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A SYNOPSIS OF THE MALESIAN SPECIES OF OSMOXYLON (INCLUDING BOERLAGIODENDRON), ARALIACEAE

W. R. PHILIPSON
Department of Botany, University of Canterbury, New Zealand

SUMMARY

A synopsis is given of the genus *Osmoxylon*, *Araliaceae*, in Malesia and the Bismarck Archipelago, including also one species of the Solomon Islands.

In the introduction arguments are given why the genus *Boerlagiodendron* is merged with *Osmoxylon*.

In all 41 species are recognized and are keyed out. Of each species the synonymy is given, as well as the distribution and collections examined; sometimes critical notes on affinity and variability are added. Two names of which the types are apparently lost and which could not be satisfactorily placed are added as insufficiently known.

Nine new species have been described and 20 new combinations appeared to be necessary.

Full descriptions of all species will appear in the Flora Malesiana treatment of *Araliaceae* to which this paper is a precursor.

INTRODUCTION

Since its inception *Osmoxylon* has remained one of the most obscure genera of the *Araliaceae*. Miquel (1863) created the genus to accommodate the plant described and figured (but not preserved) by Rumphius in 1741 together with an imperfect specimen collected by Zippelius in New Guinea. With great insight Beccari (1878) linked *Osmoxylon* with several species at that time attributed to *Trevesia*, and described several more. This view was rejected by Boerlage (1887), who set out several supposed differences between the original *Osmoxylon* and the species added to it by Beccari, which Boerlage now placed in a new genus *Eschweileria* (later re-named *Boerlagiodendron*). Boerlage separated the Rumphius and Zippelius elements as distinct species, so that the genus *Osmoxylon*, as currently understood, consisted of two very imperfectly known species.

Additional information, including photographs taken in the field and fluid-preserved material, has recently confirmed Beccari's opinion that *Osmoxylon* and what is now known as *Boerlagiodendron* share all essential characters. *Boerlagiodendron* has always been regarded as a most distinctive genus within the family. The principal characters which single it out in this way are (1) the curious crests surrounding the base of the petiole, (2) the inflorescence composed of trifid-rays, (3) the central ray bearing sterile bacciform flowers, (4) the corolla lobed above but tubular below.

Osmoxylon was considered to differ by having a single collar around the base of the petiole (or this absent in the Zippelius specimen) and also by the simple undivided blades of the leaves and the bicuspid ligules. The important central ray and its bacciform flowers were not known, and Boerlage argued from their early abscission that they were probably male flowers. He also detected differences in the stigmas and the endosperm.

More recent material of very similar species from the Philippines, Halmaheira, New

Ireland, and the Solomons shows that, in this group of species, the central rays bear sterile bacciform flowers and that the corollas are tubular below. A survey of *Boerlagiodendron* as a whole shows that the characters of a bifid stipule, a discoid sigmatic boss, and wrinkled endosperm occur sporadically in species of diverse affinities. When it is realized that several species of *Boerlagiodendron* have simple leaves and that some species with lobed leaves have petiolar-crests reduced to a single collar, it must be concluded that no character distinguishes *Boerlagiodendron* from *Osmoxylon* and that all species of both genera share the four extremely distinctive characters enumerated above. It is, therefore, necessary to regard all as forming a single natural group, for which the earliest valid generic name is *Osmoxylon*.

The present account covers the major part of the genus, but species occur to the north in Taiwan, eastwards to the Marianas and Palau Is., and south to the New Hebrides (see, Stone, 1962; Li, 1963; Smith & Stone, 1968). The species in the Solomon Islands require intensive study.

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OSMOXYLON

Osmoxylon Miquel, Ann. Mus. Bot. Lugd-Bat. 1 (1863) 5; Beccari, Malesia 1 (1878) 193; Boerlage, Ann. Jard. Bot. Buitenz. 6 (1887) 123; Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 32; Hutchinson, Gen. Flow. Pl. 2 (1967) 73.
Eschweileria Zipp. *ex* Boerl. l.c., 112; not *Eschweileria* Marb. (1828).
Unjala Reinw. *ex* Boerl. l.c. 116; not *Unjala* Blume (1823).
Boerlagiodendron Harms in Engl. & Prantl, l.c. 31.

Shrubs or trees, unarmed, glabrous or tomentose. *Leaves* palmately lobed or simple, rarely digitately compound; stipules forming a ligule, and the base of the petiole furnished with one to several crests (very rarely absent). *Inflorescence* a terminal compound umbel; peduncle short; primary rays each terminating in three branches, the central branch bearing a head or umbellule of sterile bacciform flowers, the two lateral branches each bearing a head or umbellule of hermaphrodite flowers. *Calyx* an obsolete rim or 0. *Corolla* with few to many lobes above, tubular below. *Stamens* 4 to 30, filaments thick, anthers oblong, exserted. *Ovary* inferior, not articulated with the pedicel, cells 1-many, disk flat with a central raised boss bearing the pustulate stigmas. *Fruit* sub-globose (ribbed when dry), exocarp fleshy, endocarp crustaceous. *Seeds* compressed, endosperm smooth or wrinkled.

Distribution: About 50 species, of which 41 occur in Malesia, extending from Borneo and the Philippines eastwards, the remainder lying further north and east in Taiwan, Micronesia, Melanesia, and the New Hebrides.

KEY TO THE MALESIAN SPECIES

1a. Leaves simple, without lobes 2
b. Leaves lobed or digitately compound 9
2a. Petiole base without crests (*New Guinea*) . . . . . **1. O. miquelii**
b. Petiole base with 1 or more crests 3
3a. Petiole base with several crests (*Philippines*) . . . . . **8. O. oblongifolium**
b. Petiole base with a single collar-like crest 4
4a. Fertile flowers pedicellate (*Philippines*) 5
b. Fertile flowers sessile (or subsessile) 6
5a. Leaf obovate to oblanceolate, petiole 3 cm or less . . . . . **2. O. dinagatense**
b. Leaf elliptic, petiole 5 cm or more . . . . . **3. O. simplicifolium**
6a. Leaf broadly obovate (*Solomons*) . . . . . **4. O. spathipedunculatum**
b. Leaf lanceolate or narrowly obovate 7
7a. Pseudo-fruits pedicellate (*Moluccas*) . . . . . **5. O. articulatum**
b. Pseudo-fruits sessile 8
8a. Inflorescence about 60 cm diam (*Moluccas*) . . . . . **6. O. umbelliferum**
b. Inflorescence about 30 cm diam (*New Ireland*) . . . . . **7. O. lanceolatum**
9a. Leaves digitately compound 10
b. Leaves lobed (sometimes smaller simple leaves below inflorescence) 16
10a. Ovary 10–6-celled (*New Guinea*) . . . . . **13. O. geelvinkianum**
b. Ovary 4- or 5-celled 11
11a. Leaflets lobed (*Philippines*) 12
b. Leaflets entire 14
12a. Primary rays of inflorescence *c.* 10 or fewer . . . . . **9. O. catanduanense**
b. Primary rays of inflorescence more than 20 13
13a. Inflorescence *c.* 16–20 cm in diam. . . . . **10. O. caudatum**
b. Inflorescence *c.* 5–6 cm in diam. . . . . **11. O. heterophyllum**
14a. Leaflets elliptic-oblong to ovate (*Philippines*) . . . . . **12. O. yatesii**
b. Leaflets linear-lanceolate 15
15a. Leaflets 4–7, petiole 4–6 cm long (*Philippines*) . . . . . **14. O. lineare**
b. Leaflets 9 or more, petiole longer than 10 cm (*Borneo*) . . . . **15. O. borneense**
16a. Pseudo-fruits sessile 17
b. Pseudo-fruits pedicellate 19
17a. Petiolar crests long-pectinate, bracts of the peduncle heavily setose (*Philippines*) **16. O. pulcherrimum**
b. Petiolar crests fimbriate or undulate, bracts of the peduncle not setose (*Moluccas*) 18
18a. Lateral inflorescence branches with opposite persistent bracts close to the base **17. O. soelaense**
b. Lateral inflorescence branches with scars of opposite caducous bracts near the middle **18. O. globulare**
19a. Lateral inflorescence branches without an articulation 20
b. Lateral inflorescence branches with an articulation (2 bracts or bract-scars) . . . 24
20a. Petiolar base with a single collar-like crest (*Borneo*) . . . . **19. O. kostermansii**
b. Petiolar base with several crests 21

21a. Petiolar crests long-pectinate 22
b. Petiolar crests fimbriate or undulate 23
22a. Fertile flowers pedicellate, stamens at least 7 (*Kai Islands*) . . . **20. O. barbatum**
b. Fertile flowers sessile (or sub-sessile), stamens 5 (*Bismarck Arch.*) . . **21. O. pfeilii**
23a. Stamens and ovary cells more than 5, flowers usually pedicellate (*Moluccas*) **22. O. moluccanum**
b. Stamens and ovary cells 4, flowers sessile or subsessile (*Philippines*) **23. O. ramosii**
24a. Fertile flowers pedicellate. 25
b. Fertile flowers sessile (or if subsessile bracteoles longer than the very short pedicels) 30
25a. Pedicels of fertile flowers longer than 7 mm (*New Guinea*) **24. O. novoguineense**
b. Pedicels of fertile flowers 5 mm or shorter 26
26a. Ovary cells 7 or more 27
b. Ovary cells 4 or 5. 28
27a. Leaf-lobes elliptic (*Celebes*) . . . . . **25. O. teysmannii**
b. Leaf-lobes pinnati-lobed (*Batjan*). . . . . **41. O. insigne**
28a. Petiolar crests ± entire (*Philippines*) . . . . . **26. O. humile**
b. Petiolar crests with long setae. 29
29a. Leaves coriaceous, margin thickened, teeth obtuse (*Philippines*) **27. O. pectinatum**
b. Leaves membranaceous, margin not thickened, teeth setulose (*Celebes*) **28. O. masarangense**
30a. Ovary cells 10 or more (*New Guinea*) 31
b. Ovary cells 6 or fewer 33
31a. Flower buds large (±9–12 mm long), primary rays of inflorescence very strong **29. O. insidiator**
b. Flower buds smaller (±4–6 mm long), primary rays of inflorescence more tenuous 32
32a. Heads of fertile flowers ± discoid at anthesis . . . . . **30. O. boerlagei**
b. Heads of fertile flowers globose . . . . . **31. O. sessiliflorum**
33a. Leaf-lobes lanceolate. 34
b. Leaf-lobes broader. 35
34a. Leaf-lobes 4–7; petiole 4–6 cm long (*Philippines*). . . . . **14. O. lineare**
b. Leaf-lobes 9 or more, petiole >10 cm long (*Borneo*) . . . . . **15. O. borneense**
35a. Leaf surfaces retaining some trace of setulose tomentum, umbellules of pseudo-berries small (8 mm diam. or less) (*New Guinea*) . . . . . **38. O. micranthum**
b. Leaf surfaces glabrous at maturity; umbellules of pseudo-berries 1 cm diam. or more 36
36a. Ovary cells 3 (*Philippines*) 37
b. Ovary cells 4 or more 38
37a. Petiolar crests ± entire. . . . . **32. O. camiquinense**
b. Petiolar crests long-pectinate . . . . . **33. O. fenicis**
38a. Umbellules of pseudo-berries large (3–5 cm diam.) (*Philippines*) 39
b. Umbellules of pseudo-berries smaller (2.5 cm diam. or less) 40
39a. Primary rays of the inflorescence 9–12 cm long; leaves with strong radiating veins, usually more than 11 . . . . . **34. O. eminens**
b. Primary rays of the inflorescence 4–5 cm long; leaf veins less strongly developed, usually fewer than 11 . . . . . **35. O. serratifolium**
40a. Leaf with a small triangular lobe below the middle of each side of the blade (not strictly palmately lobed) (*Philippines*). . . . . **8. O. oblongifolium**
b. Leaf palmately lobed 41
41a. Petiolar crests long-pectinate (*Celebes*) . . . . . **36. O. celebicum**

b. Petiolar crests fimbriate, entire, or undulate 42
42a. Articulation of lateral branches of umbels close to the base (*Talaud Is.*) **37. O. talaudense**
b. Articulation of lateral branches of umbels near the middle 43
43a. Inflorescence over 20 cm diam. (*New Guinea*) . . . . . **31. O. sessiliflorum**
b. Inflorescence under 20 cm diam. (*Philippines*) 44
44a. Leaf usually 3-lobed; inflorescence rays delicate, indistinctly setose to glabrous **39. O. trilobatum**
b. Leaf usually 5–7 lobed; inflorescence rays sturdy, markedly setose **40. O. luzoniense**

1. Osmoxylon miquelii Boerl.

Osmoxylon miquelii Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 125, t. 16; Harms, Bot. Jahrb. 56 (1920) 384. — O. *amboinense* Miq., Ann. Mus. Bot. Lugd.-Bat. 1 (1863) 6, *p.p.*; Beccari, Malesia 1 (1878) 194, *p.p.* — [*Gastonia simplicifolia* Zipp. *ex* Boerl. l.c. 125, *in synon*].

NEW GUINEA. *Zippelius*, without number or precise locality.

2. Osmoxylon dinagatense (Merr.) Philipson, *comb. nov.*

Boerlagiodendron dinagatense Merr., Philipp. Journ. Sci. 17 (1920) Bot. 301.

PHILIPPINES. Dinagat Id. *Ramos and Pascasio BS 35220* (type).

A species clearly demonstrating the unity of *Osmoxylon* and *Boerlagiodendron*.

3. Osmoxylon simplicifolia (Elmer) Philipson, *comb. nov.*

Boerlagiodendron simplicifolia Elmer, Leaflets Philipp. Bot. 7 (1914) 2329.

PHILIPPINES. Mindanao. Agusan Prov., Cabadbaran, *Elmer 13689* (type).

Ecol. On wind-swept ridge at 1750 m, on moss-covered soil with stones.
Vernacular name: *Bolawano* (Manobo).

A wide spreading shrub. Bark thick, yellowish, becoming grey. Wood soft, yellowish. Twigs repeatedly branched, the leafy portion sub-erect, leaves mostly ascending, rigidly coriaceous. Inflorescence branches green. Flowers orange, odourless. Fruits becoming purple-black.

This species with its simple entire leaves and disc-like crest resembles the original *Osmoxylon* species, yet its typical 'Boerlagiodendron' inflorescence confirms the unity of the two genera.

4. Osmoxylon spathipedunculatum (Philipson) Philipson, *comb. nov.*

Meryta spathipedunculata Philipson, Bull. Brit. Mus. Bot. 1 (1951) 12.

SOLOMON ISLANDS. Bougainville. Pavairi, *Lavarack and Ridsdale NGF 31156.* — Guadalcanal. Vulolo, Tutuve Mt. *Kajewski 2527* (type); Mt. Jonapan, *Whitmore and Womersley BSIP 1055.*

Ecol. In rain forest, from 800—1200 m.
Vernacular name: *Tangoie* (Guadalcanal)

5. Osmoxylon articulatum Philipson, *sp. nov.*

Arbor glabra *foliis* simplicibus; petiolus 10—13 cm longus una sola disciformi crista; lamina obovata ad 27×9 cm, basi anguste cuneata, apice rotundata vel acuta breviterque

apiculata, margine apicem versus remote dentato. *Umbella* terminalis; radii primarii c. 24, 8—11 cm longi; radius secundarius centralis 4—6.5 cm longus umbellam ferens ex c. 10 baccis sterilibus 6×6 mm (siccitate) compositam, pedicellis 9—14 mm longis; radii secundarii laterales prope basem articulati, capitulum terminale ferentes ex c. 15—18 floribus sessilibus compositum. *Calycis* margo o. Corolla c. 2.5 mm longa, tubulata, lobis c. 4. Stamina 5, exserta. Ovarium 7 vel 8 loculare. *Drupae* c. 8 mm diam., siccitate 7 vel 8 costatae.

Typus: *Pleyte 290* (L)

HALMAHEIRA. without precise locality, *Pleyte 290*.

This plant is evidently similar to that described by Rumphius. However, a number of differences make it unlikely that it is the same species. The diameter of the inflorescence of the Halmaheira plant is only about half that given by Rumphius; the lateral rays of the inflorescence are distinctly articulated near the base, a feature not shown in Rumphius' figure; and th esterile bacciform floweres are long-pedicellate, whereas Rumphius describes and figures his as borne in capitula.

6. **Osmoxylon umbelliferum** (Lam.) Merr.

Osmoxylon umbelliferum (Lam.) Merrill, Interpr. Rumph. Herb. Ambon. (1917) 406. — *Pseudo-Sandalum amboinense* Rumph., Herb. Amb. 2 (1741) 54, t. 12 — *Aralia umbellifera* Lam., Encycl. 1 (1783) 225. — *Gastonia saururoides* Roxb. [Hort. Beng. (1814) 90, *nomen nudum*] Fl. Ind. ed 2, 2 (1832) 408. — *Hedera umbelliferum* (Lam.) DC., Prodr. 4 (1830) 262. — *Osmoxylon amboinense* Miq., Ann. Mus. Bot. Lugd.-Bat. 1 (1863) 6 *p.p.* — [*Hedera amboinense* DC. *ex* Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 124, *in synon.*]

According to Rumphius: Tree with stout trunk, the branches marked with prominent round leaf-scars. Leaves clustered at the ends of the branches, glabrous; petioles long; blades simple, lanceolate (about 38×8 cm), base rounded, apex acute, margin dentate. Flowers in large spreading umbels, the radiating branches tripartite, about 30 cm long, each ending in a capitulum.

Endemic to the Moluccas. Infrequent on Ambon, but said to be more numerous on Ceram and the Soela Islands. No specimen is known to exist.

Evidently in forest in the hills of Ambon, and also planted at the time of Rumphius.

Vernacular names: *Sasura* (Leitimor), *Tonokuku* (Hitoe).

Valued for the perfume of its wood and foliage.

Since this plant is known only from a description and a figure, some uncertainties remain as to its characters. The description states that the young leaves possess a few small teeth of which some signs remain on the older leaves. It is not clear whether the teeth are best developed on distinctive juvenile foliage, or whether the newly expanded normal foliage is intended. The leaves in the figure have prominent teeth, but as they are not shown associated with the inflorescence, they may be from a juvenile shoot. The description of the size of the flower-buds is confusing, and it seems likely that sterile pseudo-fruits were mistaken for flower buds. Nevertheless, most characters of the plant are adequately portrayed and there can be no doubt that this species is distinct from the other simple-leaved species with a single collar-like petiolar crest.

7. **Osmoxylon lanceolatum** Philipson, *sp. nov.*

Arbor glabra 16 m alta, *foliis* simplicibus; petiolus 8—15 cm longus, una sola disciformi crista; lamina oblanceolata ad 33×7.5 cm, basi anguste cuneata, apice acuta, margine

integro. *Umbella* terminales; radii primarii c. 15, c. 10 cm longi; radius secundarius centralis 5—6 cm longus, capitulum sphaericum ferens ex c. 8—12 baccis sessilibus sterilibus c. 5 × 5 mm (siccitate) compositum; radii secundarii laterales c. 5 cm longi, basi articulati, capitulum terminale ferentes ex c. 15—18 floribus sessilibus compositum. *Calycis* margo o. Corolla c. 2.5 mm longa. Stamina c. 5. Ovarium 4-loculare. *Fructus* ignoti.

T y p u s: *Sands and Coode NGF 46080* (LAE).

NEW IRELAND. Namatanai Sub-dist., Danfu R. area, inland from Manga, *Sands and Coode NGF 46080*; *Coode, Sands and Lelean NGF 46103*.

E c o l. Understory tree in ridge top forest on limestone, 750—850 m.

The bark is pale grey, ± smooth with fine cracks. The twigs and cut branches are strongly aromatic. The wood is soft and dark straw-coloured. The central branches of the inflorescence rays are held ± horizontally or depressed and come to maturity before the lateral branches which are held erect.

8. **Osmoxylon oblongifolium** Philipson, *sp. nov.*

Frutex circa 2 m altus, surculis primum setulosis deinde glabrescentibus, *foliis* simplicibus; petiolus ad 16 cm longus, cristis integris vel fimbriatis; lamina oblongo-ovata ad 40 × 17 cm, basi rotundata vel truncata apice breviter acuminata, margine serrato. *Umbella* terminales; pedunculus 3—4 cm longus, bracteis fimbriatis, lanceolatis; radii primarii c. 20, 16—20 mm longi, radii secundarii centrales c. 4 mm longi, floribus sterilibus ignotis; radii secundarii laterales 3.5—4.0 cm longi, sub medio articulati, capitulum ferentes ex c. 20—30 floribus compositum. *Flores* ignoti. *Fructus* carnosi globosi c. 5 mm diam., quadriseminales.

T y p u s: *Sulit and Conese 2776* (PNH).

E c o l. In dipterocarp forest, along creek bank, at 200 m.

PHILIPPINE Is. S a m a r. Bagacay Concord, *Sulit and Conese 2776* (Herb. No. 6310); Mt. Sarawag, *Edaño PNH 15321*; Catubig R., *Edaño BS 24760*; *Ramos BS 24142*.

The manuscript name of Merrill and Quisumbing is adopted because it has been distributed on herbarium labels.

9. **Osmoxylon catanduanense** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron catanduanense Merr., Philipp. J. Sci. 13 (1918) 318.

PHILIPPINES. C a t a n d u a n e s. *Ramos BS 30438* (type).

E c o l. On forested slopes, at about 350 m.

Together with *O. heterophyllum* and *O. caudatum* this species forms a small group with leaves composed of lyrate leaflets. Although the foliage is similar (though not identical), the inflorescences are distinctive. In *O. heterophyllum* the rays are short, resulting in a compact compound umbel; in *O. caudatum* there are few rays (10 or fewer); in *O. catanduanense* there are many relatively long rays, resulting in a large diffuse compound umbel. Since *O. catanduanense* and *O. caudatum* are known only from the type collections, the range of variation of these species is not known, but these inflorescence differences justify the retention of all three species.

10. **Osmoxylon caudatum** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron caudatum Merr., Philipp. Journ. Sci. 14 (1919) 440.

PHILIPPINES. L u z o n. Ilocos Norte Prov., Mt. Palimlin, *Ramos BS 33303* (type).

Ecol. On forested slopes near the summit, at about 1000 m.

Apparently never re-collected. For discussion of distinctive features see under *O. catanduanense*.

11. Osmoxylon heterophyllum (Merr.) Philipson, *comb. nov.*

Boerlagiodendron heterophyllum Merr., Philipp. Journ. Sci. 9 (1914) Bot. 329.

PHILIPPINES. Samar. *Sulit and Conese 2624* (*PNH 6044*). — Bileran. *Sulit 5430* (*PNH 21600*). — Mindanao. Agusan Prov., *Elmer 13855*.

Ecol. Primary forest, under shade near creek, from 100—550 m.

Vernacular names: *Arañas* (Bis.); *kayuang* (Mbo); *magusayag* (C. Bis.).

For discussion of distinctive features, see under *O. catanduanense*.

12. Osmoxylon yatesii (Merr.) Philipson, *comb. nov.*

Boerlagiodendron yatesii Merr., Philipp. Journ. Sci. 13 (1918) 44.

PHILIPPINES. Luzon. Tayabas Prov., Mt. Cadig, *Yates BS 25418* (type, not seen); Camarines Prov., Paracale, *Ramos and Edaño BS 33660*. — Catanduanes. *Ramos and Edaño BS 75613*. — Dinagat, *Ahern 445* (or *145*).

Ecol. In mossy forest at 1250 m.

Vernacular name: *Magalayag* (Dinagat)

The leaves are unlike any other *Osmoxylon*, resembling those of *Macropanax* or *Schefflera*. The flowers are described as yellow, and the fruit black. The only instance of a pseudo-fruit containing apparently normal seeds occurred in this species.

13. Osmoxylon geelvinkianum Becc.

Osmoxylon geelvinkianum Becc., Malesia 1 (1877) 196. — *Eschweileria geelvinkianum* Boerl., Ann. Jard. Bot. Buitenz. 6 (1886) 120. — *Boerlagiodendron geelvinkianum* Harms in Engl. and Prantl, Nat. Pflanzenf. 3, 8 (1894) 32. — *Eschweileria elegans* Ridley, Trans. Linn. Soc. 9 (1916) 63. — *Boerlagiodendron elegans* Harms, Bot. Jahrb. 56 (1920) 380. — *Boerlagiodendron stenolobum* Harms, l.c. 382.

NEW GUINEA. Irian Jaya. Vogelkop: Geelvink Bay, *Beccari s.n.* (type); Nabire, *Kanehira and Hatusima 12280*. North: Idenburg R. *Brass 13697*; Doorman R., *Lam 1319*; Rouffaer R., *Docters van Leeuwen 10210*. South: Mimika, *Warint BW 5152*; Mt. Carstensz, *Kloss s.n.* (type of *E. elegans*). — Territory of New Guinea. Sepik Dist.: Aitape area, *Darbyshire and Hoogland 8174*; Wewak area, *Robbins 2295*; Vanimo area, *Streimann and Kairo NGF 39336*; *Ledermann 7243*, *8643* (not seen, type of *B. stenolobum*). — Papua: Fly R. area, *Brass 7056*; Ingembit, *Henty*, *Ridsdale and Galore NGF 31868*; Lake Kutubu, *Schodde 2257*.

Ecol. Primary forest, along creeks and river banks, flood-resistant, from near sea level to 850 m.

Vernacular names: *Amamoetapoe* (Kamora); *Korinki* (Orne); *Ida'pforpforsami* (Kutubu).

The narrow leaf segments, almost or quite separated at their bases, are characteristic, even though variable in outline. The flowers are described as orange or reddish, and the soft fleshy fruits as dark purple, dark blue, or black.

14. Osmoxylon lineare (Merr.) Philipson, *comb. nov.*

Boerlagiodendron lineare Merr., Philipp. Journ. Sci. 3 (1908) 253.

PHILIPPINES. Luzon. Prov. Pangasinan, *Ramos BS 4953* (type).

Apparently never re-collected. The original specimen is without field information. The foliage is similar to that of *O. borneense* but with shorter petioles and fewer leaflets.

15. Osmoxylon borneense Seem.

Osmoxylon borneense Seem., Journ. Bot. 6 (1868) 141. — *O. helleborinum* Becc., Malesia 1 (1878) 198. — *Eschweileria helleborina* Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 115, t. 12. — *Boerlagiodendron helleborinum* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 31. — *Boerlagiodendron borneense* Merrill, Journ. Str. Br. Asiat. Soc. special number (1921) 456.

BORNEO. Sarawak. Ulu Tubau, *Ashton S 18168*; Bintulu, *Beccari 4021* (type of *O. helleborinum*); Sungei Melinai, *Burtt and Woods B 2351*; Ulu Tawaran, *Haviland s.n.*; Mt. Dulit, *Richards 1333*; Upper Plieran, *Pickles and Aini S 2923*; Temalad, *Asah ak Unyong S 19053*; without locality, *Ashton S 19053*. — Sabah. Mt. Kinabalu, *Clemens 10010, 11220, 26456, 51607*; Kahung, *Darnton 343*; Sandakan, *Meijer San 53230*; Penampang, *Mikil San 37768*; Kota Belud, *Mujin San 26762*; without locality *Lobb s.n.* (type); *Carr 2752*; *Orolfo 8804*; *Keith 9201*. — Kalimantan. S. Senoen, *Amdjah s.n.* (1898); S. Sedalier, *Amdjah 208*; B. Batoe, *Amdjah 430*; L. Iboet, *Endert 2539*; S. Raun, *Hallier B 3359*; Kutei Tabang, *Kostermans 10645*; Serawei, *Winkler 237*; without locality, *Welkamp 19*.

Ecol. Characteristic of rocky river banks, often in deep shade, from near sea level to 950 m.

Vernacular names: *Medong* (Kayan), *Empasia Abor* (Iban), *Kayan* (Tamang), *Koung* (Kinabalu), *Bungor* (Murut Bokan), *Salimpangaya* (Murut Kalabakai).

Notes. The leaves of some specimens of *O. geelvinkianum* (New Guinea) resemble this species closely. This species can be distinguished by the more compact and smaller fertile flowers, and by its leaflets being uniformly unlobed.

Both species are characteristic of river banks, and *O. borneense* has a low spreading habit, with the branches often rooting, often resulting in extensive patches of this low shrub. It frequently occurs below the level of floods.

The flowers are described as greenish white or cream and the inflorescence branches are frequently dark pruple.

16. Osmoxylon pulcherrimum F.-Vill.

Osmoxylon pulcherrimum Vidal *ex* F.-Vill., Novis App. (1880) 102; Sinopsis Atlas (1883) 28, t. 55 f. B. — *Eschweileria pulcherrima* Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 123. — *Boerlagiodendron pulcherrimum* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 32. — *Boerlagiodendron sibuyanense* Elmer, Leaflets Philipp. Bot. 7 (1914) 2328.

PHILIPPINES. Luzon. Nueva Vizcaya Prov., *Ramos and Edaño BS 45636*; Tayabas Prov., *Ramos and Edaño BS 26573*. — Mindoro. Mt. Halcon, *Ramos and Edaño BS 40640*. — Sibuyan. Capiz. Prov., *Elmer 12531* (type of *B. sibuyanense*).

Ecol. Damp primary forests, 225—800 m.

Vernacular names given by Merrill: *paladukai* (Bik.), *salapak* (Neg.), and by Elmer: *palad-amok* (Visayan).

Notes. The fan-shaped leaves with several narrow lobes and prominent main veins resemble those of *O. eminens* but are less strikingly developed. The inflorescence is considerably smaller with the pseudo fruits forming a compact head borne on a comparatively long peduncle. The heads of true flowers, and of the fruits, are considerably smaller than those of *O. eminens*.

Although Vidal's material is no longer available, the figure and description relate well to this species. At first Merrill was unable to interpret Vidal's name (see Philipp. Journ.

Sci. 3, 1908, Bot.: 254) but later (Enum. Philipp. 3, 1923: 222) he associated it with this taxon, and his interpretation is adopted here. The specimens on which Elmer based his *Boerlagiodendron sibuyanensis* have the lobes of the leaf rather simpler in outline than is usual, but the fragments of a young inflorescence are quite typical of the taxon and the name is reduced to synonymy.

17. Osmoxylon soelaense Philipson, *sp. nov.*

Arbor glabra parva, *foliis* palmate lobatis; petiolus 32 cm longus, cristis fimbriatis; lamina 40 cm longa, basi late cuneata, profunde 7-lobata, lobis anguste ellipticis vel oblongo-ellipticis, leviter angustatis ad sinus rotundato, apice apiculatis, margine denticulato. *Umbella* terminalis; pedunculus 2 cm longus, bracteis lanceolatis; radii primarii c. 1.5 cm longi; radii secondarii centrales c. 10 mm longi, capitulum ferens ex 10—15 baccis sessilibus sterilibus 4×3 mm compositum; radii secondarii laterales 4.5—5.0 cm longi, bracteis oppositis c. 8 mm supra basin exorientibus, capitulum ferentes ex 25—30 floribus sessilibus compositum. *Calyxis* margo obsoletus. Corolla 5-lobata. Stamina 5. Ovarium 4- vel 5-loculare.

Typus: *Atje 151* (L).

Moluccas. Soela Is. Taliaboe Id., *Atje 151* (type); Salabesi Id., *Bloembergen 4500.*

Note. For a discussion of the distinctive features, see under *O. sessiliflorum.*

18. Osmoxylon globulare Philipson, *sp. nov.*

Frutex 4 m altus, *foliis* palmata lobatis; petiolus 55 cm longus, cristis setulosis; lamina 50 cm longa, basi cordata vel emarginata, profunde 7-lobata, lobis ovatis vel oblongo-ellipticis, leviter angustatis ad sinus rotundatos, apice acuta, margine serrato. *Umbella* terminalis; pedunculus crassus, bracteis caducis; radii primarii 30—40, 2—4 cm longi; radii secundarii centrales 8—10 mm longi, capitulum ferens ex c. 20 baccis sub-sessilibus sterilibus 5×4 mm pedicellis ad 2 mm longis compositum; radii secondarii laterales 3—4.5 cm longi, bracteis oppositis caducis prope medium exorientibus, capitulum ferentes ex 30—40 floribus sessilibus compositum. *Calycis* margo obsoletus. Corolla 6—8 lobata. Stamina 6—8. Ovarium 5—8 loculare.

Typus: *Kostermans 1532* (L).

Moluccas. Halmaheira. *b.b. 23724; b.b. 24541; Beguin 1729; Idjan and Mochtar 146.* — Morotai. *Kostermans 681, 911, 1532* (type), *1676.*

Ecol. In forest from sea level to 800 m. Said to be rare in Halmaheira but common in Morotai.

Vernacular names: *Saha-sasate, boengan-goetoe* (Djailolo).

Note. For a discussion of the distinctive features see under *O. sessiliflorum.*

19. Osmoxylon kostermansii Philipson, *sp. nov.*

Arbor glabra, 8 m alta, *foliis* palmate lobatis, petiolus ad 35 cm longus, una sola lata crista; lamina ad 30 cm diam., basi cordata, profunde 5—7-lobata, lobis ellipticis, leviter angustatis ad sinus rotundatos, apice breviter apiculatis, margine minute serrato, interdum lobato. *Umbella* terminalis, c. 14 cm diam.; pedunculus 1 cm longus bracteis parvis lanceolatis; radii primarii c. 20—24, 4—5 cm longi; radii secundarii centrales 5—6 mm longi, umbellam sphaericam ferentes ex 20 baccis sterilibus c. 2 mm diam. (siccitate),

pedicellis 5—7 mm longis compositam; radii secundarii laterales 3.5—4 cm longi nunquam articulati, umbellam ferentes ex 10—14 floribus compositam. *Calycis* margo obsoletus. Corolla super 4-lobata. Stamina 4. Ovarium 5—7-loculare. *Drupae* c. 6 mm diam., siccitate manifeste costatae.

Typus: *Kostermans 13411* (L).

BORNEO. Kalimantan. Sangkulirang Dist., Mt. Medadam, north of Sangkulirang, *Kostermans 13411*.

Ecol. Growing on limestone at 450 m.

Note. The foliage is similar to that of O. *moluccanum* except for the distinctive petiolar crest. The inflorescence is also similar to O. *moluccanum*, especially in the lack of an articulation on the rays below the umbellules.

20. **Osmoxylon barbatum** Becc.

Osmoxylon barbatum Becc., Malesia 1 (1878) 197. — *Eschweileria barbata* Boerl., Ann. Jard. Bot. Buitenz. 6 (1886) 117. — *Boerlagiodendron barbatum* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 31.

KAI ISLANDS. *Beccari s.n.* (type); *Jaheri s.n.*

Note. Distinguished from the closely related O. *moluccanum* by the long-setose petiolar crests. For discrimination from O. *pfeilii* see that species.

21. **Osmoxylon pfeilii** (Warb.) Philipson, *comb. nov.*

Eschweileria pfeilii Warb., Bot. Jahrb. 13 (1891) 396. — *Boerlagiodendron pfeilii* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 32.

BISMARCK ARCHIPELAGO. New Britain. Hoskins subdist., *Croft and Katik NGF 41437*; Whiteman Range, *Frodin NGF 26490*; Kandrian subdist., *Henty NGF 27195*; Pomio subdist., *Panoff 68, 365, 366*; Rabaul subdist. *Ridsdale and Katik NGF 38032*. — Duke of York Group. Ulu Islands *Warburg 20462* (type). — New Ireland. Namatanai, *Peekel 183* (not seen).

Ecol. In primary rain forest, from near sea level to 600 m.

Vernacular names: *Sare*, *Sasare*, or *sare a lauvolau* (New Britain, Pomio); *a ibalur* (New Ireland).

Notes. The bark is grey-brown and pustular, the wood straw-coloured and soft. The flowers are orange, and the ripe fruit dark red-violet.

The original description records 10—14 cells in the ovary. However, some specimens have as few as 5 cells in the ovary, but in other respects agree with specimens with the large number of seeds. Since the inflorescence, leaf shape, and especially the nature of the petiolar crests, as well as the distribution, are all highly distinctive within the genus, all the specimens can be accepted as examples of one species with a highly variable number of carpels.

This species is very close to O. *barbatum* of the Kai Islands. The original diagnostic character of the number of cells in the ovary has been found to be unreliable. However, since the primary rays in the inflorescence are more numerous and the pedicels of the fertile and sterile flowers are shorter this geographically distinct species is maintained.

22. **Osmoxylon moluccanum** (Miq.) Becc.

O. moluccanum (Miq.) Becc., Malesia 1 (1878) 195. — *Trevesia moluccana* Miq., Fl. Ind. Bat. 1 (1855) 748. — *Trevesia zippeliana* Miq., Ann. Mus. Bot. Lugd.-Bat. 1 (1863) 11. — *O. zippelianum* Becc. l.c. 195. — [*Uniala bifida* Reinw. *ex* Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 116, nom. in synon.] — *Eschweileria.*

palmata Zipp. *ex* Boerl. l.c. 116. — *Boerlagiodendron palmatum* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 31. — *Boerlagiodendron moluccanum* v. Ooststr., *Blumea* 6 (1950) 367.

LESSER SUNDA Is. Tanimbar Id. *Buwalda 59* (*b.b. 24278*).
CELEBES. no precise locality, *de Vriese and Teysmann, s.n.*
MOLUCCAS. Boeroe, *Binnendijk, s.n.*; *Toxopeus 356*. — Ceram. *Eyma 2378*; *Rutten 391*. — Ambon. G. Salahoetoe, *Boerlage 179*; Waai, *Teysmann, s.n.*; without precise locality *Teysmann 1919*; *Zippelius, s.n.* (type of *Trevesia zippeliana* and *Eschweileria palmata*); *Rant 73, 93*; *Kuswata and Soepadmo 246*; *Robinson 388, 389*; Saparoea, *Lamureux 4654*. — Banda. *Reinwardt s.n.* (type of *Unjala bifida*). Also specimens from plants cultivated at Bogor Botanic Garden.

Ecol. An understorey tree in primary rain forest.
Vernacular name: *Foemala-alas* (Otimer, Tanimbar Ids.)
Note. The spherical inflorescence is characteristic, having straight rigid rays with no articulation on the secondary branches, and the pseudo-fruits are well separated from the true flowers. Miquel distinguished *Trevesia zippeliana* because the collector noted that its ovary was 4-celled. Possibly, this number related to the sterile flowers. In two gatherings from Ambon (Waai, *Teysmann*; G. Salahoetoe, *Boerlage 179*) the fertile flowers are subsessile in heads, but otherwise conform to the characters of this species. The only record of this genus from the Sunda Islands consists of leaves only, but their characters conform to this species.

23. **Osmoxylon ramosii** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron ramosii Merr., Philipp. Journ. Sci. 11 (1916) Bot. 27.

PHILIPPINES. Luzon. Camarines Sur, *Edaño 72* (*BS 76011*); 927 (*BS 76291*). Tayabas, *Elmer 7704*. Albay Prov. *Edaño 8564* (*PNH 34471*); *Mendoza 1359* (*BS 18402*). Sorsogon Prov. *Ramos BS 23467* (type).

Ecol. On low-lying, wet ground, in forest, or on forested slopes, at 700—800 m.
Notes. The flat-topped inflorescence is about 15 cm in diam. with much-reduced leaves below it. The inflorescence rays are dark purplish and the flowers orange-yellow. The bark is grey and the wood soft.
This is the only species in the Philippines without opposite bracts on the lateral branches of the inflorescence rays. In this respect it resembles *O. moluccanum* and a few other species.

24. **Osmoxylon novoguineense** (Scheff.) Becc.

O. novoguineense (Scheff.) Becc., Malesia 1 (1877) 197. — *Trevesia novo-guineensis* Scheff., Ann. Jard. Bot. Buitenz. 1 (1876) 26. — *Eschweileria novoguineensis* Boerl., Ann. Jard. Bot. Buitenz. 6 (1886) 118. — *Boerlagiodendron novoguineense* Harms in Engl. & Prantl., Nat. Pflanzenfam. 3, 8 (1894) 31. — *Boerlagiodendron lauterbachii* Harms in K. Schum. & Lauterb., Fl. Deutsch. Schutzgeb. Südsee (1900) 484.

NEW GUINEA. Irian Jaya. Papuan Islands. Misoöl, *Teysmann, s.n.*; Salawati, *Teysmann 7498* (type), *Koster 4233*. — Vogelkop. Sorong, *Beccari P. P. 180, Djamhari 472, Koster 10849, Kostermans 2702, 2713, Moll BW 11715*; Meos Waar, *Koster BW 1279, Versteegh BW 3871*, Wasior, *Mayer 399*; Fakfak; Adi Id, *Moll BW 11508, Vink BW 12116*; Nabire, *Kanehira & Hatusima 11517*. Arfak Mts., *Versteegh BW 12737*; Waren, *Kanehira and Hatusima 13302*. — Territory of New Guinea. Ambunti, *Hoogland and Craven 10815*; Telefomin, *Steinkraus 15*; Sattelberg, *Clemens 211, 440*; Ogeramnang, *Clemens 4477*; Bulung R., *Clemens 5350*; Boana, *Clemens 8730, 41835*; Wantoat, *Clemens 11034, 11091, Philipson 3290*; Lae, *Floyd NGF 5533, White, Dadswell and Smith NGF 1574*; Markham Valley, *Henty NGF 11602, Stone 9773, Lae 53072, 53073*; Bumbu R., *Henty NGF 11688*; Baiyer R., Mt. Hagen, *Millar and Vandenberg NGF 35219*; Kar Kar Id., *Ridsdale NGF 33934*; Bulolo, *Streimann and Kairo NGF 27931*; Butaneng, *Lauterbach 23*; Aseki, *Streimann and Stevens Lae 53973*; Bagabag Id., *Vandenberg and Mann NGF 42243*; Simbai, *Vayda 70*. — Papua. Borabere, *Brass 726*; Koitaki, *Carr 11901*; Purari delta, *Craven and Schodae 789*; Itikinumu, *Millar UPNG 1185*; Fly R., *Millar NGF 35315*; Musgrave R. *Pulsford UPNG 129*; Lake Kutubu, *Schodde 2257*; Sogeri, *Schodde 2993*; Karema, *Stone and Galore 10085*. — Bismarck

Archipelago. Powell Harbour, *Foreman Lae 52105*; Dyaul Id., *Køie 1858*; Gazelle Peninsula, *Waterhouse 319, 878.*
Also known from the SOLOMON ISLANDS.

Ecol. Primary and second-growth forest, from sea level to 1600 m.
Vernacular names: *Lebe* (Mooi); *Teresakoei* (Manikiong); *Akriek* (Biak); *Hoppoeng* (Hottam); *Uger* (Wagu); *Faliifallii* (Tifal); *Ap Gan Dandam*, or *Aimaini* (Mamig); *Ida'pfopforsami* (Kutubu); *Pulaka* (Gazelle Peninsular).
Notes: The foliage is similar to that of *O. boerlagei*, but the pedicellate flowers of *O. novoguineense* distinguish it readily from that species. The ripe fruits are usually ovoid, but in the Solomon Islands they are characteristically spheroidal, and this feature recurs in some specimens from the Bismarck Archipelago and the adjacent coast of the main island.
The fawn bark is pustulate with many lenticels. An orange exudate flows from the cut stems.The wood is soft and straw-coloured.The inflorescence branches are dark purple, the corolla and stamens usually deep red, and the ripe fruit shining purple or blue-black.

25. **Osmoxylon teysmannii** (Boerl.) Philipson, *comb. nov.*

Eschweileria teysmannii Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 119. — *Boerlagiodendron teysmannii* Harms in Engl. & Prantl., Nat. Pflanzenfam. 3, 8 (1894) 31.

CELEBES. Southwest. Tjamba, *Teysmann 12596* (type); Kosali-Porema, *Kjellberg 2610.*

Ecol. In rainforest, to 800 m.

26. **Osmoxylon humile** (Elmer) Philipson, *comb. nov.*

Boerlagiodendron humilis Elmer, Leafl. Philipp. Bot. 7 (1914) 2327.

PHILIPPINES. Mindanao. Davao sub-Prov. Mt Apo, *Elmer 10860* (type).

Ecol. Damp fertile ground in dense forest, at 1000 m on south side of Baruring R.
Vernacular name: *Saranka-mano* (Bagob).

27. **Osmoxylon pectinatum** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron pectinatum Merr., Philipp. Journ. Sci. 3 (1908) 253.

PHILIPPINES. Batan Island. Batanes Prov. Mt. Iraya, *Ramos BS 80025, 80787, Fénix BS 3775* (type, not seen), *Bartlett 15452.*
Also known from TAIWAN.

Ecol. Forested slopes at 650 m.
Vernacular name: *Narapan* (Iv.)

28. **Osmoxylon masarangense** Philipson, *sp. nov.*

Arbor humilis, surculis primum setulosis deinde glabrescentibus, *foliis* palmatim lobatis; petiolus c. 17 cm longus, cristis longo-setulosis; lamina c. 18×22 cm, basi truncata vel emarginata, profunde 3—5 lobata, lobis oblongis vel ellipticis, ad sinus rotundatos leviter angustatis, apice breviter apiculatis margine subtiliter setuloso-serrato. *Umbella* terminalis, radii primarii c. 10, 18—20 mm longi, setulosi; radii secundarii centrales 4—5 mm longi, umbellam ferentes pedicellis 6 mm longis (flores steriles ignoti); radii secundarii laterales 2—2.5 cm longi, bracteis medio circumdatis, umbellam ferentes ex c. 10 pedicellis 3—5 mm longis (ad tempus fructificationis)compositam. *Flores* ignoti. *Fructus* (siccitate) ovoideus, 6×4 mm, quintiseminales.
Typus: *Forman 209* (L).

CELEBES. Minahasa. Tomohon, Mt. Masarang, *Forman 209* (type, L).

Ecol. Secondary forest at edge of crater lake, at 1200 m.

Note. This species is similar in aspect to *O. trilobatum* (Philippines) but the petiolar crests are distinctive.

29. Osmoxylon insidiator Becc.

Osmoxylon insidiator Becc., Malesia 1 (1877) 195. — *O. carpophagarum* Becc., l.c 196 — *Eschweileria insidiatrix* Boerl., Ann. Jard. Bot. Buitenz. 6 (1886) 120. — *Eschweileria carpophagarum* Boerl., l.c. 121. — *Boerlagiodendron insidiator* Harms in Engl. & Prantl., Nat. Pflanzenf. 3, 8 (1894) 32. — *Boerlagiodendron carpophagarum* Harms, l.c. 32. — *Boerlagiodendron pachycephalum* Harms, Nova Guinea 8 (1910) 271.

NEW GUINEA. Irian Jaya. Papua Islands. Waigeo, *van Royen 5144, NIFS b.b. 32628.* — Vogelkop. Ramoi, *Beccari s.n.* (type). — South. Lorentz R., *von Römer 279*; Noordfluss, *Versteegh 1029* (type of *B. pachycephalum*). — Territory of New Guinea. Morobe Dist., *Womersley NGF 2977.* Papua. Northern Dist., Mt. Victory, *Gillison NGF 22365*; Samboga R. *Hoogland 3850*; Central Dist. Cape Rodney, *Pullen 8141*, Abau, *Sayers NGF 19634*; Milne Bay Dist., Mt. Suckling, *Katik NGF 46925.* — Aru Islands. Vokan, *Beccari s.n.* (type of *O. carpophagarum*).

Ecol. Primary rain-forest and regrowth, frequently beside streams, from sea level to 350 m.

Vernacular names: *Angit, Kangit* (Waigeo); *Pennifogo* (Orakawa, Papua).

Notes. The bark is greyish brown, slightly fissured with many lenticels. The wood is soft and white. The flowers are reddish-brown or purple with orange-red filaments, and the fruit purple. Beccari provides a detailed description of the living plant, and notes that the fruits are eaten by various species of pigeon. *Boerlagiodendron pachycephalum* has very strongly developed umbels and leaves, but apart from size, it does not differ from this species. Since a range in stature is shown by the several gatherings now available, the whole is best regarded as a single species. Similarly, the very short pedicels of *O. carpophagarum*, which Beccari used to distinguish it from *O. insidiator*, can in fact be matched on several specimens of that species.

30. Osmoxylon boerlagei (Warb.) Philipson, *comb. nov.*

Eschweileria boerlagei Warb., Bot. Jahrb. 13 (1891) 395. — *Boerlagiodendron warburgii* Harms in Engl. & Prantl, Nat. Pflanzenfam. 3, 8 (1894) 32; K. Schum. & Lauterb. Fl. Deutsch. Schutzgeb. Südsee (1900) 484. — *Boerlagiodendron boerlagei* Harms, Bot. Jahrb. 56 (1920) 382.

NEW GUINEA. Irian Jaya. Vogelkop. Monakwari, *Schram BW 561*; Fak-fak R., *Vink BW 12147.* — North. Begowri R., *Gjellerup 228.* — Territory of New Guinea. West Sepik Dist., Amanab, *Foreman and Kumul NGF 48198*; Ambunti, *Hoogland and Craven 10262*; Madang Dist., Aiome, *Pullen 955, Frodin NGF 26928*; Gurumbu, *Henty and Sayers NGF 20566*; Western Highlands, Kopiago, *Vandenberg et al. 42024.* Eastern Highlands, Kundiawa, *Philipson 3518*; Okapa, Gimi Valley, *Coode and Lelean NGF 29924*; Morobe Dist., foot of Kassam Pass, *Philipson 3269*, Lae Botanic Garden, *Millar GH 86*; Sattelberg, *Warburg s.n.* (type, not seen); Kukukuku Ra., *Streimann Lae 53961.* — Papua. Southern Highlands, Tari, *Vink 16894*; Northern Dist., Isuarava, *Carr 15741*; Central Dist., Sogeri, *Forbes 581.*

Ecol. In primary forest and secondary growth on old cultivation, from near sea level to 1800 m.

Vernacular names: *Enuya* (Gimi); *Apiatambay* (Washkuk); *Ma-korr-korr* (Jal); *Teresahoei* (Maniteiong).

Notes. Bark yellow grey with shallow fissures and many pale corky pustules; wood straw-coloured, fibrous. The large terminal inflorescence is shallowly convex on top and is surrounded by several large leaves. Flowers reddish brown. Fruit purplish black and succulent.

31. **Osmoxylon sessiliflorum** (Lauterb.) Philipson, *comb. nov.*

Boerlagiodendron sessiliflorum Lauterb., Nova Guinea 8, 2 (1910) 272.

NEW GUINEA. Irian Jaya. Vogelkop. Fak-Fak, *Vink 12147*. — Biak Is. *Aet and Idjan 463, Britton and Winder 74, Moll BM 9666*. — North. *Kostermans and Soegeng 110, Docters van Leeuwen 10111*. — South. *Branderhorst 360, Pulle 384*. — Territory of New Guinea. Sepik Dist., *Darbyshire and Hoogland 8155, Essig and Martin Lae 55131*. — Papua. Fly R., *Brass 6794*. Milne Bay Dist., *Gillison NGF 25284*. Woodlark Id., *Brass 28820*.

Ecol. Rain forest, especially along the muddy banks of rivers, from sea level to 100 m.

Vernacular names: *Akriek* (Biak); *korinki* (Orne); *kwita-kwita* (Milne Bay); sapi-ai (Jense); *terrasahoei* (Manihing).

Notes. Unbranched or sparsely branched with crowns of large leaves. The bark is light brown and the wood cream. The inflorescence branches are purple, the flowers red, and the succulent ripe fruits black.

The variation in the numbers of floral parts is considerable. Most specimens have more than 10 stamens and the same number of cells in the ovary, or more. Three gatherings have from 5—7 stamens and cells (*Brass 28820*; *Britton and Winder 74*; *Moll 9666*). These may possibly require to be segregated as a distinct species, but other evidence to support this course is lacking. An even more distinctive gathering (*van Royen and Sleumer 7555*, Vogelkop) has central branches to 3 cm long with the pseudo-fruits on short pedicels (less than 5 mm) and flowers with 17 stamens and 25 cells in the ovary. This specimen is only very tentatively referred to this species.

This species forms an eastward extension of a complex of species, represented in the Moluccas by *O. talaudense*, *O. soelaense*, and *O. globulare*. Several similar species occur in the Philippines. They are characterized by dense spherical heads of flowers. *O. talaudense* resembles some specimens of *O. sessiliflorum* rather closely, and the difficulty of preserving the characters of these large-leaved plants in an herbarium probably obscures several good diagnostic features. The most reliable character to distinguish specimens of these two species is the position of the articulation on the lateral branches of the inflorescence rays. In specimens from the Talaud Is. this is close to the base (below the apex of the central umbellule of pseudo-fruits) and the bracts are persistent, whereas in the New Guinea material it is near (or above) the middle, and is usually marked by two inconspicuous scars which frequently are not opposite. In these two species, *O. talaudense* and *O. sessiliflorum*, the pseudo-fruits are pedicellate, whereas in the other two Moluccan species the pseudo-fruits are sessile or subsessile, forming spherical heads. In *O. globulare* (from Morotai and Halmaheira) the lateral branches are rigid and only slightly flattened with the articulation near the middle and the bracts caducous. In *O. soelaense* the articulation is much nearer the base, the bracts are persistent, and the branches are broader and much flattened.

32. **Osmoxylon camiguinense** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron camiguinense Merr., Philipp. Journ. Sci. 3 (1908) 252.

PHILIPPINES. Camiguin Is. *Fenix BS 4135* (type, not seen), *Edaño 79228, 79237*.

Ecol. On slopes in forest, at 500 m.

33. **Osmoxylon fenicis** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron fenicis Merr., Philipp. Journ. Sci. 13 (1918) Bot. 44. — *Boerlagiodendron tayabense* Merr., l.c. 45.

PHILIPPINES. Luzon. Sierra Madre, *Jacobs 7680*; without locality, *Loher 6062*; Tayabas Prov., *Ramos* and *Edaño BS 28752* (type of *Boerlagiodendron tayabense*).

Ecol. In primary dipterocarp forest, on rocky slopes near streams, 300—400 m.

Notes. I have not seen the original collection (*Fénix BS 28126*, Apayao Subprov.), but the specimens of Jacobs and Loher fit the description well. Closely allied to *O. luzoniense* and *O. pectinatum*, but the combination of long-fringed petiolar crests, pubescent inflorescence branches, excessively bristly bracts, and 3-merous flowers is distinctieve.

34. **Osmoxylon eminens** (Bull) Philipson, *comb. nov.*

Trevesia eminens Bull, Cat. New Plants (1884) 17. — *Boerlagiodendron mindanaense* Merr., Philipp. Journ. Sci. 3 (1908) Bot. 154. — *Boerlagiodendron eminens* Merr., En. Philipp. Pl. 3 (1923) 223.

PHILIPPINES. Luzon. Isabella Prov., *Gutierrez 61—269* (*PNH 78228*), *Clemens 16616*, *Jacobs 7907*. Central Luzon, *Loher 3601*. Sorsogon Prov., *Elmer 15632*. — Mindoro. *Ramos BS 40825*. Panay. Capiz Prov., *Edaño BS 46102*, *BS 46189*, *RAmos and Edaño BS 30898*. — Leyte. *Frohne PNH 35117*. — Negros. Oriental. *Leiban 164* (*PNH 40372*), *Elmer 9466*, *Edaño 112* (*PNH 7207*), *Kondo and Edaño PNH 36721*, *PNH 36722*. — Dinagat. *Ramos and Pascasio BS 35208*. — Mindanao. Zamboanga Prov., *Williams 2150*, *Foxworth et al. FB 13391*, *Hallier 4538a* (= *538a*); Lanao Prov., *Zwickey 823*. Davao Prov., *Copeland 464*, *Ramos and Edaño BS 49078*, *BS 49120*, *BS 49129*, *Clemens BS 15638*. — Sulu. Prov. Basilan, *Hallier 4538*; Tawitawi *Ramos and Edaño BS 43593*, *BS 44290*.
Also known from the CAROLINE ISLANDS.

Ecol. In primary forest at moderately low altitudes (100 m) to ridge forest and mossy forest at 950 m, often in shady ravines.

Vernacular names given by Merrill: *Apalong* or *apulong* (Bis.), *bunglui-babae* (Sul.); *mangunpulun* (Bag.); *palad-ulot* (S. L. Bis.); *piña-piña* (Sul.); *ulo-ulo* (C. Bis.). In addition: *Lolobongan* (Lan.).

Notes. This is the most widespread and most frequently collected species in the Philippines. It is also the most striking. Its large, many lobed, fan-shaped leaves and the strong inflorescences with globular flower-heads and large clusters of pseudo-fruits are distinctive. Only *O. pulcherrimum* resembles it somewhat in its leaf-characters, but the central branches of the inflorescence rays of that species are much longer and its pseudo-fruits are sessile.

The inflorescence branches are described as dull reddish-brown, the flowers as light orange, and the fruits as indigo-black.

35. **Osmoxylon serratifolium** (Elmer) Philipson, *comb. nov.*

Boerlagiodendron serratifolium Elmer, Leaflets Philipp. Bot. 2 (1908) 505.

PHILIPPINES. Leyte. *Elmer 7194* (type). — Camiguin. *Ramos BS 14708*. — Panay. *Taleon 1336* (*PNH 33747*).

Ecol. Elmer noted that this species was rare in the low hills of Leyte.

Note. The flowers are orange-yellow (salmon), the fruits dark purple. The inflores-

cence is very similar to that of O. *eminens*, but the leaves lack the many strong fan-like ribs of that species.

36. **Osmoxylon celebicum** Philipson, *sp. nov.*

[*Boerlagiodendron celebicum* Harms *ex* Koorders, Meded. 's-Lands Plantent. 19 (1898) 489, *nomen nudum.*]

Arbor parva 6 m alta, *foliis* palmate lobatis; petiolus 50 cm longus, christis aliquot setulosis; lamina 50 cm diam., basi emarginata, profunde 9 — lobata, lobis anguste ellipticis ad lanceolatis, sinus versus angustatis, apice late cuneatis, margine minute et sparse serrato. *Umbella* terminalis; pedunculus brevis bracteis magnis setosis; radii primarii c. 15, c. 6 cm longi; radii secundarii centrales ±6 mm longi umbellam ferentes ex 20—30 baccis sterilibus compositam pedicellis 6—10 mm longis; radii secundarii laterales c. 2 cm longi bracteis oppositis setulosis, capitulum ferentes ex 30—40 floribus sessilibus compositum. *Calycis* margo obsoletus. Stamina 5. Ovarium 5-loculare. *Fructus* ignoti.

T y p u s: *Koorders 16119* (BO).

CELEBES. M i n a h a s a. Manado, Bailan, *Koorders 16119.*

E c o l. On rich volcanic sand, at 10 m altitude.
V e r n a c u l a r n a m e: *Sinomaha.*
N o t e. The flower-buds are orange and the fruits deep purple.

37. **Osmoxylon talaudense** Philipson, *sp. nov.*

Arbor parva 6 m alta, *foliis* palmata lobatis; petiolus 60 cm longus, cristis 2—3 fimbriatis; lamina 50 cm longa, basi truncata vel cordata, profunde 7—11-lobata, lobis ellipticis vel oblongis, sinus versus angustate, apice apiculatis, margine denticulato vel undulato. *Umbella* terminalis; pedunculus brevis bracteis late ovatis; radii primarii c. 15, c. 3—4 cm longi; radii secundarii centrales 8—10 mm longi, umbellam ferentes ex 15—20 baccis sterilibus c. 4 mm diam. compositum, pedicellis 5—7 mm longis; radii secundarii laterales 4.5—5.0 cm longi bracteis oppositis persistentibus c. 5—10 mm supra basin exorientibus, capitulum ferentes ex 30—40 floribus sessilibus compositum. *Calycis* margo obsoletus. Corolla 5-lobata. Stamina 5. Ovarium 5-loculare. *Drupae* 9×6 mm obovoidae, siccitatae 5-costatae.

T y p u s: *Lam 2575* (L).

TALAUD Is. Karekelong, *Fairchild 422*, *Lam 2514*, *2575* (type), *2722*. Salebaba, *Lam 3078.*

E c o l. Common in forest, besides strams, from near sea level to 100 m.
V e r n a c u l a r n a m e: *laripatu* (Talaud).
N o t e. The flower is yellow-orange and the fruit dark purple. For a discussion of the distinctive features, see under O. *sessiliflorum.*

38. **Osmoxylon micranthum** (Harms) Philipson, *comb. nov.*

Boerlagiodendron micranthum Harms, Bot. Jahrb. 56 (1920) 379. — *Boerlagiodendron sayeri* Harms, l.c. 380. — *Eschweileria gawadensis* Baker *f.*, Journ. Bot. 61 (1923) 22. — *Boerlagiodendron tricolor* Philipson, Bull. Brit. Mus. Bot. 1 (1951) 11.

NEW GUINEA. I r i a n J a y a. N o r t h. Idenburg R., *Brass 12394* (type of *Boerlagiodendron tricolor*). — T e r r i t o r y o f N e w G u i n e a. Western Highlands Dist. Kuna, *Streimann and Kairo NGF 27700*;

Kubor Ra., *Vink 16522*; Al R. Mts., *Womersley et al. 5346*. Eastern Highlands Dist. near Minj, *van Royen NGF 18149*; Kerowagi, *Simonett 157*; Chuave-Chimbu road, *Womersley NGF 14122*; Daulo Pass, *Millar NGF 38498, Pullen 428*; Engwegl, *Borgman 398*; Goroka, *Robbins 907*; Kainantu, *Coode et al. 3916, Hartley 12148, Hays 38, 292, Henty and Vandenberg NGF 29334*; Okapa, *Brass 31592, Womersley NGF 17651, Hartley 13113, Henty NGF 10625, Stone 10239*; Aiyura, *Womersley and Smith NGF 1101, Womersley NGF 6010*; Bismarck Mts., *Schlechter 18604* (type, not seen); Kassam Pass, *Coode and Dockrill NGF 32663*. Morobe Dist. Aseki area, *Craven and Schodde 1379, Schodde and Craven 4735*; Lae Subdist. *Johns NGF 47190*; Wau-Salamaua road, *Womersley and Millar NGF 8733*; Boridi, *Carr 13093*; Lala Valley, *Carr 15867*. — Papua. Port Moresby Subdist. *Kanis 1384*. Sogere, *Forbes 645* (type of *Eschweileria gawadensis*); Mt. Tafa, *Brass 4096, 4951*; Mt. Dayman, *Brass 22683, 23578*; Owen Stanley Ra., *Schodde 5658*; Mt. Obree, *Lane-Poole 390, Sayer, s.n, a. 1887* (type of *B. sayeri*, not seen); Mt. Simpson, *Kanis 1282, Pullen 7785*; Lake Myola, *Gillison 360*; Woitape, *Corner and Gray NGF 12931, Paijmans 716*; Milne Bay Dist. *Fisher 79, Stevens and Veldkamp Lae 54342, 54354*; Northern Dist. Managalase area, *Pullen 5507*.

Ecol. In primary forest from foothills to montane mossy forest, often in swampy or deeply shaded situations, 700—2400 m.

Vernacular names: *Diande* (Chimbu); *Kenata* (Okapa).

Notes. The inflorescence branches are often red or purple, and the flowers either orange or reddish with yellow anthers. The ripe fruits are deep purple or black. The shape and size of the leaf can vary greatly, even on the same plant. The ovary usually has 4 cells, but plants with 3, 2, and 1 occur. Since these are alike in other respects they have been treated as a single species. Although the type of *Boerlagiodendron tricolor* has an ovary with 5 cells and is from much further west than other gatherings it is not considered to be specifically distinct.

39. **Osmoxylon trilobatum** (Merr.) Philipson, *comb. nov.*

[*O. cumingii* Seem., Journ. Bot. 6 (1868) 141, *nomen nudum.*] — *Boerlagiodendron trilobatum* Merr., Philipp. Journ. Sci. 2 (1907) Bot. 289.

Philippines. Luzon, Tayabas Prov., *Elmer 7498, 7724, Oro 297* (*FB 31054*), *Ramos BS 82061*; Laguna Prov., *Barber FB 19691, FB 19721, Curran and Merritt FB 7906*. — Catanduanes. *Ramos and Edaño BS 75186*. — Mindoro. *Bartlett 13619, Britton 189, Conklin 142* (*PNH 17498*), *Merrill 5620, Merritt FB 12123, Ramos and Edaño BS 40710*, — Camiguin, *Elmer 14235, Ramos BS 14618*. Also recorded by Merrill from Samar and Mindanao.

Ecol. In primary forest, frequently beside streams in damp ravines, from lowlands (75 m) to 750 m altitude.

Vernacular names: *Kamay-Kamay* (Tag.); *Ayun* (C. Bis.).

Note. Sparingly branched but wide-spreading slender shrub, with yellowish bark at first heavily dotted with brown lenticels. The flowers are white and the ripe fruit smooth and purple.

40. **Osmoxylon luzoniense** (Merr.) Philipson, *comb. nov.*

Boerlagiodendron luzoniense Merr., Philipp. Journ. Sci. 3 (1908) 252. — *Boerlagiodendron clementis* Merr., l.c. 155. — *Boerlagiodendron agusanense* Elmer, Leaflets Philipp. Bot. 7 (1914) 2330. — *Boerlagiodendron diversifolium* Merr., l. c. 10 (1915) 333.

Philippines. Luzon. Ilocos Norte Prov. *Ramos BS 7755*. Benguet Prov. Baguio, *Elmer 5928, 8622, Ramos and Edaño BS 45050, Williams 1123, Curran FB 5088*; Busol For. Res., *Esquerra FB 31366*. Rizal Prov. Mt. Iriq, *Ramos BS 41995*. Sorsogon Prov. Mt. Bulusan, *Elmer 16762*. Central, *Loher 3602*. — Mindanao. Agusan, *Elmer 13546*; *Imontello PNH 98394, Mendoza 61—564* (*PNH 42395*). Davao Prov. *Edaño 1103* (*PNH 11593*), *Kellman ANU 1631*; Mt. Apo, *Elmer 10860a*; Mt. Mayo, *Ramos & Edaño BS 49528*. Lanero Prov. *Britton 395*. Mountain Prov. *Conklin & Bawaya I—983* (*PNH 79572*), *Hutchinson 229*. Butuan Subprov. *Weber 1099*. Bukidnon Subprov. *Escritor BS 21447, Fénix BS 15727*. Surigao Prov. *Ramos and Convocar BS 83562*.

Ecol. In forests, often by streams; ridges in mossy forest; between 280—1650 m.

Vernacular names: *bolwang hi inalahan* (Ifugao); *eyangnoc* (Monobo); *malakapayas* (S. L. Bis.); *molonpolon* (Buk.); *tachung* (Ig.); *tangan-tangan-batu* (Buk.); *vangang* (Ig.).

Notes. At least some of the material distributed under the number *Elmer 10860a* agrees with this species, not with O. *humile* as Elmer thought (see Leaflets Philipp. Bot. 7, 1914: 2327).

Inflorescence yellow to red (salmon), fruits blue-black or purple.

Merrill did not liken his *Boerlagiodendron diversifolium* (from Mindanao) to this species, no doubt because he gave importance to the occurrence of variable leaves and the 5-merous flowers. However, specimens from Luzon may possess simple leaves below the umbel, and both 4- and 5-merous flowers occur in both Luzon and Mindanao. The greater range of material now available establishes the identity of the two species. Similarly, no features seem to distinguish *Boerlagiodendron clementis* and *B. agusanense* though a greater range of collections would be desirable.

The species is treated here in a broad sense. The inflorescence characters of most specimens are uniform, being hirsute and with the bracts at the apex of the primary rays obtuse and short. Some specimens (*Curran 5088*, *Elmer 16762*) have longer lanceolate bracts with some bristles on the back. The northernmost specimen, from Ilocos Norte, has finer and less hairy inflorescence rays (recalling O. *trilobatum*), but the foliage agrees with this species. Leaf-shape is more variable, even on the same specimen. Other species which resemble O. *luzoniense* in some respects are: O. *camiguinense* with broader shallower lobing, a more delicate inflorescence, and tri-merous flowers; O. *pectinatum* with glabrous inflorescence branches and long-pectinate petiolar crests; and O. *humile* with pedicellate flowers forming less dense heads.

The specimen from Surigao Province (*Ramos and Convocar BS 83562*) has a most interesting abnormal structure. The central branches of the inflorescence rays bear heads of apparently fertile flowers with lobed corollas and exserted stamens.

41. **Osmoxylon insigne** (Miq.) Becc.

O. *insigne* (Miq.) Becc., Malesia 1 (1878) 195. — *Trevesia insignis* Miq., Ann. Mus. Bot. Lugd.-Bat. 1 (1863) 222. — *Eschweileria insignis* Boerl., Ann. Jard. Bot. Buitenz. 6 (1887) 122.

MOLUCCAS. Batjan. *de Vriese* s.n., (?) *J. J. Smith 5897*, *Curran 3471*.

Note. Tufts of bristles along the entire length of the petiole together with the pinnatifid lobes of the leaf are distinctive. Seemann (Journ. Bot. 4, 1866: 353) refers to 5-flowered umbels with 5-angled drupes, but this probably relates to the New Guinea specimen which he included under this name.

INSUFFICIENTLY KNOWN SPECIES

1. Boerlagiodendron ledermannii Harms, Bot. Jahrb. 56 (1920) 383.

Harms compared this species with *B. geelvinkianum*. The size of the foliage and flowers prevents it from being included within that species. If it represents a local species, it has not been re-collected since the original gathering of Ledermann in 1912. The type specimen, which was incomplete, was destroyed during the war.

2. Boerlagiodendron monticola Harms in K. Schum. and Lauterb., Fl. Deutsch. Schutzgeb. Südsee. Nachtr. (1905) 330.

The incomplete type specimen, gathered by Schlechter, was destroyed during the war.

This species was evidently similar to *O. micranthum*, but the ovary was possibly 10-celled. I have tentatively identified *Robbins 1644* as this species: it is close to *O. micranthum* but its ovary, with 8 cells, is outside the range of variation of that species and the pedicels are longer (in fruit). Its distribution (foothills of Adalbert Ra.) is not dissimilar to that of *B. monticola* (Torricelli Mts.).

INDEX

Epithets of **new species** and **new combinations** are in bold type, those of *synonyms* are in italics. Numerals refer to numbers of taxa. Insufficiently known species are indicated by 'Dub.'.