

A NEW SPECIES OF *SOCRATEA* (PALMAE) FROM COLOMBIA WITH NOTES ON THE GENUS

RODRIGO BERNAL-GONZÁLEZ AND ANDREW HENDERSON

Bernal-González, Rodrigo (Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Apartado 7495, Bogotá, Colombia) and Andrew Henderson (New York Botanical Garden, Bronx, NY 10458-5126). A new species of *Socratea* (Palmae) from Colombia with notes on the genus. *Brittonia* 38: 55-59. 1986.—*Socratea montana*, a new species from Colombia, is described and illustrated, and its relationships discussed. Two groups of species within the genus are characterized.

Field work by one of us (R.B.) in Colombia between 1982 and 1984 revealed a previously undescribed *Socratea*. Study of this species suggested that two groups existed within the genus. Further joint field work in 1985 has supported these earlier findings.

Socratea montana R. Bernal & A. Henderson, sp. nov. (Figs. 1-4)

Ab omnibus speciebus generis floribus foemineis secus rachillas crassissimas crebre dispositis differt. Caudex 15-23 m altus, 17 cm diametro, radicibus epigeis 3-5 m altis sustentatus. Folia 5-8; vagina 200-260 cm longa, viridis; petiolus 25-35 cm longus; rachis 250-314 cm longa; pinnae utrinque 17-24, usque ad basin in segmentis (2) 4-7 (10) longitudinaliter fissae, segmenta 70-127 utrinque; pinnae mediae 116-135 cm longae. Inflorescentiae bracteae pedunculares 3; rachillae 7-9, usque ad 82 cm longae, fructiferae 15-17 mm diametro; florum foemineorum cicatrices valde approximatae. Stamina 84-139. Fructus ellipsoidei, apice rostrati, 3.5-3.6 cm longi, 2.4 cm diametro, maturi longitudinaliter fissi, mesocarpium album, spongiosum extrudente. Semina ellipsoidea, 2.3-2.5 cm longa, 1.8-1.9 cm diametro. Embryo apicalis.

Trunk 15-23 m high, 17 cm diam at base, grayish, with inconspicuous nodes, supported by a loose cone of stilt roots 3-5 m high, 2-2.5 m diam at base, with individual roots 5-8 cm diam and covered with spines to 1 cm long. Leaves 5-8; sheath 200-260 cm long, the crownshaft grass-green, with a conspicuous yellow area marking the former position of the inflorescence bud, sparsely covered toward apex with a yellowish, easily removed, loosely wooly indumentum, when dry with whitish, flexuous, strongly appressed hairs; petiole 25-35 cm long, 6-7 cm diam, subterete, with a thin indumentum of whitish, scaly, strongly appressed hairs, the surface smooth to the touch; rachis 250-314 cm long, adaxially acute, striate, with a whitish tomentum of soft hairs, abaxial indumentum like that of petiole; pinnae 17-24 on each side, longitudinally divided into (2) 4-7 (10) multifarious, arcuate segments, a total of 70-127 segments on each side, the inner segments of each pinna linear, to 3.3 cm wide, the outer long cuneate to lanceolate in profile, obliquely praemorse toward apex, to 17 cm wide, with very short and scattered hairs above when young, glabrescent, pubescent below with loose and rather persistent, whitish, usually somewhat erect hairs not covering entire surface; basal pinnae 70-100 cm long, middle pinnae 116-135 cm, subapical pinnae 23-50 cm, apical pinnae connate into a flabellum to 23 cm wide at apex. Inflorescence infraxillary, erect before anthesis; peduncle 28-40 cm long, 7-10 cm wide, dorsoventrally compressed, green when fresh, brown when dry, with a dense caducous indumentum of yellowish-white, appressed, flexuous hairs; prophyll 20-22 cm long, 12 cm wide, ancipitous, adaxially bifid at apex, abaxially acuminate, with a caducous indumentum similar to that of the peduncle; peduncular bracts 3, 35-60 cm long, with a caducous indumentum similar to that of the prophyll, the peduncle with a fourth rudimentary bract above to 1.5 cm long; rachis 15-20 cm

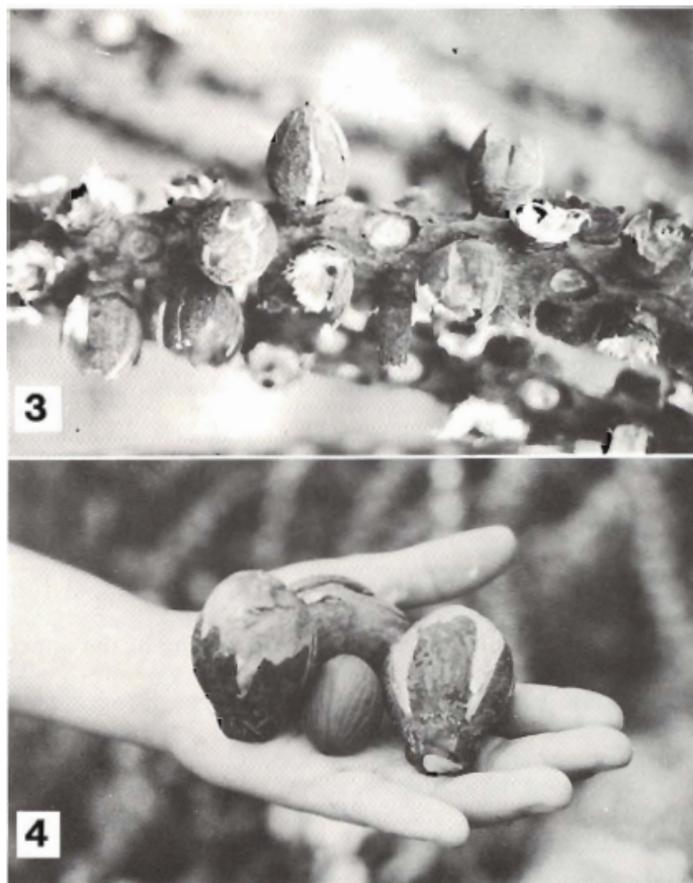


FIGS. 1 and 2. *Socratea montana*. 1. Habit. 2. Stilt roots.

long; rachillae 7–9, to 82 cm long, slightly compressed, light-brown when dry, 11–13 mm diam at middle at anthesis, 15–17 mm diam in fruit, with pistillate scars usually obovate, sometimes almost rectangular, 10–14 mm long, 5–9 mm broad, the areas between them conspicuously wrinkled when dry. Flowers densely arranged, the staminate diversely shaped by mutual pressure, 11–15 mm long; sepals 3–5 mm long, glabrous; petals to 15 mm long, irregularly shaped and angled, thick, glabrous; stamens 84–139 ($x = 118$, $N = 17$); filaments 1 mm long, anthers 5–8 mm long, briefly apiculate; pistillode 2 mm long, globose, bicornuate. Pistillate flowers 9–10 mm long, subtended by a rounded, long-acuminate bract to 10 mm long, bearing long, yellowish hairs at apex; sepals 7–8 mm long, broadly rounded, ciliate toward base, carinate, glabrous; petals similar to sepals in shape and size, but ecarinate; ovary 9 mm long, ovoid, glabrous; stigmas erect when fresh. Fruits ellipsoid, obtuse and conspicuously rostrate, 3.5–3.6 cm long, 2.4 cm diam, light brown when ripe and eventually splitting longitudinally and exposing the thick, spongy, protruding, yellowish mesocarp; endocarp thin; fruiting perianth to 15 mm long, the petals longer than the sepals; seed ellipsoid, brown, 2.3–2.5 cm long, 1.8–1.9 cm diam, without constrictions; endosperm homogeneous; embryo apical.

TYPE: COLOMBIA. DEPARTAMENTO DE ANTIOQUIA. Municipio de Frontino, carretera Nutibara-La Blanquita, vertiente occidental, 1800 m alt., 2 Jul 1983, *R. Bernal, G. Galeano & G. Bolívar 631* (HOLOTYPE: COL; ISOTYPES: HUA, NY).

Additional specimens examined: COLOMBIA. ANTIOQUIA. Same locality as type, 10 Jan 1982, *G. Galeano & R. Bernal 489* (COL, K); *ibid.*, 1450 m alt., 2 Jul 1983, *R. Bernal, G. Galeano & G. Bolívar 633* (COL, HUA, NY); Municipio de Urrao, Parque Nacional de Las Orquídeas, río Polo, cerca de la desembocadura de la quebrada El Oso, 1500 m alt., 16 Jun 1982, *R. Bernal & G. Galeano 344* (COL). CHOCÓ. Municipio de El Carmen de Atrato, Medellín-Quibdó road, El Nueve, 1250 m alt., 22 Feb 1985, *A. Henderson & R. Bernal 150* (COL, JAUM, NY).



FIGS. 3 and 4. *Socratea montana*. 3. Fruiting rachillae. 4. Fruits and seeds.

Socratea montana appears most closely related to *Metasocratea hecatonandra* Dugand, now transferred to *Socratea* (Bernal, in press), and *S. rostrata* Burret. Since the former two species grow in adjacent areas in western Colombia, the differences between them are listed in Table I. In the herbarium they are most easily separated by their rachillae, which in *S. montana* are thicker, lighter brown, with the scars of the pistillate flowers more densely arranged and the areas between them conspicuously wrinkled. In the field they can be most easily separated by the leaves. In *S. montana* the sheath is grass-green, the undersides of the pinnae green, and these are divided into more segments, which are arched and appear arranged in many planes. In *M. hecatonandra* the sheath is gray, the undersides of the pinnae brown, and these are divided into fewer segments, which appear arranged in four distinct planes.

The second related species, *S. rostrata*, was described by Burret (1940) based on Ecuadorean material, but the type was apparently destroyed in Berlin. However, Burret's original incomplete description can now be better understood with other collections from Ecuador (*Asplund 18845*, *Balslev & Brako 4279*, *Balslev & Balslev 4427*) and Colombia (*Henderson & Bernal 130*), which represent this species. In the herbarium *S. montana* can be most easily separated from *S. rostrata* by its stouter peduncle and much thicker rachillae in both the flowering and

TABLE I

DISTINGUISHING CHARACTERS OF *Socratea montana* AND *Metasocratea hecatonandra*

	<i>Socratea montana</i>	<i>Metasocratea hecatonandra</i>
Stilt roots	3-5 m high, very widely spaced	to 2 m high, rather closely spaced
Crownshaft	grass green	grayish-green
Pinnae	appearing green beneath from a distance, divided into many (to 10) segments, 70-127 per side. Segments chartaceous, arched, appearing in many planes, the interveins of abaxial surfaces with long, erect, scattered hairs	appearing brown beneath from a distance, divided into fewer (to 5) segments, 61-74 per side. Segments coriaceous, stiff, appearing in 4 planes, the interveins of abaxial surface with short appressed hairs covering surface
Fruiting rachillae	15-17 mm diam at middle	9-13 mm diam at middle
Pistillate flower scars	densely arranged, the area between them conspicuously wrinkled when dry	loosely arranged, the area between them smooth when dry
Pistillate flowers	subtended by a broadly rounded or acuminate bract reaching less than half the height of sepals	subtended by a caudate-acuminate bract usually as high as sepals
Fruiting perianth	to 15 mm	to 10 mm

fruiting stage. In the field *S. montana* can be most easily separated from *S. rostrata* by the leaves—the latter's sheath is bluish gray, and the pinnae segments abruptly pendulous at the apex, giving the palm itself something of the appearance of *S. exorrhiza* (Mart.) H. Wendl.

Some comments on the division of the pinnae seem appropriate. Wessels Boer (1965) stated that this division, in iriarteoid palms, resulted from tensions originating at the oblique point of insertion on the rachis. He suggested that this was irregular within a species depending on age or exposure to wind. However, it is our experience that division of pinnae is usually uniform and characteristic within species, and these can be recognized in the field by their foliage alone.

The discovery of *S. montana* and the transfer of *Metasocratea hecatonandra* Dugand to *Socratea* (Bernal, in press) had made clear that two groups of species existed within the genus. Our experience of *S. rostrata* in Colombia has confirmed these groupings. The first group, consisting of *S. montana*, *M. hecatonandra*, and *S. rostrata*, is characterized by its very thick fruiting rachillae (8-17 mm diam at middle), larger staminate flowers with many stamens (84-145), and rostrate fruits splitting longitudinally from the apex when ripe. The distribution and altitudinal range of this group is of some interest. *Socratea montana* is known from a restricted area on the western slopes of the western Cordillera in Colombia, in cloud forest between 1200 m and 1800 m. *Socratea rostrata* is known from the eastern Andean slopes in Ecuador and southern Colombia, in forest between 1000 m and 1500 m. *Metasocratea hecatonandra*, on the other hand, is known only from lowland forest west of the Andes in Colombia, between sea level and 800 m.

The second group of species consists of *S. exorrhiza* and apparently most other species described in the genus, many of which seem to be conspecific with *S. exorrhiza*. It is characterized by slender fruiting rachillae (to 7 mm diam at middle), smaller staminate flowers with fewer stamens (27-45), and erostrate fruits rounded at the apex, splitting irregularly when ripe. This group is widely distributed in the neotropics, from Nicaragua to Bolivia and Brazil, in lowland forest under 600 m.

Although the two groups here discussed appear clearly defined, they have not been given taxonomic status, awaiting results of current revisionary work by one of us (A.H.).