



Plate 1. Tree of *Gastonia spectabilis*, Kassam Pass, Territory of New Guinea. Inflorescences are visible below the leaves.

THE MALESIAN SPECIES OF GASTONIA (ARALIACEAE)

W. R. PHILIPSON

Department of Botany, University of Canterbury, New Zealand

Only two species of *Gastonia* occur in Malesia, but each has a complex taxonomic history. The species which became known first, *G. papuana* Miq., is evidently an uncommon plant of coastal and lowland forest, but with a very wide range. It has been collected only once, or at most a few times, from each of many islands of the Malayan Archipelago and once from the mainland of the Peninsula. Most of these collections were made in the nineteenth or early twentieth centuries. Only in western New Guinea has this species been collected in more recent times within our area. The distribution of this species shows several disjunctions, the most striking being that between West Irian and its only known locality in the extreme east of the Solomon Islands. It is interesting that this gap corresponds with the distributional range of the second species, *G. spectabilis* (Harms) Philipson, which overlaps that of *G. papuana* only in the west of New Guinea (fig. 1).

The widely dispersed range of *G. papuana* has resulted in its being described as several distinct species from different parts of its range. It was first named in 1863, when three names appeared in two genera. Miquel (1863) applied the names *Tetraplasandra paucidens* and *Gastonia papuana* to this species, and Teysmann and Binnendijk (1863) described it as *Tetraplasandra eupteronoides*. I am grateful to Professor van Steenis for information on the sequence of publication of these names. Miquel's publication was issued on 2 July 1863 (Stafleu, 1967). A report in volume 27 of the 'Natuurkundig Tijdschrift voor Nederlandsch Indië' states that volume 25 was issued in six instalments, the first of which appeared in 1862. The five remaining parts appeared in 1863. Professor van Steenis has examined the publication and concludes that page 416, on which the name *T. eupteronoides* appeared, belongs to the final instalment, and must therefore have been issued late in 1863, and in any event later than July. For this reason, Miquel's names take precedence over that of Teysmann & Binnendijk. Of Miquel's two names, I have chosen to use that which he placed in *Gastonia*. In this way the need for a new combination is avoided. As can be seen from its synonymy this species was described from other islands by subsequent authors.

The second species is more restricted in its geographical range, and since it is most frequent in upland forests of New Guinea, New Britain, and the Solomon Is its discovery was more recent. Nevertheless, it is now represented more frequently in herbaria because it is a striking and not uncommon tree (plate 1).

GASTONIA

Comm. ex Lamk, Encycl. 2 (1786) 610; Harms in E. & P., Nat. Pfl. Fam. 3, 8 (1898) 43; Hutchinson, Gen. Flow. Pl. 2 (1967) 68.

Peckeliopanax Harms, Notizbl. Berl.-Dahl. 9 (1926) 478, fig.

Indokingia Hemsl. in Hook., Ic. Pl. (1906) t. 2805.

(1917) 20. — *Tetraplasandra solomonensis* Philipson, Bull. Brit. Mus. (Bot.) 1 (1951) 11.

Shrub or small tree, sometimes epiphytic, up to 20 m high, with clear bole to 15 m, crown sparsely branched with leaves crowded at the ends of the branches, glabrous, unarmed. *Leaves* up to 80 by 20 cm; petiole c. 13 cm, terete, with clasping base; rachis articulated, leaflets in c. 10 pairs, petiolules up to 1 cm, blade oblong, ovate, or lanceolate, middle leaflets 8—14(—18) by 2.5—5.5(—8) cm, chartaceous, entire and sub-revolute, or with few obscure, more rarely several prominent crenations, base broadly cuneate, apex rounded and bluntly apiculate or tapering and acute, midrib prominent. *Inflorescence* terminal, glabrous with a stout primary axis 15—25 cm long, bearing scattered or clustered branches along its length and ending in an umbel of about 10 branches; bracts caducous, secondary branches 30—40 cm, bearing numerous subverticillate peduncles along their length and ending in an umbel; peduncles c. 3 cm long, somewhat longer in fruit; pedicels 10—25 mm, forming umbellules of c. 10 flowers. *Flower* buds (when dry) c. 7 by 3 mm. Calyx rim entire, undulate. Petals 5—9, slightly fleshy, fully separated. Stamens variable in number ((7—)14—55), filaments short, anthers broad and irregularly lobed, variable in size. Ovary glabrous, smoothly rounded below, slightly constricted below the calyx, cells 6—12, usually c. 9, disk with a prominent rim and, at anthesis, a central boss formed by closely appressed subulate style arms equal in number to the ovary cells. *Fruit* c. 9 by 7 mm (without stylopodium), the flattened stylopodium ending in a ring or double row of radiating subulate stigmatic arms, black when ripe, the fleshy exocarp enclosing compressed crustaceous pyrenes.

MALAY PENINSULA. Johore, sea level, 1939, *Henderson 36272* (LAE, SING).

SUNDA STRAITS. Dwars in den Weg (Sangian I.), *Forsten* (L, type of *Tetraplasandra paucidentis* Miq.), *Teysmann* (L, type of *Gastonia eupteronoides* Teysm. & Binn.).

WEST JAVA. Without locality, *Kuhl & van Hasselt* (L).

LESSER SUNDA ISLANDS. Sumba, Kanangar, 1925, *Iboet 537* (L); Timor, *Teysmann 8743* (L); Wetar, north of Ilwaki, 775 m, 1939, *b.b. 27220* (A, L, SING).

BORNEO. Karimata Is, *Teysmann* (L). Sg. Tajan (c. 100 km E. of Pontianak), *Teysmann 11324* (L). Kwaru, 1908, *Hubert Winkler 3078* (type of *Gastonia winkleri* Harms, not seen).

PHILIPPINE ISLANDS. Palawan, 1906, *Curran 3809* (K), *3844* (K, L).

CELEBES. Without locality, *Teysmann* (B); south east Peninsula, Lepo-Lepo, *Beccari* (K). — Minahassa, 1895, *Koorders 16102, 16103* (type of *Tetraplasandra koordersii* Harms, not seen).

MOLUCCAS. Talaud Is, Karakelong, slopes of Mt Piapi, 400 m, 1926, *Lam 3262* (L).

NEW GUINEA. Vogelkop, 60 miles south of Manokwari, sea level, 1940, *Kanehira & Hatusima 13047* (A); Klasoen hill, south east of Sorong, 50 m, 1954, *van Royen 4090* (CANB, LAE); Ajamaru, 240 m, 1962, *W. Vink BW 15261* (CANB, LAE); Tanah Merah, north side of Lake Ajamaru, 220 m, 1962, *W. Vink BW 15398* (CANB, L, LAE). — North West Irian. Rouffaer River, 250 m, 1926, *Docters van Leeuwen 10288* (L). — South West Irian. Lobo, *Zippelius 178* (K, L, type of *Gastonia papuana* Miq.); without locality, *Zippelius 191* (L). — Biak Island, 90 m, 1959, *Versteegh & Vink BW 8282* (L, LAE). — Waigeu I., 1955, *van Royen 5505* (L, LAE).

Also in the Solomon Islands (San Cristoval, as *Tetraplasandra solomonensis* Philipson).

Vernacular names. Langatora (Talaud Is); Mantzenongor (Biak); Raauwrach, or Ara-orach (Vogelkop, Maibrat).

Notes. The outer bark is described as light brown, strongly peeling with small, oblong, brittle scales. Inner bark, leaves, and inflorescences with copious sticky juice. Wood soft, white. The petals are variously described as purple, light green, and white.

This species has a wide geographical range and may be found to comprise local subspecies, but insufficient material has been collected to establish these. The variation within New Guinea is as great as over the remainder of its range. The entire or serrate nature of the leaf margins, the number of ovary cells, and especially the number of stamens are variable characters but show no discernable geographical segregation.

2. *Gastonia spectabilis* (Harms) Philipson, *comb. nov.* — *Peckeliopanax spectabilis* Harms, Notizbl. Berl.-Dahl. 9 (1926) 478. — *G. boridiana* Harms, Bot. Jahrb. 69 (1938) 282.

Tree up to 40 m high, clear bole to 28 m. d.b.h. 1.75 m, crown sparsely branched with the branches whorled or regularly forked and the leaves crowded at the ends of the branches, unarmed, all young parts with scurfy indumentum more evident in dried material. *Leaves* up to 80 by 30 cm; petiole *c.* 15 cm, terete with clasping base; rachis articulated, with some tomentum remaining at the joints; leaflets in *c.* 11 pairs, petiolule *c.* 2–8 mm, blade oblong or elliptic, middle leaflets 10–15 by 4–6 cm, chartaceous when dry, prominently crenate, base rounded or truncate, apex narrowed to a short blunt apiculus. *Inflorescences* in forks well below the leaves, when in bud covered with large scurfy cataphylls, and when mature with radiating branches forming clusters about 130 cm in diameter. Primary axis short (5–10 cm) with persistent bracts; secondary branches numerous, radiating, up to 65 cm, bearing small, persistent, scurfy bracts and peduncles scattered along their length and clustered in a terminal umbel; peduncles *c.* 1.5–50 cm; pedicels 5–15 mm, forming umbellules of *c.* 5–12 flowers. *Flower* buds *c.* 8 by 5 mm when dry (fresh *c.* 12 by 8 mm); calyx rim entire, straight; petals 6–12, very fleshy, incompletely separated (often splitting into *c.* 5 lobes); stamens 25–66, often *c.* 35, filaments short, anthers broad and irregularly lobed, variable in size; ovary with a short dense indumentum, smoothly rounded below, cells usually *c.* 16, very rarely fewer than 10, as many as 22, disk at anthesis with a prominent rim and a central boss formed by closely appressed subulate styles equal in number to the cells. *Fruit* *c.* 8 by 10 mm (without stylopodium), the flattened disk with a prominent stylopodium ending in an elliptical ring of radiating subulate stigmatic arms; dark red-brown when ripe, the fleshy exocarp enclosing compressed crustaceous pyrenes.

NEW GUINEA. Vogelkop: Sorong, 30 m, 1956, *Versteegh BW 4608* (L, LAE). Warsamson River, Sorong, 60 m, 1957, *Schram BW 2945* (L, LAE). Manokwari, 1956, *Versteegh BW 3868* (LAE). Oransbari, Ransiki, 1956, *Koster BW 1329* (A, L, LAE). Kebar Valley, 450 m, 1958, *Koster BW 7178* (L). Wariki, west of Manokwari, 5–10 m, 1958, *Schram BW 7651* (L). Warnapi, Manokwari, 60 m, 1948, *Kostermans 401* (A, SING). — North West Irian: Idenburg River, 800 m, 1939, *Brass & Versteegh 13139* (A, BM, L); 200 m, 1939, *Brass 13559* (A, BM). — Papua: Sogeri region, 1855–6, *Forbes P.P. 124* (BM, K, L). Sirinumu, 5 miles south of Sogeri, 450 m, 1962, *Schodde 2831* (CANB, L, LAE). Boridi, 1400 m, 1935, *Carr 14911* (L, SING, type of *Gastonia boridiana* Harms). Lala River, 1700 m, 1935, *Carr 14005* (L, SING). Isvarava, 1400 m, 1936, *Carr 15495* (CANB, L, SING). Pongani Falls, Abau, 250 m, 1969, *Henty & Lelean NGF 41864* (CHR, LAE). — Mandated Territory: Koropa, Ramu Valley, 200 m, 1955, *Hoogland 5089* (CANB, LAE). Madang, 70 m, 1966, *Frodin NGF 26958* (LAE). Lae, 30 m, 1962, *Millar NGF 14512* (L, LAE); 1963, *Henty NGF 16727* (CANB, LAE). Bupu River, Lae, 1957, *Evans 32* (LAE). Atzera Range, near Lae, 300 m, 1960, *Henty NGF 11921* (LAE). Ogeramnang, 1500 m, 1937, *Clemens 5150* (A, B). Sattelberg, 900 m, 1936, *Clemens 4765* (A, B); 1938, *Clemens 8065A* (B). Boana, 1200 m, 1938, *Clemens 8641* (A, B). Samanzing, 2800 m, 1938, *Clemens 9301* (A, B). Wantoat, 1200 m, 1940, *Clemens 41216* (A). Bulolo, 1944, *McIntosh s.n.* (LAE); 1949, *Womersley NGF 3569* (CANB, CHR, L, LAE); 1950, *Fryar NGF 4004* (CANB, L, LAE); 1952, *Cavanaugh NGF 4054* (CANB, LAE); 1955, *McVeigh & Ridgwell NGF 7342* (L, LAE); 1962, *Havel NGF 11191* (LAE); 1966, *Streimann NGF 27652* (LAE). Kassam Pass, 600 m, 1968, *W. R. & M. N. Philipson 3374* (CHR, L). Kerewagi, Chimbu District, 1800 m, 1968, *W. R. & M. N. Philipson 3516* (CHR, L). Kiligia, near Komun Valley, Mt Oga, 2400 m, 1957, *Pullen 197* (CANB, LAE). Fusa, Gimi Valley, Okapa, 1500 m, 1967, *Coode & Lelean NGF 29923* (LAE).

BISMARCK ARCHIPELAGO. New Ireland: Lamekot, Lamusong, 1925, *Peckel 1001* (B, type of *Peckeliopanax spectabilis* Harms).

Also in the Solomon Islands.

Vernacular names. Vogelkop: *Amoriga* (Manikiong), *Ntjier* (Kebar), *Toejoe* (Mooi), *Djak* (Karooon). Madang District: *Bokko* (Koropa), *Boinga* (Rawa), *Tubat* (Fal), *Ganiel* (Bembi). Eastern Highlands: *Aita* (Gimi). Papua: *Kuhuh* (Manglase).

Notes. Possibly the largest Araliad known. The regular habit of branching results from

the new vegetative shoots springing in pairs or whorls from below terminal inflorescence buds. Several flushes of growth occur as an inflorescence bud matures, so that at anthesis the inflorescences are situated in forks well below the leafy crown, with a succession of younger inflorescence buds in higher forks. Bole without buttresses or with buttresses 1 m high and 2 m wide. Outer bark dark brown with prominent pustular lenticels and small shallow fissures, clear exudate abundant and aromatic. Wood soft, with prominent rays; heartwood slightly darker. Flowers cream, stamens yellow. Ripe fruit dark red-brown.

Uses. Wood splits easily and is used for garden fences.

REFERENCES

- MIQUEL, F. A. G. 1863. *Araliaceae Novae*. Ann. Mus. Bot. Lugd.-Bat. 1: 1—27.
STAFLEU, F. A. 1967. *Taxonomic Literature*. Regnum Vegetabile 52.
TEYSMANN, J. E., & S. BINNENDIJK. 1863. *Plantae novae in horti Bogoriensi coluntur*. Nat. Tijds. Ned. Ind. 25: 399—428.