1936, alt. 80 m., common in forest undergrowth on flooded river banks as well as on the ridges; Palmer River, 2 miles below Black River Junction, *Brass 7304*, July 1936, alt. 100 m., common in forest undergrowth on flood plains and lower ridges; Central Division, Ononge Road, Dieni, *Brass 3943*, April-May 1933, alt. 500 m., rain-forest; Ihu, Vailala River, *Brass 974*, rain-forest. The field notes are here summarized: small slender usually unbranched tree 5-6 m. tall, with a crown of very large oblanceolate leaves (in one number, two whorls 10 cm. apart); panicles several, scattered along the stem, flowers flat, small, white; numerous brown pubescent fruits. The pubescence is somewhat variable, *Brass 3943* being practically glabrous. Not previously reported from British New Guinea.

Semecarpus fulvo-villosa Lauterb. Bot. Jahrb. 56: 371. 1920.

BRITISH NEW GUINEA: Palmer River, 2 miles below Black River Junction, *Brass 7271*, July 1936, alt. 100 m., forest undergrowth of lower ridges (sparse slender tree 3–4 m. high; leaves stiff, grey below, flowers cream-colored); Lake Daviumbu, Middle Fly River, *Brass 7461*, August 1936, contact zone of rain- and savanna-forest (tree 14 m. high, with pale brown corky deeply fissured bark exuding quantities of black resin when cut; leaves grey beneath).

In the original description based on the staminate plant, specimens are cited from Netherlands New Guinea, Northeastern New Guinea, and the Bismarck Archipelago. The above cited collections seem to fit this species reasonably well, the first is in flower (&), the second in fruit. Infructescence axis 29 cm. long; branches 1–7 cm. long; dried drupes compressed, transversely and somewhat obliquely ellipsoid, 2 cm. long, 2.5 cm. broad, slightly keeled, golden brown velutinous, closely and very shallowly sulcate from base to apex, apex a little excentric, not beaked; hypocarp also golden brown velvety, turbinate, 6 mm. long, deeply sulcate when dry.

Semecarpus rostrata Valeton, Bull. Dept. Agric. Ind. Néerl. 10: 29. 1907, Ic. Bogor. 3: 151, t. 259. 1908, Lauterb. Nov. Guin. 8: 299. 1910, 1. c. 8: 830. 1912, Bot. Jahrb. 56: 367. 1920.

BRITISH NEW GUINEA: Fly River, 528 mile Camp, *Brass 6788*, May 1936, alt. 80 m., occasional in forest undergrowth on muddy flood banks of river (shrub 1–1.5 m. high; leaves stiff, pale beneath; inflorescence racemose, terminal; fruit \pm 5 cm. long, apical portion yellow, fleshy base green); Ihu, Vailala River, *Brass 963*, February 1926, common in rain-forests (small bush with terminal racemose inflorescence; fruit dull green, with much enlarged fleshy yellow base); Murua River, Gulf Division, *Brass 1334*, March 1926, rain-forests.

There is considerable variation in the leaf-outline; nevertheless, these collections agree fairly well with Valeton's description and plate of *Semecarpus rostrata*, a species previously known from Netherlands New Guinea.

Semecarpus decipiens sp. nov.

Arbor 20 m. alta; ramulis glabris, novellis \pm angulatis vel sulcatis, innovationibus pubescentibus; foliis petiolatis petiolo 2-3.5 cm. longo glabro supra canaliculato, glabris, coriaceis, utrinque manifeste reticulatis, obovatis vel ellipticis vel lanceolatis, 11-23 cm. longis, 5-9 cm. latis, basi cuneatis atque breviter decurrentibus, apice abrupte ac plerumque anguste acuminatis, margine integris vix revolutis; venis primariis utrinsecus 14-18, supra manifestis, subtus prominentibus, late patentiadscendentibus prope marginem curvatis ac \pm anastomosantibus; paniculis terminalibus axillaribusque, plerumque quam foliis brevioribus, 10-20 cm. longis, minute pubescentibus, ramis subdivaricatis; floribus sessilibus, & : alabastris 1.5 mm. longis pubescentibus; calycis segmentis 0.5 mm. longis subtriangularibus; petalis late lanceolatis subacutis 2 mm. longis; staminibus 2 mm. longis, antheris subcordatis; ovarii rudimento piloso; 9: calycis segmentis parvis; petalis elongato-ovatis acutis 2.5 mm. longis; staminibus quam petalis brevioribus, antheris parvis; disco dense pubescente; ovario depresse globoso dense piloso, stylis 3 divergentibus, stigmate bilobo; drupis lateraliter compressis, oblique ac transverse oblongis, 2 cm. longis, 2.5 cm. latis, apice breviter rostratis, rostra 4 mm. longa, consperse pubescentibus, hypocarpio 6 mm. longo \pm turbinato.

BRITISH NEW GUINEA: Sturt Island, Lower Fly River, *Brass 8194*, October 1936, flood plain rain-forest (profusely flowering tree attaining 30 m.; bark pale brown; leaves glaucous beneath; sap black; flowers green). SOLOMON ISLANDS: Bougainville Island: Kugumaru, Buin, *Kajewski 1985*, July 1930, alt. 150 m., common in rainforest (tree up to 20 m. high), Karngu, Buin, *Kajewski 2252*, October 1930, alt. 50 m., common in rain-forest (tree up to 30 m. high). Guadalcanal Island: Uulolo, Tutuve Mountain, *Kajewski 2560*, April 1931, alt. 1200 m. (small tree up to 15 m. high; fruit green with hooked point at end, 2.5 cm. long, 2.6 cm. diameter. The sap of this tree is very caustic, burning the skin severely). San Cristobal Island: Waimamura, *Brass 2666* (TYPE), August 1932, common in coastal rain-forests (erect tree 20 m. tall; bark brown, lenticellate; leaves pale, stiff, slightly wrinkled, glaucous below; flowers white). Malaita Island: Quoimonapu, *Kajewski 2328*, December 1930,

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alt. 50 m., rain-forest, common (medium sized tree up to 20 m. high; sap very caustic; flowers minute, petals cream-colored). Y s a b e l I s l a n d : Meringue, *Brass 3167*, November 1932, littoral rain-forest (large spreading tree with pale brown flaky bark; leaves very dull, grey beneath; flowers white); Garona, *Brass 3358*, December 1932, lowland rain-forests, common (tree 10 m. tall; bark pale brown, slightly scaly; leaves stiff, dull green, grey beneath; flowers pale yellow; fruit green; sap mucilaginous).

This species is closely allied to *Semecarpus laxiflora* K. Schum. and *S. uncata* Slis, but these have terminal inflorescences and somewhat different fruits. The fruits of *S. laxiflora* K. Schum. are described as subtomentose with golden hairs, and that of *S. uncata* Slis is pictured with a longer more curving beak than is found in the Solomon Island material.

Semecarpus brachystachys sp. nov.

Arbor 25 m. alta; foliis chartaceis vel tenuiter coriaceis, petiolatis petiolo circiter 3 cm. longo minute pubescente, ellipticis, ad tertium superum paullo latioribus, 25-34 cm. longis, 12-15 cm. latis, basi rotundatocuneatis vel breviter obtusis, apice rotundatis vel obtusis deinde abrupte acuminatis, margine integris undulatis leviter revolutis, supra glabris vel conspersissime et minute substellatis, crebre reticulatis, subtus glaucis, praecipue costa venisque minute pubescentibus (trichomatibus simplicibus atque substellatis); venis primariis utrinsecus circiter 22 \pm parallelis patentibus prope marginem subabrupte arcuatim anastomosantibus, supra manifestis, subtus prominulis, secundariis a primariis fere angulo recto abeuntibus, utrinque manifestis; paniculis terminalibus, in fructu circiter 10 cm. longis, ramis \pm pubescentibus; floribus non visis; drupis immaturis lateraliter compressis oblique obovatis, breviter rostellatis rostro excentrico, circiter 4 cm. longis, in parte latissima 3 cm. latis, minute substellato-pubescentibus, brunnescentibus, in sicco longitudinaliter sulcatis; hypocarpio obtuse obconico, circiter 1 cm. longo, 1.2 cm. lato.

SOLOMON ISLANDS: San Cristobal: Magoha River, *Brass* 2740 (TYPE), August 1932, river bank, common in lowlands (tree 25 m. tall with brown suberose slightly flaky bark; leaves dull green, grey beneath; fruit immature; sap turns black upon exposure to air).

The leaves somewhat resemble *Semecarpus Anacardium* L., but the inflorescence is much shorter and the fruit much larger. Perhaps among New Guinean species it approaches *S. hirtiflora* Ridley, the latter, however, has hirsute pubescence, a very short inflorescence and fruit about half the size of that of *S. solomonensis*.

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Semecarpus Archboldiana sp. nov.

Arbor 21 m. alta; innovationibus pubescentibus; foliis \pm rigide coriaceis, utrinque reticulatis, petiolatis petiolo \pm 2.5 cm. longo basim versus \pm applanato, pubescente, obovato-ellipticis, 9–23 cm. longis, 4.5-11.5 cm. latis, basi late obtusis interdum subrotundatis, apice rotundatis deinde abrupte breviterque acuminatis, margine integris subundulatis, supra glabris interdum costa parce pubescente, subtus flavescentibus glaucis, secus costa venisque ± pilosis; venis primariis utrinsecus $15-23 \pm$ parallelis patentibus, prope marginem. arcuatim anastomosantibus, supra impressis, subtus prominentibus, secundariis a primariis fere angulo recto abeuntibus, subtus conspicuis; paniculis 9 terminalibus ± 16 cm. longis, interdum a basi ramosis, axi crasso ramisque brevissime tomentosis; floribus non visis, breviter pedicellatis vel sessilibus; drupis 1.5-2 cm. longis, 3-5 cm. latis, 3 cm. crassis, apice profunde depressis, sublobatis, uno latere subcarinatis, \pm minute tomentosis, hypocarpio obtuse obconico, 1 cm. longo, 2 cm. lato, longitudinaliter subsulcato, minute tomentoso.

NETHERLANDS NEW GUINEA: 6 km. southwest of Bernhard Camp, Idenburg River, *Brass & Versteegh 12590* (TYPE), February 1939, alt. 1230 m., rare in primary rain-forest on ridge (tree 21 m. high, 42 cm. diameter; bark 15 mm. thick, scaly, black, with some black sap; fruits green).

The alliance of this species is unquestionably with those Philippine and Polynesian species, S. philippinensis Engl. and S. vitiensis Engl., at one time placed in Oncocarpus A. Gray. Although the depressed and somewhat knobby sinuate drupes are readily distinguishable from the laterally compressed ones of Semecarpus L. f. proper, nevertheless, from the available material examined, we are inclined to agree that the two are not separable on strong generic characters, but might well represent distinct sections. Probably S. venenosa Volkens of Micronesia belongs to this same group.

CORYNOCARPACEAE

Corynocarpus J. R. & G. Forster

Corynocarpus australasica C. T. White, Contr. Arnold Arb. 4:57, pl. 5. 1933; Van Steenis, Bull. Jard. Bot. Buitenz. III. 13:101 f. 1. 1933.

NETHERLANDS NEW GUINEA: 6 km. southwest of Bernhard Camp, Idenburg River, Brass & Versteegh 13101, March 1939, alt. 1220 m., rare tree in primary forest (bark black, scaly, rough; wood yellow-

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brown). BRITISH NEW GUINEA: Lake Daviumbu, Middle Fly River, Brass 7713, September 1936, rain-forest substage (tree 12 m. high; leafnerves prominent below; immature fruit smooth, globose, \pm 4 cm. diameter).

The species is known from three previous collections, two from Queensland, and one from Netherlands New Guinea (southern part) cultivated in the Botanic Gardens at Buitenzorg. This material seems to match the type fairly well as to foliar characters and fruit, the floral parts have practically all fallen. Professor I. W. Bailey and Mr. Richard Howard very kindly sectioned twigs for us and compared the structure of the wood with that of prepared material of *Corynocarpus*.

ARNOLD ARBORETUM,

HARVARD UNIVERSITY.

OBSERVATIONS ON OLD WORLD SPECIES OF TURPINIA VENTENAT

E. D. MERRILL AND L. M. PERRY

SINCE we have found no records of the occurrence of species of Turpinia Vent. in Papuasia, we were obliged to begin with the Indo-Malaysian collections as a starting point in the identification of the nine New Guinean numbers at hand. The species are readily separated into two categories, one with simple leaves, the other with compound ones. The first, consisting of T. arguta Seem. with much larger flowers than the other species, T. formosana Nakai, T. indochinensis Merr., T. simplicifolia Merr., and T. unifoliata Merr. & Chun, has received no consideration, as all our strictly simple-leaved specimens have been Approximately 20 binomials have been proposed for the named. compound-leaved species. A few have been credited with a wide geographical range, while others are as yet restricted to limited areas. In addition to considerable unnamed material in the herbarium, there is so much variation in the named collections that it has seemed necessary to try to find some stable specific characters. This has been no easy task. Species are difficult to delimit, some currently recognized ones at times passing almost imperceptibly into closely related forms. Craib, Fl. Siam. Enum. 1: 339. 1926, commenting on his T. parviflora, said "this species, T. parva, and T. nepalensis are very closely allied and require further study in the field." Probably the only satisfactory study of the genus lies in the correlative observation of living and herbarium material. This, of course, is out of the question for us; further, we are handicapped by the lack of types. Nevertheless, we venture to set forth a summary of the compound-leaved species in the hope that it may be useful to others because of the widely scattered literature appertaining to the genus.

In the Indo-Malaysian material the stipels of the leaflets are separate. In the collections from New Guinea, the two stipels of the pairs of opposite leaflets are united into one and bent backward toward the proximal end of the leaf in such a way as to cover at the point of insertion the shallow channel of the rachis lying between the insertion of the leaflets. As to the other foliar characters, differences are evident in the leaf-texture, and also in the relatively even or obviously uneven

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distribution of the primary nerves along the midribs. Again, in some species, the margins are more definitely serrulate or crenulate-serrulate than in others. Although the leaf-outline is highly variable, if one has an abundance of material there are certain definite trends which tend to mark a species; for instance, in T. pomifera (Roxb.) DC. there is a distinct tendency toward an elongated apex which is rarely found in our material of T. sphaerocarpa Hassk. We have not found the number of leaflets a dependable character, nor seen any strictly trifoliolate species. Our specimens are 1-3-5-foliolate or 5-7-11-foliolate. Craib, in describing T. robusta, points out that one leaf is 4-foliolate in the typespecimen. We have no material either of this species or of the related T. trifoliata Ridl. from the Malay Peninsula. The latter ought to be easy to recognize by the short panicle; as for the foliar characters of Ridley's species, it should be noted that in the original description, Jour. Roy. As. Soc. Straits Branch 82: 178. 1920, the petioles are described as ".2 in. long," which is repeated in Ridley's Fl. Malay Pen. 1: 512. 1922, but fig. 50 of the latter work shows them to be longer than any of the petiolules; the sketch is probably correct. The relative length of the panicle, its laxness, and the arrangement of the flowers, whether crowded or not, are fairly useful specific characters. The flowers are almost too constant to be of much help in determinative work. In some species the petals are ciliolate, some have larger anthers, a few have pubescent filaments, and the number of ovules varies, as from 2-4, 4-6, and 6-8. The size of the fruit would seem to be a fairly good character, but it is difficult to evaluate in the herbarium on account of the collections being in various stages of development. The thickness of the pericarp appears to be of some value, since, even in immature fruits of the fleshy-fruited species, this feature is foreshadowed by the relatively small locules in comparison with the thickness of the pericarp and the size of the fruit. Pubescence is a minor feature of Turpinia Vent. In two collections from Sumatra the leaflets are pubescent on the lower surface. T. malabarica Gamble, T. ternata Nakai, and sometimes T. affinis have pubescent or ciliolate filaments. T. affinis is the only species we have found with the style and the upper part of the ovary hirtellous.

Although the genus extends from China to New Guinea, several species have a limited distribution. The one with widest range, China, Indo-China, Sumatra, and Java, appears to be *Turpinia montana* (Blume) Kurz, with a variety in Borneo. *T. pomifera* (Roxb.) DC. has been considered a collective species extending from India to the Celebes, but our specimens indicate that *T. pomifera* (Roxb.) DC. in the strict sense is found in northern India (including Assam and Burma), Siam, Indo-China, and western China. *Turpinia sphaerocarpa* occurs in Sumatra, Java, Borneo, Mindanao, and the Celebes.

Omitted from our summary is the consideration of T. parviflora Craib, T. robusta Craib, and T. trifoliata Ridl. We have no material so labelled, and none from the region of the type-localities that seems to fit their descriptions. Even when we have specimens to examine, the characters are sometimes so elusive that we cannot always be sure of the proper disposition of the collections. Our superficial key represents such species as are available to us in the herbarium material at hand. We are citing only what we take to be representative specimens, although in some cases we have numerous collections of individual species.

KEY TO SPECIES

1. Stipels separate. Indo-Malaysia.

- 2. Pericarp somewhat fleshy, 1-5 mm. or more thick in the dried fruit.
 - Fruit 2–2.5 cm. diameter; pericarp 2–5 mm. or more thick; halfopen flowers 3.5–4 mm. long, anthers oblong-ovate, 0.8–1 mm. long; leaves oblong-elliptic, often elongate-acuminate T. pomifera (Roxb.) DC.
 - Fruit up to 2 cm. diameter; pericarp 1-2(-3 in larger fruits) mm. thick; half-open flowers 2-3 mm. long, anthers ± round, 0.6-0.8 mm. diameter; leaves oblong or elliptic, rarely elongate-acuminate.
 - 4. Filaments pubescent T. malabarica Gamble.
 - 4. Filaments glabrous.
 - 5. Primary veins of leaflets 7–9, equally distributed along either side of the midrib; margins of leaflets distinctly crenulate-serrulate or serrulate.

 - 6. Leaves elliptic or oblong-ovate, coriaceous T. sphaerocarpa Hassk.
 - 5. Primary veins of leaflets 4–6, gradually more remote toward the distal end of the leaflets; margins of leaflets usually indistinctly crenulate or serrulate.

 - 6. Inflorescence more compact and stiff; fruit ± rounded or subtrilobed at the apex ... *T. ovalifolia* Elmer.
- Pericarp scarcely fleshy, 0.5-1 mm. thick, often wrinkled when dry.
 Half-open flowers relatively large, about 3 mm. long, anthers
 - elliptic, 0.8-1 mm. long.
 - 4. Pistil glabrous.

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- 5. Filaments glabrous; leaflets rather stiffly coriaceous, closely crenulate-serrulate; venation prominent; primary veins spreading, then arcuate, ascending for some distance almost parallel with the margin T. nitida M. & P.
- 4. Pistil, at least the style and exposed part of the ovary, sparsely hirtellous T. affinis M. & P.
- 3. Half-open flowers relatively small, 2–2.5 mm. long, anthers ± round, 0.5–0.6 mm. diameter or a little broader than long.

4. Inflorescence compact, somewhat stiff; flowers crowded.

- 5. Leaves coriaceous; secondary venation inconspicuous *T. cochinchinensis* (Lour.) Merr.
- 5. Leaves chartaceous to subcoriaceous; secondary venation somewhat conspicuous *T. glaberrima* Merr.
- 4. Inflorescence lax, usually longer than the leaves; flowers scarcely crowded.
- 1. Stipels united into one intrapetiolular stipel and recurved toward the proximal end of the leaf. New Guinea.
 - Leaflets ovate-elliptic, rounded at the base, inconspicuously serrulate; fruit subglobose, marked at the apex with 3 radiating lines; ovules in each locule 6-8 T. Versteeghii M. & P.
 - 2. Leaflets mostly oblong, obtuse at the base, serrulate; fruits 3pointed at the apex; ovules in each locule 2..*T. papuana* M. & P.

Turpinia pomifera (Roxb.) DC. Prodr. 2: 3. 1825.

Dalrymplea pomifera Roxb. Pl. Coromand. 3: 76, t. 279. 1819.

INDIA: Jalpaiguri, Parker 3217; Sikkim, J. D. Hooker, alt. 2-7000 ft.; Khasia, Hooker f. & Thomson, 2-5000 ft.; Assam, Margarata, Dr. Prain's collector 986, 994. BURMA: Moulmein, Falconer; Pegu, Kurz 2050; Mergui, Parker 3083, 3172. SIAM: Chiengmai Province, Rock 1841, 1904. INDO-CHINA: Tonkin, vicinity of Dong Mo, Pételot 6320. CHINA: Yunnan: Szemao, Henry 11612F; valley of the Nam Ha, Rock 2490, 2505; near Chieng Law, Rock 2367; Meng-bang, Jenn-yeh Hsien, Wang 80302; Tsang Yuan, Wang 73219; Che-li-Hsien, Wang 75946, 77674, 77574, 79334.

The strongest characters of this species appear to be the elliptic-

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oblong acuminate leaflets (up to 23 cm. long and 8 cm. broad), the panicle usually shorter than the leaves, the fairly large flowers (half-open flower about 3.5–4 mm. diameter) crowded towards the tips of the ultimate branchlets, the ovate-oblong anthers 0.8-1 mm. long, and the fleshy fruits (in our dried specimens ± 2 cm. diameter). Roxburgh described the fruit as "the size of a large medlar." None of the other species of the genus in the herbarium material available to us has as fleshy fruits as this. Further, it can usually be distinguished, even if immature, by the small locules and the relatively thick pericarp.

Turpinia malabarica Gamble, Kew Bull. 1916: 135. 1916; Alston, Handb. Fl. Ceyl. 6(Suppl.): 59. 1931.

INDIA: Concan, Stocks & Law. CEYLON: Thwaites 218.

Our material of this species is not in very good condition; but apparently the two best characters of this species are the pubescent filaments and the size of the fruit (about 1.3 cm. diameter). The pericarp is a little fleshy, not nearly so thick as in T. *pomifera* DC., but thicker than that of T. *cochinchinensis* (Lour.) Merr.

Turpinia sambucifolia Elmer, Leafl. Philip. Bot. 9: 3217. 1934.

PHILIPPINE ISLANDS: Luzon, Elmer 8750, 22178 (ISOTYPE); Loher 14941; Merrill 2502; Williams 551; Vanoverbergh 1088; Forestry Bureau 24951 (Amarillas), 29362 (Azurin); Bureau of Science 24252 (Ramos).

This species is very like *Turpinia sphaerocarpa* Hassk. The leaves are somewhat thinner in texture and oblong rather than elliptic. These are the only differences we see at present. Since we did not find any collection from Luzon exactly matching *T. sphaerocarpa* Hassk., we are maintaining the species for the present.

Turpinia sphaerocarpa Hassk. Flora 25: Beibl. 42. 1825.

Dalrymplea javanica Hassk. Pl. Jav. Rar. 439. 1848.

Turpinia pomifera sensu Koord. & Valeton, Meded. Lands Plant. 61: 245 (Bijdr. Boomsoort. Java 9:245). 1903, Atlas Baumart. Java 1: fig. 93. 1913, non DC.

JAVA: Forbes 951, 965, 973; Kuntze 5909; Netherlands Indies Forest Service Ja.3076, Ja.3145, Ja.3734. SUMATRA: Forbes 2480, W. N. & C. M. Bangham 862, 981. BORNEO: Mount Kinabalu, Clemens 10407, 34388, 34423, 34462, 40321, 51675. PHILIPPINE ISLANDS: Mindanao, Province of Davao, Elmer 11726, 11825; Province of Surigao, Forestry Bureau 26983. CELEBES: Netherlands Indies Forest Service Cel./ II-238.

We regret that we have not better material from Java representing

this species, as these are the logical collections to use as a basis of this specific concept. Only *Kuntze 5909* (a specimen borrowed from the New York Botanical Garden) has flower buds sufficiently well developed to show the parts of the flower fairly well; from this and *fig. 93* of Atlas Baumart. Java, we have taken the measurements for the anthers. In the Bornean material, particularly *Clemens 40321*, the apex of the anthers is much more distinctly apiculate; however, in view of the somewhat fragmentary material and the similarity in foliar characters, we have placed the Bornean collections in this species. *Clemens 40321* differs also in having somewhat narrower, almost ligulate, petals.

Turpinia sphaerocarpa Hassk. somewhat resembles T. pomifera (Roxb.) DC., but the leaflets as a whole are smaller, with finer crenulateserrulate margins, and usually with a shorter apex (acumen up to 1.5 cm. long; unfortunately the tips of the leaflets are mutilated in many of our specimens; in T. pomifera DC. the acumen is 1-3 cm. long, usually about 2 cm.); the inflorescence is more ample, with less crowded and smaller flowers (half-open flower 2 mm. diameter), the anthers are rounded and only 0.5-0.6 mm. long, and the dried fruit rarely exceeds 1.5 cm. diameter.

Turpinia latifolia Ridl. Jour. Roy. As. Soc. Straits Branch 82: 178. 1920, Fl. Malay Pen. 1: 512. 1922.

MALAY PENINSULA: Singapore, Corner 34688, Ngadiman 34690; Johore, Corner 28690, 28710. SUMATRA: vicinity of Rantau Parapat, Bila, Rahmat Si Toroes 1916, 1924, 2254; Division Padang Si Dimpoean, Rahmat Si Toroes 4808, 4886, 4921.

This species, in the lax inflorescences, the size of the flowers, and the small anthers, is very like *Turpinia sphaerocarpa* Hassk. The leaflets, however, have a smaller number of primary veins, and these are obviously farther apart and unevenly distributed along the midrib, the interval between the adjacent pairs becoming longer toward the distal end of the leaflet; the margins too are only indistinctly crenulate-serrulate. The specimens from the Malay Peninsula are only in flower. In the Flora of the Malay Peninsula, l.c., Ridley described the fruit as "globose fleshy green .5 in. through." In the Sumatran collections, the apex of the fruit, even in some as large as 2 cm. diameter, is depressed between the remnants of the laterally compressed subconic bases of the styles.

Turpinia latifolia Ridl. var. pubescens var. nov.

A forma typica differt ramulis, petiolo ac rhachi pubescentibus; foliolis supra glabris, subtus praecipue costa nervisque pubescentibus; inflorescentiae axi, ramis ramulisque \pm pubescentibus.

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SUMATRA: Sigamata, near Rantau Parapat, Bila, Rahmat Si Toroes 2922 (TYPE); Padang Si Dimpoean, Goenoeng Manaoen, Rahmat Si Toroes 4468.

The type is fragmentary, the leaflets being mostly separated from the rachis, but the flowers are normal. In the other specimen, the leaves are 3- and 5-foliolate, but all the flowers seem to have been stung. The general habit of the collections is much like that of *Turpinia latifolia* Ridl., hence, we have allied the material with that species. These are the only specimens of the genus in which we have seen pubescence on the leaves.

Turpinia ovalifolia Elmer, Leafl. Philip. Bot. 2: 490. 1908.

Turpinia lucida Nakai, Jour. Arnold Arb. 5: 80. 1924.

Turpinia pachyphylla Merr. Philip. Jour. Sci. 27: 33. 1925.

PHILIPPINE ISLANDS: Luzon, Elmer 8088 (isotype), 8601; Bureau of Science 22559 (Ramos & Deroy), 22585 (type of T. lucida Nakai), 40243 (Ramos & Edaño), 41483 (Ramos), 45283 (Ramos & Edaño); Forestry Bureau 22703 (Gangan), 24294 (Bawan & Borromeo); Adduru 273; Palawan, Elmer 13122.

This species and *Turpinia latifolia* Ridl., apart from their geographical range, are difficult to distinguish. In the Philippine material, the inflorescence is usually shorter than the leaves and also not so open as in *T. latifolia* Ridl., and the flowers are a little larger (half-open bud 3 mm. long) and of firmer texture than in the Malayan plant. **Turpinia nitida** sp. nov.

Arbuscula glabra, tantum inflorescentia minute pubescens; petiolo \pm 6 cm. longo, rhachi 10 cm. longa; foliis 1-2-jugis; foliolis valde coriaceis, oblongis vel ellipticis, 10-20 cm. longis, 4-9 cm. latis, basi rotundatis interdum leviter inaequalibus, apice breviter acuminatis, marginibus dense serratis, utrinque nitidis, manifeste reticulatis; venis primariis utrinsecus \pm 10 patulis deinde arcuatim adscendentibus, versus marginem inconspicue vel haud anastomosantibus; petiolulis 1-3 cm. longis; paniculis 17 cm. longis, ramis 4 cm. longis atque ramulis puberulis; pedicellis \pm 2 mm. longis; floribus sub anthesi 4.5 mm. diametro; sepalis 3-4 mm. longis late ellipticis rotundatis ciliatis; petalis oblongis 4 mm. longis vix ciliolatis; filamentis circiter 3.5 mm. longis, basi 0.8 mm. latis, apice subulatis, antheris ovatis circiter 1 mm. longis, apice apiculatis (apiculo 0.2 mm. longo); disco crenulato ovario glabro subaequilongo; stylis glabris \pm connatis; ovulis 4 in loculo; baccis immaturis ± 1 cm. diametro, stylorum basibus persistentibus; pericarpio 0.5 mm. crasso.

BORNEO: Mount Kinabalu, Penibukan, *Clemens 30770* in part, 30840 (TYPE), January 1933, alt. 4000–5000 ft. (recumbent treelet; fruit purplish); Marai Parai, *Clemens 30178*, May 1933, alt. 3000 ft. (flowers cream-green, corolla purple on the margin).

This species is perhaps closest to *Turpinia sphaerocarpa* Hassk. The leaflets, however, are more regularly coriaceous than in the latter species, the flowers are somewhat larger with anthers almost 1 mm. long and very distinctly apiculate, and the fruits, with a pericarp 0.5 mm. thick, could scarcely be called fleshy.

Turpinia ternata Nakai, Jour. Arnold Arb. 5: 78. 1924.

JAPAN: Liukiu, Yokohama Nursery Company; C. Wright; Kyushu, Tashiro (TYPE); E. H. Wilson 6107. FORMOSA: E. H. Wilson 11072. In these collections the leaves are 1- and 3-foliolate. This is the nearest approach to a trifoliolate species in our herbarium. Turpinia ternata Nakai is a fairly well marked species with half-open flowers

3–4 mm. diameter, pubescent filaments and large ovate-oblong anthers 0.8 mm. long; the fruits are immature, but in these the pericarp is scarcely more than 0.5 mm. thick.

Turpinia affinis sp. nov.

Arbor parva ubique praeter inflorescentiam glabra; cortice fusco; petiolo 6-14 cm. longo, rhachi 9-25 cm. longa; foliis impari-pinnatis 2-4(interdum-5)-jugis; stipulis caducis, stipellis minutis; foliolis elliptico-oblongis, 7-18 cm. longis, 2.5-6 cm. latis, basi cuneatis vel obtusis, apice acuminatis (acumine 1-2.5 cm. longis), margine plerumque dense serratis, coriaceis, inconspicue reticulatis; venis primariis utrinsecus 7-10 arcuatim adscendentibus; petiolulis 1-1.5 cm. longis; paniculis usque 30 cm. longis, divaricatim ramosis, axi ramulisque minute pubescentibus; floribus in ramulis ultimis pseudoracemosis vel cymosoconfertis, magnis; pedicellis \pm 1.5 mm. longis; sepalis elliptico-ovatis obtusis ciliatis 2.5-3 mm. longis; petalis 4 mm. longis obovato-ellipticis ciliatis, interdum paullo pilosis; filamentis 3 mm. longis, basi 1 mm. latis sursum angustatis, saepe ciliolatis, antheris ovato-oblongis 1(-1.2)mm. longis; disco dentato 1/2 longitudinem ovarii; ovario 1 mm. longo, parte superiore atque stylis (2 mm. longis) \pm parce hirtellis; ovulis 6–8; baccis subglobosis, 1-1.5 cm. diametro, cicatricibus stylorum persistentibus, plerumque parce hirtellis; pericarpio 0.5-1 mm. crasso.

CHINA: Hupeh, Chow 2004; Kweichow, Steward, Chiao & Cheo 768; Kwangsi, Steward & Cheo 380; Tsang 22365, Chun 6817; Szechuan, Wilson 2351, 3359, 4803; Fang 3797, 12574; Chiao & Fan



Merrill, Elmer D. and Perry, Lily M. 1941. "Observations on Old World Species of Turpinia Ventenat." *Journal of the Arnold Arboretum* 22(4), 543–555. <u>https://doi.org/10.5962/p.185443</u>.

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