

NOTES ON PAPUASIAN SAXIFRAGACEAE*

JOHN R. REEDER

With one text-figure

THE ONLY comprehensive treatment of the Papuanian Saxifragaceae is that by R. Schlechter (in Bot. Jahrb. 52: 118-138. 1914), in which he recognized seven genera and 25 species in the group. Only a few new species have been described since 1914. In the present paper 11 new species are described, of which three are in the genus *Carpodetus*, two in *Quintinia*, and six in *Polyosma*. Engler's treatment (in Nat. Pfl. ed. 2. 18a: 74-226. 1930) may be consulted for the relationships of the Papuanian genera.

In connection with this study, herbarium specimens have been seen from the Arnold Arboretum (A), the Gray Herbarium (GH), the University of Michigan (Mich), the New York Botanical Garden (NY), and the University of California (UC). In the absence of parenthetical letters indicating the place of deposit, cited specimens are to be found only at the Arnold Arboretum. The writer is indebted to the Directors and Curators of institutions from which material has been borrowed, and to staff-members of the Arnold Arboretum, especially to Dr. A. C. Smith, for advice during the progress of this work.

Carpodetus J. R. & G. Forst.*(Argyrocallymma* K. Schum. & Lauterb.)*Carpodetus amplus* sp. nov.

Arbor 6-7 m. alta, ramulis juventute teretibus circiter 4-5 mm. diametro, sparsim puberulis demum glabratibus; petiolis supra canaliculatis substrigosis decurrentibus circiter 1 mm. longis; laminis chartaceis in sicco fusco-olivaceis ellipticis vel oblongis, majoribus 10-14 cm. longis 4-10 cm. latis, supra glabris, subtus pilis 0.3-0.5 mm. longis sparsim nervis densius adpresso-strigosis, basi inaequaliter rotundatis, in apicem 1-1.5 cm. longum subabrupte angustatis, margine conspicue serrato-mucronatis, obvie revolutis, costa supra impressa subtus valde prominente, nervis lateralibus utrinsecus circiter 6 vel 7 supra impressis subtus prominentibus, venulis supra leviter subtus valde prominulis; inflorescentia corymboso-paniculata ampla terminali sub fructu circiter 15 cm. longa et 23 cm. lata e basi 3- vel 4-divisa, plerumque 5- vel 6-plo di- vel trichotoma, pedunculis secundariis 3.5-6 cm. longis inferne teretibus superne complanatis, ramis inflorescentiae pedicellisque pallido-puberulis, ramulis ultimis gracillimis; pedicellis teretibus circiter 1.5 mm. longis; fructibus subglobosis submaturis ad 6 mm. diametro rugulosis sparsim puberulis, supra medium calycis lobis

* Botanical Results of the Richard Archbold Expeditions.

4 deltoideo-lanceolatis 0.3–0.5 mm. longis ornatis, apice stylo conico-subulato circiter 1.5 mm. longo coronatis.

SOLOMON ISLANDS: Guadalcanal: Uulolo, Tutuve Mt., alt. 1200 m., *Kajewski 2599* (TYPE), April 29, 1931 (small tree 6–7 m. high, common in rain-forest; fruit on terminal panicles).

Carpodetus amplus is of the alliance of *C. arborcus* (Lauterb. & K. Schum.) Schlechter. These two species are the only ones in the genus which have thus far been described as being 4-merous. From *C. arborcus* the new species differs in having somewhat larger leaves, which are absolutely glabrous on the upper surface, only slightly appressed-strigose beneath, and with a short-attenuate tip. A further difference is that *C. amplus* has a more diffuse inflorescence, which is about one-third larger than that of its ally. Since the Kajewski specimen is in fruit, no comparison can be made with regard to characters of the flowers.

The discovery of this new species extends the range of the genus to the Solomon Islands.

Carpodetus major Schlechter in Bot. Jahrb. 52: 137. fig. 6. 1914.

NORTHEAST NEW GUINEA: Finisterre Mountains, alt. 1300 m., *Schlechter 18186* (UC, TYPE COLL.), Sept. 1908 (tree, in misty forest); Morobe District, Kaile to Sarawaket, alt. 1566 m., *Clemens 4791* (small shrub or tree on open trails); Ogeramang, alt. about 1650 m., *Clemens 5096*, alt. 1500–1800 m., *11211* (A, Mich) (tree 2.5 cm. diam.; flowers white), *11322* (A, Mich) (tree; flower-buds dull, colorless), *41024* (Mich) (small tree on mountain ridge; fruit gray).

The Clemens specimens cited above appear to be identical with the type collection, which apparently has been the only representative of the species thus far cited.

Carpodetus Archboldianus sp. nov.

Frutex vel arbuscula 2–4 m. alta, ramulis juventute subteretibus circiter 2–3 mm. diametro sparsim strigosis, demum glabratis; petiolis supra canaliculatis strigosis decurrentibus circiter 6 mm. longis; laminis chartaceis in sicco viridibus vel fusco-olivaceis ellipticis, (4–) 6–10 cm. longis, (2–) 3–5 cm. latis, utrinque pilis albidis dispersis 0.3–0.5 mm. longis sparsim adpresso-strigosis, basi obtusis, apice plerumque cuspidatis, margine dentibus 8–12 utrinsecus serrato-mucronatis, costa supra impressa subtus valde prominente, nervis lateralibus principalibus utrinsecus circiter 5–7, venulis supra leviter subtus valde prominulis; inflorescentiis corymboso-paniculatis terminalibus multifloris, pedunculo brevi rhachi pedicellisque brunneo-strigosis; pedicellis circiter 2 mm. longis extus sericeis intus glabris; calyce extus breviter sericeo ad 4 mm. longo, tubo cupuliformi 1.5–2.5 mm. longo circiter 2.5 mm. diametro, limbo 5- vel 6-lobato intus glabro, lobis anguste triangularibus 1–1.5 mm. longis; petalis 5 vel 6 patentibus ellipticis circiter 3 × 2 mm., extus sericeis intus basim versus pilosis; staminibus 5 vel 6 circiter 2 mm. longis, filamentis gracilibus distaliter angustatis sparsim pilosis, antheris ovalibus circiter 0.8 mm. diametro; stylo subulato glabro quam staminibus paulo brevioris basi circiter 0.4 mm. diametro, stigmatibus capitatis; fructibus subglobosis circiter 8 mm. diametro, calycis lobis et stylo persistente coronatis.

NETHERLANDS NEW GUINEA: 9 km. northeast of Lake Habbema, alt. 2800 m.,

Brass 10583 (TYPE), Oct. 1938 (tree 3 m. high, occasional in forest second growths, flowers cream), *10869* (small tree 2-3 m. high, common in early second growth forests on landslips; flowers white); 18 km. northeast of Lake Habbema, Bele River, alt. 2200 m., *Brass 11080* (shrub or tree 2-3 m. high, abundant in undergrowth of polewood secondary forest; flowers cream-colored); Balim River, east of Lake Habbema, alt. 1800 m., *Brass 11768* (tree 2-4 m. high, common in sparse secondary forest; flowers white).

Carpodetus Archboldianus is of the alliance of *C. Pullei* Schlechter, but differs in having both sides of the leaves sparsely covered with short appressed strigose hairs. The nerves and petiole are also sparsely strigose. *Carpodetus Pullei* is described as having leaves which are glabrous above and with the nerves below and the petiole puberulent. A further difference is found in the distinctly eglandular disk and the narrowly triangular to subulate calyx-lobes of the new species. Another species to be considered here is *Carpodetus flexuosus* (Ridley) Reeder, but it is too inadequately described to permit critical comparison. From *C. Archboldianus* this latter species differs in having larger, differently shaped leaves and in minor floral characters.

Carpodetus fuscus sp. nov.

Arbor ad 21 m. alta, ramulis juventute teretibus circiter 3-4 mm. diametro dense fusco-hispidulis demum subglabratis; petiolis canaliculatis dense hispidulis circiter 1-1.5 cm. longis; laminis chartaceis ellipticis vel oblongis, 10-17 cm. longis, 4-7.5 cm. latis, in sicco supra pallido-iridibus et sparsim adpresso-strigosis, subtus fuscis et pilos brunneos 0.3-0.5 mm. longos hispidulos dense gerentibus, basi subinaequaliter rotundatis, in apicem 1-1.5 cm. longum subabrupte angustatis, margine dentibus 3 per centimetrum callosis parvis ornatis, costa et nervis lateralibus utrinsec circiter 8 supra impressis subtus valde prominentibus, venulis supra immersis vel subimpressis subtus valde prominulis; inflorescentia corymboso-paniculata terminali vel axillari sub fructu circiter 8 cm. longa et 10 cm. lata e basi 2-4-divisa, plerumque 3- vel 4-plo di- vel trichotoma, pedunculis secundariis 3-4 cm. longis, ramis inflorescentiae pedicellisque dense fuscotomentosis, ramulis ultimis rigidis; pedicellis teretibus circiter 2 mm. longis; fructibus subglobosis submaturis ad 7 mm. diametro rugulosis, supra medium calycis lobis 5 lato-deltaoideis circiter 0.8 mm. longis et basi 1.2 mm. latis mox caducis ornatis; petalis sub fructu raro persistentibus anguste triangularibus circiter 3 mm. longis et 1.2 mm. latis, extus brunneo-puberulis intus medio albido-pilosis; stylo mox caducis.

NETHERLANDS NEW GUINEA: 9 km. northeast of Lake Habbema, alt. 2800 m., *Brass & Versteegh 10468* (TYPE), Oct. 1938 (tree 21 m. high, common in valley forest substage, the trunk 27 cm. diameter; bark 4 mm. thick, gray, fairly smooth; wood white; young fruits brownish green).

Carpodetus fuscus is easily recognized by the dense stiff brown hairs on the young twigs and on the lower surfaces of the leaves. The upper surfaces of the leaves are only slightly hairy. The size and shape of the leaves suggest *C. grandiflorus* Schlechter, but the pubescence is quite different, and the inflorescence of *C. fuscus* is much larger.

Carpodetus denticulatus (Ridley) comb. nov.

Argyroclymma denticulata Ridley in Trans. Linn. Soc. II. Bot. 9: 39. 1916.

This species is based on a collection by the Wollaston Expedition from the southern slopes of Mt. Carstensz at an altitude of 1180 m.; it appears distinct from others of the genus, although I have not seen any collections which precisely match Ridley's description. In referring species of *Argyrocalymma* to *Carpodetus* I follow the treatments of Schlechter (in Bot. Jahrb. 52: 136. 1914) and Engler (in Nat. Pfl. ed. 2. 18a: 216-217. 1930).

Carpodetus flexuosus (Ridley) comb. nov.

Argyrocalymma flexuosa Ridley in Trans. Linn. Soc. II. Bot. 9: 39. 1916.

This species is based on a collection from the same locality as the above, *C. denticulatus*, and it also appears distinct in the genus.

Carpodetus montanus (Ridley) comb. nov.

Argyrocalymma montana Ridley in Trans. Linn. Soc. II. Bot. 9: 39. 1916.

BRITISH NEW GUINEA: Central Division, Mt. Albert Edward, alt. 3680 m., *Brass* 4282 (tree 3 m. tall, common on forest-fringes and in small isolated forest-patches on grasslands; flowers brownish green; fruit green), 4321 (slender tree 5 m. tall, common in isolated forest-patches and fringes of main forest; leaves yellow-green underneath; flowers greenish brown; fruit tuberculate).

The cited specimens are certainly conspecific and agree in general with Ridley's original description, based on a plant from the southern slopes of Mt. Carstensz at 3200 m. altitude. This description is so inadequate that positive identification is impossible, but a few minor differences are apparent. Ridley described the petioles as being 2 mm. long, whereas the *Brass* specimens have some petioles up to 5 mm. long. Whereas Ridley described the inflorescences as "dense hirtae," those of the *Brass* specimens are rather sericeous. Ridley stated that the leaves are 1.5-2 cm. wide, while an occasional leaf on the *Brass* specimens may be up to 2.8 cm. wide. In all other respects the specimens seem to agree with the original description.

Quintinia A. DC.

(*Dedca* Baill.)

Quintinia Ledermannii Schlechter in Bot. Jahrb. 52: 125. fig. 3. 1914.

NETHERLANDS NEW GUINEA: 4 km. southwest of Bernhard Camp, Idenburg River, alt. 900 m., *Brass & Versteegh* 13132 (tree 21 m. high, the trunk 45 cm. diam.; bark 14 mm. thick, gray, shallowly fissured; wood red-brown; flower-buds light green; common in *Agathis* forest, on slope of a ridge), *Brass* 13703 (tree 20-25 m. high, abundant in *Agathis* forest as a subsidiary tree; flowers white).

The cited specimens are certainly conspecific and agree very well with the original description, based on *Ledermann* 9056 and 10167 from Northeast New Guinea at 850 m. and 1000 m. respectively. *Ledermann's* specimens were collected on the Etappenberg and Lordberg Mountains near the Sepik River, which is reasonably close to the Netherlands New Guinea locality.

Quintinia lanceolata sp. nov.

Arbor ad 32 m. alta, dense foliata, ramulis infra petiolum leviter

angulatis circiter 4-5 mm. diametro; petiolis canaliculatis 1-1.5 cm. longis; laminis subcoriaceis lanceolatis, (4-) 6-9 cm. longis, (1-) 1.5-2.2 cm. latis, in sicco supra fuscis subtus pallidioribus, basi cuneatis et in petiolum angustatis, apice obtusis vel acutis, margine integris et minute revolutis, costa supra impressa subtus valde prominente, nervis lateralibus principalibus utrinsecus circiter 6 vel 7 supra immersis subtus haud prominulis; racemis lateralibus ad 6.5 cm. longis 25-30-floris quam foliis paullo brevioribus, pedicellis 2-2.5 mm. longis; calyce circiter 1.5 mm. longo, tubo obconico circiter 1 mm. longo et 1.5 mm. diametro, limbo 4-dentato, dentibus apiculatis; petalis 4 uninervatis oblongis circiter 2×1 mm. apice obtusis; staminibus 4 circiter 1.2 mm. longis, filamentis ovatis circiter 0.5×0.4 mm., antheris subsagittatis in flore femineo ut videtur sterilibus; stylo quam staminibus paullo longiore circiter 0.5 mm. diametro, stigmatate 4-capitato, ovario 4-loculari, placentis axillaribus.

NETHERLANDS NEW GUINEA: 15 km. southwest of Bernhard Camp, Idenburg River, alt. 1770 m., *Brass & Versteegh 11920* (TYPE), Jan. 1939 (tree 32 m. high, occasional in mossy forest; flowers white; young fruits green).

Quintinia lanceolata is of the alliance of *Q. Ledermannii* Schlechter, of Northeast New Guinea, collected at somewhat lower altitudes, from which it differs in having narrower leaves of thicker texture and with very obscure venation, longer racemes, shorter calyx-teeth, and petals with only one nerve.

Quintinia Macgregorii F. v. Muell. in Vict. Nat. 9: 112. 1892. FIG. 1, D-F.

BRITISH NEW GUINEA: Central Division, Murray Pass, Wharton Range, alt. 2840 m., *Brass 4719* (A, NY) (tree 6 m. tall, rare in open low forest, densely branching, leaves lepidote above, the veins conspicuous on the lower surface).

This species was described very superficially. Mueller states merely. "This occurs high up on Mt. Suckling, and is nearest to *Q. Fawkneri*, but

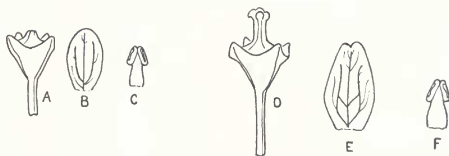


FIG. 1. A-C. *Quintinia Brassii*; A, flower with petals and stamens removed; B, petal; C, stamen. D-F. *Quintinia Macgregorii*; D, flower with petals and stamens removed; E, petal; F, stamen. All approximately $\times 5$.

the leaves are larger and on much longer stalks, the calyces are less angular, the style is much shorter, and the fruit-valves are more emersed." The Brass specimen cited above was collected at a similar altitude and seems to differ from *Q. Fawkneri* in about the same particulars as are given in the description of *Q. Macgregorii*.

The following material of *Q. Fawkenri* F. v. Muell. is available: AUSTRALIA: Queensland: Rockingham Bay, *Herb. F. v. Mueller* (coll. *Dallachy?*, prob. TYPE COLL., GH); Bellenden Ker, *C. T. White*; Mt. Spurgeon, *C. T. White 10599* (very common climber on trees and over rocks in rain-forest; leaves markedly dimorphic, at first small and rounded, those on flowering branches oblong, cuneate; flowers white); Mt. Bartle Frere, alt. 1500 m., *Kajewski 1275* (small tree up to 10 m. high, sometimes adopting a procumbent habit, rooting and climbing over rocks; petals white and very showy).

Quintinia Brassii sp. nov. FIG. 1, A-C.

Arbor 10-12 m. alta, ramulis infra petiolum leviter angulatis circiter 4-5 mm. diametro; petiolis canaliculatis 1-1.5 cm. longis; laminis subcoriaceis elliptico-oblancoelatis, (4-) 6-9 cm. longis, 1.5-2.5 cm. latis, in sicco supra fusco-viridibus, subtus pallidioribus, basi cuneatis et in petiolum angustatis, apice obtusis vel acutis, margine integris et minute revolutis, costa supra impressa subtus valde prominente, nervis lateralibus principalibus utrinque circiter 12 utrinque prominulis vel supra interdum immersis marginem versus anastomosantibus; racemo florifero incompleto solo viso, pedicellis circiter 2 mm. longis; floribus 4- vel 5-meris. calycis tubo obconico circiter 1 mm. longo et 1 mm. diametro, calycis lobis deltoideis circiter 0.7 mm. longis; petalis ellipticis circiter 2.5×1.5 mm., nervis principalibus circiter 3 prominentibus; staminibus circiter 1.2 mm. longis, filamentis oblongis circiter 0.5×0.4 mm., antheris subsagittatis in flore femineo ut videtur sterilibus; stylo quam staminibus paullo brevior circiter 0.5 mm. diametro, stigmatibus 4-capitato, ovario 1-loculari, placentis axillaribus; racemis fructiferis ad 9 cm. longis, fructibus circiter 25-30 cupuliformibus, parte basali circiter 2×2 mm. conspicue 10-costata, parte distali ovarii quam calycis lobis duplo longiore aperte dehiscente, valvis stigmatibus persistentibus coronatis.

NETHERLANDS NEW GUINEA: 6 km. northeast of Lake Habbema, alt. 3200 m., *Brass 11007* (TYPE), Oct. 1938 (tree 10-12 m. high, abundant in mossy forest on the mountain-slopes; foliage gray).

Quintinia Brassii differs but slightly in foliage from *Q. Macgregorii* F. v. Muell., from Mt. Suckling, British New Guinea, the leaves being slightly longer and narrower. The twigs of the new species are definitely angled and gray, while those of *Q. Macgregorii* are terete and reddish brown. The flowers of *Q. Brassii* are about one-half as large as those of its ally, with extremely short styles and petals with rounded rather than emarginate tips.

Quintinia Schlechteriana O. C. Schmidt in *Nova Guin. Bot.* 14: 148. 1924.

NETHERLANDS NEW GUINEA: Bele River, 18 km. northeast of Lake Habbema, alt. 2350 m., *Brass 11453* (shrub 1 m. high, in shrubby regrowth in a forest clearing; leaves pale underneath, the margins recurved; flowers white).

The cited specimen agrees in general with the original description of *Q. Schlechteriana*, based on specimens from the nearby Doormantop at similar elevations. Schmidt describes the petioles as being pubescent. The petioles of the Brass specimen are hardly pubescent, but they are covered with peltate scales; these, however, are not confined to the petioles but cover the young twigs as well. Another difference is that the Brass specimen has pedicels up to 4 mm. long while the description states " ± 2

mm." Schmidt describes *Q. Schlechteriana* as having calyx-segments "1.8 mm. long." Those of the Brass specimen are only 0.8 mm. Since the proportions of the flower are essentially the same in other respects, this is probably a misprint. The type specimen not being available for direct comparison, I do not feel justified in proposing a new species on the basis of these minor variations.

Quintinia epiphytica Mattf. in Bot. Jahrb. 70: 469. 1940.

NORTHEAST NEW GUINEA: Morobe District, Yunzaing, Mt. Aloki forest, alt. 1200-1500 m., *Clemens* 2379 (vine; petals and anthers white); A-mieng (A-mien), on Yaneng (Yanem) River, a tributary of the Buso River, above mouth of Tasapik Creek, alt. 1500-1800 m., *Clemens* 12368 (flowers white; fruits dull greenish). NETHERLANDS NEW GUINEA: 4 km. southwest of Bernhard Camp, Idenburg River, alt. 850 m., *Brass* 13453 (epiphytic shrub 1 m. high; flowers white).

The cited specimens seem certainly to be conspecific and agree very well with the original description, based on *Clemens* 7168 and 5845, from Sambanga and Sarawaket, localities of similar altitude and in the general vicinity of those cited above from Northeast New Guinea. The Brass specimen is from a slightly lower altitude. All of the cited specimens are either epiphytic shrubs or vine-like plants. The original description states: "frutex epiphyticus," but Mattfeld says that a note with the type specimen reads: "common scandent shrub on largest trees in mossy bush." Although the cited specimens have some leaves which are slightly broader, they agree with the original description in most particulars.

Quintinia altigena Schlechter in Bot. Jahrb. 52: 127. 1914, in Nova Guin. Bot. 12: 488. 1917.

NETHERLANDS NEW GUINEA: 9 km. northeast of Lake Habbema, alt. 2800 m., *Brass & Versteegh* 10449 (tree 24 m. high, rare in mossy forest; crown dark, not wide-spreading; flowers white; young fruits green); 15 km. southwest of Bernhard Camp, Idenburg River, alt. 1800 m., *Brass* 11856 (tree 15-20 m. high, one of the commonest subsidiary trees; underside of leaves very pale; flowers white), *Brass & Versteegh* 11983 (tree 19 m. high, common on slopes of a ridge; flowers white); 18 km. southwest of Bernhard Camp, Idenburg River, alt. 2100 m., *Brass* 12194 (tree 3-5 m. high, abundant in stunted mossy forest on an exposed summit; leaves very pale beneath; flowers white).

The cited specimens appear to be conspecific and probably represent *Q. altigena* Schlechter, the type of which was collected on open terrain of the Hubrecht Mountains, Northeast New Guinea. The Brass specimens may be confidently excluded from all other species of *Quintinia* except *Q. altigena*, the original description of which is too generalized to permit absolute identification. The leaves of Schlechter's species are said to be 7-9.5 cm. long including the petiole, which is described as being 1 cm. long. The Brass specimens have leaves up to 12 cm. long and petioles as much as 2 cm. long. In addition, these leaves may be up to 5 cm. wide, while those of *Q. altigena* are described as being 2-3 cm. wide. On *Brass & Versteegh* 10449, however, which most closely agrees with the description, the leaves average about 9 cm. long and about 2.5-3 cm. broad, the petioles also are only slightly more than 1 cm. long. This last-cited specimen was collected at a comparatively high elevation (2800 m.), which

is nearer to that of the type (3100 m.). It seems possible that the other specimens may well represent more robust forms of the same species growing at lower elevations. In spite of variation in leaves and other minor differences among the specimens cited, I am confident that only one species of reasonable variability is represented.

Polyosma Blume

In his discussion of *Polyosma*, Schlechter (in Bot. Jahrb. 52: 127-136. 1914) includes a key in which the main divisions are based on whether the corolla is tubular or split into separate petals. While these divisions may appear to be rather arbitrary, the present study has shown that the character is reliable. In those species in which the corollas split into separate petals, longitudinal lines are evident early in the bud; in those corollas which remain tubular, however, no lines appear even at maturity.

Polyosma mucronata sp. nov.

Frutex ad 50 cm. altus, ramulis juventute subteretibus circiter 2-3 mm. diametro, dense sericeis, demum glabratis; petiolis supra canaliculatis 1.5-3 cm. longis; laminis coriaceis in sicco fusco-olivaceis obovatis vel elliptico-obovatis, (2-) 3.5-5 cm. longis, (1.5-) 2-2.5 cm. latis, supra nitidis, subtus pallidis, basi acutis vel attenuatis et in petiolum angustatis, apice rotundatis mucronatis, margine minute revolutis, costa supra impressa subtus prominente, nervis lateralibus utrinsecus 6-10 supra inconspicue prominulis subtus leviter elevatis marginem versus anastomosantibus, venulis immersis; racemis terminalibus ad 8 cm. longis 12-16-floris, pedunculo brevi rhachi pedicellisque dense sericeis; pedicellis ad 3 mm. longis, bracteola apicali trifida extus sericea intus glabra, segmento centrali late ovato 2.5-3 mm. longo circiter 1 mm. lato, segmentis laterali-bus aequalibus anguste ovatis 2.3-2.5 mm. longis 0.6 mm. latis; calyce extus sericeo circiter 4 mm. longo, tubo obconico-urceolato circiter 2 mm. longo et 1.6 mm. diametro, limbo 4-lobato intus glabro, lobis suberectis deltoideis circiter 1.2 mm. longis; corolla cylindrica maturitate circiter 14 mm. longa et 2.5 mm. diametro extus dense sericea intus glabra 4-lobata, lobis subcarnosis late ovatis circiter 2×1.8 mm. apice obtusis; staminibus 4 circiter 11 mm. longis, filamentis complanatis circiter 0.5 mm. latis copiose pilosis, pilis ascendentibus ad 0.8 mm. longis, antheris circiter 1.8 mm. longis, connectivo latitudine filamentum aequante; stylo tereti quam staminibus paullo longiore 0.5-0.6 mm. diametro dense et breviter hispido, stigmate capitato, placentis parietalibus; fructibus ellipsoideis circiter 14×11 mm. (ex. coll.) basi et apice obtusis.

BRITISH NEW GUINEA: Central Division, Mt. Albert Edward, alt. 3600 m., *Brass* 4310 (A, TYPE, NY), June 23, 1933 (sparsely branched shrub of erect habit, up to 50 cm. high, gregarious on forest-floor, not found above 3600 m.; branches and petioles dark purple; flowers pale purple-gray, very fragrant; fruit smooth, fleshy, dark purple).

Polyosma mucronata is of the alliance of *P. stenosphon* Schlechter, from the Schraderberg Mountains of Northeast New Guinea, from which it differs in having much longer petioles, somewhat broader leaf-blades,

longer calyx-teeth, more copiously pilose filaments, and a conspicuously pubescent style.

Polyosma amygdaloides sp. nov.

Arbor ad 12 m. alta, ramis ramulisque subteretibus, ramulis juvenilibus circiter 2.5 mm. diametro primo leviter puberulis mox subglabratibus; petioli canaliculatis rugulosis 1.3–2.5 cm. longis; laminis coriaceis in sicco viridifuscis subtus pallidioribus lanceolatis, (5–) 8–17 cm. longis, (1.6–) 2.5–4.2 cm. latis, utrinque glabris, supra nitidis, basi cuneatis vel attenuatis, apice in acuminem 1–2 cm. longum gradatim attenuatis, margine subintegris vel dentes paucos callosos distanter gerentibus, costa supra impressa subtus prominente, nervis lateralibus utrinsecus 8–13 patentibus obvie anastomosantibus utrinque prominulis, rete venularum utrinque subimmerso; racemis terminalibus vel subterminalibus ad 15 cm. longis multifloris (floribus plerumque 100–150), rhachi pedicellisque sericeis; pedicellis ad 3.5 mm. longis, bracteola apicali trifida extus sericea intus glabra, segmento centrali ovato-attenuato circiter 1 mm. longo et basi 0.5 mm. lato, segmentis lateralibus aequalibus anguste ovatis 0.6–0.7 mm. longis, circiter 0.2 mm. latis; calyce extus sericeo, circiter 2.5 mm. longo, tubo obconico-urceolato 1.75–2 mm. longo 1.2–1.4 mm. diam., limbo 4-dentato, dentibus apiculatis circiter 0.5 mm. longis; corolla cylindrica maturitate circiter 15 mm. longa et 1.5–2 mm. diametro, extus dense sericea, intus copiose farinoso-puberula, lobis subcarnosis oblongo-ovatis circiter 3×1 mm. apice obtusis; staminibus circiter 13 mm. longis, filamentis complanatis sparse pilosis, antheris 2–2.5 mm. longis, connectivo latitudine filamentum aequante; stylo tereti quam staminibus paulo longiore 0.4–0.5 mm. diametro strigoso. stigmatibus capitato, placentis parietalibus; fructibus subglobosis circiter 6 mm. diametro, basi obtusis, apice umbonatis.

NETHERLANDS NEW GUINEA: Bernhard Camp, Idenburg River, alt. 900 m., *Brass* 13335 (TYPE), March 1939 (subtree tree 12 m. high, occasional in rain-forest on the slopes; flowers yellow, fragrant).

The new species, characterized by lanceolate long-acuminate leaf-blades and very abundant flowers, appears to have no close relatives. In some respects it suggests *P. buxea* Mattf. (of which a type duplicate is available at A), but it differs in its darker differently shaped leaf-blades, obviously pedicellate rather than sessile flowers, and much longer corollas.

Polyosma cestroides Schlechter in Bot. Jahrb. 52: 129. fig. 4, A–F. 1914.

NORTHEAST NEW GUINEA: Morobe District, Yunzaing, alt. about 1650 m. (*Clemens* 3744 (tree, the trunk 10–13 cm. diameter; flowers flesh-colored to salmon; fruit blue-purple [not seen on our specimen]).

The cited specimen agrees in most particulars with the original description, based on *Ledermann* 12566, from the Sepik region at a similar elevation. The only differences noted are that in the Clemens specimen the inflorescences are about 25–35-flowered, while the original description states that they are 6–12-flowered. Since Schlechter based his description on only one collection, I do not believe this difference to be significant. A further difference is in the bracteoles, which in the Clemens specimen are 1.5–2 mm. long. Schlechter describes them as being 4–5 mm. long, but in his illustration he shows no bracteoles at all. This is probably an

error. Since the ovary is only 2 mm. long, and the bracteoles are immediately below it, if these latter structures were 4-5 mm. long they would exceed the ovary and be quite conspicuous. In this case one would expect that special mention of them would be made in the description and that they would be prominently figured in the illustration.

Polyosma tubulosa Schlechter in Bot. Jahrb. 52: 130. fig. 4, G L. 1914.

NETHERLANDS NEW GUINEA: 15 km. southwest of Bernhard Camp, Idenburg River, alt. 1800 m., *Brass* 12285 (substage tree 10 m. high, in mossy forest; flowers brownish green).

The cited specimen agrees reasonably well with Schlechter's species, although the leaf-blades are sometimes longer (up to 9 cm.) than those originally described. The *Brass* specimen has racemes up to 17-flowered, while Schlechter's description states that they are "5-10-floris." His illustration, however, shows a raceme with 17 flowers. In other particulars our specimen agrees well with both the description and illustration.

Polyosma induta sp. nov.

Arbor ad 4 m. alta, ramulis juventute subcomplanatis dense tomentosis, demum glabratibus; petiolis supra canaliculatis dense tomentosis 1.3-2.5 cm. longis; laminis in sicco fusco-viridibus ellipticis, 8-15 cm. longis, 2.5-5.5 cm. latis, supra glabris, subtus praecipue nervis tomentosis, basi cuneatis vel attenuatis et in petiolum angustatis, apice acutis vel breviter acuminatis, margine dentibus utrinsecus 5-7 distanter calloso-serratis, costa supra impressa subtus prominente, nervis lateralibus utrinsecus 8-12 supra prominulis subtus valde elevatis marginem versus anastomosantibus, venulis supra immersis subtus elevatis; racemis terminalibus ad 10 cm. longis dense 30-45-floris, pedunculo brevi rhachi pedicellisque dense tomentosis; pedicellis 4-8 mm. longis, bracteola apicali trifida extus tomentosa intus glabra vel sparsim pilosa, segmento centrali lanceolato 3-3.5 mm. longo 0.5-0.8 mm. lato, segmentis lateralibus aequalibus lanceolatis circiter 2.5 mm. longis et 0.4 mm. latis; calyce extus sericeo-tomentello circiter 3 mm. longo, tubo obconico-urceolato circiter 2 mm. longo et 2-2.5 mm. diametro, limbo 4-dentato, dentibus apiculatis; corolla cylindrica maturitate circiter 17-20 mm. longa et 1.5-2 mm. diametro, extus dense sericea intus subglabra, lobis subcarnosis oblongo-ovatis circiter 3×1 mm., apice obtusis; staminibus 4 circiter 15-18 mm. longis, filamentis complanatis circiter 0.5 mm. latis sparsim pilosis, antheris 2.5-3 mm. longis, connectivo latitudine filamentum aequante; stylo tereti quam staminibus paulo longiore 0.5-0.6 mm. diametro sericeo, stigmatibus capitatis, placentis parietalibus; fructibus subglobosis 6-9 mm. diametro, bracteola conspicua persistente subtentis, calycis dentibus minutis persistentibus coronatis.

NETHERLANDS NEW GUINEA: Bele River, 18 km. northeast of Lake Habbema, alt. 2350 m., *Brass* 11483 (TYPE), Nov. 1938 (tree 4 m. high, in forest undergrowth; flowers purplish brown).

This species and the following (*P. vochysioides*) are very similar in foliage but differ markedly in characters pertaining to the inflorescence. They appear to have no close relatives, forming an isolated group in the general vicinity of *P. buxea* Mattf., *P. cestroides* Schlechter, etc., from

which the copious pubescence separates them. *Polyosma induta* may also be compared to *P. dentata* Schlechter, from which it differs not only in its persistently tubular corolla, but also in its more pronounced indument, much longer petioles, pedicels, and corollas, and more copiously flowered inflorescences.

Polyosma vochysioides sp. nov.

Arbor 8–10 m. alta, ramulis juventute subcomplanatis dense tomentosis, demum glabratibus; petiolis subteretibus dense tomentosis 1–2 cm. longis; laminis in sicco viridi-olivaceis ellipticis, (5–) 7–13 cm. longis, (2–) 3–5.5 cm. latis, supra nitidis mox glabratibus, subtus praecipue nervis tomentosis, basi cuneatis, apice in acuminem 1–1.5 cm. longum gradatim attenuatis, margine dentibus utrinsecus 4–6 distanter callososerratis, costa supra impressa subtus prominente, nervis lateralibus utrinsecus 7–10 supra prominulis subtus elevatis marginem versus anastomosantibus, venulis supra immersis subtus leviter elevatis; racemis axillaribus vel terminalibus ad 15 cm. longis, 35–65-floris, pedunculo brevi rhachi pedicellisque dense tomentosis; pedicellis sub anthesi ad 4 mm. longis, bracteola apicali trifida, lobis aequalibus linearibus ubique tomentosis circiter 3.5 mm. longis; floribus ex apice pedicellorum abrupte obstipis; calyce extus sericeo circiter 3 mm. longo, tubo obconico-urceolato circiter 1.5 mm. longo et diametro, limbo 4-lobato intus glabro, lobis suberectis deltoideis circiter 1 mm. longis; corolla in alabastro cylindrica 1 mm. diametro, extus dense sericea; staminibus 4, filamentis complanatis breviter sericeis; stylo subclavato sericeo, stigmate capitato; fructibus ellipsoideis circiter 7×5 mm., bracteola persistente subtentis, calycis limbo coronatis, pedicellis sub fructu ad 10 mm. longis persistenter tomentosis.

NETHERLANDS NEW GUINEA: Bernhard Camp, Idenburg River, alt. 1800 m., *Brass* 12090 (TYPE), Jan. 1939 (tree 8–10 m., frequent in mossy forest substage, with flower-buds and unripe fruits).

From *P. induta*, above described, this species differs but slightly in foliage, its leaf-acumen being more attenuate and longer. In inflorescence, however, there are striking differences between the two species. *Polyosma vochysioides* has the bracteole equally cleft into linear lobes which are uniformly tomentose; the bracteoles of *P. induta* have the central lobe the largest and all the lobes are lanceolate and glabrous within. The flowers of *P. vochysioides* are sharply bent at the apices of the pedicels rather than continuing their direction; the calyx-lobes of *P. vochysioides* are distinctly larger, and it is probable that its corollas are shorter, although mature ones are not available.

Polyosma ocellia sp. nov.

Arbor parva dense foliata, ramis ramulisque subteretibus, ramulis juventute circiter 2–3 mm. diametro densissime fusco-velutinis; petiolis canaliculatis subvillosis 0.6–1.5 cm. longis; laminis subcoriaceis undulatis in sicco pallido-viridibus ellipticis vel oblongo-ellipticis, (3–) 3.5–5 cm. longis, (1.5–) 2–2.5 cm. latis, supra subglabris vel sparsim puberulis, subtus densius puberulis, nervis subvillosis, basi cuneatis, apice obtusis vel acutis et callosis-apiculatis, margine dentibus 5 vel 6 distanter callososerratis, costa supra impressa subtus prominente, nervis lateralibus utrin-

secus 6–10 patentibus supra prominulis subtus prominentibus conspicue anastomosantibus, rete venularum supra subimmerso subtus leviter elevato; racemis subterminalibus immaturis 3–6 cm. longis 8–20-floris, rhachi pedicellisque subvillosis; pedicellis ante anthesin circiter 2 mm. longis, bracteola apicali trilobata foliacea utrinque subsericea supra sparsius, segmento centrali ovato-lanceolato circiter 7 mm. longo et 2.5 mm. lato, segmentis lateralibus subaequalibus lanceolatis circiter 6 mm. longis et 1.8–2 mm. latis; calyce extus dense sericeo circiter 4.5 mm. longo, tubo vascolari circiter 2 mm. longo et 1.5 mm. diametro, limbo 4-lobato, lobis suberectis lato-ovatis 1.3–1.5 mm. longis intus distaliter sparsim sericeis; corolla in alabastro visa cylindrica 2 mm. diametro extus dense sericea; staminibus 4, filamentis complanatis pilosis; stylo subclavato, sericeo, stigmate capitato; fructibus ovoideo-ellipsoideis, circiter 10×7 mm., bracteola conspicua persistente subtentis, calycis limbo coronatis, pedicellis sub fructu ad 6 mm. longis persistenter pilosis.

BRITISH NEW GUINEA: Central Division, Wharton Range, Murray Pass, alt. 2840 m., *Brass* 4524 (A, NY, TYPE), June–Sept. 1933 (small tree of forest borders, with smooth undulate leaves; flower-buds brown; fruit green).

This remarkably distinct species is at once recognized by its large persistent foliaceous bracteoles, which conspicuously exceed the calyx in length, and by its ovary, which is definitely bilocular proximally. Further differentiating characters are the compact habit, dense foliage, comparatively small leaf-blades, and few-flowered inflorescences. Another species with a conspicuous bracteole is *P. longibracteolata* O. C. Schmidt, but that species has narrower leaf-blades, shorter petioles, shorter pedicels, and a smaller and differently shaped bracteole. *Polyosma helicioides* F. v. Muell. is too inadequately described to permit comparison, but it apparently differs from the new species in its shorter petioles and pedicels; Mueller does not mention the presence of bracteoles.

The specific epithet refers to the fact that the calyces are concealed by the large bracteoles.

Polyosma oligantha sp. nov.

Arbor 25 m. alta inflorescentiis exceptis ubique glabra, ramulis apicem versus subcomplanatis rugosis crassis circiter 5 mm. diametro, nodis tumefactis; petiolis canaliculatis striatis 1–2.3 cm. longis; laminis crassocoriaceis in sicco fusco-olivaceis ellipticis, 6–10 cm. longis, 3.5–5.5 cm. latis, basi obtusis vel cuneatis, apice obtusis vel rotundatis interdum leviter emarginatis, costa supra impressa subtus valde prominente, nervis lateralibus utrinsecus circiter 10 erecto-patentibus supra prominentibus conspicue anastomosantibus subtus prominulis, rete venularum supra leviter elevato subtus subimmerso; racemis robustis axillaribus vel terminalibus ad 7 cm. longis 5–8-floris, pedunculo circiter 3 cm. longo, rhachi striata; pedicellis sparsim sericeis 2–3 mm. longis, bracteola apicali trifida extus sparsim sericea intus glabra, segmento centrali ovato 2–3 mm. longo circiter 1 mm. lato, segmentis lateralibus subaequalibus ovatis circiter 1 mm. longis et 0.6 mm. latis; calyce extus sparsim sericeo 5–6 mm. longo et 2.5–3 mm. diametro, lobis erecto-patentibus late ovatis circiter 2 mm. longis et 1.5 mm. latis; corolla cylindrica subcarnosa ad 28 mm. longa et 2.5–3 mm. diametro extus sericea intus glabrata; staminibus quam corolla paullo brevioribus,

filamentis complanatis sparsim pilosis, antheris circiter 7 mm. longis, connectivo quam filamentis angustiore; stylo tereti sericeo quam staminibus paullo longiore 0.5–0.75 mm. diametro, stigmatе capitato, placentis parietalibus; fructibus ellipsoideis circiter 13×11 cm., basi et apice obtusis.

NETHERLANDS NEW GUINEA: Bernhard Camp, Idenburg River, alt. 2000 m., *Brass 12502* (TYPE), Feb. 1939 (tree 25 m. high, rare in rain-forest on slope of a ridge, the trunk 71 cm. diam., the crown fairly wide-spreading, the flowers brown-green, the fruits green, the bark 10 mm. thick, the wood brown).

Polyosma oligantha seems to have no close relatives in New Guinea. It is easily recognized by its thick twigs, thick leaves with entire margins and rounded to emarginate tips, and its very large flowers. Another species with very long corollas is *P. tubulosa* Schlechter, from the Schraderberg Mountains, Northeast New Guinea, but that species has acuminate, narrower leaves and a calyx only about half as long as that of *P. oligantha*.

Polyosma brachyantha Merr. in Philip. Jour. Sci. Bot. 11: 273. 1916.

BRITISH NEW GUINEA: Central Division, Dieni, Ononge road, alt. 500 m., *Brass 3899* (slender tree 10 m. tall, in rain-forest; upper surface of leaves shining, the midrib brown; green [immature] fruit about 1 cm. long by 8 mm. diameter). SOLOMON ISLANDS: Bougainville: Kupei Gold Field, alt. 950 m., *Kajewski 1647* (small tree up to 15 m. high, common in rain-forest; flowers white on long racemes), *1675* (fruit blue-black when ripe).

The cited specimens seem to be conspecific and appear to be identical with *Polyosma brachyantha* Merr., based on specimens from Amboina. Both the isotype (A) of *P. brachyantha* and the flowering specimen cited above have immature flowers, but these are very similar. Both have stamens with densely pilose filaments and a style which is rather sparsely retrorsely pilose. Although Merrill says that the style is glabrous, a critical re-examination of the isotype shows retrorse hairs.

Polyosma macrobotrys Mattf. in Bot. Jahrb. 69: 273. 1938.

NORTHEAST NEW GUINEA: Morobe District, Quembung Mission, alt. 360 m., *Clemens 2138* (small tree 8–10 m. tall; fruit green-white). NEW BRITAIN: Kirigo, Maisua, alt. 300 m., *Waterhouse 22688* (small tree 1.5–2 m. tall). SOLOMON ISLANDS: Ysabel: Tiratona, alt. 600 m., *Brass 3211* (slender thin-barked tree; leaves dark dull green; flowers white), *3311* (fruit costate); Guadalcanal: Uulolo, Tutuve Mt., alt. 1200 m., *Kajewski 2556* (tree up to 20 m. high; fruit green when ripe).

The cited specimens appear certainly to be conspecific and to agree in all particulars with Mattfeld's description; furthermore the Clemens specimen is from the type locality. The occurrence of this species in the Solomon Islands extends the range of the genus to the east; otherwise *Polyosma* is known from the Solomons only by *P. brachyantha* Merr., specimens of which are cited in this paper.

It is possible that the New Hanover specimen cited by Lane-Poole (in For. Res. Papua 90. 1925) and White and Frances (in Proc. Roy. Soc. Queensl. 39: 63. 1928) as *P. lagunensis* Merr. actually represents *P. macrobotrys* Mattf.

Polyosma Forbesii Valetton ex Lauterb. in Nova Guin. Bot. 8: 821. 1912.

BRITISH NEW GUINEA: Central Division, Koitaki, alt. about 485 m., *Carr 12644*

(NY) (tree about 8 m. tall; buds green), alt. about 450 m., *Carr 12780* (NY) (tree about 16 m. tall; flowers dull grayish violet); Western Division, Wuroi, Oriomo River, *Brass 5767* (A, NY) (large shrub, uncommon on tidal mudbanks in river; leaves stiff, the upper side glossy, the nerves deeply impressed above, prominent; flowers whitish).

The cited specimens appear to be conspecific and to agree well with Valetton's original description, which is based on a collection from Sogeri in southeastern New Guinea. The Brass specimen has pedicels up to 1.5 mm. and petals up to 10 mm. long, but it agrees in all other particulars. The Carr specimens agree almost precisely with Valetton's description.

ARNOLD ARBORETUM,
HARVARD UNIVERSITY.