

MISCELLANEOUS BOTANICAL NOTES 1*

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SUMMARY

1. *Papuodendron* C. T. White is reduced to *Hibiscus* L.; the species is renamed: *H. papuodendron* Kosterm.
2. *Hibiscus hooglandianus* represents a new species from New Guinea.
3. New species in *Pentace*: *P. microlepidota* Kosterm., *P. paludosa* Kosterm. and *P. adenophora* Kosterm.
4. *Parapentace* Gagnepain is included in *Burretiodendron* Rehd. As the species of *Parapentace* were published without latin diagnosis, the following new species of *Burretiodendron* are presented: *B. tonkinensis* Kosterm. and *B. brilletii* Kosterm.
5. Two new species of *Heritiera* (*H. rumphii* Kosterm. and *H. ornithocephala* Kosterm.) are described; additional notes on *H. littoralis* from Madagascar, *H. longipetiolata* and *H. arafurensis* are presented.
6. *Heritiera burmensis* Kosterm. is reduced to a synonym of *H. macrophylla* Kurz.
7. *Sterculia cubensis* Urb. is referred to *Hildegardia*; the curious distributional area of *Hildegardia* is stressed.
8. A note on *Hildegardia erythrospikon* Kosterm. is presented.
9. *Sterculia ankaranensis* Arènes is relegated to *Hildegardia*.
10. *Sterculia heritieriformis* Arènes represents a mixture of *Heritiera littoralis* and *Firmiana colorata*.
11. *Sterculia guppyi* Greenwood is a synonym of *Firmiana diversifolia* A. Gray.
12. *Ficus serpyllifolia* Blume belongs actually to Apocynaceae and is renamed: *Micrchites serpyllifolia* (Bl.) Kosterm. It is suggested that *M. radicans* Markgr. is conspecific with this wide-spread species.
13. *Ortholobium* Gagnepain, being inadmissible under the Rules (no latin diagnosis) is replaced by *Cylindrokelupha* Kosterm. The following new species are presented: *C. poilanei* Kosterm., *C. platyphylla* Kosterm.; *C. annamcense* Kosterm. and *C. chevalieri* Kosterm.

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I wish to express here my gratitude to the Ford Foundation, New York and the UNESCO (Southeast Asia Branch), who enabled me by generous grants to visit numerous Herbaria and Botanical Institutes all over the world. The results of this tour, which took place in 1959, will be published in a series of papers, of which this is one.

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Mr. J. van Borssum-Waalkes, the authority in *Hibiscus* and Dr. van Steenis commented at length on *Papuodendron*. For this stimulating exchange of ideas, I am very grateful, and although agreement was not reached, it helped to clarify the problem.

Mr. Anwari Dilmy, the Director of the Herbarium, gave his continuous support in matters directly and indirectly connected with my work. I take this opportunity to express my sincere gratitude.

To Messrs Soekirno, Moh. Anwar and Damhuri, I am indebted for the drawings and to the Harvard University Herbarium for the photograph of *Heritiera ornithocephala*.

MALVACEAE

PAPUODENDRON C. T. White

This monotypical genus was published in 1946 (in *J. Arnold Arb.* 27: 272) and was included in Malvaceae. Van Steenis (in *J. Arnold Arb.* 28: 422. 1947) referred the genus to Bombacaceae, although White, quoting Dadswell, had pointed out that the wood structure fitted the tribe *Hibisceae* rather than the tribe *Durioneae*, as it lacked "tile cells" in the medullary rays, characteristic for the latter.

Borssum Waalkes (in *Reinwardtia* 4: 41—68. 1956) described several *Hibiscus* species (*H. pulvinulifer*, *H. womersleyanus*, *H. carrii*), which are very close to *Papuodendron lepidotum* and could be easily referred to that genus.

The only difference between *Papuodendron* and *Hibiscus* is the position of the anthers. In *Hibiscus* the anthers are rather spaced on the filament tube (which means, that the original filaments differed conspicuously in length) and the staminal tube ends beyond the last anther usually in 5 teeth, which might represent as many sterile filaments.

In *Papuodendron* the anthers are closely packed, which means that their filaments are almost equal in length. In *Papuodendron lepidotum* the 5 sterile teeth are lacking or are too small to be detected.

Although I personally do not think, that for the time being, this relative character is important enough to draw a line between *Papuodendron* and *Hibiscus* and as the three closely related species, mentioned above, were referred by Borssum-Waalkes to *Hibiscus*, I include *Papuodendron* in *Hibiscus*. If later it should be proved, that the position of the anthers in *Hibiscus*

carrii, *H. hooglandianus*, *H. papuodendron*, *H. pulvinifer* and *H. womersleyanus* should be constant and differing from that in *Hibiscus* the genus *Papuodendron* should be reinstated. For the time being I follow Borssum-Waalkes, who has revised *Hibiscus*.

The character of the stamens is again an argument, that Bombacaceae are hardly separable from Malvaceae, if at all.

In *Durio*, species occur with free filaments, i.e., the filaments are grouped in 5 phalanges, of which the composing filaments slightly adhere at base. In other species a tube is formed, in which the composing filaments are free at different heights, a situation comparable to that in *Hibiscus*; likewise there are sterile filaments interpaced with the fertile ones. Sometimes there are single stamens in between the 5 phalanges. This all suggest, that the original number of stamens was 5 (or multiple of that) and as suggested by others, the phalanges could well represent stamens, which have multiplied by division. In some *Durio* species, each filament bears a single cell, but, if indeed these filaments are the result of splitting, this single cell could well represent only half an anther.

The same phenomenon occurs in *Heritiera*, *Pterocymbium* and *Scaphium* in Sterculiaceae. Here again is a staminal tube, where the anthers are placed in a group at the top, but like in *Papuodendron* (and *Hibiscus*), they are either spaced, because of the difference in length of their filaments, and then form a irregular clump, or the filaments are equal in length and their anthers are than placed in a regular ring. Especially in the first case, it is often clear, that the apical part of the anther has split and the cells have become separated, which gives the impression of the anthers having one cell only. The number of cells, however, is 10, which fits with the supposition of 5 anthers, each with two cells.

Hibiscus papuodendron Kosterm., nom. nov. — *Papuodendron lepidotum* C. T. White, I.e.). The specific epithet "*lepidotum*" is not available because of *Hibiscus lepidotum* Borssum-Waalkes, I.e. 63.

An undescribed *Hibiscus* species, which I included temporarily (MSS) in *Papuodendron* is treated below. It is named in honour of Dr. R. D. Hoogland, a well-known collector and botanist of Australian New Guinea.

1. *Hibiscus hooglandianus* Kostermans, *spec. nov.* — Fig. 1.

Arbor, ramulis foliis inflorescentiisque minute lepidotis; foliis orbiculato-ovatis acuminatis; stippulis magnis; inflorescentiis terminalibus, racemis in paniculam laxam dispositis; floribus in axillis bractearum magnarum.

Tree 20 m tall. Bark greenish grey with pustular lenticels; inner bark straw yellow with vertical wedges of soft white tissue. Wood white, fibrous,

soft to cut. Branchlets, leaves and inflorescences covered with minute, scattered, pale, round scales. Leaves rigidly chartaceous, ovate-orbicular, 16—19 by 13—18 cm long, base truncate or subcordate, top acuminate; both surfaces covered with scales; upper surface with obscure veins, prominent on lower one; the two lowest lateral nerves starting from the petiole insertion or slightly above it, lower down a pair of almost horizontal, faint, short, lateral nerves, higher up to 5 pairs of distant, rather patent, lateral nerves, connected by distant parallel secondary nerves. Petiole 4—7 cm long, thick, subtended by large, foliaceous, ovate-orbicular, ca 1—1.5 cm long, caducous, stellate-pilose bracts.

Inflorescence terminal, up to 25 cm long, lepidote, consisting of a main rachis and distant racemes; the latter in the axil of reduced leaves; racemes erect-patent, lower part bare, upper part with shortly pedicelled flowers; each pedicel with a large bract at base. Flower buds globose, lepidote.

TYPUS. — *N.G.F. 4160* (BO)

The species is close to *H. womersleyanus* Borssum-Waalkes, from which it differs mainly by its inflorescence character.

Papua, Central Div., Vesorogo Creek Trail, Sogeri, July, fl. buds, *Womersley N.G.F. U60* (A, BISH, BO, K).

TILIACEAE

PENTACE Hassk.

1. *Pentace microlepidota* Kosterm., *spec. nov.* — Fig. 2.

Arbor, ramulis perparce minute stellato-lepidotis, foliis chartaceis, orbiculatis vel ovato-orbiculatis, basi cordatis vel truncatis, margine crenulatis, supra glabris, nervis impressis, subtus parce stellato-lepidotis, nervis basilibus paucis palmatis; petiolis longis, apice incrassatis, dense stellato-pilosis, sparse minute hirsutis, glabrescentibus; fructum alis semiorbicularibus, sparse minute stellato-lepidotis.

Tree; branchlets sparsely covered with tiny stellate hair like scales, glabrescent. Leaves chartaceous, orbicular to ovate-orbicular, 15—21 cm in diameter, cordate, rarely truncate at base, margin crenulate, above glabrous, smooth, nerves slightly impressed, below covered with a lax layer of greyish, tiny, stellate hair-like scales, midrib prominent, lateral nerves about 5 pairs, basal nerves about 5, palmate, secondary nerves lax, parallel, prominent, tertiary nerves lax, slender. Petiole 8—14 cm, swollen at both ends, the apical swelling covered densely with tiny stellate-hair-like scales, the main stalk sparsely covered with the same scales, glabrescent, base slightly thickened.

Infructescence up to 27 cm long with a long, stout, minutely stellate-lepidote main stalk and slender densely stellate-lepidote few ramifications, up to 6 cm long. Fruit covered with sparse, minute, stellate hairlike scales, glabrescent. Wing semiorbicular, up to 2 x 3 cm.

TYPUS: *Kep. 30305* (KEP).

The specimen is characterized by the large sparsely scaly leaves and samaras.

MALAY PENINSULA, Perak, Tapak, Plus Forest Reserve, Sept., fr., *Kep. 30306* (KEP, K), *30305* (KEP) and *45220* (KEP).

2. *Pentace paludosa* Kosterm., *spec. nov.* — Fig. 3.

Arbor (?), ramulis gracilibus adpresse lepidotis; foliis chartaceis, lanceolatis, acuminatis, supra glabris lucidis, nervo mediano impresso, subtus dense adpresse minute lepidotis, nervo mediano prominente, nervis lateralibus teneribus; petiole distincto; inflorescentibus axillaribus, lepidotis, laxe paniculatis; pedicellis distinctis; calycis tubo distincto, lobis ovato-acutis, lepidotis; petalis unguiculatis spathulatis glabris quam sepalis multo longioribus; staminibus numerosis, glabris, liberis; staminodis liguliformibus; ovario dense fimbriato-lepidoto, costato; stylo glabro longo; stigmate inconspicuo.

Tree (?) with slender, densely, minutely adpressed lepidote branches (scales without fringe, often irregular). Leaves chartaceous, lanceolate, 8—12 x 3—3.5 cm, base shortly acute, apex long acuminate with blunt tip, above smooth, glabrous, midrib impressed; lower surface with two layers of minute non-fimbriate adpressed scales, the top scales larger, midrib prominent, nerves very slender, about 12 pairs, arcuate near margin; the lowest pair often opposite. Petiole slender 5—7 mm long, lepidote. Inflorescences axillary, up to 7 cm long, adpressed lepidote, with few and short ramifications. Pedicels ca 5 mm long, slender, lepidote; calyx tube distinct, cylindrical, saccate at base, 2 mm high, densely fimbriate-lepidote, lobes ovate-acute, 2—3 mm, rarely very short. Petals glabrous, spathulate, unguiculate, ca 7 mm long. Stamens numerous, free, ca 4 mm, glabrous, anthers peltate. Staminodes liguliformous, glabrous, about as long as stamens. Ovary densely fimbriate-lepidote, ribbed, style longer than stamens, glabrous, truncate, slender; stigma small.

TYPUS: *Béjaud 789* (P).

The specimen shows some likeness with *Brownlowia tersa* Kosterm. In *Pentace* it comes in leafshape near *P. laxiflora* Merr. but has much larger flowers.

From the shape of the ovary, it may be assumed, that the species belongs in *Pentace*, although *Biownlowia* should not be outruled, before the mature fruit are known.

CAMBODIA: Trasiyet, inundated forest, fl., *Bejaud 789* (BO, P).

3. *Pentace adenophora* Kosterm., spec. nov. — Fig. 4.

Arbor, ramulis laxe rufo-hirsutis itemque stellato-pilosis, vel stellato-pilosis; foliis rigide chartaceis, suborbicularibus vel ovato-orbicularibus apice rotundatis vel minute apiculatis interdum submarginatis, basi cordatis, supra glabris, nervis principalibus impressis, subtus densissime minute argenteo-stellato-pilosis, pilis cum setis remotis intermixtis, nervis prominentibus, hirsutis, nervibus lateralibus paucis prope margines in glandulas exeuntibus; petiolis conspicuis, hirsutis, stellato-pilosis, glabrescentibus; infructescentibus terminalibus magnis, glabrescentibus; fructibus alatis, alis hirsutis magnis; inflorescentis dense rufo-stellato-pilosis, ramulis distantibus; bracteis lanceolato-acutis, hirsutis; floribus pedicellatis; sepalis pilosis, ovato-acutis, basi connatis; petalis subspathulatis glabris sepalis longioribus; staminibus in phalangeis 5 coalitis; staminodis 5, linearibus glabris.

Tree 25—35 m, diam. 70 cm. Buttresses 1—3 m, thin, out 1—2 m. Bark darkbrown, fissured, scaly; living bark 10 m, pink to red-brown, inner layer yellow, fibrous. Sapwood yellowish, merging into the redbrown heartwood. Branchlets densely rusty stellate pilose, interspaced with stiff bristles or the bristles absent. Leaves rigid chartaceous, sub-orbicular or ovate-orbicular, 8—14 x 9—15 cm, apex rounded or emarginate and often apiculate, margin crenulate, glandbearing at the end of the lateral nerves, base cordate; upper surface glabrous, main nerves impressed, lower surface covered with a dense, grey felt of small stellate hairs, interspaced with stiff bristles, the latter more numerous on the main nerves, veins prominent, lateral nerves 3—4 (—5) pairs (the lower pair at petiole insertion), base often 7-nerved; secondary nerves parallel, prominent, reticulation lax, prominent. Petiole 4—8 cm, apical part often with stiff bristles, glabrescent. Inflorescence terminal, leafy, up to 40 cm long with distant stiff branches, partial inflorescences hardly branched, about 10 cm long, densely lightbrown stellate-pilose; bracts narrowly ovate-acute, persistent for a long time.

Calyx lobes ovate-acute, 3—4 mm long, densely pilose, connate at base; petals spathulate, unguiculate, 6—10 mm long, with longitudinal veins. Stamens in 5 phalanges of about 15 stamens each, glabrous, base connate for 2 mm, filaments 4—5 mm long; staminodes 5, ligulate, alternating with

the staminal phalanges. Wing of fruit stellate-haired, nut with stiff bristles; wing vieux rose, semi-circular, up to 3 x 6 cm.

TYPUS: *Kostermans 13614*- (BO)

DISTRIBUTION: Malay Peninsula, Sumatra, Borneo.

The species is easily recognized by the marginal glands of the crenulate leaves and the pilose samaras. In young trees the leaves are toothed and have a long acumen. They are up to 25 x 30 cm with a 15 cm long petiole.

MALAY PENINSULA: State Land Dungun, Jarangan, 3 miles from Police Station, flatland. July, fl., *Kep. 80810* (A, K, L, SING); Pahang, K. Rompin, alt. 30 m, fr. June, *Kep. 75895* i(KEP); Trengganu, 34th mile Kuala Trengganu - Besut Road, lowland, young tree, *Sinclair and Kiah bin Salleh S.F.N. 40771* (A, BO, K, L, SING); INDONESIA. Sumatra, Inderagiri, alt. 75 m, Sept. ster., 66.30074- (A, BO, L); Borneo. N. Borneo. Kabili For. Res., Sandakan, detached leaves only, *Sy- mington 35645* (KEP); *ibid.*, young tree, *Sinclair 9317* (BO, K, SING); *ibid.*, ster., *B.N.B.F.D. 9294* (BO); *ibid.*, Compt. 10, Kabili F. R., ster., *Agama & Puasa 9294* (SING); *ibid.*, June, fr., *Puasa 4871* (SING); Temburong, Mile % Bangar-Batu Apas Road, March, fr., *Saw 17096* (A, BO, BRI, K, KEP, SING); Indonesian Borneo. East Borneo, Sangkulirang distr., Karangan R. region, sandstone, Aug., fr., *Kostermans 1314* (BO, L); *ibid.*, young tree, *Kostermans 13598* (A, BO, CANB, K, L, SING); West Kutei, Mujup, alt. 50 m, ster., 66.16736 (BO, L); East Kutei, Pengadan, ster., 66.12960 (BO, K, L).

BURRETIODENDRON Rehder and PARAPENTACE Gagnep.

Burretiodendron Rehder was published in 1936 (in J. Arnold Arb. 17: 47) and based on *Pentace esquirolii* L veill , which Rehder considered to be not related to any other genera of Tiliaceae or Sterculiaceae by the uni-sexual flowers, the lack of the 5 staminodes inside the row of stamens, the oblong stamens, and the elongated wings of the fruit and especially by the nectary at the base of the sepals.

In 1943 (in Bull. Soc. bot. France 90: 70) Gagnepain created the genus *Parapentace* with two species. No latin diagnosis of the genus was given, which consequently is not considered to be validly published (Article 34 of the Paris Code).

As is evident from the descriptions (I had moreover the opportunity to examine all specimens) the two genera mentioned above are synonymous, which make the following renaming necessary.

Burretiodendron tonkinensis Kosterm., spec. nov. — *Pentace tonkinensis* A. Chevalier in Bull.  con. Indochine 20: 803. 1918 (nomen nudum); *Parapentace tonkinensis* (Chev.) Gagnepain in Bull. Soc. bot. France 90: 70. 1943 (nomen inval.). Chevalier's name, is a nomen nudum; there are only

remarks on the size of the tree, notes on wood, uses, price and geographical distribution. For the latin description cf. *Parapentace tonkinensis* Gagn., l.c. — Typus. — Brillet 8 (P).

Burreliodendron brilletii Kostermans, spec. nov. — *Parapentace brilletii* Gagnepain in Bull. Soc. bot. France 90: 71. 1943 (nomen inval.).

Arbor. Ramulis floriferi 2—3 mm. crassi, ad apicem tomentoso-stellati, pallidi. Folia suborbicularia, basi leviter cordata, apice abrupte acuminato-obtusa, 6—8 cm. longa lataque, membranacea, utrinque glaberrima, margine dentata, pauculum sinuata; nervi basales 5, n. medius 3—4 lateralibus utrinque comitatus; n. transversales tenues, supra infraque conspicui; venuloe rete densissimum efformantes; petiolus gracilis, 3—4 cm. longus, breviter tomentosus, pallidus. Inflorescentiae ♂ pedunculi axillares, 2—2.5 cm. longi, breviter tomentosi, pallidi, 2—4 flores verticillati gerentes; pedicelli 6—10 mm. longi; alabastrum ovoideum, 5 mm. longum, tomentosum, pallidum; flos 11 mm. longus, apertus 10 mm. latus. Calyx campanulatus, 5-lobus, lobis lanceolatis, longe tempo ad basin coalitis, reflexis, 10 mm. longis, 3 mm. latis, nectario basali notatis. Petala 5, cuneiformia, apice truncato 3 mm. lata, gradatim usque ad basin alveolata. Stamina 15—18, haud vel vix coalita, filamenta 5 mm. longa, anthera oblonga vel elliptica 2 mm. longa, basifixa. Pistillochium ovoideum, 1 mm. longum, stellato-pilosum, apice 3-cuspidatum. Flos ♀ fructusque ignoti.

TYPEUS. — Brillet 19 (P).

This species differs from *B. tonkinensis* by its hardly connate filaments; its pale tomentose inflorescence and the thin, cordate leaves.

Tonkin. Hoa Binh, fl., Brillet 19 (P).

STERCULLACEAE

HERITIERA Ait.

1. *Heritiera rumphii* Kostermans, spec. nov. — Fig. 5.

Atun Utan; Runum Laumuri, Rumphius, Herbarium Amboinense (sub Atunus litorea 3: 95. 1743.

Arbor alta, ramulis minute fimbriate-lepidotis; stipulis aciculatis; foliis chartaceis ellipticis acutiusculis subtrinervis, supra glabris, subtus dense minute adpresse lepidotis; petiolis conspicuis; fructibus magnis alatis, alis longis triangularibus in nucis elongato-ovoidei partem basalem gradatim excurrentibus.

Tree 30 m. tall, 50 cm diameter. Buttresses small. Bark dark brown, cracked, peeling off in large pieces. Branchlets densely adpressed lepidote, scales very small, fimbriate. Stipules aciculate, 1 cm, caducous. Leaves chartaceous, elliptical 13—30 x 5—17 cm., top obscurely acuminate, base rounded or obscurely subcordate; above glabrous, smooth, lateral nerves slightly impressed; lower surface densely adpressed, minutely, silvery lepidote, midrib prominent, nerves ca 10 pairs, prominent, running out arcuately towards margin, the lower two pairs opposite, slightly subtriplinerved; secondary nerves prominulous, lax. Petiole up to 3.5 cm long, swollen at both ends, lepidote. Fruit ellipsoid-ovoid, glossy, smooth, nut up to 7.5 cm long, 3.5 cm wide, a short neck at base, apex with a conspicuous triangular up to 2.5 cm long wing which merges gradually into the basal ridge of the nut.

TYPUS. — *Kuswata & Soepadmo 303* (BO).

The species was mentioned for the first time by Rumphius in 1743, but never collected again. The description of the leaves, as given by Rumphius fits, but he described the fruit as being shorter, broader and rounder than those of *H. littoralis*, which they are certainly not. I formerly included the species hesitatingly in *H. arafurensis*. When the two botanists Kuswata and Soepadmo planned to make a collecting trip to the island of Amboina, I asked them to be on the look-out for this species. They were very lucky to locate a tree not far from the township of Amboina and found plenty of old fruit together with seedlings, the later were brought alive to the Bogor Gardens.

The fruit resembles somewhat that of *H. littoralis*, but the wing is differently shaped. The leaves resemble those of *H. novoguineensis* by their long petioles.

AMBOINA, road from Ambon township to Kusukususereh, about 2 km from Ambon, Manggadua, limestone rocks, alt. 150 m., *Kuswata and Soepadmo 303*, old fruit Sept. (A, BO, K, L, LAE, P, SING, US).

2. *Heritiera ornithocephala* Kosterm., *spec. nov.* — Fig. 6.

Brownlowia species, A. C. Smith in *J. Arnold Arb.* 26: 101. 1945.

Arbor, ramulis dense lepidotis; foliis alternantibus rigide chartaceis vel coriaceis ellipticis acutis vel subacutis, basi subobtusis, subtus lepidotis, distincte petiolatis; fructibus caputis avis simillimus, lepidotis.

Tree up to 35 m tall and 1 m in diameter with low buttresses (Mead); branchlets densely, minutely lepidote. Leaves alternate, rigid chartaceous or coriaceous, elliptical, 8—9 x 3.2—3.8 cm, apex acute or subacute, base

slightly narrowed and obtusish; upper surface smooth, somewhat glossy, veins flush with the surface or very slightly raised; lower surface with a dense adpressed layer of tiny, radially striate, aureous, fimbriate scales; midrib prominent, nerves 12—13 pairs, the lowest pair starting at the petiole insertion; secondary nerves scarcely prominulous, laxly reticulate. Petiole 1.6—2 cm long. Fruit shaped like a birds head, sessile, with a short neck at base, densely, minutely lightbrown-lepidote, the fruit 4.5—5 cm long, 2.5 cm diam., 1.7 cm thick, more or less obliquely ellipsoid-globose; the beak (wing) flattened and obtuse, about 1 cm long.

Infructescence 4.5 cm long (not including fruit).

TYPUS. — *Home 905* (A).

Vernac. names. Tofaki; Rongi (Tholo North); Thaundamu (savai).

Apart from the rather poor type specimen, collected between 1877—78 in Fiji, no fertile specimens are known. Several specimens, collected from young trees, are known. They were not recognized and incorporated in *Brownlowia*, (Tiliaceae) and one in *Heritiera littoralis*.

The leaves of the youngest specimens are up to 30 x 14 cm, the lower leafside being silvery; in older trees the leaves become gradually smaller and the lower leaf surface becomes more aureous. The stipules are up to 1.5 cm long, slender and acute.

FIJI ISL., Mandarivatu, alt. 1000 m, March, ster., *Mead F.N. 1975* (K); Viti Levu, Rewa Prov., slopes of Korombambu Mt., alt. 200 m, Aug., ster., *Gillespie 2372* (GH); Namosi Prov., near Namuamua, alt. 400 m, Sept., ster., *Gillespie 8000* (GH); *ibid.*, ster., *Greenwood 957A* (A, BISH, GH, K, US); Tholo North, Mt. Victoria, alt. 970 m, May, ster., *Greenwood 1177* (BISH, GH); Mba, Lantoka, East of sawmill at Navai Hills between Nggaliwana and Tumbein dreketi Creeks, alt. 800 m, young tree, *A. C. Smith 6019* (A, GH, K, US); S. slopes of Nansori Highlands, in drainage of Nemosi Creek above Tubenasole, alt. 400 m., ster., *A. C. Smith 4580* (A, GH, K, US); locality not indicated, fr., *Home 905* (A, K); Tonga Isl. Kao, May, ster., *Yuncker 15949* (US); Niue, alt. 500 m ster., *Greenwood 957* (A, BISH, GH, K, US); Mutukau, alt. 65 m, *Yuncker 10244* (BISH, K).

3. HERITIERA LITTORALIS Ait.

J. Arènes (in *Mém. Inst. Scientif. Madagascar*, ser. B., vol. 7: 76. 1956, fig. IV) recognizes two subspecies, *littoralis* and *Ralima*. The first should be characterized by the relatively slender branches of the infructescence. This is certainly wrong. We were able to study abundant material, living and herbarium material; the infructescence of *H. littoralis* is always robust. In all our material and in the field I have never discovered a variety of *H. littoralis*. All parts of a single individual are enormously variable.

As to the subspecies *Ralima* I omitted to examine (in Paris) the specimens closely; the shape of the fruit falls within the variability of *H. littoralis*: the branch depicted as subspecies *littoralis* (IV, 2) is aberrant by its long petioles. Plate IV, 1 depicts a typical *H. littoralis* branch. Has a mix-up of branches and detached fruit occurred?

In that case — if IV. 2 and IV, 7 belong together, an undescribed species is involved.

4. HERITIERA LONGIPETIOLATA Kanehira.

In my paper: "A monograph of the genus *Heritiera*" (Publication 1, Council for Sciences of Indonesia, Djakarta, April 1959), the citation of the numbers *Fosberg* 26383 and 25404- should be deleted. They represent *H. littoralis*.

5. HERITIERA ARAPURENSIS Kosterm.

That this species occurs in N. Celebes can be proved now by a specimen, collected by Riedel (s.n., fruiting, K) in Gorontalo; the numbers *bb.* 32484 and 31884 can now be definitely relegated to this species.

6. HERITIERA BURMENSIS Kosterm. and *H. MACROPHYLLA* Kurz.

After having been in the position to examine more material of *H. macrophylla* in the Dehra Dun, Calcutta and Kew herbaria, I have come to the conclusion, that *H. burmensis* is conspecific with *H. macrophylla* and has to be deleted.

In the Stockholm herbarium I found a specimen of *H. macrophylla*, marked *Heritiera grandis* Fisch., leg. K. Forsberg, floret Kew 1850; *H. macrophylla* Hortor. belg.). This might represent the base for *H. grandis* Fisch. ex Steudel (nomen). It is possible that *H. fischeri* Regel and Rach. represents also *H. macrophylla*.

In the Baillon herbarium in Paris a specimen of *H. littoralis* is represented, which is marked *Systemon fischeri* Regel. This might be the base of *H. fischeri* (*S. fischeri* = *Galipea* Aubl., Rutaceae).

HILDEGARDIA Schott & Endl.

1. *Hildegardia cubensis* (Urban) Kostermans, *comb. nov.*

Sterculia cubensis Urban (basionym), *Symbol. Antill.* 9: 235. 1924.

During my stay in Santiago de las Vegas, south of Havana, Cuba, I had the opportunity to examine a living specimen of *Sterculia cubensis*, which

is endemic in Cuba. The tree with its grey-green, glossy, smooth bark, buttresses, the small crown, the succulent leaves, the branchlets with the large soft pith, reminded me immediately of *Hildegardia*.

Dr. Royg y Mesa could provide me with some fruiting material of this tree, collected several years before and it became at once clear, that *Sterculia cubensis* belongs in *Hildegardia*. The fruit are flat, papery, non-dehiscent and have one seed.

In Leon and Alain, Flora de Cuba 3: 290. 1953, nothing is said about the fruit, which was apparently unknown to these authors. They state that the species is in danger of becoming extinct.

The tree occurs in a limited area between the provinces of Oriente and Camaguey.

In Stockholm I had the opportunity to examine the type specimen of *St. cubensis* Urban (*Ekman 4867*); although the fruit of *H. cubensis* strongly resemble those of *H. barteri* (Mast.) Kosterm. from Africa, a tree cultivated all over the tropics in Botanic Gardens, the flowers are entirely different.

The genus *Hildegardia* has a very peculiar distribution; one species in Cuba, two in tropical east Africa, three in Madagascar, one in continental tropical Asia, one in the Philippines and one on the island of Sumbawa in Indonesia.

2. In my paper: A monograph of the genus *Heritiera* (Publication of the Council for Sciences in Indonesia, April 1959, Djakarta) page 74 two mistakes crept in. The combination *Hildegardia erythrosiphon* (Baillon) Kostermans was published already in 1954 (in Bull. Jard. bot. Bruxelles 24: 335), whereas the combination *H. perrieri* (Hochreutiner) Arènes was made by Arènes in 1956 (in Mém. Inst. scientif. Madagascar, sér. B. vol. 7: 122).

3. The type specimen of *Hildegardia merrittii* (Merr.) Kosterm. (*Merritt F.B. 8555*) could be examined in the New York Botanical Gardens herbarium (an isotype specimen is deposited in the Kew Gardens Herbarium). The specimens consists of some old, fallen, deteriorated leaves and loose fruit.

4. HILDEGARDIA ERYTHROSIPHON (Baill.) Kosterm.

Arènes (in Mém. Inst. scientif. Madagascar, sér. B. vol. 1: 2—5. 1949; *ibid.* 7: 122—123. 1956) recognizes no less than 3 subspecies, 7 varieties and even 2 subvarieties of this species.

I can hardly imagine that these have any real value in nature. According to my experience in tropical trees it is very difficult, if not impossible, to recognize varieties, unless an enormous quantity of material is available

one is well acquainted with the variability in the field. The variation in a single individual tree is already very large. Although I have not examined the above mentioned varieties, etc., I am sure that a revision will prove that they do not exist or that different species are involved; the chance for the latter is, however, very small.

5. *Hildegardia ankaranensis* (Arènes) Kosterm., *comb. nov.*

Sterculia ankaranensis J. Arènes (basonym) in *Mém. Inst. scientif. Madagascar*, sér. B, 7: 72. 1956.

I could examine the type specimen (*Humbert 18981 bis*) in the Paris herbarium. The leaves are typical for *Hildegardia* and according to the structure of the follicle (which has been torn open in the type specimen) it must definitely be a *Hildegardia*.

STERCULIA L.

1. STERCULIA HERITIERIFORMES J. Arènes.

Of this species, published in *Mém. Inst. scientif. Madagascar*, sér. B., vol 7: 71. 1956, fig. III, I could examine the type specimen in the Paris herbarium.

I agree with Capuron, who made a note on this specimen, that it represents a "mixtum compositum", the leafy branch belongs to *Heritiera littoralis*, the flowers are those of *Firmiana colorata*.

The scales of the lower leaf surface of *Heritiera littoralis* are wrongly drawn.

2. STERCULIA GUPPYI Greenwood

This name was published in *Kew Bull.* 1929: 240 to replace *Sterculia diversifolia* (A. Gray) Seemann (*Fl. Vit.* 23. 1865), as the latter is a later homonym of *Sterculia diversifolia* G. Don, 1830 from Australia, As, however, the status of *Firmiana* has been well established now, *Sterculia guppyi* becomes a synonym of *Firmiana diversifolia* A. Gray, whereas *Sterculia diversifolia* G. Don represents *Brachychiton diversifolium* (G. Don) R. Br.

APOCYNACEAE.

FICUS SERPILLIPOLIA Blume.

Ficus serpillifolia Blume (*Bijdr. Fl. Ned. Ind.*, 9e Stuk: 443. 1825) was described after a sterile specimen, collected in Java (no precise locality indicated), known under the vernacular name: djuket seriawan (djuket = grass = herb; seriawan is a deficiency illness; apparently the plant was used as a

medicinal herb), of which a fragment is represented in the Bogor Herbarium. The species has been collected many times since, but all specimens are sterile. Because of its opposite leaves, I referred it to Apocynaceae. After E. H. J. Corner (Cambridge) expelled it from the genus *Ficus* and referred it tentatively to *Willughbeia* in Apocynaceae, I re-examined the Bogor specimens and I am now able to refer the species definitely to *Micrechites* as *Micrechites serpyllifolia* (Bl.) Kosterm. comb. nov. (basionym: *Ficus serpyllifolia* Bl.). A flowering specimen of *Micrechites radicans* (Wall.) Markgraf from New Guinea (Brass 8091) is almost certainly conspecific with our species. The species is widely distributed in Malaysia. I collected it in Borneo. Blume himself altered the orthography of the specific epithet on the label of his type specimen; I believe it advisable to follow this correction.

LEGUMINOSAE

ORTHOLOBIUM Gagnepain and CYLINDROKELUPHA Kosterm.

As *Ortholobium* Gagnepain was published in 1952 (in Bull. Soc. bot. France 99: 36) without a Latin description, and since it does not represent a "descriptio generico-specifica", the name was not validly published and has to be replaced by *Cylindrokelupha* Kosterm. (in Bull. 20, Organ. scient. Research Indonesia 20, Dec. 1954; Addit. Notes on Mimosaceae; the genera *Mammea* L. and *Ochrocarpos* Thou. 7, Jan. 1956).

It is recommended in the Rules to avoid the use of nomina nuda which Gagnepain's names are not. In the interest of stability of nomenclature it is better to take up his names.

1. *Cylindrokelupha poilanei* Kosterm., *spec. nov.*

Ortholobium umbellatum Gagnep. (nomen inval.) in Bull. Soc. bot. France 99: 37. 1952.

Arbor modice elata, pluricaulis, ramis validis brevibus. Ramuli validi, 6—5 mm. diam., glabri, pallide rufi. Folia bipinnata petiolo brevi, 2—3 cm. longo; pennae 2, oppositae, paris folioli 3 gerentes; foliola obovata, utrinque obtusa, asymetrica, parte superiore latiora, 5—11 cm. longa, 3—5 cm. lata, deinde 14 x 8 cm. attingentia, glaberrima; nervi secundarii 3—4 utrinque, ad basin decurrentes; venulae transversales reticulatae, petioluli 4—5 mm. longi, basi glandulosi. Inflorescentiae umbellulis compositae, sat remotae, sessiles; pedunculi numerosi, capitula 3—5-flora gerentes; floribus sessilibus, alabastro ovoideo-cylindraco, 8—9 mm. longo, ad apicem calycis constricto. Calyx ovoideus, 5-mm. longis, lobis 5, deltoideo-abbreviatis. Corolla 15 mm. longa, sursum dilatata; lobis 5.5 mm. longis, glabris, dorso apiceque pilosis, pilis appressis. Stamina numerosissima, filamentis ad 3 mm. coalitis,

sinuatis; antheris orbicularibus, bast apiceque emarginatis, deinde prominentibus. Ovarium 2 mm. stipitatum, 2.5—3 mm. longum, glabrum; ovulis usque 10 et ultra. Legumen saepissime solitarium subsessile, 10—12 cm. longum, rectum, cylindraceum, 2.5—3 cm. latum crassumque; seminibus globosis, vel compressim truncatis, 25 mm. diam., saepe medulla dissepimentiiformi disjunctis.

TYPUS. — *Poilane 6328 (P)*.

VERNAC. NAMES. — Cay dai heo; Bopla unh.

ANNAM. — N. of Ninh-hoa, Prov. of Nhatrang, *Poilane 6328 (P)*.

2. *Cylindrokelypha platyphylla* Kosterm. *spec. nov.*

Ortholobium platyphyllum Gagnepain. (nomen inval.) in Bull. Soc. bot. France 99: 37. 1952.

Arbor 8—9 m. alta; trunco 15 cm. diam., mox ramoso, ramis numerosis. Ramuli glaberrimi, pallide rufi, teretes, 5 mm. crassi, sat virgati vel sinuati. Folia pinnata, petiolo communi 4 cm. longo, petiolos secundarios inaequales ad apicem gerente; foliolis in unumquinque 6, ovalibus; supremis 15 cm. longis, 10 cm. latis atingentibus, minoribus 10 cm. longis, 7 cm. latis, omnibus supra nitidissimis, infra pallidioribus, basi obtusis, apice attenuato-obtusis, symmetricis; nervis secundariis 3—4-jugis, ad costam decurrentibus; venulis laxe reticulatis; petiolo 5 mm. circiter longo. Inflorescentiae fructigerae racemosae, capitula efformantiae, breves, 15—20 cm. longae, oligocarpae. Pedunculus ultimus 1—2 cm. longus, legumen immaturum gerens, 6 cm. longum, 3 cm. latum, marginibus rectis, compressum, faciebus concaviusculis. Legumen maturum (*jide Poilane*) longum crassumque, seminibus crassis.

TYPUS. — *Poilane 11161 (P)*.

VERNAC. NAMES. — To no chi an.

The mature pods should weigh 1 kilogram and the seeds 0.1 kg. according to *Poilane*.

ANNAM. S. E. of Lang-khoai, Prov. of Quang-tri, *Poilane 11161 (P)*; Prov. of Thanh-hoa, Phong-y, *Poilane 1650 (P)*; Prov. of Vinh, Bukhang, *Poilane 1666U (P)*.

3. *Cylindrokelypha annamense* Kosterm., *spec. nov.*

Ortholobium annamense Gagnepain (nomen invalid.) in Bull. Soc. bot. France 99: 37. 1952.

Arbor 5—15 m. trunco 8—30 cm. diam. Ramuli validi 4—6 mm. crassi, pallide rufi, glaberrimi. Folia bipinnata, petiolo communi 15 mm. longo;

petiolis secundariis oppositis 1-geminis, 4—5 cm. longis, 2—6 foliolis gerentibus; foliola lanceolato-oblonga, basi attenuata, apice acuminata, suprema ampliora, 7—10 cm. longa, 2—3.5 cm. lata, glaberrima, subsymetrica; nervi secundarii 6—7 utrinque, ad costam decurrentes, intra marginem arcuati confluentesque; petioluli 3—4 mm. longi; glandula cupularis, ad apicem petiolum sita. Inflorescentia 10 cm. longa paniculata, capitula gerens, floribus pilosis, pilis appressis; inflor. fructigera axillaris capitula nonnulla saepe legumen solitarium gerens, pedunculo communi 4—6 cm. longo, capitulo circiter 10-floro (id est cicatricibus 10 notato). Calyx glaber sessile; corolla appresse pilosa (teste reliquiae). Legumen (haud maturum) 10 cm. longum, 15—20 mm. latum, crassum sed faciebus planis, rectum; maturum 3.5 cm. latum, 2.5 cm. crassum; semina globosa vel ellipsoidea 15—20 mm. diam.

TYPUS. — *Poilane 24418 (P).*

VERNAC. NAME. — Xi ko clio (Moi).

ANNAM. Prov. Haute Donnai, Braian near Djiring, *Poilane 24418 (P)*; Prov. Darlac, Chu-yang-sin Mountain range, *Poilane 32620 (P)*; E. of Nhatrang, *Poilane 4385 (P)*; Tonkin, prov. of Vinh-yen, Tam-das, *Eberhardt 5029 (P).*

4. *Cylindrokelupha chevalieri* Kosterm., *spec. nov.*

Ortholobium chevalieri Gagnepain (nomen invalid.) in Bull. Soc. bot. France 99: 38. 1952.

Ramuli grisei, 3 mm. crassi, deinde pulverulenti vel furfuracei. Folia bipinnata; petiolus communis 15 mm. longis; petioli secundarii 2.3 cm. longi, bifoliolati, graciles, glabri, foliolis alternis, symmetricis, lanceolatis, basi acuto attenuatis, apice acuminato-obtusis, persistentibus, firmis vel subcoriaceis, supra nitidis, in sicco brunnescentibus, 7—9 cm. longis, 3—4 cm. latis; nervis secundariis 3—4 jugis, suboppositis, ad costam decurrentibus, infimis apicem subattingentibus, intra marginem arcuatis confluentibus; venulis transversalibus reticulatisque infra prominulentibus. Inflorescentia fructigera 10 cm. longa, capitula nonnulla gerens; flores ignoti. Legumen monospermum orbiculare, valde convexum, 3 cm. diam; vel 3-spermum, oblonga, 10 cm. longum, circiter 4 cm. latum, 2 cm. crassum, rectum, valde convexum, basi 1 cm. stipitatum, apice abrupte apiculatum, faciebus levibus, venis laxe reticulatis; semina 1—3, subglobosa, vel compressim truncata, 2.5—3 cm. longa, 2—2.5 cm. lata false dissepimentis disjuncta.

TYPUS. — *Chevalier 38636 (P).*

ANNAM. Prov. of Nhatrang, Hon-ba mountain range, *Chevalier 38636 (P)*; ct 38682 (P); Col des Nuages, near Tourane, *Poilana 7845 (P).*



Fig. 1. — *Hibiscus hooglandianus* Kosterm.

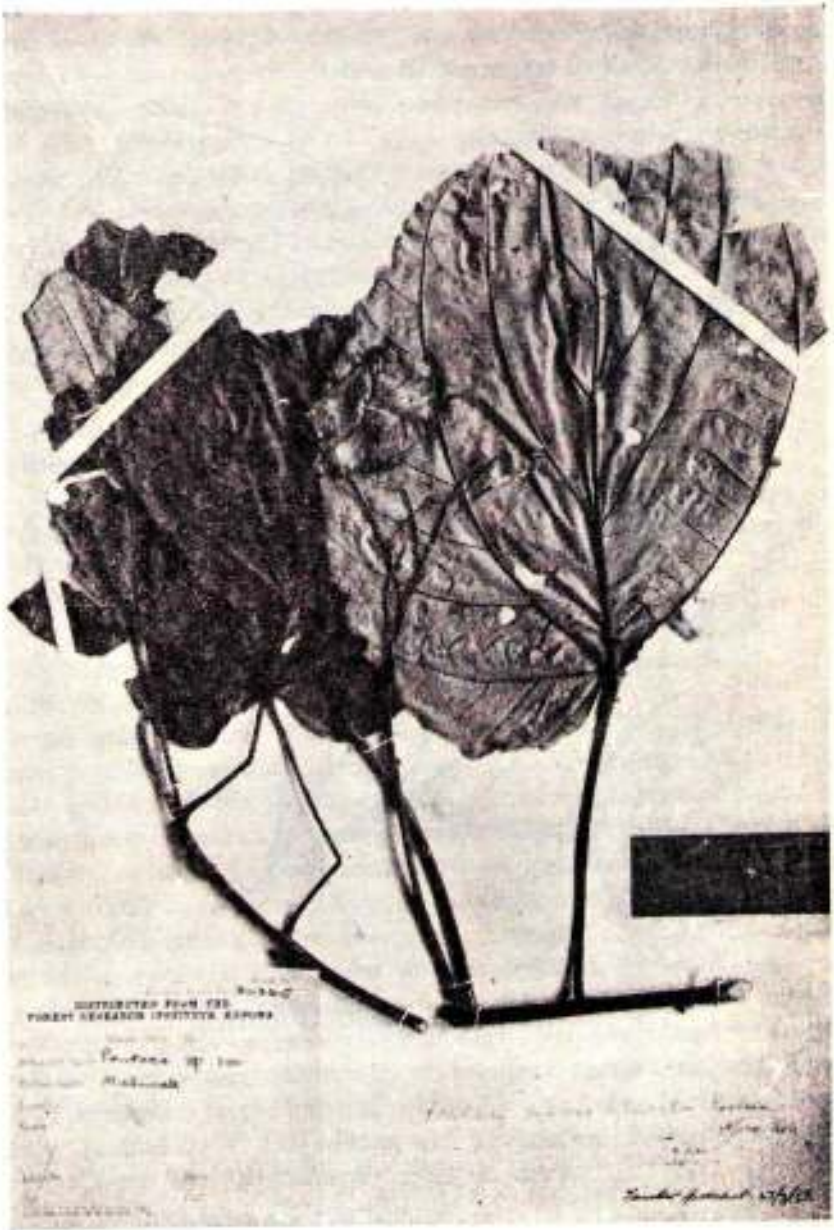


Fig. 2. — *Pentace microlepidota* Kosterm.



Fig. 3. — *Pentace paludosa* Kosterm.

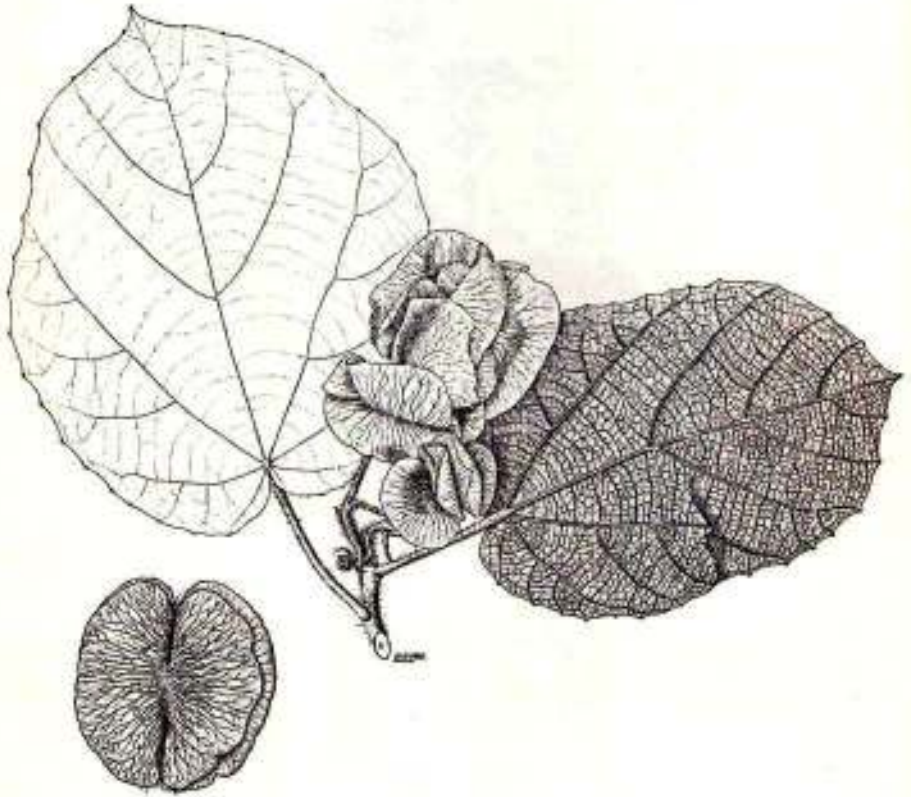


Fig. 4. — *Pentace adenophora* Kosterm,

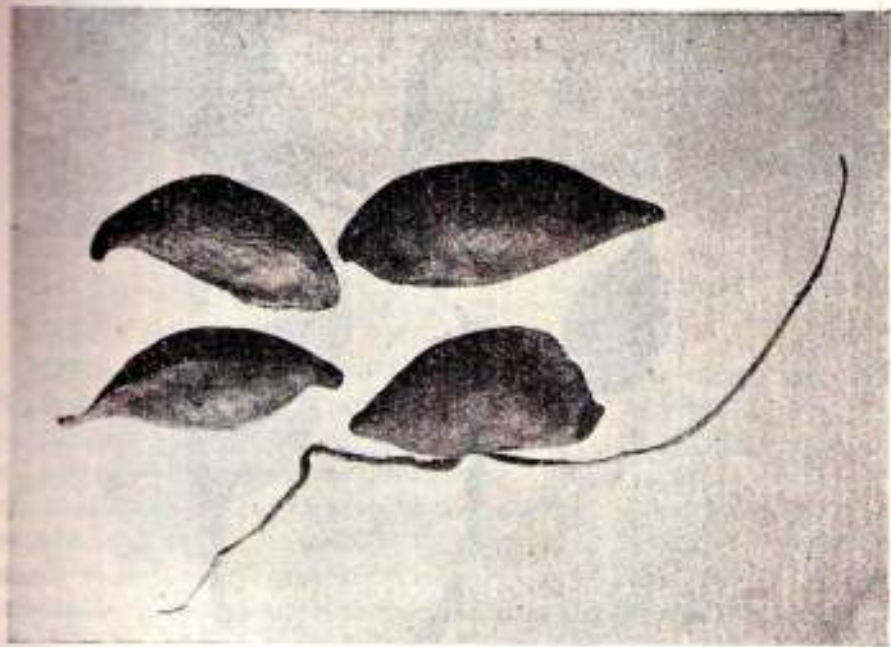


Fig. 5. — *Heritiera rumphii* Kosterm.



Fig. 6. — *Heritiera ornithocephala* Kosterm.