

## THE IDENTITY OF YNESA COLEND A (PALMAE)

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Balslev, Henrik (Botanical Institute, University of Aarhus, 68 Nordlandsvej, DK-8240 Risskov, Denmark) and Andrew Henderson (New York Botanical Garden, Bronx, NY 10458-5126). The identity of *Ynesa colenda* (Palmae). Brittonia 39: 1-6. 1987.—*Ynesa colenda* O. F. Cook has remained a poorly known palm since its description in 1942. Recent collections by the authors in Ecuador make it clear that the palm correctly belongs to *Attalea*, and the transfer is here made. A complete description of the palm is given, as well as notes on its relationships, distribution, pollination, and economic importance.

*Ynesa colenda* was described as a new genus and species by O. F. Cook (1942). As a staff member of the U.S. Department of Agriculture he had received for identification oil-bearing palm seeds from a commercial shipment originating in Ecuador. Independently, herbarium material of the same palm had been collected by Mrs. Ynes Mexia in the province of Los Ríos on the coastal plain of Ecuador. Cook's (1942) description included many details of the new palm, including a Latin diagnosis and citation of a type specimen, but mixed in with it were his comments on the difficulties of palm collecting, criticisms of the code of nomenclature, and discussions of intergeneric relationships in Palmae. Because of this somewhat eccentric presentation, Cook's work has often been ignored. Contributing to this uncertainty was the fact that Cook, in illustrating the new palm, included two plates of *Astrocaryum standleyanum* L. H. Bailey. Further, he did not see, or describe, staminate flowers.

*Ynesa colenda* was included in the Gray Card Index and in Index Kewensis, but was excluded by Glassman (1972), purportedly because of a lack of a Latin diagnosis. Little and Dixon (1969) included it in their treatment of the trees of Esmeraldas. Although knowing of Cook's work, they considered it better to call the palm *Maximiliana* sp., without, however, presenting any reasons. Acosta-Solis (1971) treated the economically important palms of northwestern Ecuador, and discussed *Ynesa colenda*. Moore (1973) listed *Ynesa* in his generic index, but did not assign it to any of his major groups. Patiño (1977) discussed *Ynesa* in southern Colombia. Dodson and Gentry (1978) and Dodson et al. (1986) identified *Ynesa* as *Scheelea butyracea* (Mart.) Karst. ex Wendl. Thus, although the palm has been mentioned several times in the relevant literature, its true identity has remained uncertain.

In preparation for a treatment of Palmae for the Flora of Ecuador (Balslev & Henderson, in prep.) we have collected *Ynesa colenda* on the coastal plain of Ecuador, and made observations on its distribution and economic importance. Herbarium studies of these specimens, and examination of the type specimen, have convinced us that the palm properly belongs to *Attalea*. The transfer is made and a complete description given.

***Attalea colenda* (O. F. Cook) Balslev & Henderson, comb. nov. (Figs. 1-8)**

*Ynesa colenda* O. F. Cook, Natl. Hort. Mag. 21: 70-85. 1942 (excluding lower 2 plates of Fig. 1).

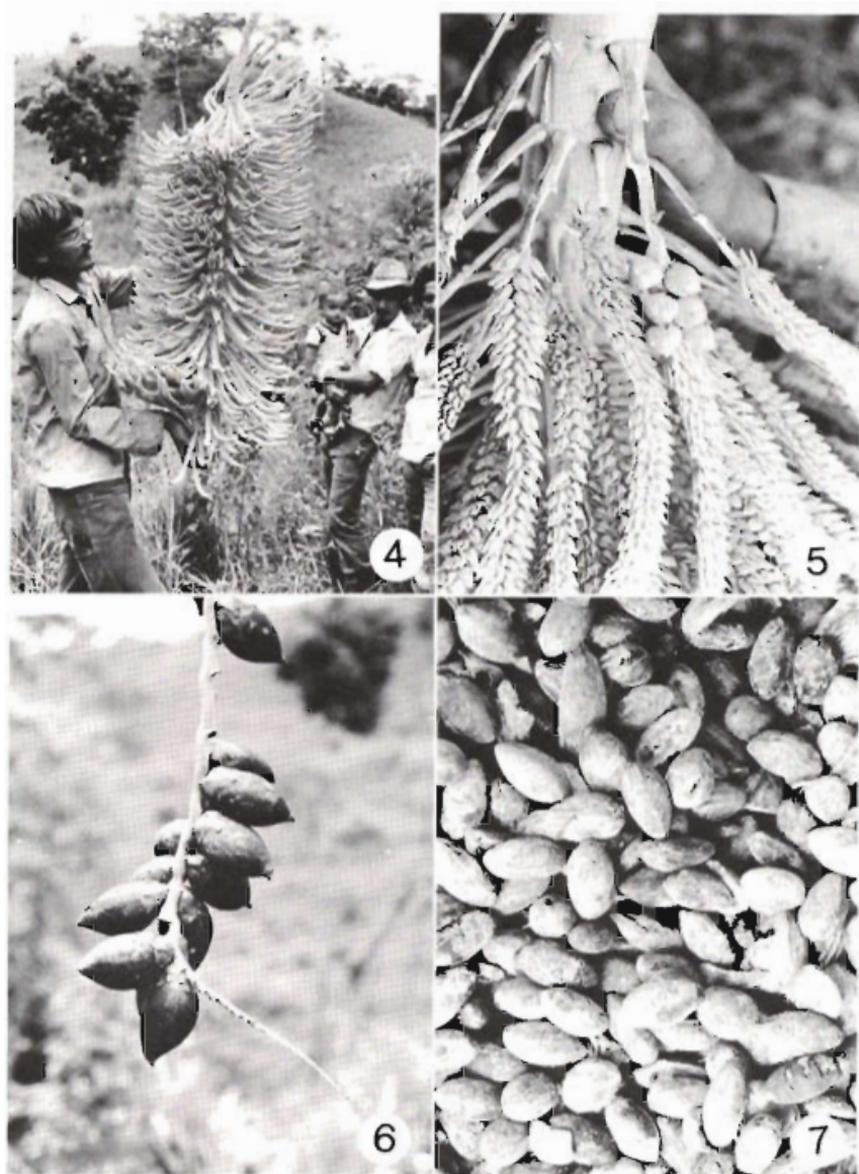
TYPE: ECUADOR. PROV. LOS RÍOS: Cantón Vinces, hacienda Santa Lucía, 20 Oct 1934, *Ynes Mexia 6574* (HOLOTYPE: US!).

*Stem* solitary, erect, columnar or slightly swollen at or below the middle, to 30 m tall, 30-50 cm diam, gray, smooth, the base with a thick mass of brown, spinulose adventitious roots 1 m × 5 mm, internodes to 20 cm long and leaf scars



FIGS. 1-3. *Attalea colenda* (Balslev, Henderson & Kristensen 62027). 1. Habit and habitat. 2. Leaf. 3. Inflorescence.

7-10 cm long, these appearing as unevenly wide and oblique rings around the stem. *Leaves* 15-25, erect in young trees, arching and spreading in mature trees with rachis twisted so pinnae appear in a vertical plane, abscising and leaving a clean stem; *sheath* open to base, not distinguishable from petiole; *sheath and petiole* 2.5-2.8 m long, 30 cm wide at base and tapering to 8 cm at apex, channelled adaxially, rounded abaxially, margins covered with conspicuous fibers to 1 m  $\times$  3 mm; *rachis* 5-6 m long, 8-10 cm wide at base and tapering toward apex, flat becoming ridged adaxially, rounded to flat abaxially with whitish or brownish



FIGS. 4-7. *Attalea colenda* (Balslev, Henderson & Kristensen 62027). 4. Predominantly staminate inflorescence. 5. Detail of rachillae, pistillate flowers at base, staminate above. 6. Fruits. 7. Seeds.

tomentum, smooth, green, margins flat to 3 cm wide; *pinnae* 130-170 per side, strongly reduplicate, opposite to subopposite, evenly spaced, 4-5 cm apart, arranged in one plane, dark green adaxially, lighter green abaxially; *basal pinnae* 70-80 × 1 cm; *middle pinnae* 140-160 × 7-10 cm; *apical pinnae* 70-80 × 2-3 cm. *Inflorescences* interfoliar, erect at anthesis, becoming pendulous in fruit, either predominantly staminate or predominantly pistillate and both types occurring on the same tree; *peduncle* dorsiventrally flattened, 80-130 × 5-7 cm; *prophyll* persistent, to 1 m × 20 cm, dorsiventrally flattened, round at the apex, bicarinate,

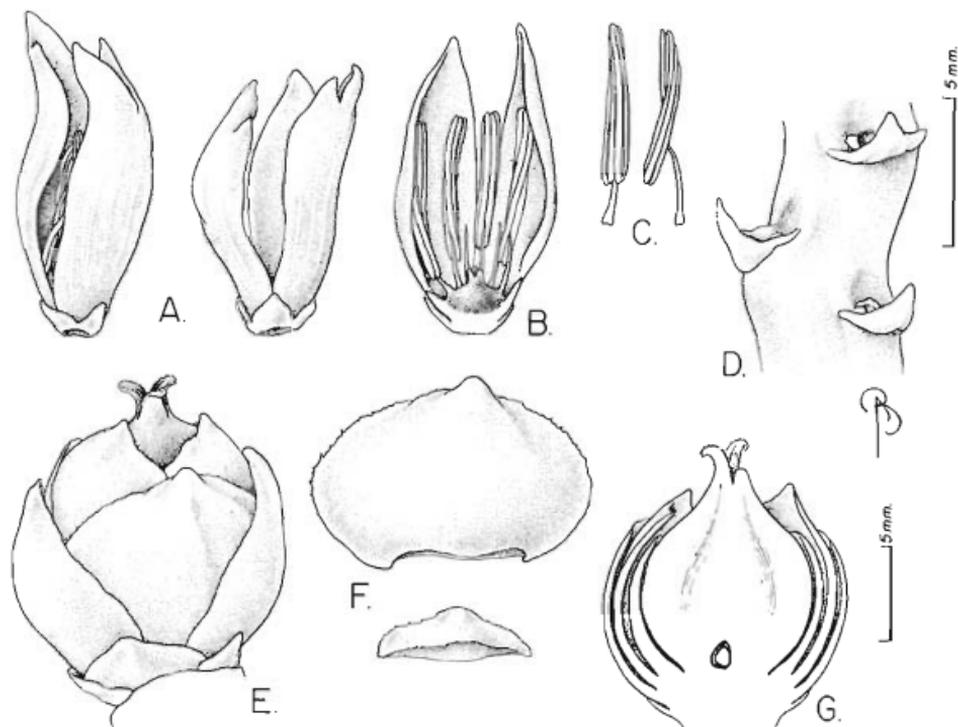


FIG. 8. *Attalea colenda* (Balslev, Henderson & Kristensen 62027). A. Staminate flowers. B. Staminate flower in vertical section showing stamens and pistillode. C. Stamens. D. Portion of rachilla from predominantly staminate inflorescence showing bracts of staminate flowers. E. Pistillate flower. F. Pistillate sepal (above) and bracteole (below). G. Pistillate flower in vertical section showing position of ovule.

brown, woody, becoming fibrous with age; *peduncular bract* persistent, inserted near base of peduncle, 2.8–3.3 m long, brown without and cream-colored within, sheathing peduncle for ca 1 m then open to 50 cm wide along rachis, the apical 50 cm forming an acuminate solid tip, outer 5 mm of expanded portion woody, deeply sulcate, inner 8 mm spongy, smooth; *rachis* to 1.5 m long, tapering to a 40 cm long flower-bearing apex; *rachillae* 600–1000, spirally arranged, ascending, 25–40 cm long, each subtended by a 4 mm long apiculate bract, basal 5–10 cm sterile, covered with white, mealy tomentum; *predominantly staminate inflorescences* with staminate flowers arranged in 2 rows of dyads along the abaxial side of the rachillae, with 0–6 pistillate flowers, also in 2 rows, borne at the base of the proximal few rachillae; *dyads* subtended by an acute, erect, 2 mm long bract; *staminate flowers* to 12 mm long, each subtended by a small bracteole, yellowish; sepals 3, free, triangular, slightly carinate, ca 2 mm long; petals 3, 1 free to the base, the 2 others more or less connate, fused to the short receptacle at base, 10–12 mm long, lanceolate to sigmoid, acuminate and sometimes with more or less bifid apices, flat, coriaceous, with smooth margins; stamens 10 or 11, borne around edge of receptacle; filaments 2–3 mm long, attached abaxially 2 mm from the base of the anthers; anthers bithecate, more or less straight and not coiled or twisted, ca 5 mm long, apically rounded, the base sagittate; pistillode ca 1 mm long, 3 or 4-fid at apex; *predominantly pistillate inflorescences* with pistillate flowers arranged in 2 rows along the abaxial side of the rachillae, to 19 pistillate

flowers borne from base to middle of rachillae, above staminate flowers; *pistillate flowers* 3000–7000 per inflorescence, to 15 mm long, subtended by an acute, erect, 2 mm long, bract and 2 low bracteoles, yellowish, occasionally with vestigial lateral staminate flowers; sepals 3, free, imbricate, triangular, concave, coriaceous, 10 × 12 mm; petals similar to sepals, 12 × 14 mm; staminodial tube 7 mm high, thin, coriaceous, closely appressed to gynoecium; gynoecium subglobose, rostrate, 10 × 13 mm; styles 3, sessile, conical, 3 mm long, smooth abaxially, papillose adaxially; ovary trilobular, 1-seeded; *fruit* oblong, 6 × 3.5 cm, acute, orange with brown scale-like tomentum; fruiting perianth ca 17 mm long, hard, woody; exocarp fibrous, ca 1 mm thick; mesocarp fleshy, 2–3 mm thick, with odor of apricots; endocarp 2–3 mm thick, hard, bony, triporate basally; *seed* 3 × 1.5 cm; embryo basal; endosperm homogenous.

Common name, "palma real."

Specimens examined: ECUADOR. MANABÍ: 20 km NW of El Carmen on road to Chone, cattle pasture with scattered trees, 300 m, 4 Apr 1986, *Balslev, Henderson & Kristensen 62027* (AAU, CEN, K, NY, QCA, QCNE); 5 km E of Chone, 2 Jun 1985, *Barfod & Skov 60024* (AAU, QCA, QCNE). GUAYAS: Km 20 on road from Empalme to Daule, 200 m, 27 May 1986, *Balslev, Henderson & Kristensen 62114* (AAU, NY, QCA). ESMERALDAS: Businga (Vilda) on Río Verde, 25 km S of the mouth of Río Verde in the Pacific Ocean, 150 m, 2 Oct 1965, *Little & Dixon 21208* (NY). COLOMBIA. NARIÑO: Tumaco, near Piñal Dulce, *Romero Castañeda 5339* (COL).

The palm described as *Ynesa colenda* clearly belongs to the tribe Cocoeae, subtribe Attaleinae (sensu Dransfield & Uhl, 1986) because of its lack of spines, presence of two inflorescence types on the same plant, large, woody, sulcate peduncular bract, and 3-porate endocarp. It keys in Glassman (1977) to *Attalea*, and fits completely within Glassman's description of that genus. *Attalea* has often been regarded as including several closely related genera, *Orbignyia*, *Scheelea*, and *Maximiliana*, but equally these genera have been separated on staminate flower morphology (see Glassman, 1977, for discussion). The long, flattened petals and straight anthers of the staminate flowers of *Ynesa colenda* clearly place it in *Attalea* sensu stricto.

In Glassman (1977), *Attalea colenda* keys to that group of species having a well-developed stem, regularly spaced pinnae, and rachillae with one or two rows of staminate flowers. This group contains *A. burretiana* Bondar, *A. compta* Mart., *A. concentrata* Bondar, *A. oleifera* Barb. Rodr., *A. piassabossu* Bondar, and *A. pindobassu* Bondar. These species are all from eastern Brazil and seem little different from each other. *Attalea colenda* differs from them by a combination of characters, including arrangement and size of staminate flowers, number of stamens, length of anthers, and one-seeded fruit.

In Ecuador, *Attalea colenda* is scattered from 900 m on the western Andean slopes (Caluma, Santo Domingo) across the coastal plain to sea level, and from near the Colombian border in the north (La Tola), south to Guayaquil. It is more abundant in the drier forests of the western and southern part of the coastal plain. In Colombia it is scattered throughout Nariño (Patiño, 1977). The natural vegetation of coastal Ecuador has mostly been cleared, but *Attalea colenda* is left in pastures and is a conspicuous part of the landscape, especially on well-drained and hilly ground.

The inflorescence of *Attalea colenda* is apparently protogynous, and cream-colored at anthesis. A predominantly staminate inflorescence (Fig. 4) was found to contain thousands of *Mystrops* sp. (Nitidulidae) and far fewer *Cactophagus* sp. (Curculionidae). *Cactophagus* belongs to a group of weevils which are pests of palms, but *Mystrops* are well-known pollinators (Henderson, 1986). It is possible that *A. colenda* has a similar pollination system to that outlined for the

related *Orbignya phalerata*, which is pollinated by *Mystrops* (Anderson, Overal & Henderson, in press).

At present the economic importance of *Attalea colenda* appears to be waning. Previously the oil-rich seeds were an important export item from Ecuador to Colombia and the United States (Acosta-Solis, 1971; Cook, 1942). The gathering and sale of *A. colenda* seeds by local people continues, and individual trees are jealously guarded by smallholders, but the African oil palm, *Elaeis guineensis*, is now much more important, and is grown on an intensive commercial scale. In the town of El Carmen, seeds of *A. colenda* are currently traded for 800 sucres ( $\pm$ US \$5.00) per 'quintal' (=112 lb). *Attalea colenda* produces one or two infructescences per year when it is 10 to 12 years old, and three to four per year when older. Each infructescence contains between 60 and 150 lb dry weight of seeds (Acosta-Solis, 1971). The oil content of the seeds is 51.74% (Cook, 1942). Using these data it can be calculated that 100 trees per hectare could produce between 10 and 27 tons of seeds, or between five and 13 tons of oil, per hectare per year.

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