REDUCTION OF TWO ENDEMIC MONOTYPIC PAPUAN GENERA

BY

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1. LAMIOFRUTEX LAUTERBACH = VAVAEA BTH. (MELIACEAE)

Among the rather numerous monotypic endemic genera described from New Guinea there are some of which the position is doubtful. One of them is *Lamiofrutex* Lauterbach (Nova Guinea 14 : 147. 1924) referred by its author to the Rutaceae, presumably on account of its pellucid-dotted leaves. ENGLER (Nat.Pfl.Fam.ed.2, 19a : 330. 1931) had little hesitation to insert it in the Aurantioideae next to *Atalantia*.

The plant of which authentic material is preserved both at Bogor and Leiden appears to represent a species of *Vavaea*, of the Meliaceae.

I have compared it with 14 of the 16 species described, and I cannot reduce it to any of them; apparently it represents an unknown species. Its specific epithet papuanus cannot be used in Vavaea on account of *V. papuana* F. M. Bailey. It is therefore renamed here: **Vavaea lamii** nom.nov. — *Lamiofrutex papuanus* Laut. Nova Guinea 14 : 147. 1924.

Among the Vavaeas it is distinguished by thin leaves, absence of

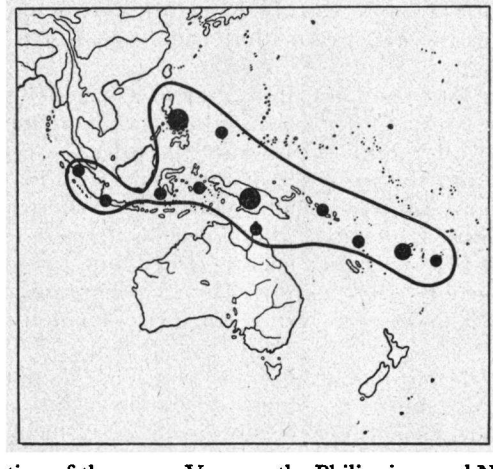

Fig. 1. Distribution of the genus Vavaea; the Philippines and New Guinea possess ca. 5 spp. each, Fiji 3, the other dots represent the occurrence of one species or one locality.

indument, a nearly entire staminal tube, and its habit which is that of an unbranched 1 m high shrub. Specific distinction in this genus is difficult, and many reductions may be expected by a future revisor.

Notwithstanding the rather large number of species, specimens are few and apparently rare. The richest centres of development (in described species) are New Guinea and the Philippines. The area of distribution is gradually becoming clear and I have drawn it on the accompanying map. As with several genera which are now known as largely Malaysian, the first species described was from the margin of the area viz *V. amicorum* Bth. from the Tonga group, E of Fiji, the easternmost extension of the genus. In West Malaysia there is still a gap in the area by the absence of Vavaea in Borneo; it may be expected to occur there (fig. 1).

2. Classification and revision of the genus Nouhuysia (= Idenburgia), family Guttiferae.

In 1939, while checking some generic names of Papuan plants, I found that *Nouhuysia* Lauterbach described in the Guttiferae (1912) and *Idenburgia* Gibbs (1917) referred to the Monimiaceae are identical.

According to a private communication (May 1951) Dr J. G. B. Beumée had independently reached a similar conclusion earlier.

The position of *Idenburgia* in the Monimiaceae has been connected with that of *Trimenia* and *Piptocalyx*. Miss Gibbs was convinced of this alliance although she regarded both genera as anomalous in the family in her earlier work and established a separate tribe for them, and later (1917) a separate though allied family Trimeniaceae in which she also included Idenburgia on the strength of anatomical characteristics.

L. Mooney, I. W. Bailey & B. G. L. Swamy (Journ.Arn.Arb. 31 : 373, 395. 1950) in their thorough anatomical study of the Monimiaceae keep both families Monimiaceae and Trimeniaceae separate, but have come to the conclusion that Idenburgia does not belong to either of them.

Hitherto there has been no doubt about the placing of *Nouhuysia* in the Guttiferae, and a closer examination has confirmed this, mainly by the absence of the pellucid-punctate balsam cells typical of Monimiaceous leaves and the presence of short, but distinct resinous ducts in the young leaves and tepals, both characters hitherto not described.

Within the family Guttiferae *Nouhuysia* occupies a rather separate position, specially in its habit: leaves spread but pseudo-whorled on the nodes (similarly to those found in many other genera e.g. *Daphniphyllum*, *Drimys*, *Pittosporum*, *Terminalia*, etc.) which are distinctly glandular-dentate.

Engler (Nat.Pfl.Fam.ed.2, 21 : 169 seq. 1925) placed it in the tribe Calophylleae, but this seems definitely erroneous. In determining *Nouhuysia* with Engler's system one arrives closer to the Formosan genus *Owataria* Matsumura (Bot.Mag.Tokyo 14 : 1. 1900) in the tribe Clusieae. Besides being entirely different in floral structure, this genus seems to be doubtful in the Guttiferae since Gagnepain

(Fl.Gén.Indochine 5 : 426. 1926) has reduced it to the Euphorbiaceous *Gelonium*, a reduction which needs corroboration.

In my opinion *Nouhuysia* is undoubtedly representing a separate tribe of the Guttiferae which I will name:

Tribus *Nouhuysieae*, trib. nov. Guttiferarum. Folia sparsa vel ± pseudoverticillata ad nodos, margine glanduloso-dentata. Racemi terminali; segmenta perianthii 4, dimera, caduca. Antherae elongatae, 6—12 uniseriatim dispositae, longitudinaliter dehiscentes. Ovarium 2-loculare, ovulum 1 pro loculo, ab apice pendens. Drupa 2 vel 1 seminata, interiore ruminata.

Typus: *Nouhuysia* Laut. Nova Guinea 8^4 : 843. 1912.

The examination of the pollen of *Nouhuysia* was kindly executed by Dr G. Erdtman, Director of the Palynological Institute at Stockholm. He shares my opinion about the status of *Nouhuysia* in Guttiferae; he finds a few features in common with *Montrouziera* and *Symphonia*, from New Caledonia and Madagascar respectively. His diagnosis of the pollen of the specimen Kostermans 2198, dd. 6/6/51, runs: Pollen grains 3-porate, oblate (14.5 × 20.5 μ). Exine 1.5 μ thick. Sexine thinner than nexine, tegillate, faintly baculate; pattern ± obscure. Pore diameter about 3 μ. Grains ± circular in polar view, ± rectangular (with thin, depressed, slightly irregular polar areas) in equatorial view.

As to the demarcation of the species it is clear that *Nouhuysia papuana* Laut. has been redescribed in *Idenburgia*, and a thorough investigation has resulted in the distinction of only 3 species by reducing 3 other names to synonymy. Of *N. arfakensis* Gibbs I had no material but a recent collection in the type locality by Dr Kostermans has furnished excellent material entirely fitting the type description and figure. I have also not seen type material of *I. pauciflora*, but according to Dr Smith's full description it is a marked species. Of all other types I could examine type material as Dr Beumée had formerly secured fragments of the types for the Bogor Herbarium at Berlin.

The following general remarks are made on the variability.

(1) Indument. The indument in *N. papuana* Laut. is very scarce. The inflorescence is slightly hairy becoming glabrescent with age. But in several specimens the hairs on rhachis and pedicels have been replaced by minute brown scurfy scales. In one sheet (Kostermans 2198) I found both types of indument in one number. This is apparently a case similar to some others I found in Javan *Rhododendron* and in *Aglaia* where in one species a hairy or lepidote indument can occur. The occurrence of some ciliae on the tepals is of no importance, all intergrades to glabrous ones occur.

(2) Floral bracts. In *N. papuana* the bracts are early caducous, but young inflorescences have a strongly strobiloid appearance resembling that of *Trimenia* and *Piptocalyx*, to which resemblance adds the slightly carinate midrib (through pressure?) of bracts and outer tepals. Such bracts are not found in *N. arfakensis* as far as the material permitted to observe.

(3) Tepals. The two outer tepals are distinct from the 2 inner

by their slightly saccate solid base. One could accept them to represent large bracteoles.

(4) Third whorl of tepals. The occurrence of a third whorl of tepals is mentioned and figured for a specimen described by GILG & SCHLECHTER as *I. pachyphylla*. The occurrence of these lanceolate-oblong segments seems occasional. In the dozens of flowers which I

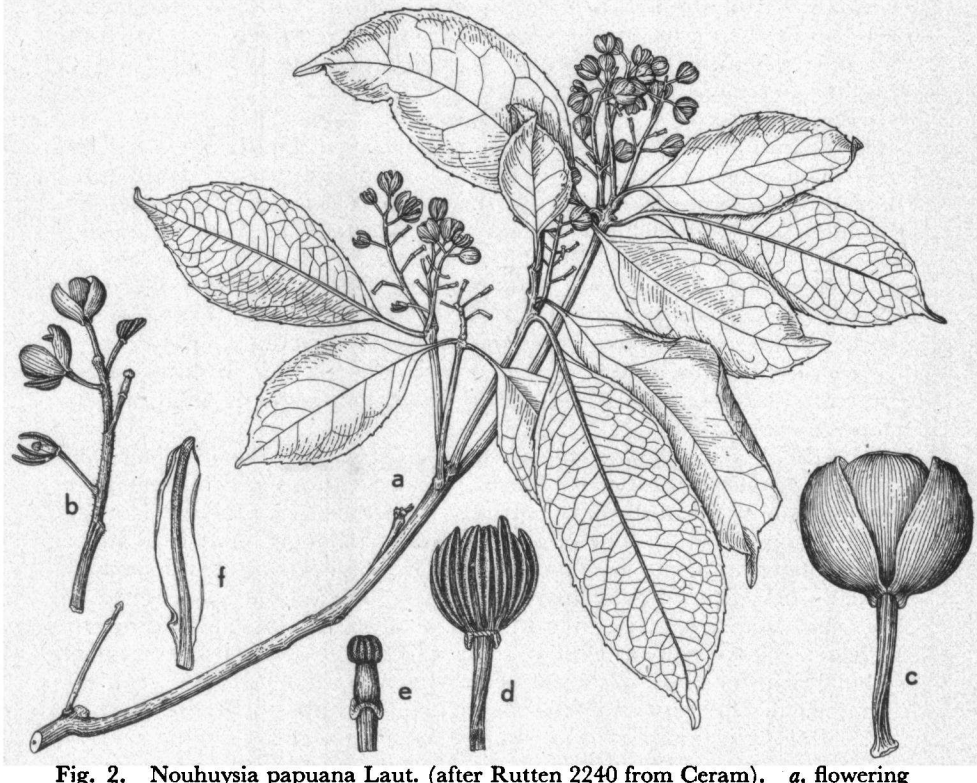

Fig. 2. Nouhuysia papuana Laut. (after Rutten 2240 from Ceram). *a.* flowering twig, × 1/2, *b.* inflorescence, nat. size, *c.* ripe bud, × 3, *d.* flower during anthesis, × 3, *e.* pistillum, × 3, *f.* anther dorsal side, × 5.

dissected I found only once one such segment (PULLE 681) and that was obliquely placed and not decussate as pictured by GILG & SCHLECHTER. It did certainly not belong to the staminal whorl but could well be imagined to represent a staminode of a potential second staminal whorl.

(5) Stamens. The stamens in all specimens are much alike and the androecium certainly has the aspects of the Trimeniaceae. The number is in *N. arfakensis* 6, and in *N. papuana* 8—12 (in one flower 7 only). Flowers of the same twig may in the latter species vary in number of stamens. The arrangement is mostly more or less flattened, one anther being found at the ends of the ellipsoid cluster. In several flowers I found occasionally anthers forked towards their apex.

(6) Gynoecium. The shape of the ovary I do not regard as of taxonomic value, being different in different stages of development in bud and during anthesis. In young buds the floral parts are cramped, later they expand a little when the tepals have dropped. In some specimens some ciliae are developed on the terminal blunt edge of the tepals; only in *N. pauciflora* the ovary appears to be distinctly hairy.

(7) Ovary and seed. Contrarily to LAUTERBACH's statement the ovules hang from the top of the cells as rightly observed by GIBBS, GILG & SCHLECHTER, etc. The fruit is a definite drupe turning red to dark blue when ripe. It contains either one (broad ellipsoid) stone or two plano-convex ones. The stony layer produces irregular lamellae towards the interior and the seed appears to be distinctly ruminate.

In the following key I have given the specific characters of the three closely allied species:

Key to the species

1a. Twigs, petioles, underside of the leaves, inflorescence and ovary tomentellous. Inflorescence up to 1½ cm long (mature?). [Bracts 4—4½ by 2½ mm, early caducous. Tepals 2½ mm diam. (in bud?). Stamens ± 8] . . . . 1. **N. pauciflora**

b. Plant subglabrous, not tomentellous; inflorescence sometimes sparsely hairy. Ovary at most with some lines of sparse ciliae. Inflorescence 2—4 cm long. 2

2a. Stamens 6. Bracts not early caducous, thin, 2—2½ by 1 mm. Flowers about 4 mm long. Drupe 10 by 7 mm . . . . . 2. **N. arfakensis**

b. Stamens (7—)8—12. Bracts broad, firm, ± orbicular, early caducous, 8—9 mm diam. Flowers about 6—7 mm. Drupe 11—20 by 9—10 mm. . . . . 3. **N. papuana**

1. **Nouhuysia pauciflora** (A. C. Sm.) comb. nov. — *Idenburgia pauciflora* A. C. Smith, J. Arn. Arb. 22 : 234. 1941.

N.E.New Guinea. Morobe district, 1400 m, Clemens 3828 (type, not seen).

2. **Nouhuysia arfakensis** (Gibbs) comb. nov. — *Idenburgia arfakensis* Gibbs, Fl. Phyt. Arfak 139. 1917.

N.W.New Guinea. Mt Arfak, Kubree Ridge, 2700 m, Gibbs 6003 (type, not seen,); Mt Arfak, Angi Gita Lake, 1800 m, Kostermans 2217 (B, L), tree 5 m, fls white, fl. fr. Oct. 1948.

3. **Nouhuysia papuana** Lauterbach, Nova Guinea 8^4 : 844. 1912. — *Idenburgia novoguineensis* Gibbs, Fl. Phyt. Arfak 137. 1917. — *Idenburgia pachyphylla* Gilg & Schlechter, Bot. Jahrb. 58 : 246, fig. 2 A—M. 1923. — *Idenburgia elaeocarpoides* Gilg & Schlechter, l.c. 247, fig. 2 N—X; A. C. Smith, J. Arn. Arb. 22 : 233. 1941. — Fig. 2.

Central Celebes. Masamba, near Salu Ranté, 1500 m, bb 24204 (B, L), tree 15 m to 1st branch 6 m, diam. 25 cm; Malili, near Porehoe, 1500 m, bb 19566 (B), tree 15 m, to 1st branch 8 m, 30 cm diam.,

fl. 15/3/35; ibidem, B. Takale Kadju, 1500 m, bb 24083 (B, L), tree 27 m, to 1st branch 20 m, 21 cm diam., kaju oeé (BareE).

Moluccas. Central Ceram, Makina, 1000—1100 m, Rutten 2240 (B, L), fl. 18/5/19; Eyma 2012 (B).

West New Guinea. Mt Arfak, Kubree Ridge, summit, 2700 m, Gibbs 5654 (L), fl. Dec. 1913, exposed, fastigiate form! (type of I. novoguineensis Gibbs); Mt Arfak, Angi Gita Lake, 1900 m, Kostermans 2198 (B, L), tree 9 m, fl. fr. Oct. 1948; Resi summit, 900 m, G. M. Versteeg 1668 (B, L), fl. white, fr. from green to red to dark blue, fl. fr. 29/8/07 (type of N. papuana Laut.); 9 km E of Habbema Lake, 2740 m, Brass & Versteegh 10472 (L), tree 15 m, 27 cm diam., fl. Oct. 1938; 18 km SW of Bernard camp, Idenburg River, 2150 m, Brass 12661 (L), tree 20 m, fl. fr. 2/39, ovary with some ciliate longitudinal lines; 18 km NE of Habbema Lake, 2200 m, Brass 11078 (L), tree 14 m, fr. Nov. 1938, red; Mt Hellwig, Bijenkorf Bivak, 1750 m, Pulle 681 (B) fl. 14/12/1912, one flower with an oblong segment between stamens and tepals; ibidem, Pulle 647 (B), fr. 18/12/1912, one of the flowers had 7 stamens; Wissel Lake district, 1700 m, Eyma 5177 (B); Mt Cyclops, road from Netar to the coast, 900 m, bb 25014 (B, L), tree 13 m, 30 cm diam., fl. 26/6/38.

East New Guinea. Hunsteinspitze, ca 1300 m, Ledermann 10940 (B), Ledermann 11324 (B), (types of Idenburgia elaeocarpoides Gilg & Schlechter); Schraderberg, 2070 m, Ledermann 11883, 12075 (B), with young inflorescence showing bracts not described (type of Idenburgia pachyphylla Gilg & Schlechter); Boridi, C. E. Carr 13149 (L), fr. 14/9/36, tree 30 m; ibidem 1500 m, Carr 13148 (L), fl. 14/9/35; ibidem 1500 m, Carr 13240 (L), tree 27 m, fl. 18/9/35; Lala River, C. E. Carr 14056 (L), tree 15 m, fr. 27/12/36; ibidem, 1650 m, Carr 14055 (L). Morobe district, Yunzaing, 1350 m, Clemens 3978; Ogeramnang, 1800 m, Clemens 5122.