

On Pandanophyllum and allied genera, especially those occurring in the Indian Archipelago; by S. KURZ, ESQ., Curator of the Calcutta Herbarium.

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The genus *Pandanophyllum*, established in 1844, by Dr. Hasskarl in his catalogue of the plants, cultivated in the Botanic gardens at Buitenzorg (p. 297) remained for a long time but imperfectly known, until Dr. Thwaites in his Ceylon plants, and Professor Oudemans in von Mohl and Schlechtendal's "Botanische Zeitung" directed the attention of botanists to this interesting genus of tropical plants.

Some time ago I noticed, in Professor Miquel's supplement to the flora of Sumatra, several species which that author had placed in the genus *Lepironia*, but which doubtless are congeners of *Pandanophyllum*. This circumstance has induced me to examine all the Indian species belonging to *Pandanophyllum* and its allies, and at the same time to describe those species, which occur in the Indian Archipelago, as far as the materials at my disposal allow it. In the present communication, I shall briefly state the results which I have thus obtained, trusting that they will be acceptable to Indian botanists. The new genus, *Thoracostachyum*, of which I shall give a detailed characteristic in the course of this paper, forms to a certain extent a connecting link between *Hypolytrum* and *Lepironia*, but it is sufficiently distinct from both of them, and deserves to be treated as an independent genus of CYPERACEÆ.

Scirpodendron, established by the late Zippelius in the Herbarium of the Botanic gardens at Buitenzorg, is the most gigantic of all the CYPERACEÆ I am acquainted with and, when destitute of flowers, it is hardly to be distinguished from stemless screw-pines.

HYPOLYTREÆ, N. E.

Spicæ compositæ squamis undiquè imbricatis squamulis squamæ ut plurimum contrarie instructis; spiculæ solitariae, rarius ternae, squamâ oppositâ obtectae, compressae, 1—multiflorae; declines v. raro hermaphroditæ; flosculi masculi monandri, uni-squamulati, saepius ad squamulam solam reducti; flosculus femineus centralis v. excentri-

cus, nudus v. rarius squamulatus; stylus 2-3—fidus; achenium v. achenium drupaceum.

I shall at first give a short review of the genera belonging to this tribe of the natural order CYPERACEÆ, and then enter in detail upon the description of the species, as far as this appears necessary.

Conspectus generum.

A. Pauciflorae. Spiculae 1-3—florae; flosculi hermaphroditi v. dielines.

1. *HYPOLYTRUM*: Spicae corymbosae; spiculae 3—florae; fl. masc. 2-3; flosc. femin. nudus, centralis; stylus bifidus; achenia ossea.

B. Multiflorae. Spiculae 6—multiflorae; flosculi dielines.

* Achenia ossea.

2. *THORACOSTACHYUM*: Spicae corymbosae; spiculae circiter 6-florae; flosc. exteriores masculi, sequentes ad squamulas reducti; flosculus centralis femineus, nudus; stylus trifidus.

3. *LEPIRONIA*: Spica solitaria, sub apice culmi lateralis; spiculae multiflorae; flosc. masc. 1—6, vario modo inter squamulas vacuas dispositi; flosc. centralis nudus; stylus bifidus.

* * *Achenia drupacea.*

4. *PANDANOPHYLLUM*: Spicae capitatae, v. rarius solitariae, terminales; spiculae 6-8—florae; flosc. 3 exteriores masculi, sequentes ad squamulas reducti; flosc. femineus excentricus, squamulatus; stylus 2-3—fidus; achenia acuminata, non stipitata.

5. *CEPHALOSCIRPUS*: Spicae capitatae; spiculae circiter 7-10—florae; flosculi 3 exteriores saepius masculi, sequentes ad squamulas reducti; flosc. femineus excentricus squamulatus et squamulam vacuum amplectens; achenia longe rostrata et longiuscule stipitata.

6. *SCIRPODENDRON*: Spicae compacto-paniculatae; spiculae 8-10—florae; floscul. centralis femineus nudus; fl. reliqui omnes masculi; stylus bi—(v. tri?) fidus; achenium majusculum, sulcato—6 costatum.

I.—*HYPOLYTRUM*, *Rich.*

Spicae laxae vel compacto-corymbosae, teretes. Squamae arcte imbricatae, dein deciduae, inferiorum nonnullae vacuae, reliquae triflorae, androgynae. Flosc. masc. 2—3, monandri, uni-squamulati; squamulae squamam oppositam breviores, carinato-compressae; flosc. femin. nudus, centralis; ovarium oblongum v. sublagenaeforme; stylus bifidus. Achenium styli basi conicam spongiosam rostratum,

compressiuscule ovatum.—*Herbae perennes, rhizomate obliquo ramoso lignescente, foliis trifarie equitantibus, frequentius trinerviis, basi complicatis, culmis trigonis paucifoliatis, foliis culmeis ochreaeforme vaginantibus, corymbis squamosis, spicis parvis v. pusillis.*"

1. **H. latifolium**, *L. C. Rich. in Pers. Syn.* I. 70; *Kth. Enum.* II. *Fl.* 1; *Steud., Cyper.* 132; *Miq. Fl. Ind. Bat.* III. 333; *Bth. Fl. Hongk.* 389; *Kurz in Tydsch. Nat. Vereen. Ned. Ind. deel XVIII.* 164; *ejusd. in Bot. Ztg.* 1865. 204.—Folia lato-lineararia v. linearia, sursum margine costâque apicem versus serrulato-scabra, trinervia, nervis lateralibus 2 crassis in pagina superiore obtuse prominentibus; culmi paucifoliati; corymbus amplus, intricato-ramosus, v. (in var.) simpliciuscule ramosus, contractus; achenia vix nitentia, in sicco lacunosorugosa v. sublaevia.

Rhizoma crassum, ramosum. Folia subcoriacea v. chartacea, trifarie equitantia, lato-lineararia v. linearia, flaccida, basin versus parum angustata, complicata, superne explanata, plicato-trinervia, margine a medio costâque subtus apicem versus serrulato-scabra, 2—2½ ped. longa, 1½—½ poll. lata. Culmi penn. gallin. crassi v. graciles, strictiusculi v. debiles, trigoni, laeves, glaucescentes, pauci—1—2 foliati. Folia culmea basi ochreaeforme invaginantia, fol. superius corymbo saepe valde approximatum et potius involuero adnumerandum. Corymbus confertiusculus v. divaricatus, nunc simpliciuscule nunc intricate ramosus, squarrosus, involu-cratus. Involucri phylla solitaria, semiverticillos ramorum sustinentia, sursum decrescentim minora et in bracteas transeuntia. Rami ancipites, laeves, v. acie scabriusculi, basi bulboso incrassati; inferiores terni rarius quaterni, semiverticillati, 1½—2 poll. longi, v. abbreviati basi unibracteati, superiores bini v. solitarii, basi bracteati; ramuli ½ poll. longi, bibracteolati, apice 4—2 spiculas gerentes v. iterato ramulosi et bispiculati, basi vix incrassata ochreaeformibracteolati. Ramorum bracteae membranaceae, marginibus chartaceis ochreaeformi-vaginatae, 2—3 lin. longae, v. in ramulis superioribus bractea inferior carinato-lanceolata acuminata, viridis, bracteolâ superiore obtusâ duplo longior. Spicae minimae, elliptico-oblongae, obtusiusculae v. acutiusculae, castaneae, nitentes. Squamae ovales, obtusae, infimarum nonnullae vacuae, reliquae 3—florae. Flosculi laterales masculi, monandri, antheris inclusis, uni-squamulati; squa-

mulae carinato-compressae squamâ multo breviores; flosc. centralis nudus, femineus, cum flosculis masculis quasi flosculum bisquamulatum hermaphroditum representans. Ovarium sublagenaeforme, glabrum; stylus breviusculus, bifidus, ramis crassis exsertis. Achenium parvum, in sicco frequentius rugoso-lacunulosum, nitidum v. sub-canescens.

HAB.—In hill forests, from Ceylon through Hindoostan to Birma, Malacca, and the Indian Archipelago, also occurring in the Philippines, Tropical Africa, Mauritius, Fidji islands.

NATIVE NAMES: Harassas lalakki, Sund., according Hassk.; ielat, Mal., but the same name is applied by the Malays to many other CYPERACEÆ.

This would appear a very variable plant, judging from Bentham's identification of *H. latifolium* with *H. trinerve*. I myself have not met with the intermediate forms, and I accept here their identity merely on the authority of that distinguished botanist who, no doubt, had a more complete series to compare than I have at present at my disposal. The varieties might be distinguished as follows:—

Var. *a. genuinum*,—spicae duplo majores, circ. 2 lin. longae, fructigeræ, ovales, fusco-canescentes; achenia oblonga, crasse rostrata praesertim rostro canescente puberulae.—*H. latifolium*, *L. C. Rich.*, *l. c.*; *H. Mauritanum*, *N. E. in Linn. IX.* 288; *Kth. Enum. II.* 272; *H. giganteum*, *Wall. Cat.* 3404; *N. E. in Linn. IX.* 288; *ejusd. in Wight Contr.* 93; *H. diandrum*, *Dietr. Spec. II.* 365; *Albikia scirpoides*, *Prsl. Reliq. Haenk. I.* 185, *t.* 35; *Tunga diandra*, *Rxb. Fl. Ind. I.* 184; *Hypoclyptum nemorum*, *P. d. B. Fl. d' Oware, II.* 13 *t.* 67; *H. ensifolium*, *Willd. herb.* 1450; *Schoenus nemorum*, *Vhl. Symb. III.* 8. (*Rheede XII. t.* 58) *ejusd. Enum. II.* 227.

HAB.—Sumatra; Singapore: *T. Anderson*, No. 204; South Andaman; Birma, Moulmein and Amherst: *Wall. Cat.* 3404; Penang on the hills (rompôt ayam incol.): *Wall. Cat.* 3404; Silhet: *Wall. Cat.* 3404; Malay Peninsula: *Griff.* 6271; Fidji islands: *Seemann*.

Var. *β. trinerve*, spicae minores, fructigeræ globosae, fuscæ; achenia laevia, in sicco magis minusve lacunoso-rugata, nitentes, fuscæ.—*Hypolytrum trinervium*, *Kth. En. II.* 272; *Steud. Cyp.* 132; *Miq. Fl. Ind. Bat. III.* 332; *Kurz in Tydsch. Natuurk.*

Vereen. Ned. Ind. deel. XVIII. 164; *ejusd. in Bot. Ztg.* 1865, 204; *Albikia schoenoides*, *Prsl. in Reliq. Haenk.* I. 185, t. 34? *Hypolytrum schoenoides*, *N. E. in Linn.* IX. 283; *Scirpus anomalus*, *Retz. Obs.* V. 15; *Hypolytrum myrianthum*, *Miq. Fl. Ind. Bot.* III. 333.

Sub-var. 1, contracta;—folia ultra poll. lata; culmi penn. gall. crassi; corymbi (praecipue fructigeri) contracti, ramosissima ramis inferioribus plerumque quaternatis.—Western Java; Sumatra, in Priaman: Diepenhorst (paro-paro inc.; Herb. Bogor. No. 2888.)

Sub-var. 2, diffusa;—folia ultra poll. lata, culmi penn. gall. crassi; corymbi divaricato-squarrosi, ramosissimi, ramis inferioribus ternatis. Rather frequent in the hill forests of Western Java, as on the Salak and Pangerango.

It is often difficult to distinguish *Sub-var. 1* and *2* from each other, as there are many transgressions.

Sub-var. 3, gracilis;—folia vix. poll. lata, 3—3½ ped. longa; culmi graciles; corymbi divaricato-squarrosi, ramosi, ramis inferioribus ternatis.—This form is cultivated in the Botanic gardens, Buitenzorg, and most probably has come from the hill forests of the Pangerango or Salak. It is especially marked by the narrow leaves and the slender habit.

Var. γ minor, folia angustissima, ½ poll. lata v. angustiora; culmi graciles; corymbi parvi, ramis abbreviatis vix ramosis; acheniis ut in var. β.

Andamans, on Termoklee island; Ceylon: Thwaites, 3468.

2. H. Borneense, *Kurz.*—Folia anguste linearia, apicem versus serrulato-scabra, sub-plana, nervis 2 lateralibus in pagina superiore impressis, subtus acute prominentibus; culmi nudi; corymbus parvulus, squarrosus, ramis vix ramosis; achaenia laevissima, nitida, bisulcata.

Rhizoma stoloniferum, horizontaliter repens, squamatum, radices crassas demittens. Folia sub-coriacea, trifarie equitantia, e basi sensim angustatâ linearia, acuminatissima, trinervia, nervis omnibus subtus acute prominentibus, supra autem immersis, marginibus costaque subtus apicem versus spinuloso-scabra, 1—1½ pedalia, 6—8 lin. lata. Culmi foliis longiores, trigoni, nudi, laevissimi; corymbus vix pollicaris in diametro, contractiusculus, basi phyllis 1—2 culmo ipso triplo longioribus sustentus; spicae fructigeræ subglobosae, iis *H. latifo-*

liae, var. β . *trinervis*, *simillima*; *achenia nitida*, *ovata*, *atrofusca*, *acuminata*, in sicco *bisulcata*.

HAB.—Borneo, Labuan: *Barber*, No. 193.

This species, in general appearance, resembles *H. latifolium* γ . *minor*, but may be readily distinguished by the nervature and the bisulcate achenes.

(3.) **H. Longirostre**, *Thw. Enum. Pl. Zeyl.* 346.

HAB.—Ceylon: *Thwaites*, No. 3468.

SPECIES DUBIA.

Hypolytrum compactum, *N. E., in Linn.* IX. 280; *Kth. Enum.* II. 272; *Stead. Cyp.* 32; *Miq., Fl. Ind. Bat.* III. 333.

A Luzon species which by Steudel, and subsequent authors, is compared with *Pandanophyllum humile*, Hassk.

II. THORACOSTACHYUM.

Kurz in Tydsch. Nat. Vereen. Ned. Ind., deel. XXVII. (nomen nudum).

Spicae corymbosae, teretes. Squamae undique imbricatae, dein deciduae, inferiorum nonnullae vacuae, reliquae spiculum 6—7 florum androgynam foventes. Flosculi 3 exteriores masculi, sequentes ad squamulas reducti; flosculus summus femineus, uni-squamulatus. Squamulae squamâ communi breviores et oppositae, carinato-compressae. Ovarium compresso-oblongum, utrinque attenuatum; stylus trifidus. Achenium osseum, lenticulari-compressum, utrinque attenuatum, rostratum.—*Herbae habitu et vegetatione omnino Hypolytri, sed spicis multo majoribus rigide squamatis insignes.*

1. **Th. Sumatranum**, *Kurz.* Folia linearia, plicato-3-nervia, spinuloso-serrulata; culmi foliis longiores, trigoni, oligophylli; corymbus polystachyus, involucreatus, divaricato-squarrosus; spicae obov-ideo-ellipticae, parvulae, in sicco stramineae; achenia lenticulari-compressa, utrinque attenuata, rostrata, lacvia.—*Lepironia Sumatrana, Miq., Suppl. Fl. Sumatra*, 604.

Rhizoma abbreviatum, verticale, radices crassas demittens. Folia firma, densa, trifarie equitantia, linearia, acuminata, plicato-trinervia, margine costâque subtus a medio spinuloso-serrulata, 2—2½ ped. longa, ¼ poll. lata. Culmi folia longitudine superantes, 3—3½ ped. longi, trigoni, striati, glabri, basi paucifoliati. Corymbus polystachyus, divaricato-squarrosus, ramis brevibus triquetris; rami inferi-

ores foliis fere 1—3 ped. longis involucrentibus sustenti, reliqui sensim minora et in bracteas abeuntia. Spiculae 2—5 nae, aggregatae, oblongo-ovatae v. obovoideo-ellipticae, acutiusculae, majusculae, nitentes, in sicco stramineae. Squamae cartilagineo-rigidae, convexiusculae, sursum deorsumque minores, elliptico-oblongae, obtusae; infimae 4—5 vacuae saepe acutiusculae; sequentes spiculam 7-floram androgynam includentes. Flosculi 3 exteriores masculi, monandri, sequentes 2 neutri ad squamulas reducti; flosc. intimus excentricus, femineus, uni-squamulatus, squamulam septimam sterilem amplectens. Squamulae laterales 2 compresso-naviculares, in carinâ ciliolatae, reliquae depressae. Ovarium e basi constrictâ compresso-oblongum, acuminatum; stylus brevis, cum ovario continuus, trifidus, ramis elongatis exsertis. Achenium compresso-lenticulare, utrinque attenuatum, styli basi persistente acuminato-rostratum.

HAB.—Sumatra, in the forests of the Lampong district, near Ipil, Battang lekko: *Teysmann* (H. Bogor. No. 3932).

NATIVE NAMES: Selingsieng (inc. Lampongensium).

2. **Th. Bancanum**, *Kurz, in Tydsch. Nat. Vereenig. Ned. Ind. XXVII. 286*; *ejusd. in Bot. Ztg. 1865. 204*. Folia elongato-lineararia, spinuloso-serrulata; culmi trigoni, aphylli; corymbus involucrentis, contractus; spicae breviores, ellipsoideae, obtusae, pauci spiculatae, in sicco griseae; achaenia ellipsoideo-trigona, convexa, apiculata.—*Lopironia Bancana, Miq. Suppl. Fl. v. Sumatra, 604*.

“Caulis subnullus; folia densa, trifarie equitantia, elongata, lineararia, marginibus carinâque spinuloso-serrulata; culmus trigonus, aphyllus, angulis versus apicem scabris; involucrentis inaequaliter 2-4-phyllum; corymbus contractus, ramis 6—10—stachyis, pedicellis ad angulos serrulato-scabris geminis ternis pluribusve confertis; spiculae ellipsoideae, obtusae, squamis infimis vacuis subacutis, reliquis ovalibus obtusis striulatis griseis cum levi rubore (sub anthesi); squamulae interiores 6 (?), quarum exteriores naviculari-compressae, carinâ ciliolatae; achaenia in singulâ spiculâ circiter 4, reliquis suppressis, ellipsoideo-trigona, faciebus convexis, sulco interjecto separatis, unâ majore, 2 aequalibus minoribus, crasso-crustacea, styli basi apiculata, (Miq. l. c.)

HAB. Banca, especially on river banks and in swampy places of the forests; Singapore, near swamps: *Wall. Cat. 3401*.

III. LEPIRONIA, L. C. RICH.

Spicae solitariae, infra culmi apice laterales, teretes, multi-spiculatae. Squamae spiraliter arcte imbricatae, deciduae, inferiorum nonnullae vacuae, sequentium paucae passim squamulas steriles plurimas cum flosculo femineo includentes, reliquae multiflorae, androgynae. Flosculi masculi monandri 1—6, vario modo interpositi, uni-squamulati, reliqui ad squamulas reducti; flosculus femineus centralis, nudus. Squamulae carinato-naviculares. Antherae spurie 4-loculares, mucronatae. Ovarium sublagenaeforme; stylus bifidus. Achaenium lenticulare, compressum, obovatum, styli basi persistente rostratum, osseum.—*Herba perennis aphylla habitu Juncorum, rhizomate vage repente squamato, culmis teretibus basi vaginatis, spicis indole Scirporum quorundam.*

1. **L. mucronata**, L. C. Rich. in *Pers. Syn.* I. 170; *A. Rich.* in *Dietr. Class.* 297; *Kth., Enum.* II. 366; *Miq., Fl. Ind. Bat.* III. 346; *Steud., Glum.* I. 181.—*Scirpus coniferus*, *Poir., Encycl.* 756; *Suppl.* V. 90; *Restio articulatus*, *Retz., Obs.* IV. 15; *Chondrachne articulata*, *R. Br., Prod.* 220.

HAB.: Indian Archipelago, Sumatra in Lampòngs: *Teysm.* IIb. Bog. 4249; isl. Banca; Borneo, Banjermassing: *Motley*, Hb. 1267, Singapore.

DISTRIB. New Holland; Madagascar. •

NATIVE NAMES: Tikoooh in *Lamp.*; Pooron in *Banca*.

Planta elegans, 2—3 ped. alta et altior, vegetatione Juncis accedens. Rhizoma vage repens, hypogaeum, radices crassas per plurimas emittens, squamis chartaceis testaceis v. brunnescentibus striatis obtectum. Culmi pennae scriptoriae crassitudinis v. crassiores, atrovirides, striati, intus transverse septati, in sicco ad septa nodosi, aphylli, basi pauci-vaginati. Vaginae striatae, marginibus membranaceis, mucronatae, culmo magis minusve concolores, basin versus fusco-purpurascens, infimae 1—2 ovatae v. ovato-lanceolatae e rhizomate orientes; sequentes magis elongatae amplectentes; suprema usque semipedalis, caeteras longitudine multo excedens. Spica solitaria, lateralis, elliptico-ovalis v. oblonga, obtusiuscula v. acutiuscula, multiflora, basi culmi processu dilatato versus apicem terete spurie bracteata. Rhachis elongato-conica, confertissime et spiraliter cicatrizzata, sublignea, intus medullosa. Squamae spiraliter dispositae, con-

fertissimae, post acheniorum maturitatem valde deciduae, inaequali lato-oblongae, obtusissimae, concavinsculae, scariosae, ad margines non raro magis minusve laceratae, fusco-ferrugineae v. badiae, apice intensius coloratae, inferiores paucissimae, vacuae, reliquae spiculam squamâ propriâ vix longiorem androgynam continentes. Spicula 12—15 flora, flosculi masc. unisquamulati, 1—6, monandri, reliqui ad squamulas reducti et sine ordine manifesta circum flosculum femin. excentricum nudum dispositi. Squamulae hyalino-albidae, apice brunnescentes, acuminatae; laterales carinato-naviculares, carinâ eleganter ciliatae: staminigeræ medianae depressae, marginibus inflexis; steriles lineari-lanceolatae, planae. Antherae dein exsertae, spurie 4-loculares, lineares, atropurpureae, mucrone albo terminatae, loculis longitudinaliter dehiscentibus, filamenta pilosiuscula, glabrescentia. Pollinia, irregulari-ovalia, sulfurea. Ovarium compresso-ellipticum uni-ovulatum, ovulo erecto, glabrum; stylus bifidus. Achaenia plano-convexa, oblonga, utrinque attenuata, marginata, striata, nitentia, testacea, stylo persistente rostellata; rostrum dimidium fere longitudinis achaenii ipsius attingens introisum curvatum.

IV. PANDANOPHYLLUM, HASSK.

Spicae solitariae v. capitato-compactae, teretiusculae, magnae, multispiculatae. Squamae undique imbricatae, dein laceratae et emarcescente-persistentes; inferiorum plures vacuae, reliquae spiculam 5—8-floram androgynam squamâ ipsâ paullo longiores v. breviores gerentes. Flosculi exteriores 3 masculi, monandri, uni-squamulati; sequentes 2—4 steriles squamulis totitem representati; flosculus femineus excentricus unisquamulatus saepius squamulam sequentem vacuum amplectens. Squamulae laterales carinato-compressae, naviculares, squamae contrarie insertae. Ovarium sublagenaeforme v. oblongum; stylus 2—3 bifidus. Achaenium obovatum, styli basi persistente rostratum, utrinque attenuatum, pericarpio carnescente indutum, nucleo lapideo, hilo excavato.—*Herbae perennes, habitu omnino Pandanorum, rhizomate lignescente; foliis trifariis basi complicatis sessilibus v. petiolatis trinerviis; culmis trigonis, e stolonibus abbreviatis squamatis ortis, nudis v. squamatis; spicis solitariis v. capitatis, basi involucreatis v. subnudis.*

1. **P. palustre**, Hassk. *Cat. Bog.* 297; *ejusd. Tydsch. Nat. Vereen.* X. 118; *Steud. Glum.* I. 134; *Zoll. Cat.* 61; *Walp. Ann.*

I. 753; *Miq. Fl. Ind. Bat.* III. 334.—Folia lato-lineararia, acuminatissima, trinervia, margine costâque spinuloso-serrulata, rigide coriacea; culmi 1—1½ pedalia, aphylli, obtuse trigoni; capitulum oligo-v. polystachyum, compactum, magnum, phyllis 3—4 latis squamaeformibus eo ipso brevioribus v. aequilongis involucreto; squamae lanceolatae, obtusae v. apice dilaceratae, sub-enerviae, chartaceae; achaenia inaequali-oblonga, styli basi acuminata.

VAR. *α*. **Malesica**, capitulis saepe pugni infantis magnitudine, hemisphaericis v. subglobosis, polystachyis; spicis autem duplo v. triplo minoribus.

VAR. *β*. **Silhetana**, capitulis irregulari oblongis, e 3—9 spicis maximis compositis.

HAB.—In damp hill forests in Western Java frequent, as on Pan-gerango, 3—4000'; on the Salak 4—5000'; var. *β*, between rocks and tree stumps, Passir Madang, Probakti, 2—4000'; Zollinger. Singapore: *Wall.* 3541 (young inflorescence); Silhot: *Wall. Cat.* 4474 (var. *β*).

NATIVE NAMES: Bangkonoh or Harassas tjac in Java.

Rhizoma crassum, obliquum, radices crassas demittens. Folia rigide coriacea, trifarie equitantia, lato-lineararia, acuminatissima, trinervia, marginibus rectangulariter deviis spinuloso-serrata, subtus in carinâ basi retrorse scabra, apicem versus spinuloso-serrulata, 6—9 ped. longa, 1½—2 poll. lata, supra atroviridia, nitida, subtus glaucescenti viridia. Culmi 1—1½ pedales, deorsum sensim attenuati, obtuse trigoni, basin versus subteretes, glaucescenti-virides, glabri, sublente albido-punctati. Spicae plurimae elliptico—v. conico-oblongae, ½—1 pollicem paene longae, capitato-conglomeratae, involucreto; involucri phylla 3—4 v. 6—8, squamaeformia, coriacea, e basi latissimâ oblongo-ovalia, acutata, planiuscula v. concaviuscula, spicularum longitudine aequalia v. vix longiora. Squamae lato-lanceolatae v. lanceolatae, apice obtusae v. saepius dilaceratae, sub-enerviae, laeves, chartaceae, e flavescente brunnescentes; inferiorum nonnullae vacuae; sequentes spiculam squamâ brevioribus 6-floram androgynam includentes. Flosculi omnes uni-squamulati; exteriores 3 monandri, interiores 2 ad squamulas reducti, flosculus intimus excentricus femineus. Squamulae laterales compresso-naviculares, carinâ ciliatae; squamula flosculi femin. linearis, sub-plana, marginibus inflexis. Antherae exsertae, biloculares,

ab ovario aversac. Ovarium sublagenaeforme, glabrum; stylus longiusculus, bifidus. Achaenium inaequali-oblongum, utrinque attenuatum, obsolete trigonum, styli basi persistente acuminatum, pericarpio tenui carnescente testaceo, nucleo lapideo nigro.

2. **P. squamatum**, *Kurz.*—Folia lato-linearria, acuminatissima, trinervia, margine costâque spinuloso-serrulata, rigide coriacea; culmi abbreviati, $\frac{1}{2}$ — $1\frac{1}{2}$ —pollicares, squamati, trigoni, obscuri; capitula oligo-rarius mono-stachya, compacta, oblonga; squamae ellipticae, obtusae v. apice laceratae, in sicco striatae, chartaceae; achaenia utrinque attenuata, bicarinata, rostrata.

HAB. Java, in hilly parts of Buitenzorg: *Zippelius* (in *Hb. Bogor.*)

Rhizoma lignescens, verticale v. obliquum, radices crassas demittens. Folia trifarie equitantia, e basi complicatâ lato-linearria, acuminatissima, trinervia, lateribus deviis margine subtusque in costâ apicem versus spinuloso-serrulata, coriacea, 5—6 ped. longa, 1— $1\frac{1}{4}$ poll. lata. Culmi e foliorum axillis erumpentes, abbreviati, $\frac{1}{2}$ — $1\frac{1}{2}$ poll. longi, undique, praesertim basi, squamis ovato-oblongis concavis acutis striatis obtecti, trigoni, striati, glabri. Spicae 2—3, capitato-conglomeratae, rarissime solitariae, oblongae, obtusae. Squamae undique imbricatae, ellipticae, obtusae v. saepius lacerantes, in sicco striolatae, fuscescentes, inferiores 4—5 vacuae saepe involucrantes, reliquae spiculam 6-floram squamâ propriâ paullo longiorem androgynam continent. Flosculi 3 exteriores masculi, monandri, sequentes ad squamulas reducti, flosculus intimus excentricus femineus squamulam vacuum amplectens. Squamulae laterales lineares, curvati, carinato-naviculares, in carinis minute denticulatae. Achaenium adhuc (immaturum) oblongum, utrinque acuminatum, bicarinatum, pericarpio tenui coriaco, nucleo lapideo cinerascens apiculato.

3. **P. Zeylanicum**, *Thw. Enum. Pl. Ceyl.* 345.

HAB. Ceylon: *Thwaites*, *C. P.* 3029; South Andamans.

This species, which is not yet recorded from the Indian Archipelago, differs from the next one, *P. Miquelianum*, especially by the more robust and obtuse spikelets, which form a head, when fully grown, not dissimilar to that of *P. palustre*. The scales are furnished by a broader white (in dried state brown) margin. Dr. Thwaites describes his plant as having a clavate style, but the Andaman specimens have them normally two cleft. I saw the Ceylon

plant in the Herbarium of the Botanic gardens at Buitenzorg, but unfortunately I have here no specimen to examine. I strongly suspect that Dr. Thwaites, when describing the plant, has had before him young spikelets only.

4. **P. Miquelianum**, Kurz. Folia elongato-lineararia, acuminatissima, trinervia, margine costâque spinuloso-serrulata, flaccida, utrinque nitentia, saturate v. flavescente viridia; culmi elongati, $1\frac{1}{2}$ —3 pedales, nudi, trigoni, nitentes; spicae solitariae, squamis laete viridibus anguste albide (in sicco fusciscente) marginatis; achenia oblonga, utrinque attenuata, acuminata, vix carinata.—*Lepironia enodis*, Miq., Suppl. Fl. v. Sumatra, 603; *Lepir. foliosa*, Miq l. c. (*spicis adhuc virgineis.*)

HAAB. Sumatra, in the jungles of Danoh-tjaloh, Moesi, Palembang: *Teysm. Hb. Bog.* 3686 et 4051.

NATIVE NAME: Rumpu selingsieng in Palembang.

Rhizoma crassum, obliquum v. subverticale, lignescens, radices plurimas crassas demittens. Folia trifarie-equantia, lato-, v. angustolincaria, acuminatissima, infra medio paullo angustata, complicata, basi vix dilatata, 4—5 ped. longa, $\frac{1}{2}$ —1 poll. lata, margine versus basin et apicem, v. totâ longitudine, remotiuscule spinuloso-serrulata, costâ apicem versus spinulosa, trinervia, marginibus rectangulariter deviis. Culmi e rhizomate stolonibus abbreviatis squamatis orientes, $1\frac{1}{2}$ — $3\frac{1}{2}$ ped. long., sursum sensim incrassati, obtuse trigoni, striulati, nitentes. Spicae terminales, solitariae, conico-ellipticae v. clavato-oblongae, obtusae, dein acuminatae. Squamae undique arcte imbricatae, emarcescente persistentes, sursum sensim minores, oblongo-lanceolatae v. lato-oblongae, acutatae; superiores obtusiusculae, virides, margine anguste membranaceo albidae (in sicco autem fusciscentes), sub-trinerviae, nervis tenerioribus parallelis percursae; inferiores 9—10 vacuae, sequentes 5—florac. Flosculi omnes unisexuales, exteriores 3 masculi, monandri, intimus femineus squamulam sterilem amplectens. Squamulae flosculorum exteriorum compresso-naviculares, carinâ crosco-ciliolatae, medianae depresso-bicarinatae, in angulis ciliolatae. Filamenta dein elongata paullo supra squamulam exserta; antherae lineares filamento dimidio breviores, biloculares, longitudinaliter dehiscentes, flavescente-albidae, apice minute apiculatae. Flosculi feminei excentrici, squamula depressa, linearis, marginibus inflexis

squamulam sterilem amplectens. Ovarium sublagenaeforme laeve; stylus breviusculus, ovario continuus, emarcescente persistens, trifidus, ramis inclusis. Achaenium obovatum, basi angustatum, apice styli basi persistente acuminatum, pericarpio tenue carnosulo (in sicco coriaceo) laevi testaceo, nucleo lapideo nigrescente.

Prof. Miquel, in establishing his *Lepironia enodis* had only the full-grown inflorescences before him, which were distributed from the Botanic gardens, Buitenzorg, under No. 3029, and described therefore the plant as having no leaves. But the leaves with young inflorescences were (by mistake probably) distributed at the same time under No. 4051, coming also from Palembang, and upon these specimens he founded his *Lepironia foliosa*.

5. **P. Humile**, *Hassk., Cat. Bog.*, 297; *Steud., Cyp.* 134; *Zoll., Cat.* 61; *Walp., Ann.* I, 753; *Miq., Fl. Ind. Bat.* III, 334; *Oudem., in Bot. Ztg.* 1866, 193.—Folia petiolata, laminâ elongato-ellipticâ retusâ abrupte subulato-cuspidata, marginibus apicem versus spinuloso-serrulatâ; petioli complicati, basi vaginato-dilatati; culmi plerumque geminati, elongati v. abbreviati, basi squamato-vaginati; spicae solitariae (rarius binac), squamis fuscis viridibus plurinerviis; achenia oblonga utrinque attenuata, acuminata, obsolete bicarinata.—Lepistachya praemorsa, *Zipp. M. S.*; *Lepironia cuspidata*, *Miq. Suppl. Fl. v. Sumatra*, 603; *Pandanophyllum Zippelianum*, *Kurz in natuurk. Tydsch. v. Ned. Ind.* XXVII. 126; *ejusd. Bot. Ztg.* 1865 204.

HAB.: One of the most common grasses in the hill forests of Western Java, at 3-5000' ft. elevation; occurs also in Banca: *Teymann*; and in Sumatra: *Korthals*.

NATIVE NAME: Sohlenat, Sunda.

Rhizoma crassum, obliquum v. verticale, lignescens, radices plurimas demittens. Folia trifarie equitantia, subcoriacea, petiolata; lamina elongato-ellipticâ, 1—1½ ped. longa, 1½—2½ poll. lata, basi in petiolum complicatum longitudine ab 1—2½ poll. variantem basi vaginato-dilatatum decurrens, apice retuso abrupte subulato—(—2 poll.) cuspidata, plicata, 3—nervis, margine apicem versus costâque spinuloso-serrulata. Culmi e stolonibus abbreviatis squamato-vaginatatis plerumque geminatim orti, nudi, deorsum attenuati, obtuse trigoni, striati, glabri, 1—4 poll. usque ad pedem longi, intense virides opaci, sub lente albedo-punctati. Spicae oblongae v. ovato-

oblongae, obtusiusculae v. acutiusculae, solitariae, v. passim binae. Squamae arcte imbricatae, emarcescente persistentes, sursum sensim minores; inferiores 3—4 vacuae, lanceolatae v. oblongo-lanceolatae, obtuse carinatae, striatae, opacae, virides, margine membranaceo brunnescentes; sequentes ecarinatae, nervosae, teneriores, flavescente-testaceae v. brunnescentes, nitentes, spiculam 6 florum androgynam foventes. Flosculi omnes uni-squamulati, 3 exteriores masculi, monandri; 2 interiores ad valvulas reducti: flosc. intimus excentricus, femineus. Squamulae flosculorum laterali compresso-naviculares, in carinis crosso-ciliolatae, medianae depressae. Antherae exsertae. Ovarium sub-lagenaeformae, laeve; stylus brevis ovario continuus, emarcescente persistens, trifidus, ramis elongatis inclusis. Achaeia oblonga, styli basi apiculata, obsolete bicarinata, pericarpio carnescente (in sicco coriaceo) brunnescente asperulo, nucleo lapideo nigrescente.

This is a very variable species, not only with regard to the leaves, which are longer or shorter petioled, but also with reference to the length of the culms, sometimes attaining nearly the length of the leaves, sometimes reduced so as to let the spike appear almost sessile. Sometimes these culms are furnished also with a few bracts.

6. **P. immersum**, *Thw. Enum. Pl. Zeyl.* 433.

HAБ.: Ceylon: *Thwaites C. P.* 3819.

Rhizoma crassum, lignescens, radicosum. Folia trifarie-equantia, 2—2½ pedalia, pollice angustiora, anguste linearia, acuminata, basin membranaceo-marginatum breviter vaginantem versus angustiora, complicato-trinervia, laevia, supra nitida, subtus glaucescentia et opaca, marginibus costaque basin versus remote et minute serrulata v. omnino laevia. Culmi pollicares v. breviores, bracteis sursum majoribus spicâ ipsâ solitariâ sublongioribus obtecti. Bractee culmeae superiores involucrantes, membranceo-marginatae, lineares, acuminatae. Spica fructigera cerasi minimi magnitudine, densiuscula, squamis lato-ovatis acuminatis in sicco fuscescentibus striatis. Achaeia ovata, incurvato-rostrata, ecarinata; pericarpio carnosulo.

V. **CEPHALOSCIRPUS**, KURZ.

Spicae glomerato-capitatae, multi-spiculatae. Squamae undique imbricatae, emarcescente persistentes, inferiorum nonnullae vacuae, reliquae spiculigerae. Spiculae 7—10 florum, squamâ propriâ longiores. Flosculi omnes uni-squamulati, nunc 3 exteriores, nunc 3 alii masculi,

monandri, reliqui ad squamulas reducti; flosculus intimus femineus squamulum sterilem amplectens. Squamulae laterales carinato-compressae. Ovarium basi stipitiforini-attenuatum; stylus trifidus. Achaenium longe stipitatum, rostratum, pericarpio carnosulo, nucleo lapideo.—*Herba perennis habitu omnino Pandanophyllum, sed phyllis involucrentibus longissimis etiam ad aspecta diversa.*

1. **C. macrocephalus**, *Kurz.*—*Hypolytrum macrocephalum*, *Gaud. in Freyc. Jt. Bot.* 414; *Kth. En.* II. 273; *Stuedl., Cyp.* 133.

HAB.: Moluccos; *Gaudichaud*; ib. isl. Batjan; *Teysmann.* (in *Hb. Bog.*)

Rhizoma.....Folia.....Culmi trigoni, glabri, pedales, basi paucitoliati. Spicae semipollicares, majusculae, plurimae, inaequali-oblongae, compressiusculae, glomeratae; glomeruli phyllis singulis sustenti in capitulum involucrentum pollicem dein $1\frac{1}{2}$ poll. crassum compacti. Involucri phylla inferiora 3—4, pedalia v. longiora, poll. lata, lato-linearia, subulato trigono-acuminata, trinervia, marginibus rectangulariter deviis, margine costâque subtus apicem versus spinuloso-serrulata, subcoriacea, phylla sequentia mox in bracteas glomerulis ipsis minores lato-ovatas acuminatas transcuntia. Squamae undique imbricatae pellucescence-chartaceae, oblongo-lanceolatae, obtusiusculae, trinerviae, glabrae, nitentes; inferiorum nonnullae vacuae, reliquae spiculum 7—10—floram includentes. Spiculae lineares, compressae, squamâ longiores. Flosculus intimus excentricus femineus uni-squamulatus, squamulum sterilem amplectens; flosculi sequentes 3 v. 3 alii extimi masculi, monandri, uni-squamulati, reliqui ad squamulas vacuas reducti. Squamulae laterales compresso-naviculares, carinâ ciliatae, medianae depressae. Ovarium sublagenaeforme, utrinque angustatum, glabrum; stylus longus, persistens, trifidus, ramis elongatis. Achaenia oblonga, basi in stipitem longum gracilem attonnata, tricarinata, stylo persistente longe acuminato-rostrata (rostrum achaenium longitudine paullo superans), pericarpio carnosulo, (in sicco tenni coriaceo) glabro testaceo, nucleo lapideo nigrescente.

I have not *Gaudichaud's* work above cited for consultation, but I think I am correct in quoting his plant from *Kunth's* and *Stuedel's* descriptions.

VI. SCIRPODENDRON, ZIPPÉLIUS.

Spicae glomerato-paniculatae, compactae, undique squamatae. Squamae emarcescente persistentes, inferiores saepius tri—superiores uni-

spiculatae, 8—10 florum, androgynae. Flosculus centralis feminus, nudus; flosculi reliqui masculi omnes monandri, uni-squamulati. Squamulae squamae contrariae; laterales compresso-naviculares; vacuae nullae (an semper?). Ovarium lagenaeforme; stylus longiusculus, bi—(an etiam tri?) fidus. Achaenium magnum, obovatum, 6, (12?) costatum, pericarpio carnosio (in sicco corticoso rugoso), nucleo lapideo mucronulato.—*Planta perennis habitu Pandanis veris acaulibus ita similis, ut ab his aegre discernenda nisi inflorescentia.*

1. **Sc. costatum**, Kurz. Scirpodendron pandaniforme, Zipp. MS.; Pandanophyllum costatum, Thw. En. Pl. Zeyl. 433? Scleria macrocarpa, Wall. Cat.

HAB.—In the hill jungles of Western Java along the torrents and in swampy places: Zippelius, &c. Singapore and Penang: Wall. 3538; Ceylon: Thwaites.

NATIVE NAMES: Harassas in Sunda.

Rhizoma crassum, obliquum, lignescens. Folia coriacea, trifarie equitantia, lato-linearia, acuminatissima, 6—9 ped. longa, pollicem lata et latiora, trinervia, lateribus rectangulariter deviis, margine costâque a medio spinuloso-serrulata. Culmi 1—1½ ped. longi, trigoni v. triquetri, glabri v. in angulis scaberrimi, aphylli, basi squamati. Panicula compacta, terminalis, pauci-ramosa, ramis brevibus crassis simplicibus, inferioribus 3—4 phyllis singulis sustentis involucrentibus. Involucri phylla longissima, 7—2 ped. longa, foliis subconformia. Spicae sessiles v. sub-sessiles, compositae, basi bractea magnâ chartacea e basi latâ oblongâ acutâ concavâ sustentae. Squamae oblongae, obtusiusculae, carinatae v. subcarinatae, striatae, membranaceae, inferiores saepe spiculas tres, sequentes spiculam unicam squamâ propriâ brevioribus tegentes. Flosculus centralis nudus feminus. Squamulae laterales lato-carinato-naviculares, carinâ ciliolatae. Antherae exsertae. Ovarium sublagenaeforme; stylus longus, bifidus, ramis brevibus. Achaenia drupacea, magnitudine pisi majoris, in sicco sulcato—6—costata, rugosa; pericarpium in sicco corticosum; nucleus obovatus, obsolete 6—costatus, apiculatus, lapideus.

I am in doubt whether Dr. Thwaites' *Pandanophyllum costatum* is identical with this plant, as his short description does not well coincide with the above characteristic. According to that author the achenes are 6—12 ribbed, but the Malayan species which I have examined, have them all 6-ribbed only.