

## A REVISION OF HARMSIOPANAX (ARALIACEAE)

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*Harmsiopanax* is a small structurally isolated genus confined to the Malesian Archipelago. The three species here recognized are uniform both in their vegetative and their reproductive features. It has long been recognized that some of the characters of this genus are anomalous within the *Araliaceae* and a return to its earlier position within the *Umbelliferae* would have something in its favour. The monocarpic habit is unknown elsewhere in the *Araliaceae*, but is not uncommon in the *Umbelliferae*. The character of the fruit, which splits into two dry mericarps, closely approaches the fruit of the *Umbelliferae*, and the vascularization of the gynoeceum (Philipson, 1970) is also characteristic of that family. However, the structure of the leaf-base, the tree stature, and the shape of the petals all incline towards the *Araliaceae*. This genus and a few other genera from the south-east Pacific region confirm the close relationship between these two families.

The earliest known of the three species ranges through Java and the Sunda Islands to Timor and also northwards into Celebes. This species, *H. aculeatus*, is rather uniform in its characters. Within the Island of New Guinea the forms of the genus are more complex. A species of low to moderate altitudes (sea level to 1800 m) was described early in this century as *H. harmsii*. This species is confined to the eastern part of the island. It differs from *H. aculeatus* in several respects, particularly in leaf-shape and in the spherical umbellules borne on a distinct peduncle.

A second species from New Guinea is described here as *H. ingens*. This is a variable species with a wide altitudinal range (1400—3600 m) but all specimens agree in the presence of spines on the surfaces of the large peltate leaves, a character absent from *H. aculeatus* and *H. harmsii*. Some variation in leaf-tomentum and in size of umbellules occurs along the central mountain chain of New Guinea, but it has not been thought necessary or advisable to formalize these. However, a form with distinctive inflorescence features and with a range to the north and south of the Huon Gulf has been distinguished as a subspecies.

## HARMSIOPANAX

*Harmsiopanax* Warb. in E. & P., Nat. Pfl. Fam. Nachtr. 1 (1897) 166; Hutchinson, Gen. Flow. Pl. 2 (1967) 62.  
*Horsfieldia* Bl. ex DC., Prodr. 4 (1830) 87; Harms in E. & P., Nat. Pfl. Fam. 3, 8 (1898) 60, *nom. illeg., non*  
 Willd., Sp. Pl. ed. 4 (1805) 872.  
*Schubertia* Bl., Bijdr. (1826) 884, *nom. illeg., non* Mirb., Nouv. Bull. Soc. Philom 3 (1812) 123.

Normally monocarpic trees, having a terminal cluster of large, palmately lobed, often peltate, exstipulate leaves. The trunk, petioles, and sometimes the blades spiny. *Flowers* in very large, repeatedly branched, terminal panicles which develop after the leaves have fallen. The umbellules arranged racemosely on the ultimate branchlets, sessile or pedunculate. Each umbellule consisting of a few to many pedicellate flowers, the pedicels

subtended by a bract and bearing two subulate bracteoles. Flowers hermaphrodite or polygamodioecious with hermaphrodite flowers on terminal and male flowers on basal branches. *Calyx* a minute rim. *Petals* 5, free, valvate with a broad base. *Stamens* 5, dorsifixed, versatile, introrse. *Ovary* inferior, narrowly obconic, densely bristly, cells 2; disk conical, deeply cleft between the two subulate styles. *Fruit* consisting of 2 dry mericarps, each 3-ribbed and bearing a persistent slightly hooked style.

Three species occurring from Java to Celebes, Timor, and New Guinea, easily recognized by the single-trunked monocarpic habit, the spines, the terminal cluster of palmate leaves, and the large much branched panicle.

#### KEY TO THE SPECIES

1. Upper surface of leaves uniformly setulose
    2. Umbellules sessile. (*Timor and Celebes westwards to Java*). . . . . **1. H. aculeatus**
    2. Umbellules pedunculate. (*eastern New Guinea*). . . . . **2. H. harmsii**
  1. Upper surface of leaves with many (or rarely few) larger spines among the setulose hairs. (*mountains of New Guinea*). . . . . **3. H. ingens**
- 1. Harmsiopanax aculeatus** (Bl.) Boerl.

*Schubertia aculeata* Bl., Bijdr. (1826) 885. — *Horsfieldia aculeata* Bl. ex DC., Prodr. 4 (1830) 87. — *H. aculeatus* Warb. ex Boerl., Handleiding 3, 1 (1900) 88.

A tree up to 4 m. high, with a slender spiny trunk. Young stems covered more or less densely with woolly hairs, bristles, and spines with bulbous bases, the spines enlarging on older stems. Probably monocarpic. *Petiole* about 60 cm long, 1 cm thick at the base, terete with clasping base, densely covered with woolly hairs, bristles, and some spines; blade rounded, variable in size, often 60 cm or more in diam., deeply palmately lobed, usually peltate in mature foliage leaves, sinuses between the lobes broad or narrow, lobes 7—10, usually sharply and irregularly incised and toothed, apex acute, the upper surface rather sparsely covered with evenly-spaced, appressed, sometimes branched hairs (denser on the main veins), the underside densely clothed with a soft woolly tomentum, often with some bristles on the main veins. *Inflorescence* with the main branches rather sparsely covered with a short tomentum and, when young, bearing numerous bracts similar to the leaves but smaller, not peltate, and often 3-lobed or entire; the ultimate branchlets slender and often woolly-tomentose, bearing minute linear bracts which subtend the sessile umbellules. Umbellules about 4 mm in diam. in flower, the broadly ovate outer bracts forming a more or less distinct involucre. *Flowers* hermaphrodite or those in the basal umbellules male, ca. 10—15 per umbellule, each subtended by a lanceolate receptacular bract ca. 2 mm long; pedicel ca. 0.5 mm long; calyx rim fringed; petals strap-shaped, ca. 1.5 mm long at anthesis; filaments ca. 2 mm long, anthers ca. 0.3 mm long, orbicular; ovary covered with cilia which lengthen as the fruit ripens. *Mericarps* long ciliate, crowned with the divergent styles.

JAVA. West: *Backer 8682*, G. Tjikoraj (L); *Koorders 13904*, Preanger (A), 25799, ditto (BM, L); *Raul 642*, Malabar (L); *Ridley s.n.*, G. Guntur, 1915 (K); *Winckel 1606*, Tjadasmalang (L). — Central: *Horsfield s.n.*, Surakarta (BM); *Koorders 751*, Telamaja (L), 776, Tegal (L), 33836, Banjumas, Pringombo (L); *Tirtot-modjo s.n.*, Ambarawa, 1897 (L). — East: *Backer 25235*, Besuki, Sempol (L); *Buysman s.n.*, Lawang, Mt. Tengger, 400 m, 1911 (B); *Elbert 272*, Lawu, 1200—1400 m (L); *Kobus 177*, Tengger (L); *Koorders 749, 750, 753, 29338*, G. Pitjijis (L); *De Voogd 638*, Lawu (L). — Without locality: *Blume s.n.* (L); *Dorgelo 351* (L); *Horsfield 62* (BM), 810 (A, BM, K); *Junghuhn s.n.* (L); *Korthals s.n.* (L; erroneously labelled Sumatra); *Teijsmann s.n.* (L); *De Vriese & Teijsmann s.n.* (L); *Waitz s.n.* (L); *Zippelius s.n.* (L); *Zollinger 3272* (A, BM). — cultivate d: *Teijsmann s.n.*, Botanic Garden, Bogor, 1860 (L).



Figure 1. Approximate known distribution of the three species of *Harmsioplanax*: 1. *H. aculeatus*, 2. *H. harmsii*, 3. *H. ingens*.

BALI. *De Voogd 2207*, Mt. Agung (A, L).

LOMBOK. *Elbert 1682*, Mt. Rindjani (L).

SUMBAWA. *Kostermans 1880*, Batudulang, 500—900 m (L).

TIMOR. Indonesia: *Teijsmann 8776, 8778* (L). — Portuguese: *Cinatti 260* (L).

CELEBES. Central: *Eyma 1126*, Masamba Subdiv., between Tandung and Baska, 270 m (A, L), *3321*, Malili Subdiv., between Sinongko and Inalahi, 650 m (A, BM, BRI, L, SING). — Southwest: *Bünnemeijer 11059*, Lombasang, ca. 950 m (L, SING), *11758*, Tanette, ca. 400 m (L); *Noerkas 336*, between Rapang and Enrekang (L), *501*, between Mesawa and Polewali (L). — Without locality: *Teijsmann 13997* (L).

Note. Though frequently collected the specimens rarely represent the species adequately and few of the labels bear a field description. It has, therefore, been difficult to assess the range of habit of the plant, and especially whether the plants from which the specimens were taken were unbranched and monocarpic. Nor has it been possible to record the maximum size of leaves or inflorescences. The species occurs in primary forest, in second growth, and on open hillsides. It has been recorded from sea level to 1800 m.

## 2. *Harmsioplanax harmsii* K. Schum. & Laut.

*H. harmsii* K. Schum. ex K. Schum. & Laut., Nachtr. Fl. Deutsch. Schutz. Südsee (1905) 329.

Tree up to 7 m high, with a slender trunk. Young stem covered with bristles, hairs, and spines, the older stems with a smooth bark with small rounded lenticels and numerous spines. Monocarpic. *Petiole* 50 cm long, 0.5 cm thick at base, terete with clasping base, densely covered with bristles, woolly hairs, and spines; blade rounded, 30 × 40 cm, deeply palmately lobed, cordate at the base, lobes 5—9 with broad sinuses between them, margin unevenly and sharply dentate, apex acute, the upper surface densely covered with evenly spaced bristles of varying size (larger on the main veins), appressed and directed towards the leaf margin, often with woolly hairs inserted on their enlarged bases, the underside very densely woolly and with many bristles, usually bearing crisped hairs on their enlarged bases. *Panicle* at first with numerous leaf-like bracts, the principal branches with some spines, rather sparsely covered with bristles and hairs, the ultimate branches slender and tomentose, bearing linear bracts about 4 mm long subtending pedunculate umbellules;

peduncles up to 5 mm long, slender, tomentose, bearing 2 minute bracts. Umbellules spherical, about 4—5 mm in diam. in flower, the outer bracts not forming a distinct involucre. *Flowers* hermaphrodite, maturing in basipetal succession, the lower bracts of a branch either with sterile umbellules or lacking flowers. Flowers up to 60 in an umbellule, each subtended by a lanceolate bract, *ca.* 1 mm long and ciliolate, and borne on a glabrous pedicel, *ca.* 1.25 mm long; calyx rim fringed with many lacerate filaments; petals ovate, *ca.* 1 mm long; filaments *ca.* 1 mm long, anthers *ca.* 0.5 mm long; ovary covered with cilia which lengthen as the fruit ripens. *Mericarps* with rounded ribs, long ciliate, crowned with the divergent styles.

NEW GUINEA. Papua. Central Dist.: Sogeri Subdist., Rouna, 430 m, 1970, *Millar NGF 48614* (CHR, LAE). — MANDATED TERRITORY. Madang Dist.: Adelbert Ra., Utu village, 150 m, 1955, *Hoogland 4952* (A, BRI, L, LAE); Ramu R., 80 m, 1896, *Lauterbach 2859* (B, type; K); Wabe, 100 m, 1908, *Schlechter 18074* (K). West Highlands: Mt. Hagen, Jimi Patrol Post, 1200 m, 1966, *Hainsworth 74* (LAE). Morobe Dist.: Patep R., 450 m, 1962, *Millar NGF 14699* (BRI, L); Mumeng, 1150 m, 1968, *Streimann NGF 39075* (BRI, CHR, L); Boana, 900 m, 1959, *Henty NGF 11555* (A, L, LAE); Finisterre Ra., Ekwap, 1200 m, 1968, *Philipson, W. R. and M. N. 3313* (CHR, L), Kikiepa, 1800 m, 1960, *Womersley and Thorne NGF 12719*, (BRI, L, LAE); Sattelberg, 900 m, 1935—6, *Clemens, J. and M. S. 1253, 1954* (A, B, L); Sarawaket, 1800 m, 1947, *Clemens, J. and M. S. 5741* (A); Matap, 1800 m, 1940, *M. S. Clemens 11230* (A).

Vernacular names. Mandated Territory, Mt. Hagen: *Opme* (Ganja). — Morobe Dist., Sattelberg: *Mafiong*.

Note. Occurs on roadsides, regrowth, and forested hills. Information about the habit is inadequate and it is possible that the species is not always monocarpic with a single stem and that the leaves may not always be caducous.

### 3. *Harmsioplanax ingens* Philipson, *sp. nov.*

Arbor simplex spinifera. *Folia* ampla ad apicem trunci congesta. *Lamina* peltata rotundata usque ad 1 m. diam. profunde palmatifida grosse dentata, supra paucis vel multis spinis suffulta et plus minusve tomentosa, infra saepe dense fulva vel grisea tomentosa et spinis instructa. *Panicula* terminalis ingens ramosissima erecta, umbellulis pedunculatis vel sessilibus racemosis praedita. Umbellulae involucreatae 5—7 mm. diam. c. 12 (8—30) floribus. *Flores* hermaphroditae. *Calyx* fimbriatus. *Petala* 5, valvata. *Stamina* 5. *Ovarium* obconicum ciliatum styli ramis linearibus in fructu persistentibus.

Unbranched tree up to 18 m with a thick or sometimes slender trunk densely covered, except towards the base of mature specimens, with long, sharp, upwardly directed spines and marked with leaf-scars, monocarpic. *Petiole* up to 1 m long and 3 cm thick, terete with clasping base, covered with woolly hairs and bearing many spines; blade usually peltate, rounded, up to 1 m in diam., deeply palmately lobed, the lobes usually with minor lobes and coarsely dentate, apex acute, the upper surface bearing few to many long spines, especially on the mid-rib and principal veins between which the surface is often rugose and glabrous except for the remains of a tomentum of branched hairs, or with many bristles often with woolly hairs on their bases, the under surface also with few to many long spines and usually clothed with a fawn or greyish woolly tomentum of branched hairs, or densely furnished with bristles usually with woolly hairs on their bases, or occasionally glabrous between the spines except for a few bristles. Panicle up to 5 m long and 5 m broad, leafless or with lobed bracts about 10—20 cm long, the principal branches spiny especially below, the ultimate branches slender, tomentose, bearing linear bracts about 1 cm long subtending pedunculate or sessile umbellules; peduncles elongating as fruit ripens, up to 4 mm long, rather stout, tomentose, bearing 1 or 2 minute bracts. Umbellules bowl-shaped, about 5—7 mm in diameter in flower, enlarging slightly in fruit, with an involucre of about 8 ovate bracts, 2—4 mm long and ciliolate distally.

Flowers hermaphrodite, maturing in basipetal succession, terminal branches bearing maturing fruit while lower branches bear flowers or unopened buds, usually about 12 (8—30) in an umbellule each subtended by an involucre bract or a narrower receptacular bract and borne on a glabrous pedicel 1—2 mm long; calyx rim fringed with many lacerate filaments; petals ovate, 1—2 mm long; filaments 2—3.5 mm long, anthers 0.5—0.75 mm long; ovary covered with cilia which lengthen as the fruit ripens. *Mericarps* with rounded ribs, long ciliate, crowned with the divergent styles.

## KEY TO THE SUBSPECIES

- 1a. Umbellules spaced more or less evenly and densely along the ultimate branches of the inflorescence, frequently pedunculate . . . . . subsp. **ingens**  
 1b. Umbellules spaced irregularly along the ultimate inflorescence branches, sessile. . . . . subsp. **moniliformis**

subspecies **ingens**

The umbellules arranged in dense regular racemes, frequently pedunculate; flowers usually about 12—16 per umbellule, floral parts often large; fruiting heads frequently large (to 10 mm in diam.).

NEW GUINEA. North west Irian. Orion Mts., Tenmasigin, 1800 m, 1959, *Kalkman 4094* (BM, L, LAE); Lake Habbema, 2800 m, 1938, *Brass 10787* (A, BM, L), 2300 m, 1938, *Brass 11232* (A); Komanemembuno, 300 m, 1966, *Borgmann 205* (LAE). — P a p u a. Mt. Kerewa, 2940 m, 1966, *Kalkman 4702, 4703* (L, LAE); Mt. Giluwe, 3200 m, 1967, *Coode and McVean NGF 32549* (LAE); Mt. Maneao, 2750 m, 1956, *Crutwell 782* (K); Murray Pass, 2700 m, 1968, *Ridsdale and Woods NGF 36901* (BRI, CHR, LAE). — M a n d a t e d T e r r i t o r y. Sepik Dist.: Hindenburg Ra., 2700 m, 1966, *Frodin NGF 32140* (BRI, LAE). Western Highlands Dist.: Al River Mts., 2150 m, 1953, *Womersley 5363* (BRI, L, LAE); Mt. Hagen, 3000 m, 1967, *Wheeler ANU 6370* (LAE), 2500 m, 1962, *Simonett 175* (LAE); Tomba, 2850 m, 1961, *Walker ANU 31* (BRI, LAE); Upper Minj R., 2600 m, 1957, *Pullen 271* (L, LAE); Lagaip Valley, 2500 m, 1960, *Hoogland and Schodde 7307, 7308*, (BM, L, LAE); Laiagam, 2600 m, 1965, *Flenley ANU 2593* (L); Wabag, 2000 m, 1964, *Flenley 2069* (L, LAE); Mur Mur Pass, 2500 m, 1971, *Womersley and Stone NGF 43757* (CHR, LAE). Eastern Highlands Dist.: Mt. Wilhelm, 3470 m, 1959, *Brass 30136* (A, L, LAE), 3500 m, 1965, *van Balgooy 735, 736* (L, LAE, SING), 3600 m, 1966, *Wade ANU 7533* (LAE), 3700 m, 1968, *Philipson, W. R. and M. N. 3483, 3484* (CHR, L), *Vandenberg NGF 35081* (BRI, LAE); Guraguragulk Valley, 3500 m, 1965, *van Balgooy 844* (L, LAE); Mt. Otto, 2200 m, 1959, *Brass 30908* (A, L, LAE); Watabung, 2700 m, 1962, *Simonett 17* (LAE); Mt. Kerigomna, 3250 m, 1956, *Hoogland and Pullen 5571* (A, BM, L, type); Okapa, 1600 m, 1964, *Hartley TGH 13122* (L, LAE), 2000 m, 1968, *Philipson, W. R. and M. N. 3260* (CHR, L); Upper Omahaiga Valley, 2700 m, 1957, *Pullen 572* (LAE).

V e r n a c u l a r n a m e s. Papua: *Maukoe* (Huli). Mandated Territory: Sepik Dist., *Kamool* (Hindenburg Ra.); Western Highlands, *Murri* (Hagen), *Tolsan* (Minj), *Mauri* (Melpa), *Mai* (Mendi), *Makua*, *Makw*, *Kinogore* (Enga). Eastern Highlands, *Kimu* (Ka), *Ollu* (Chimbu).

N o t e s. Occurs in montane and mossy forest and in second-growth forest. The bark is described as grey brown and the wood white with a wide pith. The inflorescence has the appearance of bearing female flowers above and male flowers below, but this is evidently due to a basipetal sequence of anthesis. The terminal flowers have stamens when freshly opened and all those on lower branches bear styles. Apparently, the female organs of the lower branches are functional because branches from mature inflorescences bear fruit uniformly. Nevertheless, herbarium specimens cannot adequately represent such a large inflorescence so that the possibility remains that some female-sterile flowers occur in this species. Variation occurs in both tomentum and inflorescence characters. For example, most specimens from West Irian have small umbellules and fewer leaf-spines. In the eastern part of the Eastern Highlands Dist. a number of gatherings display a series

of variations: the under-leaves give the appearance of being glabrous between bristles, the inflorescence branches bear small leafy bracts, the umbellules are sessile, with rather numerous (about 18—21) small flowers subtended by rather broad bracts. Specimens from Mt. Otto (*Brass 30908*) show all these features combined, but other specimens from this region (*Hartley 13122*, *Simonett 17*, *Philipson 3260*) diverge from the typical state in only some of these characters. No specimens of this sub-species are known from the Finisterre Ra. and only one (*Ridsdale and Woods 36901*) from the Owen Stanley Ra., although *Philipson 3371*, which has an abnormally developed inflorescence, may also belong here.

subspecies **moniliformis** Philipson, *subsp. nov.*

Umbellulae secus ramos irregulariter dispositae, nunc solitariae, nunc fasciculis parvis cum nudis locis alternantis, sessiles, flores plerumque circa 20—30 per umbellulam, floris partes minores; capitula fructifera minuscula (c. 5 mm. in diam.).

The umbellules disposed irregularly along the branches, singly or in small groups, with bare spaces intervening, sessile; flowers usually about 20—30 per umbellule, floral parts smaller; fruiting heads rather small (ca. 5 mm diam.).

NEW GUINEA. Papua. Hovea-Evi divide, 1400 m, 1935, *Carr 13603* (A, BM, L). — MANDATED TERRITORY. Morobe Dist.: Samanzing, 1700 m, 1938, *M. S. Clemens 8946* (A, BM), *8946A* (A, type; BM); Zatarl, Boana, 1700 m, 1963, *van Royen and Millar NGF 15675* (BRI, L, LAE); near Edie Creek, 1600 m, 1964, *Whitmore a* (LAE), 1969, *Millar NGF 40972* (BRI, CHR, LAE). Northern Dist.: Yodda R., 1400 m, 1935, *Carr 13938* (A, BM, L, LAE).

Vernacular name. Morobe Dist.: *Mobian* (Finschafen).

NOTE. This subspecies occurs at lower altitudes than is usual for subsp. *ingens*. No specimens of either subspecies have been collected from higher altitudes in the mountains north of the Markham River and the Huon Gulf. At higher altitudes in the Owen Stanley Range subsp. *ingens* is known from one gathering. The most southeasterly gathering at present known (*Carr 13603*) has a distinctive appearance due to the straight rigid inflorescence branches with small sessile umbellules.

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