

plane matus, ellipticus, cum rostro 0.2-0.3 cm. longo et caudiculo 0.1-0.15 cm. longo, 1.5-1.8 cm. altus, circ. 0.8 cm. in diam., utrinque contractus. *Squamae* in vivo flavidæ, in sicco badiæ, concolores (margine haud diversæ), in seriebus verticalibus 15-17 dispositæ. *Semen* ambitu ovoideo-ellipticum, utrinque rotundatum, 0.8-0.9 cm. longum, 0.6 cm. latum, 0.4-0.5 cm. crassum, fovea chalazali in dimidio latere impressum, in altero latere dense rugulosum. *Albumen* profunde ruminatum. *Embryo* basilaris.

Planta mascula ut foeminea, sed spiculis brevioribus, floribus magis approximatis, calyce quam corolla 0.4 cm. longa duplo minore, perianthio infra apicem non contracto differt.

BRITISH NORTH BORNEO: Kinabalu Mts. at *Tenompok*, alt. circ. 4,500 feet, female, abundant (legit Furtado, comm. Clemens sub. no. 28650. Type in Singapore); *ibid*, male plant (leg. Furtado, comm. Clemens sub no. 28844); *ibid*, alt. 5,000 feet Clemens, n. 28566 (bis) female spadix only, leaves of a different plant); *ibid* (Clemens no. 28375, female).

This species belongs to *Group IX* of Beccari and in certain respects approaches very near to *C. diepenhorstii* and *C. marginatus* Mart. From *C. Diepenhorstii*, *C. rostratus* differs by its longer spines on sheath and ochrea, the leaflets being more approximate, the terminal pair of the leaflets being somewhat united at base (and not free), perianth more pedicelliform, fruit scales being not (or obscurely) bicolorous and the seed not globular. From *C. marginatus* it differs in the longer spines on the sheath and ochrea, larger and rostrate fruits, reddish brown, concolorous (or obscurely bicolorous) scales and in its distinctly ruminant seeds. Owing to its indistinct ruminations Beccari was inclined to put *C. marginatus* in *Group V* rather than in *Group IX*, but in the absence of better developed seeds, I find it better to retain *C. marginatus* in *Group IX*. The bases of the primary branches of the spadix of *C. rostratus* are also included for a greater part in the upper part (often split) of the spathe. Similar arrangement has not been observed in the two above mentioned *Calami*. In the living state the petiole and leaf rhachis are coloured golden yellow. The stem is not used by the Dusuns for tying purposes.

16. *Calamus stramineus* Furtado spec. nov.

Caudex scandens, circ. 7 cm. longus. *Frondis* *vagina*, ochrea et petiolus ignoti. *Frondes* magnæ ut videtur, cirriferæ, secus rhacheos dorsum unguibus armatæ. *Segmenta* ad 2 aggregata, gregibus oppositis vel fere

alternis, inaequidistantibus, lanceolata vel oblanceolata, utrinque attenuata, apice acuminata, basi acuta, 25-35 cm. longa, 4-5 cm. lata, 5-9-costulata, secus leviter plicata, costis et nervulis transversis utrinque sat distinctis, glabra, in margine spinulosa, supra viridia, subtus fere glauca. *Spadix foemineus* longus, flagelliformis ut videtur. *Spathae primariae* partim visae, tubulosae; secundariæ tubulosae, truncatæ, glabræ, decidue furfuraceæ. *Spathellae* spathis secundariis similes, sed minores, apice plerumque ciliolatae. *Rami primarii* circ. 30 cm. longi, in apicem sterilem, 2 cm. longum exeuntes, utrinsecus spiculis circ. 8. *Spiculae* 4-7 cm. longæ, sessiles, utrinsecus fructus 6-13 gerentes. *Involucrophorum* sessile vel subpedicelliforme. *Involucrum* cupuliforme. *Perianthium* fructiferum pedicelliforme, calyce corollæ æquilongo. *Fructus* elliptico-ovatus, utrinque rotundatus, summo abrupte rostratus, cum caudiculo 0.15 cm. et rostro 0.3 cm. longo 1.8 cm. altus, 1 cm. in diam. *Squamæ* stramineæ, secus marginem subconcolores, dorso canaliculatae in orthostichis 15 dispositæ. *Semen* ovatum, 1 cm. longum, 0.6 cm. in diam., fere cylindricum, utrinque rotundatum, raphen secus prominens, ceterum irregulatiter alveolatum vel rugosum. *Albumen* profunde ruminatum. *Embryo* lateralis, proxime basin situs.

BRITISH NORTH BORNEO: Kinabalu Mts. near *Dallas*, alt. circ. 3,000 feet (Clemens no. 27010. Type in Singapore) *ibid* (Clemens n. 26496).

Evidently belongs to the *Group XIII* of Beccari and appears to be very near to *C. spathulatus* and *C. palembanicus*, but both these have seeds with homogeneous albumen. *C. Scipionum* has seeds with slight intrusions of the integuments in the albumen, but the leaflets here are equidistant (not arranged in groups). *C. densiflorus* bears distinctly ruminate seeds, but it has very narrow, linear, equidistant leaflets.

var. *megalospermus* Furtado var nov. A forma typica recedit spadicibus robustioribus, fructibus majoribus, squamis in orthostichis 17-18 dispositis, semine in latere foveali sat planato.

BRITISH NORTH BORNEO: Kinabalu Mts., near Dallas, alt. circ. 3,000 feet (Clemens no. 27009. Type in Singapore).

The leaves in this specimen are apparently from very young shoots or plants and bear no thorns on the rhachis. The leaflets which are arranged in groups of 1-4 are papery in texture, narrower than in the type, green, concolorous, oblanceolate suddenly narrowed into a long acuminate apex, 3-5 costulate, spinulose along the costæ above and along the margins. In the duplicate preserved in the Berlin herbarium and bearing this number there is no trace of any

cirrus on the leaf, but the Singapore specimen which has somewhat older leaflets bears a very thin, filiform hooked prolongation at the apex. The lowermost spathe (secondary spathe) of the partial inflorescence in the type specimen bears also stout recurved spines, a fact which makes me surmise that the spadix in this species is flagelliform.

17. *Calamus tenompokensis* Furtado spec. nov.

Caudex scandens vel semiscandens, circ. 5 m. longus, sine vagina circ. 1 cm. in diam. Frondis vagina flagello carens (semper?), sensum in petiolum transiens, in parte superiore ventrali longitudinem secus breviter aperta, aculeis plus minus in seriebus transversalibus dispositis, valde applanatis, tenuibus, patentibus, cinnamomeis ad 2 cm. longis armata, decidue ferrugineofurfuracea. Ochrea brevissima, aculeis rigidis armata, in speciminiibus junioribus lobis papyraceis caducis, 8-10 cm. longis ornata. Frondes cirrho carentes, cum petiolo 1-1.50 m. longæ, utrinsecus segmentis 6-9. Petiolus circ. 80 cm. longus, subtus convexus, aculeis robustis, solitariis vel confluentibus, patentibus vel reflexis, dispersis armatus, supra glaber, paulo concavus; rhachis aculeis solitariis, rarissime confluentibus, recurvatis subtus armata, circ. 50-70 cm. longa. Segmenta distantia, circ. 30 cm. longa, 4.5-5 cm. lata, inferiora alternantia, robuste-papyracea, latolanceolata, maxima latitudine in dimidia vel supra sita, basi attenuata, plicata, apicem versus subito vel potius sat subito acuminata, ad margines parce spinulosa, utrinque glabra, 5-7-stulata, nervulis transversis distinctis; terminalia ad 2/3 confluentia, sequentia ambo opposita vel sub-opposita, jugo terminalio valde approximata. Spadix foemineus fronde minor, apice saepe flagelliformis, ramis secundariis patentibus, fructiferis 5-7 cm. longis. Spathae primariæ basin versus spinulosæ, in parte basilare tubulosæ, ad ramorum basin in lobos liberos exeuntis, longitudinem secus irregulariter fissæ, primariæ et secundariæ decidue ferrugineo-furfuraceæ. Rami primarii et secundarii ad spatharum orificium orientes. Spathelæ truncatæ, furfuraceæ. Involucrophorum sessile; involucrum calyculiforme. Perianthium explanatum, calyx quam corolla duplo vel subduplo brevior. Fructus ovoideus vel ellipsoideus utrinque rotundatus, apice in rostellum 0.2 cm. longum abrupte productus, sine rostrello circ. 0.9 cm. longus, 0.7-0.8 cm. in diam. Squamae stramineæ, apice fuscæ, seriebus 18-21 verticalibus imbricatae. Semen ambitum ellipsoideum, utrinque rotundatum, fovea chalazali laterali, nonnihil lateque impressum, ceterum applanatum, superficie sulcis latiusculis a fovea radiantibus pertensa, 0.7 cm. longum, 0.5 cm. latum, 0.4 cm. crassum. Albumen æquabile. Embryo in latere opposito proxime basin situs.