

Additions to the Genus *Bactris* (Arecaceae) of Mesoamerica

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Two new species of *Bactris*, found in the understory of humid forest on the Pacific Coast of Costa Rica, are described and illustrated.

The genus *Bactris* Jacq. ex Scop. is one of the most diverse groups of palms in the Neotropics. It has fewer species than the *Chamaedorea* group and more than *Geonoma*. Henderson et al. (1995) recognized 64 *Bactris* species for the whole of the Americas, and the latest treatment of the genus for the Mesoamerican region comprises twenty species; four of them new for science (de Nevers et al. 1996).

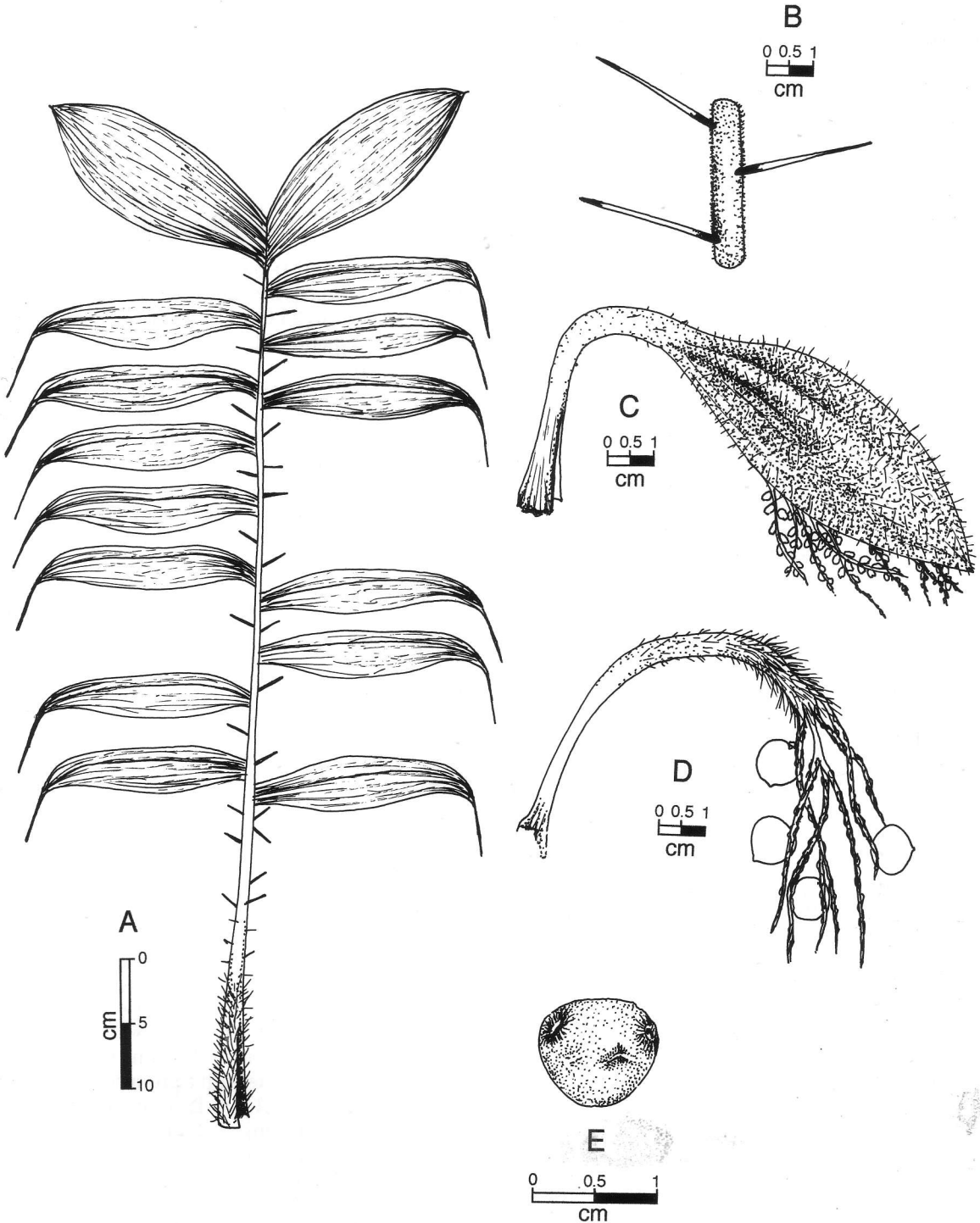
Costa Rica possesses between thirteen to fifteen species of *Bactris*, two of which are apparently endemic to the country (Grayum 1998): *B. longiseta* H. Wendl. ex Burret, and *B. polystachya* H. Wendl. ex Grayum (in press). In this paper two additional endemic species of *Bactris* from the Pacific Coast of Costa Rica are newly described and illustrated.

Bactris ana-juliae Cascante, sp. nov. Fig. 1.

Inflorescentia *B. hondurensis* Standl. affinis sed foliis pinnatis, foliolis fasciculatis utrinque pubescentibus, apicem aristatibus, spinis luteis differt. Typus: COSTA RICA. San José: Perez Zeledón, Fila Tinamaste (17 km from San Isidro in road to Dominical), 1000 m, 9° 17' 40" N, 83° 46' 00" W, 28 May 1998. O. Valverde 993 (Holotypus CR; isotypi MO, USJ).

Stem cespitose, 1.8–3.0 m tall, stems 4–6, 1.2–1.5 cm diam., internodes usually spiny. Leaves 5–8, sheaths to 16.0 cm long., covered with black

spines; petiole glabrous or with a short whitish pubescence, 11.2–16.0 (–25.5) cm long; spines yellow with the extremes dark brownish tips, (0.5–) 1.6–3.5 cm long, the basal portion of the petiole with more abundant, shorter spines. Lamina rachis (33.0–) 41.0–54.0 cm long, bearing a whitish pubescence and spines abaxially as on the petiole, pinnate, the pinnae (4–) 7–10 per side, irregularly arranged in groups of 2–3 and spreading in different planes; terminal pinnae larger than the middle ones, 17.0–31.0 (–39.5) long, and 5.5–14.5 cm wide, apex apiculate; middle pinnae sigmoid and convex, 15.0–22.5 (–28.7) cm long, and 4.2–5.1 (–7.0) cm wide, whitish pubescence on both sides, with (1–) 2 prominent main veins, apex strongly aristate, 3.5–7.0 cm long, and bent downward. Inflorescence infrafoliar, peduncle 5.0–8.0 cm long, 5.0 mm wide, recurved at anthesis, spinulose on the distal part, prophyll 8.0 cm long, peduncular bract 11.0–14.6 cm long, covered with short blackish-brown spines, rachis short (0.7–) 1.4–1.7 cm long, rachillae 8–12, 3.2–5.0 cm long, covered with glandular hairs; triads irregularly arranged. Staminate flowers not seen. Pistillate flowers sessile, sepals connate, to 1.5 mm long, glabrous; corolla tubular, 2.1–2.8 mm long, glabrous and striate (when dry). Fruits obovate, to 1.2 cm long and 1.0 cm diam. the stigmatic residue prominent, orange-red when mature, glabrous and striate, corolla evident in fruit, irregularly divided, to 3 mm long (Fig. 1).



1. *Bactris ana-juliae* Cascante: A. leaf general view; B. spines on the lower surface of leaf rachis; C. inflorescence at anthesis; D. infructescence; E. seed.

ADDITIONAL SPECIMENS EXAMINED. COSTA RICA. San José: Perez Zeledón, Fila Tinamaste, semi-cloudy forest, remnants on the top of the hill, 900–1050 m, 9° 17' 40" N – 83° 46' 00", 2

December 1998, A. Cascante *et al.* 1472 (CR); 25 March 1998, O. Valverde 773 (CR, MO, USJ).

DISTRIBUTION AND HABITAT. Known only from the type locality on the Pacific Coast of Costa Rica,

on the Fila Tinamaste, Pérez Zeledón; between 900–1050 m. The forest in this area has been severely fragmented, but some remnants are located on top of the Fila Tinamaste, a rocky formation that arises abruptly in the landscape. The climatic conditions on the top of the "Fila" form a certain type of microclimate, which is very humid and characteristic of a cloud forest. The palm community in the remnants is mainly composed of understory species, such as: *Astrophyne martiana*, *Bactris herrerana*, *B. dianeura*, *Chamaedorea pinnatifrons*, *C. pumila*, *Geonoma ferruginea* and *Synechanthus warszewiczii*.

ETYMOLOGY. The specific epithet refers to my friend and companion of several years, Ana Julia Sánchez.

COMMENTS. *Bactris ana-juliae* shares similar floral characteristics with *B. hondurensis* Standl., and *B. dianeura* Burret; these species have a short rachis (<3.0 cm long.) in the inflorescence, and possess relatively few rachillae (<17), in relation to the other species of *Bactris* in Costa Rica.

Bactris ana-juliae resembles *B. hondurensis*, a common species in the Atlantic side of the country, in the general morphology of its inflorescence. In the latter, the peduncle is regularly erect in fruiting vs. recurved in the new species, and possesses fewer rachillae (3–9 vs. 8–12). The main differences between *B. ana-juliae* and *B. hondurensis* are in the leaf morphology of the former. It usually has more pinnae per side (7–10 vs. 5 or fewer) than the pinnate form of *B. hondurensis*, also the middle pinnae are wider (4.2–5.1 vs. 1.2–4.0 cm); the lamina is pubescent on both sides (less dense above), and it lacks the cross veined pattern present in the leaf blade of *B. hondurensis*. Moreover, in *B. ana-juliae* the leaflets have an aristate tip (3.5–7.0 cm long.), opposed to an acuminate tip in *B. hondurensis*, and the spines on the petiole and leaf rachis are yellow with the ends darker, although *B. hondurensis* may have yellow spines, but in younger leaves.

Bactris ana-juliae is easily separated from *B. dianeura* by the leaf shape. This new species possesses fewer pinnae per side (8–10 vs. 12–20), these are sigmoid vs. linear-lanceolate, pubescent vs. glabrous, and they lack cross veined blades.

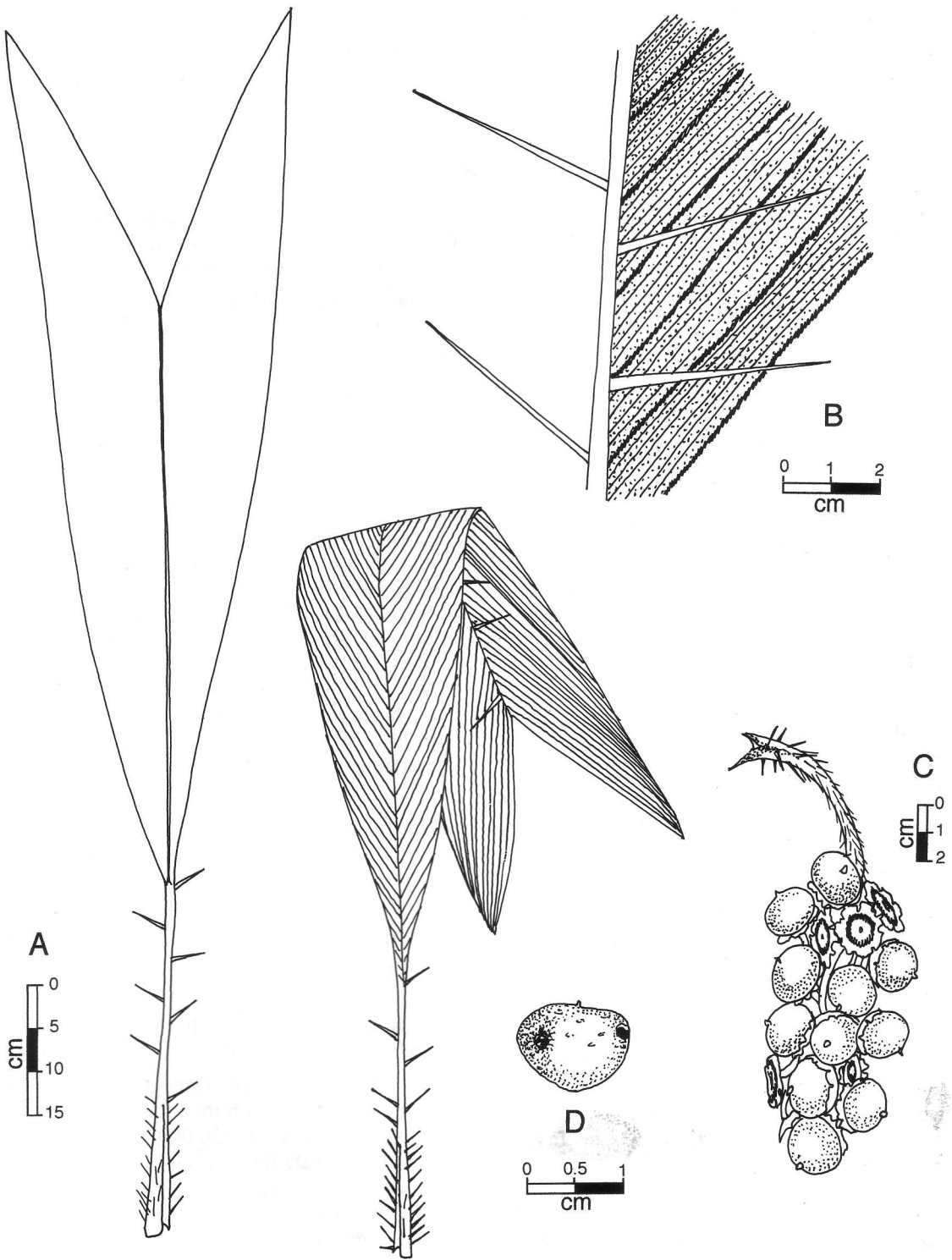
The sigmoid and convex pinnae with a long tip pointing downward is a striking feature of *B. ana-juliae* in natural conditions. The pinnae have a shiny dark green color above that becomes lighter near the tip of the blade. At the type locality the population produces flowers in March and April; fruiting occurs from November to March.

***Bactris herrerana* Cascante, sp. nov. Fig. 2.**

Inflorescentia *B. glandulosae* Oerst. affinis sed foliis simplicibus bifidis abaxialiter pubescentibus differt. Typus: COSTA RICA. San José: Pérez Zeledón, San Cristobal, Finca Tinamaste (17 km from San Isidro on road to Dominical), remnant forest near Fila Tinamaste, 650–680 m, 9° 17' 54" N, 83° 46' 20" W, 2 December 1998. A. Cascante et al. 1470 (Holotypus: CR; isotypi: MO, USJ).

Stems cespitose, 2.0–3.0 m tall, stems 3–6, 1.5–2.5 cm diam., internodes usually spiny. Leaves 4–6 (–11), sheaths to 24.0 cm long, covered with short black spines; petiole glabrous or shortly pubescent, (15–) 20–28 (–43) cm long, with black spines (0.5–) 2.5–3.6 (–5.7) cm long, the basal portion with more numerous, shorter spines. Lamina simple and deeply bifid (rarely irregularly divided), 0.8–1.2 m long, glabrous adaxially and the secondary veins prominent, abaxially with a short brownish pubescence, lobes 10.0–17.0 cm wide at apex of rachis, 35–45 cm long, spinulose margin. Rachis pubescent underneath, with or without black spines, (2.5–) 3.5–5.0 (–5.7) cm long. Inflorescence infrafoliar, peduncle 3.5–7.0 cm long, 5.0–7.0 mm wide, recurved in anthesis, covered with short spines especially on the basal portion, prophyll ca. 9.0 cm long, peduncular bract 12.0–18.0 cm long., spinulose, with short blackish-brown and yellowish spines; rachis 4.5–7.2 cm long, rachillae 31–45, 4.5–7.5 cm long, densely covered with glandular hairs. Staminate flowers grouped on the proximal part of the rachillae, pedicel 0.4–0.6 mm long, sepals fused at the base, lobes apiculate, ca. 1 mm long, glabrous; corolla 2.0–3.5 mm long, petals white-cream, glabrous, fused at the base and apically, thecae ca. 0.5–0.6 mm long., longitudinally dehiscent. Pistillate flowers sessile, cupular calyx, 1.0–3.0 mm long, glabrous or sub-glabrous, and striate (when dry); corolla forming a tube, 3.0–4.5 mm long, with brown ascendent trichomes outside, glabrous inside, style glabrous, to 4.0 mm long, stigma capitate. Fruits obovate with a prominent stigmatic residue, (0.9–) 1.0–1.2 (–1.5) cm diam., (0.7–) 1.1–1.3 (–1.5) cm long, red when ripe, glabrous, and striate; endocarp black, corolla conspicuous in the fruit, irregularly divided (Fig. 2).

ADDITIONAL SPECIMENS EXAMINED. COSTA RICA. Puntarenas: Golfito, Reserva Forestal Golfo Dulce, Estación Aguabuena, ca. 5 km W of Rincón, Quebrada Aguabuena, 250 m, 7 June 1992, A. Henderson et al. 1819 (INB), 1824 (INB, MO), 1826 (INB); Golfito, Península de Osa, Cerro Rincón, cabecera de los ríos Tigre, and Rincón, 700 m, 7 May 1993, R. Aguilar 1885 (INB); Parrita, and Pirris-



2. *Bactris herrerana* Cascante: A. leaf detail and leaf blade; B. spines on the lower surface of leaf rachis; C. infructescence; D. seed.

Damas rivers watershed, SW side of Cerro Cabeza de Chancho, 600 m, 1 May 1998, *J. F. Morales 6425* (INB). San José: Acosta, Fila Bustamante, SE side of Fila Pital, ca. Quebrada Colorado, 180-600 m, 10 April 1997, *J. F. Morales 6175* (INB); Puriscal, Zona Protectora La Cangreja, forest near Río Negro, ca. 1.5 km E of Santa Rosa de Puriscal, 320 m, 14 May 1987, *M. Grayum et al. 8310* (INB); Zona Protectora La Cangreja, Santa Rosa de Puriscal, primary forest on Fila La Cangreja, 500 m, 10 September 1992, *J. F. Morales 637*; Pérez Zeledón, San Cristobal, Finca Tinamaste (17 Km from San Isidro in road to Dominical), remnant forest near Fila Tinamaste, 650-680 m, 9° 17' 54" N - 83° 46' 20", 25 March 1998, *O. Valverde 782* (CR, MO).

DISTRIBUTION AND HABITAT. Along the central part and the south region of the Pacific Coast of Costa Rica, and possibly extending to Panamá. From 200-300 m in La Cangreja Protected Zone and Corcovado National Park, to 950-1000 m in the Fila Tinamaste in Pérez Zeledón, San José. In "Tropical humid forest, transition to premontane," and in "Pluvial premontane forest" according to Holdridge's "Life Zones Classification" (Tosi 1969); or "Sub-tropical, Tropical, humid with three to four dry months," and "Tropical, tropical, humid with one to two dry months" according to Herrera and Gómez's "Biotic Units Classification" (1993).

ETYMOLOGY. The epithet honors our Costarican botanist colleague Gerardo Herrera, whose unsurpassed work in the recent botanical exploration of the country has given many new species to science.

COMMENTS. *Bactris herrerana* is related to *B. glandulosa* Oerst., and *B. baileyana* H. E. Moore, which have in common the numerous filiform rachillae (> 40) of the inflorescence. Floral morphology of *B. glandulosa* is very similar to *B. herrerana*, but the former has more rachillae (ca. 60-80+), and develops more numerous, smaller fruits than *B. herrerana*. This group of related species grows sympatrically in Costa Rica, however *B. herrerana* can be distinguished in natural conditions by its long simple leaves with the strongly bifid apex, contrary to pinnate leaves in the other two species.

Some individuals of *B. herrerana* may seem to have pinnate leaves from a distance, but a close examination reveals that the leaf divisions do not follow a regular pattern, and are probably due to leaf age and effect of the wind.

Flowering of *B. herrerana* occurs during the ending of the dry season and beginning of the rainy season (March to May). This phenological pattern is shared with *B. glandulosa* and *B. baileyana* along its distribution range in Costa Rica, and it may be in response to the climatic pattern of the region.

In herbarium conditions the specimens of *B. herrerana* usually have leaf blades grayish above, and brownish underneath.

Acknowledgments

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LITERATURE CITED

- De NEVERS, G., A. HENDERSON AND M. H. GRAYUM. 1996. Mesoamerican *Bactris* (Palmae). Proceedings of the California Academy of Sciences 49 (7): 171-210.
- GRAYUM, M. H. 1998. Nomenclatural and taxonomic notes on Costa Rican palms (Arecaceae), with five new species. *Phytologia* 84: 307-327.
- HENDERSON, A., G. GALEANO AND R. BERNAL. 1995. Palms of the Americas. Princeton University Press. Princeton, New Jersey. U.S.A.
- HERRERA, W. AND L. D. GÓMEZ. 1993. Mapa de Unidades Bióticas de Costa Rica. Escala 1: 685 000. Incafo, S.A. Costa Rica.
- TOSI, J.A. Jr. 1969. Mapa Ecológico de Costa Rica, según la clasificación de Zonas de Vida de L. R. Holdridge. Escala 1: 750 000. Centro Científico Tropical, Costa Rica.