2. Pseudopedicels of the perfect flowers and of the fruits less than 4 mm. long; endocarp 13–17 mm. in diam.; pinnae lacking scales within basal fold. Hispaniola .. 1. *P. Lediniana*
2. Pseudopedicels of the perfect flowers and of the fruits more than 4 mm. long; endocarp less than 12 mm. in diam.; pinnae with scales within the basal fold.
   3. Stamen filaments less than 1.5 mm. long, not united at their bases to form a cupule. Hispaniola ..... 3. *P. Ekmanii*
   3. Stamen filaments more than 2 mm. long, united at their bases to form a cupule ..... 4. *P. Sargentii*
      4. Inflorescence less than ⅓ as long as the leaves, erect in fruit; primary bract less than ¾ as long as the peduncle. Florida, Mexico, British Honduras ..... 4A. *P. Sargentii* subsp. *Sargentii*
      4. Inflorescence more than ⅓ as long as the leaves, pendulous from an arcuate peduncle in fruit; primary bract more than ¾ as long as the peduncle ..... 4B. *P. Sargentii* subsp. *saonae*
         5. Leaves gray-green below; fruit globular or subpyriform, less than 1.5 cm. in diam. Hispaniola, Saona, La Gonave, Cuba, Bahama Islands ..... 4Ba. *P. Sargentii* subsp. *saonae* var. *saonae*
         5. Leaves white or silvery below; fruit ovoid, more than 1.5 cm. in diam. Navassa ..... 4Bb. *P. Sargentii* subsp. *saonae* var. *navassana*

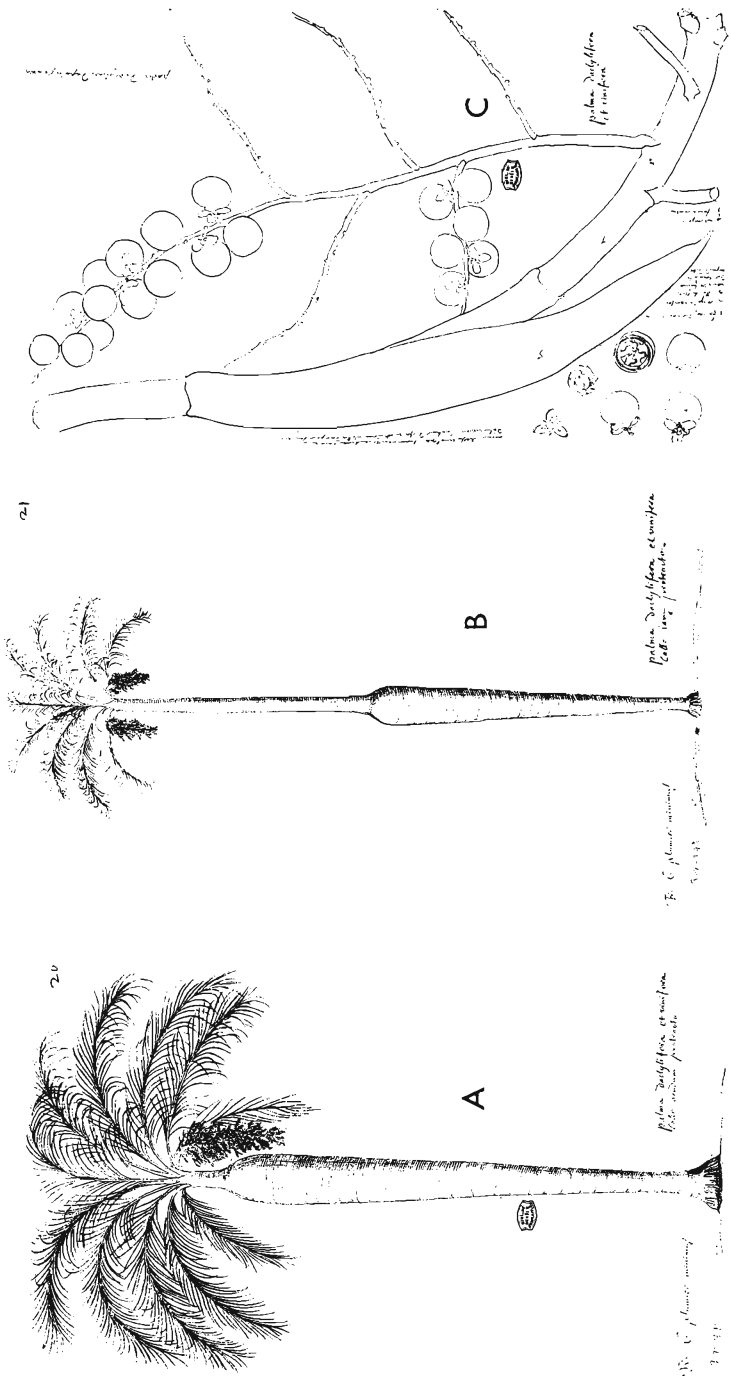
1. **Pseudophoenix Lediniana** Read, **sp. nov.** Type: *R. W. Read & F. Pierre-Louis 1154* (BH, holotype; FTG, isotype).

P. elata Cook ex Burret in syn., Sv. Vet-akad. Handl. III, **6**(7): 21. 1929.

Palma 20–25 m. alta, caule subventricoso ad 105 cm. in diam. Squamarum brunnearum caespes, quae in costa dorsali intra basin pinnae cuiusque complicatum in omnibus huius generis speciebus aliis adest, in hac specie deficiens. Inflorescentia arcuata, rachillis 8.5–16 cm. longis, 1.2–2.0 mm. in diam. Floris pseudopedicellus perbrevis, 1.5–3.0 mm. longus. Calyx profunde trilobatus, sepalis obovatis mucronatis. Inflorescentiae fructificantis staminum filamenta apice tumida et mucronulata, 2.0–2.6 mm. longa. Fructus globosus, endocarpio 13–17 mm. in diam., semine tantummodo uno.

Large, subventricose palm to 25 m. high; roots 7–8 mm. in diam., black, their mass forming an enlarged base (to 90 cm. in circumference) to the caudex which is deeply rimose by the expansion of the interior and consequent splitting of the rind; caudex narrowed above the base to 60 cm. in circumference at a height of about 2 m., then gradually enlarging to 100 cm. in circumference at the middle, decreasing again to a slender columnar portion slowly tapering in old plants to 35 cm. in circumference, distinctly banded with dark leaf scars and lighter-colored internodes; internodes in young plants waxy, gray-green, 7–9 mm. high near the base of the trunk, 15–17 cm. high at 2 m. above the base, becoming shorter toward the top of the trunk, where only to 0.5 cm. high in very old plants; leaf scars dark green, becoming lighter with age, 4 cm. high near base of trunk, to 0.5 cm. high toward top of old plants.

Leaves lax, to 3.35 m. long; sheath 36–40 cm. long, moderately waxy, blue-green; petiole 25 cm. long, 14 cm. wide at base, tapering to 4 cm. wide at lowermost pinna, petiole margins with brown scales to 4 mm. long which continue along outer edge of the greatly reduced lowermost pinna on each side of the leaf; rachis to 2.36 m. long, with lateral margins 3–5 mm. wide flaring winglike over the pinnae and edged with rusty-brown scales which fall with age leaving brown or black scars (normally there are no other scales of any kind on the expanded leaf); pinnae about 160 on each side of the rachis, arranged in groups of 2–4, the groups separated at intervals of about 3 cm. midway along the blade and more evenly spaced at the two ends where they lie in one plane, those along the rest of the blade inserted at widely divergent angles; lowermost



13. Plumier's "*palma dactylifera et vinifera*" as illustrated in his unpublished manuscript at the Bibliothèque Centrale, Muséum National d'Histoire Naturelle, Paris: **A** (plate 20) and **B** (plate 21) represent *Pseudophoenix vinifera* (Martius) Beccari; **C** (plate 30a) is now regarded as representing *P. Lediniana* Read.

pinnae greatly reduced and crowded, 1.5 mm. or less apart (up to 22 pinnae occurring in the first 10 cm.), very narrow and short, 2.8–6.5 mm. wide, 13–23 cm. long, those near the middle of the blade 22–26 mm. wide, 59–64 cm. long, those at the apex 7–14 mm. wide, 37–48 cm. long; bases of the pinnae strongly complicate, 2–4 (–5) mm. (average 2.5 mm.) wide between the edges, midrib within the folded base of the pinna normally lacking brown scales, upper surface of pinnae glossy dark green with midrib and several secondary parallel veins conspicuous.

Inflorescence arcuate, to 1.5 m. long (Figs. 9A, 10A), twice branched, the secondary branchlets frequently forked; peduncle to 82.5 cm. long, not flexible; outer primary bract 75 cm. long, 6–7 cm. wide, inner primary bract 67 cm. long, 5 cm. wide; axis at fruiting time 3 cm. wide, 2 cm. thick at the first branch; rachillae (8.0–) 8.5–16.0 cm. (average 11.6 cm.) long, (1.1–) 1.2–2.0 (–2.2) mm. (average 1.6 mm.) in diam. (measured at middle of rachilla); flowers 28–50 per rachilla, flower scars 1.7–2.2 mm. in diam. (third scar from base) to 0.8–1.1 mm. in diam. (third scar from apex).

Flowers at anthesis unknown; pseudopedicel in fruit (1.3–) 1.5–3.0 (–3.5) mm. long, (1.2–) 1.3–1.6 mm. (average 1.4 mm.) in diam. (measured at the middle); calyx deeply 3-lobed (Fig. 11), the obovate-mucronulate sepals united for less than ¼ their length, margins thin, drying dark brown, with the main body remaining tan, with 1–3 veins visible by transmitted light; petals 3.6–4.7 mm. wide, 6.2–7.0 mm. long, spreading in fruit, not reflexed along pseudopedicel; stamen filaments angular in cross section, 2.0–2.6 (–2.9) mm. (average 2.4 mm.) long, with a dark, horny, bulblike apex which remains rounded and mucronulate when the body shrinks in drying or in fruit (Fig. 11), bases dilated and fusing to form a narrow cupule adnate to the petals and surrounding the base of the fruit.

Fruit (Figs. 11, 12) 1-seeded (rarely 2-seeded) at maturity, smooth, spherical when fresh, 1.8 cm. in diam. and smooth when dry; stigmatic remains nearly covered by the petals; abortive carpels present but often inconspicuous below the stigmatic remains; exocarp very thin, red; mesocarp fleshy, oily, yellow to orange; endocarp brown, smooth, 1.5 cm. in diam.

Pseudophoenix Lediniana is found only on steep limestone cliffs at elevations from 150–300 meters. The environment is xerophytic, as evidenced by the agaves and cacti present. The region has distinct dry and wet seasons, with very little precipitation during the three or four months of the dry season; however, precipitation is higher than in the habitats occupied by *P. vinifera* or *P. Ekmanii.*

This species has been found only in a very limited area along gorges of a river system between Carrefour Fauché and Trouin in the valley of the Riv Levange on the southwestern peninsula of Haiti, Département de L'Ouest. Wherever possible, the plants are preserved by the local inhabitants and the fruit is collected for animal feed. The trees are climbed by means of notches cut into the trunk for footholds. The leaves are used occasionally for thatch, but this species is not used for wine-making. Fruits ripen during April and May.

According to a note attached to one of the Ekman specimens (*H-5860*), this species is called "palme marron" by the local inhabitants, presumably a reference to the maroons or escaped Negro slaves who fled to the hills and probably found this palm useful. In more recent times the palm has been known as "pti-coco," at least by the inhabitants of Levange.

Specimens examined: HAITI: Forested limestone cliffs of river gorge between Grand Goâve and Trouin, ca. 150 m., Apr 26, 1960, *R. W. Read 237* (BH); Limestone cliffs or . . . slopes above valley of the Riv. Levange, 3–4 miles west of Carrefour Fauché on road to Gerard and

palma dactylifera et vinifera.

In Insula Sandominicana Sylvis suis asperioribusque reperitur. Hac alia palma etiam copiosissima (quam vulgo palmiste avin nominant) propter liquorem quem e medulla caudicis nostri venatores (vulgo Boucaniers) catachenes summo cum oblectamento potant.

Palma est igitur cuius pes seu imus trunci basis alicuius instar dilatatus, innumeris radicibus nervosis digito fere aequabilis, nigris et durissimis fortissime radicatus. Super basim truncus crassior existens deinde paulatim usque ad summitatem, termini alicuius lorenti in modum intumescit, postea tandem in collum longissimum et angustissimum protenditur. Colli huius extremum rami periphrasis occupant eminentes et sunt in caelum palmis in orbem protensi, foliisque arundinaceis paulatim circa latera dispositis exornati.

Inter ramos vagina exumpunt ut in caelum palmis ramum deprimentes ramosum floribusque onustum circumdent. Continentibus qui embryones deinde in fructus evadunt globulares, cerasis nostratibus paulo maiores, corallino splendore et rubore suffusos, pauca carne constantes cum legente offendunt durissimum et rotundum. Racemum constituunt hi fructus elegantissimum quatuor pedes circiter longum ex interno ramorum complexu propendentem. Circa Augustum maturescunt ac decidunt, unde gratissimus fructus subus et equis sylvestribus cibus.

Modus autem vinum ex medulla huius palmae conficiendi hic est. Media aetatis palma (quae scilicet nondum collum protrusit ac fructus nondum protulerit) eligitur, secuique prostrenitur. prostrata ad humidiorem partem nempe prope colli futuri regionem segmentum cortices seu ligni (lignum enim pro cortice habet) pedem circiter latum et duos pedes longum eximitur. medulla quae in hac parte teneraspinguis succulenta dulcissimaque continetur, extrahitur. quam tandiu pistillo ingenti ligneo intra alveum, exquo fuit extracta, contundunt, donec ex succus manibus facile exprimi queat. Contusa paulatim medulla alium in eodem caudice alveum alium excavant quadratum pro dolio scilicet futuro, cui folia eiusdem palmae superimponentes (ne magma cum succo confundatur) et globulos medulla contusa super haec folia fortiter manibus exprimentes succum intra alveum infundunt, ubidemque per aliquot temporis spatium donec fermentescat permittunt. fermentatum vasculis ex involucris coriaceis ramorum eiusdem palmae confectis (quae toutelines vocant) exhauriente, deliciosle potant. Sersum saltis cum sapore cum albedine quam primum amittitur hoc potio .. e qua ne magis quam decet, potatur, caveandum. nam et ipse amulis didici, si plus quam satis sumatur, lethargicus affectus induit.

Flores huius palmae non vidi.

14. Reproduction of description of Plumier's "*palma dactylifera et vinifera*" from his unpublished manuscript, "Botanicum americanum. . . . ," at the Bibliothèque Centrale, Muséum National d'Histoire Naturelle, Paris.

Trouin, Apr 15, 1963, *R. W. Read & F. Pierre-Louis 1154* (BH, holotype; FTG, isotype); Trouin, Mai 22, 1923, *O. F. Cook s.n.* (US); Jun 22, 1927, *O. F. Cook s.n.* (US); Massif de la Hotte, in limestone cliffs at Riv. Courte-Oreille, ca. 150 m., Apr 15, 1926, *E. L. Ekman H-5860* (DA, NY, S, US).[3]

Plumier (1689–1697) illustrated his *Palma dactylifera et vinifera* with three plates, which now bear the numbers 20, 21, and 30a. Of these, the first two (which illustrate the habit of the tree) (see Fig. 13A,B) and the manuscript (Fig. 14) are the basis for *Pseudophoenix vinifera*. Plate 30a (Fig. 13C), however, illustrates an inflorescence and fruits which prove, after careful study, to represent a wholly different taxon, here described as *P. Lediniana*. The inflorescence illustrated in Plate 30a shows characters identical with those of specimens collected by O. F. Cook in 1923, 1925, and 1927 at Trouin, Haiti; by E. L. Ekman in 1926, also near Trouin; and by the author in 1960, from a river gorge between Fauché and Trouin.

Urban's (1920) account of Plumier's life contains valuable information on some of the places Plumier visited in Haiti. Plumier traveled and collected in the Cul de Sac and Port de Paix regions, and it was probably there that he saw the wine palm and made sketches of its habit (Fig. 13A,B). Several ports on the southwestern peninsula are also said to have been visited by Plumier, and it is probable that near one of them Plumier sketched his plate 30a (Fig. 13C). Because of their different fruiting times, it would be possible to obtain fruiting material of *P. Lediniana* on the southwestern peninsula when fruit of the wine palm was not available north of Port-au-Prince.

Plumier's illustration clearly reveals a short pseudopedicel, deeply three-lobed calyx, very short stamen filaments, much reduced abortive carpels, spreading to clasping petals, and an arcuate peduncle. *Pseudophoenix vinifera*, as interpreted here, has an elongate pseudopedicel, a triangular calyx, long cuspidate stamen filaments, prominent abortive carpels, spreading to reflexed petals, and a pendulous inflorescence with the peduncle making a 180 degree turn.

Cook's 1923 collection is labeled "*P. elata*," his 1925 collection simply "*Pseudophoenix*," and his 1927 collection "*P. elata* Cook ex Burret," all at the United States National Herbarium. Ekman's collection (*H-5860*) is divided and distributed among several herbaria. The specimens are either labeled "*P. elata* Cook (ined.)" and annotated as "*P. vinifera*" or labeled simply "*P. vinifera* Becc." A note in Ekman's handwriting reads, "Really different from the Morne Cabrits species (*Ps. insignis* Cook). Cannot possibly be *Ps. vinifera*, since it is hard and dry throughout." Differences were noticed by both collectors, but Cook apparently did not consider them sufficiently important to publish *P. elata*.

Burret (1929) was the first to publish Plumier's plate 30a. He referred it to *P. vinifera*, suggesting that he did not recognize specific differences. In his discussion of *P. vinifera*, Burret said that the simple branching of the inflorescence on *Ekman H-5496* from Morne à Cabrits (herein identified as *P. vinifera*) matched that of Plumier's plate 30a. He also compared the *Ekman H-5860*

[3] Abbreviations for herbaria are those of J. Lanjouw and F. A. Stafleu in Index Herbariorum, *Reg. Veg.* 31(1), ed. 5, 1964, with the addition of DA (herbarium, l'École National d'Agriculture, Damien, Port-au-Prince, Haiti) and FTG (herbarium of the Fairchild Tropical Garden, Coral Gables, Florida).

collection (fruiting material from Trouin, herein assigned to *P. Lediniana*) with *Ekman H-5496* (flowering material from Morne à Cabrits), pointing out that in the latter the primary branches of the inflorescence are divided only once again, and the secondary branches curve toward the apex, but that in the former the primary branches are twice-divided, and the secondary branches are strongly spreading. Burret also stated that Ekman's *H-5860* and Plumier's plate agreed well in the size of the fruits, the fruit perianth, the filaments, seed, and raphe. This was true, of course, for he was comparing a specimen from Trouin with an illustration of a plant from the same region. Had Burret compared fruiting material from Morne à Cabrits, or the illustrations of the fruit in Cook's paper on *P. insignis*, with the Plumier illustration, he might have seen differences. The degree of ramification of the inflorescence is unimportant as a character for separating *P. vinifera* and *P. Lediniana*, but the shape of the calyx and the stamen filaments on the fruit are excellent diagnostic characters. Burret stated that it was difficult to compare flowering material with fruiting material, and that he was unable to find specific differences. It is unfortunate that he did not observe the calyx and pseudopedicel, or even the presence or absence of scales on the undersurface of the pinnae.

Cook never published the specific epithet *elata* and Burret (1929) mentioned *Pseudophoenix elata* only to indicate that he thought the name synonymous with *P. vinifera* (which it is not). Since the name *P. elata* has never been validly published, I have chosen to name this species in memory of the late Dr. R. Bruce Ledin, whose interest in the flora of South Florida and in palms, *Pseudophoenix* in particular, stimulated the author to make a study of this genus.

2. **Pseudophoenix vinifera** (Martius) Beccari, Pomona Coll. Journ. Econ. Bot. 2: 268. 1912.

Raphia vinifera sensu Descourtilz, Flore Med. Ant. 1: 157, *pl. 33*. 1821, non *R. vinifera* Palisot de Beauvois. 1804.

Euterpe ? vinifera Martius, Hist. Nat. Palm. 1: LXXXV, *t. Z II, f. XVIII-XIX*. 1845. Type: *Palma dactylifera et vinifera* Plumier, descriptio in ms. et *t. 20, 21*, Botanicum americanum . . . . ined. (Bibliothèque Centrale du Muséum National d'Histoire Naturelle de Paris).

Cocos ? vinifera (Martius) Martius, Hist. Nat. Palm. 3: 324. 1853.

Gaussia vinifera (Martius) H. Wendland in Kerchove, Les Palmiers 245. 1878.

Aeria vinifera (Martius) Cook, Journ. Wash. Acad. Sci. 13: 399. 1923.

Pseudophoenix insignis Cook, Journ. Wash. Acad. Sci. 13: 397–404. 1923. Type: *O. F. Cook s.n.*, Aug 1924 (US, holotype).

Large, strongly ventricose palm to 25 m. high; caudex enlarged at base (by numerous thick roots to 7 mm. in diam.), to 50 cm. in diam., narrowed above the base to 30–40 cm. in diam. at a height of 1 m., gradually enlarging to 45–60 cm. in diam. at 3–6 m. above the ground, but narrowed again much more abruptly to 28 cm. in diam. and then to only 17–18 cm. in diam. at a height of 8–10 m., ringed with dark leaf scars and lighter-colored internodes; internodes near base of trunk 14 cm. high, those in vicinity of the bulge 5–8 cm. high,