Amphiroa fragilissima, L., var. *linearis*.
Lithothamnion mamillare, Harv.
Gracilaria corticata, J. Ag.
Hypnea hamulosa, Turner.
—— *Valentiæ*, Wulf.
Gelidium rigidum, Vahl.
Liagora viscida, Forsk.
Chylocladia rigens, Ag.
Caulerpa ericifolia, Ag.
—— *Boryana*, J. Ag.
—— *plumaris*, Vahl.
—— *mamillosa*, Mont.
Halimeda opuntia, Lamx.
—— *tuna*, Lamx.
Codium tomentosum, Stackh.
—— *adhærens*, Ag.
Valonia ægagropila, Ag.
Microdictyon Agardhianum, Dne.
Dictyosphæria favulosa, Dne.
Ulva latissima, L.
Enteromorpha intestinalis, Link.
—— *compressa*, Grev.
—— *ramulosa*, E. B.
Batrachospermum moniliforme, Ag., var. *æquinoctiale*.
Thorea violacea, Bory.
Conferva moluccana, Ag.
—— *bombycina*, Ag., var. *inæqualis*, Ktz.
—— *Ansonii*, Ag.
Cladophora Roettleri, Ktz.
—— *pannosa*, Dickie.
Chantransia cærulescens, Mont.
Œdogonium fonticola, A. Braun ?
Rhynchonema angulare, Hass.
Staurospermum capucinum, Bory ?
Lyngbya majuscula, Dillw.
Leptothrix lutea, Ktz.
Nostoc commune, Vauch.

Aspects of the Phænogamic Vegetation of Rodriguez, with Descriptions of new Plants from the Island. By I. Bayley Balfour, D.Sc., F.L.S.

[Read February 1, 1877.]

(Abstract *.)

As regards the history of its flora, the island of Rodriguez bears a striking resemblance to St. Helena. We read of the latter island

* A full and descriptive account of the botany of Rodriguez, amply illustrated, will hereafter be published by the Royal Society in their general Report of the Venus-transit Expedition to that island. But as a wish has been expressed by several botanists that I should give a *résumé* of some of the novelties among the flowering plants without further delay, I herewith, by permission, lay an abstract of a few of the more important points before the Linnean Society.

that fire, goats, and finally introduced foreign plants well nigh exterminated the indigenous flora; and the same causes have operated and, I regret to say, are still operating in Rodriguez. The result is that the primitive vegetation has been in great part destroyed, leaving the island a field for the rank and rapid growth of common tropical weeds. The old and luxuriant vegetation of two hundred years ago—thus quaintly described by Leguat*, "We could hardly take our eyes off from the little mountains of which the island entirely consists; they are so richly spread with great and tall trees," and, again, "'Tis as I have hinted, composed of lovely hills covered all with fine trees whose perpetual verdure is entirely charming"—has now, to a large extent, disappeared, and is represented by only a few species, many of which are confined to the more unfrequented and less accessible places. It is indeed difficult to recognize in the barren and arid Rodriguez of the present day the "little Eden," "lovely isle," "earthly paradise" of Leguat.

The flora, as it now exists, is an exceedingly fragmentary one; it is therefore a matter of some difficulty to determine its exact limits and to draw conclusions as to its affinities with the floras of other oceanic islands and of adjacent continents. This is the more to be regretted, as, from the geographical position of the island and the physical condition of climate to which it is subject, its flora might be expected, whether taken singly or as part of that of the Mascarene group, to contribute very important data towards the solution of the problem of the distribution of plant-life in that region. The following general statements may, however, be made:—

1. The flora is essentially insular.
2. The facies is tropical.
3. It is that of a dry rather than of a humid climate.
4. It is characteristically Mascarene, but possesses a fair amount of individuality.
5. It presents affinities with the floras of many other regions, most markedly with the African; but there are also some curious Polynesian and American relations, and strong Asiatic or eastern connexions.

The flora, as I found it, is composed of 470 species: of these, 297 are Phanerogams; the remainder (173) are Cryptogams. Of the 297 species of Phanerogams now growing on the island, con-

* 'A New Voyage to the East Indies,' English translation. London, 1708.

siderably over one third have been introduced, and many of the remainder are widely spread weeds in the tropics of both hemispheres. In this number I include many plants which have escaped from, or are relics of, former cultivation, and ought perhaps to be expunged from the list; but I record their presence, as it is possible that, in time, many of them may occupy a more prominent position in the flora.

The prevailing natural orders of the flowering plants are Leguminosæ, Convolvulaceæ, Solanaceæ, Malvaceæ, Compositæ, Euphorbiaceæ, Rubiaceæ, Cyperaceæ, Myrtaceæ, Liliaceæ, and Rutaceæ. All but the last three are, it will be observed, orders which, as a rule, compose a great part of the flora of any tropical islands reached by civilization. There are 35 endemic species of Phænogams, and 34 species which occur nowhere out of the Mascarene islands. The 35 peculiar species belong to 30 genera, and are included in 21 natural orders. Monocotyledons constitute six of these species, or about one sixth of the whole. Of the endemic species hitherto undescribed diagnoses are now given. Of the natural orders in which peculiar species occur, Rubiaceæ, which constitutes one thirtieth of the whole flora, is most largely represented in them, including 5 species belonging to as many genera. Altogether ten Rubiaceous plants are found in Rodriguez. Two of these are introduced—*Coffea arabica*, a relic of cultivation, and the common *Vangueria edulis*; and of the remaining 8, 3 (*Oldenlandia Sieberi*, *Fernelia buxifolia*, and *Antirrhœa frangulacea*) are Mascarene only; whilst 5 are peculiar, though 3 of them have representatives in other Mascarene islands.

Of 11 Compositæ, 3 species belonging to two genera are endemic, 2 belonging to *Psiaclia*, and the third is a species of the curious genus *Abrotanella*; and a fourth, a species of *Senecio*, is Mascarene.

Other Dicotyledonous orders containing peculiar plants are:—Myrtaceæ, including a peculiar *Eugenia*; Euphorbiaceæ, embracing a new *Euphorbia* and a *Phyllanthus* found by Commerson; Piperaceæ, represented by 3 new species of *Peperomia*; Rutaceæ, of which a *Zanthoxylon* occurs; Meliaceæ possessing a characteristic species of the Mascarene genus *Quivisia*; Turneraceæ, having a peculiar genus with Central-American affinities; Verbenaceæ, of which the Polynesian hitherto monotypic *Nesogenes* is represented by a new species, and there is also a *Clerodendron*; Ascle-

piadaceæ, comprising a new genus of Indian affinity and a new species of *Sarcostemma*; Anacardiaceæ, including a species of the African genus *Sclerocarya*; Ebenaceæ, with a new *Diospyros*; Nyctagineæ, containing a *Pisonia*; Amaranthaceæ, represented by an *Ærua*; and Urticaceæ by a *Pilea*.

The 6 peculiar Monocotyledons, included in 5 genera of 4 orders, are amongst the most interesting of Rodriguez plants, as amongst them occur those which may be considered physiognomic. These are the Pandanaceæ (Screw Pines), of which two species, both peculiar, occur. Three others are recorded, but on insufficient evidence. It is curious that the family, though in individuals far outstripping other families, is not rich in species.

The Palms are also peculiar, excluding *Cocos nucifera* and *Phœnix dactylifera*, of which but few individuals exist. There are three species, all of Mascarene genera—*Latania Verschaffeltii*, *Hyophorbe Verschaffeltii*, and *Dictyosperma alba*, var. *aurea*. The representation of these Palms in other islands of the group by cognate species is remarkable and worthy of notice. The Rodriguez species of *Latania* is represented in Mauritius by *L. Commersonii*, also found in Bourbon; and on Round Island a third species, *L. Loddigesii*, occurs. Again, *Hyopherbe Verschaffeltii*, peculiar to Rodriguez, is represented in Mauritius and Bourbon by *H. indica*, and on Round Island there is *H. amaricaulis*. *Dictyosperma alba*, on the other hand, is a very variable Palm, and occurs in all the islands of the group, but under a different form in each. In Rodriguez it assumes a singularly graceful and delicate character, constituting a very distinct variety long known to horticulturists in this country and in Europe as *Areca aurea*.

The paucity of Orchidaceæ is a very striking feature; but we find one new species and a distinct variety of another. This paucity is more remarkable as contrasted with the profusion of this family in the sister isles, the dryness of the island and absence of forest no doubt mainly contributing to this result.

Such is a brief indication of the endemic Phænogamic vegetation of Rodriguez; and the following is a list of the species. Those marked with an asterisk have been already described; of those not so marked a description follows.

Zanthoxylon paniculatum, *Balf. fil.*
Quivisia laciniata, *Balf. fil.*
Sclerocarya castanea, *Baker.*
Eugenia Balfourii, *Baker.*
*Mathurina penduliflora, *Balf. fil. in Linn. Soc. Journ.* xv. 159.
Danais corymbosa, *Balf. fil.*
Randia heterophylla, *Balf. fil.*
Pyrostria trilocularis, *Balf. fil.*
Scyphochlamys revoluta, *Balf. fil.*
Psychotria lanceolata, *Balf. fil.*
*Psiadia Coronopus, *Hk. et Benth. Gen. Pl.* ii. 235.
P. rodriguesiana, *Balf. fil.*
Abrotanella rhynchocarpa, *Balf. fil.*
Lobelia vagans, *Balf. fil.*
*Diospyros diversæfolia, *Hiern in Journ. Bot.* N. S. iv. p. 353, t. 172.
Tanulepis sphenophylla, *Balf. fil.*
Sarcostemma odontolepis, *Balf. fil.*
Hyprestes rodriguesiana, *Balf. fil.*
H. inconspicua, *Balf. fil.*
Nesogenes decumbens, *Balf. fil.*
Clerodendron laciniatum, *Balf. fil.*
Pisonia viscosa, *Balf. fil.*
Ærua congesta, *Balf. fil.*
Pilea Balfourii, *Baker.*
Peperomia hirta, *Balf. fil.*
P. reticulata, *Balf. fil.*
P. rodriguesii, *Balf. fil.*
Euphorbia daphnoides, *Balf. fil.*
*Phyllanthus dumetosus, Poir.; *DC. Prod.* xv. 2, 398.
Listrostachys aphrodite, *Balf. fil. et S. Moore.*
Aloë lomatopylloides, *Balf. fil.*
*Latania Verschaffeltii, *Ch. Lem. Ill. Hort.* 229.
*Hyophorbe Verschaffeltii, *Wendl. Ill. Hort.* 462.
Pandanus heterocarpus, *Balf. fil.*
P. tenuifolius, *Balf. fil.*

Rutaceæ.

Zanthoxylon paniculatum, *Balf. fil.*, sp. nov.

Arborea; ramulis validis teretibus, spinis paucis, nigrescentibus, uncinatis, arcuatis; foliis imparipinnatis 15–19, foliolatis, ad apicem ramulorum confertis, breviter petiolatis; foliolis oppositis sessilibus subcordato-oblongis, obtusis, basis inæqualiter cordatis, glabris, subcoriaceis, supra nitidis, subtus pallidioribus, costa venisque prominentibus; paniculis subsessilibus, patentibus, folio brevioribus, ramis puberulis, pedicellis brevibus; flor. ign.; capsula globosa, bivalvi, glabra, valide minuteque tuberculata, breviter stipitata; sem. ign.

***Hab.* in ripis fluvii Quitore prope ejus ostium. Nom. vulg. Bois Pasner.**

A small tree of which only two or three specimens were seen in the locality named. Is not far removed from the Indian species *Z. Budrunga*, Wall. Hk. fil. Flor. Ind. iv. i. 495.

Meliaceæ.

Quivisia laciniata, *Balf. fil.*, sp. nov.

Frutex glaber ramosissimus; foliis oppositis v. suboppositis, subsessilibus, adultis obovato-cuneatis, obtusis v. retusis, integris, junioribus alte pinnatifidis 3–5-lobatis in formam adultam gradatim transeuntibus, nitidis, rigide coriaceis, reticulato-venulosis; floribus in cymas axillares bifloras brevissime pedunculatas collectis, pedicellis brevibus validisque erectis v. suberectis; calyce cotyliformi, minute 4-dentato, strigoso, dentibus deltoideis; petalis 4 oblongo-ellipticis obtusis, patentibus; staminibus 8, tubo brevi; ovario dense strigoso; styli apice subito incrassato ibique strigoso et constricto; stigmate capitato leviter umbilicato, obscure 4-lobato, lævi.

***Hab.* In insula late dispersa. Nom. vulg. Bois Balais.**

A heterophyllous species distinguished from the Mauritian *Q. filipes*, Baker, Fl. Maur. Seych. p. 46, by its heterophylly, stout floral pedicels, and larger flowers.

Anacardiaceæ.

Sclerocarya castanea, *Baker, Fl. Maur. Seych.* p. 63.

Arborea, ramulis validissimis teretibus; foliis 7–11, imparipinnatis, foliolatis, ad apicem ramulorum confertis, petiolatis; foliolis oppositis sessilibus rarius brevissime petiolulatis, oblongis v. ovatis, acutis v. breviter acuminatis, basi inæqualiter rotundatis, obscure crenulatis, submembranaceis, supra nitidis glabrisque, subtus medio nervo subhirsuto; floribus dioicis (?), breviter pedicellatis in racemis brevibus sessilibus v. breviter pedunculatis solitariis in axillis foliorum terminalium dense confertis; ♀ sepalis 5 minutis rotundatis ciliatis; pe-

talis 5, oblongis obtusis reflexis imbricatis; disco crenate 10-lobato; staminibus 10 partim anantheris; ovario oblongo, glabro, stylis 5 validis, distantibus, brevibus, erectis divaricatis, sub apicem ovarii sitis; stigmatibus capitatis, spongiosis; ovulis solitariis pendulis; fruct. ign.

Hab. in vallibus prope fontes fluminum Palmiste et Mouruc.

A rare species, differing in its symmetry and crenated disk from the published description of *Sclerocarya*. It approaches the monotypic Cape genus *Harpephyllum*, Benth. & Hook. fil. Gen. Plant. i. 427, which is unfortunately imperfectly known. It may be a connecting link between these genera.

Myrtaceæ.

Eugenia Balfourii, *Baker, Fl. Maur. Seych.* p. 116.

Arborea, ramosissima, ramulis glabris tetragonis; foliis breviter petiolatis oblongis v. ovali-oblongis v. oblanceolatis acutis, basi cuneatis, glabris, rigide subcoriaceis, pellucido punctatis, penninerviis, nervis tenuibus plurimis arcte positis; paniculis longe pedunculatis pauci-floris axillaribus folia æquantibus glabris late patentibus; floribus sessilibus v. brevissime pedicellatis; calyce obscure dentato, denti-bus deltoideis.

Hab. in valle fluvii Baleine prope fontem.

An uncommon plant having some affinity with the Bourbon *E. paniculata*, Lam. Dict. iii. 199, = *Syzygium paniculatum*, DC. Prod. iii. 259.

Rubiaceæ.

Danais corymbosa, *Balf. fil.*, sp. nov.

Herba scandens volubilisve, ramulis tenuibus, glabris, tetragonis; foliis oppositis breviter petiolatis oblongis v. lanceolatis acutis v. acuminatis, basi cuneatis, integris, glabris, subcoriaceis, reticulato-venulosis, sub-tus pallidis; stipulis minutis; cymis corymbosis axillaribus in axillis foliorum terminalium densifloris breviter pedunculatis; pedicellis erec-tis tenuibus brevibus; bracteolis minutissimis; calyce 5-dentato, tubo campanulato, dentibus lanceolatis; corolla hypocrateriformi, seg-mentis oblongo-spathulatis, acutis, patentibus, quam tubus dimidio brevioribus, fauce dense villosa; staminibus florum brevistylium longe exsertis; stylo furcato, tubum corollæ æquante, ramulis tereti-bus clavatis; capsula globosa, glabra.

Hab. In declivibus montis "Grande Montagne" sparse lecta.

Distinguished by its leaves and inflorescence from the Mascarene

D. fragrans, Comm. (Cordem. in Adans. x. 357), to which the species mentioned in DC. Prod. iv. 361 are reducible.

RANDIA HETEROPHYLLA, *Balf. fil.*, sp. nov.

Suffrutex glaber, ramulis tetragonis; foliis oppositis breviter petiolatis, adultis oblongis v. ellipticis, obtusis, mucronatis v. emarginatis, ad extremitatem utramque rotundatis, sæpe lanceolatis et versus extremitates attenuatis, rigide coriaceis, glabris, supra nitidis; foliis juvenilibus lineari-lanceolatis elongatis, acutis, hispidulis, gradatim in formam adultam transeuntibus; stipulis brevibus, connatis, subtruncatis; cymis solitariis, extraaxillaribus, patentibus, 1–5 floris, pedunculis glabris, petiolum longe excedentibus, bracteolis fere obsoletis; floribus sessilibus v. brevissime pedicellatis, erectis; calyce anguste infundibuliformi, minute 5-dentato; corolla hypocrateriformi, fauce breviter villosa, segmentis lanceolatis. Antheris partim exsertis, ligulatis, acutis; ovario 5-gono; fructu ovoideo oblongo 5-angulato.

Hab. in locis seclusis insulæ. Nom. vulg. Café Marron.

A remarkable heterophyllous species of a genus hitherto unknown in the Mascarene Islands.

PYROSTRIA TRILOCULARIS, *Balf. fil.*, sp. nov.

Frutex glaber, ramosus, ramulis tetragonis; foliis adultis breviter petiolatis, oblongo-ovalibus v. oblongis v. fere obovatis acutis, juvenilibus subsessilibus, linearibus, mucronatis, rigide coriaceis, marginibus leviter revolutis, glabris, nitidis, penninerviis, subtus costa prominente; stipulis connatis, deciduis, longe cuspidatis, glabris; floribus axillaribus, cæt. ign.; fructu breviter stipitato, 3- rarius 2-loculari, globoso, subtrigono.

Hab. In insula late dispersa. Nom. vulg. Bois Chauve-Souris.

A heterophyllous plant (provisionally referred to the genus *Pyrostria*) of which the seed is as yet unknown.

The plant was obtained only in fruit; and there is therefore some difficulty in determining its exact position.

SCYPHOCHLAMYS, gen. nov.

Calycis tubus campanulatus; limbus truncatus v. obscure 4-lobatus, coriaceus, persistens. *Corolla* infundibularis, tubo brevi, fauce villosa; limbi lobi 4–5 (6 ?), lanceolato-triquetri, acuti, incrassati, valvati. *Stamina* 4–5 (6 ?), ori corollæ inserta, filamentis brevibus; antheræ dorso infra medium affixæ, vix exsertæ, lanceolato-acutæ. *Discus* annularis v. pulvinaris. *Ovarium* 4–5- (6- ?) loculare; stylus validus, profunde 4-fidus; ovula in loculis solitaria, infra apicem loculi pendula. *Fructus* pyriformis, costatus....(maturum non vidi). *Semina* pendula,

non compressa.—Arbores parvæ, glaberrimæ, ramulis subtetragonis. *Folia* opposita, breviter petiolata, rigide coriacea, penninervia. *Stipulæ* interpetiolares, latæ, connatæ, coriaceæ, persistentes. *Flores* in capitulum 6–12-florum densum pedunculatum congesti; capitula intra bracteas duas oppositas conniventes crasse coriaceas persistentes in involucrum cyathiforme connatas inclusa.

Monotypic and endemic.

S. REVOLUTA, sp. unica.

Arbor parva, ramosa; foliis heteromorphicis, adultis breviter petiolatis ellipticis v. late ovato-oblongis nitidis venulosis, marginibus revolutis 3½–4 poll. longis 1½–2½ poll. latis (petiolo excluso ⅙–¼ poll. longo), juvenilibus linearibus 4–6 poll. longis, ⅛ poll. latis; stipulis ⅓ poll. longis; capitulis solitariis, axillaribus, erecto-patentibus, pedunculis petiolum excedentibus, ⅓—1½ poll. longis; involucro ½ poll. diam. basi, intus tuberculis appressis brevibus teretibus linearibus dense vestito; corolla ¼ poll. longa, calyce triplo longiore; fructu in singulo involucro solitario.

Hab. In insula dispersa. Nom. vulg. Bois Mangue.

A near congener of *Pyrostria*. Remarkable for the large two-leaved persistent involucre embracing and enclosing the flowers, and also for its heteromorphic leaves.

PSYCHOTRIA? LANCEOLATA, *Balf. fil.*, sp. n.

Frutex glaber; ramulis tetragonis; foliis oppositis lanceolatis acutis inferne in petiolum brevem gradatim attenuatis, coriaceis; stipulis deciduis; floribus in paniculam corymbosam pedunculatam, ebracteatam v. minutissime bracteatam, in axillis foliorum superiorum congestis, minutis, breviter pedicellatis; calyce late cupuliformi truncato obscure 5-dentato; corolla subcampanulata lobis lanceolatis incrassatis tubo brevioribus, fauce dense pilosa; antheris dorso affixis, filamentis brevibus; disco magno; ovario 2-loculari; ovulo solitario in singulo loculo, erecto, basilari, oblongo-ovato compresso; stylo furcato, ramis brevibus; fruct. ign.

Hab. In declivibus montis "Grande Montagne" infrequens. Nom. vulg. Bois Lubine.

The specimens I obtained of this are very imperfect, and a final determination is impossible. Its position, therefore, in this genus is provisional.

COMPOSITÆ.

PSIADIA RODRIGUESIANA, *Balf. fil.*, sp. n.

Suffrutex, ramulis teretibus pubescentibus; foliis lanceolatis, acutis,

superne profunde serratis, inferne cuneatis integrisque et in petiolum pilosum brevem attenuatis, dense pilosis, nervo centrali subtus prominente nervos 5–7 adscendentes parallelos subtus prominulos emittente; capitulis breviter pedunculatis in corymbos laxos axillares patentes dispositis; bracteis involucri glabri interioribus lanceolatis v. oblongis acutis margine submembranaceis, exterioribus brevioribus post anthesin patentibus; achæniis compressis angulatis, rugis calvis, inter rugas strigosis; pappo rigido, setoso, scabriusculo.

Hab. in locis excelsis non frequens. Nom. vulg. Bois de Ronde.

A rare shrub, quite distinct from the Mauritian species of *Psiadia*, resembling more nearly the Bourbon plants originally described under the generic name *Conyza*.

ABROTANELLA RHYNCHOCARPA, *Balf. fil.*, sp. n.

Herba pusilla, pulvinata, glabra, caulibus dense confertis; foliis imbricatis, stellatim patentibus, recurvatis, late amplexicaulibus, lyrate pinnatifidis v. pinnatipartitis, rarius simplicibus spathulatisque, acutis, coriaceis, uninerviis, nervo prominente; capitulis solitariis sessilibus, singulo 6–10-floro; involucro 6-phyllo, bracteis ciliatis, exterioribus plurinerviis latioribus, interioribus 2–3-nerviis angustioribus; receptaculo foveolato; floribus exterioribus femineis, interioribus hermaphroditis fertilibus; femineis corolla 3-dentata, basi globosa, stylo exserto breviter bifido; hermaphodritis corolla 4-dentata, antheris inclusis ovoideis acutis inappendiculatis, stylo valido, tubo corollæ subæquilongo, alte bifido, ramis ciliatis; achæniis obovatis, compressis, calvis, lente curvis, obscure 4–5-angulatis, apice in rostrum primum tortum, demum rectum elongato.

Hab. In terra calcarea juxta oram maritimam solum crescit.

A very distinct species of this curious South-Temperate-American and Australian genus hitherto unknown as Mascarene.

CAMPANULACEÆ.

LOBELIA VAGANS, *Balf. fil.*, sp. n.

Annua; caulibus repentibus tenuibus glabris; foliis membranaceis, inferioribus ovato-lanceolatis v. elliptico-ovato-acutis v. obovatis, basi cuneatis, superne crenatis, inferne integris, breviter petiolatis, superioribus linearibus acutis v. obtusis, retusis v. submucronatis, subsessilibus, crenato-serratis; floribus solitariis in axillis foliorum superiorum, pedicellatis; pedicellis bractea brevioribus; calycis tubo obconico lacinias subulatas subæquante v. breviter excedente; corollæ tubo calycis lobis quadruplo longiore, lobo inferiore obovato-oblongo acuto, superiore lineari; antheris 2 inferioribus apice barbatis, superioribus pilosiusculis; stylo longo; stigmate bilobato; capsula obovoidea.

Hab. in vallibus umbrosis prope fluminum fontes.

Distinguished from the nearly allied Mauritian *L. serpens*, Lam. (DC. Prod. vii. 368), and *L. filiformis*, Lam. (DC. *l. c.*), by its broader leaves and larger flowers.

Asclepiadaceæ.

Tanulepis, gen. nov.

Calyx minutus, 5-partitus, basi intus 5-glandulosus. *Corolla* subrotata, alte 5-fida, subvalvata; coronæ squamæ 5-lineari-lanceolatæ elongatæ, petalis subæquilongæ, antheras breviter excedentes, subincrassatæ, basi connatæ gynostegioque adhærentes. *Stamina* filamentis latis brevibusque basi annulo coronæ affixa. *Antheræ* apice cuspidatæ, conniventes; pollen granulosum in quoque loculo in massas duas subcohærens, appendicibus latis, orbicularibus corpusculorum longe stipitatorum applicitum. *Stigma* 5-gonum? *Folliculi* divaricati, tenues, subteretes, subcostati. *Semina* comosa.—Suffrutex volubilis, glaber. *Folia* opposita nitidula. *Cymæ* laxe ramosæ ad apices ramorum breviter pedunculatæ. *Flores* parvi, pedicellati. Bracteæ minutissimæ.

Monotypic and endemic.

T. sphenophylla, sp. unica.

Caulibus tenuibus; foliis membranaceis breviter petiolatis, lanceolatis acuminatis v. oblanceolatis basi cuneatis $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longis (petiolo excluso $\frac{3}{8}$ poll.), $\frac{1}{3}$–$\frac{1}{2}$ poll. latis, integris, nitidis, subtus pallidioribus penninerviis; cymis pauciflоris, pedunculis $\frac{1}{16}$ poll. longis, bracteis deciduis, pedicellis $\frac{1}{3}$–$\frac{1}{2}$ poll. longis; corollæ lobis $\frac{1}{8}$ poll. longis; stipite corpusculorum appendicem duplo excedente; folliculis fusconigris, glabris 2–3 poll. longis, $\frac{1}{12}$–$\frac{1}{8}$ poll. latis; seminibus compressis $\frac{1}{8}$ poll. longis, latere bisulcatis.

Hab. Per insulam totam crescens.

With the monotypic East-Indian genus *Brachylepis*, W. & A. (Benth. et Hook. fil. Gen. Plant. ii. 742), it has many points of resemblance; but the elongated outer scales of the corona and their mode of attachment, as well as the character of the inflorescence, distinguish it.

Sarcostemma Odontolepis, *Balf. fil.*, sp. n.

Planta aphylla scandens v. decumbens, caulibus teretibus glabris carnosis ad nodos articulatis ibique squamis minutis oppositis in loco foliorum instructis; umbellis solitariis ad nodos sessilibus breviterve pedunculatis v. terminalibus. Receptaculo paleis vestito; floribus breviter pedicellatis; calycis segmentis ovatis v. suborbicularibus

concavis margine ciliatis, extus puberulis; corolla altelo bata, laciniis oblongo-ellipticis glabris; corona exteriore corollæ adnata, alte 5-partita, lobis tridentatis singulo squamæ interiori adhærente, dente centrali maximo; interiore exteriorem triplo excedente, segmentis superne saccatis, dolabriformibus, gynostegio subæquilongis; stigmate apiculato, obscure bilobato, umbilicato.

***Hab.* in insula late dispersa. Nom. vulg. Liane Calé.**

Probably merely a variety of *S. viminale*, R. Br. (DC. Prod. viii. 538), from which the only point of difference is the deeply 5-partite outer corona. I have seen one flower in which there was an arrangement of the corona exactly halfway between the two forms.

Acanthaceæ.

Hypoëstes rodriguesiana, *Balf. fil.*, sp. n.

Herba parva ramosissima glabra, ramis crassis lignosis; foliis longe petiolatis ovato-lanceolatis, inferne deltoideis, integris, subcoriaceis, substrigulosis; racemis breviter pedunculatis in axillis foliorum confertis, bracteis obovatis v. oblanceolatis capitula uniflora opposita arcte disposita gerentibus; involucro tubuloso, subventricoso, tetraphyllo, ad medium discreto, lobis inæqualibus, exterioribus longioribus, ovato-acutis, extus plaga lineari lateraliter notatis, interioribus lanceolatis brevioribus; calyce brevi extus hispidulo, laciniis tubo brevioribus, ciliatis; corolla alte bifida, pilosa, labiis tubo subæquilongis, superiore oblongo, inferiore tridentato v. trifido; staminibus et filamentis exsertis; ovario oblongo, compresso, glabro; stylo filiformi, exserto.

***Hab.* in locis excelsis montis Malartic, sparse dispersa.**

A dwarfed plant allied to *H. Bojerianum*, DC. Prod. xi. 506, of Madagascar.

H. inconspicua, *Balf. fil.*, sp. n.

Herba tenuis, caule repente valde articulato, ad nodos radicante; foliis oppositis distantibus ovalibus v. obovatis, obtusis v. subacutis, strigosis integris, inferne in petiolum subæquilongum longiorem attenuatis; capitulis solitariis axillaribus subsessilibus, bracteis nullis; involucro unifloro strigoso tetraphyllo, laciniis lineari-lanceolatis inæqualibusque ad medium connatis, exterioribus dimidio longioribus; calyce brevissimo lobis lanceolatis acuminatis, involucro multo breviore; corolla involucro longiore: cæt. ign.

***Hab.* In solo calcareo a litore remoto secus extremitatem occidentalem insulæ sparse crescit.**

An ally of *H. serpens*, R. Br.; DC. Prod. xi. 501. A Mauritian plant, which has larger leaves and glabrous involucres.

Verbenaceæ.

Nesogenes decumbens, *Balf. fil.*, **sp. nov.**

Herba perennis diffusa, ramis laxis oppositis v. suboppositis, teretibus, tenuibus, divaricatis humifusis, glabris sed versus extremitatem biseriatim pilosis; foliis oppositis lanceolatis v. rhomboideis, acutis, integris, margine ciliatis, inferne in petiolum brevem attenuatis, siccitate non nigrescentibus; floribus in 1–2-floras cymas axillares dispositis; pedicellis brevissimis pubescentibus; calyce amplo ¼ poll. longo, alte 5-dentato, dentibus acutissimis, crenatis, extus intusque glandulosis; corollæ lobis subæqualibus rotundatis, tubo quintuplo v. sextuplo brevioribus; antheris oblongis; fructu lævi compresso, apice hispido, basi glabro, stylo mucronato, calyce cincto.

Hab. **In solo calcareo secus extremitatem occidentalem insulæ loco singulo reperta.**

An interesting species of a hitherto monotypic Polynesian genus.

Clerodendron laciniatum, *Balf. fil.*, **sp. nov.**

Frutex v. arbor parva; foliis oppositis petiolatis, coriaceo-membranaceis poroso-punctatis, adultis ovatis v. ovato-oblongis, acutis basi subdeltoideis, integris, glabris, subtus pallidis, juvenilibus filiformiter tripinnatipartitis, segmentis distantibus puberulis ligulatis obtusis per formas intermedias in adultam transeuntibus; cymis axillaribus breviter pedunculatis, paucifloris, bis trifidis, patentibus, bracteolis minutissimis; calyce cupuliformi truncato, ore integro v. obscure lobato glabro, demum patulo; corolla infundibuliformi, calycem sextuplo excedente, tubo intus resinoso-papillato, laciniis obtusis tubo brevioribus, genitalibus breviter exsertis.

Hab. **In insula late diffusum. Nom. vulg. Bois Cabri.**

C. heterophyllum, R. Br. (DC. Prod. xi. 660), of Mauritius, is a near ally, but differs in the character of its heterophylly and in the flowers.

Nyctaginaceæ.

Pisonia viscosa, *Balf. fil.*, **sp. nov.**

Arbor non armata, foliis petiolatis ovatis v. obovatis, obtusis v. acutis, v. breviter cuspidatis, basi deltoideis, subrepandis, membranaceis, primo subpuberulis demum scabrulis, siccitate nigrescentibus; petiolo tenui. ♂ panicula corymbosa in axillis foliorum terminalium oriente, brunneo-pubescente, densa; pedunculo compresso, bracteolis minutis deciduis; perianthio infundibuliformi extus piloso, breviter 5-dentato, dentibus reflexis; staminibus 13 exsertis. ♀ panicula laxe lateque patente, pedicellis erecto-patentibus; perigonio elongato, 5-angulato, angulo singulo brevibus uncinatis glandulosis tuberculis seriatim instructo.

Hab. In littore crescit. In insula Frigate frequenter, sed in Rodriguez rarius invenitur. Nom. vulg. Bois Mapou.

The bristly fruit completely filled by the seed, amongst other characters, distinguishes this from *P. ovalifolia*, DC. Prod. xiii. 2, 441, a Mauritian species, of which probably *P. lanceolata*, DC. Prod. xiii. 2, 442, is a variety.

Amaranthaceæ.

Ærua congesta, *Balf. fil.*, sp. nov.

Herba perennis, dense cæspitosa, ramosissima, pulvinata, ramis firmis, lignosis, humifusis; foliis alternis, petiolatis, obovato-spathulatis, obtusis v. acutis, subcoriaceis, glabris, junioribus subtus pilosis; spicis in axillis villosis foliorum superiorum sessilibus, solitariis, oblongis v. subrotundatis erectis; bracteolis deltoideis perianthio brevioribus, glabris; perianthii segmentis oblongo-lanceolatis uninerviis, exterioribus duobus latioribus pilosiusculis, interioribus tribus angustioribus denseque pilosis; staminodiis minutissimis, antheris rotundatis; utriculo compresso suborbiculari glabro; semine inæquali-ter reniformi, minute tuberculato, margine obtuso.

Hab. In terra calcarea solum crescit.

A very distinct species, unlike any other Mascarene.

Urticaceæ.

Pilea Balfourii, *Baker, Fl. Maur. et Seych.* p. 276.

Herba parvula monoica perennis glaberrima, caule brevi 4-gono, basi cæspitose ramoso, ramis patentibus oppositis exsiccatis cystolithiferis; stipulis deltoideis minutissimis; foliis oblanceolato-rhomboideis acutis v. acuminatis, basi cuneatis, superne alte inciso-crenatis, inferne integris triplinerviis, nervis usque ad apicem productis, lamina exsiccata membranacea, paginis utrisque cystolithis linearibus suffultis; cymis patentibus, multifloris, breviter pedunculatis, axillaribus, petiolo brevioribus; floribus breviter pedicellatis; ♂ perianthio bilobato, lobis concavis, subcucullatis, acutis; ♀ achæniis lævibus, acute marginatis, compressis, ovoideis, vix segmentum intermedium perigonii superantibus.

Hab. in locis humidis umbrosisque in vallibus prope fontes fluminum.

Distinguished from the nearly allied Mauritian *P. cuneiformis*, Wedd. (DC. Prod. xvi. 133), by the habit, spreading inflorescence, and long petiolate leaves.

Piperaceæ.

Peperomia hirta, *Balf. fil.*, sp. nov.

Herba repens, pilosus, caule simplici v. ramoso e nodis radicante; foliis oppositis petiolatis ellipticis v. oblongo-ellipticis v. obovatis, 5-nerviis,

utrinque villosis, nervulo obscuro juxta marginem currente, petiolo villoso; cæt. ign.

Hab. In locis siccis scopulosisque sparse crescit.

The Mauritian species *P. elliptica*, Dietr. (DC. Prod. xvi. 440), is the nearest ally; but its non-pilose character sufficiently separates it.

P. RETICULATA, *Balf. fil.*, sp. nov.

Herba carnosa repens, caule simplici v. uniramoso, in parte inferiore e nodis radicante, versus apicem adscendente; foliis oppositis, petiolatis, summis ternis, elliptico-rhomboideis, apice emarginulatis v. acutis, utrinque glabris 5-nerviis et reticulato-venulosis, nervulo obscuro juxta marginem currente; amentis solitariis axillaribus, breviter pedunculatis, folia terminalia superantibus, bracteis subrotundatis peltatis breviter stipitatis; ovario globoso immerso; stigmate umbilicato prominente, glabro.

Hab. in locis excelsis umbrosisque insulæ.

A species nearly allied to the Indian *P. dindygulensis*, Miq. (DC. Prod. xvi. 442) but distinguished by its glabrous shortly petiolate leaves.

P. RODRIGUESIANA, *Balf. fil.*, sp. nov.

Herba repens ramosissima carnosa, caulibus ad nodos radicantibus subpilosis; foliis oppositis petiolatis obovato-ellipticis, basi cuneatis obtusis, utrinque glabris, ciliolatis, subtus albido-pallidis subtiliter 3–5-nerviis, enervulosis, petiolo piloso; cæt. ign.

Hab. In locis umbrosis sparse crescit.

Has a close affinity with *P. Ventenatii*, Miq. (DC. Prod. xiv. 446), an East-Indian species.

EUPHORBIACEÆ.

EUPHORBIA DAPHNOIDES, *Balf. fil.*, sp. nov.

Suffrutex, caule tenui, ramulis lignosis teretibus; foliis ad apicem ramulorum confertis, breviter petiolatis, oblanceolatis, obtusis, mucronatis, tenuiter coriaceis, glabris, cito deciduis, exstipulatis; cymis terminalibus, pedunculatis, bracteis 2 magnis coriaceis ovalibus v. suborbicularibus mucronatis, v. retusis v. emarginatis; involucris campanulatis breviter pedicellatis glabris, lobis brevibus, glandulis 5 rubris rotundatis v. lunatis poroso-punctatis integris; stylo brevi; capsula glabra depressa trisulcata, transverso diametro majore, coccis paulum compressis, seminibus ovoideis irregulariter papillatis glabris.

Hab. in valle "Riviere de l'Est" solum.

A very distinct species.

ALOË LOMATOPHYLLOIDES, *Balf. fil.*, sp. n.

Subacaulescens, foliis stellatim patentibus ensiformibus, versus apicem gradatim attenuatis, acutis, dentibus deltoideis paulum incurvatis subrigidis armatis, carnosis, subtus convexis, supra concavis, paginis lævibus, atroviridibus; scapo ramoso, striato, compresso, inferne subalato, alis obscure dentatis, ramulis 2–3 adscendentibus racemos densos gerentibus; bracteis lanceolatis membranaceis; floribus breviter pedicellatis; perianthio obclavato, segmentis lanceolatis, tubum oblongum rectum dilatatumque dimidio superantibus; staminibus perianthio subæquilongis, filamentis membranaceis alatis, basi dilatatis; capsula angulari ovoidea.

Hab. In insula late diffusa. Nom. vulg. Ananas Marron.

PANDANACEÆ.

PANDANUS HETEROCARPUS, *Balf. fil.*, sp. n.

Arbor ramosa, caudice lævi, radicibus aëreis plurimis, ramis patentibus; foliis lanceolato-acuminatis, basi amplexicaulibus dilatatis, erecto-patentibus coriaceis strictis viridescentibus, basi sæpe glaucescentibus subplanis, marginibus per totum costaque subtus a medio distanter rubro-spinosis spinulis subincurvatis; ♀ capitulis solitariis globosis subdepressis v. elliptico-oblongis, nunc longe nunc breviter pedunculatis, pendulosis v. inclinatis, spathis pluribus brevibus deciduis; drupis 2–5-locularibus obpyramidalibus non compressis 5–6-gonis, fere per totum coadunatis, apice breviter pyramidali, rarissime convexo sæpius applanato v. umbilicato, distincte 5–6-angulato, areola centrali stigmata plana sessilia reniformia suberosa cingente.

Hab. Per insulam totam late dispersus. Nom. vulg. Vacoa Calé rouge; V. Calé blanc; V. Sac; V. Poteau; V. Parasol.

A very variable species, approaching *P. utilis*, Bory, Voy. ii. 2, but distinguished by habit, and by its drupes with wide and flattened summits.

P. TENUIFOLIUS, *Balf. fil.*, sp. n.

Arbor parva, caudice lævi, radicibus aëreis paucis, ramis erectis crassis; foliis anguste lineari-lanceolatis acuminatissimis, apice subflagellatis, basi dilatatis lateque amplexicaulibus, coriaceis recurvatis pendulisque, subplanis, atroviridibus, saepe basi dealbatis, marginibus subincrassatis, per totum costaque a medio rubrospinosis, spinis brevibus acutis, incurvatis, adscendentibus; capitulis solitariis pendulosis, pedunculo curvato, paucidrupatis, subglobosis; spathis pluribus, deciduis; drupis subpyriformibus, 2–5-locularibus non-compressis, usque ad $\frac{2}{3}$–$\frac{3}{4}$ a basi coadunatis, parte conjuncta 5–6-gona obpyramidali, apice libero rubiginoso rotundato umbraculiformi obscure 5–6-angulato, vertice applanato v. depresso, areola marginata stigmata plana sessilia reniformia cingente.

Hab. In vallibus montibusque a litore remotis crescit. Nom. vulg. Vacoa Chevron.

A species belonging to the *Utilis* group, and by some (perhaps hybrid) forms approaching very near *P. heterocarpus*, but easily distinguished when typical by habit, the narrow drooping leaves, and the large drupes with rounded apices.

A very marked feature in the Rodriguez flora, and one worthy of special notice, is the variability in size, form, and habit exhibited by the leaves of many plants at different stages of growth. The variation is confined almost absolutely to small trees and shrubby plants, occurring in seventeen species, all of which are either endemic or Mascarene, one only extending into Africa. The young plant, in these heterophyllous species, produces leaves of a lower stage of development than the adult; and as the individual grows older the leaves successively developed are more like those of the mature tree, until at a certain age only the form of leaf typical of the adult is produced. But in an adult plant, should any adventitious shoots be given off from the stem below its first branching, these have the juvenile, not the adult form. The heteromorphism varies greatly in degree and kind; but each species presents variations always of the same kind. Whether all the species of the same genus on the island exhibit, when they vary, the same type of heterophylly, I had no opportunity of determining; certainly representative species in the adjacent islands do not always do so. The phenomenon is confined to no special family; but it is worthy of note that of Rubiaceæ no less than four species exhibit it.

We may best understand the variations in size and form by considering that there are three types of variations.

In the first the difference between the leaves of the young and the adult is mainly one of size, the relative proportion of length and breadth of lamina being the same in both; and in each the margins of the lamina are usually entire. Sometimes the parenchyma is deficient at the margin in the juvenile, so that it is slightly spiny, this character gradually disappearing in the adult. This kind of heterophylly is observed in three species—*Ludia sessiliflora*, *Fernelia buxifolia*, *Carissa Xylopicron*.

The second kind of variation results from the non-development in breadth of the leaves of the young plant, usually accompanied by a great increase in length, the relative proportion of length

to breadth of lamina being vastly different in the juvenile form from what it is in the adult. The lamina is entire, developing equally, though toothings characteristic of the adult may be seen; but it is never lobed or cleft. The leaves in the young plant are thus more or less linear or lanceolate, and, as a rule, greatly exceed the adult in length, being sometimes twice or thrice as long. This is the commonest kind of variation, occurring in nine species, viz. *Dombeya ferruginea*, *Elæodendron orientale*, *Terminalia Benzoin*, *Fœtidia mauritiana*, *Mathurina penduliflora*, *Randia heterophylla*, *Pyrostria trilocularis*, *Scyphochlamys revoluta*, and *Diospyros diversifolia*. Only in *Pyrostria trilocularis* and *Diospyros diversifolia* the linear juvenile leaves do not greatly exceed the adult in length. Probably *Eugenia cotinifolia* is also heterophyllous after this type.

In four species the third type of heteromorphism is seen. Here the lamina in the leaves of the young plants develops unequally, and thus a lobed or cleft leaf is formed; but the relative proportion of length to breadth of lamina is the same in both juvenile and adult. The amount of lobation in the juvenile leaves varies; they may be even twice or thrice cleft; and according as the leaf is pinnately or radiately veined, the leaf is pinnatifid, or palmatifid. The species in which this type is seen are *Aphloia mauritiana*, *Hibiscus liliiflorus*, *Quivisia laciniata*, and *Clerodendron laciniatum*. In *Hibiscus liliiflorus* the palmatifid form occurs; the other three are pinnatifid. In *Abrotanella rhyncocarpa*, a small Composite herb, the leaves as they get older tend to become pinnatifid, the young being quite entire. Its variation, then, is the converse of this third type.

In addition to the alteration in form, there is often a difference between the habit and consistence of the leaves in the juvenile and adult plants. *Dombeya ferruginea* shows this very well. Its green glabrous juvenile leaves are, in the adult, clothed on the under surface with a dense brown tomentum. The converse is sometimes seen, for instance in *Randia heterophylla*, where pubescent juvenile leaves become glabrous in the adult. As to consistence, the hard rigid young leaves of *Ludia sessiliflora* and *Carissa Xylopicron* become in the male more flaccid and coriaceous.

It is curious that *Hibiscus* (*Paritium*) *liliaceus* is not heterophyllous in Rodriguez, though it is recorded as being so on the

coast of Africa; and this is the more remarkable if, as Mr. Dyer suggests (Linn. Soc. Journ. xv. 83), *H. tricuspis* is merely an insular form of this plant.

The Tropical Ferns collected by Professor Steere in the years 1870–75.

By M. W. Harrington, M.A., F.L.S., Assistant Professor of Botany, University of Michigan.

[Read March 1, 1877.]

In the following list the American ferns were collected earliest, and are mostly from the Andes of Peru and Ecuador. The Formosan and Philippine ferns were collected in 1874–75. The specimens were in part identified by me before bringing them to Kew, where Mr. Baker completed the identifications, thus eliminating the novelties for me. My special thanks are due to Mr. Baker, who has aided me much, and to the authorities at Kew, who gave me free access to the herbarium and library.

The order of arrangement is that of Hooker and Baker's 'Synopsis Filicum;' and before each new species I have given the number nearest to which they would fall in the series as given there.

I. Old-World Forms.

Gleichenia dichotoma, *Willd.*	Posia, Formosa.
Cyathea spinulosa, *Wall.*	Balabac Is., Philippines.
Alsophila latebrosa, *Hooker.*	Luzon, Philippines.
Dicksonia Barometz, *Link.*	Posia, Formosa.

14*. Hymenophyllum thuidium, *Harrington*, n. sp.

Stipe slender, 1–3 inches high, winged, from 2–5 in. long, 1–2 in. broad, ovate to oblong, tri- or quadripinnate, erect; rachis and branches winged like the stipe; pinnæ 1 in. long or less, deltoid; wing and ultimate divisions of lamina finely crisped throughout; surface glabrous; sori few to many on the upper part of the froud, at the ends of the ultimate divisions, large; involucre divided nearly to the base; valves large, ovate, crisped.

Mountains of Panay, Philippines, growing thickly on the trunks of trees.