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NOTES ON GEOGRAPHIC DISTRIBUTION

New records of Papilionoideae (Leguminosae) to Colombian flora: *Lonchocarpus schiedeanus* (Schltdl.) Harms and *Bowdichia nitida* Spruce ex Benth.

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Abstract. We report the first records of *Lonchocarpus schiedeanus* (Schltdl.) Harms and *Bowdichia nitida* Spruce ex Benth. from Colombia. *Lonchocarpus schiedeanus* represents the first species of *L.* sect. *Willardia* in South America; this section was previously known only from Central America and the Caribbean. *Bowdichia nitida* is primarily known from Brazil, with scattered records in Bolivia. Our findings extend the known distributions of these species to the Colombian Orinoquia and Amazon regions. Complete descriptions, images, information about habitat, and phenology are presented.

Key words. Fabaceae, Millettieae, *Willardia*, *Bowdichia* clade, South America

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INTRODUCTION

Leguminosae comprises 800 recognized genera and approximately 23,000 species (Bruneau et al. 2019). In the Neotropics, there are 314 genera (Miliken et al. 2009), and in Colombia 174 genera and 1123 species (Lewis and Castellanos 2019). The family consists of six subfamilies, five of which are represented in Colombia; Duparquetioideae is restricted to Africa (TLPWG 2017). Papilionoideae is the largest subfamily and a well-supported monophyletic group (Kajita et al. 2001; Wojciechowski et al. 2004; TLPWG 2017). In Colombia, there are about 110 genera and 640 species of Papilionoideae (Lewis and Castellanos 2019).

Lonchocarpus Kunth is a genus of more than 180 Neotropical species (Cruz-Durán and Andrade-Murguía 2019). Throughout its taxonomic history, various classifications have been proposed, including subgenera, series, and sections (da Silva 2010). Sousa (1992, 2009a, 2009b, 2011) and Sousa et al. (2014) outlined recent circumscriptions. Phylogenetic studies using molecular data have validated the clustering patterns of *Lonchocarpus sensu lato* and reconstructed its diversification events. These studies suggest that recent evolutionary processes, occurring approximately three million years ago, primarily took place in Neotropical forests with seasonal climates (da Silva et al. 2012).

The genus *Bowdichia* Kunth comprises two Neotropical species primarily distributed in the lowland areas of the Amazon and the Guiana Shield. It belongs to the *Bowdichia* clade, along with the genera *Leptolobium* Vogel, *Guianodendron* Sch. Rodr. & A.M.G. Azevedo, *Diplotropis* Benth., and *Staminodianthus* D.B.O.S. Cardoso, H.C. Lima & L.P. Queiroz (Cardoso et al. 2012; Cardoso et al. 2013). *Bowdichia* species are recognized by their odd-pinnate leaves with alternate to subopposite leaflets and an emarginate apex, flowers with blue to purple petals, a suborbicular standard without auricles, wings much larger than the keels, an ovary with a capitate stigma, and samaroid, membranous, oblong fruits with the upper suture shortly winged. *Bowdichia virgilioides* Kunth is one of the most common trees in the wooded savannas of the Neotropical region (Conceição et al. 2011; Soares et al. 2015).

Relevant studies on the biogeography of plants in the Neotropics, including the Fabaceae family, explain the migration of tree species and the origins of biodiversity in Colombia and South America (Richardson et al. 2001; Schrire et al. 2005; Pennington and Dick 2010). Several efforts have been made to document the composition and richness of the family Fabaceae in Colombia, with notable contributions from the works of Ruiz and Forero (2005) and Ariza (2022). However, gaps remain in our understanding of species distribution due to limited collections and a lack of exploration in ecologically important yet underrepresented areas of

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Colombia (Castellanos and Lewis 2012). Nonetheless, recent studies have documented new records in the Colombian Orinoquia and Magdalena Valley (Mijares et al. 2017; Lucas et al. 2023). This manuscript reports the first records of species from the genera *Lonchocarpus* and *Bowdichia* within Colombia's tropical forests. Our objectives include a comprehensive description of key morphological traits, along with photographic documentation and insights into the ecology and distribution of these species.

METHODS

We examined botanical collections of the genera deposited in the UDBC, LLANOS, HUA, JAUM, COAH, FMB, and COL herbaria (acronyms according to Thiers 2025) between 2022 and 2024. We also reviewed the genera using Tropicos (Missouri Botanical Garden 2025) and analyzed their type collections available on the JSTOR Global Plants platform (Ryan 2018). Additionally, we visited the Meta and Guaviare departments to monitor trees in the field. Terminology for describing leaf venations was based on Ellis et al. (2009), while the nomenclature for reproductive traits followed Beentje (2016) and Alemán et al. (2020). We observed morphological traits and made measurements using a Zeiss Stemi SV 11 stereoscope. Distribution maps were created with QGIS (Rosas-Chavoya et al. 2022) employing records from GBIF (GBIF 2023).

RESULTS

***Lonchocarpus schiedeanus* (Schltdl.) Harms**
Figures 1, 2

New record. COLOMBIA — Meta • Restrepo, Vereda Caney, Finca Villa Esperanza, km 5 para cruzar a Cumaral, camino a Cosmopolitana; 04°15'18.6''N, 73°32'09.9''W; 434 m alt.; 17.VII.2017; F. Castro leg.; 22313



Figure 1. *Lonchocarpus schiedeanus*. **A.** Trunk. **B.** Leaves. **C.** Inflorescences. **D.** Fruits.

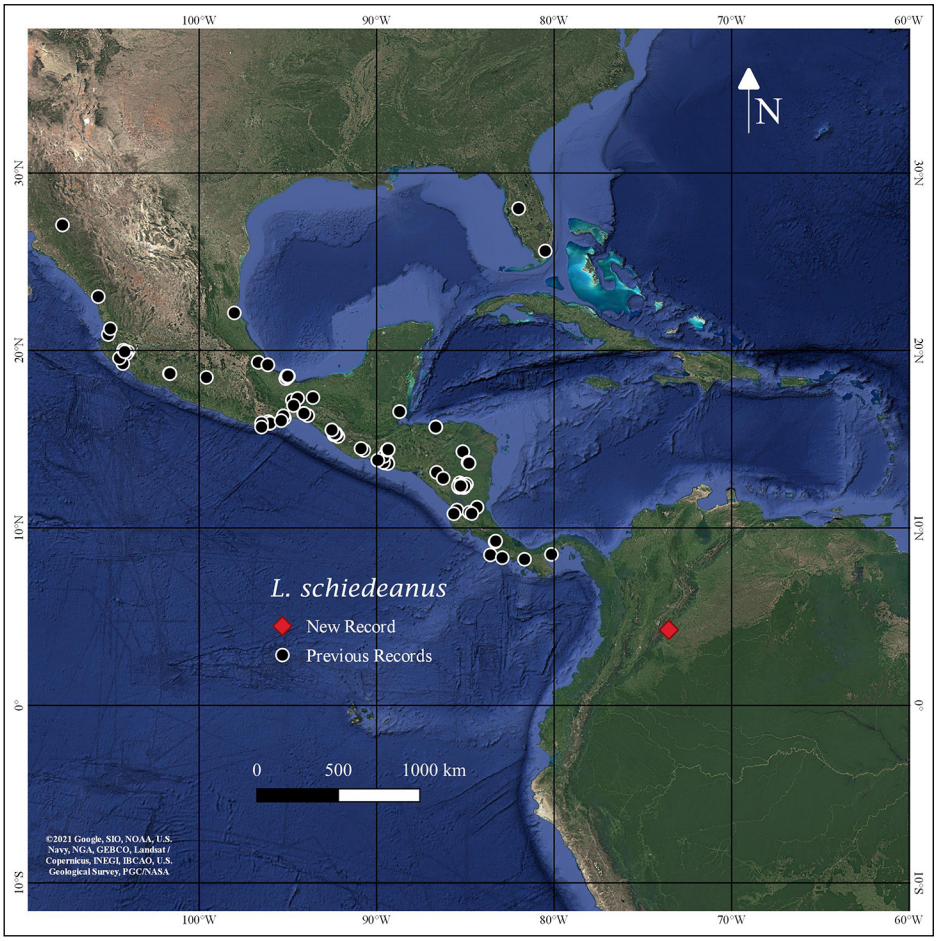

Figure 2. Distribution map of *Lonchocarpus schiedeanus*.

(UDBC) • ibid.; 30.IX.2021; W. Ariza-C. & S.E. Díaz-C. leg.; 9365 (COL, HUA, LLANOS, FMB, UDBC) • ibid.; 26.VII.1994; F. Castro leg.; 1131 (LLANOS) • ibid.; 30.IX.2003; F. Castro leg.; 1169 (LLANOS) • ibid.; 25.V.1994; G. Santiago leg.; 003 (LLANOS).

Description. Tree up to 20 m tall, 45 cm in diameter, with a ribbed stem. Bark brown with white spots externally and pale yellow internally. Twigs striate, reddish brown, with lenticels. Leaves odd-pinnate, alternate, arranged in a spiral pattern, 10.2–12.3 (–12.8) cm long; petioles 2.8–3.2 (–3.6) cm long; rachis grooved towards the apex, slightly grooved at the base; leaflets 11–13, opposite, oblong, coriaceous, sometimes with a revolute margin, with pellucid points, and papillose texture abaxially; indumentum golden, comose, and dispersed along the midvein and secondary veins abaxially, apex retuse to obtuse; venation eucamptodromous, tertiary venation black. Petiolules 1.7–2.0 mm long, grooved, drying yellowish-brown adaxially and olive-yellow abaxially. Inflorescence in axillary pseudo-racemes, (8.4) 11.3–16.7 (–19.7) cm long; brachyblast (2.0) 2.5–3.1 (–3.5) mm long, bearing two flowers each. Flowers papilionaceous, 16 mm long; pedicels (1.5) 2.1–2.8 (–3.0) cm long; bracteoles triangular, 0.3–0.5 mm long, positioned between the middle and apex of the pedicel; calyx purple, (2.5) 3–3.5 (–4.0) mm long, (3.5) 3.8–4.5 (–5.0) mm wide, gamosepalous, with short lobes, less pubescent at the apex, and pellucid points; corolla pink to lilac, standard 0.7–1.1 × 0.8–1.2 cm, slightly reflexed, with a white spot at the base, suborbicular, apex emarginate, basal auricles, 0.7–1.0 mm wide, adaxially glabrescent, abaxially puberulent, claw 0.7–1.0 × 0.6 mm, wings 0.7–0.9 × 0.3–0.4 cm, falcate, auriculate base, rounded apex, abaxially puberulent, claw ca. 2 mm, keel 0.6–0.8 × 0.3–0.4 cm, oblong-falcate, acute apex, acute base, with sparse pubescence in the lower half and pellucid points in the upper half; androecium pseudo-monadelphous, without fenestrae, isomorphic, stamens 0.9–1.1 cm long, glabrous; anthers suborbicular, basifixed, with longitudinal dehiscence; gynoecium 1.1 cm long; stigma discoidal, 0.5 mm; style linear-curved from the base, 2 mm; ovary simple, superior, pubescent, 8–9 mm long. Fruit a samaroid legume, oblong, indehiscent, with a persistent androecium vestige at the base, (4.8) 5.2–7.8 (–10.8) cm long, (0.7) 1.0–1.4 (–1.6) cm wide, slightly thickened at the seed insertion point; seeds 1–4, reniform, concolorous.

Identification. *Lonchocarpus schiedeanus* closely resembles *Lonchocarpus castilloi* Standl. but differs in its brachyblast length (2.5–3.1 mm vs. 1.6–2.1 mm in *L. castilloi*), calyx lobes (short vs. pronounced), fruit width (1.0–1.4 cm vs. 2–3 cm), and seed chamber (flat vs. prominent in *L. castilloi*).

Phenology. Collected from May to July with flowers, and from August to October with fruit.

Bowdichia nitida **Spruce ex Benth**
Figures 3, 4

New Records. COLOMBIA — Guaviare • San José del Guaviare, Cerro Azul, km 2, cerca de la vía; 02°33'29''N, 72°50'51''W; 215 m alt.; 19.X.2022; W. Ariza-C. leg.; 9496 (UDBC) • San José del Guaviare, Carretera que conduce a Cerro Azul; 02°34'42.22"N, 73°32'9.91"W; 230 m alt.; 21.X.2023; W. Ariza-C. & R. López leg.; 10082 (UDBC) — Guainía • Rio Inírida; 100-600 m alt.; VII.1978; E. Acero leg.; 838 (UDBC) — Vichada • Puerto Carreño, sabana entre el centro administrativo y el tapón; 10.IV.1995; M.P. Córdoba leg.; 1448 (COL).

Description. Tree up to 25 m tall, with an open crown, partially deciduous; bark lenticellate with slight exfoliation in plates; exudate absent; terminal branchlets pubescent. Stipules triangular, pubescent, and caducous. Leaves imparipinnate, alternate, distichous; petiole rounded and slightly canaliculate, 1.5–3.5 cm long; rachis canaliculate, with triangular stipels 0.5–1.5 mm long; leaflets 9–15, alternate to subopposite, ovate, elliptic, oblong, or ovate-oblong; base rounded, acute, or subcordate; apex acute to acuminate; adaxial surface glabrous; abaxial surface strigillose, golden, with scattered black trichomes; margin revolute; venation brochidodromous; secondary veins 8–15; intersecondary veins present; tertiary venation reticulate; petiolules canaliculate, 1.5–3.0 mm long, with strigose indumentum. Inflorescences in terminal panicles, up to 50 cm long; axes slightly canaliculate, strigillose; bracts triangular; bracteoles triangular to filiform, located at the base and apex of the pedicel. Flowers 1.4–1.8 cm long; pedicel 1.5–3.5 cm long; calyx turbinate, 0.6–0.8 cm long, 0.4–0.5 cm wide, purple, with triangular lobes and golden strigose indumentum; corolla lilac, petals with undulate margins; standard clawed, lamina elliptic, 1.2 × 0.8 cm; wings falcate, 13 × 6 mm; keels linear, 8 × 2 mm. Androecium with 10 free stamens; filaments 6–8 mm long; anthers rounded, basifixed, with longitudinal dehiscence. Gynoecium 1.0–1.4 cm long, with stipitate ovary; stipe 0.3 cm long; ovary 0.7–0.9



Figure 3. *Bowdichia nitida*. **A.** Trunk. **B.** Leaves. **C.** Inflorescences.

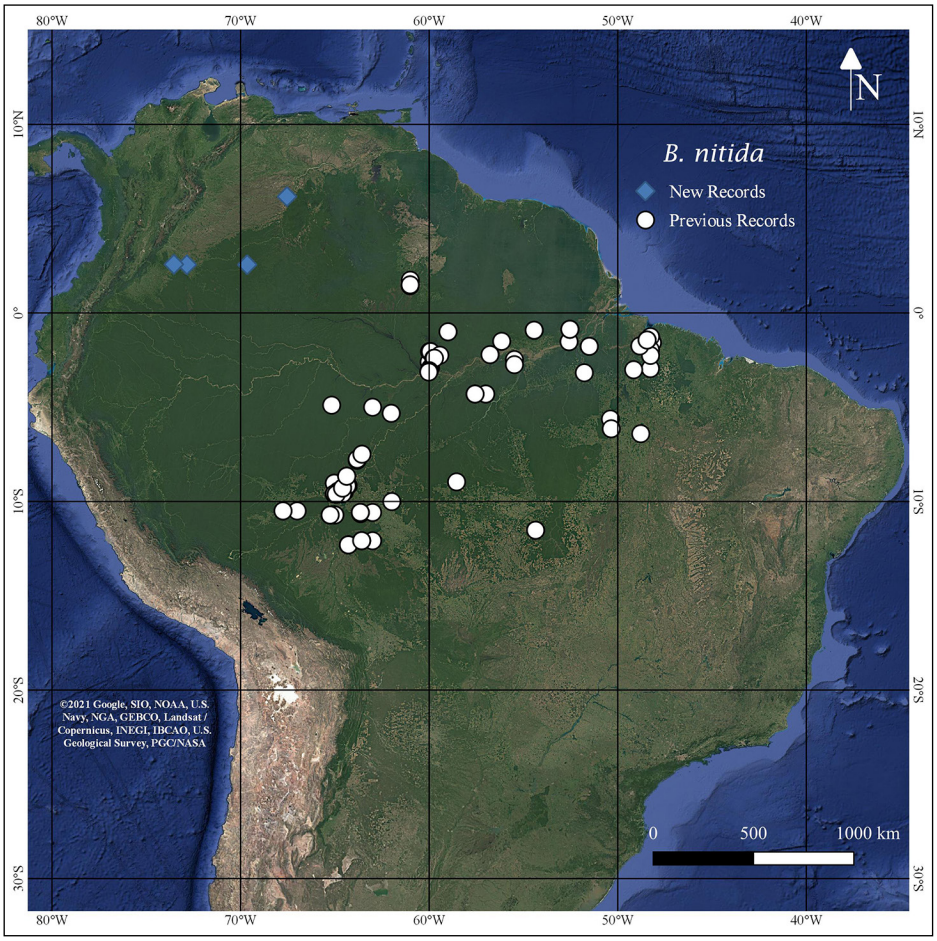

Figure 4. Distribution map of *Bowdichia nitida*.

cm long, with sericeous pubescence; style curved, 0.3–0.4 cm long; stigma subcapitate. Fruit a samaroid legume, oblong, elliptic to linear-oblong, 4–8 cm × 1–2 cm, glabrous, slightly reticulate; seeds 1–6.

Phenology. Collected from September to November with flowers, and from December to March with fruit.

Identification. *Bowdichia nitida* is distinguishable from *B. virgilioides* by its growth form (medium-sized to large trees vs. small trees up to 6 m), glaucous and glabrescent abaxial leaf surface (vs. generally pubescent), and more developed inflorescences. Additionally, in Colombia, *B. nitida* occurs mainly in forests, whereas *B. virgilioides* is primarily found in savannas and open areas.

DISCUSSION

The genus *Lonchocarpus* is predominantly represented in Central America. However, in recent decades, numerous taxa have been discovered in northern South America, primarily in Brazil (da Silva and Tozzi 2012). *Lonchocarpus schiedeanus* represents the first record of *L.* sect. *Willardia* in South America, a section previously documented only in Central America and the Caribbean. This group is characterized by leaves with a helical arrangement, ovoid or oblong bracteoles, persistent and distant from the calyx, a glabrous corolla, and free wings of the keel (Sousa 1992). Notably, there are no records of the species on the western side of the Andes or in the inter-Andean valleys. This new record is from the trans-Andean zone, over the Orinoco river basin.

Bowdichia is a genus represented by two species: *B. nitida* and *B. virgilioides*. The latter is generally a medium-sized to small tree, widely distributed in South America, and abundant in wooded savannas and areas with water deficits. Conversely, *B. nitida* can grow up to 25 m in height. It has been primarily recorded in Brazil, with scarce records in Bolivia. It grows in forested areas of the Amazon rainforest and in regions with white sands on Precambrian shields (Cardoso et al. 2015). The two species of *Bowdichia* can be confused, especially in juvenile individuals. However, *B. virgilioides* typically exhibits abundant indumentum on the abaxial surface of its leaves and features distinctive corky bark, whereas *B. nitida* has leaves that are usually glaucous on the abaxial surface, with bark that is smooth or removable in plates. There is a significant gap in collections of *B. nitida* between the most northwestern samples in Brazil and the new records of the species in Colombia.

In this contribution, we emphasize the importance of botanical collections and research in understanding species distributions, niches, and conservation status (Feeley and Silman 2011). Recently, new plant populations have been discovered at considerable distances from their known populations through herbarium reviews (da Silva et al. 2023), suggesting that sampling remains insufficient in many areas and for several taxa. Finally, we highlight the need to gather information on the population ecology of these new records. We also recommend continuing botanical explorations in these areas due to the floristic singularities that have been found; particularly in the case of *L. schiedeanus*, it is important to continue exploring and monitoring areas adjacent to the current record to locate additional individuals. Additionally, local propagation programs for the species are highly desirable.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: WAC. Data curation: WAC, LCR, SEDC. Formal analysis: WAC, LCR, SEDC. Methodology: WAC, LCR, SEDC. Resources: WAC, LCR. Visualization: WAC, LCR, SEDC. Writing – review and editing: WAC, LCR, SEDC.

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Data availability

All data that support the findings of this study are available in the main text.

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