Novelties in Erythroxylum (Erythroxylaceae) of the Greater Antilles

Author: Prieto, Ramona Oviedo

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RAMONA OVIEDO PRIETO

Novelties in *Erythroxylum (Erythroxylaceae)* of the Greater Antilles

Abstract

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Three new Antillean species of *Erythroxylum* are described: *E. mogotense* and *E. banaoense* from Cuba and *E. domingense* from Hispaniola. The main diagnostic characters are leaf morphology, stipules and number of flowers per axil. Phenology, ecology and chorology are also relevant criteria. *E. williamsii,* described from Venezuela, is a new record for Hispaniola.

Introduction

Erythroxylum is the largest and most difficult genus of *Erythroxylaceae,* with over 250 mostly neotropical species. It presents major taxonomic problems due, not only to the large number of its taxa, but also to the high variability of its vegetative features (those of the stems, twigs, brachyblasts and leaves), and conversely, the paucity of variation in reproductive structures (sepals, petals, stamens, ovaries and fruits). In the last few decades our knowledge of the genus has improved substantially, thanks to increasingly sophisticated studies. Notably, *Erythroxylum* has been treated in several country or local floras, both on the American continent and the Caribbean islands. According to these studies, the Antillean species of *Erythroxylum* are 33 in number.

Material and methods

Material (now in HAC) and observations gathered during 20 years' field work form the basis of my treatments of *Erythroxylum* for the "Flora de la República de Cuba" and the "Flora de las Antillas Mayores". In addition, 3200 specimens from 24 herbaria were studied (Cuba: HAC, HAJB, HPPR, HPVC, AJBC, HIPC, HMC; Dominican Republic: JBSD; Puerto Rico: UPR, UPRRP, MAPR, SJ; Jamaica: IJ, UCWI; Costa Rica: CR; Mexico: IEB, CREG, ENCB; USA: US, NY, F, FTG; Spain: MA; Sweden: S – abbreviations as in Holmgren & al. 1990).

The following parameters were found to be taxonomically relevant: (1) biological type, (2) leaf morphology, with strong emphasis on vein pattern, (3) stipules, (4) phenology, as observed in the field or inferred from specimen data, and (5) ecology and chorology of Antillean species. The Cuban vegetation units accepted here are those defined by Capote & Berazaín (1984); for Hispaniola, label data were used.

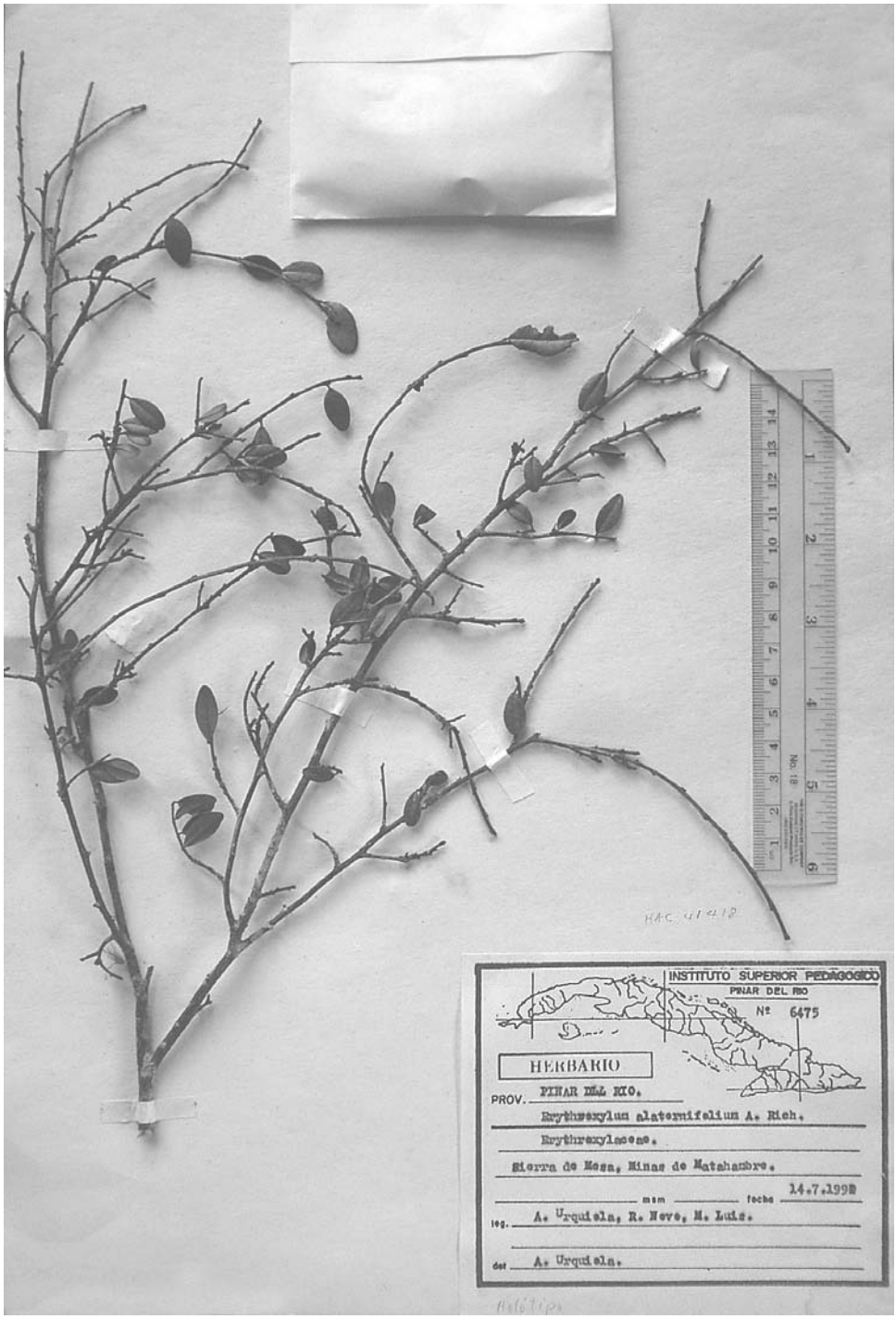

Fig. 1. *Erythroxylum mogotense,* holotype specimen.

The taxa defined in the course of the study were compared and identified with those characterised in the relevant literature (Schulz 1907a, 1907b, 1913, Urban 1925, 1929, León & Alain 1951, Alain 1960, Liogier 1969, 1985, 1988, Borhidi & Muñiz 1977, Proctor 1984, Adams 1972, Correll & Correll 1982, Plowman 1988, Oviedo & Borhidi 1994, Oviedo 1994, Acevedo-Rodríguez 1996).

Four taxa that could not be matched with species previously known from Cuba or Hispaniola are dealt with in the present paper, which presents their taxonomy, distribution and ecology. Three of them are species new to science, the fourth is an addition to the flora of Hispaniola.

Erythroxylum (sect. *Archerythroxylum*) ***mogotense*** R. Oviedo, **sp. nova** – Holotypus: *Urquiola & al. 6475* (HAC 41418; isotypus: HPPR). – Fig. 1, 5A.

Proximum *Erythroxylo alaternifolio* A. Rich. et *E. flavicante* Borhidi, differt a priore ramis gracilibus flexuosis (nec robustis rectis) et foliis coriaceis ellipticis opacis 1.2 cm longis (nec papyraceis obovato-cuneatis lucidis 2-6 cm longis), ab altero foliis acutis vel leviter retusis dense reticulato-venosis (nec emarginatis et laxe reticulatis).

Semideciduous *shrub,* 0.5-2 m tall, diffusely branching from the base. *Branches* slender and flexuous; *brachyblasts* 1-2 cm long. *Leaves* few; *stipules* veinless, triangular-truncate, 1 mm long, entire, acute and mucronate; *petioles* channelled, 1-2 × 1 mm; *lamina* elliptic, 12 × 5-7 mm, coriaceous, dull green, base acute, margin revolute, tip acute to slightly retuse, mid-vein deeply impressed above, prominent beneath, venation reticulate, craspedodromous to semicraspedodromous, veinlets twice forked. *Flowers* borne single in the leaf axils on some of the brachyblasts; *pedicel* keeled, 2-2.5 mm long; *sepals* 5, 0.5 mm long, free almost to the base, abruptly acuminate. *Drupe* ellipsoidal, 5-7 × 3 mm, ridged.

Specimen seen. – CUBA: prov. Pinar del Río, "Sierra de Mesa, Minas de Matahambre", 14.7.1991, *Urquiola & al. 6475* (HAC 41418, HPPR).

Distribution and habitat. – Endemic and only known from the type gathering. Growing on a karstic limestone bluff (mogote), at 200-500 m above sea level. Flowering in May and June, fruiting in July.

Etymology. – From the Cuban word "mogote" for the locally characteristic karstic limestone bluffs.

Erythroxylum (sect. *Rhabdophyllum*) ***banaoense*** R. Oviedo, **sp. nova** – Holotypus: *Bécquer & al.* (HAC 41419). – Fig. 2, 5B.

Erythroxylo rufo Cav. proximum, a quo differt floribus 2-3(-4) (nec ≥ 4) fasciculatis, stipulis truncato-triangularibus 2.3 mm longis margine denticulatis (nec lanceolato-triangularibus 2.5-4 mm longis margine fimbriatis) et foliis elliptico-ovatis chartaceis 5-7 cm longis subtus opacis (nec oblongo-obovatis coriaceis 6-10 cm longis utrinque lucidis).

Evergreen *shrub,* 2-5 m tall. *Branches* erect. *Stipules* veined, triangular-truncate, 2.3 mm long, margin denticulate, tip 3-setulose; *petiole* somewhat channelled at the distal end, 5-7 × 1 mm; *lamina* ovate-elliptic, 5-7 × 2.5-3.5 cm, chartaceous, shiny above, dull green beneath, base acute, tip obtuse to slightly emarginate, veins prominent on both faces, venation craspedodromous-mixed. *Flowers* in fascicles of 2-3(-4); *pedicels* 1-1.5 × 1 mm; *calyx* 1-1.5 mm long, divided halfway into triangular, acuminate lobes with a somewhat fimbriate margin. *Drupe* oblong, 13-15 × 4-6 mm.

Specimens seen. – CUBA: Prov. Sancti Spíritus, SW escarpment of the Tetas de Juana (Pico Banao), Alturas de Banao, 700 m, 24.7.2000, *Bécquer & al.* (HAC 41419); id., Lomas de Banao, 5.1920, *Luna 553* (HAC, NY); id., Loma Mala, el Tibisial near Loma Gavilanes, Alturas de Banao, 650 m, 5.2000, *Bécquer & Orozco* (HAC 41420).

Fig. 2. *Erythroxylum banaoense,* holotype specimen.

Distribution and habitat. – Endemic to the Banao and Trinidad Mts of Sancti Spíritus province, central Cuba. Growing on karstic limestone bluffs, in spiny xerophilous scrub on serpentine and in lowland rainforest, at 400-900 m above sea level, tolerating some anthropic influence. Flowering May to June, fruiting June to July.

Etymology. – From the Cuban toponym "Banao" (a village and mountain group in central Cuba).

Erythroxylum (sect. *Eurysepalum*) ***domingense*** R. Oviedo, **sp. nova** [*E. minutifolium* var. *domingense* Ekman in sched., ined.] – Holotypus: *Leonard 4836* (US; isotypi: NY, US). – Fig. 3, 5C.

Proximum *Erythroxylo minutifolio* Griseb., sed differt ramis rectis rigidis teretibus (nec flexuosis costatis) simul cum foliis rufo-brunneis (nec grisaceis), stipulis 1-1.2 mm longis hastatis acuminatis (nec 0.7-1 mm longis basi truncatis apice bifidis) et foliis ovatis profunde emarginatis (nec orbicularibus leviter emarginatis) venatione perfecte actinodroma (nec [semi-]craspedodroma). *E. barahonense* O. E. Schulz & Ekman, quamvis etiam affine, discedit propter ramos flavido-grisaceos aliquanto crassiores breviores et rigidiores, stipulas auriculato-hastatas margine cerino papyraceo cinctas et folia orbicularia obtusa chartacea (nec ut in nostro coriacea).

Evergreen *shrub,* 0.5-2 m tall. *Branches* long and slender, stiff, terete, spiny, reddish brown (same as the leaves). *Stipules* veinless, triangular-hastate, 1-1.2 mm long, acuminate and mucronate; *petiole* 1-1.2 × 0.5 mm, deeply channelled; *lamina* ovate, 5-7 × 3-5 mm, coriaceous, shiny, base obtuse, tip deeply emarginate, mid-vein deeply impressed above, prominent beneath, venation prominent on both surfaces, actinodromous-perfect, reticulate basally, with a narrowly acute angle of divergence. *Flowers* 1(-2) in the leaf axils, white to greenish; *pedicel* 5 mm long; *calyx* 1.5 mm long, cleft almost halfway into triangular, acute lobes. *Drupe* oblong, 5-6 × 2-3 mm, 4-keeled.

Specimens seen. – Hispaniola, Haiti: Vicinity of Piétonville, dry woodland on limestone, 350 m, 15.-28.6.1920, *Leonard 4836, 4836a* (NY, US [2×]); vicinity of Port-au-Prince, road from Piétonville to Port-au-Prince, 21.5.1929, *Leonard & Leonard 15827* (US, NY); Massif des Matheux, Morne à Cabrit, near Croix-des-Bouquets, 500 m, 15.7.1924, *Ekman 897* (S). — Hispaniola, Dominican Republic: Arroyo Francés, serpentine hill c. 3 miles W of Puerto Plata, 50-150 m, 28.-29.10.1969, *Liogier 16591* (S, NY); prov. Azua, Sierra de Ocoa, San José de Ocoa, el Cercado, 800 m, 18.3.1929, *Ekman 11958* (S, US); prov. Independencia, serpentine mountain of Sierra Prieta, at town of Sierra Prieta (halfway between Villa Mella and Yamasa), 18°39'N, 69°58'W, < 254 m, 8.7.1981, *Zanoni & al. 15346* (NY); prov. Independencia, Sierra Prieta, Villa Mella, scrub on serpentine, 150 m, 23.3.1974, *Liogier & Liogier 21447* (NY); prov. Independencia, Sierra de Baoruco c. 9 km S of Puerto Escondido along the path to Caseta Forestal No. 1, 18°19'N, 71°34'W, 900-1000 m, 24.1.1987, *Zanoni & al. 37818* (NY).

Distribution and habitat. – Endemic to Hispaniola. In dry scrubs or forests, on serpentine or limestone, at 50-1500 m above sea level. Flowering in March and June-July, fruiting in June and July.

Etymology. – Ekman's unpublished varietal epithet, commemorating the Dominican Republic, has been adopted. It appears on the handwritten label of the gathering *Ekman 11958.* Erik Ekman, the famous Swedish collector and botanist, was thus the first to recognise the distinctness of the present taxon.

Erythroxylum (sect. *Archerythroxylum*) ***williamsii*** Standley ex Plowman in Brittonia 34: 453. 1982. – Holotype: *Plowman 7700* (F; isotypes: F, G, GH, INPA, K, NC, NY, US, VEN). – Fig. 4, 5D.

Branches grey, terete, stiff and divaricate. *Stipules* triangular-sagittate, 1.5-3 mm long, margin fimbriate-ciliate, tip bisetulose; *lamina* obovate, 0.8-2.5 cm long, tip retuse, membranaceous to chartaceous, shiny, grey above, reddish brown beneath. *Flowers* 1-3 in each leaf axil. *Drupe* 5-8 mm long.

Specimens seen. – Venezuela, Amazonas Federal Territory: "Puerto Ayacucho, 'Lajas' outcrop in Parque Ayacucho", c. 100 m, 20.2.1979, *Plowman 7700* (NY 399939, US). — Hispaniola, Dominican Republic: Prov. Independencia, las Baitoas, 6 km W of Duvergé, 3.9.1960, *Marcano & Jiménez 4303* (US); prov. Montecristi, Hatillo de Palma, scrub, 50-100 m, 8.1.1976, *Liogier & Liogier 24619* (NY); prov. Peravia, 3 km E of Sabana Huey, along road to

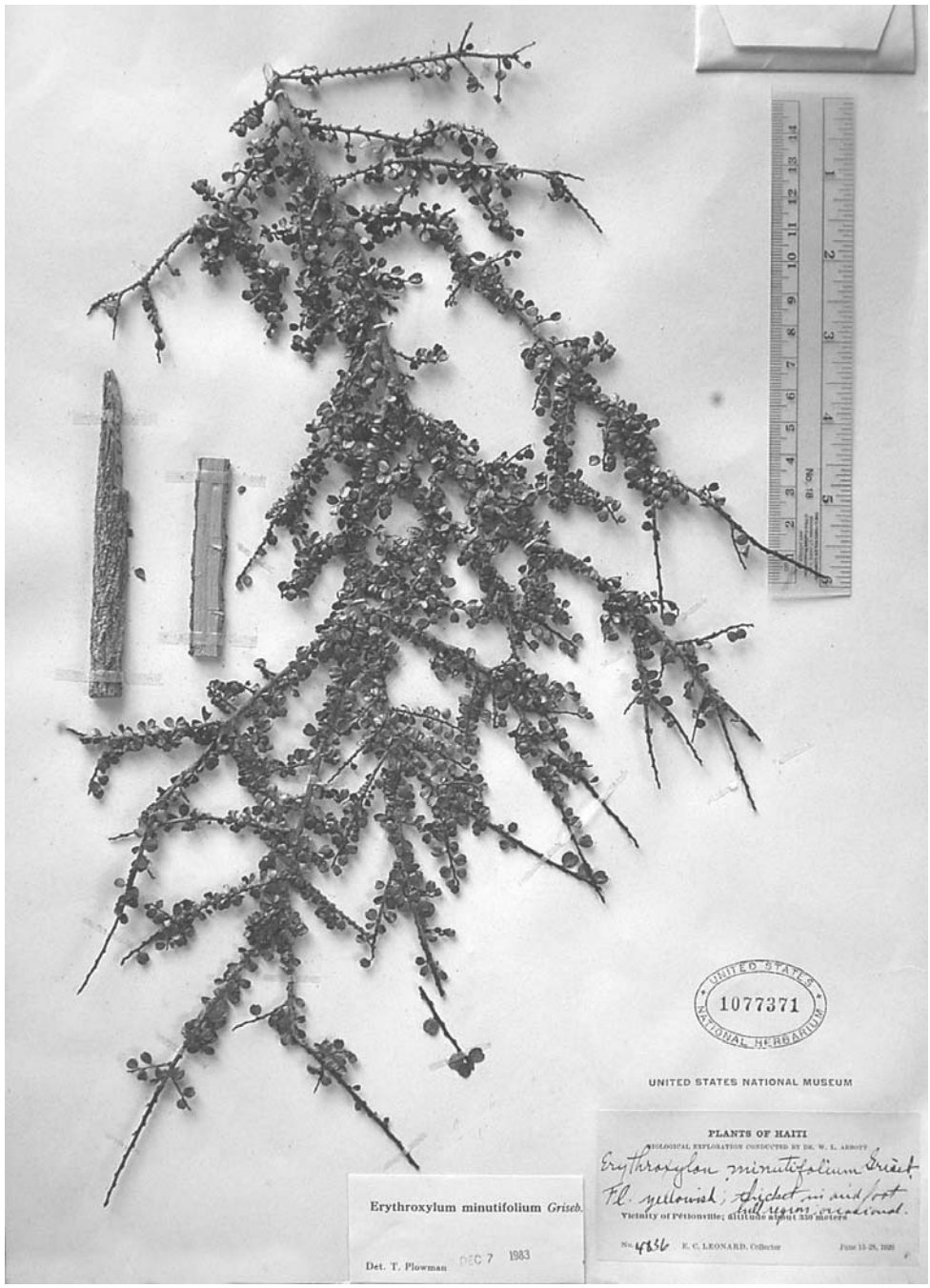

Fig. 3. *Erythroxylum domingense,* holotype specimen.

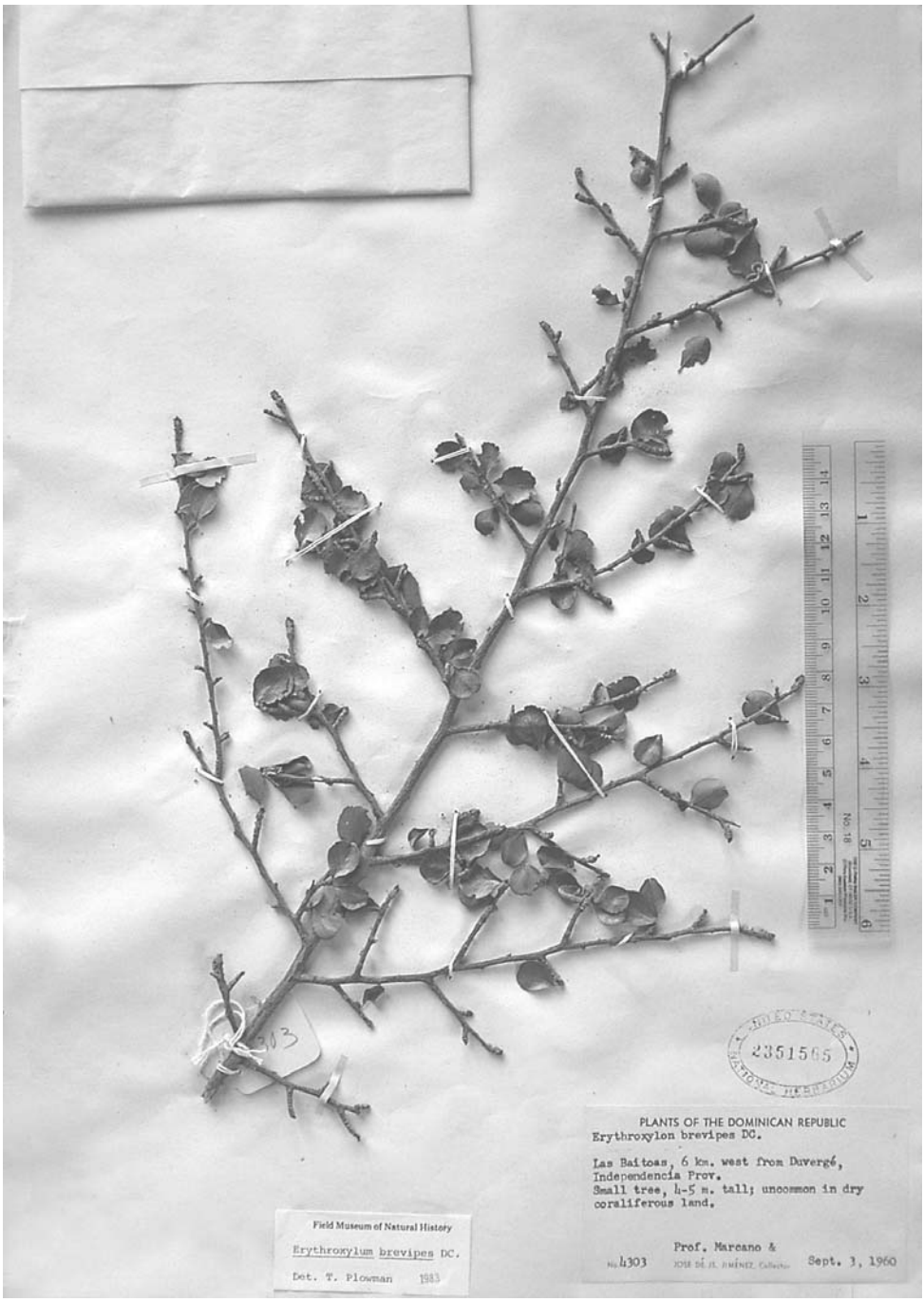

Fig. 4. *Erythroxylum williamsii,* specimen *Marcano & Jiménez 4303* (US).

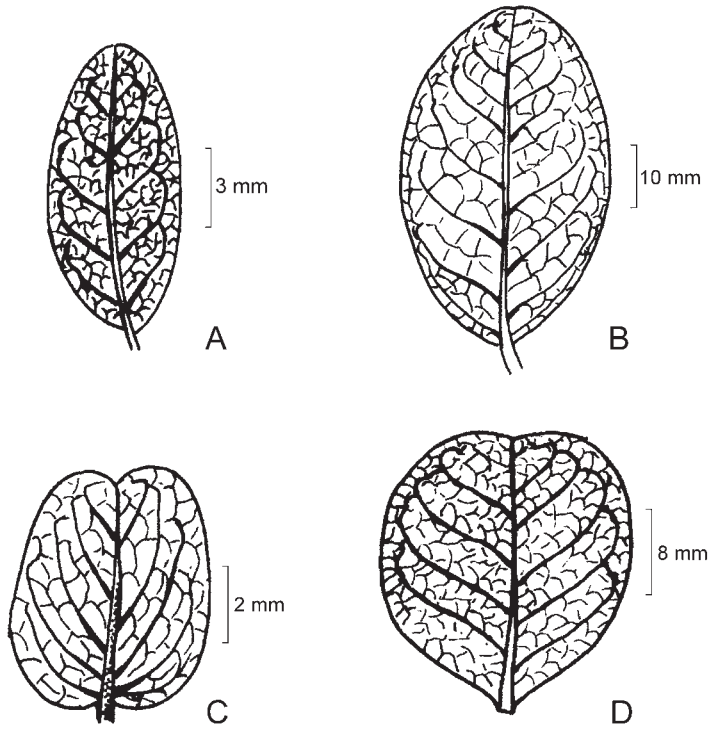

Fig. 5. Venation of characteristic leaves. – A: *Erythroxylum mogotense,* from the holotype; B: *E. banaoense,* from the holotype; C: *E. domingense,* from *Ekman 11950* (S); D: *E. williamsii,* from *Marcano & Jiménez 4303* (US).

Villa Fundación, 18°13'25"N, 70°28'54"W, 40 m, 22.9.1996, *Acevedo-Rodríguez & al. 8516* (JBSD, NY); prov. Azua, dry scrub between Baní and Azua, at km 80, 50-100 m, 27.10.1973, *Liogier 20516* (JBSD).

Distribution and habitat. – Believed to be endemic to Venezuela (Plowman 1982), this being the first record of the species for the Antilles (Hispaniola). Growing in dry habitats, at 50-100 m above sea level.

Note. – Material of this species collected in Hispaniola had been variously misnamed *Erythroxylum minutifolium* Griseb., *E. brevipes* DC. or *E. rotundifolium* Lunan.

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Address of the author:
Ramona Oviedo Prieto, Instituto de Ecología y Sistemática, Ministerio de Ciencia, Tecnología y Medio Ambiente, Carretera Varona, km 3 ½, Capdevila, Boyeros, c.p. 10800, ap. 8029, La Habana, Cuba; e-mail: botanica.ies@ama.cu, direccion.ies@ama.cu