XV. *On the Palms of Western Tropical Africa.*

By GUSTAV MANN and HERMANN WENDLAND.

Communicated by J. D. HOOKER, Esq., M.D., F.R.S., V.P.L.S., &c. &c.

(Plates XXXVIII.-XLIII.)

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OUR knowledge of the Palms of Western Tropical Africa is, in comparison with other parts of the world, very limited, as there are but five species described up to the present time, viz. *Phoenix spinosa*, Thonn., *Calamus secundiflorus*, P. de B., *Raphia vinifera*, P. de B., *Borassus Æthiopum*, Mart., and *Elæis Guineensis*, Jacq.

All these species have been re-found by one of us, and in addition twelve others, which are even of more importance than the former in a botanical point of view; and perfect specimens of all have been collected, with the exception of a few the difference between which was not recognized on the spot.

Before speaking in detail, we wish to tender our warmest thanks to Sir W. J. Hooker, of the Royal Gardens, Kew, for the materials so kindly placed at our disposal to enable us to publish the following synopsis; and more especially am I (Mann) indebted to him, for it was only through his instrumentality that I was enabled to travel in Western Africa; and for this and his continued kindness I wish publicly to express my gratitude.

The group of *Arecineæ* have, up to the present time, been quite unknown on the mainland of Africa; now, however, two species have been discovered, constituting two new genera, viz. *Podococcus* and *Sclerosperma*.

Podococcus, Mann & Wendl., is distinguished at first sight from all other genera by its pedicellate ovary and by its fruit, which, when mature, stands at almost right angles with the pedicel, and is, in comparison with its diameter, with the exception of *Areca paradoxa*, Griff. (*Kentia paradoxa*, Mart.), the longest in the whole group. The flowers are inserted in depressions of the spadix, which might lead, on a casual view, to the supposition that it belonged to the *Geonomæ* with undivided spadices; but minute examination at once proves its generic difference, which shows itself particularly in the position of the flowers in each depression; for in *Geonoma*, Willd., and the genera separated from *Geonoma*, such as *Calyptrogyne*, Herm. Wendl., and *Calyptronoma*, Grsb. & Wendl., the female flowers are hidden under two male flowers, by which this group is at once distinguished from other *Arecineæ* (except *Caryota*), in which the male flowers, if present, are situated behind the female flower. The leaflets are very similar to those of *Ceratolobus*

glaucescens, Bl., and *Ptychosperma Rumphii*, Bl., but the difference in the fruit of these two genera is so marked that it is unnecessary here to mention them in particular. Its nearest affinity is with the genera *Dypsis*, Noronh., *Chamædorea*, Willd., *Hyospathe*, Mart., and *Synechanthus*, Herm. Wendl., from all of which, however, *Podococcus* differs in the form of its leaflets, and in the flowers being inserted in depressions.

SCLEROSPERMA, Mann & Wendl., has for its nearest affinities the genera *Orania*, Bl., and *Manicaria*, Gærtn. To both of these *Sclerosperma* approaches in habit, although it is stemless, the præmorse leaflets resembling *Orania* in their grey-blue coating, and *Manicaria* &c. in the large lobes into which they are united: it differs from *Manicaria* in its very small spadix, but again approaches it in its spathe, which is persistent and lace-like upon the spadix; but differs again in its spathe opening at the apex, whilst *Manicaria* opens at the base or at the centre, the upper part being then pushed off. Although both *Orania* and *Manicaria* have large divided spadices, still *Sclerosperma* resembles them in the arrangement of its flowers, all three genera having female flowers with two male flowers only at the base of their spadices, whilst at the apex male flowers only are present. The outer perianth of the male flowers of *Sclerosperma* resembles that of *Nipa*, Th., and the inner that of *Arenga*, Labill. *Sclerosperma* is most remarkable for its extrorse anthers, and the position of the petals of the female flowers, which are membranous and imbricate only at the base; in *Orania* they are not at all imbricate. It differs also from the last-named genera in its unilocular ovary, on the apex of which is a large one-sided stigma. Its fruit bears a great resemblance to that of *Orania*, except that the chalaza is a little below the vertex, and not near the base. In its extraordinarily hard albumen it differs from both *Orania* and *Manicaria* and approaches *Phytelphas*, so much so that it might be taken for a small seed of that genus if the embryo were situated as near the chalaza as it is in *Phytelphas*; but this is not so, the embryo being almost opposite and a little below the vertex.

The second subfamily, *Lepidocaryineæ* or *Calameæ*, is largely represented in Western Tropical Africa, ten new species having been found, besides the two previously known; thus two-thirds of the Palms of this country belong to this subfamily, leaving only one-third for the *Arecineæ*, *Cocoinæ*, and *Borassineæ*. Whilst the ovule of *Arecineæ* and *Cocoinæ* is extrorse, in *Lepidocaryineæ* it is always introrse, which has already been pointed out by v. Martius in his 'Hist. Nat. Palm.' p. 196, "Micropyle sæpius centrum fructûs spectans?"

Most of the species of *Lepidocaryineæ* found in Western Tropical Africa will constitute separate subdivisions. With the exception of one *Calamus*, all have a trilocular ovary, as in the genus *Raphia*, P. de B., so in the four new subgenera of *Calamus* which I here propose (*Laccosperma*, *Ancistrophyllum*, *Oncocalamus*, *Eremospatha*), and in the American genera *Mauritia*, L., and *Lepidocaryum*, Mart., which fact is of great interest with regard to the geographical distribution of Palms.

Some of these new subdivisions are also remarkable for the formation of their seeds, the ovules being attached above their lower end by a short funicle to the lower part of

the dissepiment; whilst, from a comparatively stronger development of the lower part of the seed, the chalaza is elongated, whence the dissepiments are lengthened out towards the apex and base of the fruit, and, the funicle being in the centre, the seed shows a peltiform attachment, which is seen in the genus *Raphia* and in the subgenera *Laccosperma* and *Eremospatha*.

RAPHIA became first known through Palisot de Beauvais, and is represented by four well-marked species. Our investigations have shown that the *Raphia* described and figured by Palisot de Beauvais, viz. *R. vinifera*, is most nearly related to *R. tædigera*, Mart., which it resembles most in shape of fruit and scales, and that the *Raphia* figured by Gærtner (Fruct. et Sem. i. p. 27, tab. 10. fig. 1) as "*Sagus Palma Pinus*" is altogether different from *R. vinifera*, and not a synonym of the latter as v. Martius (*l. c.* p. 216) supposed it to be; and this we have called *R. Gærtneri*. Although v. Martius describes a lateral spadix in *Raphia*, we have always found it terminal, whence the description given by v. Martius of *R. tædigera* appears to us erroneous. It has also up to the present time been overlooked that several species of this genus are, in the very young state, dichotomous and even sometimes trichotomous, in consequence of which the species are always seen with two or three stems together, whilst others, as for instance *R. Hookeri*, are always single-stemmed.

The following subgenera of *Calamus* (*Laccosperma*, *Ancistrophyllum*, *Eremospatha*, and *Oncocalamus*) have the following characters in common, viz. very slender stems, with pinnate fronds, the sheaths of which at their apex are more or less elongated, forming an ochrea, the petiole of which, if present, and the midrib on the edges only and never on the centre of the back (as in all Indian *Lepidocaryineæ*) are covered with reversed thorns; and besides this they have the peculiarity of being elongated beyond the part covered with leaflets, and on the elongations the leaflets through abortion have become reversed hooks thickened at their base as in several American genera, viz. *Desmoncus*, Mart., and some *Chamædoreæ*.

Although these four subgenera have several characters in common, still there are other distinctions important enough to separate them, which are easily perceived in the following Table:—

LACCOSPERMA.	ANCISTROPHYLLUM.	EREMOSPETHA.	ONCOCALAMUS.
Sheathing: thorny	thorny	naked	scaly thorns
Ochrea: very long thorns	very long thorns	naked and short	naked, short
Petiole: long	short	wanting	wanting
Leaflets: broad, ligulate	narrow, slightly ligulate	straight	ligulate
Inflorescence: terminal	terminal	lateral	lateral
„ doubly divided	doubly divided	simply divided	simply divided
„ imperfectly sheathed	imperfectly sheathed	not sheathed	imperfectly sheathed
Flowers: binate	binate	binate	11, 9, 7, or 5
„ hermaphrodite	hermaphrodite	hermaphrodite	monœcious
Seeds: round	compressed	compressed	
„ with deep foveas	smooth	smooth or edges crenate	
„ attached near the centre	attached at the lower end	attached near the centre	

From the above comparison it will be seen that *Laccosperma* agrees in habit with *Ancistrophyllum*, and *Eremospatha* with *Oncocalamus*; also that *Ancistrophyllum* and *Eremospatha* have something in common in their seeds, so much so that we at first doubted if they might not be brought together in one subdivision; further investigation, however, convinced us that they were four well-marked subgenera, each of them having at least one well-defined character. Thus, *Laccosperma* is altogether distinct from *Ancistrophyllum* by the deep foveas in the seeds; and whilst *Ancistrophyllum* agrees with *Eremospatha* in the form of its seeds, these differ in their attachment to the dissepiment, for in *Ancistrophyllum* the attachment is by the lower end of the seed, whilst in *Eremospatha* it is near the centre. Besides this, the spadices are in the former terminal and covered with imperfect sheaths, whilst in the latter they are lateral and without sheaths—a character which is peculiar to this subgenus. In the former there is a tripartite inner perianth and almost entirely free stamens, and in the latter a short tridentate inner perianth, and the stamens connected in a tube. As *Eremospatha* differs in its short unsheathed spadix, so again we find in *Oncocalamus* the spadix with imperfect sheaths; also in *Eremospatha* and the two former subgenera (*Ancistrophyllum* and *Laccosperma*) always binate hermaphrodite flowers, whilst in *Oncocalamus* the flowers are glomerate 11 or 9, 7 or 5, and monœcious, the centre one only being female.

These characters are confirmed by the agreement of the two species of *Laccosperma* and of the three species of *Eremospatha*; whilst the other two plants must each be considered as the type of a new subgenus.

Throughout the tropics Palms are amongst the most useful plants to mankind; this is more especially the case among people so little advanced in civilization as the natives of West Africa, who obtain from them the source of many of their comforts.

Foremost among the useful palms of tropical Western Africa stands the *Elæis Guineensis*, Jacq. The oil of the mesocarp of the fruit of this palm constitutes in most parts the chief food of the natives, who hardly ever take a meal in which it is not used in some way or other. It is nutritious and of an agreeable flavour—so much so, indeed, that it generally becomes a favourite dish with Europeans.

Besides being used as food, the natives also use it for oiling their bodies, partly to keep away insects, and partly as a substitute for clothing, of which they are entirely destitute. The Bubis or Boobees of the Island of Fernando Po make an excellent poultice of it, which they apply when the hand of any person, found guilty of adultery, has, in accordance with the usage of these people, been cut off.

Among the more civilized natives it is used, as with us, in the manufacture of soap; and it is also employed for lighting their huts, but the oil extracted from the kernel of the nut is generally preferred for this purpose.

The exportation of the seeds of this palm is rapidly increasing, and already large quantities are shipped from Sierra Leone and its neighbourhood.

Were there less jealousy and more energy among the European traders, and could they induce or force the natives of the coast to give up their monopoly, much larger supplies could be obtained at the chief sources of the trade, as at Bonny, Brass, and Old Calabar

Rivers, and this oil would be found much superior to that now obtained from the mesocarp of the seeds.

Elæis wine, a drink much liked by the natives, is obtained by cutting off the male flower-spike; this wine is also used by the Europeans instead of yeast in making bread. The main nerves of the pinna and the exterior of the petiole are used for basket-work, for the making of brooms, and similar purposes. Dr. Welwitsch says that at St. Paul de Loando the fibre at the base of the leaves, and also that of the spathe, is used for stuffing cushions, &c.; the soft centre of the upper part of the stem, consisting of the undeveloped petioles, is much relished as a vegetable. Finger-rings, bracelets, necklaces, and other ornaments are cut from the endocarp of the seed.

Many as are the benefits derived from this palm by the natives, they are comparatively few compared with the uses made of its products by Europeans; of these we need not speak, as all must be more or less acquainted with them. It may, however, be worthy of mention that during the last three years 130,381 tons of palm oil, of the value of £5,605,913, have been imported into Great Britain.

With regard to their utility to the natives, the various species of *Raphia* rank next to the *Elæis*. The petioles furnish the materials of which their huts and beds are made, while the pinnæ are used for roofing; and the epidermis of the leaflets gives the material from which their clothing is made. In places where the *Elæis* is scarce, the oily substance between the scaly exterior of the fruit and the kernel, although bitter, is eaten with yam, cassada, &c., and the oil pressed out of it is by the women thought superior to that of *Elæis* for dressing their hair.

The pleasant taste of the wine obtained from *R. Hookeri* has even been sufficient to overcome the innate idleness of the natives of Old Calabar, and has induced them to cultivate it. The wine is procured by cutting out the terminal inflorescence as soon as it makes its appearance; the wine is then produced in large quantities. The natives of Old Calabar manufacture cloths, &c., from the epidermis of the leaflets of this palm, and in the south, at St. Paul de Loando, *R. Welwitschi* is used for the same purpose, and the petioles of *R. vinifera* are employed as poles upon which to carry the palanquins. On the river Sherboro the natives make hammocks from the former material, as well as all sorts of basket-work, mats, &c. The roofing made of the leaflets of *R. vinifera* lasts for three years, while that made from *R. Hookeri*, it is said, requires to be renewed every year.

Wine is also obtained from *Phoenix spinosa*, and the fruits of this palm are much liked by the natives. The very young leaflets, before the leaves expand, are used for the plaiting of hats and caps at Accra.

The outer part of the stems of the climbing palms of Western Tropical Africa is used for binding together the materials of which the huts are constructed. The Bafan people also make large cylindrical baskets of this in which to carry the rubber manufactured by them, and the same people take large quantities of *Calamus (Ancistrophyllum) secundiflorus* with them as food when they go into the hills of the Sierra del Crystal to procure the rubber. For this purpose they choose the extremities of the stem, cutting off the leaves to make the bundles more portable, and when required for use they simply

roast the whole in the fire and then eat the soft central part, which is, however, rather bitter and tough for persons not accustomed to such primitive fare.

The fruits of *Podococcus* are also eaten. The leaves of *Sclerosperma* are used for roofing and constructing the walls of the huts, being tied between the petioles of *Raphia*.

Subfamily I. ARECINEÆ.

Genus 1. *PODOCOCCLUS*, Mann et Wendl.

MONOICA. *Spadix* simplex, longe pedunculatus. *Spathæ* 4, inferiores tubulosæ, superior subcompleta.

Flores in foveis sessiles, masculi geminati prope medium fœmineum rudimentarium, fœminei solitarii in diversis? spadicebus vel fortasse flores ternati in eodem spadice, laterales masculi, medius fœmineus serius florens.

MASC. *Perianthium* exterius triphyllum, interius stipitatum tripartitum. *Stamina* 6, filamentis subulatis, liberis, basi cum germinis rudimento et cum perianthii interioris tubo concretis; antheris oblongo-cordatis, dorso affixis.

FÆM. *Perianthium* exterius triphyllum, interius trifidum stipitatum. *Staminodia* 6, minima. *Germen* stigmatibus 3 triangularibus recurvatis, triloculare; ovulo pendulo. *Fructus* baccatus, abortu monospermus, raro 2- rarissime 3-spermus, supra basin genuflexus, elongato-ellipsoideus; stigmatum cicatrice subbasilari; epicarpio tenui, coriaceo, aurantiaco, lævi; mesocarpio gelatinoso-succoso; endocarpio tenuissime membranaceo. *Semen* erectum, hilo basilari, circumclusum vasorum fasciculis ex hilo radiatim ortis adscendentibus simpliciter ramosis in parte superiore anastomosantibus. *Albumen* æquabile. *Embryon* dorsale, in vel sub dimidia albuminis altitudine.

PODOCOCCLUS BARTERI, Mann et Wendl. (Plates XXXVIII. A., XL. B., & XLIII. A.)

Palma 5–8' alta, in omnibus fere partibus furfure rufo vestita. Caudex simplex, $\frac{3}{4}$ " crassus, basi se innovans, rectus, annulatus, internodiis 3–5" inter se distantibus. Frondes 6–9, glaucescenti-virides, 5–6-pedales, pinnatisectæ; vaginis circ. pedem longis, striatis, oblique fissis, margine laceratis; petiolis 1–1½' longis teretiusculis supra basin versus canaliculatis; rhachi 2½–3' longa, dorso convexa, supra acutangula. Segmenta utrinque 8–10, elongato-elliptica vel oblongo-elliptica, plicata, multinervia, marginibus inferioribus integris superioribus irregulariter eroso-dentatis, majora 1' longa 4" lata, alternantia, 3–4" inter se distantia, inferiora decrescentia, duo terminalia confluentia. Spadices laterales, simpliciter teretiusculi, patentes deinde penduli, circ. 2½' longi, fusco-hirsuti, pedunculo rhachique æquilongis, illo in parte inferiore spathis 4 vestito, spathis tubulosis marcescentibus, duabus inferioribus incompletis 4–5" longis, superioribus magis completis oblique apertis et irregulariter fissis 8–12" longis, rhachi 3" crassa. Flores in foveis orthostichis 8–10 vel spiraliter dispositis sessiles, ternati, rufescentes.—**MASC.** *Perianthium* exterius triphyllum, phyllis oblongo-ellipticis apice sæpe bifidis, dorso carinatis, subfalcatis, marcescentibus, vix 1" longis, foliatione contorta; interius tripartitum 2" longum, laciniis oblongo-ellipticis, concavis, cartilagineis, dorso striatis, patentibus, foliatione valvata. *Stamina* 6, alternatim paulum longiora; filamentis filiformibus, basi cum perianthii interioris tubo et cum germinis rudimento subgloboso apice tridenticulato concretis; antheris oblongo-cordatis, dorso affixis.—**FÆM.** *Perianthium* exterius uti in fl. masc. sed paulum rigidius; interius trifidum, basi cum germine in stipitem brevem concretum, laciniis oblongis, acutis, concavis, dorso striatis, erecto-patentibus. *Staminodia* 6 minima. *Germen* triloculare, plerumque loculis duobus abortivis, stipitatum, oblongum, apice stigmatibus tribus brevibus recurvis; ovulo pendulo. *Fructus* baccatus, edulis, oblongus vel elongato-oblongus, aurantiacus, stipitatus, supra basin genuflexus, stigmatum cicatrice

subbasilari, fere pollicem longus, 4–5''' crassus. Semen erectum, elongato-ellipsoideum, paulum obliquum, 9''' longum, 2''' crassum.

Hab. Collected by *C. Barter*, whose name we have given to this graceful plant, and by *G. Mann* (no. 452), in swampy places at the mouth of the rivers Nun, Brass, and Gaboon, where it flowers from June to August.

PLATE XXXVIII. A. View of the plant, showing its habit.

PLATE XL. B. fig. 1. Spadix in fruit (natural size); fig. 2. Female fl.; fig. 3. Male fl. (both magnified); fig. 4. Seed (nat. size).

PLATE XLIII. A. fig. 1. Male fl.; fig. 2. do. outer perianth removed; fig. 3. do. laid open; fig. 4. Stamens; fig. 5. Female fl.; fig. 6. Outer perianth leaflet; fig. 7. Inner do. laid open; fig. 8. Vertical section of pistil; fig. 9. do. of seed: all but fig. 9 magnified.

Genus 2. SCLEROSPERMA, Mann et Wendl.

MONOICA. *Spadix* brevis, simplex. *Spathæ* 2, persistentes, interior subcompleta. *Flores* utriusque sexus in eodem spadice conferti, basi masculi ad singulorum fœmineorum latera, apicem versus solum masculi.

MASC. *Perianthium* exterius triphyllum, interius tripartitum foliatione valvata. *Stamina* plurima; filamentis brevissimis; antheris linearibus, extrorsis, basi affixis.

FÆM. *Perianthium* exterius tripartitum aut triphyllum; interius triphyllum, phyllis interioris basi convolutis, apicem versus valvatis. *Staminodia* 6–9, minima. *Germen* unicarpellare; ovulo pendulo; stigmate obliquo maximo. *Fructus* drupaceus, magnus, oblique depressus, stigmatum cicatrice laterali; epicarpio tenui; mesocarpio fibroso; endocarpio tenui lapideo. *Semen* depresso-globosum, circumclusum vasorum fasciculis ex hilo lineari ortis, radiatim divergentibus, ramosis, versus embryotegam laxè anastomosantibus. *Albumen* magnum, durissimum, æquabile, lacteum. *Embryon* dorsali-verticale, hilo suboppositum.

SCLEROSPERMA MANNII, Wendl. (Plates XXXVIII. C. & XL. A.)

Palma humilis, cæspitosa, socialis. Caudex perbrevis. Frondes 10–13 pedes longæ, furfure rufo-griseo detergibili partialiter obtectæ, rigidæ; vaginis margine reticulato-fissis 12–18'' longis; petiolis digitum crassis 7–8' longis, teretiusculis, rigidis, fulvis; lamina oblongo-elliptica, apice bifida, 4–5' longa, 2' lata, utrinque 50–60-nervia, irregulariter pinnatisecta; rhachi circ. 4' longa, supra acutangula, dorso convexa. Segmenta utrinque 9–12 opposita vel subopposita, 1–2'' inter se distantia, coriacea, supra glaucescenti-viridia, lævia, nitidula, subtus albicantia squamulis fuscis detergibilibus tecta, reduplicata, ima basi paulum contracta, 3–5- raro 7-nervia, apice oblique truncata, grosse crenato-dentata et minute acuteque dentata, 2–1½' longa, 2–3'' lata; nervis primariis fere 9''' inter se distantibus, subtus prominentibus, in marginis anterioris sinu in mucronem acutum procurrentibus, inter 2 nervos primarios nervo commissurali subtus prominente et in dentis apice excurrente, inter nervos primarios et commissurales circ. 30 nervis tertiariis quorum fere medio fortiore et utrinque paulum prominente, terminalia inæqualia, late confluentia, 12–17-nervia, margine exteriore abrupte truncato crenato, 4–7'' lata, margine interiore 7'' longo. Spadices simplices, breves, primum circ. 8'' longi, deinde paulum elongati, laterales inter frondium bases reconditi erecti, spathis 2 basilaribus persistentibus apice apertis fuscis vestiti; exteriore 5–6'' longa, basi coriacea compressa, apice irregulariter fisso-laciniata; interiore circ. 8'' longa, ellipsoidea vel elongato-ellipsoidea, apicem versus reticulatim disrumpente; pedunculo crassitudine digiti minoris, 4'' longo, fusco-tomentoso, rhachi circ. 4'' longa, inclusa, simplici, subcylindrica, apice attenuata. Flores spiraliter dispositi, in parte inferiore ternati, duo masculi ad latera fœminei, bractea

communi latissime ovata acuta concava cum bracteis communibus collateralibus confluyente suffulti, in parte superiore solum masculi confertissimi suborthostichi circ. 17 sessiles primum tomento fusco obtecti deinde glabri.—MASC. in basi spadiceis seu cum foemineis conjuncti breviter pedicellati, bractea minima saepe obsoleta suffulti. Perianthium exterius triphyllum, phyllis oblongo-lanceolatis, concavis, dorso carinatis, membranaceis $1\frac{1}{2}$ –2''' longis; interius tripartitum, laciniis ovali-ellipticis, rigidis, crassis 3–4''' longis. Flores masculi in apice spadiceis basilaribus dimidio majores; perianthii ext. phyllis lineari-spathulatis, intus canaliculatis, dorso carinatis, apice obtusis, incurvis, inferne membranaceis superne coriaceis; interioris laciniis obovato-rotundatis, apice mucrone incurvo, concavis, crassis, subcorneis, 5''' longis, testaceis, foliatione valvata. Stamina plurima, 25 aut plura, inclusa; filamentis brevissimis e corpusculo crasso hemisphaerico enatis; antheris linearibus connectivo percurrente, extrorsis, basi affixis. Rudimentum germinis nullum.—FÆM. bractea late ovata acuta suffulti, circ. 15 in spadice. Perianthium exterius triphyllum aut tripartitum, phyllis late ovatis, incrassatis, acutis, subcarinatis, concavis, margine ciliato-lepidotis deinde glabris, foliatione convoluta 5''' longa; interius 3-phyllum, phyllis ovatis, abrupte acuminatis, concavis, basi foliatione convoluta, marcescentibus, apicem versus valde incrassatis foliatione valvata, phyllis exterioribus æquilongis vel paulum superantibus. Staminodia 6 vel 9 lanceolata, minima, ima basi germinis. Germen uniloculare, oviforme, ellipsoideum, phyllis perianthii int. brevius; stigmatibus magno suberecto in latere ventrali paulum decrescente; ovulo basi affixo. Fructus drupaceus, $1\frac{1}{4}$ '' in diametro, monococcus, oblique depressus, oviformi-globosus, stigmatum cicatrice laterali verticem versus; epicarpio brunneo tenui nitidulo; mesocarpio fibroso fibris tenuissimis; endocarpio tenuissimo lapideo, extus membrana medullosa brunnea tecto. Semen ei generis *Phytelephantis* affine sed minus depressum, oviformi-globosum, pollicem longum et vix $\frac{3}{4}$ '' altum, hilo paulum excentrico magis ad extremitatem superiorem versus, e quo fasciculi vasorum plures ramosissimi et valde anastomosantes versus embryonis situm currentes radiatim oriuntur. Albumen magnum, durissimum, æquabile, lacteum. Embryon dorsali-verticale, hilo oppositum.

Hab. In swampy places near the river Gaboon, from Point Clara upwards (no. 1046).

This highly interesting genus is, I think, one of the finest discoveries among the numerous novelties which my friend G. Mann gathered in West Africa, for which cause I will not let the occasion escape of putting his name to the only species. Highly interesting and of much habitual beauty, I deplore sincerely the failure of the attempt to introduce it into European gardens, where it would become a great ornament in our stoves.—H. W.

PLATE XXXVIII. C. View of plant, showing its habit.

PLATE XL. A. Fig. 1. Spathe; fig. 2. Spadix in fruit; fig. 3. do. in flower; fig. 4. Fruit with portion of pericarp removed; fig. 5. Seed cut open, showing the embryo; all of nat. size: fig. 6. Ovary; fig. 7. Vertical section of do.; fig. 8. Petal of female fl.; fig. 9. Female fl.; fig. 10. Sepal of do.; fig. 11. Male fl.; all magnified.

Genus 3. PHŒNIX, L.

PHŒNIX SPINOSA, Thonning; Mart. Hist. Nat. Palm. p. 275.

Hab. On the banks of the river Nun (*Mann*, no. 528).

Subfamily II. LEPIDOCARYINEÆ.

Genus 4. CALAMUS, L.

(Subgenus 1. CALAMI VERL.)

1. CALAMUS DEERRATUS, Mann et Wendl. II. Loriferi; caudice scandente; aculeis vaginæ ancipiti-subulatis transverse seriatis petioli rhacheosque brevioribus solitariis reduncis; petiolo brevi; segmentis æquidistantibus utrinque circ. 35 elongato-lanceolatis acuminatis ad margines et ad nervos 7 paginæ inferioris et raro in nervo medio paginæ superioris nigro-setulosis, subtus squamulis minimis rufis adspersis; spadicebus elongatis 2-3-partitis apice in loram elongatis, spinis 1-3 aggregatis reduncis; spathis cylindricis appressis; fructu ovoideo, squamis flavescentibus ad marginem brunneis orthostichis 19-21. (Plate XLI. F.)

Caudex scandens, 20-25' altus, 1' crassus. Frondes circ. 5' longæ, longe vaginatæ, patentes, in planta juvenili aggregato-pinnatisectæ in adultiore æquidistante pinnatisectæ, partialiter aculeatæ et fusco-tomentosæ; aculeis basi flavescentibus apice nigris nitidis, vaginæ ancipiti-subulatis basi dilatatis margine dentato-serratis 3-12''' longis basi sæpe 3''' latis, petioli erectis subulatis 9-12''' longis, rhacheos conico-subulatis reduncis. Vagina cylindrica, arcta, inferne inermis, superne transverse zonatimque aculeata, oblique aperta, apice utrinque in lacinias ovatas cartilagineas marginibus aculeatissimis producta, 1½' longa. Petiolus semiteres, supra leviter canaliculatus, margine et medio dorsi sparse aculeatus, 3'' longus, ½'' latus. Rhachis gradatim attenuata, supra in parte posteriore applanata et sparse aculeata, in dorso longitudinaliter unifariam remote grossequ aculeata, in lateribus partis posterioris sparse minuteque aculeata, tomento fusco detergibili oblecta. Lamina ovata. Segmenta utrinque circ. 35, alterna, utrinque decrescentia, subæquidistantia, elongato-lanceolata, basi valde contracta, acuminata, membranaceo-cartilaginea, in pagina inferiore squamulis minimis fuscis adspersa, trinervia, nervo medio supra partialiter et remote setuloso, marginibus et nervis 7 subtus sparse setulosis, setis flavescentibus apice nigris, media 14-15'' longa 12-14'' lata, 1-1¼'' inter se distantia, terminalia 6'' longa. Spadices tenuissimi, 8' longi, arcuato-dependentes, ramis primariis binis ternisve simpliciter ramulosis, tumque rhachi communi apice in appendicem nudam longissimam teretiusculam arcte vaginatam, ad internodia lateris alterius inermem, alterius aculeis solitariis geminatis raro ternatis quaternatisve et dimidiato-verticillatis recurvis ornatam protensa. Pedunculus basi cum vagina frondis superioris longitudinaliter connatus. Spathæ longæ, cylindricæ, apice oblique fissæ et bifidæ, sparse aculeatæ, tres inferiores ramos involventes, infima circ. 1' longa anceps marginibus remote spinulosis, superiores unilateraliter sparse aculeatæ. Rami circ. pedem inter se remoti, arcuato-patentissimi, 9-12'' longi, simpliciter alternatim disticho-ramulosi, spathella cyathiformi oblique acuminata 6'' longa suffulti, ramulis florigeris circ. 30 bipollicaribus densissime bracteatis spathellis ramorum similibus sed multo minoribus et magis cupuliformibus. Flores flavescentes in spadice masculo solitarii, ima basi a bractea minima cupuliformi apice bidenticulata dorso fere usque ad basin fissâ circumdata, in spadice fœmineo geminati, alter masculus vel neuter, alter fœmineus, ambo bractea communi uti flores masculi circumdati, fœmineus bractea partiali cupuliformi ore obliquo bidentato.—MASC. fere 3''' longi. Perianthium exterius cupuliforme, trifidum, laciniis late ovatis; interius tripartitum, exterius duplo superans, laciniis oblongo-ovatis. Stamina 6 basi concreta, filamentis subulatis, antheris basi sagittatis lineari-oblongis. Rudimentum germinis globosum, apice stigmatibus 3 longis.—FÆM. Perianthium staminaque ut in mare, antheris effœtis, germine oblongo stigmatibus tribus triangularibus brevibus recurvis. Fructus ovoideus, apice attenuatus, 7 8''' longus 4''' in diametro, 19-21 seriebus squamularum loricatus, squamis convexiusculis medio sulco levi longitudinali notatis, testacco-ochreatis, nitidis, margine inferiore membranaceo eroso-laciniato, margine

linea brunnea pictis. Semen 4-5^{'''} longum, compressiusculum, oblongo-ellipsoideum, rugulosum, basi affixum, chalaza incrassata dorsali. Albumen corneum. Embryon basilare, erectum, juxta hilum.

Hab. Collected at two places: on the Bagroo River, under no. 895; and on the Cameroons River, under no. 2147.

It is very interesting to meet with a true *Calamus* so far westwards, going astray from its relations, in the regions explored by Mr. Mann. As far as is yet known, no connexion exists in the geographical extension of this subgenus; for we are not aware of any species which grows between the west coast of Africa and India, as *Calamus secundiflorus*, P. de B., does not belong to the subgenus *Calamus*, but is the representative of a new subgenus, as our examinations have shown. A second species seems to grow in Senegambia, where it was discovered by M. Heudelot, but his specimens in the Kew Herbarium are not sufficient to allow of their being described.

PLATE XII. F. Leaflet, portion of fruiting spadix, seed, and the same cut open vertically.

(Subgenus 2. LACCOSPERMA, Mann et Wendl. (λάκκος, a hole; σπέρμα, seed).)

HERMAPHRODITA. *Spadix* terminalis, spathis incompletis vaginatus, alternatim disticheque ramosus, ramis spathellulis vestitis. *Flores* geminati, alternatim distichi.

Perianthium exterius campanulatum, trifidum, basi subcallosum; interius tripartitum, exteriore duplo longius. *Stamina* 6; filamentis ima basi perianthii int. adnatis, linguæformibus, crassis; antheris elongatis, sagittatis, dorso affixis. *Germen* triloculare, stylo longissime columnari-subulato, stigmatibus 3 brevibus, ovulo paulum supra extremitatem inferiorem et paulum supra fundum carpelli affixo, deinde peltato. *Fructus* baccatus, monospermus, subglobosus. *Semen* peltatum, subglobosum; hilo lineari, raphe lineari per canalem basilarem ad foveam dorsalem magnam adscendente, chalaza magna mamillæformi. *Albumen* lacunosum. *Embryon* ventrale, horizontale, in dimidia albuminis altitudine.

Palmæ Calamis veris similes; caudicibus elongatis, remote frondiferis, inermibus. Frondes pinnatisectæ, vaginis spiniferis longissime ochreatis, petiolatæ, in marginibus petioli rhacheosque retrorso-spinosæ, rhachi apice in cirrhum longum filiformem producta, segmentis abortivis in hamos seu uncis inferne alternantes superne oppositos reversos mutatis. Segmenta lato-lanceolata vel elliptico-lanceolata, falcata, reduplicata, subaggregata. Spadices terminales abbreviati, duplicato-ramosi, spathis incompletis vestiti, spathellis abbreviatis infra ramos et bracteis infra flores instructi, ramis alternatim distichis secundis. Flores geminati, alternatim distichi, flavescentes. Fructus aurantiaci.

2. CALAMUS (LACCOSPERMA) LÆVIS, Mann et Wendl. Segmentis utrinque 9-13 subuniformibus lanceolato-ellipticis margine inermibus bi- raro uninerviis nitidis. (Plate XXXVIII. B.)

Caudex scandens, tenuis, 30-40' longus, digitum crassus, sobolifer, annulatus, internodiis $\frac{3}{4}$ -1' longis, raro dichotomo-partitus, inermis. Frondes 4-5' longæ, tomento atrobrunneo detergibili obtectæ, glaucescentes. Vagina circ. 1' longa, tubulosa, arcte caudicem amplexens, apicem versus spinis solitariis horizontaliter patentibus conoideo-subulatis circ. 3^{'''} longis oblecta, apice in ochream circ. 1' longam unilateraliter rumpentem producta, spinis sparsis solitariis fortissimis compresso-subulatis erecto-patentibus basi flavescentibus apice nigris vestita. Petiolus 8-9" longus, 3^{'''} latus, supra applanatus, dorso convexus, ad margines remote spinosus, spinis conoideis reduncis basi incrassatis et flavescentibus apice nigro 3^{'''} longis et 3-12^{'''} inter se distantibus obsitus. Rhachis in parte foliosa 18-20"

longa, gradatim attenuata, dorso convexa, supra basin versus convexa apicem versus acutangula et producta in cirrhum $1-1\frac{1}{2}'$ longum filiformem segmenta 4-6 abortiva hamæformia solitaria alternantia reversa basi incrassata, infima $6-12'''$ longa suprema diminuta, inferne $4''$ inter se distantia superne magis approximata ferentem; margine rhacheos cirrhiue spinoso, spinis iis petioli simillimis sed magis recurvis approximatis et gradatim diminutis. Segmenta subaggregata, gregibus oppositis vel suboppositis utrinque 9-13, late lanceolato-elliptica, basin versus angustata, apice acuminata, leviter falcata, marginibus inermibus utrinque lævibus nitidis, nervis duobus raro uno primariis supra prominentibus percursa, utrinque decrescentia, infima paulum retroflexa, superiora erecto-patentia, media $7-9''$ longa, $1\frac{1}{2}''$ lata. Spadix terminalis, ovatus, $1\frac{1}{2}-2'$ altus, ramis 6-8 primariis, infimis recurvato-patentibus simpliciter ramulosis basi spatha incompleta spinosissima tubulosa oblique rumpente, apice in caudam plures pollices longam transeunte, ramulis alternatim distichis in ramo inferiore 10-12 primum erectis deinde recurvis, infimis $4-5''$ longis apicem versus gradatim decrescentibus spathulis pollicem longis tubuloso-inflatis apice oblique truncatis et unilateraliter in apicem acuminatissimum productis suffultis, inermibus densissime spathellulis $2-3'''$ longis obsitis. Flores alternatim distichi, patentissimi, geminati; ambo spathellula communi ventre plano vel concavo apice utrinque paulum producta dorso convexa $2'''$ longa circumdati, breviter pedicellati supra pedicellum horizontaliter patentes, unusquisque ad hæc singulis spathellulis partialibus dorso inter se concretis circumdatus altera a latere rupta, altera cyathiformis florem alterum basi bractea suffultum circumcludens. Perianthium exterius campanulatum, $2'''$ longum, basi calloso-incrassatum, fere semitrifidum; laciniis ovatis, acuminatis, rigidis, dorso nervoso-striatis, interiori arcte appressis: interius $4'''$ longum, tripartitum, flavescens; laciniis $3\frac{1}{2}'''$ longis, lineam latis, elongato-lanceolatis, acutis, marginibus præcipue superioribus incrassatis, foliatione valvata, rigidiusculis, intus concavis, tenuissime longitudinaliter nervoso-striatis. Stamina 6, perianthio int. paulum breviora; filamentis basi cum perianth. int. concretis, crassis, linguæformibus, acutis, $1\frac{1}{2}'''$ longis; antheris basi bifidis, medio dorso affixis, $1'''$ longis, flavis. Germen globosum; stylo columnari, intus cavo $2'''$ longo, apice stigmatibus 3 oblongis brevibus coronatum, squamulis minimis laciniato-fimbriatis arcte involutum, triloculare, uniovulatum. Fructus immaturus seriebus 18 verticalibus squamularum straminearum margine castaneo laciniato-eroso.

Hab. In shady virgin forests in the neighbourhood of Gaboon (*G. Mann*, no. 1045).

PLATE XXXVIII. B. View of the plant, showing its natural habit.

3. CALAMUS (LACCOSPERMA) OPACUS, Mann et Wendl. Segmentis utrinque circ. 11 biformibus alternatim majoribus elliptico-lanceolatis vel elongato-lanceolatis falcatis marginibus ciliato-spinosis 1-4- raro 5-nerviis. (Plates XLI. D. & XLIII. D.)

Caudex 25-30' longus, sobolifer. Frondes patentes, 6-8' longæ, glaucescentes, tomento detergibili fusco obtectæ. Vagina circ. 1' longa, tubulosa, arcte caudicem amplexens, apicem versus spinis solitariis ancipiti-subulatis basi flavescens apice nigris $6'''$ longis vestita, apice in ochream $6-12''$ longam tubulosam unilateraliter rumpentem spinis iis vaginæ affinibus obsitam producta. Petiolus circ. $7''$ longus, $4-5'''$ crassus, supra canaliculatus, dorso convexus, ad margines spinis retrorsis $3-6'''$ longis dense vestitus. Rhachis in parte foliosa $2\frac{1}{2}-3'$ longa, gradatim attenuata, dorso convexa, supra basin versus applanata, apicem versus acutangula, apice producta in cirrhum $2\frac{1}{2}-3'$ longum filiformem et segmentis 4-6 abortivis hamæformibus flexilibus inferne solitariis alternantibus $4-6''$ inter se distantibus superne oppositis reversis basi incrassatis magis approximatis et decrescentibus infimis $1\frac{1}{4}-1\frac{1}{2}''$ longis $1'''$ latis vestitum. Margines rhacheos cirrhiue dense spinosi, spinas valde recurvas apicem versus decrescentes ferentes. Segmenta subaggregata, gregibus oppositis, utrinque 11 biformia, angustiora et latiora alternantia, elongato-lanceolata vel elliptico-lanceolata, basin versus contracta, apicem versus acuminata, marcescentia, opaca, ad margines remote spinifera, falcata, 1-4- raro 5-nervia,

nervis utrinque prominentibus, 8" longa 1" lata ad 12" longa et 4" lata, utrinque decrescentia. Spadix terminalis, ovatus, $1\frac{1}{2}$ – $2\frac{1}{2}$ ' altus, ramis primariis patentissimis inferioribus 1– $1\frac{1}{4}$ ' longis alternatim distiche ramulosis, ramulis homomallis, pendulis, 4–8" longis, tenuibus, cæteris uti in *C. lævi*. Flores geminati, alternatim distichi, spathellulis uti in *C. lævi* circumdati, breviter pedicellati, horizontaliter patentissimi et divergentes. Perianthium exterius campanulatum, fere 2" longum, basi calloso-incrassatum, rigidiusculum; laciniis late ovatis acutis: interius fere 4''' longum, tripartitum; laciniis lanceolato-ellipticis, acutis, rigidis, intus concavis, dorso nervoso-striatis, foliatione valvata. Stamina 6, perianthio int. paulum breviora; filamentis crassis, linguæformibus, basi cum perianthio int. concretis, apice acutis; antheris elongatis, basi bifidis, dorso affixis, longitudinaliter rumpentibus. Germen globosum, stylo 2''' longo columnari coronatum, stigmatibus 3 oblongis margine fimbriatis, triloculare; loculis uniovulatis; ovulo paulum supra extremitatem inferiorem et paulum supra fundum carpelli affixo. Fructus baccatus, monospermus, miniatus, globosus, 6''' in diametro, stylo longo coronatus, seriebus 12 verticalibus squamularum membranacearum sulco longitudinali obsolete notatarum straminearum margine castaneo. Semen subglobosum, profunde lacunosum, 5–6''' in diametro, in latere dorsali fovea magna in cujus medio mamilla calcariformis, supra extremitatem lateris ventralis inferiorem affixum, raphe lineari adscendente et per canalem basilarem ad foveam dorsalem et chalazam calcariformem adscendente. Albumen durum, lacunosum. Embryon ventrale, horizontale, in dimidia albuminis altitudine.

Hab. In shady woods on the island of Fernando Po from the shore to 1000 feet above the level of the sea; collected by *G. Mann*, under no. 97.

PLATE XLI. D. Leaflet, portion of fruiting spadix, and seed: nat. size.

PLATE XLIII. D. fig. 1. Male fl.; figs. 2 & 3. Outer and inner perianth of do.; fig. 4. Vertical section of do.; fig. 5. Perianth segment and stamen; fig. 6. Stamen; fig. 7. Filament; fig. 8. Pollen; fig. 9. Vertical, and fig. 10. Transverse section of ovary; fig. 11. Top of style and stigma; fig. 12. Transverse section of seed: all but fig. 12 magnified.

(Subgenus 3. ANCISTROPHYLLUM, Mann et Wendl. (ἀγκιστρον, a grapple-hook; φύλλον, a leaf).)

HERMAPHRODITA. *Spadix* terminalis, distiche duplicato-ramosus, spathis pluribus incompletis, spathellis et spathellulis obtectus. *Flores* alternatim distichi, geminati. *Perianthium* exterius campanulatum, tridentatum; interius tripartitum, exteriore duplo longius. *Stamina* 6; filamentis basi perianthio inter. adnatis, linguæformibus; antheris elongatis, sagittatis, dorso affixis. *Germen* triloculare; stylo longe columnari; stigmatibus 3 brevibus; ovulis erectis. *Fructus* baccatus, monospermus, oblongus. *Semen* compresso-oblongum, læve, erectum, hilo basilari, raphe lineari fere usque ad extremitatem lateris dorsalis superiorem adscendente tum vasorum fasciculis obsolete divaricantibus, chalaza dorsali longitudinaliter paulum incrassata et albumini impressa. *Albumen* æquabile, durum. *Embryon* ventrale, horizontale, in dimidia albuminis altitudine.

4. CALAMUS (ANCISTROPHYLLUM) SECUNDIFLORUS, Mann et Wendl. (Plates XXXVIII. D., XLI. G., & XLIII. C.)

Calamus secundiflorus, P. de Beauv. Fl. d'Oware et de Benin, i. 15, tab. 9 & 10; Mart. l. c. p. 341.

Palma cæspitosa, supra arbores longe lateque scandens. Caudex circ. $1\frac{1}{4}$ " crassus, 50–60' longus, remote frondifer, inermis. Frondes 12–14' longæ, longe vaginatæ, breviter petiolatæ, pinnatisectæ, 1– $1\frac{1}{2}$ ' inter se distantes, rhachi apice in flagellum longum transeunte, dilute virides. Vagina 1– $1\frac{1}{2}$ ' longa, cylindrica, clausa, basin versus inermis, apicem versus spinosa, spinis brevibus conoideo-subulatis 1–2''' longis solitariis, apice in ochream longam producta. Petiolus 4" longus, $\frac{3}{4}$ " crassus, dorso convexus et supra concavus, ad margines spinis remotiusculis subulatis basi incrassatis apice nigris recurvis obsitus.

Rhachis 5-6' longa, gradatim attenuata, in parte foliosa dorso convexa inermis supra inferne angulato-convexa, superne acutangula ad margines inter segmenta et ad angulos ventrales spinifera, spinis $\frac{1}{4}$ - $\frac{1}{2}$ " longis subulatis tenuissimis rectis vel paulum curvatis sursum decrescentibus, apice in cirrhum 5-6' longum subinermem vel raro spiniferum producta et segmentis usque ad 18 abortivis hamæformibus basi valde incrassatis superne applanatis vel triangularibus, infimis solitariis alternantibus 4-8" inter se distantibus 2" longis 3" latis, superioribus oppositis basi confluentibus gradatim decrescentibus et approximatis ornata. Segmenta utrinque 45-55, lineari-lanceolata, basi abrupte contracta apice acuminata, ad margines ciliato-aculeata, cartilaginea, rigidiuscula, stricta, pendula, uni- vel binervia, nervis paulum prominentibus supra remote aculeatis, infima approximata 4-5" longa $\frac{1}{2}$ " lata, media 12-13" longa $\frac{3}{4}$ -1 $\frac{1}{2}$ " lata raro latiora, 1-1 $\frac{1}{2}$ " inter se distantia, suprema inter se paulum remotiora. Spadix terminalis, late ovatus, 4-6' altus. Rami 10-15 primarii circ. 3' longi, spathulis incompletis cylindrico-tubulosis apice oblique truncatis inermibus lævibus erecto-appressis infimis vacuis circumdati. Ramuli floriferi alternatim distichi, penduli, homomalli, longissimi, pedem longi tenues, spathellulis campanulato-cylindricis brevibus 2" longis apice oblique truncatis alternatim distiche obsiti. Flores geminati, hermaphroditi, spathellula communi iis ramulorum simili sed minore et spathellula partiali apice bidentata circumdati, flavescentes, breviter pedicellati, divergentes et horizontaliter patentes. Perianthium exterius fere 2" longum, campanulatum, tridentatum, læve, basi calloso-incrassatum; laciniis transverse semioblongis, acutiusculis: interius tripartitum 4" longum; laciniis lineari-oblongis, breviter acutis, rigidis, crassiusculis, patentibus, foliatione valvata, 1-1 $\frac{1}{4}$ " latis, lævibus, dorso convexis, tenuissime nervoso-striatis. Stamina 6, perianthio inter. paulum breviora; filamentis crassiusculis, linguæformibus, compressiusculis; antheris linearibus, basi bifidis, 2" longis flavis, introrsis. Germen globosum, stylo columnari coronatum, stigmatibus tribus oblongis, triloculare, ovulo erecto, hemianatrope, squamulis retroflexis vestitum. Fructus baccatus, monospermus, vegetans aurantiacus, sicco brunneus, 6" longus, 4-5" latus, compresso-oblongus, seriebus 17 verticalibus squamularum membranacearum brunnearum marginibus scabris et castaneis circumdatus. Semen læve, compresso-oblongum, basi obtusum vel leviter bilobum, in apice mucrone brevissimo, in latere dorsali convexum, in ventrali applanatum, 4-5 $\frac{1}{2}$ " longum, 3-4" latum, 2 $\frac{1}{2}$ " crassum, in extremitate inferiore affixum, hilo rotundato, raphe lineari fere usque ad extremitatem lateris dorsalis superiorem adscendente et in mamillam appressam calcariformem transeunte, chalaza in dimidia seminis altitudine, testa castanea in latere dorsali albumini impressa lævi subnitida. Albumen æquabile, corneum, in latere dorsali per testam chalazamque exsculptum. Embryon ventrale, horizontale, in dimidia albuminis altitudine.

Hab. Along the coast on the margins of the forest from the equator to Sierra Leone (*G. Mann*, no. 453).

PLATE XXXVIII. D. View of plant, showing its natural habit.

PLATE XLI. G. Portion of fruiting spadix and seed.

PLATE XLIII. C. figs. 1 & 2. Outer and inner male perianth; fig. 3. The same laid open; fig. 4. Stamen; fig. 5. Anther; fig. 6. Vertical section of ovary; fig. 7. Transverse do. of style; fig. 8. Top of do. and stigma; figs. 9-11. Seeds; fig. 12. Vertical section of do.: all but figs. 9-11 magnified.

(Subgenus 4. EREMOSPETHA, Mann et Wendl. (ἐρημος, without; σπάθη, spathe).)

HERMAPHRODITA. *Spadix* lateralis, simpliciter distiche ramosus, spathis nullis. *Flores* distichi, geminati, uti rami bractea suffulti.

Perianthium exterius campanulatum, tridenticulatum; int. inflatum apice tridentatum, crassum, perianth. exter. superans. *Stamina* 6, perigyna; filamentis in tubum inter se et cum perianth. int. usque ad ejusdem partitiones connatis; antheris cordatis ad basin dorsi affixis. *Germen* triloculare, stigmatibus 3 linguæformibus fimbriatis; ovulo paulum supra extremitatem inferiorem et paulum supra fundum carpelli affixo, deinde peltato.

Fructus baccatus, 1- raro 2-3-spermus, squamis tenuibus fragilibus, endocarpio membranaceo. *Semen* pelatum, oblongo-disciforme, subrugulosum, hilo lineari, chalaza in lateris dorsalis medio hilo opposita, ibi testa longitudinaliter incrassata vel mamillæformi, raphe lineari partem seminis inferiorem amplectente, vasorum fasciculis e chalaza ortis radiatim divergentibus et in embryotegam convenientibus. *Albumen* æquabile, leviter sulcatum. Embryon ventrale, horizontale, in dimidia albuminis altitudine.

• *Palmæ Calamis veris* similes; caudicibus elongatis in et ultra arbores sylvestres plerumque longe scandentes, remote frondiferis, annulatis, inermibus. Frondes pinnatisectæ, vaginatæ, vagina breviter ochreate inermi sessiles, rhachi marginibus ciliato-spinosa apice in cirrhum longum filiformem triangularem producta, segmentis abortivis in hamos oppositos reversos mutatis armata. Segmenta plicato-nervosa, reduplicata, margine ciliato-spinosa, inferiora decrescentia reflexaque, superiora erecto-patentia. Spadices inter vaginas erumpentes, patentes, breves, espathæ; ramis infra basin bractea remota suffultis. Flores straminei. Fructus aurantiaci.

5. *CALAMUS (EREMOSPETHA) HOOKERI*, Mann et Wendl. Segmentis utrinque 12-14 elongato-obovato-ellipticis, marginibus inferioribus ciliato-paucispinosis, superioribus subcrenulatis inermibus; fructu seriebus orthostichis 20. (Plate XLI. C.)

Caudex semipollicem crassus. Frondes 4-5' longæ; vagina tubulosa nervoso-striata, glabra, apice in ochream 6-9''' longam valde oblique truncatam producta; rhachi circ. 3½' longa, basi ½'' crassa, superne gradatim attenuata, apice in cirrhum inermem elongata, dorso convexa, supra subrotundata, inter segmenta bina spinis 1-2 uncinato-recurvis, minimis, apice nigris, 1-2''' longis obsita. Segmenta utrinque 12-14, subæquidistantia, basin versus approximata, apicem versus paulum remotiora, media 1½-2'' inter se distantia, alternantia, 6-7'' longa, 2-2¼'' lata, elongato-obovato-elliptica, plana, basin versus angustissima, reduplicata, papyracea, longitudinaliter nervoso-plicata, nervo medio et nervis 5 secundariis utrinque paulum prominentibus, marginibus superioribus levissime repando-crenatis, opaca, subglaucescentia, erecto-patentia, inferiora ad margines inferiores spinis paucis 2''' longis obsita, infima retroflexa caudicem subamplectentia basi paulum incrassata 1'' longa 3''' lata; segmenta abortiva opposita, 5-juga, infima circ. 7'' a segmentis supremis distantia 1'' longa 1''' crassa reversa, rhachi subappressa, basi confluentia et incrassata, leviter sigmoidea, cornea, subulato-triquetra, faciebus binis concavis, superiora gradatim approximata et decrescentia. Cirrhi rhachis tenuissima, vix 1''' crassa, parte pinnifera brevior. Spadix longe pedunculatus, inter vaginas frondium conspicuus, 1½-2' longus, pedunculo compresso, rhachi compressiuscula 10-12'' longa 4-5''' crassa superne gradatim attenuata, simpliciter disticheque ramosa, elongato-ovata, ramis 14-22 patentibus, 2''' crassis, rigidis, toto floriferis, suffultis bractea transverse oblonga acuminata a basi ramorum 3''' remota, alternantibus, inferioribus 5-6'' longis, mediis 1'' inter se distantibus, superioribus brevioribus. Fructus ovoideo-cylindrici, 10-12''' longi, 8-9''' in diametro, 1- raro 2-spermi, 20 seriebus verticalibus squamarum loricati, squamis rhombeis, planiusculis, sulco medio exaratis, aurantiacis, chartaceis, margine inferiore subintegerrimo, linea fusca cinctis, 2''' in diametro. Dissepimenta persistentia, membranacea. Semen 9''' longum, 6''' latum, 3''' crassum.

Hab. At the mouth of the river Nun (*G. Mann*, no. 451).

PLATE XLI. C. Leaflet, fruit, and seed: nat. size.

6. *CALAMUS (EREMOSPETHA) CUSPIDATUS*, Mann et Wendl. Segmentis utrinque 25-27 elongato-lanceolatis cuspidatis marginibus minute ciliato-spinosis; fructu seriebus orthostichis 18. (Plate XLI. A.)

Caudex 1'' crassus. Frondes 6-7' longæ, vagina tubulosa lævi circ. 1' longa apice in ochream tubulosam 1'' longam oblique truncatam producta, rhachi 5-6' longa basi 6''' crassa gradatim attenuata apice in

cirrhum elongata, dorso convexa, supra ad partem inferiorem angulato-rotundata, ad partem superiorem triangulari, ad margines partis pinniferæ inter segmenta bina spinis 1-2 uncinato-recurvis apice atro basi incrassata fortissimis 2-3''' longis obsita. Segmenta utrinque 25-27, subæquidistantia, basin versus approximata, apicem versus paulum remotiora; media 1-2'' inter se distantia, opposita, aut alternantia, 8-9'' longa, 10-12''' lata, elongato-lanceolata, in apice reduplicato-contracta in cuspidem 1-2'' longam producta, chartacea, subopaca, utrinque glabra, longitudinaliter plicato-nervosa, nervo medio paulum prominente, utrinque nervis 6 secundariis, ad margines ciliato-spinosa, spinulis numerosioribus sed tenuioribus quam in specie sequente; inferiora retroflexa, caudicem subamplectentia, ima basi valde incrassata, rigidiora, grosse spinosa, 1-2'' longa, 1-3''' lata; segmenta abortiva opposita, 8-juga, inferiora 8'' inter se distantia, 1½'' longa basi 3''' crassa, supra basin confluentia, reversa, leviter sigmoidea, cornea, subulato-triquetra, faciebus binis concavis; superiora gradatim approximata et decrescentia. Cirrhi rhachis tenuis, 1''' crassa, infra jugam ad 2-3''' incrassata. Spadix longe pedunculatus, inter vaginas frondium conspiciens, 18-20'' longus, pedunculo compresso circ. 1' longo basi vix ½'' lato intus concavo dorso convexo superne dilatato, rhachi compressiuscula 7-9'' longa basi ½'' crassa superne gradatim attenuata simpliciter disticheque ramosa ovata vel elongato-ovata, ramis 20-30 patentissimis 2''' crassis rigidis toto floriferis, suffultis bractea transverse oblonga acuminata a basi rami 3''' remota, inferioribus oppositis 4-5'' longis, superioribus brevioribus et alternantibus. Flores uti in specie sequente. Fructus ellipsoidei, 1'' longi, circ. 9''' in diametro, fere æquilati, 1- raro 2-spermi, 18 seriebus verticalibus squamarum loricati, squamis rhombeis in sicco valde bullatis sulco medio exaratis miniatis chartaceis margine inferiore lacerato linea fusca cinctis 1½-2''' in diametro. Dissepimenta persistentia. Semen 9''' longum, 5''' latum, 3-4''' crassum, a ventre paulum compressum, in dorso convexum, pericarpium cavitatem replens; testa brunnea, chalaza dorsali valde incrassata et mamillæformi marginibus sublævibus, hilo lineari. Embryon hilo paulum superpositum, in dimidia albuminis altitudine, ventrale, horizontale.

Hab. Near the mouth of the river Gaboon (*G. Mann*, no. 1043).

PLATE XLI. A. Leaflet, portion of male spadix, fruit, and seed: nat. size.

7. CALAMUS (EREMOSPATHA) MACROCARPUS, Mann et Wendl. Segmentis utrinque circ. 23 elongato-lanceolatis acutis marginibus grosse ciliato-spinosis; fructu seriebus orthostichis 24. (Plates XLI. B. & XLIII. B.)

Caudex vix 1'' crassus, 30-50' longus. Frondes circ. 9' longæ; vagina tubulosa circ. 1' longa, apice in ochream oblique truncatam 1'' longam, furfure atrofusco detergibili oblecta; rhachi circ. 7-8' longa, basi 4-5''' crassa, gradatim attenuata, apice in cirrhum elongata, dorso convexa, ventre angulata, partis pinniferæ marginibus antrorsum retrorsumque uncinato-spinosa, parte cirrhifera inermi parti pinniferæ æquilonga. Segmenta utrinque circ. 23, subæquidistantia, apicem versus paulum remotiora, elongato-lanceolata, apice acuta, subdentata, papyracea, rigida, nervoso-striata, glabra; nitida, marginibus grosse ciliato-spinosis, spinis 1-2''' longis fuscis basilaribus ima incrassatis; inferiora decrescentia, elongato-elliptica, retroflexa, basi valde incrassata, alternantia; superiora opposita vel subopposita, 14'' longa, 12-13''' lata, nervo medio paulum prominente, utrinque nervis 6 secundariis; segmenta abortiva opposita, 7-11-juga, reversa, cornea, basi valde incrassata et fere confluentia, subulato-triquetra, faciebus binis concavis; inferiora 6-8'' inter se distantia, 12-15''' longa, basi 2''' crassa; superiora minora gradatim approximata. Spadix 1½-2' longus, glaber, simpliciter alternatim distiche ramosus, sine spathis; pedunculo 6-8'' longo, fere 6''' crasso, intus concavo, dorso convexo, ramis 4-5'' longis 1''' crassis sursum decrescentibus, bractea semiamplexicauli marcescente ovata acuminata 3''' longa fere pollicem infra basin ramorum posita. Flores geminati, alternatim distichi, sessiles, 5''' longi. Perianthium exterius monophyllum, campanulato-cyathiforme, 2''' altum, tridentatum, papyraceum, rigidum, læve, obsolete striatum; interius exteriore fere triplo longius, monophyllum, valde inflatum,

crassum, tridentatum. Stamina 6, æquilonga; filamentis in tubum inter se et cum perianth. int. usque ad ejusdem partitiones connatis, apice brevissime liberis; antheris erectis, cordatis, ima basi lateris dorsalis affixis, introrsis. Germen ovoideo-globosum, squamulis minutissimis obductum, triloculare, cum ovulo campylotropo in quovis loculamento. Stylus brevis, squamulis vestitus, stigmatibus 3 linguæformibus margine ciliolatis coronatus. Fructus $1\frac{1}{4}$ " alti, compresso-cylindrici, utrinque obtusi, apice brevissime attenuati, mono- raro dispermi, 24 seriebus squamarum verticalibus loricati; squamis rhombeis, $2'''$ in diametro, planiusculis, sulco medio exaratis, aurantiacis, chartaceis, margine inferiore membranaceis et linea fusca cinctis. Dissepimenta persistentia. Semen $9-12'''$ longum, $9'''$ latum et $4-5'''$ crassum, a dorso ventrequ compressum, disciforme, pericarpium cavitatem exacte replens, testa brunnea, chalaza dorsali valde incrassata et mamillæformi, marginibus plus minusve crenulatis, ventre lævi. Embryon hilo approximatum et ei paulum superpositum, in dimidia albuminis altitudine, ventrale, horizontale.

Hab. Rivers Old Calabar and Bagroo (no. 2330).

PLATE XLI. B. Leaflet, portion of male spadix, fruit, and seed: nat. size.

PLATE XLIII. B. Figs. 1 & 2. Outer and inner perianth of female fl.; fig. 3. do. laid open; fig. 4. Imperfect stamens; fig. 5. Pistil; fig. 6. Vertical section of do.; fig. 7. Seed; fig. 8. Transverse section of do.: all magnified.

(Subgenus 5. ONCOCALAMUS, Mann et Wendl. (ὄγκος, a hook; κάλαμος, cane).)

MONOICA. *Spadix* lateralis, spathis incompletis vaginatus, simpliciter disticheque ramosus, ramis longissime pendulis. *Flores* spathellulati 11-5 glomerati, glomerulis alternatim distichis, medii fœminei, cæteri masculi.

MASC. *Perianthium* exterius campanulatum, tridentatum ad trifidum; interius tripartitum, fere triphyllum. *Stamina* 6 in cyathum campanulatum apice minute 6-dentatum concreta; antheris cordatis, dorso affixis. Rudimentum *germinis* oblongum, stylo cylindrico, stigmatibus minutis.

FÆM. *Perianthium* filamentaque ut in mare; antheris effœtis. *Germen* triloculare, stylo subnullo, stigmatibus 3 linguæformibus, ovulo paulum supra extremitatem inferiorem et paulum supra fundum carpelli affixo. *Fructus* ignotus.

8. CALAMUS (ONCOCALAMUS) MANNII, Wendl. (Plates XLI. E. & XLIII. E.)

Palma *Calamis veris* affinis; caudicibus circ. 60' longis semipollicem crassis remote frondiferis. Frondes 5-6' longæ, atrovirides, in juventute cupreæ, longe vaginatæ, vaginis $1-1\frac{1}{2}'$ longis cylindricis ochreatis, ochrea $\frac{1}{2}-\frac{3}{4}''$ longa oblique truncata, sessiles; rhachi foliosa $1\frac{1}{2}'$ longa, ad margines sparse minuteque spinosa, apice in cirrhum 3' longum inermem debilem producta, segmentis abortivis $\frac{1}{2}''$ longis $1\frac{1}{2}-2''$ inter se distantibus inferne alternantibus superne oppositis basi confluentibus reversis corneis mutatis; vaginis rhachique squamis atrobrunneis spiniformibus caducis vel deliquescentibus $1-3'''$ longis vestitis. Segmenta utrinque circ. 16, continua, alternantia vel subopposita, subæquidistantia, nutantia, elongato-lanceolata, acuta, leviter falcata, nitida, uninervia, utrinque nervis secundariis 6-7 obsoletis percursa, ad margines remote spinifera, patentia, $9-10''$ longa, $12-15'''$ lata; inferiora paulum diminuta et paulum magis approximata non reversa. Spadices axillares, $4-5'$ longi, atrobrunnei, penduli, simpliciter alternatim disticheque ramosi, inermes, basi nudi, superne spathis incompletis tubulosis truncatis deinde irregulariter rumpentibus $2''$ longis appressis vestiti, ramis longissimis pendulis $10''$ longis. Rami basi ad rhachim appressi, $1''$ longi, nudi, tum per totam longitudinem spathellis campanulato-infundibuliformibus deinde ventre rumpentibus se imbricantibus alternatim distichis $3-4'''$ altis dense superpositis. Flores in ramorum parte inferiore plerumque 11, in superiore 7, 5 vel 3 aggregati, medii fœminei ebracteati, cæteri masculi totidem bracteolis variis circumpositi et æquabiliter ad utrumque floris fœminei latus dispositi.

Hab. Near the river Gaboon and on the Sierra del Crystal, at an elevation of about 1500 feet above the level of the sea (*G. Mann*, no. 1044).

PLATE XLI. E. Leaflet and portion of male spadix: nat. size.

PLATE XLIII. E. Transverse section of portion of spadix, showing the positions of the axis (α), male fl. (σ), and female fl. (φ): magnified.

Genus 5. *RAPHIA*, P. de Beauv.; Mart. Hist. Nat. Palm. p. 216.

MONOICA in eodem spadice, monocarpa. *Spadices* (laterales, Mart.) 1–2 raro terni in apice caudicis, duplicato-ramosissimi, absque spatha communi, pluribus spathis incompletis vaginati, ramis et ramulis alternatim distichis. *Flores* in ramulis seu spicis compressis distichi, singuli e bractea cyathiformi perfoliata, bracteola campanulata cincti; fœminei basin, masculi apicem versus.

MASC. *Perianthium* exterius campanulatum, truncatum, subdenticulatum; interius tripartitum. *Stamina* 6–16; filamentis crassis clavæformibus basi plus minusve confluentibus; antheris linearibus basi affixis extrorsis. Rudimentum *germinis* nullum vel obsoletum.

FÆM. *Perianthium* exterius ut in masc.; interius campanulato-infundibuliforme, tridentatum ad semitridum. *Staminodia* in urceolum 6- vel multidentatum cum perianth. int. connata; antheris effectis, cordato-sagittatis. *Germen* triloculare; ovulo paulum supra extremitatem inferiorem et paulum supra fundum carpelli affixo. *Stigmata* 3 sessilia, subulata, patentia.

Fructus baccatus, magnus, monospermus. *Semen* peltatum, elongato-ellipsoideum vel elongato-obconicum, exeso-sulcatum, hilo infra lateris ventralis medium, raphe lineari descendente usque ad chalazam in extremitate inferiore positam, tum radiatim partita in vasorum fasciculos ramosissimos anastomosantes maxima ex parte ad extremitatem superiorem adscendentes versus embryotegam revolventes. *Albumen* osseum, solidum, irregulariter ruminatum. *Embryon* ventrale, horizontale, in dimidia albuminis altitudine.

Palmæ plerumque in locis aquosis crescentes, plerumque in juventute dichotome partitæ; caudicibus mediocribus vel altis, circ. pedem crassis, dense obsoleteque annulatis. Frondes longissimæ, pinnatisectæ, segmentis divergentibus nervo medio et marginibus aculeatis. Spadices maximi, terminales, penduli, duplicato-ramosissimi, ramis ramulisque e spathis coriaceis distichis distiche prodeuntibus. Flores roseo-lutei, coriacei, in ramulis compressis. Fructus olivaceo-fusci vel cinnamomeo-castanei, nitidi.

1. *RAPHIA VINIFERA*, P. de Beauv. Fl. d'Oware et de Benin, i. p. 76, tab. 44. fig. 1, et tab. 45 & 46. Staminibus in fl. σ 10, fl. φ circ. 20 ad basin ramulorum inferiorum; fructu cylindrico-ellipsoideo, seriebus orthostichis 8–9, squamis latissimis basi leviter emarginatis supra basin convexiusculis infra apicem valde impressis sulco latissimo subvirescenti-olivaceis margine subfimbriato et fusco; albumine anguste ruminato. (Plate XLII. C.)

Caudices mediocres. Spadix circ. 8' longus, elongato-ovatus, laxiuscule ramulosus, ramis primariis 55–60, inferioribus 3–3½', superioribus pedem longis, ramulis inferioribus 8–10" longis 5–6" latis. Flores fœminei plerumque in dimidia superiore spadiceis parte. Fructus breviter mucronati, 3" longi, 1½–1¾" crassi; squamis margine patulo, 9–10" latis, 9" altis. Semen cylindrico-ellipsoideum, 2¼" longum, 1" crassum.

Hab. Banks of the Old Calabar River (*G. Mann*).

PLATE XLII. C. Fruit and transverse section of seed: nat. size.

2. *RAPHIA GÆRTNERI*, Mann et Wendl. *Sagus Palma Pinus*, Gært. Fruct. et Sem. i. p. 27, tab. 10. fig. 1. Staminibus in fl. σ 8, fl. φ circ. 8 ad basin ramulorum inferi-

orum; fructu elongato-vel ovali-ellipsoideo, seriebus orthostichis 8-10, squamis convexiusculis basi leviter emarginatis sulco latiusculo pallide castaneis margine subfimbriato et fusco; albumine anguste ruminato. (Plate XLII. D.)

Spadix laxè ramulosus; ramulis gracilibus, inferioribus 5-7" longis et 4" latis. Flores masculi vix 6" longi, filamentis clavæformibus. Fructus oblique mucronati, 2½-3" longi, 15" crassi, squamis margine subpatulo 8" latis et altis. Semen elongato-ellipsoideum, utrinque acutiusculum, fere 2-2¼" longum, 9-11" crassum.

Hab. Fernando Po, from the shore up to 500 feet above the level of the sea (*G. Mann*).

PLATE XLII. D. Fruit; seed; transverse section of do.; male and female fl.: nat. size.

3. *RAPHIA LONGIFLORA*, Mann et Wendl. Segmentis utrinque circ. 160 coriaceis apicem versus inermibus subconcoloribus, nervis 2 secundariis marginibus approximatis tertiariis utrinque 9-10; fl. ♂ maximis, staminibus 15; fl. ♀ 4-5 ad basin ramulorum inferiorum; fructu elongato-ovali, seriebus orthostichis 12, squamis valde convexis levissime sulcatis spadiceis basi obtusa raro leviter emarginata margine subintegerrimo; albumine anguste ruminato. (Plates XXXIX. A. & XLII. E.)

Palma 40-50' alta. Caudices mediocres 3-4, basi uniti, 15' alti, pedem crassi. Frondes 33' longæ, petiolo 11-12' longo marginibus dissolubilibus, fibrillitio rigidissimo erecto. Segmenta rigida, 5-5½' longa, 2¼-2½" lata, carina supra et marginibus solum basin versus spinosa, apicem versus inermia, utrinque nervo secundario margini approximato subtus prominente, nervis tertiariis utrinque 9-10. Ramuli spadicum crassi. Flores ♂ 12-13" longi. Fructus 3-3¼" longi, 16-17" crassi, oblique longeque mucronati, squamis 8" latis et altis margine subintegerrimo. Semen 2¼" longum, 11" crassum, elongato-ellipsoideum.

Hab. Island of Corisco (*G. Mann*, no. 1910).

PLATE XXXIX. A. View of plant, showing its natural habit.

PLATE XLII. E. Portion of male spadix; fruit; seed; transverse section of do.; male and female fl.: nat. size.

4. *RAPHIA HOOKERI*, Mann et Wendl. Segmentis utrinque 190-200 marcescentibus spinosis subtus glaucis, nervis secundariis obsoletis, tertiariis utrinque 7-8; fl. ♂ staminibus 16; fl. ♀ 9-12 ad basin ramulorum inferiorum; fructu ovali-ellipsoideo, seriebus orthostichis 12-15, squamis convexis levissime sulcatis castaneis vel cinnamomeis basi obtusa margine subintegerrimo; albumine anguste ruminato. (Plates XXXIX. B. & XLII. A.)

Palma circa 70' alta, solitaria; caudice circ. 30' alto, pedem crasso. Frondes 40' longæ, petiolo 10-12' longo marginibus dissolubilibus, fibrillitio pendulo cincinnato. Segmenta rigidiuscula, 4-5' longa, 1¾-2" lata, carina supra in medio inermi, basin et apicem versus et marginibus spinosa. Spadices bini raro solitarii, e cacumine caudicis penduli, compresso-cylindrici, coarctato-ramosissimi, subglaucescentes, ramis primariis 55-60, ramulis rigidis inferioribus 10-11" longis 6-7" latis. Flores masculi 9" longi. Fructus 3¾-4" longi, 1¾-2" crassi, oblique longeque mucronati, squamis fere 8" latis 9" altis margine subintegerrimo. Semen 2½-3" longum, 13-15" crassum, ovali-ellipsoideum.

Hab. In humid places along the coast, on the island of Corisco, Cameroons, and Old Calabar; at the last place it is also cultivated, and called by the natives *Ukot*! (*G. Mann*, no. 1911).

PLATE XXXIX. B. View of plant, showing its natural habit.

PLATE XLII. A. Portion of male spadix; fruit; seed; transverse section of do.; male and female fl.: nat. size.

We give also a diagnosis of the fruit of another new species of *Raphia* collected by Dr. Welwitsch.

5. *RAPHIA WELWITSCHII*, Wendl. Fructibus ovali-turbinatis, seriebus orthostichis 11-14, squamis latissimis basi convexiusculis apicem versus planiusculis plane lateque sulcatis atrocastaneis basi acuta margine magis atrocastaneo subfimbriatoque; semine ovali-turbinato plane exeso, albumine paulum ruminato. (Plate XLII. B.)

Fructus $2\frac{3}{4}$ " longi, fere 2" crassi; squamis 11-12''' latis, 11''' altis. Semen $2\frac{1}{4}$ " longum, 16''' crassum.

Hab. In humid places on the rivers in the interior of Angola, in the district of Galungo (*Welwitsch*).

PLATE XLII. B. Portion of female spadix; fruit; seed; transverse section of do.: nat. size.

Subfamily III. COCOINEÆ.

Genus 6. ELÆIS, Jacq.

ELÆIS GUINEENSIS, Jacq. Amér. p. 280, tab. 172; edit. pict. p. 136, tab. 257; Mart.

l. c. p. 62, tab. 54 & 56.

Hab. All along the coast (without a number).

Subfamily IV. BORASSINEÆ.

Genus 7. BORASSUS, L.

BORASSUS ÆTHIOPUM, Mart. l. c. p. 220.

Hab. Isolated on the coast (without a number).

B

A

D

W. Fitch, del. et lith.

C

Vincent Brooks, Imp.

A. *Podococcus Barteri*. B. *Calamus lævis*. C. *Sclerosperma Mannii*.
D. *Calamus secundiflorus*.

W. Fitch, del. et lith.

A

B

Vincent Brooks, Imp.

A. *Raphia longiflora*. B. *Raphia Hookeri*.

W. H. Fitch, del et lith.

A. *Sclerosperma Mannii*, Wendl. B. *Podococcus Barteri*, M. & W.

Vincent Brooks, Imp.

W.H. Fitch, del et lith.

Vincent Brooks, Imp

CALAMUS { A. cuspidatus. C. Hookeri. E. Mannii. G. secundiflorus.
B. macrocarpus. D. opacus. F. deerratus.

W.H. Fitch, del. et lith.

RAPHIA { A. *Hookeri*. C. *vinifera* E. *longiflora*.
B. *Welwitschii*. D. *Gærtneri*.

Vincent Brooks, Imp.

A. *Podococcus Barteri*.

B. *Calamus macrocarpus*.

C. *Calamus secundiflorus*.

D. *Calamus opacus*.

E. *Calamus Mannii*