

ON SOME GENERA OF SANTALACEAE OSYRIDEAE FROM THE MALAY ARCHIPELAGO, MAINLY FROM NEW GUINEA

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An investigation of the Santalaceae of the Malay Archipelago based on the materials of the Leiden, Utrecht, and Buitenzorg Herbaria showed me, that the species usually included in the genus *Henslowia* are greatly different as regards the structure of the fruit. With these differences other peculiarities seem to be correlated, and this makes it possible to base a natural subdivision on them. I could distinguish the groups of species thus obtained either as sections of *Henslowia* or as separate genera, and I have chosen the latter standpoint. Had I accepted them as sections of one genus, it would have been necessary to include also the genus *Phacellaria* in that genus. I thought it would fit in better with the further system of the Santalaceous genera, if I based genera on the peculiar structures of the fruits discovered by me. The nomenclatorial difficulties thus raised cannot be a severe objection, as at any rate the name *Henslowia* has to be replaced by that of *Dendrotrophe*, according to the International Rules of Botanical Nomenclature. Moreover, it has the advantage, that one is now obliged to examine, in the first place, the structure of the fruit of a plant of this alliance, before trying to determine the species, unless he will mix up again and again rather little allied species.

The first stimulation to this study gave me a correspondence about *Henslowia* with Dr C. G. G. J. VAN STEENIS, Botanist at the Buitenzorg Herbarium, in which Dr VAN STEENIS drew my attention to the fact, that the fruit of *Henslowia Reinwardtiana* is so different from that of other *Henslowias* that, in his opinion, it would probably be necessary to base a new genus on that species (efr. his paper on this subject in *De Trop. Nat.*, XXII, 1933, p. 97-99). Further investigations proved his opinion to be correct, but at the same time the taxonomic question appeared to be much more complicated as soon as a more copious material of *Henslowia* was taken into consideration.

In the following I am giving a short review of five allied genera, of which three are new to science and which together form a natural group within the Santalaceae Osyrideae, in the first place drawing attention to the characteristics of the fruit and the seed and the mode of growing, in the second place distributing the species already known over them, and finally describing a number of new species.

I. **DENDROMYZA** DANSER, nov. gen.

Fructus drupaceus; exocarpium fibris longitudinalibus cum apice endocarpium cohaerentibus, postea ab exocarpio solutis et caudas filiformas ex apice endocarpium formantibus; mesocarpium fibris nullis; endocarpium glabrum, sulcis 5 facile in partes 5 dehiscens, uniloculare, septis nullis vel apice carinis 5 indistinctis tantum. Semen integrum.

Fruit drupaceous; exocarp of longitudinal coherent fibers, with the apex of the endocarp, behind the exocarp forming ciliate (filiform) tails from the apex of the endocarp; mesocarp fibers none; endocarp glabrous, 5-grooved, easily dehiscing into 5 parts, unilocular, without septae or an apex of 5 barely distinct fleshes. Seed entire.

Dioecious, or the female plant with a few male flowers. Flowers single or several together in the leaf axils and on the leafless nodes, each on a separate peduncle with scales, the upper and lower of which are more or less crowded to an involucre; tepals usually 5, deltoid, valvate. Male flowers with 5 stamens inserted on the bases of the tepals, their anthers with 2 separate thecae, these each with 2 loculi. Female flower with inferior ovary, rather flat 5-lobed disk, and short style with 5 papilliform stigmas. Fruit a drupe, crowned by the persistent tepals and style; exocarp thin-coriaceous, on the inner surface with numerous longitudinal rather strong fibres, which are connected with the apex of the endocarp and later are detached, forming a bundle of tails to the endocarp; endocarp not very hard and rather thin-walled, with 5 longitudinal shallow grooves, along which it easily splits into 5 equal parts, dull and rather rough but glabrous outside, entirely one-celled inside or with slightly prominent ribs in the upper portion. Seed entire. - Glabrous small shrubs, parasitic on tree branches, with often climbing and partly twining stems, the twining parts here and there attached to the host plant by means of haustoria, with bract-like leaves, and here and there forming non-climbing, shorter, simple or branched, lateral twigs with well-developed leaves. All leaves scattered.

Cfr. plate XIV, figs. 1-2.

As regards the mode of growing *Dendromyza* mainly agrees with *Cladomyza*, but the endocarp is very different.

Distribution: Malay Archipelago from Sumatra and Luzon to New Guinea and the Solomon Islands.

Only species:

1. *Dendromyza Reinwardtiana* (BLUME) DANSER, nov. comb. - *Tupeia Reinwardtiana* BLUME, ex KORTHALS, in Verhand. Batav. Genootsch., 17 (1838) 195, cum tab.; *Henslowia Reinwardtiana* BLUME, Mus. Bot. Lugd. Bat., I, 16 (1850?) 244; *Dendrotrophe Reinwardtiana* MIQUEL, Fl. Ind. Bat., I, 1, 5 (1856) 780; *Dendrotrophe plurinervis*: MIQUEL, Fl. Ind. Bat., I, 1, 6 (1858) 1096; *Henslowia plurinervis* BOERLAGE, Handl. Fl. Ned. Ind., III, I (1900) 181; *Henslowia Robinsonii* MERRILL, in Phil. Journ. Sc., bot., XI, 5 (1917) 268; *Henslowia kaniensis* PILGER, in Engl. Jahrb., 59 (1924) 127; *Viscum orientale* (non WILLDENOW) KOORDERS, Versl. Dienstr. Minah. (1898) 578, p. p.; *Henslowia Lobbiana* (non ALPH. DE CANDOLLE) MERRILL, Phil. Journ. Sc., I, supplement (1906) 50; *Henslowia umbellata* (non BLUME) KOORDERS, Exkursionsfl. Java, II (1912) 168, pro parte, indus. ic. 35.

This species is very polymorphous, and its extremes are different enough to base separate species on them; as soon, however, as one tries to delimitate them, one perceives that they are too much connected by intermediates even to base varieties on them. Most striking is, in the first place, a broadleaved, sometimes large-leaved, sometimes small-leaved, type, having the largest leaves roundish, and occurring from Sumatra to New Guinea. To this type all specimens from Sumatra and Java belong, from Borneo all except TEYSMANN 8089, among the Philippine specimens only FORESTRY BUREAU 1200 from Luzon, furthermore all specimens from the Moluccas and Celebes, and most of those from New Guinea. This form consequently includes the types of *Tupeia Reinwardtiana*, *Dendrotrophe plurinervis*, *Henslowia Robinsonii*, and *H. koniensis*. The rest of the Philippine specimens, and TEYSMANN 8089 from Borneo, are remarkably narrow-leaved, having the largest leaves obovate to obovate-oblong. In New-Guinea most specimens are of the broad-leaved type, but rarely characteristic; only BRASS 3800 belongs to the narrow-leaved type. Nearly all of them show, however, another peculiarity, viz., shortacuminate leaves, but with this no other peculiarities seem to be correlated. It is, however, possible that among the New Guinea

specimens there are hidden one or two undescribed species.

Specimens examined:

Sumatra. West-Coast, KORTHALS s.n. (L.), PR(AETORIUS?) s.n. (L), originals of *Henslowia Reinwardtiana* Blume; TEYSMANN 1075 H.B. (B, U). originals of *Dendrotrophe plurinervia* Miguel; 360 malt., BECCARI P.S. 737 (L).

Borneo. Mt. Kinabalu, 4000-5000 ft, CLEMENS 30970, 32471, 33039 (B, L), 33155 (B); Poentianak, TEYSMANN 8089 (B) and s.n. (B, L); S. Kenepai, HALLIER B. 2190 (B); E. Division, JAHERI s.n. (B); West-Koetai, 100-1200 m, ENDERT 2958, 5268, 3843 (B).

Java. REINWARDT ? (L), specimen pictured in *Flora Javae*, Lor., t. 28, probably type of the species; West-Java, 1-1250 m, BRUGGEMAN 736 (B), BAKHUIZEN VAN DEN BRINK 5244 = B. v. d. BR. Jr. 857 (B, L, U), BACKER 4511 (B, L, U), 31508, 12462 (B, L).

Luzon. Baguio, ELMER 8987 (B, L, U); Mt. Mariveles, FORESTRY BUREAU 1200 (B). Negros. Cucmos Mts., ELMER 10106 (B, L).

Mindanao. Butuan subprov., BUREAU OF SCIENCE 15917 (B); Surigao, WENZEL 2553 (B); Mt. Apo, ELMER 11296 (B, L); Mt. Urdaneta, ELMER J4063 (B, L).

Celebes. Minahasa, Mt. Sopoetan, 1300 mm, KOORDERS I7750f3 (B), Mt. Klabat, KOORDERS 17745f3 (B); Maloea and Tendok, 600 m, KJELLBERG 1636, 1641 (B).

Ambon. TEYSMANN 5153 H. B. (B, L, U); RANT 323 (B, L), 66 (B); DOCTERS VAN LEEUWEN 8674 (B); ROBINSON 1809 (B, L).

Ceram. DE VRIESE and TEYSMANN s.n. (L); TREUB 158 (B); below 100 m, RUTTEN 2064 (B). New Guinea. N. W. part: Arfak Mts., 2500 mm, GJELLERUP 1215 (B, L); Nassau Mts., 700 m, DOCTERS VAN LEEUWEN 10687 (B); S. W. part, Oroh Valley, 1200 mm, PULLE 1182 (L); N. E. part, HELLWIG 650 (B); SCHLECHTER 16456 (L); 14259 (B); 17283a (L), type of *Henslowia kaniensis* Pilger; CLEMENS 199 (L); CARR 13025, 11918, 14308 (L); BRASS 5393, 3800 (B).

Solomon Islands. Bougainville Island, 950 m, KAJEWSKI 1672 (B).

II. CLADOMYZA DANSER, nov. gen.

Fructus drupaceus; exocarpium fibris longitudinalibus cum fibris apicalibus endocarpii cohaerentibus, postea caudas fimbriatas ex apice endocarpii formantibus; mesocarpium fibris radialibus tenuissimis floccosis endocarpium cum exocarpio coniungentibus et fimbrias fibrorum longitudinalium formantibus; endocarpium apice uniloculare vel incomplete 4-6-loculare, ceterum usque ad basin complete 4-6-loculare. Semen apice integrum vel lobatum, versus basin in lobos 4-6 divisum.

Fruit drupaceous; longitudinal exocarp fibers coherent with the apical endocarp fibers, afterwards forming ciliate (filiform) tails from the apex of the endocarp; radial mesocarp fibers delicate woolly endocarp with exocarp united and forming fringed fibers longitudinally; endocarp apex unilocular or incomplete 4-6 locular, moreover at the base completely 4-6 locular. Seed apex entire or lobed, towards the base divided into 4-6 lobes.

Dioecious or rarely monoecious. Male flowers either in budlike sessile inflorescences, pedicellate in the axils of the bud-scales, or, like the female ones, single on short peduncles bearing scales, the upper and lower scales more or less crowded to involucre; tepals deltoid, valvate. Male flower with 4 or 5 stamens inserted on the base of the tepals, their anthers (as far as known) with 2 contiguous thecae, each theca with 2 loculi, a posterior superior one, and an inferior anterior one, moreover with style rudiment (perhaps hermaphrodite). Female flower with inferior ovary, flat or vaulted disk, short style, and 4-5 separate stigmas. Fruit a drupe, crowned by the persistent tepals and style; exocarp thin-coriaceous, with a number of longitudinal fibres on its inner surface, which are pilose by the delicate fibres of the

mesocarp, connected with the apical fibres of the endocarp, and later forming ciliate tails to the endocarp; mesocarp with numerous delicate fibres ascending from the surface of the endocarp and connecting in with the exocarp, forming a woolly or sericeous indument on the endocarp and the inner surface of the exocarp; endocarp roundish to oviformous, slightly 4-5-lobed, thickwalled, not splitting longitudinally, with a solid beak at the apex, below this one-celled or incompletely more-celled in the upper portion, and for the rest completely 4-5-celled down to the base. Seed entire or lobed in the upper part, divided for the rest into 4-5 parallel lobes directed towards to base. - Glabrous shrubs, parasitic on tree branches, with the stems climbing, now and then twining and here and there attached to the host plant by means of haustoria, mostly with scale-like leaves, but from the axils of these forming short, straight, non-climbing twigs with well-developed leaves (of some species only non-climbing stems are known). Leaves scattered.

Cfr. plate XIV, figs. 3-4.

In the mode of growing *Cladomyza* mainly agrees with *Dendromyza*, but the structure of the endocarp is entirely different.

Distribution: mainly New Guinea, moreover one species in the Solomon Islands, and one in Borneo.

Type species:

1. ***Cladomyza microphylla*** (LAUTERBACH) DANSER, nov. comb. - *Henslowia microphylla* LAUTERBACH, in Nova Guinea, VIII, 2, 813 (1912).

LAUTERBACH does not describe the fruits of this species, though there are on the type specimen.

On account of their taxonomic importance they may be described here.

Drupe (probably unripe) bottle-shaped, to 4 mm long, in the lower portion subglobose, slightly- 4-lobed, up to 1.5 mm in diameter, somewhat attenuate upwards into a neck, bearing the perigone and style at its apex; exocarp thin-coriaceous, mesocarp not fibrous, endocarp hard, slightly 4-lobed, with shallow grooves over the back of the lobes, smooth for the rest, incompletely one-celled in the upper 2/5 parts, the lower 3/5 parts completely 4-celled, the dissepiments somewhat thicker than the outer walls, the cavities nearly 0.5 mm wide.

New Guinea. Hellwig Mts., top, 2000 m, VON ROEMER 1250 (B), ♂, ♀, type specimens; ridge, 2600 m, PULLE 908 (L), ♀; southern part, 1900 m, PULLE 842 (B, L), ♂, ♀.

2. ***Cladomyza nivalis*** (RIDLEY) DANSER, nov. comb. - *Henslowia nivalis* RIDLEY, in Transact.

Linn. Soc., bot., IX (1916) 146.

I have not seen the type specimen of this species, and RIDLEY does not describe the fruit. Yet I believe that it must be a *Cladomyza*, and that it is not identical with any other species enumerated here. A plant included by PILGER in this species (VERSTEEG 2447) is described below as a new species.

3. ***Cladomyza crassifolia*** (GIBBS) DANSER, nov. comb. - *Henslowia crassifolia* GIBBS, Contrib. Arfak Mts. (1917) 132.

I have not seen the type of this species, but, according. to the description, it must be a *Cladomyza* closely allied to *Cl. microphylla*, and perhaps specifically identical with it.

4. ***Cladomyza acutata*** (PILGER) DANSER, nov. comb. - *Henslowia acutata* PILGER, in Engl. Jahrb., 59 (1924) 125.

PILGER hardly describes the fruit of this species. Because of its taxonomic importance I

let follow the description here.

Drupe oblong-oviformous, somewhat bottle-shaped (unripe), up to 5 mm long, crowned by the tepals and the style, up to 3 mm in diameter above the rounded base; exocarp thin-coriaceous, with longitudinal fibres on its inside, which are connected at the top with the apical fibres of the endocarp and later form a bundle of fimbriate tails to the endocarp; mesocarp with delicate floccose fibres connecting the endocarp with the exocarp and causing a soft indument on the endocarp and on the inside of the exocarp, and a fringe to the longitudinal fibres; endocarp in the basal part of the drupe, sub-globose, nearly 2 mm in diameter, one-celled in the upper portion, completely 5-celled for the rest with rather thick wall and dissepiments.

N. W. New Guinea, Doormantop, 3500 m, LAM 1649 (B, ♂, L, ♀, U, ♂), types; foot of Doormantop, 3250 m, LAM 1590 (B, L), ♀; 3260 m, LAM 1696 (B, L), ♀.

5. *Cladomyza laevis* (PILGER) DANSER, nov. comb. - *Henslowia laevis* PILGER, in Engl. Jahrb., 59 (1924) 125.

Of this species only male specimens are known. The resemblance with *Cl. microphylla* and its nearest allies is, however, so great, that there is no doubt as to whether *Henslowia laevis* is a *Cladomyza*.

Locality of the type: S. W. New Guinea, Wichmann Mts., top, 3100 m, PULLE 1038 (B, L, U), 0.

6. *Cladomyza cuneata* DANSER, n. sp.

Caules scandentes prolongati defoliati, iam volubiles et haustoriis plantae nutrici affixi, iam stricti, probabiliter substrato appressi, teretes, ad 2.5 mm crassi, longitudinaliter costati, denique cortice rimulis asperis, fusco; rami laterales non scandentes, semel pinnatim ramosi, stricti (substrato appressi ?), 8-20 cm longi, basi circiter 1.5 mm diametro, apicem versus nonnihil attenuati, angulati, passim sulcati, ceterum leves, ad foliorum insertiones vix incrassati, ramulis 2-5 cm longis. Folia in omnibus ramis lateralibus bene evoluta, sparsa, plerumque 1-2 mm distantia, subsessilia, obovato-cuneata, sed marginibus lateralibus revolutis primo visu cuneata, 2-6 mm longa, 1-3.5 mm lata, supra apicem rotundatum breve acuminata, basin versus sensim attenuata, crassiuscula, statu sicco atra, facie superiore distincte, inferiore indistincte rugulosa, apice nonnunquam paulum incrassata, costa facie inferiore praecipue basin versus prominente. Inflorescentiae gemmiformes, primum singulae, denique saepe ad 5 in axillis foliorum; involucrem e 5 vel pluribus perulis triangularibus acutis compositum, denique expansum ad 1 mm diametro; inflorescentiae femineae semper uniflorae, masculae primum uniflorae, denique floribus 1 vel 2 ex axillis perularum superiorum auctae. Flos masculus centralis pedicello tereti ad 1 mm longo, perigonio primum pileiformi tepalis 4 valvatis, apertus ignotus. Flos femineus ovario infero cylindrico ad 1 mm longo et perigonio breve obtuseque conico tepalis plerumque 5, 0.75 mm diametro, apertus ignotus. Fructus non suppetit. (Description from both specimens under mentioned).

Stems scandent without leaves, twining and haustoria attached to host plants, just the straight ones closely appressed to substrate, terete, to 2.5 mm thick, longitudinally ribbed, bark in sharp fissures, dark brown; lateral branches not scandent, once pinnately branching, straight (appressed to substrate?), 8-20 cm long, base about 1.5 mm in diameter, toward the apex somewhat attenuate, angled, sulcate in all directions, however slight, scarcely thickened at the insertions of leaves, branches 2-5 cm long. The leaves of the lateral branches in all well-developed, sparse, mostly 1-2 mm distant, subsessile, obovate-cuneate, but the lateral margins revolute, at first sight cuneate, 2-6 mm long, 1-3.5 mm wide, the apex rounded above, acuminate, the base gradually attenuate, thick, in the dry state black, because of the distinct upper but indistinct lower somewhat wrinkled, apex sometimes slightly thickened, especially prominent are the lower veins toward the base. Inflorescence bud-like, the first single, short, often to 5 in the axils of leaves; involucre formed by 5 or more triangular, sharp, mucronate

scales, finally spread to 1 mm in diameter; female inflorescence always one-flowered, first male one-flowered, finally flowering with 1 or 2 per axil, to more in the upper parts. Central male flower pedicellate, terete, to 1 mm long, perigone first with hair-like tepals, 4 valvate, open ones unknown. Female flower with inferior ovary, cylindrical to 1 mm long and with a short perigone, very shortly conical tepals mostly 5, 0.75 mm in diameter, open ones unknown. The fruit is not available.

Though fruits are not available, there is no doubt as to whether this species is a *Cladomyza* allied to *Cl. microphylla*. Most remarkable are the great difference between the leafless climbing main stems and the pinnately branched, non-climbing lateral stems, the small apparently cuneate leaves, and the toadstool-shaped male flower-buds.

S. E. New Guinea, forest on trees, c. 5000 ft, II IX 1935, CARR 13092 (B), ♀, “epiphyte, flowers yellow-green”, type of the species; Mt. Tafa, 2400 m, V-IX 1933, BRASS 5013 (B), ♂, “slender parasitic climber in tall Sama forest, small shining recurved leaves, solitary yellow flowers”.

7. *Cladomyza robustior* DANSER, n. sp.

Caules prolongati longe prorepentes, efoliati, passim haustoriis plantae nutrici affixi, ad 3.5 mm crassi, cortice aspero atro; caules laterales pinnatim ramosi, foliati, apicibus incurvatis, basi ad 2 mm crassi, versus apices incurvatos angulosos ad minus quam 1 mm attenuati. Folia in caulibus lateralibus bene evoluta, 1-1.5 mm tantum distantia, passim squamiformia, etiam versus apices ramulorum (et tunc flores subspicati); hae squamae e basi lata valde acuminatae acutae, ad 1.5 mm longae; folia bene evoluta elliptica vel rotundato-elliptica vel obovato-elliptica, plerumque 5-10 mm longa, crassiuscula, statu sicco atra, utrinque rugulosa, lucidula, costa facie inferiore parte basali prominente, ceterum enervia vel venis indistinctis. Inflorescentiae (femineae) gemmiformes, involucrio perulis circiter 8 obtusiusculis, c. 1 mm diametro, flore singulo. Flos masculus ignotus. Flos femineus ovario infero tenuiter cylindrico ad 1 mm longo, perigonio breve pyramidalis obtuse 4-angulo, tepalis 4 deltoideis obtusis erectis 1 mm longis; discus planus; stylus brevis stigmatibus 4 vel 5 papilliformibus. Drupa ad 6 mm longa 2 mm diametro, perigonio persistente paulum aucto excluso; exocarpium tenuiter coriaceum, facie interiore fibris longis longitudinalibus cum fimbriis apicalibus endocarpii cohaerentibus, postea caudas fimbriatas in apice endocarpii formantibus; mesocarpium fibris tenuissimis densis endocarpium cum exocarpio coniungentibus; endocarpium c. 3.5 mm longum 2 mm diametro, 2/5 partibus - superioribus uniloculare, ceterum complete 4- vel 5-loculare.

The very prolonged stems are creeping, leafless, with random attachments of haustoria to host plants, to 3.5 mm thick, bark rough, dark; lateral pinnate branched stems, foliar, tips curved inward, base to 2 mm thick, angular towards incurved apex, attenuated to less than 1 mm. The leaves on the stems of the laterals well developed, only 1-1.5 mm distance, here squamiform leaves, even the tips of branches (and then the subspicate flowers); these scales from a very broad base, acuminate to acute, 1.5 mm long; well-developed leaves elliptical or rounded-elliptic or obovate-elliptic, mostly 5-10 mm long, rather stout, in the dry state black, rugulose [somewhat wrinkled] on both sides, shiny, veins on the lower part prominent, for the rest without veins or veins indistinct. Inflorescence (female) bud-like, involucrial scales mucronate about 8, obtuse, ca. 1 mm in diameter, the flower solitary. Male flowers unknown. Female flower ovary inferior, slightly cylindrical to 1 mm long, perigone shortly pyramidal, obtuse 4-angled, tepals 4, deltoid, obtuse, erect, 1 mm long; disk flat; style short with 4 or 5 papilliform [nipple-like] stigmas. Drupe to 6 mm long and 2 mm in diameter, excluding the persistent perigone which slightly increases; exocarp slightly leathery, the inner longitudinal long fibers with fimbriate tips connected to the endocarp, then fringed tails at the apex of the endocarp form; mesocarp with very fine fibers, with dense endocarp combining with exocarp; endocarp ca. 3.5 mm long, 2 mm in diameter, 2/5 of the upper part uniloculare, the remaining completely 4- or 5-locular.

Cfr. plate XIV, figs. 3-4.

This species is characterised by the creeping main stems and the incurved lateral stems, together with the rather large dimensions of all parts.

S. W. New Guinea, Hubrecht Mts., ridge, 3200 m, 8 II 1913, VERSTEEG 2447 (B, L, U), 9, flower greenish, slightly tinged with red, leaf red-brown; type of the species.

8. *Cladomyza acrosclera* DANSER, n. sp.

Fruticulus erectus dense ramosus; rami vetustiores (qui suppetunt) ad 25 cm longi, basi ad 5 mm diametro, subteretes, cortice fusco rimulis albidioribus, iuniores angulati, sub foliorum insertionibus carinati, novissimi minus quam 1 mm diametro, atri, acutanguli, fusci, saepe tuberculis asperi. Folia subsessilia, cuneato-obovata, supra apicem rotundatum vel subtruncatum apiculo brevi, versus basin sensim fere in petiolum attenuata, plerumque 10--15 mm longa, 4-7.5 mm lata, crasse coriacea, fragilia, utrinque (statu sicco) atra, haud lucida, enervia, vel costa facie inferiore indistincta, in et sub apiculo incrassatione lenticulari dura albida in foliis maximis ad 1.5 mm diametro. Inflorescentiae gemmiformes, singulae vel demum paucae in axillis foliorum, involucre perulis fuscis 7-10, quarum interiores c. 1 mm longae, obtusiusculae vel rotundatae, exteriores minores; inflorescentiae masculae floribus 3-7, quorum unus terminalis, ceteri in axillis perularum superiorum; feminea flore singulo terminali tantum. Flos masculus centralis pedicello c. 1 mm longo, perigonio c. 1 mm longo, pyramidalis, obtuse 4-angulo, postea lobis nonnihil expansis; stamina 0.6-0.8 mm longa, anthera dorsifixa, statu clauso rotundata, c. 0.3 mm longa et lata, loculis 4, quorum 2 posteriores longiores antice dehiscentes, anteriores breviores postice dehiscentes et eodem tempore deflectentes; discus planus 4-lobus; styli rudimentum nullum; flores laterales paulo minores quam terminalis breviusque pedicellati. Flos femineus ovario infero cylindrico ad 1.5 mm longo, tepalisque plerumque 4 vel 5 denique recurvatis, deltoideis, obtusiusculis, crassiusculis; staminorum rudimenta nulla; stylus brevissime cylindricus, stigmatibus 4 vel 5 papilliformibus erectis. Drupa oblonge ovata, tepalis persistentibus exceptis 7 mm longa, 3 mm diametro; exocarpium tenuiter coriaceum, facie interiore fibris longitudinalibus cum apice endocarpii cohaerentibus denique ab exocarpio sulutis; mesocarpium floccosum; endocarpium oblongo-ovatum, c. 6 mm longum, rostro solido 1 mm longo incluso, 3 mm diametro, sub rostro in 1 mm superiore uniloculare, ceterum complete 4-6-, plerumque 5-loculare, pariete 0.3 mm septis 0.6 mm crassis duris, loculis c. 0.3-0.4 mm diametro, septis in centro partem solidam 1.2 mm diametro formantibus. (Description from BRASS 4749, ♀, and BRASS 4587, ♂).

Small, densely branched shrub; older branches (that are available) to 25 cm long, 5 mm in diameter at the base, subterete, bark dark brown, whiter in creases, younger stems angled, below the point of leaf insertion carinate [keeled], later less than 1 mm in diameter, black, sharp-angled, dark, often with rough tubercles. Leaves subsessile, cuneate-obovate, apex rounded or subtruncate, tapering gradually towards the base of the petiole, for the most part 10-15 mm long, 4-7.5 mm wide, coarsely coriaceous, brittle, and on both sides (in the dry state) black, not shiny, veins not visible, or veins on lower side indistinct, below the apex of the largest leaves hard, white thickened lenticels to 1.5 mm in diameter. Inflorescences gemiform [bud-like], solitary or only a few in the axils of the leaf, involucre with brown leaf scales 7-10, the interior ca. 1 mm long, slightly obtuse or rounded, the outer ones smaller; inflorescence with 3-7 male flowers, one of which is terminal, the rest in the axils of upper scales; the solitary female flower terminal. The central male flower pedicel ca. 1 mm long, perigone ca. 1 mm long, pyramidal, obtusely 4-angled, later the lobes expand a little; stamens 0.6-0.8 mm long, anthers dorsifixed, rounded in the closed state, ca. 0.3 mm long and wide, locules 4, the posterior ones 2 with slit-like longitudinal dehiscence, the anterior ones shorter than the previous, shorter anterior opening downward at the same time; disk flat, 4-lobed; style rudimentary or absent; lateral flowers smaller than the shorter terminal pedicels. Female flower ovary inferior, cylindrical, to 1.5 mm long, tepals mostly 4 or 5 eventually recurved, deltoid, obtuse, moderately thick; stamens rudimentary to absent; style shortly cylindrical, stigmas 4 or 5, papilliform, erect. Drupe oblong-ovate, excepting the persistent tepals 7 mm long, 3 mm in diameter; exocarp thin leathery, the longitudinal fibers attached to the inner face of the apical endocarp, finally from the free exocarp; mesocarp floccose [with tufts of small hairs]; endocarp oblong-ovate, ca. 6 mm long, including the 1 mm long, 3 mm

diameter solid beak, in the upper 1 mm below the beak unilocular, the rest completely 4-6-, usually 5-locular, enclosed by a 0.6 mm by 0.3 mm thick hard wall, locule ca. 0.3-0.4 mm in diameter, forming a septum in central part 1.2 mm in diameter. (Description from BRASS 4749, ♀, and BRASS 4587, ♂).

This species is remarkable for its shrub-like, non-climbing habit (though on the label of BRASS 4240 we read: “often straggling”), the hard thickening in the leaf tip, which, according to the collector, is not visible in the living state, the hardly fibrous, rather floccose mesocarp, and the thick-walled endocarp with narrow cavities and solid beak. The two specimens not included in the description are slightly different by limper, somewhat curved stems, as if the plant had not been growing erect, and the stems consequently somewhat incurved.

S. E. New Guinea, Wharton Range, Murray Pass, 2840m, VI-IX 1933, BRASS 4749 (B), 9, type of the species, and BRASS 4587 (B), ♂, “parasitic on low trees fringing forest, compact shrub with shining, brownish leaves, whole plant with brown appearance”; Mt. Albert Edward, 3680 m, V-VII 1933, BRASS 4240 (B), ♀, and 4240a (B), ♂, “parasitic on forest border trees, much branched shrub, often straggling, leaves darker underneath, thickened apex of dried leaf not apparent in life”.

9. *Cladomyza uncinata* DANSER, n. sp.

Fruticulus erectus. Caules (qui suppetunt) ad 16 cm alti, vetustiores cortice aspero atrofusco rimis albidioribus, torulosi, basi ad 3 mm diametro, versus apices sensim attenuati, tenuiter striati, paulum angulati, foliorum insertionibus incrassatis, apice 0.5 mm tantum diametro. Folia inferiora petiolo ad 2 mm longo vel breviora, ad 3 cm longa 8 mm lata, obovato-oblonga, supra apicem rotundatum in acumen uncinatum vel revolutum producta, basin versus sensim attenuata, utrinque atra haud lucida, enervia vel nervis 1-3 indistinctis vel raro distinctis; folia superiora gradatim angustiora, ceterum ut inferiora. Planta mascula ignota. Flores feminei singuli in axillis foliorum, involucro e perulis 5-8 acutiusculis composito, c. 1 mm diametro, c. 2 mm longi, ovario infero c. 1 mm longo campanulato, tepalis 5 rotundato-triangularibus c. 1 mm longis, stylo brevissimo stigmatibus 5 papilliformibus expansis. Drupa sessilis, oblongo-ovata, ad 6 mm longa 3 mm diametro; exocarpium tenuiter coriaceum, facie interiore fibris longitudinalibus cum apice endocarpii cohaerentibus denique solutis et caudas fimbriatas ex apice endocarpii formantibus; mesocarpium fibris tenuissimis numerosissimis ex endocarpio adscendentibus et eum cum exocarpio coniungentibus; endocarpium breve oviforme, c. 3 mm longum 2.5 mm diametro, apice rostro acuto solido 0.5 mm longo, sub rostro in 1 mm superiore uniloculare, ceterum 5-loculare, loculis angustis 0.5 mm tantum diametro, pariete c. 0.25 mm, septis 0.5 mm, massa centrali solido 1.5 mm crassis.

Small erect shrub. Stems (that are available) to 16 cm tall, older bark rough, dark-brown with whitish fissures, torulose [cylindrical with bulges at intervals], 3 mm in diameter at the base, gradually attenuating towards the apex, finely grooved, slightly angled, leaf insertions thickened, apex only 0.5 mm in diameter. Lower leaves with petiole to 2 mm long or shorter, to 3 cm long, 8 mm wide, obovate-oblong, above the apex rounded extended into a sharp beak or revolute, gradually attenuated towards the base, both sides dark, by no means shiny, without nerves or with 1-3 indistinct or rarely distinct nerves; the upper leaves a little narrower, the rest as the lower. Male plant unknown. Female flowers solitary in the axils of leaves, involucre composed of 5-8 acute scales, ca. 1 mm in diameter, ca. 2 mm long, ovary inferior, c. 1 mm long, campanulate, tepals 5 rounded-triangular, ca. 1 mm long, the short style expanding into 5 papilliform stigmas. Drupe sessile, oblong-ovate, to 6 mm long, 3 mm in diameter; exocarp thin leathery, the longitudinal fibers attached to the inner face of the apical endocarp finally free from the endocarp tips and forming fimbriate tails; mesocarp fibers thin numerous, ascending from endocarp and joining it to the exocarp; endocarp shortly oviform, ca. 3 mm long 2.5 mm in diameter, the apex an acute solid beak 0.5 mm long, in the upper 1 mm below the

beak unilocular, the rest 5-locular, the loculi only a narrow 0.5 mm in diameter, wall ca. 0.25 mm, septum 0.5 mm, a solid mass of the center 1.5 mm thick.

Cladomyza uncinata resembles *Cl. acrosclera* more than any species of the genus, not only in its shrubby non-climbing habit, but still more in its thick-walled endocarp with narrow cavity. It is, however, easily distinguished by means of its different leaf-shape, especially its peculiar leaf-tip.

S. E. New Guinea, Boridi, forest, c. 5000 ft, 12 VII 1935, CARR 13121 (L), ♀, fruit green.

10. *Cladomyza multinervis* DANSER, n. sp.

Fruticulus (ex schedulis longe scandens); caules (qui suppetunt) ad 50 cm longi, vetustiores ad 4 mm diametro, cortice atro-fusco rimulis albidioribus, iuniores teretes, leves, apice tantum angulati, praecipue sub foliorum insertiones carinati. Folia petiolo 1-3 mm longo, oblongo-obovata, nonnihil spathulata, plerumque 3-4 cm longa, 7-13 mm lata, apice rotundata vel raro apiculo brevi involuto, basin versus sensim in petiolum attenuata, crasse chartacea, utrinque atro-fusca, haud lucida, nervis longitudinalibus 7-9 facie superiore paulo distinctioribus quam inferiore. Planta mascula et flores utriusque sexus ignoti. Fructus tantum suppetunt involucris iam deciduis; drupa oblongo-ovata, c. 7 mm longa, supra basin rotundatam 2.5 mm diametro, apicem versus sensim attenuata, levissima, enervia, endocarpio sub apice 5-loculari.

Small shrub (from [herbarium sheet] labels, long and scandent); stems (that we know) to 50 cm long, the older to 4 mm in diameter, the bark dark-brown with whitish fissures, the younger stems terete, smooth, angled only at the apex, carinate [keeled] especially under the leaf insertions. Foliar petioles 1-3 mm long, oblong-obovate, somewhat spathulate, usually 3-4 cm long, 7-13 mm wide, apex rounded or rarely covered with a short apiculus, gradually attenuate toward the base of the petiole, thickly chartaceous, dark-brown on both sides, not shiny, longitudinal nerves on the upper surface 7-9, a little more distinct than the lower. Male plants and flowers of both sexes unknown. Fruit only enough with the involucre already deciduous, drupe oblong-ovate, ca. 7 mm long, above the rounded base 2.5 mm in diameter, gradually attenuate towards the apex, completely smooth, without nerves, endocarp below the apex 5-locular.

Though the label speaks of “branches long and scandent”, such branches are entirely lacking on the type specimen. There is resemblance with *Cl. uncinata*, especially in the incurved apiculus of some of the leaves, but *Cl. multinervis* is larger in all vegetative parts, and the rather narrow leaves are many-nerved. Moreover the rather large fruit is strikingly smooth; it could not be more closely examined, as only one well-developed fruit was available.

Solomon Islands, Ysabel Island, Tatamba, 50 m, 4 I 1933, BRASS 3430 (B), “parasitic on tall forest trees, plentiful, branches long and scandent, leaves pale, fleshy, obscurely nerved, fruit green, tinged with red”.

11. *Cladomyza pachydisca* DANSER, n. sp.

Caules prolongati scandentes, iam recti, foliati, sub foliis angulati, iam volubiles, efoliati, subteretes, passim haustoriis plantae nutrici affixi, vetustiores ad 3 mm crassi, cortice atro rimulis albidioribus, iuniores c. 1.5 mm diametro, striati; caules laterales breves, 1-12 cm longi, recti, foliati, angulati vel apices versus applanati, basi 1 mm diametro, apice saepe ad 2 mm lati. Folia in caulium scandentium partibus volubilibus et in caulium lateralium partibus basalibus squamiformia vel decidua, parva, acuta; folia bene evoluta petiolo brevi 1-2 mm longo, supra plano, infra nonnihil convexo, lamina obovata, plerumque 2-4 cm longa, 1-2 cm lata, apice rotundata, basi in petiolum contracta, crasse chartacea, atra, faciebus paulum diversis, haud lucidis, in foliis maioribus nervis longitudinalibus 5, in minoribus 3, facie superiore paulo distinctioribus quam inferiore. Inflorescentiae in omnibus nodis praecipue

caulium lateralium singulae vel paucae, pedunculo brevi plerumque 0.5-1 mm longo, perulis fere omnino tecto, quarum superiores 3-5 obtusiusculae involucrem stellatum c. 1 mm diametro primum incurvatum denique expansum sub flore formant. Flores masculi semper singuli in pedunculis, saepe in iisdem ramulis cum femineis, statu alabastri adulti subglobosi, c. 1 mm diametro, postea in tepala 4 deltoidea c. 0.75 mm longa crassiuscula divisa; stamina totidem filamentis brevi latoque, anthera dorsifixae c. 0.25 mm longa et lata, thecis non separatis, loculis 2 superioribus posterioribus maioribus distinctis, 2 inferioribus anterioribus minoribus fere confluentibus; discus planus; stylus conicus obtusus, staminibus aequilongus, stigmatibus separatis nullis. Flores feminei etiam singuli in pedunculis, involucre similibus, 1.5 mm longi, ovario infero campanulato et perigonio depresso globoso tepalis 4 vel 5 valvatis deltoideis crassiusculis, staminibus nullis, disco margine plano medio conice elevato, stylo in discum immerso stigmatibus 4 vel 5 papilliformibus tantum emergentibus. Drupa oblongo-oviformis, ad 6 mm longa, supra basin obtusissimam 3 mm diametro; exocarpium tenuius, facie interiore fibris longitudinalibus cum fibris apicalibus endocarpii cohaerentibus denique ab exocarpio separatis et caudas fimbriatas ex apice endocarpii formantibus; mesocarpium fibris lucidis numerosissimis ex endocarpio adscendentibus et endocarpium cum exocarpio coniungentibus; endocarpium breve oviforme, c. 2 mm longum et diametro, leviter 4-5-lobum, apicem versus conicum et in fibras crassas usque ad perigonium et stylum currentes prolongatum, pariete duro sed non crassissimo dimidia parte superiore uniloculare sed cavitate stellata, ceterum 4-5-loculare. (Description from CLEMENS' no. 27308).

Stems extended, scandent, soon straight, leafy ones, within the leaf angles, soon twining, the leafless stems subterete, haustoria attaching here and there to host plant, the older to 3 mm thick, bark dark with whitish fissures, younger stems ca. 1.5 mm in diameter, grooved; lateral stems short, 1-12 cm long, straight, leafy, angular or tips turning smooth, base 1 mm in diameter, apex often to 2 mm wide. The leaves on the scandent stem parts twining and in the lateral stem basal parts squamiform or deciduous, small, acute; leaves well-developed with a short petiole 1-2 mm long, plane above, somewhat convex below, the leaf blade obovate, mostly 2-4 cm long, 1-2 cm wide, apex rounded, base contracted into a petiole, coarsely chartaceous, black, faces a little different, not at all shiny, in the major leaves 5 longitudinal nerves, minor leaves 3, little difference between the upper and lower faces. Inflorescences in all the nodes especially solitary or few cauline lateral, peduncle short mostly 0.5-1 mm long, scales almost entirely covered, the upper 3-5 somewhat obtusely stellate involucre ca. 1 mm diameter first incurved, finally expanding before the flowers form. Male flowers are always solitary on the peduncle, often in the same branches with a female, the state of the adult buds subglobose, ca. 1 mm in diameter, later divided into 4 moderately thick deltoid tepals ca. 0.75 mm wide; stamens **latoque** as many short filaments, anthers dorsifixae ca. 0.25 mm long and wide, thecae not separate, the 2 upper posterior locules quite distinct, the 2 lower anterior minor locules almost confluent; disk flat; conical style obtuse, stamens of the same length, separate stigma not present. Female flowers also solitary on the peduncle, involucre similar, 1.5 mm long, ovary inferior campanulate and perigone depressed globose, tepals 4 or 5 valvate, deltoid, moderately thick, stamens absent, the plane of the conical disk margin elevated, style immersed in the disk, also emerging 4 or 5 papilliform stigmas. Drupe oblong-oviform, to 6 mm long, above the obtuse base 3 mm in diameter; exocarp thin, the longitudinal fibers attached to the inner face of the apical endocarp finally free from the endocarp tips and forming fimbriate tails; mesocarp fibers shiny, numerous, ascending from endocarp and joining it to the exocarp; endocarp shortly oviform, ca. 2 mm long and in diameter, slightly 4-5-lobed, apex turning conical and thick fibers and concurrently prolonged all the way to the perigone and style, the wall hard but not coarse, the upper half unilocular with a star-shaped cavity, the remainder 4-5-locular.

It is not clear whether the flowers of this species are monoecious or partly hermaphrodite. Besides entirely female flowers, I sometimes found, on the same twigs of the type specimens, flowers of the male type but with style, and perhaps now and then fruiting. For on the second number collected by Mr. and Mrs. Clemens on Mt. Kinabalu (no. 26905) I found, besides such flowers, fruits with rudimentary stamens before the tepals, and others that had no such

stamens. Perhaps the former had originated from nearly male flowers as I have described them from no. 27308. On no. 26905 I also found open anthers, showing a peculiar structure: the posterior loculi of the thecae were opened separately, each forming an empty cup, the anterior loculi were opened together forming a third empty cup.

I cannot distinguish VERSTEEG'S no. 1385, from New Guinea, from the species above described. It not only agrees with it in its twigs and leaves, but also in the swollen disk, in which the style seems to be immersed up to the stigmas, and in the endocarp with stellate apical cavity. I found on this plant only few unripe fruits, and therefore could not examine the mesocarp.

Borneo, Mt. Kinabalu, Dallas, 3000 ft, 2 XI 1931, CLEMENS 27308 (B, L), type specimens, and CLEMENS 26905 (B, L).

New Guinea, Lorentz-River Region, in virgin forest, 6 VII 1907, VERSTEEG 1385 (B, L, U), parasite, flower yellow-green, fruit red.

12. *Cladomyza latifolia* DANSER, nov. sp.

Caulis prolongatus teres, efoliatus, 1.5-2.5 mm diametro; caules laterales 1.5-4 cm distantes, ad 4 cm longi, parte inferiore teretes, 0.5-1 mm diametro, foliis bracteiformibus, apicem versus angulati, saepe applanati et dilatati, ad 1.5 vel 2 mm lati, foliis bene evolutis. Folia bracteiformia parva, crassa, minus quam 1 mm longa; folia bene evoluta petiolo 2-6 mm longo, supra plano subtus leviter convexo, lamina elliptica vel rotundato-elliptica vel nonnihil ovata vel obovata, 2-5 cm longa, 1.5-3 cm lata, apice rotundata, basi in petiolum contracta, faciebus vix diversis, atris, haud lucidis, indistincte curvinerviis nervis longitudinalibus 5. Flos masculus ignotus. Flores feminei singuli vel pauci in axillis foliorum etiam bracteiformium, singuli in singulis pedunculis ad 1 mm longis, bracteis tectis quarum superiores involucrum 3-phyllum c. 1 mm diametro sub flore formant; ovarium inferum campanulatum c. 1.5 mm longum, tepala 4 deltoidea, discus elevatus, stylus fere nullus, stigmatibus 4 papilliformibus. Drupa ovato-oblonga, ad 6 mm longa, supra basin rotundatam 2.5 mm diametro, apice tepalis disco stigmatibusque persistentibus coronata; structura interna ut in *Cl. pachydisca*.

Stems prolonged terete [tapering?], without leaves, 1.5-2.5 mm in diameter; the lateral stems 1.5-4 cm distant, to 4 cm long, the lower part terete, 0.5-1 mm in diameter, the bract-like leaves, towards the apex angular, and often flattened and dilated, to 1.5 or 2 mm wide, foliar leaves well developed. The bract-like leaves very small, thick, less than 1 mm long; petiole of well-developed leaves 2-6 mm long, plane above, slightly convex below, blade elliptic or rounded-elliptic or somewhat ovate or obovate, 2-5 cm long, 1.5-3 cm wide, apex rounded, base contracted into a petiole, faces scarcely different, dark, not shiny, with 5 indistinct curvinerved longitudinal nerves. Male flowers unknown. The female flowers solitary or a few in the axils of the foliar and bracteal leaves, each on its own peduncle up to 1 mm long, bracts covering the upper 3-leaved involucre ca. 1 mm in diameter forming below the flowers; ovary inferior, campanulate ca. 1.5 mm long, tepals 4, deltoid, the disk is elevated, style almost none, 4 papilliform stigmas. Drupe ovate-oblong, to 6 mm long, 2.5 mm in diameter above the rounded base, the apex crowned with persistent tepals and stigmatic disk; internal structure as in *Cl. pachydisca*.

This species is perhaps only a variety of *Cl. pachydisca*, with which it agrees in the structure of the flower and the fruit, and also in general habit, but from which it differs in the greater difference between the main stem and the short lateral twigs, and the larger and more elliptical leaves.

S. E. New Guinea, Boridi, 5000 ft, 5 X 1935, CARR 14406 (L), climber, flowers green.

III. *HYLOMYZA* DANSER, nov. gen.

Fructus drupaceus; exocarpium fibris longitudinalibus nullis; mesocarpium fibris

radialibus membranaceis numerosissimis endocarpium cum exocarpio coniungentibus; endocarpium fibris mesocarpii vestitum, intus septis longitudinalibus 5 apice basique complete, parte media incomplete 5-loculare. Semen apice basique lobis 5 parallelis, parte meda sulcis longitudinalibus 5 sectione transversa 5-lobum. Semen apice basique lobis 5 parallelis, parte meda sulcis longitudinalibus 5 sectione transversas-lobum.

Fruit drupaceous; longitudinal exocarp fibers absent; radial membranous mesocarp fibers numerous joining the endocarp with the exocarp; endocarp fibers clothing the mesocarp, interior longitudinal dissepiments [septa, cross-walls] 5 apically, complete basally, median part incompletely 5-locular. Seed apex and base with 5 parallel lobes, median part with 5 longitudinal furrows, in transverse section 5-lobed.

Dioecious. Male inflorescences umbellate, the peduncle with scales of which the inferior and superior ones form an involucre, and with one terminal and several lateral pedicellate flowers; female flowers single and without pedicels of their own on similar peduncles. Male flower with deltoid valvate tepals, as many stamens inserted before these, and a rather flat 5-lobed disk. Female flower with campanulate inferior ovary, 5 valvate deltoid tepals, as many rudimentary stamens before these, a rather flat 5-lobed disk, and a short cylindrical style with 5 papilliform spreading stigmas. Fruit drupaceous, crowned by the persistent flower; exocarp rather thin; mesocarp with radial membranous fibres running from the endocarp to the exocarp; endocarp not hard, longitudinally grooved or not so, with or without beak, with 5 longitudinal dissepiments, completely 5-locular in the lower and the upper part, incompletely so between these. Seed with 5 parallel lobes at the base and the apex, between these 5-lobed on transverse section. - Glabrous shrubs, parasitic on branches of trees, the stems not twining nor attached with haustoria. Leaves foliaceous, scattered.

Cfr. plate XIV, figs. 5-6.

Hylomyza agrees, in its mode of growing, with the non-climbing *Cladomyza*-species and also with *Phacellaria*. In the structure of its fruit and seed the only differences with *Phacellaria* are, that this genus has the endocarp completely more-celled only at the apex, *Hylomyza* at the base and at the apex, and that the fibres of the mesocarp are membranous in *Hylomyza*, filiformous in *Phacellaria*. The main difference between these two genera is in the vegetative parts: *Hylomyza* has foliaceous leaves and short-peduncled inflorescences, *Phacellaria* has bract-like leaves only, and entirely sessile flowers.

Distribution: Southeastern Asiatic Continent, Sumatra, Borneo, Java.

Type species of the genus:

1. *Hylomyza sphaerocarpa* DANSER, n. sp.

Fruticulus, ad 50 cm altus et ultra, valde ramosus ramis paulum divergentibus. Ramorum partes vetustiores teretes, ad 6 mm diametro, nodis incrassatis, superficie cinerea, aspera, non autem profunde sulcata; ramuli iuniores lucidi, striati, basi teretes, apicem versus tenuiores et magis angulati, sub foliorum insertionibus carinati, apice saepe dilatati. Folia pauca mm tantum distantia, vix petiolata, anguste obovato-cuneata vel nonnihil spathulata, maiora saepe pro longitudine latiora, obovato-cuneata, plerumque 1-6 cm longa, petiolo incluso 5-30 mm lata, faciebus paulum tantum diversis, vix vel haud lucida, plerumque nervis longitudinalibus 5 facie superiore magis distinctis quam inferiore, in foliis minoribus utrinque indistinctis. Inflorescentia mascula statu juvenili pedunculo brevi omnino bracteis tecto, tempore florendi 2-3 mm longo, apice basique involucre distincto, florem terminalem et 2-4 flores laterales in axillis bractearum superiorum gerente. Flores masculi primum sessiles, tempore florendi pedicello ad 1.5 mm longo, apicem versus incrassato, perigonio fungiformi basi fere truncato apice rotundato, tepalis 5 crassiusculis c. 1 mm longis, staminibus c. 0.5 mm longis; filamentis c. 0.3 mm longis, antheris 0.2 mm longis et latis, thecis distinctis, basi latioribus quam apice, loculo posteriore et anteriore; disco subplano, styli rudimento nullo.

Inflorescentiae femineae uniflorae, singulae vel paucae in axillis foliorum, praecipue in parte inferiore ramulorum novissimorum, pedunculo brevi, primum 0.5 mm, sub fructu ad 1.5 mm longo, bracteis tecto quarum superiores acutiusculae involucri cupuliforme sub flore formantes. Flos femineus sessilis in involucrio, c. 1.75 mm longus, ovario infero campanulato-infundibuliformi, c. 1 mm longo, apice c. 1 mm lato, tepalis deltoideis 5 in semiglobum conniventibus, staminibus minimis, c. 0-4 mm longis, anthera filamentum brevius, thecis minimis ovatis basin versus divergentibus, disco plano lobis 5 incrassatis, stylo breve cylindrico c. 0.2 mm longitudine et diametro, stigmate distincte 5-loba expanso. Drupa subglobosa, pedunculo et perigonio exceptis c. 3 mm longa et 3.5 mm diametro; exocarpium tenue; mesocarpium floccosum, fibris membranaceis endocarpium cum exocarpo coniungentibus; endocarpium obovatum, c. 2.5 mm longum 1.5 mm diametro, albidum, sulcis fuscis longitudinalibus 5, septis longitudinalibus apice basique complete 5-loculare, media parte incomplete 5-loculare. Semen circuitu subglobosum, apice **basique** lobis 5 parallelis, media parte sectione transversa 5-lobum. (Description from the Kinabalu specimens).

Small shrub, to 50 cm high and beyond, vigorously branching with small divergent branches. Older branch parts smooth, to 6 mm diameter, nodes thickened, surface cinereous [ash grey], rough, on the other hand not profoundly grooved; small young twigs shining, striate, base terete, apex thinner and more angular, below the leaf insertion carinate [keeled], apex often dilated. Leaves standing only mm apart, scarcely petiolate, narrowly obovate-cuneate or somewhat spatulate, most often as wide as long, obovate-cuneate, generally 1-6 cm long, petiole included 5-30 mm wide, faces only slightly different, hardly or not at all shiny, generally 5 longitudinal nerves that are more distinct on the upper rather than the lower surface, on smaller leaves indistinct on both sides. Male inflorescences in the juvenile state shortly pedunculate, entirely covered with bracts, with time flowers 2-3 mm long, capped basally by a distinct involucre, flowers terminal and bearing 2-4 lateral flowers in axils of upper bracts. Male flowers at first sessile, with time the flowers pedicellate to 1.5 mm long, apex becoming thickened, perigone fungiform [mushroom shaped], base almost truncate, apex rotund, tepals 5 moderately thick ca. 1 mm long, stamens ca. 0.5 mm long; filaments ca. 0.3 mm long, anthers 0.2 mm long and wide, thecae distinct, base wide as the apex, loculi posterior and anterior; disk nearly flat, style rudimentary to none. Female inflorescence with solitary flower, singular or few in the axils of the leaves, especially in the region below the new young branches, peduncle short, at first 0.5 mm, after fruiting to 1.5 mm long, bracts covering the upper acute cup-like involucre forming below the flowers. Female flowers sessile in involucre, c. 1.75 mm long, ovary inferior campanulate-funnel-shaped, ca. 1 mm long, apex ca. 1 mm wide, 5 deltoid tepals connivent [convergent apically without fusion] when semiglobular, staminodia small, ca. 0-4 mm long, anther filament short, theca small ovate basally turning divergent, disk flat with 5 thickened lobes, style short cylindrical, ca. 0.2 mm longitudinally and in diameter, stigma expanding distinctly into 5-lobed. Drupe subglobose, pedunculate and without perigone ca. 3 mm long and 3.5 mm in diameter; exocarp thin; mesocarp floccose, fibers of the membranous endocarp joined with the exocarp; endocarp obovate, ca. 2.5 mm long 1.5 mm in diameter, white, dark longitudinal grooves 5, apical longitudinal septae basally completely 5-locular, medial region incompletely 5-locular. Seeds subglobose in circumference, apex and base with 5 parallel lobes, median part in transverse section 5-lobed. (Description from the Kinabalu specimens).

Hylomyza sphaerocarpa may easily be distinguished from all other species of the genus by its small subglobose fruits.

Specimens examined:

Borneo. Mt. Kinabalu, Penibukan, 4000 ft, 16 I 1933, CLEMENS 31093 (B, L), ♀, type of the species; ibidem, 4 I 1933, CLEMENS s. n. (B), ♀, parasite on tree; CLEMENS 30857 (B, L), cf, parasite on oak, greenish buds; 16 I 1933, CLEMENS 31117 (B, L), ♂, on tree; 25 X 1933, CLEMENS 40831 (L), ♂, parasite on 60' tree, flowers green, small, but open; Mt. Kinabalu, Colombon River basin, Minatuban Spur to Lobang, 7000 ft, 29 VI 1933, CLEMENS 33784 (B, L), ♀, fruit green; Soengai Kenepai, XII 1893-1 1894, HALLIER B. 2166 (B, L), ♂.

Sumatra. Atjeh, Boer-ni-Geredong, 1500 m, 5 IX 1934, VAN STEENIS 6440 (B), 9, one twig fallen from tree in old forest; Mt. Kerintji, forest, 1900-2000 m, 7-18 IV 1920, BUNNEMEYER 9580 (B), ♂ and ♀; 9177 (B, L), ♂ 9361 (B, L), ♀ or ♀, flowers green.

2. *Hylomyza oresitropha* DANSER, n. sp.

Fruticulus erectus. Caules (qui exstant) ad 25 cm longi, ramosissimi, ramulis paulum divergentibus, basi ad 4 mm diametro, teretes, longitudinaliter rugosi, nodis paulum incrassatis; ramuli foliati apices versus sulcati nonnihil angulati, sensim ad 0.5 mm diametro attenuati, foliorum insertionibus nonnihil incrassatis. Folia pauca mm tantum distantia, petiolo 0--2 mm longo supra plano subtus leviter convexo, lamina obovato-cuneata vel oblongo-obovata, plerumque 12-20 mm longa, 4-8 mm lata apice rotundata, sub basi sensim attenuata in petiolum contracta, crassiuscula, utrinque haud lucida, nonnihil granulata vel rugulosa, facie superiore plerumque nervis 3-5 longitudinalibus, inferiore enervia. Inflorescentiae et flores masculi ignoti. Inflorescentiae femineae uniflorae, singulae vel gregatim in axillis foliorum, praecipue versus apices ramulorum, pedunculis brevissimis perulis tectis, quarum superiores plerumque 5 rotundato-triangulares involucrum sub flore formant fere 1 mm diametro. Flos femineus c. 2 mm longus, ovario infero campanulato et tepalis 5 deltoideis, crassiusculis, denique erectis vel nonnihil expansis c. 0.75 mm longis; staminorum rudimenta c. 0.4 mm longa, anthera c. 0.1 mm longa 0.2 mm lata, loculis 4, quorum posteriores anterioribus aequilongi sed magis distantes; stylus brevissimus, stigmatibus 5 acutis divaricatis stellam 0.4--0.5 mm diametro formantibus. Drupa oviformis acuta, ad 7 mm longa 4 mm diametro supra basin rotundatam, apice tepalis staminibus styloque coronata; exocarpium crassiusculum; mesocarpium floccosum, e fibris membranaceis compositum; endocarpium oblongo-obovatum, c. 6 mm longum, rostro c. 1 mm longo, supra basin c. 1.5 mm, 3-4 mm supra basin c. 2 mm diametro, non sulcatum, facile in partes 5 dehiscens, septis 5 in 1 mm apicali et prope basin complete 5-loculare, media parte incomplete 5-loculare. Semen apice lobis 5 longioribus, basi lobis 5 brevioribus, parte media sectione transversa 5-lobum.

Small shrub erect. Stems (standing out, projecting) to 25 cm tall, much branched, the branches slightly divergent, at the base to 4 mm in diameter, terete, longitudinally rugose, nodes slightly thickened; foliar branch tips somewhat angled, gradually attenuating to 0.5 mm in diameter, leaf insertions somewhat thickened. The leaves distanced by only a few millimeters, petiole 0-2 mm long, above plane, below slightly convex, blade obovate-cuneate or oblong-obovate, mostly 12-20 mm long, 4-8 mm wide, rounded at apex, gradually attenuating at the base into a contracted petiole, thick, both sides not shiny, somewhat granulated or rugulose, the upper face usually with 3-5 longitudinal veins, lower without veins. Inflorescences and male flowers are unknown. Female inflorescence one-flowered, solitary or aggregated in the axils of leaves, especially toward the tips of the branches, peduncle covered with short scales, the upper mostly 5, rounded-triangular forming an involucre below the flower about 1 mm in diameter. Female flower ca. 2 mm long, ovary inferior, campanulate and tepals 5, deltoid, stout, short, erect or somewhat expanded to ca. 0.75 mm long; stamens rudimentary ca. 0.4 mm long, anthers ca. 0.1 mm long and 0.2 mm wide, locules 4, the posterior anterior one equally long but more distant; style short, forming 5, spreading, star-shaped stigmas, 0.4 - 0.5 mm in diameter. Drupe oviform acute, to 7 mm long and 4 mm in diameter above the rounded base, apex crowned with the tepals, stamens and style; exocarp moderately thick; mesocarp floccose and composed of membranous fibers; endocarp oblong-obovate, ca. 6 mm long, the beak ca. 1 mm long, above the base ca. 1.5 mm long, 3-4 mm above the base ca. 2 mm in diameter, not sulcate, easily dehiscing into 5 parts, walls 5 in the apical 1 mm and near the base completely 5-locular, the middle part incompletely 5-celled. The seed with 5 longer apical lobes, the 5 basal lobes shorter, the middle part in transverse sections 5-lobed.

Cfr. plate XIV, figs. 5-6.

Borneo, Mt. Kinabalu, below Dachang = Silau Basin, 6—9,000 ft, 8 IV 1932, CLEMENS

29084 = 29742 (B, L), ♀, parasite, fruit green to purple.

3. *Hylomyza oocarpa* DANSER, n. sp.

Fruticulus erectus. Caules (qui suppetunt) ad 25 cm longi, ramosissimi ramulis paulum divergentibus, basi ad 3 mm diametro, teretes, cortice albido, longitudinaliter rugoso et rimuloso, nodis paulum incrassatis; ramuli foliati apices versus angulati et sulcati, sub foliorum insertionibus carinati, sensim attenuati ad 0.75 vel etiam 0.5 mm diametro. Folia inferiora 8 mm, superiora minus distantia, petiolo ad 2 mm longo plerumque breviora, supra plano subtus convexo, lamina obovato-cuneata, 12-23 mm longa, 5-12 mm lata, apice rotundata, basin versus sensim attenuata et in petiolum contracta, crassiuscula, utrinque haud lucida, rugulosa vel facie inferiore nonnihil granulosa, facie superiore plerumque nervis longitudinalibus 3-5 et venis indistinctis, marginibus lateralibus saepe paulum revolutis. Inflorescentiae et flores masculi ignoti. Inflorescentiae femineae uniflorae, singulae vel paucae in axillis foliorum praecipue superiorum, pedunculis brevissimis primum 1 mm postea ad 2 mm longis, perulis tectis quarum superiores maiores involucrum sub flore formant denique expansum ad 1.5 mm diametro. Flores feminei c. 2 mm longi, ovario infero campanulato tepalisque 5 deltoideis c. 0.75 mm longis, crassiusculis, acutiusculis, staminibusque minimis c. 0.4 mm longis antheris minimis, disco subplano styloque brevi crasso 5-sulcato stigmatibus 5 expansis subglobosis stellam 0.3 mm diametro formantibus. Drupa oviformis, ad 6 mm longa 3.5 mm diametro, tepalis staminibus styloque coronata; exocarpium tenuius; mesocarpium floccosum fibris membranaceis; endocarpium ellipsoideum, c. 3 mm longum 1.75 mm diametro, sulcis 5 longitudinalibus, apice obtusum rostro nullo, sed fibris crassis cum perigonio et stylo coniunctum, facile in partes 5 dehiscens, septis 5 parte superiore et inferiore complete 5-loculare, parte media incomplete 5-loculare. Semen apice **basique** lobis 5 parallelis, parte media sulcis longitudinalibus sectione transversa profunde 5-lobum.

Small erect shrub. Stems (that we know) to 25 cm long, twig branches slightly divergent, to 3 mm in diameter at the base, terete, bark whitish, longitudinally wrinkled and cracked, nodes slightly thickened; angled and grooved toward the tips of leafy branches, carinate below the leaf insertions, gradually attenuated to 0.75 or even 0.5 mm in diameter. Lower leaves 8 mm, upper less distant [spacing], petiole to 2 mm long, generally shorter, upper surface flat, lower convex, leaf blade obovate-cuneate, 12-23 mm long, 5-12 mm wide, apex rounded, gradually attenuated and contracted towards the base of the petiole, moderately thick, both sides shiny, lower face rugulose or somewhat granular, upper face mostly with 3-5 longitudinal nerves and indistinct veins, lateral margins often slightly revolute. Inflorescence and male flowers unknown. Female inflorescence 1-flowered, single or a few in the axils of the leaves, especially of the upper ones, peduncle first very short, later 1 mm to 2 mm long, scales covering the upper part form the major involucre below the flowers, finally expanding to 1.5 mm in diameter. Female flowers ca. 2 mm long, ovary inferior, campanulate tepals 5 deltoid ca. 0.75 mm long, moderately thick, acute, stamens small ca. 0.4 mm long, anthers small, disk almost flat, style short, thick 5-grooved expanded forming a subglobose, star-shaped, 0.3 mm in diameter stigma. Drupe oviform, to 6 mm long and 3.5 mm in diameter, crowned with tepals, stamens and style; exocarp thin; mesocarp floccose with membranous fibers; endocarp ellipsoidal, ca. 3 mm in length and 1.75 mm in diameter, with 5 longitudinal furrows, apex obtuse without a beak, but thick fibers and style associated with the perigone, easily dehiscing into 5 parts, septae 5 in the upper part, in the lower part completely 5-locular, in the middle part incompletely 5-locular. Seed apex 5 basal parallel lobes, middle part with longitudinal furrows, in transverse section deeply 5-lobed.

Hardly to be distinguished, at first sight, from *Hylomyza oresitropha*, clearly distinct, however, in the fruit, which is much like that of *Hylomyza euryphylla*.

Malay Peninsula, Mt. Tahan, 5500-7000 ft, 12 VI 1922, SINGAPORE FIELD No. 7918 coll. HANIFF & NUR (B), ♀.

4. ***Hylomyza euryphylla*** DANSER, n. sp. - *Tupeia Reinwardtiana* (non BLUME) MOLKENBOER, in MIQ., PI. Jungh., p. 117 (1852) cum var. *angustifolia*.

Frutex. Caules (qui suppetunt) ad 40 cm longi, ramosi ramulis oblique divergentibus, partibus vetustioribus ad 6 mm diametro, teretibus, nodis incrassatis, cortice atro rimis longitudinalibus albidis ornato, ramulis folia tis plerumque 1.25-2 mm diametro, apices versus angulatis sub foliorum insertionibus carinatis apicibus saepe ad 1.5 mm raro ad 3 mm dilatatis. Folia rotundato-obovata, a basi ad apicem ramulorum maiora, plerumque 2.5-8 cm longa, 1.5-6 cm lata, apice rotundata, basi contracta vel subpetiolata, faciebus paulum diversis, utrinque haud lucida, atra, nervis longitudinalibus 5-7 venisque intermediis tenuiter prominentibus. Inflorescentiae et flores masculi ignoti. Inflorescentiae femineae uniflorae, primum singulae, denique numerosae in axillis foliorum, pedunculo sulcato 0.5-2 mm longo, perulis tecto, quarum inferiores involucrum parvum, superiores 5 involucrum maius 1 mm diametro primum erectum denique expansum formant. Flos femineus ovario infero campanulato 1-1.5 mm longo, tepalis plerumque 5 deltoideis 0.75 mm longis crassiusculis; stamina rudimentaria tepalis breviora, 0.3-0.4 mm longa, anthera didyma c. 0.1 mm longa; discus subplanus; stylus brevissimus truncatus stigmatibus 5 papilliformibus stellatim expansis. Drupa oblonga, ad 5 mm longa 2.5 mm diametro; endocarpium oblongum, nonnihil oviforme, ad 3 mm longum 1.75 mm diametro, sulcis 5 longitudinalibus facile dehiscens, apice leviter 5-lobatum, septis 5 longitudinalibus tertia parte superiore et inferiore complete 5-loculare, tertia parte media incomplete 5-loculare. Semen apice basique lobis 5 parallelis, parte media sulcis 5 sectione transversa profunde 5-lobatum.

Shrub. Stems (that we know) to 40 cm long, branching twigs obliquely divergent, older parts to 6 mm in diameter, terete, nodes thickened, bark furnished with a dark longitudinal cracks whitish, small branches packed with leaves mostly 1.25-2 mm in diameter, apex turned to angular, below the leaf insertions carinate, often spreading to 1.5 mm rarely to 3 mm wide. Leaves rounded-obovate, from the base to the apex of the larger branches, mostly 2.5-8 cm long, 1.5-6 cm wide, apex rounded, base contracted or subpetiolate, faces little different, both sides shiny, dark, longitudinal nerves 5-7 and intermediate veins slightly prominent. Inflorescences and male flowers unknown. Female inflorescence 1-flowered, first single, finally numerous in the foliar axils, peduncle sulcate 0.5-2 mm long, scales covering the lower small involucre, the upper 5 involucre more than 1 mm in diameter at first erect, finally reaching an expanded form. Female flower ovary inferior campanulate 1-1.5 mm long, tepals usually 5, deltoid 0.75 mm long, moderately thick; stamens rudimentary, tepals short, 0.3-0.4 mm long, anthers didymus [in 2 lobes] ca. 0.1 mm long; disk almost flat; the style shortly truncate expanding into 5 papilliform stellate stigmas. Drupe oblong, up to 5 mm long, 2.5 mm in diameter; endocarp oblong, somewhat oviform, to 3 mm long and 1.75 mm in diameter, easily dehiscing along 5 longitudinal grooves, apex slightly 5-lobed, 5 longitudinal septae in the upper third part and lower part completely 5-locular, middle third part incompletely 5-locular. Seed apex 5 basal parallel lobes, middle part with 5 longitudinal furrows, in transverse section deeply 5-lobed.

Description from the type-specimen:

Sumatra, "Hochankola, Waldregion, 1-2000' ", JUNGHUHN s. n. (L), ♀.

From Java there are, moreover, several collections, partly male, partly female specimens (but all without fruit), which in their vegetative parts cannot be distinguished from the species described above. They perhaps represent the same species, perhaps all or part of them a closely allied one. The male specimens have their flowers in short-peduncled umbels, like those of *H. sphaerocarpa*. These collections are the following:

Java. 1880-82, H. O. FORBES 1084 (L), ♀; Nirmala, 1200 m, 28 XII 1913, BACKER mm78 (B, L), ♂, parasitic on *Ficus*, perigone 1.5 mm high, greenish-yellow, somewhat fleshy, 5-partite almost down to the base, with erect triangular-ovate lobes, 5 stamens opposite to the lobes and inserted above the base of these, 1/2 to 2/3 as long, anthers with 2 thecae, disk flat and red; Bandoeng, 1550m, 13 IV 1911, SMITH & RANT (B, L), ♂; Priangan, Pengalengan Plateau, in the woods, 4300 ft, JUNGHUHN s. n. (L), ♀, type of

Tupeia Reinwardtiana var. *angustifolia* MOLKENBOER; Mt. Papandajan, Tegal Pandjang, 2041 m, 16 V 1931, VAN STEENIS 4872 (B, L), ♂, one specimen, parasitic on *Quercus spicata*, nearly 2 m in diameter, young leaves bright red.

To the genus *Hylomyza* probably also belong the following species already described:

5. ***Hylomyza platyphylla*** (SPRENGEL) DANSER, nov. comb. – *Viscum latifolium* (non LAMARCK 1789, nec SWARTZ 1797) D. DON, Prodr. fl. nepal. (1825) 142; *Viscum platyphyllum* SPRENGEL, Syst. veg., cur. post. (1827) 47; *Viscum heteranthum* A. P. DE CANDOLLE, Prodr., IV (1830) 279; *Henslowia heterantha* ALPH. DE CANDOLLE, in D. C., Prodr., XIV, 2 (1857) 632.

All specimens seen by me are male and in bud, and do not bear fruit. Of these, the Nepaul and Sikkim specimens, cited below, may be considered as originals. From HOOKER'S description of the fruit ("small, elliptic-oblong, pyrene 5-6-furrowed") I conclude that this species is a *Hylomyza*.

India. Nepaul, WALLICH Cat al. 488 coil.. WALLICH (L), on one sheet intermingled with *Viscum album*; Sikkim, 2-5000 ft, J. D. HOOKER s. n. (L); Khasia, 2-3000 ft, J. D. HOOKER & T. THOMSON s. n. (L).

6. ***Hylomyza granulata*** (ALPH. DE CANDOLLE) DANSER, nov. comb. - *Henslowia granulata* ALPH. DE CANDOLLE, in D. C., Prodr., XIV, 2 (1857) 632, cum var. *sikkimensis*.

If really the following specimens are types of the species and its var. *sikkimensis*, *Henslowia granulata* is a *Hylomyza*.

India. Khasia, 5-6000 ft, J. D. HOOKER & T. THOMSON s. n. (L); Sikkim Himalaya, 5-7000 ft, J. D. HOOKER, s. n. (L, U).

IV. PHACELLARIA BENTHAM

in BENTHAM & HOOKER FIL., Gen. pl., III, I (1880) 229; cfr. DANSER, in Blumea, III, 2 (1939) 212.

Flowers hermaphrodite, monoecious, polygamous or dioecious, always sessile, either single or in groups in the axils of the scale-like leaves, in the latter case each flower either with 2 prophylls and now and then small buds in the axils of these, or with an involucre of more numerous small bracts, and in this case either with secondary flowers in the axils of these bracts, or adventitious flowers around the involucre, or both; moreover now and then terminal flowers on the flowering stems, or on short lateral branches covered with bracts. Tepals 3-8, deltoid, valvate, thickish. Male flowers with short tube, 3-6 tepals, and as many stamens inserted before these and composed of a dorsally flattened filament and a short and broad anther with 2 separate oblong-ovate thecae contiguous with their rather acute tips and diverging with their rounded bases; disk rather flat. Female flowers with inferior usually campanulate ovary, 4-8 tepals with or without rudimentary stamens, flat disk, and short cylindrical style with truncate or slightly lobate stigma. Hermaphrodite flowers like the female ones, but with well-developed stamens. Fruit a drupe, crowned by the persisting perigone lobes and style; exocarp thin-coriaceous; mesocarp with delicate fibres running from the endocarp to the exocarp; endocarp with rather thin wall, completely 4-6-celled in the apical part, incompletely so for the rest. Seed with 4-6 parallel lobes at the apex, 4-6-lobed on transverse section for the rest; embryo against the apex of the endosperm between the apical lobes. - Shrubs or undershrubs, glabrous or more or less short-hairy, parasitical on Loranthaceae and Santalaceae, the stems originating in bundles from the branches of the host, often through the lenticels, not or little branched, never climbing, with scattered bract-like leaves, and in the axils of these the flower-groups.

Cfr. plate XIV, figs. 7-8.

Phacellaria agrees, as regards the structure of the fruit, almost entirely with *Hylomyza*, but the completely 5-celled basal part of the fruit and the basal lobes of the seed are nearly none in *Phacellaria*; moreover *Hylomyza* has more membranous fibres in its mesocarp, *Phacellaria* more hair-like ones. The most important difference between the two genera is, that *Hylomyza* has well developed foliaceous leaves, *Phacellaria* bract-like leaves only.

Distribution: West-China, East-Burma, French Indo-China, Siam, Malay Peninsula. For the species see DANSER, l.c.

V. DENDROTROPHE MIQUEL

Tupeia (non CHAM. & SCHLECHT. 1828) BLUME, ex KORTHALS, In Verhand. Batav. Genootsch., 17 (1838) 194; *Henslowia* (non WALLICH 1832, nee LOWE 1844) BLUME, Mus. Bot. Lugd, Bat., I, 16 (1850?) 242; *Dendrotrophe* MIQUEL, Fl. Ind. Bat., I, 1,5 (1856) 779.

Flowers dioecious, monoecious, or hermaphrodite. Inflorescences one- or more-flowered umbels or short racemes, the peduncle with scales of which the lower and upper ones often crowded to involucre, the male ones usually more-flowered, with one terminal and several lateral flowers, the latter in the axils of the upper bracts, the female inflorescences usually one-flowered, sustained by an involucre formed by the upper bracts. Tepals usually 4 or 5, deltoid, valvate, thickish. Male flowers with as many stamens as tepals, the anther with 2 thecae, each theca with 2 loculi, and a rather flat disk. Female flowers with an inferior ovary, rather flat lobed disk, short style and 5 short stigmas. Fruit a drupe crowned by the persistent tepals and style; exocarp thin; mesocarp fleshy, parenchymous with longitudinal delicate fibres; endocarp hard, more or less rough or tuberculate outside, the larger tubercles usually in about 10 longitudinal rows, completely 5-celled at the base and the apex, incompletely nearly 5-celled for the rest, the cells moreover transversely chambered. Seed filling all cavities, situated in the centre of the endocarp, and in all directions with rounded lobes. - Glabrous shrubs or woody climbers, epiphytic or terrestrial, but probably always root-parasites, often with twining stems, but these never with haustoria. Leaves scattered, foliaceous, usually rather large.

Cft. plate XIV, fig. 9.

Distribution: S.E. Asiatic Continent, Malay Archipelago, N. to Palawan, W. to Sumatra, S. to Java, E. to Celebes or perhaps to New Guinea.

The genus *Dendrotrophe* differs strikingly from all allied genera described in this paper by the structure of its fruit, which reminds of that of *Juglans*, especially by the parenchymous mesocarp, and the hard, tubercled, incompletely many-celled endocarp. It includes a rather large number of, for the majority, closely allied species, which, however, were never the subject of a critical revision. For lack of type specimens the present author had not yet the opportunity to realise this revision. Therefore he had to restrict himself here to the enumeration of those species that with certainty belong to this genus, without describing new ones.

Type species of the genus:

1. ***Dendrotrophe umbellata*** (BLUME) MIQUEL - *Thesium spathulatum* & *Viscum unibellatum* BLUME, Bijdr. Fl. Ned. Ind., 13 (1825) 646, 666; *Tupeia umbellata* BLUME, ex KORTHALS, in Verhand. Batav. Genootsch., 17 (1838) 195; *Henslowia umbellata*, *H. retusa*, *H. pauciflora* BLUME, Mus. Bot. Lugd, Bat., I, 16 (1850?) 243,244; *Dendrotrophe umbellata* MIQUEL, Fl. Ind. Bat., I, 1, 5 (1856) 779.

None of the originals of the names enumerated bears any fruit, with exception of that of

Henslowia retusa; the type specimen of *Henslowia pauciflora* is accompanied by a detached fruit, apparently described by BLUME, but probably not belonging to the plant, as it seems not to be a Santalaceae fruit. Later collections of this species, however, show that *Henslowia umbellata* has the fruit structure as it is described above for the genus *Dendrotrophe*.

Specimens examined:

Sumatra. Locality illegible, KORTHALS s. n. (L).

Java. Probably -Mt. Salak, BLUME s. n. (L), originals of *Viscum umbellatum* BLUME; probably Mt. Gede, VAN BASSELT s. n. (L), originals of *Thesium spathulatum* BLUME; Mt. Cede, above Tjibodas, 1400-2400 m, SCHEFFER s. n. (B), KOORDERS 31640 f3 (B, L), F. W. WENT s. n. (B, L, U), VAN STEENIS 5012 (B); Tjiboener, 3-5000 ft, JUNGHUHN s. n. (L); Mt. Patoeha, BLU1n s. n. (L), type of *Henslowia pauciflora* BLUME; G. Slamet. WAITZ s. n. (L), type of *Henslowia retusa* BLUME.

Flores. Mt. Larantoea, TEYSMANN 10769a (B).

2. *Dendrotrophe varians* (BLUME) MIQUEL - *Henslowia varians* BLUME, Mus. Bot. Lugd.

Bat., I, 16 (1850?) 244, t. 43, cum var. *crassifolium*; *Henslowia cassiaefolia* et *H. spicata* BLUME, ibid.; *Dendrotrophe varians*, *D. cassiaefolia*, *D. spicata* MIQUEL, Fl. Ind. Bat., I, 5 (1856) 780.

Dendrotrophe varians is probably widely spread in the S. E. part of the Asiatic Continent and in the Malay Archipelago, and has certainly several times been described as a new species under different names, but as its synonymy is not yet clear to the present author, he has restricted himself to the enumeration of few synonyms and the localities of these. On BLUME'S plate accompanying the original description of *Henslowia varians*, the transverse section of the fruit suggests that this species might be a *Hylomyza*, but this is not the case.

Localities of the types:

Borneo. Without exact locality, but, like the following specimens undoubtedly from S. E. Borneo, KORTHALS s. n. (L), type of *Henslowia spicata* BLUME; Martapoera, KORTHALS s. n. (L), types of *Henslowia varians* and the var. *crassifolia* BLUME; "Pulu Lampei", KORTHALS s. n. (L), type of *Henslowia cassiaefolia* BLUME.

3. *Dendrotrophe buxifolia* (BLUME) MIQUEL - *Henslowia buxifolia* BLUME, Mus. Bot. Lugd. Bat., I, 16 (1850?) 244; *Dendrotrophe buxifolia* MIQUEL, Fl. Ind. Bat., I, 5 (1856) 781.

This species is spread in Cochin-China, the Malay Peninsula, Sumatra, Borneo, and the Archipelagoes between these islands. I restrict myself to the localities of the type specimens.

Borneo, probably S. E. part, KORTHALS s. n. (L), types of *Henslowia buxifolia* BLUME.

4. *Dendrotrophe frutescens* (BENTHAM) DANSER, comb. nov. - *Henslowia frutescens* BENTHAM, in HOOKER, Kew Journ., 5 (1853) 194.

I have seen no type specimens, but the original description of the fruit ("endocarpio crasso osseo lignoso 5-sulco rugoso cellulose") clearly shows that *Henslowia frutescens* is a *Dendrotrophe*. It is closely allied to *Dendrotrophe varians* and perhaps a variety of it.

5. *Dendrotrophe Lobbiana* (ALPH. DE CANDOLLE) MIQUEL - *Henslowia Lobbiana* ALPH. DE CANDOLLE, in D. C., Prodr., XIV, 2 (1857) 631; *Dendrotrophe Lobbiana* MIQUEL, Fl. Ind. Bat., I, 6 (1858) 1096.

Cfr. plate XIV, fig. 9.

I cannot distinguish this from *D. varians*, but I keep it apart provisionally on GAMBLE'S

authority (Materials, 23, p. 273). I have not seen the type specimen collected by LOBB, but I saw the following one cited by GAMBLE.

Penang, top of Government Hill, MAINGAY 1315 (L).

6. *Dendrotrophe monticola* (GAMBLE) DANSER, comb. nov. - *Henslowia monticola* GAMBLE, in Kew Bull. 1912 (1912) 201.

I have seen no specimens, but from the description of the fruit (“endocarpio rugoso angulis multis in albumen porrectis”) it is sufficiently clear that this species is a *Dendrotrophe*.

7. *Dendrotrophe Ridleyi* (GAMBLE) DANSER, nov. comb. - *Henslowia Ridleyi* GAMBLE, in Kew Bull. 1912 (1912) 201.

I have seen none of the specimens cited by GAMBLE, but from the description of the fruit (“endocarpio sulcato rugoso angulis multis intus in albumen porrectis”) it is clear that this species is a *Dendrotrophe*.

8. *Dendrotrophe Wrayi* (GAMBLE) DANSER, nov. comb. - *Henslowia Wrayi* GAMBLE, in Kew Bull. 1912 (1912) 201.

I have seen no specimens, but the description of the fruit (“endocarpio rugoso; albumen multilobatum”) shows, that this species is a *Dendrotrophe*.

9. *Dendrotrophe palawanensis* (ELMER) DANSER, nov. comb. - *Henslowia palawanensis* ELMER, Leaf. Phil. Bot., V, art. 93 (1913) 1934.

I have seen specimens distributed by ELMER, which represent a *Dendrotrophe* hardly distinguishable from *D. varians*.

Palawan, Mt. Pulgar, Puerto Princesa, III 1911, ELMER 12752 (B, L, U).

10. *Dendrotrophe minor* (RIDLEY) DANSER, nov. comb. - *Henslowia Ridleyi* (non GAMBLE 1912) RIDLEY, in Journ. Fed. Mal. Stat. Mus., VI, 3 (1915) 170; *Henslowia minor* RIDLEY, ibidem, VII, 2 (1916) 50.

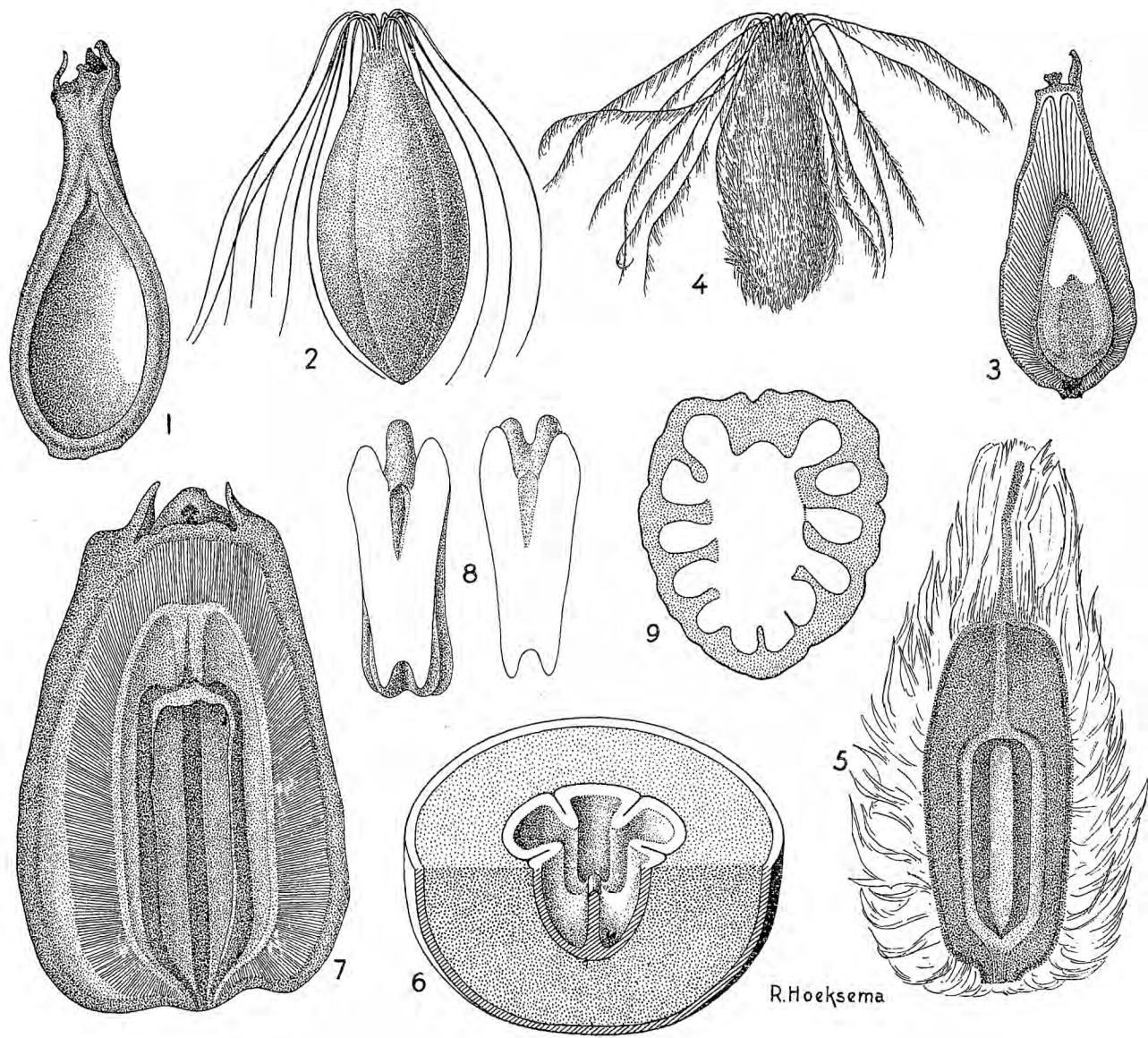
I have seen no specimens, but RIDLEY'S drawing, in his Flora of the Malay Peninsula (III, p. 168), clearly shows the typical seed shape of *Dendrotrophe*. RIDLEY describes, it is true, the seed as “indistinctly 5-ribbed”, but here “seed” undoubtedly is a mistake for “endocarp”.

INDEX TO THE COLLECTORS' NUMBERS ACCOUNTED FOR IN THIS PAPER,
REFERRING TO THE SPECIES BY MEANS OF THE NUMBERS OF THE GENUS AND
THE SPECIES

BACKER 4511 = I, I; 11178 = III, 4; 12462, 31508 = I, I; BAKHUIZEN VAN DEN BRINK
5244 = BAKHUIZEN VAN DEN BRINK JR. 857 = I, I; BECCARI P. S. 737 = I, I; BLUME
s. n. = V, I; BRASS 3430 = II, 10; 3800 = I, I; 4240, 4240a, 4587, 4749 = II, 8; 5013 = II, 6;
5393 = I, I; BRUGGEMAN 736 = I, I; BUNNEMEYER 9177, 9361, 9580 = III, I; BUREAU
OF SCIENCE 15917 = I, I; CARR 11918, 13025 = I, I; 13092 = II, 6; 13121 = II, 9; 14308 =
I, I; 14406 = II, 12; CLEMENS s. n. = III, I; 199 = I, I; 26905, 27308 = II, I; 29084, 29742 =
III, 2; 30857 = III, I; 30970 = I, I; 31093, 31117 = III, I; 32471, 33071, 33155 = I, I; 33784,
40831 = III, I; DE VRIESE & TEYSMANN s. n. = I, I; DOCTERS VAN LEEUWEN 8674,
10687 = I, I; ELMER 8987, 10106, 11296 = I, I; 12752 = V, 9; 14063 = I, I; ENDERT 2958,
3843, 5268 = I, I; FORBES 1084 = III, 4; FORESTRY BUREAU 1200 = I, I; GJELLERUP
1215 = I, I; HALLIER B. 2166 = III, I; B. 2190 = I, I; HELLWIG s. n. = I, I; HOOKER s. n. =
III, 6; HOOKER & THOMSON s. n. = III, 5, III, 6; JAHERI s. n. = I, I; JUNGHUIN s. n. =
III, 4, V, I; KAJEWSKI 1672 = I, I; KJELLBERG 1636, 1641 = I, I; KOORDERS 17745 β ,
17750 β = I, I; KORTHALS s. n. = I, I, V, 2, V, 3; LAM 1590, 1649, 1696 = II, 4;
MAINGAY 1315 = V, 5; PRAETORIUS s. n. = I, I; PULLE 842, 908 = II, I; 1038 = II, 5;
1182 = I, I; RANT 66, 323 = I, I; REINWARDT s. n. = I, I; ROBINSON 1809 = I, I;
RUTTEN 2064 = I, I; SCHEFFER s. n. = V, I; SCHLECHTER 14259, 16456, 17283a = I, I;
SINGAPORE FIELD No. 7918 = III, 3; SMITH & RANT 493 = III, 4; TEYSMANN 1075
H. B., 5153 H. B., 8089 = I, I; 10769a = V, I; TREUB 158 = I, I; VAN HASSELT s. n. = V, I;
VAN STEENIS 4872 = III, 4; 5012 = V, I; VERSTEEG 1385 = II, II; 2447 = II, 7; VON
ROEMER 1250 = II, I; WAITZ s. n. = V, I; WALLICH CATAL. 488 = III, 5; WENT s. n. =
V, I; WENZEL 2553 = I, I.

EXPLANATION TO PLATE XIV

1. *Dendromyza Reinwardtiana* (ENDERT 5268), unripe fruit, longitudinally cut, the seed removed, 7 X.
2. *Dendromyza Reinwardtiana* (BACKER 4511), endocarp of a ripe fruit, with tail-like fibres of the exocarp, 7 X.
3. *Cladomyza robustior* (VERSTEEG 2447), longitudinal section of the fruit, 7 X.
4. *idem*, endocarp of a ripe fruit, covered with the fibres of the mesocarp, and with the tail-like fibres of the exocarp, 7 X.
5. *Hylomyza oresitropa* (CLEMENS 29084), longitudinal section of the endocarp covered with the fibres of the mesocarp, the seed removed, 14 X.
6. *idem*, lower portion of a ripe fruit, the anterior portion cut away, the seed removed, 14 X.
7. *Phacellaria Fargesii* (FARGES 1511), longitudinal section of the ripe fruit, the seed removed, 14 X.
8. *idem*, seed taken from the former, longitudinally, but somewhat, obliquely, cut in two, 14 X.
9. *Dendrotrophe Lobbiana* (MAINGAY 1315), longitudinal section of the endocarp with seed, cut slightly behind the middle, 7 X.



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