

# A NEW RECORD FOR THE FLORA OF VENEZUELA AND THE RIO NEGRO BASIN: *DOURADOA CONSIMILIS* (XIMENIACEAE)

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**Abstract.** A new record for the flora of Venezuela and the Rio Negro Basin, *Douradoa consimilis*, is reported herein. It was collected in the Ekeweni river, a major tributary of the San Miguel River, itself a tributary of the Guainía river that eventually becomes the Rio Negro after its confluence with the Casiquiare canal. It was collected in vegetation subject to immersion, partially or totally, during the rainy season.

**Keywords:** Amazonia, *Douradoa*, Rio Negro basin, San Miguel River, Venezuela, Ximeniaceae

The largest tropical forest in the world is located in the Amazon basin and the Guiana Shield region (Myster, 2016; Antonelli et al., 2018). This area covers ca. 40% of South America and harbors 10% of the world's plant species (ca. 50,000); including ca. 16,000 taxa estimated to be trees (ter Steege et al., 2013, 2020; Cazzolla Gatti et al., 2022). One the most relevant issues observed in the last decade is that only 1.4% (227 spp.) of the tree species are extremely common. This subset of disproportionately common trees has been dubbed the “hyperdominants” (ter Steege et al. 2013).

More than 25,000 plant species are endemic to the region (Science Panel for the Amazon, 2021). Such high plant diversity is presumably due to changes in climatic, hydrological, edaphic, and geological conditions that this region has undergone (Latrubesse et al., 2007, 2010, 2017; Tuomisto et al., 2016; Jaramillo, 2023). These changes oscillated extensively during the biogeographical history of Amazonia, allowing the assembly of unique habitats that reached its present geological configuration throughout the Neogene, during the uplift of the Andes (Hoorn et al., 2010, 2017, 2022; Boschman et al., 2021).

The distribution range of some Amazonian tree species extends across the entire Amazon basin, but most are apparently restricted to much smaller areas shared with other rare species (Zizka et al., 2016). A similar imbalance is observed in species:genus ratios; over half of all Amazonian tree species belong to genera with 100 or more species, while the majority of genera (52%) have ten or fewer species (Gentry, 1993; Dexter and Chave, 2016).

The difficult and, in some cases, impossible access (for multiple reasons) to some field sites in Amazonia, especially remote ones (geographically and/or logistically) has hindered botanical exploration; therefore, the Amazon flora remains inadequately studied (Hopkins, 2007; Aymard et al., 2016; Arellano et al., 2019).

The Rio Negro basin, in particular, shows considerable variation in floristic composition and forest structure along local and regional environmental gradients; it comprises a mosaic of unique vegetation types, particularly sclerophyllous forests on oligotrophic and acid soils, known as “caatinga Amazónica” (Venezuela). The area also harbors small to extensive areas of savannas, shrubby savannas, and scrublands growing on white sands. Additionally, these white-sand forests are established through an ecological and floristic transition between *terra-firme* forests commonly found on peneplain red-yellow clay soils, and flooded forest communities on alluvial plains called *igapó* and *varzea* (for a review see Arellano-Peña et al., 2023). Sporadic reports of new distributions for Amazonian tree species have been published recently, such as the first report of *Rhabdodendron amazonicum* (Spruce ex Benth.) Huber (Rhabdodendraceae) for the flora of Colombia and the upper Rio Negro (Aymard et al., 2016; Arellano et al., 2019) and a new report of *Schoeffia clarkii* Steyerl. (Scheffiaceae) within the Rio Negro basin (Farroñay et al., 2019).

The species reported here is another notable example. The genus *Douradoa* Sleumer and *D. consimilis* Sleumer (Ximeniaceae), described by Sleumer (1984: 136), were based on two collections made in 1968, *Silva 1082* and *Oliveira 4134*, and a third one made in 1976, *Rosa 1374* (the latter sterile; see additional specimens examined). All three collections were gathered in the general area of Monte Dourado, along the border of the states of Amapá and Pará, Brazil. Another collection from the same area, made in 1982, *Silva 5288*, was not examined by the author of the species. Two additional collections from Brazil were reported more recently, *Maas et al. 9176*, made in 2001 in the state of Acre, and *Zartman 5547*, made in 2006 in the state of Amazonas.

The collection reported here was made, serendipitously, in the context of an orchid inventory project in southern

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Venezuela. Due to limitations in the weight and volume that could be carried in a small plane, collections were restricted to Orchidaceae, and few other families were collected unless they appeared rare or exceptional to the senior collector (one of us, GAR-G). *Douradoa consimilis* was collected after an eight-hour journey by boat departing from Maroa (2°43'12"N, 67°33'46"W), on the eastern side of the Guainía River, navigating up the San Miguel river and "caño" Ekeweni, to a camp site near Sabana Tinaja (see coordinates below). The collection was made at night, when we sampled the vegetation around the camp site using flashlights. It was identified by the junior author based on a small sample from a hand press (Fig. 1). It was first reported for the Venezuelan Rio Negro basin in Romero-González et al. (2019: 98). Again, surprisingly, this new locality is ca. 1850 km from the ones reported in the protologue, ca. 1430 km from the locality in Amazonas, Brazil, and approximately 1300 km from the locality in Acre, Brazil.

We report herein *Douradoa consimilis* for the flora of Venezuela and the Rio Negro basin. We present photographs, amend the description of floral parts, and provide new data on geographic distribution and ecology.

*Douradoa consimilis* Sleumer, Fl. Netrop. 38: 136. 1984. TYPE: BRAZIL. Pará: [lower] Rio Jarí, Monte Dourado [0°51'51"S 52°32'25"W], Planalto A., mata de terra firme, árvore de 38 m, botão verde, 2 October 1968, *N. T. Silva* 1082 (Holotype: IAN, not seen; Isotypes: NY [00285458 & 00285459], L [0038961, image seen]. Fig. 1–3.

**Additional specimens examined:** BRAZIL. Acre: Município Cruzeiro do Sul, 364 near comunidade Assis Brasil, Ramal do Pentecoste, Km 10, 7°31'17"S, 72°51'15"W, forest on white sand, tree 25 m tall, 40 cm in diam., pedicels pink, ovary green, tepals pale green, 23 October 2001, *P. J. M. Mass, H. Mass-van de Kamer, J. Prado, D. P. Gomes Silva, R. L. Maia, E. C. Oliveira, & J. R. Bandeira* 9176 (NY [00868494], MO [1791025]). Amapá: Município Mazagão, área do Felipe V, floresta de terra firme, 0°6'54"S, 51°17'22"W, tronco cilíndrico, DAP 35 cm, altura

commercial 12 m, copa 08 m, total 20 m, 23 February 1982 (fr), *N. T. Silva* 5288 (MG [124357\_2, image seen]); Porto Platon-Serra do Navio, 0°59'N; 52°03'W, 10 October 1976 (st.), *N. A. Rosa* 1374 (MG, not seen). Amazonas: Apuí, Rio Sucunduri acampamento, Floresta riparia na beira do Rio Sucunduri, 8°00'S, 59°40'W, 26 June 2006, *C. E. Zartman* 5547 (INPA). Pará: Rio Jarí, Monte Dourado, Planalto, mata alta, T. firme, árvore de 22–25 m, 0°52'S; 52°31'W, 28 January 1968, *E. Oliveira* 4134 (NY [02259736]); same locality, Planalto A., mata de Terra firme, árvore de 30–35 m, flôr esverdeada, 10 September 1968, *N. T. Silva* 929 (NY [02259737]). VENEZUELA. Amazonas: Municipio Autónomo Maroa, cuenca del río San Miguel, margen oeste del caño Ekeweni, en los alrededores del Puerto de Tinaja, 2°44'11"N, 66°47'42"W, árbol de 7 m, flores verdes, en el ápice blancas, único individuo visto en la orilla del caño, 28 August 2008 (fl), *G. A. Romero, C. Gómez, O. Gómez, E. Yuriyuri, & J. Aragua* 4013 (GH, MO, TFAV, VEN [x2]).

**Common name:** "Pau curupira" (based on *Silva* 5288).

**Distribution and ecology:** Brazil (Acre, Amapá, Amazonas, and Pará) and Venezuela (Amazonas; Fig. 3). In the type locality, found on *terra firme*; in Acre, found in forest on white sand; in Venezuela, found in seasonally flooded forest, along a black-water river, growing on white sand.

**Iconography:** Sleumer (184: 137, Fig. 19), reproduced in Kuijt and Hansen (2015: 188, Fig. 71).

The material from Venezuela, although apparently referable to *Douradoa consimilis*, differs from the original description in some features (Fig. 2). First of all, it is much more floriferous, ranging from 18 to 27 flowers per inflorescence (versus "8–10 *florae*" in Sleumer, 1984: 138), and the petals are reflexed and, consequently, the stamens are exposed (versus "*stamina... inclusa*" in Sleumer, 1984: 138; Fig. 2D herein).

The full collection of *Romero et al.* 4013, five sets, destined for, in the following order, VEN [x2], GH, TFAV, and MO, are in storage at TFAV, where they were dried, are yet to be distributed.

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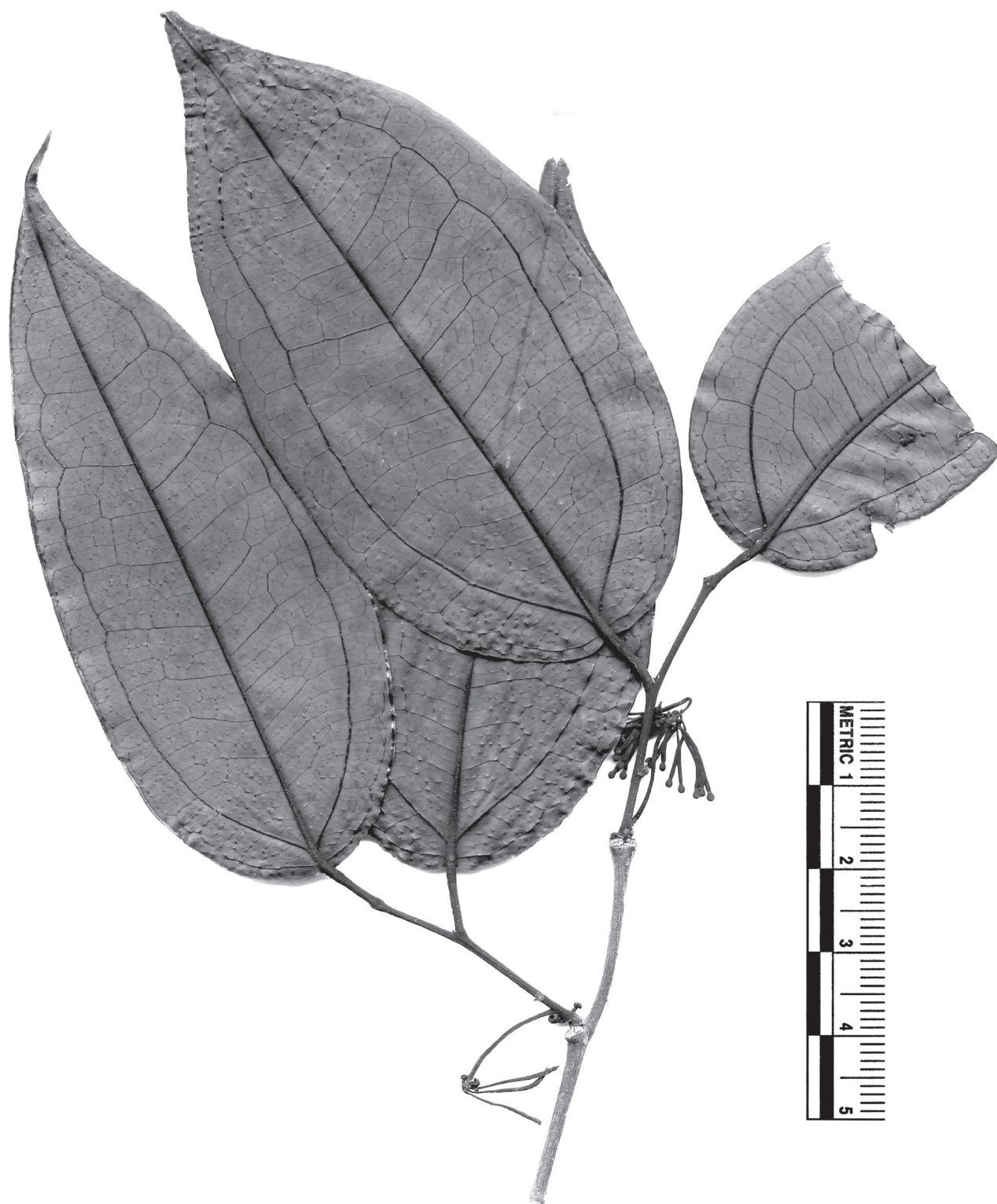


FIGURE 1. *Douradoa consimilis* Sleumer. Based on Romero *et al.* 4013 (TFAV). Photographs by G.A. Romero-González.

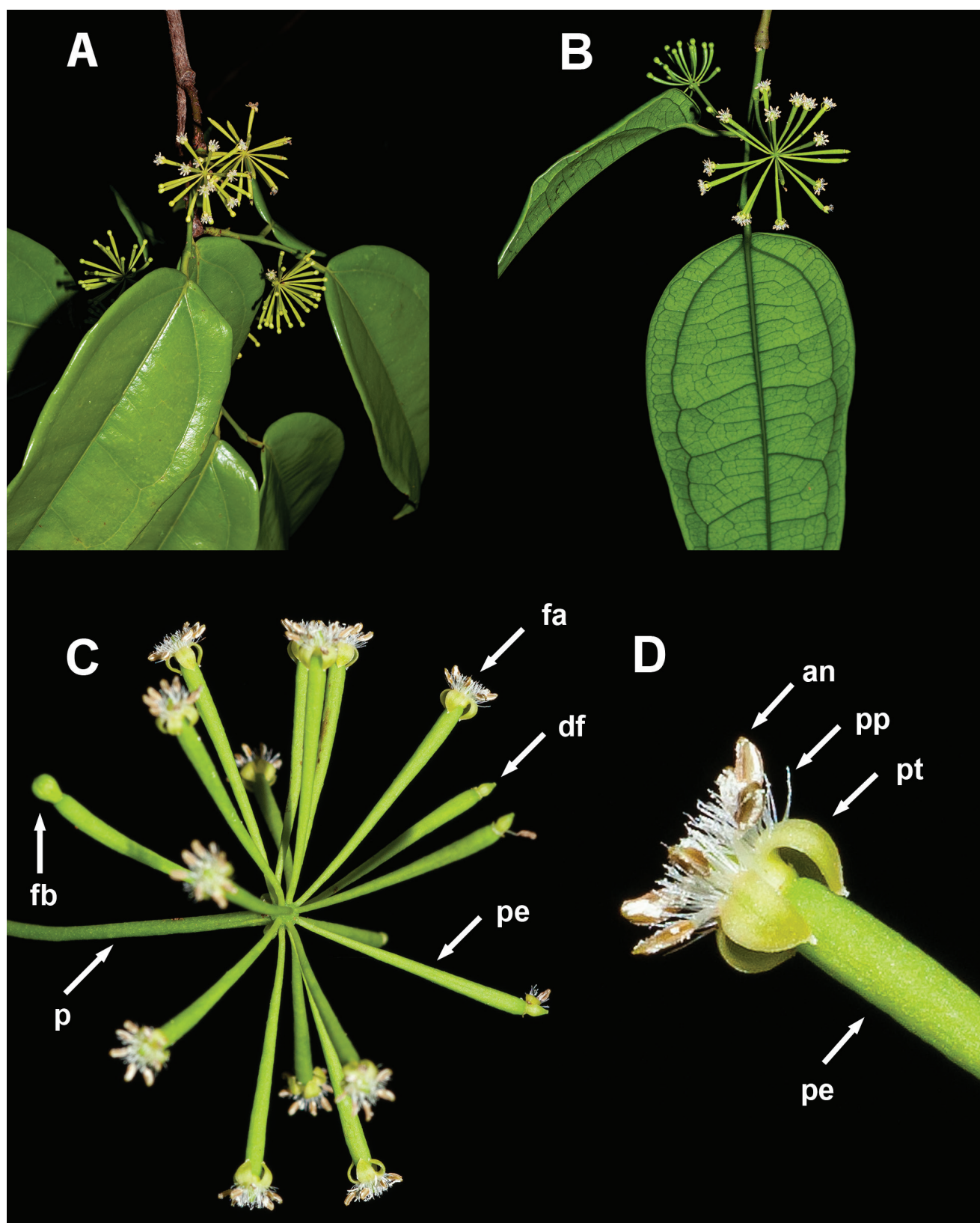


FIGURE 2. *Douradoa consimilis* Sleumer from the Venezuelan Rio Negro basin. **A**, branch showing adaxial side of leaves and several inflorescences; **B**, branch showing abaxial side of a leaf, one immature inflorescence and one at anthesis; **C**, inflorescence, showing the peduncle (p), pedicels (pe), a flower bud (fb), flowers at anthesis (fa), and three developing fruits (df); **D**, flower at full anthesis showing the pedicel (pe), the reflexed petals (pt), the trichomes on the inner surface of the petal (pp), and the anthers (an). Photographs by G.A. Romero-González.

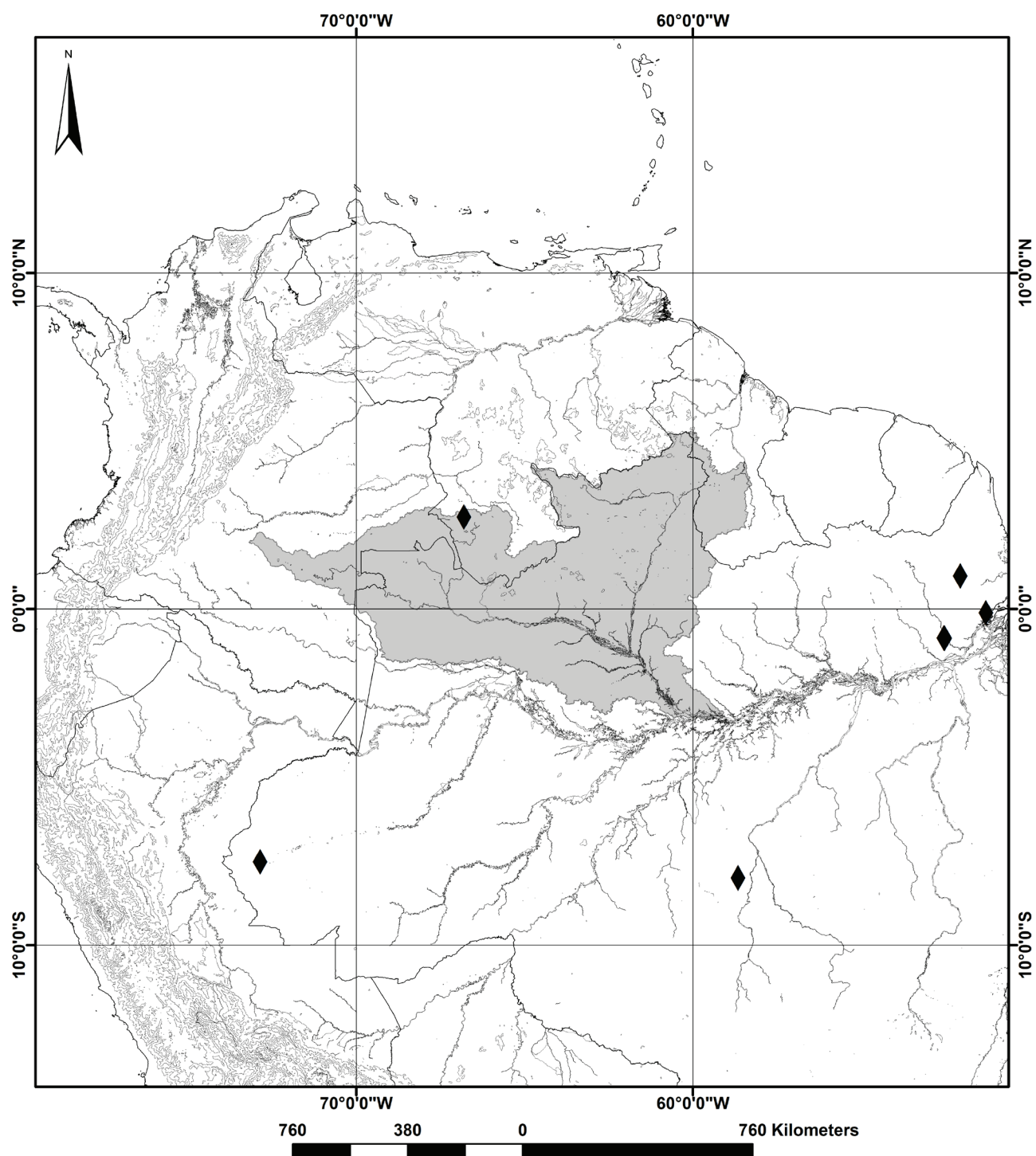


FIGURE 3. Geographical distribution of *Douradoa consimilis* Sleumer in the Amazon basin (the Rio Negro basin shaded). Prepared by H. Arellano-Peña.

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