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BOERLAGIODENDRON (ARALIACEAE) IN
EASTERN MELANESIA¹

BY BENJAMIN C. STONE²

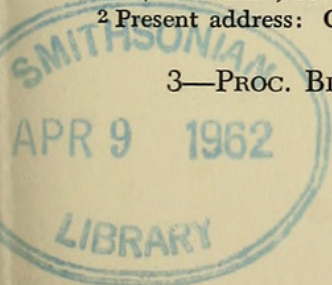
U. S. National Museum, Smithsonian Institution

The genus *Boerlagiodendron* Harms was actually first established by Zippel (ex Boerlage in Ann. Jard. Bot. Buitenz. 6: 112. 1887), but the name then given, *Eschweilera*, had to be replaced because of the earlier *Eschweilera* Martius (ex DC. Prodr. 3: 293. 1828) of the Lecythidaceae. The first extensive treatment of species was that of Beccari (in Malesia 1: 195-198. 1898), who described six species and discussed the peculiar floral dimorphism and its biological significance. He placed these species, however, in the genus *Osmoxylon* Blume, which is now regarded as amply distinct from *Boerlagiodendron*. Since 1900 a rather considerable number of species have been described. At present there are about fifty-five species known, including two proposed as new in the present paper. Of these, 22 are Philippine endemics; 13 are from New Guinea; and the remainder of the species are from Java, Borneo, Celebes, Formosa, Micronesia, and Melanesia.

The present treatment summarizes the known species from the Solomon Islands and the New Hebrides, here called Eastern Melanesia (though the term could well include Fiji). There are no records of the genus in Fiji, and it would appear probable that it will not be found. It is unknown in New Caledonia, which also has been rather extensively (but scarcely completely) explored, and does not occur anywhere in Polynesia. Thus the New Hebrides represent the easternmost extension of the genus, and but one species is presently known from the group. Two species had previously been recorded from the Solomon Islands; two more here described

¹ This report is the third in a series of studies of plants of the Solomon Islands and phytogeographically related areas. The first appeared in Bot. Not. 112: 372-376, 1959 (I. E. Lane, co-author); the second in Brittonia 13: 212-224, 1961.

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as new have been discovered. The flora of the Solomon Islands is a rich one, and that of the New Hebrides, although attenuated in comparison, is still relatively dense in number of genera and species. Both island groups are, from a botanical standpoint, virtually *terrae incognitae*, and it is to be expected that there are several, perhaps many, as yet undiscovered species.

The systematic understanding of the genus in Melanesia rests primarily on the synopsis by Harms (in Bot. Jahrb. 56: 377. 1921), who describes several species from New Guinea. He lists also the species known from the Bismarck Archipelago, i.e., New Britain and New Ireland. This large (and botanically very imperfectly known) island group lies between New Guinea and the Solomon Islands. It appears to share botanical relations with areas both to the east and west, but at present seems to have more in common with continental New Guinea than with the Solomons (except perhaps for Bougainville). At any rate, the present limitation to the Solomons and New Hebrides appears as a reasonably natural one. From this region five species are now recorded.

Unfortunately I am unable to add to our understanding of the floral adaptations in the genus, except to state that the theories and observations of Beccari appear just as pertinent in relation to the Solomons species. The tripartite umbels, a characteristic of the genus, bear, on the central radiolus, flowers which enlarge and appear to be fruits. Often they lack stamens, and sometimes lack a corolla also. These "bacciform" or pseudofeminine flowers are sought by fruit-pigeons, which act unwittingly as pollinators by shaking the hermaphrodite flowers of the two lateral radioli, which attain anthesis at the time that the pseudofeminine flowers attain their fruit-like appearance. It is believed that the pigeons transport pollen from one plant to another in this manner; it seems just as possible, however, that there is a certain amount of self-pollination.

Boerlagiodendron Harms

Boerlagiodendron Harms in Pflanzenfam. 3, 8: 31. 1894.

Eschweilera Zipp. ex Boerl. in Ann. Jard. Bot. Buitenz. 6: 112. 1887;
not *Eschweilera* Mart. ex D. C.

Unjala Reinw. ex Boerl. *ibid.* 116.

Osmoxylon Bl. sensu Becc. et auctt. pro parte.

Boerlagiodendron Burck fide Index Kew. Suppl. I. 162. 1901-6.

Key to the East Melanesian Species

Leaves palmately divided (the divisions petiolulate, the petiolules narrowly alate); leaf divisions pinnatifid with entire margins; stems and leaves glabrous; stamens 5-11, usually 9-11. Malaita, Solomon Islands. ----- *B. puniceopolleniferum*

Leaves palmately lobed (sometimes subentire in juvenile stage); leaf divisions entire to lobulate and/or serrate; stems and leaves glabrous or puberulent and bristly-scaly; stamens 4-6 or (?) up to 14.

Leaf divisions entire or nearly so, glabrous; stamens 4; ovary multi-locular (but many cells abortive); San Cristoval Island, Solomon Islands. ----- *B. tetrandrum*

Leaf divisions lobulate to grossly serrate; leaves etc. glabrous to puberulent and bristly-scaly; stamens 4, 5, or 6 (or up to 14?); ovary 5-14 locular.

Leaves trilobate, glabrous; ovary 5-locular; stamens 4. Espiritu Santo, New Hebrides. ----- *B. orientale*

Leaves 5-7-lobed, glabrous to puberulent; ovary 5-14-locular; stamens 5 or 6 (or more?).

Ovary 5-10-locular; stamens 5 or 6; petiolar crests pectinate, petioles and branchlets bristly-scaly, leaves puberulent beneath and bristly on the nerves; inflorescence bristly-puberulent. Malaita, Solomon Islands. ----- *B. reburrum*

Ovary about 14-locular; stamens more than 6 (?); petiolar crests pectinate, but the plants otherwise not bristly-scaly except for the sparsely furfuraceous inflorescence. Russell Islands, Solomons. ----- *B. russellensis*

***Boerlagiodendron puniceopolleniferum* B. C. Stone, sp. nov.**

Fig. 1

Arbor parva pauciramosa c. 8 m alta glaberrima, ramis crassis ascendentibus, foliis confertis apicem ramorum versus petiolatis, petiolis crassis glabris subteretibus c. 15-25 cm longis basi ad 12 mm diam. cristulatis, cristulis c. 4-7 angustis sinuato-crispatis inter se 7-10 mm distantibus vaginis ut videtur brevibus ad 1 cm longis, laminis palmatisectis glabris ad 70 × 80 cm, lobis basi petiolulatis (petiolulis c. 3 cm longis anguste alatis) profunde 3-5-pinnatifidis (lobis centralibus longioribus usque ad 60-70 cm longis ad 17 cm latis) vel leviter paucilobulatis vel subintegris (lobis basalibus minoribus), apice obtusis, margine integris; inflorescentia terminalis amplissima composite umbellata, bracteis caducis (non visi), radiis numerosis dense confertis curvato-erectis sublevibus subteretibus ad 20 cm (vel ultra) longis, ad 6 mm diam. apice tripartitis, radiolo intermedio brevior ad 3.5 cm longo; flores pseudo-

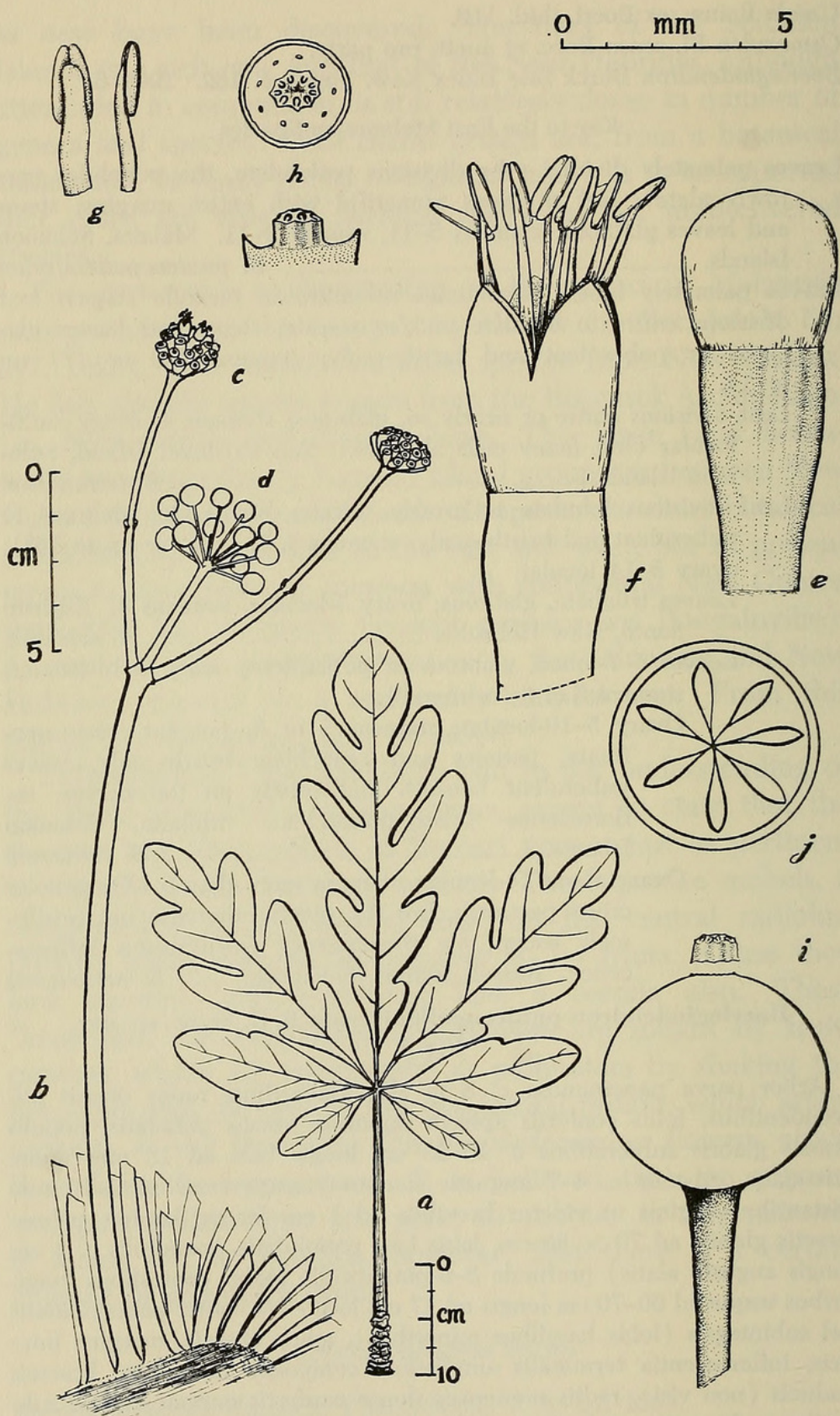


FIG. 1. (Legend on facing page.)

foemineos baccaeformes c. 12 globosos c. 5 mm diam. pedicellatos (pedicellis c. 15 mm longis) gerente; radiolis lateralibus medium vel supra medium bibracteolatis (bracteolis caducis non visi) quam radiolo intermedio duplo longioribus apice floriferis (capitulum similibus) floribus breve pedicellatis, pedicellis c. 3 mm longis cum calycis confluentibus, floribus c. 25–40 (basi probabiliter bracteolatis bracteolis caducis non visi) hermaphroditis (alabastris c. 9 mm longis) glabris arcte congestis; calycis tubo anguste tubuloso c. 4 mm longo, ore truncato c. 2.6 mm lato; corolla rubropunicea basi tubulosa (juventute apice globosa) ad 4.7 mm longa distaliter irregulariter in lobas 3 vel 4 demum scissa; stamina (5-)9-11, filamentis c. 2.8 mm longis et 0.5 mm latis, antheris versatilibus obtusis c. 1.7 mm longis, polline jocunde puniceum (i.e. rubro-violaceum); ovarium (5-)9-11-loculare, disco subplano, stigmatibus (5-)9-11 sessilibus connatis turriculatis radiate dispositis minute hippocrepiformibus; fructus globosus atropurpureus.

Type: In the herbarium of the Bishop Museum (Honolulu), collected on the trail from Auki to Tantalau village (Kwara'ai District) on the island of Malaita, British Solomon Islands, 29 September 1957, by Benjamin C. Stone (No. 2450); isotypes in the U. S. National Herbarium, the herbarium of the Royal Gardens, Kew, and the herbarium of the Arnold Arboretum.

Remarks: This new species (named with reference to the brilliant magenta pollen) is a glabrous, single-trunked tree ("Schopfbaum") of the section *Pedicellata* (of Harms' treatment of the genus). The hermaphrodite flowers are dark maroon; the fruits and pseudofruits are similar or purplish. The nearest relative in the region may be *B. tetrandrum*, but that species differs in various major characters as pointed out in the key and description. Elsewhere, the closer relatives appear to be *B. novoguineense* or *B. Lauterbachii*.

Boerlagiodendron tetrandrum C. T. White

Boerlagiodendron tetrandrum C. T. White in Journ. Arn. Arb. 31: 102. 1950; ex F. S. Walker, Forests of Brit. Sol. Is. Protect. 98. 1948 (nomen et descriptio anglie).

SOLOMON ISLANDS: San Cristoval: Makira Island, Anganiwai, Walker B.S.I.P. 260 (type).

Known only from the type collection.

White distinguished the species from *B. barbatum* (Becc.) Harms of the Kei Islands (southwest of New Guinea), which has deeply 5–7-lobed leaves, the petioles basally manicate-cristate, and the flowers with 7 or rarely 5 stamens. It is relatively remote from the other East Melanesian

FIG. 1. *Boerlagiodendron puniceopolleniferum*. a.—leaf; b.—portion of inflorescence, showing one of the tripartite umbels; c.—umbellule of hermaphrodite flowers; d.—umbellule of pseudofemale flowers; e.—hermaphrodite flower in bud; f.—the same at anthesis; g.—anthers; h.—top and lateral views of apex of ovary and stigmas; i.—pseudofemale flower in lateral view, and showing the caducous stylopodium; j.—the same in cross section.

species considered herein, in its entire or subentire leaf divisions, and from all except *B. orientale* in its 4-stamened flowers.

Boerlagiodendron orientale Guillaumin

Boerlagiodendron orientale Guillaumin in Journ. Linn. Soc. Bot. 51: 554. 1938.

NEW HEBRIDES: Espiritu Santo, Hog Harbor, I. & Z. Baker (Oxford Univ. Exped.) 258 (type).

Known only from the type collection. The collectors report the vernacular name "varaku."

Guillaumin relates this species to *B. novoguineense* (Scheff.) Harms. From the other Melanesian species it is amply distinct in its trilobate leaves, flowers with but 4 stamens, and 5-celled ovaries.

Boerlagiodendron reburum B. C. Stone, sp. nov.

Fig. 2

Arbor parva ad 8 m alta (vel ultra) pauciramosa, ramis adscendentibus, foliis apicem ramorum versus confertis longe petiolatis, petiolis c. 30–45 cm longis dense fimbriato-paleatis (paleis saepe furcatis denticulatisque pallide rufis vel pallide fuscis) basi ad 16 mm diam. cristulatis, cristulis latis petiolum c. $\frac{3}{4}$ cinctis dense pectinatis (paleis gracilis subrectis ad 10–15 mm longis), laminis profunde palmatifidis, lobis 5, 6, vel 7, centralibus majoribus (lobis omnibus apice abtusis) ad 60 × 15 cm, basi sinibus latiusculis rotundatis sejunctis, grosse pauciserratis sublobulatis, margine in sinebus exceptis dentatis vel denticulatis, facie superiore glabris, inferiore dense minute puberulentibus, et nerviis costisque puberulentibus trichomis diversis: minoribus simplicibus c. 0.1–0.3 mm longis majoribus bicellularibus ad 1–3 mm longis ad medium articulatis cellula apicali anguste cornuta quam cellula basali pallidiore saepe longiore; inflorescentia terminalis composite umbellata contracta confertiflora, paleis fimbriatulis furfuraceis oblecta; umbellis tripartitis subimmaturitate c. 3 cm longis, radiolo intermedio brevissimo ad 18 mm longo, pedunculis c. 6 mm longis dense furfuraceo-puberulentibus, umbellulam florum bacciformium subglobosorum ad 5 mm diam. pedicellis teneribus longiusculis ad 6–7 mm longis gerente; radiolis lateralibus ut videtur brevioribus sed immaturis basi bracteis lanceolatis dense paleato-puberulentibus suffultis ad 1 cm longis apice capitulum florum subsessile parvorum gerentibus; flores pseudofoeminei parvi ad 9 mm longi, calyce c. 4.5 mm longo compresso ore dense ciliato-paleato tubo puberulento; corolla punicea angusta tubulosa c. 4.5 mm longa; stamina 5 vel 6 c. 4 mm longa, filamentis c. 2 mm longis, antheris versatilibus oblongis obtusis c. 2.3 mm longis; ovarium 9-vel 10-loculare, disco plano, stigmatibus in turriculam dispositis, apice subtruncatis minute hippocrepiformibus, 5–6 (vel ultra ad 10²); fructus maturus non visus.

Type: In the herbarium of the Bishop Museum (Honolulu), collected between Tantalau Village and the Fiu River in the Kwara'ai District,

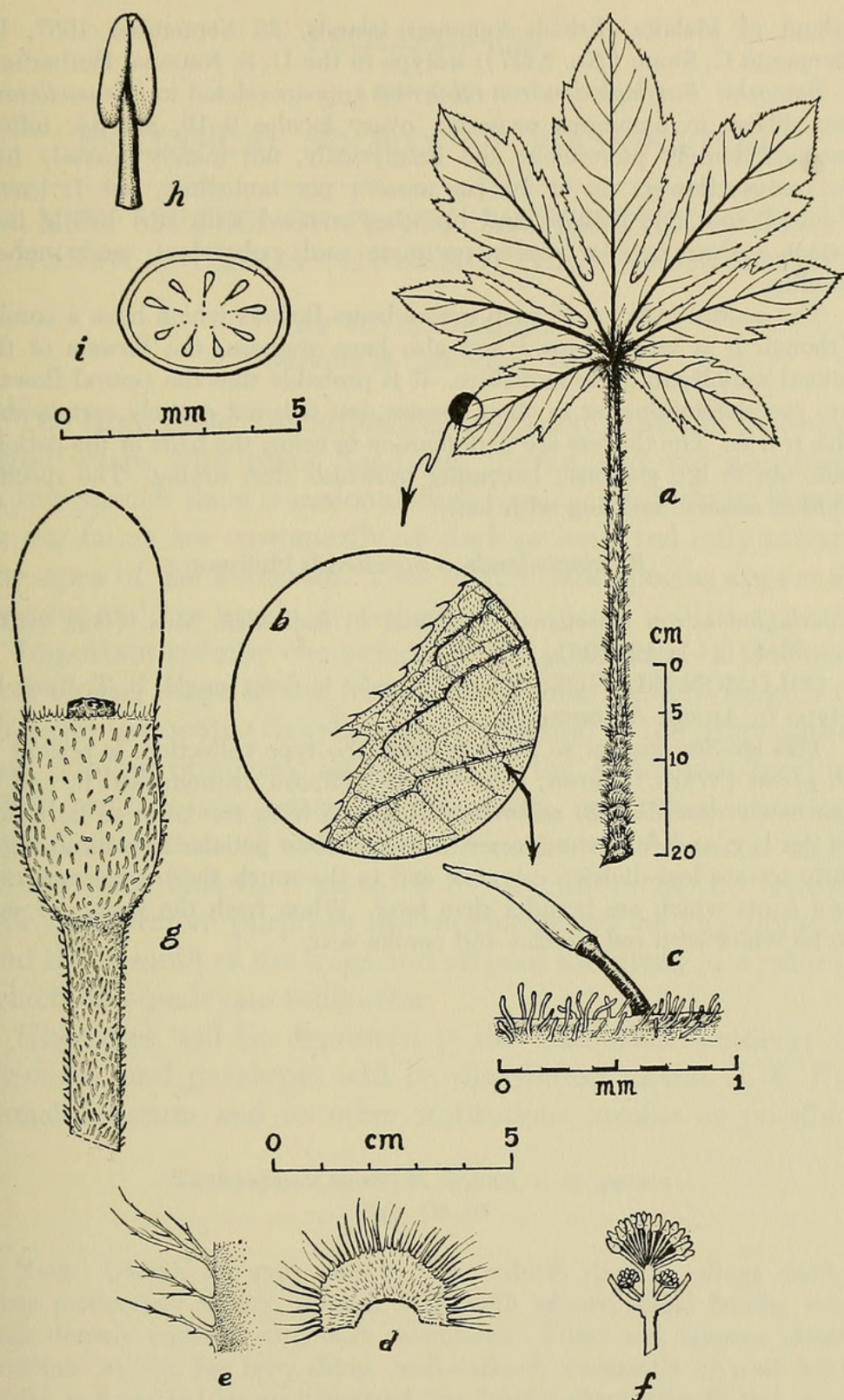


FIG. 2. *Boerlagiodendron reburum*. a.—leaf; b.—portion of leaf margin, showing the undersurface enlarged; c.—greatly enlarged view of small part of a vein in lateral view, showing two types of trichomes; d.—crest from base of petiole; e.—fimbriate hairs from petiole; f.—one of the tripartite umbels from the inflorescence; g.—a flower from the center radiolus; h.—anther; i.—ovary in cross section.

Island of Malaita, British Solomon Islands, 25 September 1957, by Benjamin C. Stone (No. 2397); isotype in the U. S. National Herbarium.

Remarks: *Boerlagiodendron reburum* appears related to *B. russellensis*, but differs in numerous respects: ovary locules 9–10, not 14; inflorescence densely puberulent and bristly-scaly, not merely sparsely furfuraceous; flowers up to 14 (or more?) per umbellule, not 7; leaves 7-lobed (not 5); petioles and branches covered with stiff bristly fimbriant scales; petiolar crests pectinate and puberulent; and umbels smaller.

The central radiolus of each umbel bears flowers which have a corolla (though it is very narrow) and also have stamens; the flowers of the lateral radioli are quite immature. It is probable that the central flowers are pseudofeminine, as in other species, but it is not entirely certain that this is true. The flowers are dark maroon in color; the hairs of the petiole, etc., are in life greenish, becoming brownish after drying. The specific epithet means "bristling with hair."

Boerlagiodendron russellensis Philipson

Boerlagiodendron russellensis Philipson in Bull. Brit. Mus. (Nat. Hist.) Bot. 1(1): 12. 1951.

SOLOMON ISLANDS: Russell Islands; in deep jungle, R. T. Brice 18 (type in Arnold Arboretum).

This species, known so far only from the type collection, is related to *B. pfeilii* (Warb.) Harms, from which Philipson distinguished it, and to the newly described *B. reburum*. It differs from the latter as indicated in the key, and from the former in its pectinate petiolar crests and regularly serrate leaf-division margins, and in the much shorter primary rays and fruits which are broader than long. When fresh the fruits are said to be white with red stigmas and corolla scar.



Stone, Benjamin C. 1962. "Boerlagiodendron (Araliaceae) in eastern Melanesia." *Proceedings of the Biological Society of Washington* 75, 25–32.

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