx appearing swollen at base with lanceolate lobes, corolla villous to lanate, and style with glandular trichomes. Additionally, *D. squamosa* is categorized as vulnerable (VU) based on the IUCN criteria.

Key words. Andes, *Drymonia*, Flora of Colombia, Neotropics, protected areas.

RESUMEN
Se describe e ilustra una especie nueva de *Drymonia* (Gesneriaceae) de la Cordillera Occidental de los Andes colombianos, departamento de Antioquia. La nueva especie, *Drymonia squamosa,* se distingue por tener los pecíolos cubiertos con escamas, el envés de la lámina foliar glabrescente y punteado, el cáliz con la base engrosada y los lóbulos lanceolados, la corola vilosa a lanosa, y el estilo con tricomas glandulares. Adicionalmente, *D. squamosa* es categorizada como vulnerable (VU) siguiendo los criterios de la IUCN.

Palabras clave. Andes, *Drymonia*, Flora de Colombia, Neotrópico, áreas protegidas.

INTRODUCTION

The northern Andes is one of the most diverse regions on Earth (Mittermeier *et al.* 2005), and harbors the highest species richness of Gesneriaceae in the world. Colombia has the largest number of species of Gesneriaceae in the Neotropics (Kvist *et al.* 1998, Clavijo *et al.* 2015), and the largest number of species of *Drymonia*, which are especially diverse in the Andes with 28 of the 37 species found in the country (Clavijo *et al.* 2015). However, the Andes have suffered some of the highest deforestation rates because of anthropogenic pressures such as the conversion of forest to farmland (Mittermeier *et al.* 2005, Suárez *et al.* 2011). In Colombia, the deforestation rate in the Andes is high, with 0.67% of the native forest disappearing every year as a result, primarily, of the expansion of

agriculture and pasture frontiers (Armenteras *et al.* 2011, Rodríguez *et al.* 2013). The declaration of protected areas in regions suffering rapid deforestation is important for the conservation of native flora, and has been successful in preserving natural ecosystems in the northern Andes where biological diversity is greatest (Joppa *et al.* 2008, Armenteras *et al.* 2009, Rodríguez *et al.* 2013). Additionally, research intended to document the diversity in these protected areas is urgently needed and fundamental for ongoing conservation efforts. Las Orquídeas National Natural Park, located in the northwestern department of Antioquia, was created in 1974 with an area of 29.784 ha to preserve the forests in the Andean and Chocó Biogegraphic region, which are two of the most diverse regions in the world. The inventory of the flora in Las Orquídeas (Pedraza-Peñalosa & Betancur 2014) has resulted in the discovery of several new species, some of them already published (Garzón & González 2012, Garzón *et al.* 2012, Giraldo & Dalström, 2012, Szlachetko & Klonowska 2013, Smith *et al.* 2013, Amaya-Márquez 2014, Clavijo & Clark 2015, Croat *et al.* 2015, Pedraza- Peñalosa 2015), and many others still in preparation (Pedraza-Peñalosa pers. comm.).

Drymonia, with 74 species, is the third largest genus in the Neotropics, and one of the most morphologically diverse among the neotropical genera of the family Gesneriaceae (Weber 2004, Clark *et al.* 2006, 2015, Clavijo & Clark 2009). Extensive fieldwork, revision of herbarium collections, and molecular phylogenetic analyses have contributed to our current knowledge of the diversity and morphological variation of the genus. However, documenting the diversity of *Drymonia* is a task that is far from complete. There are numerous species that are new to science and many others that are only known from limited (i.e., one to few) localities that need to be studied and included in ongoing phylogenetic studies. Here, we describe a new species of *Drymonia* from Las Orquídeas National Natural Park, increasing the number of species found in Colombia to 39 and the total number to 75. The description of *D. squamosa* is based on the study of herbarium specimens, and the terminology used in the description follows Harris & Harris (2001).

Drymonia squamosa Clavijo & J.L. Clark, *sp. nov.* (Figs. 1 & 2)

Type: COLOMBIA. Antioquia: Urrao, Parque Nacional Natural Las Orquídeas, sector Calles, cerca de la Cabaña de Parques, margen izquierdo del rio Calles, 6º 31' 7.5" N, 76º 15' 58.5" W, 1340 m, 7 Apr 2011 (fl, fr), *J. Betancur et al. 15045* (holotype COL!, isotype NY!).

Drymonia squamosa differs from other species of *Drymonia* by dense clusters of scales on the petioles, glabrate leaf blades with minute punctations on the lower surface, calyx appearing swollen at base with lanceolate lobes, corolla villous to lanate, and style with glandular trichomes.

Hemiepiphytic, scandent or terrestrial shrub, 2.5-4.5 m tall. **Stem** erect to decumbent, branched, adventitious roots absent, subquadrangular in cross-section, 3.7-7.4 mm in diameter, surface papyraceous, glabrous, lenticels present, internodes 4.4-6.8 cm long. **Leaves** opposite, decussate, equal in a pair, evenly spaced; petiole 0.6-2.2 cm long, terete in cross-section, with a pair of glands at base of petiole, glabrous, covered with a dense clusters of scales (more evident when dry); blade ovate to elliptic, 9-27 x 5-12 cm, coriaceous, green adaxially, light green abaxially, apex acuminate, base cuneate to rounded, sometimes oblique, margin with scattered small teeth, glabrous adaxially, glabrate and with minute punctations abaxially, 4-5 pairs of main lateral veins, higher order of venation only evident abaxially. **Inflorescence** a reduced pair-flowered axillary cyme with 1-4 flowers; peduncle absent; bracts 3.5-6.5

x 0.5-1 mm, green to maroon, linear, apex acute, base truncate, margin entire, glabrate to strigillose. **Pedicel** erect or oblique relative to the stem, 10-23 mm long, green, rugose, scarcely pilose to pilose, with glands toward the apex. **Calyx** green during anthesis, then becoming green with pink margins and apex in fruit, swollen basally, membranous apically, only mid-vein conspicuous, with a pair of conspicuous glands at base, lobes fused at base for 3-14.5 mm; calyx lobes 5, 4 nearly equal and dorsal lobe slightly reduced, 26-40 x 8.4-16 mm, lanceolate, apex acuminate, margin serrate and recurved, abaxial surface punctate, strigose basally, strigillose apically, adaxial surface pubescent basally. **Corolla** zygomorphic, 4.5-5 cm long, oblique relative to calyx, protandrous, infundibuliform; base gibbous, 6-7 mm in diameter, gibbosity 4-5.5 mm long; tube 3.5-4 cm long, 0.8-1.6 cm wide, outer surface white, sometimes pink ventrally, villous to lanate, inner surface white to yellow, glabrate; throat 9.5-16 mm in diameter, inner surface with dark red or purple spots, glandular trichomes dorsally; corolla lobes 5, subequal, spreading, white, apex rounded, ventral lobe 16-17 x 12-14 mm, oblong, margin slightly erose, glabrous, lateral lobes 8-13 x 9-10 mm, ovate to oblong, margin slightly erose, lanate abaxially, glabrous adaxially, dorsal lobes 8-10 x 8-11 mm, ovate, margin entire. **Androecium** of 4 stamens, didynamous, filaments 30-32 mm long, adnate to the corolla tube for 15-17 mm, white, glabrous, coiling after anthesis; staminode absent; anthers sagittate, 5-6 x 2-3 mm, coherent by the lateral walls, dehiscence by basal pores that develop into longitudinal slits. **Gynoecium** with a single bilobed dorsal nectary gland, oblong, apex emarginate, 3-4 mm long, whitish, glabrous; ovary superior, 5-7 x 3-4 mm, ovate, strigillose; style 20-22 mm long, pilose, with regular and glandular trichomes, stigma stomatomorphic. **Fruit** a bivalved fleshy capsule, ovate, valves reflexed up to 90°, 19-25 x 10-15 mm, strigose and light green to yellow with pink margins abaxially, glabrous and purple adaxially; seeds numerous, immersed in a mass of fleshy funicular tissue forming a central cone, 1.2-1.7 mm long, 0.5-0.8 mm wide, black, elliptic, surface smooth.

Etymology. The species epithet refers to the squamate or densely clustered scale-like indument present in the petioles that is especially conspicuous when dry.

Distribution and habitat. *Drymonia squamosa* is endemic to Colombia and only known from Las Orquídeas National Natural Park along the Pacific slopes of the Cordillera Occidental in the department of Antioquia, between 980 and 1340 m of elevation. *D. squamosa* has been collected only in well-preserved cloud forests.

Phenology. Flowers recorded from April to July, and fruit recorded in July.

Taxonomic affinities. *Drymonia squamosa* can be distinguished from the other species in the genus by the densely clustered scale-like indument on the petiole that is especially conspicuous when dry, the glabrate leaf blades with minute punctuations on the lower surface, the villous to lanate corolla, and the style with glandular trichomes. *Drymonia squamosa* and *D. glandulosa* Kriebel are similar in their habit, foliage, scale-like indument on the petiole, and the style with glandular trichomes. However, these two species can be differentiated by the following characters in *Drymonia squamosa*: petiole 0.6-2.2 cm long (*vs.* 3.5-6 cm long); blade with 4-5 pairs of main lateral veins (*vs.* 7-9), with minute punctuations abaxially (*vs.* absence of punctuations); calyx lobes lanceolate, 2.6-4 cm long (*vs.* oblong to ovate, 1.5-2.5 cm long); corolla villous to lanate, 4.5-5 cm long (*vs.* glabrate, 5.5-7 cm long), and throat white to yellow, suffused with dark red or purple spots (*vs.* purple). *Drymonia glandulosa* is endemic to northern Costa Rica and *D. squamosa* is endemic to the Pacific slopes of the Colombian Andes in the department of Antioquia.

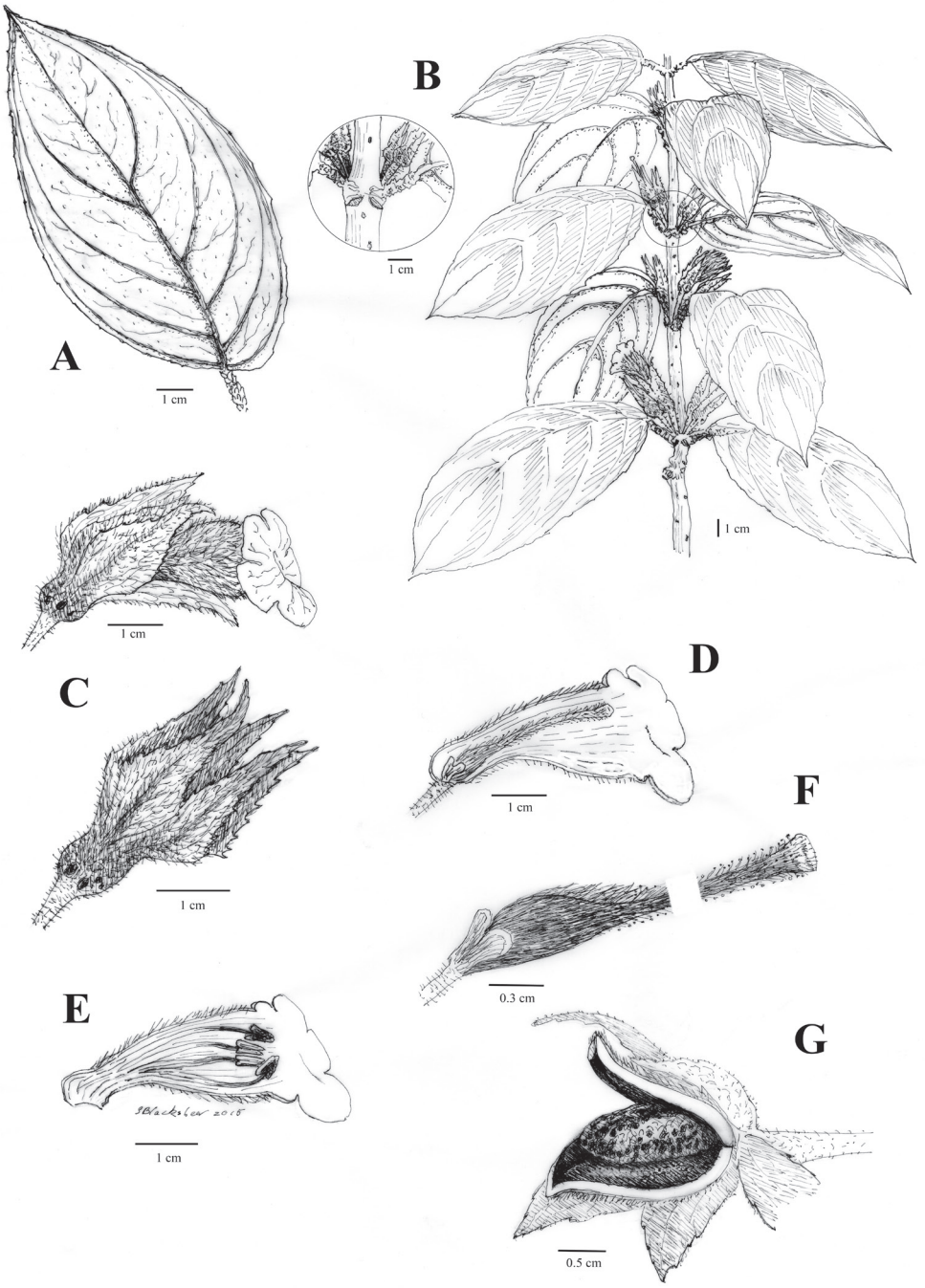

Figure 1. ***Drymonia squamosa*** Clavijo & J.L. Clark. **A**. Lower leaf surface. **B**. Habit and inset showing the petioles with densely clustered scale-like indument, and glands at the base. **C**. Lateral view of the flower. **D.** Lateral view of flower showing gynoecium. **E.** Lateral view of flower showing androecium. **F.** Gynoecium showing single dorsal nectary gland, glandular trichomes on style, and stigma. **G**. Open fruit showing the central cone of seeds. (A-F from the holotype, *J. Betancur 15045;* G from *J. Betancur 15465*).

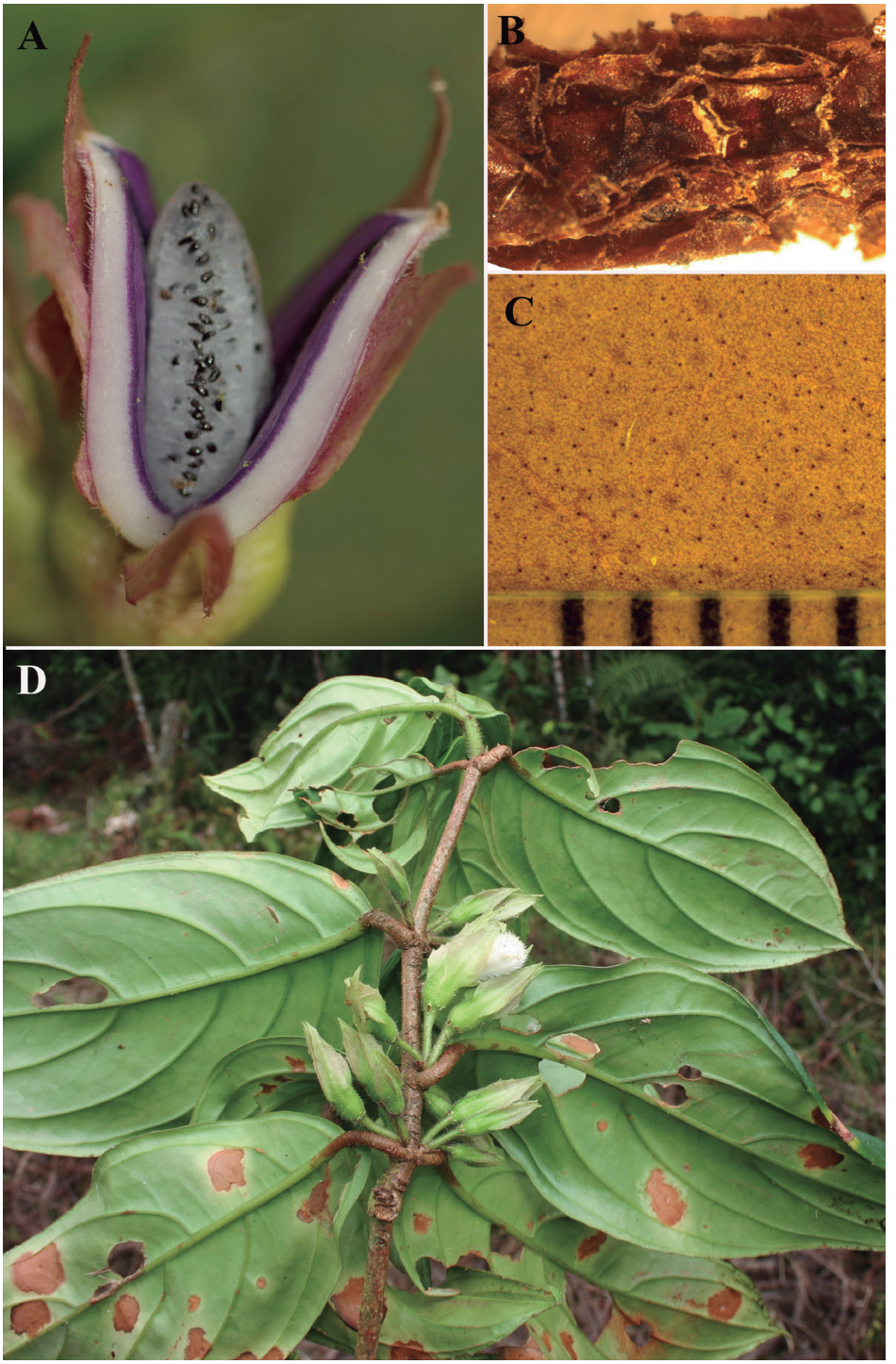

Figure 2. ***Drymonia squamosa*** Clavijo & J.L. Clark. **A**. Lateral view of fleshy bivalved capsule. **B**. Petiole with densely clustered scale-like indument. **C**. Lower leaf surface showing minute punctations. **D**. Habit. (A & B from *J. Betancur 15465*; C & D from *S.E. Hoyos-Gómez 2278*).

Drymonia squamosa and *D. alloplectoides* Hanst. have similar flowers. However, *D. squamosa* is differentiated by the following characters: petiole with clustered scale-like indumentum (*vs.* smooth); blades 9-27 x 5-12 cm (*vs.* 3.8-11.3 x 1.8-5.4 cm); blade glabrate and with minute punctuations abaxially (*vs.* villous); stigma stomatomorphic (*vs.* bifid); fruit with valves reflexed up to 90° (*vs.* 180°), and seed surface smooth (*vs.* striated).

Conservation status. The only known populations of *Drymonia squamosa* are located in the protected area of Las Orquídeas National Natural Park. The species has a restricted geographic distribution, small area of occupancy, and has only been collected from the type locality. Therefore, according to the IUCN Red List criteria (IUCN 2012) for restricted area of occupancy and number of locations (D2, area of occupancy less than 20 km^2, and known to exist at only a single location), *D. squamosa* should be listed in the category VU (Vulnerable).

Additional specimens examined: COLOMBIA. **Antioquia**: Frontino, Parque Nacional Natural Las Orquídeas, sector Venados, vereda Venados Abajo, sitio La Miquera, 6º 32' 23''- 6º 32' 28'' N, 76º 17' 59''- 76º 18' 5'' W, 1000-1030 m, 27 Jul 2011 (fl, fr), *J. Betancur et al. 15465* (COL!, NY!); Urrao, Parque Nacional Natural Las Orquídeas, vereda Cruces, sitio Piñares, camino a Perdidas, poco después de la escuela La Esperanza, orilla izquierda del río Calles, 6º 28' 35.5'' N, 76º 19' 39.5'' W, 980 m, 3 May 2013 (fl), *S.E. Hoyos-Gómez et al. 2278* (COL!, NY!, UNA!).

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