NEW SPECIES OF PARINARI Aublet (Rosaceae-Chrysobalanaceae),
by
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The following is an account and description of new species of Asiatic
and one Fijian species of Parinari Aublet, originally intended to be included
into a forthcoming monographic treatment of the Asiatic Parinari species.

Dr. Yan France (New York Botanical Garden) has informed me, that
his revision and new classification of genera of the Chrysobalanaceae will
be published soon and consequently I have deferred the publication of my
monograph to a later date.

The species here are treated in a conservative way and described as
belonging to the genus Parinari sensu lato; between brackets I have added
the section to which the species belongs.

1. Parinari (§ Eu-Parinari) argenteo-sericea Kosterms., spec. nov.—Fig. 1

Arbor ramosus globis jolis characeaus glabra obovatae pet olorogos
bas rostratosis, apice breve acuminatis, nervo mediae supra impressus,
subfoliorum interdum. Foliis 14—16 paribus; petiolis brevibus; stipulis
longis eccentricis caducis; panicum pendens albo-seric-criminato, truncato
sub-aceo-longo, floribus graciis, semenibus fertilibus 7—8, stigma acuminatos.

TYPUS: Son 16175 (BO)

Tree 25—33 m tall and 25 cm and more in diam.; bark lenticellate,
brown; outer bark hard; inner bark red, hard, 1.2 mm thick; cork cambium
red; cambium yellow; branchlets dark purplish brown with numerous pale
tiny lenticells, glabrous. Leaves glabrous, chartaceous, elliptic to obovate
or subovate-elliptic, 4.5 × 9.5 to 7 × 20.5 cm, base rounded, apex shortly
often obscurely acuminate; upper surface glossy, midrib impressed (except
for its basal 1—4 mm which shows protruding tissue from the petiole),
lateral nerves filiformum, reticulation prominent or inconspicuous; lower
leaf surface dull, paler, lateral nerves 11—15 pairs, central-pair the lower
ones patent), secondary nerves rather lax, prominent; base of leaf below
near the petiole insertion rarely with glandular tissue. Stipules lateral,
lanceolate: base 3 mm wide), acute, stipped, striate, especially along
its midline outside, 8 mm long, early caducous. Petiole 5—9 mm, glandless.

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Panicles axillary and terminal, up to 9—15 cm lon?, lax, densely white sericeous-tomentellous (hairs more or less adpressed), except for peduncle and main branches which are more laxly white tomentellous; bracts ovate, acute, densely white tomentellous outside, caducous. Pedicels 1—3 mm long; calyx infundibuliform, gibbose, rather slender, densely white tomentellous, 2—3 mm long; lobes 1.5—3 mm long, ovate-lanceolate or narrowly triangular, densely white tomentellous outside, inside densely pilose; petals spathulate, 2 mm long; fertile stamens 7—8, 15 mm long on a 0.5—1 mm high rim, the sterile ones teethlike on an 1 mm high rim; style slightly shorter than the stamens, apex (stigma) truncate, somewhat triangular; ovary with a dense layer of long, white, glossy strigose hairs, which cover (in a reverse direction) also the upper part of the inside of the tube.

**DISTRIBUTION:** N. Borneo

The species is allied to *P. glaberrima*, from which it may be recognized by the leafshape, number of stamens, the slender flowers and especially by the white indumentum of the inflorescences.

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2. Parinari (§ Cyclandrophora) elliptica Kosterm., spec. nov.—Fig. 2

_d. Arbor parva ramulis sparse adpresso strigosis, foliis chartaceis usque ad glabra chartaceis ellipticis utrinque rotundatis vel variisque basi subacutis, supra glabra nitida prominule reticulata, nervo mediano prominulo, subitus in foliolis junioribus sparse adpresso pilosa, max glabra, prominule reticulata, costis utrinque 6—8; paniculis peryaucifloris, floribus dense minute pilosis, staminibus fertilibus circa 20, petalibus superantibus, stylus filamentorum subaequilongis, apice truncatus._

**TYTYPUS:** *Parham* s.n. (K)

Small tree, 7—8 m high; branchlets slender with minute, scattered, adpressed, strigose hairs; branches blackish or grey with numerous tiny lenticils, glabrous. Leaves chartaceous to rigidly chartaceous, elliptical, 4 x 6 to 9.5 x 15 cm, both ends rounded (rarely base acutish); upper surface glossy, glabrous, densely, prominently reticulate, midrib slightly prominent, lateral nerves very slender; lower surface more dull, glabrescent (near the base adpressed strigose hairs subsierpentine), midrib strongly prominent, lateral nerves 6—8 pairs, slender, prominent, slightly arcuate-patent, reticulation prominulous with rough veins. Petiole about 5 mm long, glandless. Stipules aciculate, 10 mm long, caducous.

Panicles depauperate, raceme-like, few-flowered, hardly and shortly branched, densely adpressed grey-strigose, slender, up to 7 cm long; bracts caducous. Pedicel 2—5 mm long. Calyx slender, about 5 mm, densely adpressed-strigose, infundibuliform, lobes ovate-elliptic, obtuse, up to 5 mm long, outside densely sericeous, inside less; petals not seen. Fertile stamens about 20, up to 9 mm long, on an 1 mm high rim, sterile ones on the rim represented by short teeth, ovary densely adpressed strigose; style glabrous, as long as the stamens, apex (stigma) truncate.

**DISTRIBUTION:** Fiji Islands

**VERNAC. NAME:** Makita leka

In leaf-shape the species resembles *P. latifrons* from the Malay Peninsula, but the apex is always rounded, moreover it has far less lateral nerves.

The local name is Makita leka which means the short makita; makita is the name for the common *P. laurina*.

According to Parham from the kernel an oil is obtained.

Fiji Islands, Viti Levu, Vunidawa, sheltered valley, alt. 70 m, Jan., fl., *Parham*, s.n. (K); Naitasiri, alt. 30 m, ster., *Peni Turaga* s.n. (K); locality not indicated, fl., *Home* U2 (K).

3. Parinari (§ Eu-Parinari) metallica Kosterm., spec. nov.—Fig. 3

_d. Arbor mediocris foliis rigide chartaceis vel coriaceous ellipticis obtusis vel obscure breve acuminatis supra pernitida metallica, subitus glabra, perdense areolata, areolis parvis venis latis, costis 10—13 paribus; petaloi longis; paniculis axillaribus foliis brevioribus ferrugineo pilosis, staminibus fertilibus 8; stylus filamentis aequilongis._

**TYTYPUS:** *Ashton*, Brun. 3267 (SAR).

Understory tree ca 16 m tall, 25 cm in diam., clear bole to 12 m; bark smooth, purplish; crown broad lanceolate; branchlets stout, crooked, dark brown, lenticellate; the youngest ones adpressed strigose, soon glabrous. Leaves rigidly chartaceous to coriaceous, elliptic, 3.5 x 8 to 9 x 17 cm, base rounded or shortly acute, apex very shortly acuminate, but usually obtuse, upper surface very glossy with a grey metallic sheen, midrib flat, lateral nerves filiform, prominulous, secondary nerves prominulous, but usually inconspicuous; lower surface in young leaves with a dense layer of woolly, cobweblike, brown hairs, soon glabrous; in adult leaves a very dense and intricate areolated present with flat topped veins and hardly any interspace, which is pilose, midrib strongly prominent, lateral nerves 10—
13 pairs, erect-patent, straight (curved at margin), prominent. Petioles 12—20 mm long, glabrescent, becoming corky. Stipules ovate-lanceolate, acute, densely brown pilose, ca 8 mm long, early caducous.

Panicles axillary, rather narrow, little branched, densely brown tomentellous, 4—10 cm long; base surrounded by numerous bud scales; bracts early caducous. Flowers cream; in dried conditions rusty pubescent; calyx gibbose, 2—3 mm long; lobes lanceolate, acute, 1 mm long; petals lanceolate, glabrous, slightly longer than the calyx lobes; fertile stamens about 8; filaments ca 2 mm long; staminodial ones represented by short teeth; rim short; ovary densely silky striose; style glabrous as long as the stamens, stigma truncate.

**DISTRIBUTION:** Brunei

Characteristic are the grey metallic upper surface, the long petioles, the obtuse leaves with the extremely dense areolation and the short axillary inflorescences.

The species falls within the alliance of *Parinarium Alberti* Bth.

**Brunei:** Andulau For. Res., undulating hills, yellow sandy loam, alt. 50 m, July, fl., Ashton, Brum. 3267 (BO, K, L, SAR); Bukit Teraja, mile 21%, alt. 300 m, yellow, sandy clay, Sept., fl., Ashton, Brum. 673 (BO).

4. Parinarium (§ Cyclandrophora) nannodes Kosterm., spec. nov.—Fig. 4


**Arbor, parva ramulis gracilibus minutissime (sub lente) puberulis et adpressae longe strigosis, foliis rigide chartaceis glabris nitidis lanceolatis vel oblongs vel plerumque ovato-lanceolatis vel ovato-oblongis, basi in petiolum contractis breve acuminatis, apice conspicue acuminatis vel caudatis, supra laevia nervo mediano gracilibus prominulosis costis utrinque 10—12 prominulis, subto nervo mediano sparse strigosis mox glabris prominentibus, costis arcuatissimis prominulosis, rete laxioribus prominulosis; petalis parvis glabris eglandulosis; inflorantissiis axillarisbus dense adpressa sericeeva, spiciformibus, floribus pro generis magnis tubo longo cylindrico gracilibus, staminibus fertilibus ca 18 longe exsertis, stylus filiformis glabris staminibus superantibus.

Small tree, 7—10 m tall, 7.5—15 cm in diam. Branchlets very slender, the youngest ones covered with a dense layer of dark brown minute hairs and glossy adpressed long striose hairs. Leaves rigidly chartaceous, oblong or lanceolate or ovate-oblong, 3 x 7 cm to 5 x 13 (—18) cm, base contracted into the petiole, shortly acuminate; apex conspicuously long and slenderly acuminate or caudate-acuminate; both surfaces glossy, upper surface in mature leaves smooth, often sub-bullate, midrib and the slender lateral nerves prominent in a groove; lower surface with a prominent midrib with adpressed striose hairs (soon glabrous) and 10—12 slender, prominent, arcuate, lateral nerves; secondary nerves prominent, forming a lax, smooth reticulation. Petiole 2—4 mm long, soon glabrous, glandless and becoming corky. Stipules narrowly lanceolate, acute, outside laxly adpressed striose or glabrous, tip with a hairbrush, inside glabrous, 8—10 mm long, lateral of the petiole, enveloping the striose axillary bud, caducous.

Inflorescences axillary, spike-like, densely adpressed golden-brown sericeous, 3—7 cm long (flowers included), in bud with numerous large bracts and bracteoles; peduncle short; the densely sericeous flowers almost sessile with a deciduous, ovate, acute, 7 mm long bract at the base of the almost missing pedicel and a narrowly lanceolate, 3—4 mm long bracteole at the base of the calyx tube (this bracteole still present at anthesis). Calyx tube very slender, cylindrical, 10—12 mm long; calyx lobes oblong-ovate, acute, fleshy, unequal, ca 7 mm long, inside densely, minutely puberulous; petals white, usually spathulate, rarely ovate, 8—12 mm long, base gradually narrowed; fertile stamens pale blue or purplish, about 18—20, ca 12 mm long on a short rim; style filiform, glabrous, 15 mm long with a minute, capitellate stigma.

Fruit ellipsoid, 25 x 12 to 40 x 15 mm, base with an obscure neck, apex rounded, dark rusty brown, pustular (almost like the fruit of *Euphoria* species); outer crusty layer very thin; followed by a radial, fibrous layer of 2—2.5 mm and a very thin seedcoat enveloping the single ruminat seed, which fills completely the large central cavity.

**TYPUS:** Beccari P.B. 2955 (BO)

**DISTRIBUTION:** The Malay Peninsula, Borneo in well-drained forests; rather common.

The species is closely related to *P. latifrons* Kosterm., but has narrower leaves with less lateral nerves and a caudate acumen.

The species is related to *P. scabrum*, but has differently shaped leaves which are more smooth and glossy; the veins (on the upper surface) have also rough pits. Young leaves are reticulate on both surfaces and are not bullate.

**Malay Peninsula:** Penang, buds, Curtis s.n. (SING); Pahang: Gading Bintang, Sept., buds, C.F. 3920 (SING); ibid., Talang R., July, fr., Ridley 2603 (SING); Negri Sembilan: Mt. Angi, Oct. , fl., Symington, F.D. 25310 (SING); ibid., Dec., fl., Holtum 9893 (BO, SING); ibid., Dec., fl., Osman, F.D. 23722 (SING); ibid., Dec., fl., Tachun, F.D. 23680 (SING); Johore: Kg. Kayu Ara, Mawat-Jumalang Rd., low, May, fl., Corner, S.F.N. 29929 (BO, SING); ibid., April, fl., Corner, S.F.N. 3724.5 (BO, SING); ibid., Mt. Pulai, March, fl., Sinclair, S.F.N. 39511 (SING); Borneo: Sarawak: Mt. Matang, Dec., fl., fr., Beccari P.B. 2955 (BO et 2510 (BO, G); ibid., 100—500 m,
lateral nerves, the pilosity of the leaves, the smaller and more slender fruit; the leaves are never ovate-elliptic as in *P. sumatrana*. The species is also near *P. elmeri* by the shape and size of the inflorescence with the persistant bracts, but the leaves are different.


6. Parinari (§ Eu-Parinari)rigida Kosterm., *spec. nov.*—Fig. 6

*Arbor parvum* *ramulis* *dense* *ferrugineo-tomentosis* *foliiis* *ellipticis* *vel* *oblongis*, *magnis*, *basi* *rotundatis* *apice* *breve* *acuminatis*, *supra* *glastra*, *nervi* *mediano* *substantia*. *petiolis* *subpersistentibus*; *staminibus* *fertilibus* *8*, *stylus* *staminibus* *subtus* *glabra*. *fructus* *ellipsoideus*, *gracilibus*.

**Typus**: S.F.N. 40773 (SING).

Tree 5 m tall; branchlets densely rusty tomentose; branches grey, smooth. Leaves rigidly coriaceous, elliptic or oblong, 6 x 17.5—8.5 x 25 cm, base rounded, apex shortly acute with sharp tip; upper surface glossy, glabrous, slightly bullate, midrib flat, lateral nerves filiformous; lower surface in young leaves rusty tomentellous; in adult leaves prominently reticulate with a matting of cobweblike white hairs in the areoles; veins not broadened, not flat topped, roughish; midrib strongly prominent, densely, minutely pilose, glabrescent, lateral nerves prominent, rather widely spaced, about 20 pairs, erect-patent, slightly curved (strongly curved at margin); in young leaves glandular tissue present on the lower leaf base surface at both sides of the base of the midrib. Petioles stout, 5—8 mm long, bearing orbicular glands, in older leaves petioles corky, glandless.

**DISTRIBUTION**: Only known from the type locality.

As *Parinari* species are mainly characterized by their leaves. I venture to describe this species, which seems to be very close to *P. parva* Kosterm., from which it mainly differs by its thick, rigidly coriaceous leaves.

**Malay Peninsula**: Trengganu, 34th mile Trengganu-Besut Rd. (West side), lowland forest, Sept., ster., *Sinclair & Kiah, S.F.N. U0773* (E, SING).

7. Parinari (§ Eu-Parinari) ashtoni Kosterm., *spec. nov.*—Fig. 7

*Arbor mediocres* *foliiis* *rigide* *coriaceis*, *ovato-oblongis* *sensim* *acuminatis* *basi* *petiolum* *contractis* *supra* *glastra* *permittidis* *obscure* *bullatais*
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subtus perdense areolatis nervis perlatis, areolis parvis profundis albopilosis, costis 13—17 paribus, petiolis crassis, brevis; fructus irregulariter, ellipsoideus, obtusis, parte basilibus constrictis.

TYPUS: Ashton, S. 17281 (BO)

Tree 10—17 m tall, up to 20 cm in diam.; bark smooth, white mottled. Branchlets glabrous, dark purplish brown with tiny rather obscure lenticells, the youngest ones minutely adpressed-pilose. Leaves rigidly coriaceous, ovate-oblong, 3 x 9 to 6 x 13 cm, base contracted into the petiole, apex gradually narrowed, acuminate, tip sharp; upper surface glossy, glabrous, midrib impressed (except near its base), lateral nerves filiform, impressed; reticulation dense, slightly bullate; lower surface areolate, but the nerves not flat, densely white cobweblike, adpressed pilose (on the midrib adpressed strigose), midrib strongly prominent, lateral nerves 13—17 pairs, prominent, straight, erect-patent, curved at the margin; secondary nerves filiform, prominulous, parallel. Petiole rather stout, pubescent, glabrescent, ca 10 mm long, often with two small, dark round, slightly protruding glands on the upper surface, about the middle of the petiole.

Inflorescence with 2 rows of bud-scales at its base. Sepals ovate-lanceolate 5 mm long; sterile stamens represented by broad, obtuse, almost 2 mm long, pubescent teeth, inserted on a thin, 1 mm high rim. Infructescence up to 13 cm long. Fruit irregularly ellipsoid, obtuse, 5 cm long. 3.5 cm in diam., with a pronounced basal neck; fruit more or less completely covered by a pale brown scaly substance.

DISTRIBUTION: Heath forest in Sarawak

The species is related to P. oblongifolia, from which it differs by its leaf shape, the fewer lateral nerves and the different areolation of the lower leaf surface; the fruit are smaller and of a different shape. The two known collections are from heath forest.


8. Parinarium (§ Cyclandrophora) latifrons Kosterm., nom. nov.
Parinarium latifolium (non Exell) Henderson in Garden's Bull. Straits Settl. 7: 102. 1933, typus: Haniff, S.F.N. 21119 (K), basionym.

Fig. 1. — Parinarium arfenteo-sericea Kosterm.
Fig. 2. — *Parinari elliptica* Kosterm.

Fig. 3. — *Parinari metallica* Kosterm.
Fig. 4. — *Parinari nannodes* Kosterm.

Fig. 5. — *Parinari parva* Kosterm.
Fig. 6. — Parinari rigida Kosterm.

Fig. 7. — Parinari ashtonii Kosterm.