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Two New Species of *Ceroxylon* from Colombia

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Ceroxylon is one of the most poorly studied genera of neotropical palms and a revision of it is highly desirable. With *Ceroxylon floccosum* Burret reduced to synonymy under *C. quindiuense* (Karst.) H. A. Wendl. (Galeano-G. and Bernal-G. 1982), some 19 species make up the genus at present. Most of the species are incompletely described; information about some of them includes scarcely more than the name. Nevertheless, the two species described below are very characteristic and do not seem to match any known taxon. Furthermore, the relatively narrow range of the known species, especially those growing on isolated mountains, suggests that endemism through altitudinal isolation may be common in the genus. This and the fact that very complete information about the two species is available has moved us to describe them as new.

Ceroxylon flexuosum Galeano & Bernal **sp. nov.** (Fig. 1).

Caudex 13 m altus, versus apicem flexuosus. Folia 12-15, crispa: vagina 72-79 cm longa; petiolus 24-31 cm longus; rachis 98-110 cm longa; pinnae utrinque 71-82, in fasciculos 2-7 aggregatae, subtus indumento tenui fusco-flavescenti obtectae, mediae usque ad 56 cm longae. Spadix ad 226 cm longus; bracteae pedunculares 7. Florum femineorum dentes calicis quam $\frac{1}{4}$ corollae tubo multo minores; staminodia 6. Fructus globosi, verruculosi, maturitate exocarpio rubro.

Typus: Colombia, *Galeano & Bernal* 257 (holotypus COL; isotypus HUA).

Trunk to 13 m tall, 15-20 cm diam. at base, more slender and flexuous towards the apex, covered with a thin layer of wax; leaf scars oblique, internodes 21-36 cm long near base. Leaves 12-15, arranged in five vertical rows; sheath 72-79 cm long, 27-30 cm wide, with fibrous margins, covered with brown appressed scaly tomentum, a short distal portion appearing as the petiole; petiole 24-31 cm long, 3.3-3.6 cm wide at apex, green when fresh, scurfy, flat adaxially with a slight central ridge, the margins sharp, convex and greyish-green abaxially; rachis 98-110 cm long, scurfy like the petiole, greyish-green when fresh, flat adaxially to 39-46 cm from base, triquetrous thereafter, flattened abaxially; pinnae 71-82 on each side, irregularly arranged in clusters of 2-7, displayed in several planes, those of the distal $\frac{1}{4}$ of the leaf regularly arranged in one plane, all pinnae slightly tapering towards the entire usually inequilateral (sometimes almost symmetrical) apex, glabrous, waxy and glossy dark green adaxially, the midrib elevated, yellowish, with a deciduous, brown scurf, the lower surface covered with a thin, compact, persistent indumentum of yellowish-brown, elongate, medifixed scales arranged in longitudinal rows; lowermost pinnae almost filiform, 16-23 cm long, sixth pair of pinnae 29-38 \times 1-1.5 cm, central pinnae 44-56 \times 3.2-3.6 cm, apical pinnae 20-23 \times 0.4-0.6 cm.



1. Group of *Ceroxylon flexuosum* at the type locality. The type specimens were collected from the tree in the center. The individual on the left is staminate.



2. Staminate inflorescence of *Ceroxylon mooreanum*.

Inflorescences up to 8, in different stages, 155 cm long at anthesis, 200–226 cm long in the fruiting stage; prophyll 2-keeled, 34–36 cm long, 8–8.5 cm wide, thin, buff, not entirely encircling the peduncle, with a brown rather deciduous scaly tomentum; peduncle slightly compressed, 80 cm long at anthesis, 137–185 cm long in the fruiting stage, ca. 3 cm wide at apex, with a brown scaly tomentum; peduncular bracts 7, with an indumentum like that of the prophyll, the proximal 4 bracts inserted within 15 cm from the base: first bract carinate, open apically, 51–52 cm long, 2nd bract carinate, open apically, 87–97 cm long, 3rd bract carinate, open ventrally to the middle, 129–130 cm long, 4th bract slightly bicarinate, ventrally split, 139–160 cm long, 5th bract thin, carinate, inserted ca. 37 cm above the base, 132–152 cm long,

6th bract incomplete, open, inserted within the distal $\frac{1}{3}$ of the peduncle, 14–20 cm long, 7th bract much reduced, ca. 2 cm long; rachis 54–65 cm long, brown at base when fresh, the upper portion green, the basal $\frac{1}{4}$ covered with a scaly tomentum, otherwise glabrous; branches 43–47, up to 30 cm long, the longer branches inserted above the rachis base, with rachillae of the 3rd order, straw-colored. Pistillate flowers straw-colored, both fertile and sterile occurring on the same rachilla; fertile flowers 6–8 mm long; calyx teeth minute, triangular, 0.3–0.5 mm long, 0.2–0.3 mm wide, reaching less than $\frac{1}{4}$ of the corolla tube; petals ovate-triangular, long to very long-acuminate, 6.5–7.5 mm long, connate for slightly less than $\frac{1}{3}$ their length; staminodes 6, one opposite each sepal and one opposite each petal; filaments 1–1.5 mm long, abortive anthers 1.2–1.5 mm long, sagittate; gynoeceium 4.5–5.5 mm diam., minutely verruculose;

stigmas lateral, recurved on a short style. Fruits green when immature, ripening red; exocarp verruculose, mesocarp yellow; seed globose, dark brown, 1.3–1.5 cm diam.; hilum basal, round, raphe branches deeply depressed, anastomosing, hidden under the brittle adherent testa.

SPECIMEN EXAMINED: COLOMBIA, Departamento de Antioquia, Municipio de Bello, Inspección de San Félix, vía de Ascenso al Alto Los Baldíos, ca. 2,400 m altitude, 27 September 1980 Galeano & Bernal 257 (holotype COL; isotype HUA).

Ceroxylon flexuosum is very distinctive in its slender, apically flexuous trunk, the small leaves and the number of staminodes. It is necessary to compare this species with *C. utile* (Karst.) H. A. Wendl., a poorly known taxon.

Due probably to lack of pollination, the infructescence of the type specimen bears fruit which, although sterile, became red and increased in size. The description and measurements of the seed are based on old seed collected from the base of the palm.

The type plant, which we have climbed in order to collect specimens, is one of a group of three individuals cultivated near a farmhouse. These trees (one staminate and two pistillate) are the only known individuals of this species. They are said to have been brought last century from the Alto Los Baldíos, at somewhat higher altitudes, where once they were abundant. The practice of cutting the young leaves for use on Palm Sunday has endangered this species.

***Ceroxylon mooreanum* Galeano & Bernal sp. nov.** (Fig. 2, Cover).

Caudex 8 m altus. Folia 17; vagina 107–110 cm longa; petiolus 43–47 cm longus; rachis 148–150 cm longa; pinnae utrinque 81–82, regulariter in eadem planitie insertae, patulae, subtus indumento tenui fusco-flavescenti obtectae, mediae usque ad 64 cm longae. Spadix

ca. 230 cm longus; bracteae pedunculares 6. Florum masculorum calicis dentes quam $\frac{1}{2}$ corollae tubo minores. Stamina 6–7(–8). Typus: Colombia, Bernal & Galeano 213 (holotypus COL; isotypus HUA).

Trunk 8 m tall, 18 cm DBH, rather uniform, brown, covered with a thin layer of grey wax; leaf scars oblique, internodes 20–31 cm long. Leaves 17; sheath 107–110 cm long, ca. 40 cm wide, costate-carinate, brown, fibrous along the margins, the fibers long and stout, covered with an indumentum of grey scales, the upper portion resembling the petiole; petiole 43–47 cm long, 3 cm wide at apex, green when fresh, adaxially flat, with a slight central ridge, brown-scurfy, abaxially convex, covered with grey medifixed scales, revealing the surface beneath in age; rachis 148–150 cm long, green when fresh, covered with an indumentum like that of the petiole, adaxially flattened to 64–68 cm from base, triquetrous thereafter, convex abaxially; pinnae 81–82 on each side, regularly inserted, almost horizontally arranged in one plane, tapering toward the inequilateral apex, glabrous, waxy and glossy dark green adaxially, the midrib elevated, yellowish, densely covered, like the proximal portion of pinnae, with purplish, white-margined, irregular, rounded, fimbriate, deciduous scales, the lower surface of pinnae densely covered with a thin indumentum of yellowish-brown, elongate, medifixed, persistent scales, arranged in longitudinal rows; lowermost pinnae 36–46 × 0.2 cm, almost triquetrous, fourth pair of pinnae 48–53 × 1–1.1 cm, central pinnae 53–64 × 4.9–5.8 cm, apical pinnae 23–25 × 0.7–0.8 cm, the pinnae of the right side of leaf 5–10 cm longer than those of the left side.

Inflorescences up to 3, almost in the same stage, ca. 230 cm long; prophyll 2-keeled, 43 cm long, 10 cm wide, coriaceous, covered with brown scales; peduncle 140–145 cm long, 3.5 cm wide, compressed, densely covered with yellowish-brown, medifixed, richly woolly-mar-

gined scales arranged in longitudinal rows; peduncular bracts 6, their outer surface covered with an indumentum of rufescent, medifixed, yellowish-centered, fimbriate-margined, appressed scales towards the bract margin, the indumentum becoming like that of the peduncle: first bract 95 cm long, 2nd bract 136 cm long, 3rd bract 154 cm long, 4th bract 162 cm long, 5th bract ca. 140 cm long, 6th bract incomplete, 37 cm long, inserted high on the peduncle; rachis 72–75 cm long, either glabrous or covered, only at base, with an indumentum like that of the peduncle; rachillae 53–55, glabrous, up to 32 cm long, subtended by an ovate-oblong abruptly long-acuminate bract, that of the lower branch 10 mm long, 6 mm wide, those of the upper branches smaller, the lower branches branched into rachillae of the 3rd order. Staminate flowers 6–8 mm long; pedicel ca. 0.6 mm long, subtended by an ovate-acuminate bract ca. 1 mm long; sepals ovate-acuminate, 0.9–1 mm long, connate for 0.4–0.5 mm, reaching less than $\frac{1}{2}$ of the corolla tube; petals broadly elliptic, abruptly long-acuminate, 5–6.2 mm long, 2.5–3.2 mm wide, connate for 1.4–2 mm; stamens 6–7(–8), 1 opposite each sepal, 1–2 opposite each petal; filaments 1.9–2.2 mm long, anthers 3.7–4.2 mm long, 1–1.5 mm wide, basally bifid for 1.4–1.7 mm, shortly bifid at apex, slightly unequal; pistillode 1 mm long, long and narrow, 3-lobed, with long abortive stigmas, ca. 0.6 mm long.

SPECIMEN EXAMINED: COLOMBIA, Departamento de Antioquia, Municipio de Bello, Inspección de San Félix, vía de Ascenso al Alto Los Baldíos, ca. 2,400 m altitude, 12 August 1980. *Bernal & Galeano* 213 (holotype COL; isotype HUA).

Ceroxylon mooreanum is dedicated to the memory of Dr. Harold E. Moore, Jr., as an acknowledgment of the stimulus he gave to our study of Colombian palms, up until his very death. Through his lifelong love of palms and tireless field and her-

barium work, he contributed greatly to a better knowledge of the family. His special interest in the genus *Ceroxylon* drove him to clear up finally the identity of *C. alpinum* Bonpl. ex DC., the type species of the genus (Moore and Anderson 1976).

Ceroxylon mooreanum differs from the remaining species with six stamens, in the regularly arranged pinnae and the dense woolly indumentum of the peduncle. Since the pinnae of the right side are usually longer than those of the left side, leaves bend to the right in the distal half, where the rachis is more slender and triquetrous (see cover photo). This bending of the leaves gives the palm a very characteristic appearance.

Two other species, *C. sclerophyllum* Dugand, from northeastern Colombia and *C. latisectum* Burret, from Peru, resemble *C. mooreanum* in their regularly arranged pinnae, but they can be told apart, *inter alia*, because the calyx teeth are almost as high as or higher than the corolla tube. This character has proved to be constant enough to be of taxonomic importance. Further knowledge of these species may reveal additional differences.

The type plant of this species is cultivated near a farmhouse less than one kilometer away from the type of *C. flexuosum* and it is also said to have been brought from the Alto Los Baldíos, where it is now rare.

A second individual, also a staminate plant, is cultivated in the main square of El Retiro, 33 kilometers east of Medellín. The trunk of this individual is some 16 meters tall, which suggests that the type plant is still not fully grown.

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