

† *Scheelea zonensis*, spec. nov. § *Dialphocaryum*, Burret. Figs. 20-23.

Palma alta robusta, gregi *S. Liebmannii* relata: flores staminati ochroleuci vel straminei, angusto-clavata petala 10-15 mm. longa, sepala angustiora et aliquid longiora quam petala: sepala florum pistillatorum longi-atenuata, petala excedentia: fructus circa 6 cm. longus si siccus rostrum et perianthium includens, et fere 3 cm. crassus, sepala angustiora et aliquid longiora quam petala: semen unicum.

Big massive unarmed tree, irregularly monœcious, in the open usually with a short thick stock covered with leaves, and petiole-bases in which other plants grow, but in the forest the bole becoming 30 feet or more and 4-5 feet in circumference at 3 feet from the ground with bare but irregularly

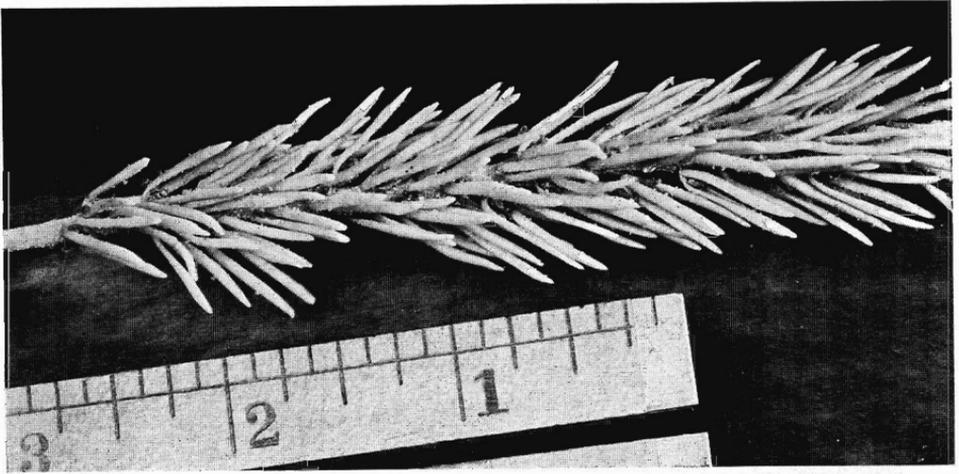


FIG. 21. STAMINATE STRAND of *Scheelea zonensis*.

ringed or corrugated surface; crown or top broad-vasiform with long-ascending and curved leaves that stand more or less edgewise and numerous drooping pinnæ; head in old trees comprising many heavy hanging trusses in different stages of fruit-bearing accompanied by the dead dry woody sheaths or spathes, all issuing from the axils of the ponderous leaves: leaves short-stalked, the blade to 20 feet long; petiole 1-2 feet, 3-4 inches across and much broader at enlarged base, rounded on lower side but flat-trough-like above with sharp upstanding edges, passing into a stout rachis double-furrowed above but higher up in the leaf becoming narrowed sidewise with acute keel and flattish opposite surface, the scores of pinnæ taking off from the two sides; pinnæ stiff, entire, glabrous, regularly spaced, hanging and the basal ones ribbon-like, attached to rachis by the entire width but becoming expanded or flat a few inches away from rachis and the base therefore trough-shaped with lower surface in the trough, 3-4 feet long, to  $1\frac{1}{2}$ - $2\frac{1}{2}$  inches broad, long-tapering to a narrow indefinitely bifid apex which may split deeply with age, midrib strong and upstanding on upper surface, finely striate and cross-veined: spathe woody and deeply many-furrowed, becoming brown, base contracted to a long portion or handle (Fig. 6, Fasc. i), apex narrowed into a slender flattish bayonet or

point, the whole 6-9 feet long and perhaps 8 or 10 inches thick at middle just before anthesis, dehiscing on lower side, in flower standing more or less horizontal above the declined great inflorescence or spadix, but hanging with age even after fruit falls; inflorescence a simple rachis bearing numerous pendent side-branches 1 foot and more long loaded with cream-colored staminate flowers and a few large pistillate ones at base, attractive to tiny insects, the whole flowering part of spadix to 26 inches or so long; staminate flowers 10-15 mm. long, consisting of only minute calyx envelopes, 3 cylindrical club-shaped slender perianth parts or petals and 6 very short anthers, soon caducous and exposing the sterile bare ends of the branchlets; pistillate flowers much larger, with 6 prominent tapering envelopes in two series, of which the outer (calyx) is the longer, single pistil bearing 3 stigmas about equalling the perianth: fruit oblong, narrowed to a beak,  $2-2\frac{5}{8}$  inches long and one-half or somewhat more as broad, glabrous, dull orange at maturity with a firm and hardly fleshy exterior, earth-brown and finely striate when dry; fruiting perianth about  $\frac{3}{4}$  inch long, the outer parts (sepals) narrower than the inner and somewhat longer; nutlet thick and bony, imbedded in a tough hard fibrous husk, containing a single seed with solid continuous albumen; trusses in fruit to 4 feet more or less, hanging on a heavy stout peduncle.



FIG. 22. ONE PISTILLATE AND TWO STAMINATE FLOWERS of *Scheelea zonensis* ( $\times 1\frac{1}{2}$  or 2).

This *Scheelea* belongs to Burret's section *Dialphocaryum* and is related to *S. Liebmannii*, Becc. of Mexico, *S. Preussii*, Burr. of Guatemala, and *S. brachyclada*, Burr. of eastern Peru. Dr. Burret has kindly compared material of *S. zonensis* with those species, and makes these contrasts: The fruit is about twice greater than that of *S. Liebmannii* and *S. Preussii*. It reminds one of *S. brachyclada* but in the fruiting perianth of that species the petals are conspicuously longer than the sepals, the staminate flowers are smaller, the fruits are longer and relatively less thick.

Striking feature of this Canal Zone *Scheelea* is the variation in sex character of the flower-clusters. Three types of clusters may be distinguished: (1) Practically all pistillate, not showy in anthesis; (2) all staminate; (3) nearly all staminate but with a few well-developed pistillate flowers at base of strands. Mr. Lindsay has made observations for me on these points, and writes that "all three types of flower-clusters may be borne on the same tree. This is specially true of the young trees, as I did not find the three types on a single old tree. I have not found a healthy tree that showed a tendency to produce all staminate flowers." In my own observation I was struck with the fact that some trees are abundantly fruitful while

others of similar age and bearing many remains of spathes were sterile. Some trees are showy in bloom and others are not. The meaning of these differences is subject for unhasting study on the spot when trees are in fresh bloom. One notes variations in fruits and flowers.

Profusely staminate clusters are showy as they burst, the male flowers being a lively light cream-color; blossoms soon become darker and stramineous as they quickly fall; dried preserved material is very dark brown.



FIG. 23. FRUITS OF THE ZONE SCHEELEA, somewhat over-size. *Scheelea zonensis*.

Associated with the staminate clusters of *Scheelea* as they open were great numbers of a very small beetle simulating the color of the flowers. These with other insects and mites taken in palm flowers were turned over to Dr. J. Chester Bradley of Cornell University who submitted them to specialists. The beetle in the *Scheelea* flowers was determined by L. L. Buchanan of the United States Bureau of Entomology as a *Derelomus*, neither of the two species of the *Biologia Centrali-Americana*, either undescribed or a South American species.

Four genera comprise an American group of heavy palms of the *Coccoloba*, very similar in general appearance: these are *Attalea* of Humboldt

Bonpland and Kunth 1815; Maximiliana of Martius 1826; Orbignya of Martius according to Endlicher 1837; Scheelea of Karsten 1856. The group was monographed by Burret in 1929 (in Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem) with the following results as to species: *Attalea* 17 species in South America (mostly Brazil) including the doubtful *A. Cohune* of Honduras; *Maximiliana* 9 species in South America and West Indies; *Orbignya* 19 species in South America; *Scheelea* 40 species mostly in South America but a few in West Indies, Mexico and Central America. By some authors *Scheelea* has been included in *Attalea*, but there are good marks of separation, or, as Burret writes, "*Attalea* und *Scheelea* sind gut geschiedene und natürliche Gattungen". In *Attalea* the perianth parts of staminate flowers are flat or lanceolate and stamens mostly many; in *Scheelea* the parts are terete or cylindric and stamens only 6; and there are other contrasts.

The generic name *Scheelea*, established by Karsten in 1856 (*Linnaea*, xxviii, 263-4), commemorates the German chemist Scheele, who lived and worked in Sweden.

The genus *Maximiliana* is distinguished by absence of showy petals in staminate flowers, these parts being small or minute. The other three genera are also separated from each other primarily on characters of the staminate flowers. In *Attalea* and *Scheelea* the long anthers are straight and not contorted, although in dried material they may have a slight twist but if so always longitudinally; *Orbignya*, on the other hand, has the anthers distinctly spiralled, or irregularly winding (meandriform), or curled laterally, sometimes twisted into a ball. For the purposes of this paper Burret has drawn the contrasts between these three genera as he now defines them:

- |    |   |                    |
|----|---|--------------------|
| A. | Antheræ mæandriformiter contortæ: stamina 6-∞.                | i. <i>Orbignya</i> |
| B. | Antheræ normales.   |                    |
| a. | Flores ♂ petalis planis, plus minus latis:<br>stamina 6-12.   | 2. <i>Attalea</i>  |
| b. | Flores ♂ vivi petalis teretibus, carnososubulatis: stamina 6. | 3. <i>Scheelea</i> |

The plant intended as *Attalea gomphococca*, Martius, is undetermined, the species having been founded on an unidentified fruit. The nativity was given originally as Central America, but Burret indicates its likeness to South American *Scheeleas*, and he transfers the name to that genus. The name *Attalea Cohune* is commonly attached to planted palms, usually without verification. The true *Cohune* is now considered to belong to another genus: *Orbignya Cohune*, Dahlgren in Standley, *Tropical Woods* (Yale School of Forestry), No. 30, 2 (1932); Burret in *Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem*, xi, 689 (1932); whether it is planted in the Canal Zone I do not know.

The name *cohune* is a vernacular in Central America for a kind of palm nut; Martius made it a Latin specific name (three syllables) in *Attalea*; and Sereno Watson in 1886 described a *Bactris Cohune* (which Standley has recently put into *Astrocaryum*), called in Guatemala Warree Cohune "from the resemblance of its fruit in shape to those of the *Attalea*, and in their bristly covering to the 'warree' or white-lipped peccary of the country."

### RAPHIA

The African genus *Raphia* was established by Ambroise Marie François Joseph Palisot de Beauvois (1752-1820), French naturalist, in his illustrious folio, *Flore d'Oware et de Benin en Afrique*, vol. i, 1804, founding also two species; and the diagnoses were again published in the old *Journal de Botanique*, vol. ii, 1809. Palisot had important relations with Oware and the Benin region bordering the Gulf of Guinea in western tropical Africa and he traveled extensively elsewhere, some of his journeys being in North America. The singular cone-like fruits of the *Raphia* palms had long been known and various names had been applied to them; by pre-Linnæan writers they had been called *Palma-pinus*, and by post-Linnæan authors they had been described under *Sagus*, a generic name now abandoned. Our author is known to North American botanists chiefly for his important work on grasses, being cited as Beauv. (Beauvois). He is commemorated in the genus *Palisota* of the *Commelinaceæ*.

Two *Raphias* were described by Palisot de Beauvois, *R. vinifera* and *R. pedunculata*, the former with an oblong and the latter with a broad nearly pyriform fruit, both represented in colored plates. Martius, writing in his monumental *Historia Naturalis Palmarum*, recognized three species, one of them American. The recent monographer, 1910, the late Odoardo Beccari, recognizes twenty species and several varieties, of which nineteen species are African (*Webbia*, vol. iii). The raffia palm (*R. Ruffia*) is indigenous in Madagascar, the others in western and equatorial Africa; *R. Ruffia* has been planted in other countries and it is on cultivated or introduced plants that Beccari supposes the *Raphia nicaraguensis* of Oersted (from Nicaragua) to have been founded. The *Raphias* are celebrated for their enormous leaves, those of the raffia palm of Madagascar said to reach a length of 65 feet and to be the largest in the vegetable world.

A *Raphia* native in equatorial America has long been known. It was described by Martius in 1824 as *Sagus tædigera* (cone-bearing: Latin, *tæda*, a pitch-pine), later transferred by him as *Raphia tædigera*. Whether the single American *Raphia* is distinct from the original *R. vinifera* of Nigeria has long been in doubt. As early as 1876 Drude suggested it might be a variety of *vinifera* and later writers have considered it to be the same as the African species. One would hardly expect an Amazonian palm to be the same species as a Nigerian. Beccari, however, with more material