

NOTES

A NEW SPECIES OF *COSTUS* (COSTOIDEAE, ZINGIBERACEAE) FROM VERACRUZ, MEXICO

Costus L. is a genus of about 90 species, with a pantropical distribution mostly in the Neotropics. The most recent taxonomic studies dealing with the genus are those by Maas (1972, 1977) and Maas & Maas (1990).

Mexico represents the northernmost distribution limit of this genus in America. This genus is represented in Mexico only by five species of subg. *Costus*: *C. comosus* (Jacquin) Roscoe var. *bakeri* (Schumann) Maas, *C. scaber* Ruiz & Pavón, and *C. pulverulentus* C. B. Presl within sect. *Ornithophilus*; and *C. pictus* D. Don, *C. guanaiensis* var. *tarmicus* (Loesener) Maas, and *C. guanaiensis* var. *macrostrobilus* (Schumann) Maas belonging to sect. *Costus*.

Studies carried out during a comprehensive floristic project of the Flora de la Estación de Biología Los Tuxtlas, Veracruz, Mexico (Ibarra & Sinaca, 1987), have brought to light a distinctive new species.

Costus dirzoi García-Mendoza & Ibarra-Manríquez, sp. nov. TYPE: Mexico. Veracruz: Municipio San Andrés Tuxtla, Estación de Biología Tropical Los Tuxtlas, 18°34'–18°36'N, 95°04'–95°09'W, 200 m, 7 June 1989 (fl), Ibarra 3400 (holotype, MEXU; isotypes, BM, ENCB, K, LE, MO, U, US, XAL). Figure 1.

A *C. picto* D. Don inflorescentia terminali in caule aphylo (raro 1–2 foliis), callo conspicuo, bracteola puberula, ovario villosa et foliis supra glabris, infra dense velutinis differt.

Plants 1–1.5(–2) m tall, pale green when dry, sheaths, ligules, and petioles sparsely puberulous. Sheaths (4–)4.5–7(–8) × 1–1.4(–2) cm, green; ligule (3–)4–9(–12) mm long, obliquely truncate, mostly dilacerating into fibers; petiole 3–10(–15) mm long. Leaves narrowly to broadly elliptic, (15–)20–27(–32) × 8–15 cm, (1.5–)2.1–2.5(–2.8) times longer than wide, cuneate at the base, with a (1.5–)2–3 cm acumen at the tip, upper surface glabrous, lower surface densely velutinous. Inflorescence ovoid to fusiform, 3–6(–10) ×

(2.5–)3–4 cm, elongating to 16 × 5.5 cm in fruit, borne on a leafless shoot 20–40(–70) cm tall, or occasionally terminal on a leafy stem. Sheaths obliquely truncate, 4–5(–8) × 1.3–2 cm, minutely puberulous, sericeous at the insertion, reddish to green. Bracts broadly ovate, 2.5–4 × 2–3 cm, acute, coriaceous, exposed part green, glabrous, covered part reddish, puberulous; callus 5–6(–8) mm long, yellowish, rarely inconspicuous; bracteole 1.5–1.8(–2) cm long, sparsely puberulous; calyx 5–9 mm, sparsely puberulous, lobes deltate, (2–)3–4 mm long. Corolla 4.5–6 cm long, bright yellow, lobes narrowly obovate, 4–5 × 1–1.8 cm, the dorsal one to 6 cm long, outer side minutely puberulous, tube 1–2 cm long. Labellum broadly obovate when spread out, 5–6.5 × 3–3.5 cm, yellow, margins crenulate, lateral lobes with a pubescent line inside, with dark red stripes, the middle lobe reflexed, irregularly 3–5 lobulate, tube 2–2.5 cm; stamen narrowly elliptic, 3.3–4.5 × 1–1.2 cm, yellowish white, apex dark red, rectangular, reflexed, anther 8–9(–10) mm, dorsifixed; ovary 4–6(–7) mm, densely villose; style filiform; stigma bilamellate with a 2-lobed appendage and one lunular, ciliate structure. Capsule broadly obovoid, 8–11 × 6–8 mm, densely villose, seeds 4–4.5 × 2.5–3 mm, black, 5–20 per fruit. Seedlings epigeous.

Common names. Bordón, caña agria, caña de venado.

Uses. The local people chew and suck on the stems to satisfy thirst.

Distribution and habitat. *Costus dirzoi* is known only from the Los Tuxtlas region, Veracruz, Mexico, where it grows in primary tropical rainforest but is more abundant in gaps produced by tree falls or edges of the forest and river banks, at elevations of 160–300(–700) m. The aerial parts of the plants show growth quickly after their stems are cut. The fruits and seeds are eaten and depredated (perhaps dispersed) by mice. Flowering occurs from May to June, rarely in August, and mature fruits are found from November to Decem-

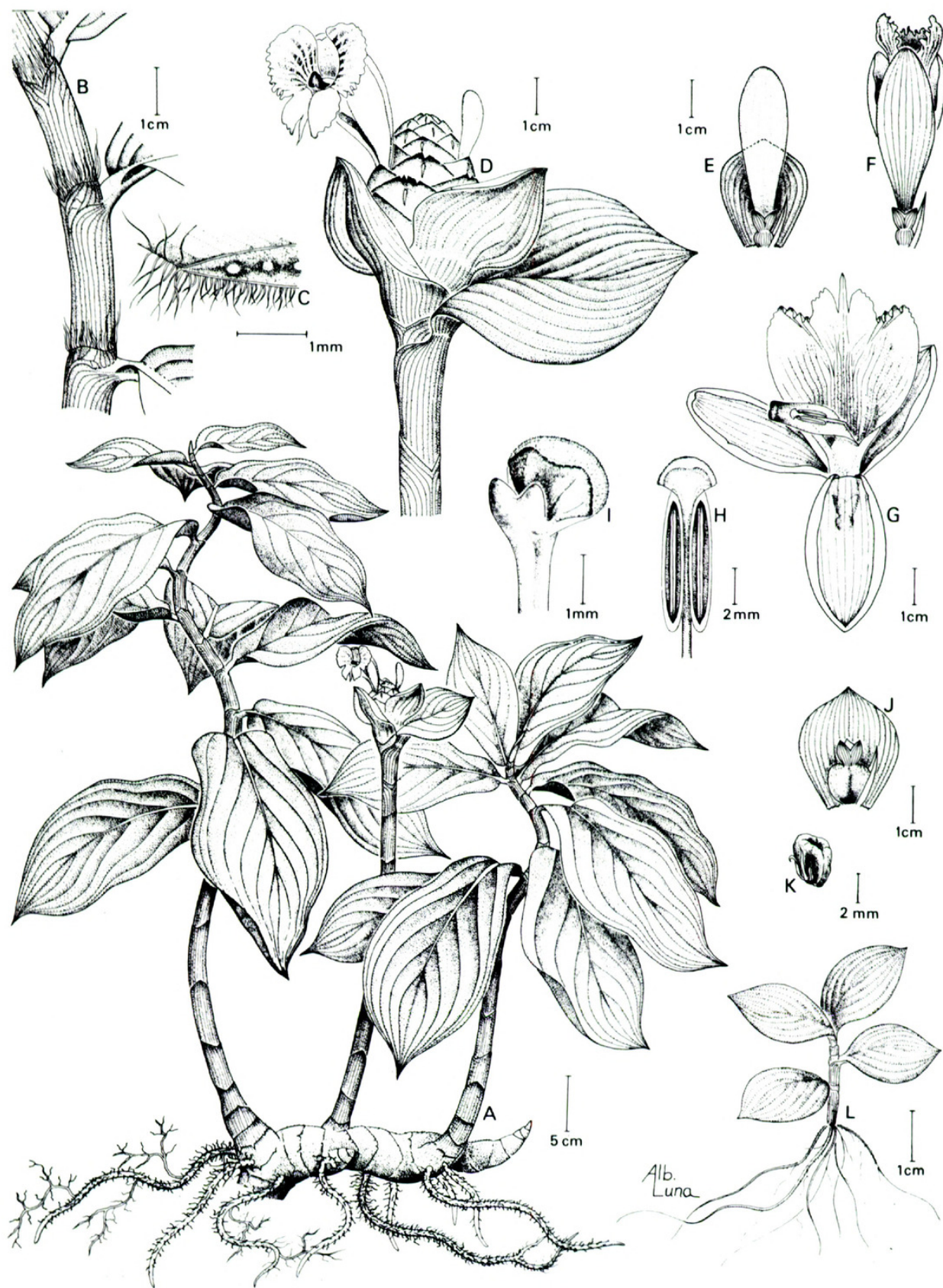


FIGURE 1. *Costus dirzoi*. A-I from Ibarra 3400, J, K from Ibarra & Sinaca 2209, and L from Ibarra 1376. — A. Habit. — B. Part of a leafy stem. — C. Detail of leaf indument, cross section. — D. Inflorescence. — E. Bract and flower bud. — F. Flower. — G. Flower, showing three petals, labellum, and stamen. — H. Stamen and stigma without petaloid part. — I. Stigma seen from ventral surface. — J. Capsule, bracteole, and bract. — K. Seed. — L. Seedling.

TABLE 1. Comparison of morphological features in *Costus dirzoi* and *C. pictus*.

	<i>C. dirzoi</i>	<i>C. pictus</i>
Height	1–1.5(–2) m	1–4 m
Sheath and ligule	Puberulous	Glabrous or rarely strigose
Petiole	Puberulous	Glabrous
Lower surface of leaves	Velutinous	Glabrous to densely puberulous, rarely strigose
Length/width ratio of leaves	(1.5–)2.1–2.5 (–2.8)	(2.1–)3.7–4.6 (–5.3)
Inflorescence shoot	Leafless or rarely leafy	Leafy
Callus of bracts	Conspicuous	Inconspicuous
Bracteole	Puberulous	Glabrous to puberulous
Anther	8–9(–10) mm	7–8 mm
Ovary	Villose	Glabrous

ber. The seeds germinate in 2–4 weeks, and seedlings are particularly abundant in February and March. Cultivated plants are found in the greenhouses of Jardín Botánico Francisco Javier Clavijero, Xalapa, Veracruz (29 May 1985 (fl), *Iglesias 23* (XAL)), and Jardín Botánico de la Universidad Nacional Autónoma de México, Distrito Federal.

Additional specimens examined. MEXICO. VERACRUZ: Municipio San Andrés Tuxtla, Estación de Biología Tropical Los Tuxtlas, 31 May 1983 (fl), *Ibarra 641* (MEXU); 9 Nov. 1983 (fr), *Ibarra 996* (MEXU); 25 Jan. 1984 (seedling), *Ibarra 1219* (MEXU); 28 Feb. 1984 (seedling), *Ibarra 1376* (MEXU); 3 July 1984 (seedling), *Ibarra 1843, 1871* (MEXU); 28 Dec. 1984 (fr), *Ibarra & Sinaca 2209* (ENCB, MEXU, XAL); 26 May 1985 (fl), *Ibarra 2439* (ENCB, MEXU, XAL); 15 May 1989 (fl), *Ibarra 3353* (ENCB, K, MEXU, MO, XAL); 22 May 1989 (fl), *Ibarra 3395* (BM, ENCB, K, LE, MEXU, MO, U, US, XAL); 14 Dec. 1969 (fr), *Lot 699* (MEXU, XAL); 26 May 1970 (fl), *Martínez-Calderón 3015* (BM, ENCB, K, MEXU, MO, U, US, XAL); 18 July 1970 (fl), *Martínez-Calderón 3103* (MEXU); 6 June 1989 (fl), *Sinaca 1515* (BM, ENCB, K, MEXU, MO, U, US, XAL); 15 Jan. 1990 (fr), *Sinaca 1564* (ENCB, K, MEXU, MO, XAL); Montepío, some km before Montepío, 2 May 1980 (sterile), *van Rooden 812* (U); Municipio Santiago Tuxtla, 6.5 km de Santiago Tuxtla y 3.6 km camino a Cerro El Vigía, 12 Aug. 1960 (fl), *González & Garza 5599* (MEXU); Municipio de Catemaco, km 18 camino Las Palmas-Catemaco, 6 May 1960, *González & Garza 3333* (MEXU); Municipio de Pajapan, 5 km NW of Pajapan, SE slopes of Cerro San Martín Pajapan, 3 Nov. 1981 (fr), *Nee & Calzada 22759* (XAL).

Costus dirzoi belongs to subg. *Costus* because of its folded bracteole, bilamellate stigma and coriaceous bracts. In addition, the labellum with a short tube and a distinct, exposed yellow limb, with lateral lobes striped with red, permit the placement of the new species in sect. *Costus*. The most closely related species is *C. pictus*, from which it differs by the features shown in Table 1. *Costus pictus* is a plant with a broad distribution range, from southeastern Veracruz to Costa Rica, whereas *C. dirzoi* seems endemic to the Los Tuxtlas region. *Costus scaber* and *C. pulverulentus* are sympatric with *C. dirzoi*, sharing the same habitat. *Costus scaber*, however, differs from the new species in having red-orange bracts and flowers. *Costus pulverulentus*, on the other hand, differs from *C. dirzoi* by its pointed fusiform inflorescence and narrowly obovate leaves.

In order to identify *Costus dirzoi* in the key of Maas & Maas (1990), the eighth couplet needs to be changed as follows and a new couplet, 8A, added. The Maases' use of × to identify second halves of couplets is preserved here.

8. Calyx 5–9 mm long 8A
× Calyx 10–22 mm long 9
- 8A. Lower side of leaf velutinous; capsule villose;
plant green when dry (Mexico) *C. dirzoi*
× Lower side of leaf mostly glabrous; capsule gla-
brous; plant mostly brownish when dry (Central
America and western South America) *C. laevis*

This species is named after Rodolfo Dirzo, who has been working intensively in forest conservation, especially in the Los Tuxtlas area.

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