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RESEARCH ARTICLE

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Revision of *Creochiton* (*Melastomataceae*)

A. Kartonegoro[1], J.F. Veldkamp[2]

Key words

Creochiton
Malesia
Melastomataceae
new combination
revision

Abstract A taxonomic revision of the Malesian genus *Creochiton* (*Melastomataceae*) is presented. Twelve species are recognized, although one is based on the original description only. *Creochiton turbinatus* (comb. nov.) is raised to specific rank from a variety of *C. ledermannii*. A key to the species, descriptions, ecological habitats, distributions (with maps), synonymy, taxonomic notes, vernacular names and an index to collections are provided.

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INTRODUCTION

The genus *Creochiton* (*Melastomataceae*) was established by Blume (1831a, b) for two species from Java previously included in *Melastoma* L.: *C. bibracteatus* Blume (1826) and *C. pudibundus* Blume (1823). The latter is here designated as the lectotype. The name is derived from the Greek, kreas chitoon (κρεας χιτων), fleshy garment, which refers to the usually large and thickened bracteoles that cover the flower bud before anthesis. Note that the gender of *chiton* is male and all epithets have here been corrected where necessary. The genus is easily recognized as woody climbers (scrambling shrubs), creepers, or epiphytic shrubs with distinct fleshy bracteoles enveloping the flower buds. It has been regarded by most authors as allied to *Dissochaeta* Blume. The circumscription employed here is after Veldkamp (1978) followed by Maxwell (1980, 1981, 1983).

There is a remark by Kadereit (née Clausing; 2006) that *Creochiton* would partially belong to *Dissochaeta* but (in litt.) she then thought that *Creochiton anomalus* (King & Stapf ex King) Veldk., *C. furfuraceus* (M.P.Nayar) Veldk. and *C. monticola* (Ridl.) Veldk. would belong there because of the axillary placentation, anthers with ventral appendages and extra-ovarial chambers.

Naudin (1852: 141, 153) pointed out similarities to the American subtribe *Pyxidanthinae* ('*Pyxidantheae*') Naudin, but noted that perhaps it was better placed with the subtribe *Dissochaetinae* ('*Dissochaeteae*') Naudin (1851: 67). Triana (1865, 1871) elevated this to the tribe *Dissochaeteae* (Naudin) Triana in which he was followed by later authors, e.g. Cogniaux (1891), Krasser (1893), Maxwell (1983). Baillon (1880: 15) even regarded *Creochiton* in a heterogeneous assembly of genera ranked as sections of *Dissochaeta* but did not make the necessary combinations for the two *Creochiton* species. Because of the close relationships between the two genera both are included in the *Dissochaeteae* (Naudin) Triana, e.g. because of their habit and the shape of their inflorescences (Triana 1871, Cogniaux 1891, Krasser 1893, Maxwell 1983).

Mansfeld (1925) put *Creochiton* into the capsular-fruited tribe *Astronieae* Triana on the basis of the basal placentation. Bakhuizen van den Brink Jr. (1943: 306) agreed with this and although he knew that the fruits are berry-like, he created the subtribe *Creochitoninae* (Miq.) Bakh.f. because of the leaf-like bracteoles that clasp the flower buds, and the cuneate seeds. This division is not supported by wood anatomy (Van Vliet 1981) and macromorphology (Veldkamp 1978) and *Creochiton* should be included in the *Dissochaetinae.*

Enchosanthera was established by Guillaumin (1913: 341) for *E. anomala* (King & Stapf ex King) Guillaumin based on *Anplectrum anomalum* King & Stapf ex King. He decided to create a separate new genus because it differed from *Anplectrum* A.Gray by the shape and structures of the eight heteromorphous anthers. He distinguished *Creochiton* by the homomorphous stamens. Veldkamp (1978) reduced *Enchosanthera* to *Creochiton* because the differences seemed only of specific value. The structure and nervation of the leaves (plinerved) and rather thick bracteoles were more similar to *Creochiton* than to *Dissochaeta*.

Eisocreochiton was described by Quisumbing & Merrill (1928: 177) on the basis of *E. bracteatus* Quisumb. & Merr. They said that it was similar to *Creochiton* in its vegetative and inflorescences characters. The differences were in the number of stamens and the presence of extra-ovarial chambers. Although no fruits were available they placed their new genus in the capsular-fruited *Oxysporeae* Triana near *Blastus* Lour. Judging from labels in BO Ohwi in 1945 already equated it with *Creochiton*. Nayar (1970) revised the genus and correctly assigned it to the baccate *Dissochaeteae*. He distinguished three species, *E. bracteatus*, *E. furfuraceus*, and *E. monticola*. Veldkamp (1978) and Maxwell (1980, 1981, 1983) noted that the characters supposedly differentiating between *Creochiton* and *Eisocreochiton* cannot separate them at the generic level and that they must be united into a single genus. Similar to the situation in *Dissochaeta*, the number of stamens and the presence and depth of the extra-ovarial chambers are of specific value only, not generic. With this in mind, the three species of *Eisocreochiton* were transferred to *Creochiton* (Veldkamp 1978). Furtado (1963) was apparently not aware of *Enchosanthera* Guillaumin and described *Anplectrella* for the same species, *Anplectrum anomalum*. Being homotypic, the name *Anplectrella* is superfluous.

[1] Research Center for Biology, Indonesian Institute of Sciences (LIPI), Jl. Jakarta-Bogor KM 46, Cibinong, West Java, Indonesia; corresponding author e-mail: mykwini@gmail.com.
[2] Naturalis Biodiversity Center, P.O. Box 9517, 2300 RA Leiden, The Netherlands; e-mail: jef.veldkamp@naturalis.nl.

GENERAL MORPHOLOGY

Habit

The species of *Creochiton* are creepers (scrambling shrubs) or epiphytic shrubs, 2–40 m in height or sometimes woody climbers, e.g. the Philippine species (*C. bracteatus*, *C. dipterus* and *C. roseus*). Inflorescences are only seen on thin twigs, which suggest that the growth mode is sympodial as seems usual for the *Dissochaeteae*. This is most obvious in *C. anomalus* where the inflorescences are terminal. Because of this older stems are rarely collected it cannot be ascertained how exactly the plants climb.

For *C. brevibracteatus* Mansfeld reported that the stem is as thick as an arm. A specimen of *C. roseus* (*PNH 9924*, *Sulit*) is described as 5–6 m tall and 1 cm diameter.

Usually they have terete branchlets except for *C. furfuraceus* and *C. monticola* where they are obscurely triangular and become terete when mature. They are never flattened. The nodes are usually thickened with or without a distinct interpetiolary ridge. The indument is variable from absent to densely stellate furfuraceous or floccose (*C. bibracteatus* and *C. ledermannii*).

Leaves

The leaves of *Creochiton* are more or less coriaceous when dry. The shape is quite variable, usually they are ovate-elliptic oblong and only rarely suborbicular. They are largest in *C. bibracteatus* (6–12.5 by 3.2–7.5 cm) and smallest in *C. monticola* (2–3 by 1.4–1.5 cm). The apex usually is acute or rounded while in three species it is retuse (*C. anomalus*, *C. ledermannii* and *C. monticola*). The base is mostly rounded or cuneate, or sometimes subcordate in *C. bibracteatus*, and the margin always entire. Similar to nearly all *Melastomataceae* genera, *Creochiton* has acrodromal venation with one or two pairs of lateral nerves which arise at or above the base. This subbasal or plinerved nervation is a character that usually distinguishes *Creochiton* from *Dissochaeta*. It is also found in *Boerlagea* Cogn., *Medinilla* Gaudich., *Pachycentria* Blume and *Plethiandra* Hook.f., but these are different in habit. The secondary venation is scalariform.

Generally, the upper side of the leaves is glabrous with sunken main nerves, while the pubescence of the lower sides is similar to that of the branchlets.

Inflorescence

The inflorescence of *Creochiton* is either a cymose pseudoumbel with 3–5 flowers or a thyrse with up to 35 flowers. It is mostly axillary except for *C. anomalus* where it is terminal. The main axis is usually terete and sparsely to densely furfuraceous. Bracts are present at each node and there is a pair of bracteoles at the base of each pedicel which usually more or less covers the flower bud. In general they are coriaceous, caducous, concave and usually glabrous, more rarely furfuraceous in- or outside. In *C. bracteatus*, *C. brevibracteatus* and *C. dipterus* they are thin and do not fully enclose the flower bud and are still present at the time of anthesis.

Flowers

The flowers are tetramerous, similar to those of *Dissochaeta*. The calyx tube or hypanthium is usually campanulate or urceolate with a truncate rim or with 4 wave-like teeth. It has the same indument as the main axis and branchlets.

The petals are ovate to elliptic. The colours vary between white, pink or purplish, but cannot be used to distinguish species. Their length has here been measured as much as possible from buds about to open. Similar to *Dissochaeta*, the characters of the stamens are also considered to have specific taxonomic value. When there are only 4 stamens the anthers are usually equal and homomorphic. When there are 8 stamens they may be either homomorphic or heteromorphic, in which case the oppositipetalous ones are smaller.

The anthers are elongate and glabrous and open distally with a single pore. The connective usually has a dorsal appendage (a triangular, hastate or sagittate crest in alternipetalous anthers and spur-like or ligular in oppositipetalous ones) and in *C. anomalus* and *C. monticola* there are two lateral appendages (ligular or filiform).

The ovary is from 1/2 to nearly 2/3 times as long as the hypanthium. The apex is usually glabrous, but sometimes densely pubescent. Similar to other genera in *Dissochaeteae* it is concrescent with the hypanthium with or without septs forming extra-ovarial chambers in which the anthers are inserted before anthesis (Kartonegoro & Veldkamp 2010). The chambers vary from absent to shallow to reaching to halfway or to the base of the ovary.

Fruits

The fruits of *Creochiton* as in all other *Dissochaeteae* are berry-like, globose or subglobose, colourful when mature, sometimes with four small calyx remnants. They are variously described as berries, leathery berries, or even indehiscent capsules.

True berries by definition have a well-developed usually juicy or fleshy mesocarp, with the seeds immersed in it and without cavities or septs. Capsules are by definition dehiscent. An ancient term for fruits with a dry indehiscent pericarp with several hollow cells without contents except for the many seeds was carcerule.

They are usually glabrous, but sometimes they are sparsely furfuraceous. In *C. turbinatus* there are distinct vertical ridges by which they look turbinate-shaped. The seeds are numerous, smooth and curved.

DISTRIBUTION AND ECOLOGY

Creochiton is an endemic genus of the Malesian region ranging from the Malay Peninsula and E Sumatra (*C. anomalus*: Johor, Perak; Indragiri, Bangka) to the Central and New Britain Provinces of Papua New Guinea (*C. novoguineensis*). There is no indication for a centre of diversity due to a more or less equal number of species in every region. *Creochiton monticola* and *C. furfuraceus* are endemic to Borneo; *C. ledermannii*, *C. novoguineensis* and *C. turbinatus* to New Guinea; while *C. bracteatus*, *C. dipterus* and *C. roseus* to the Philippines. *Creochiton pudibundus* and *C. bibracteatus* were previously known only from Java but now the first has been found in Celebes and the second in Ceram.

Creochiton mainly grow as epiphytic shrubs or woody climbers with adventitious roots in rainforests that are not affected by seasonal climate. Perhaps this explains its absence in the Lesser Sunda Islands. Some species are found in mountain forests up to 2 000 m altitude like *C. bibracteatus*, *C. monticola*, *C. novoguineensis* and *C. pudibundus*.

Several species such as *C. anomalus*, *C. furfuraceus*, *C. ledermannii* and *C. turbinatus* are known from lowland primary forest or swampy forest between 50–500 m. The plants usually grow at the edge of primary or secondary forest, near river banks or in disturbed forest with gaps in the canopy. The scarce number of specimens in the herbarium is probably due to the fact that the plants grow high in the trees. According to Furtado (1963) all specimens of *A. anomalus* in the Malay Peninsula were collected from logged or fallen trees.

TAXONOMIC TREATMENT

Creochiton

Creochiton Blume (1831a) 506; Naudin (1852) 153; Miq. (1855) 559; Triana (1871) 85; Cogn. (1891) 604; Krasser (1893) 179; Merr. (1905) 32; (1923) 191; Koord. (1912) 693; (1923) 212; Bakh.f. (1943) 307; (1963) 362. — *Dissochaeta* Blume sect. *Creochiton* (Blume) Baill. (1880) 15, 51. — Lectotype (designated here): *Creochiton pudibundus* (Blume) Blume.

Enchosanthera Guillaumin (1913) 341. — *Anplectrella* Furtado (1963) 106, nom. superfl. — Type: *Enchosanthera anomala* (King & Stapf ex King) Guillaumin [≡ *Anplectrella anomala* (King & Stapf ex King) Furtado ≡ *Creochiton anomalus* (King & Stapf ex King) Veldk.].

Eisocreochiton Quisumb. & Merr. (1928) 177; M.P. Nayar (1970) 87. — Type: *Eisocreochiton bracteatus* Quisumb. & Merr. [≡ *Creochiton bracteatus* (Quisumb. & Merr.) Veldk.].

Dissochaeta Blume fide Kadereit (2006) 3 (p.p.).

Diplectria auct. non (Blume) Rchb.: Kuntze (1891) 246 (p.p.).

Melastoma auct. non Burm. ex L.: Blume (1823) 71; (1826) 1071; DC. (1828) 148.

Woody creepers, climbers, scrambling or epiphytic shrubs; branchlets commonly terete or sometimes obscurely triangular, glabrous to densely covered with brown furfuraceous or floccose hairs, sometimes with adventitious roots; nodes thickened or rarely flattened, with or without an interpetiolary ridge. *Leaves* with acrodromal venation, thin, subcoriaceous or coriaceous, ovate to oblong rarely suborbicular, apex acute or rounded to retuse, base cuneate to subcordate, margin entire; leaves glabrous above, midrib immersed, glabrous to densely furfuraceous, glabrous to densely tomentose below; nervation plinerved with one or two main lateral nerves arising at or above the base, midrib raised below; secondary nervation pinnate, commonly reticulate; petiole terete, dorsally grooved, glabrous to densely furfuraceous. *Inflorescences* commonly axillary, either umbellate, 3–5-flowered or paniculate with up to 35 flowers, rarely terminal (*C. anomalus*); main axis terete, sparsely to densely furfuraceous; bracts minute to conspicuous, thin or coriaceous; bracteoles distinct, paired, commonly coriaceous, concave, obovate or orbicular, caducous, glabrous or densely furfuraceous, enclosing the flower bud, rarely thin or minute; pedicel terete, glabrous to densely furfuraceous; flower tetramerous; hypanthium campanulate or nearly urceolate, glabrous to densely furfuraceous, hairs simple or stellate; calyx rim truncate or wavy with 4 short lobes; petals ovate or elliptic, glabrous, acute tip, white, pink to purplish. *Stamens* 4 or 8, equal or unequal, if 8, 4 alternipetalous larger, 4 oppositipetalous smaller; filaments flat, straight; anthers basifix, cylindric, elongate, straight or slightly curved at anthesis, opening with a single terminal pore; connective with a triangular, hastate or sagittate crest in alternipetalous ones, triangular, spur-like or ligular in oppositipetalous ones, lateral appendages commonly absent, rarely paired; ovary globose, 0.5–0.75 times as long as the hypanthium, glabrous, 4-locular, placentation axillary or basal; stigma capitate; style straight or curved, glabrous, slender; extra-ovarial chambers rarely developed or narrowed at the top of the ovary, or extending to about half the length of the ovary. *Fruits* berry-like, globose to subglobose, green or purplish when mature, glabrous; stalk glabrous or sparsely furfuraceous, seeds numerous, cuneate, curved, flat-topped.

Distribution — The genus with twelve species is endemic to the Malesian region (Malay Peninsula, Sumatra, Borneo, Java, Celebes, Moluccas, Philippines and New Guinea), but is not yet found in the Lesser Sunda Islands.

KEY TO THE SPECIES

1. Hypanthium densely furfuraceous 2
1. Hypanthium glabrous, glabrescent or sparsely furfuraceous 4
2. Leaf underneath glabrescent (but for midrib). — Philippines 3
2. Leaf underneath densely furfuraceous or densely tomentose. Bracteoles obovate, completely covering the flower bud, fleshy, densely furfuraceous. — Java, Moluccas . . . . . 2. *C. bibracteatus*
3. Bracteoles partially covering the flower bud, thin, outside densely furfuraceous . . . . . 5. *C. dipterus*
3. Bracteoles completely covering the flower bud, fleshy, outside glabrous . . . . . 11. *C. roseus*
4. Petiole glabrous to sparsely furfuraceous 5
4. Petiole densely furfuraceous or floccose 8
5. Petiole 8–15 mm long. Leaf 4.5–13 cm long, base cuneate to rounded, apex acuminate to acute. Inflorescences axillary. Bracteoles ovate to obovate, completely covering bud, fleshy, glabrous or densely furfuraceous. Stamens equal. — Borneo, Celebes, Java, New Guinea 6
5. Petiole 2–6 mm long. Leaf 1.5–4 cm long, base acute, apex rounded or retuse. Inflorescences terminal. Bracteoles linear, partially covering bud, thin, scaly. Stamens unequal. — Malay Peninsula, Sumatra . . 1. *C. anomalus*
6. Leaf apex acute. Bracteoles obovate. Stamens 8, lateral appendages and extra-ovarial chambers absent. — Celebes, Java, New Guinea 7
6. Leaf apex acuminate. Bracteoles ovate. Stamens 4, lateral appendages and extra-ovarial chambers present. Petiole sparsely furfuraceous. Leaf underneath densely furfuraceous. Inflorescences umbellate, few-flowered. Bracteoles densely furfuraceous. Hypanthium stellate furfuraceous. Fruits globose. — Borneo . . . . . 6. *C. furfuraceus*
7. Petiole sparsely furfuraceous. Leaf underneath glabrous (but for midrib). Inflorescences paniculate, many-flowered. Bracteoles densely furfuraceous. Hypanthium sparsely stellate furfuraceous. Fruits subglobose. — New Guinea . . . . . 9. *C. novoguineensis*
7. Petiole glabrous or with some hairs. Leaf underneath pubescent. Inflorescences umbellate, few-flowered. Bracteoles and hypanthium glabrous. Fruits globose. — Celebes, Java . . . . . 10. *C. pudibundus*
8. Petiole 8–20 mm long. Leaf 3.5–7 by 1.8–4 cm, underneath glabrous to glabrescent (but for midrib). 9
8. Petiole 2–6 mm long. Leaf base cuneate to rounded. Bracteoles completely covering the flower bud, 4–8 mm long. Hypanthium glabrous to sparsely stellate furfuraceous. Stamens 8 10
9. Leaf base cuneate. Inflorescences umbellate. Bracteoles completely covering the flower bud, 6–7 mm long. Hypanthium sparsely stellate furfuraceous. Stamens 4, lateral appendages present. — Philippines . . . 3. *C. bracteatus*
9. Leaf base rounded. Inflorescences paniculate. Bracteoles partially covering the flower bud, 1 mm long. Hypanthium glabrous. Stamens 8, lateral appendages absent. — New Guinea . . . . . 4. *C. brevibracteatus*
10. Leaf 3.4–6 by 2.2–3.1 cm, underneath glabrescent to densely tomentose. Inflorescences umbellate, few-flowered. Bracteoles orbicular or ovate. Stamens equal, lateral appendages absent. — New Guinea 11
10. Leaf 2–3 by 1.4–1.5 cm, underneath glabrous (but for midrib). Inflorescences paniculate, many-flowered. Bracteoles obovate. Stamens unequal, lateral appendages present. Leaf elliptic to obovate. Fruits subglobose, smooth. — Borneo . . . . . 8. *C. monticola*
11. Leaves obovate, apex retuse, underneath densely tomentose. Bracteoles inside stellate furfuraceous. Hypanthium sparsely stellate furfuraceous. Fruits subglobose, smooth . . . . . 7. *C. ledermannii*

11. Leaves ovate, apex acute, underneath glabrescent (but for midrib). Bracteoles inside glabrous. Hypanthium glabrescent. Fruits globose, ridged . . . . . 12. *C. turbinatus*

1. *Creochiton anomalus* (King & Stapf ex King) Veldk. — Map 1

Creochiton anomalus (King & Stapf ex King) Veldk. (1978) 431; Veldk. & M.P. Nayar (1978) 438. — *Anplectrum anomalum* King & Stapf ex King (1900) 58; Ridl. (1922) 800. — *Enchosanthera anomala* (King & Stapf ex King) Guillaumin (1913) 341, f. 1, 2. — *Anplectrella anomala* (King & Stapf ex King) Furtado (1963) 106. — Lectotype (Veldkamp 1978): *King's Collector 5779* (holo CAL n.v.; iso K, L, P, SING), Malay Peninsula, Perak, Gopeng.

Epiphytes or woody climbers, 10–40 m high; branchlets terete, covered by stellate brown scales, glabrescent; nodes thickened with an interpetiolary ridge. *Leaves* coriaceous, obovate to elliptic, apex rounded to retuse, base acute; above glabrous, light green, sparsely stellate scaly on the midrib, below densely covered with stellate tomentose hairs, yellowish green, dark brown when dry; 1.5–4 by 1–3 cm; nervation with 1–2 pairs of lateral nerves from above the base; petiole 3–8 cm long, covered with stellate scales, 2–6 mm long. *Inflorescences* terminal, paniculate, few- to many-flowered; main axis angular, covered with stellate scales, furfuraceous; secondary axes, 1–6 mm long; bracts minute or linear; bracteoles linear, not enveloping the flower buds, covered with brown scales, 2–3 mm; pedicel covered with stellately furfuraceous hairs, 8–11 mm

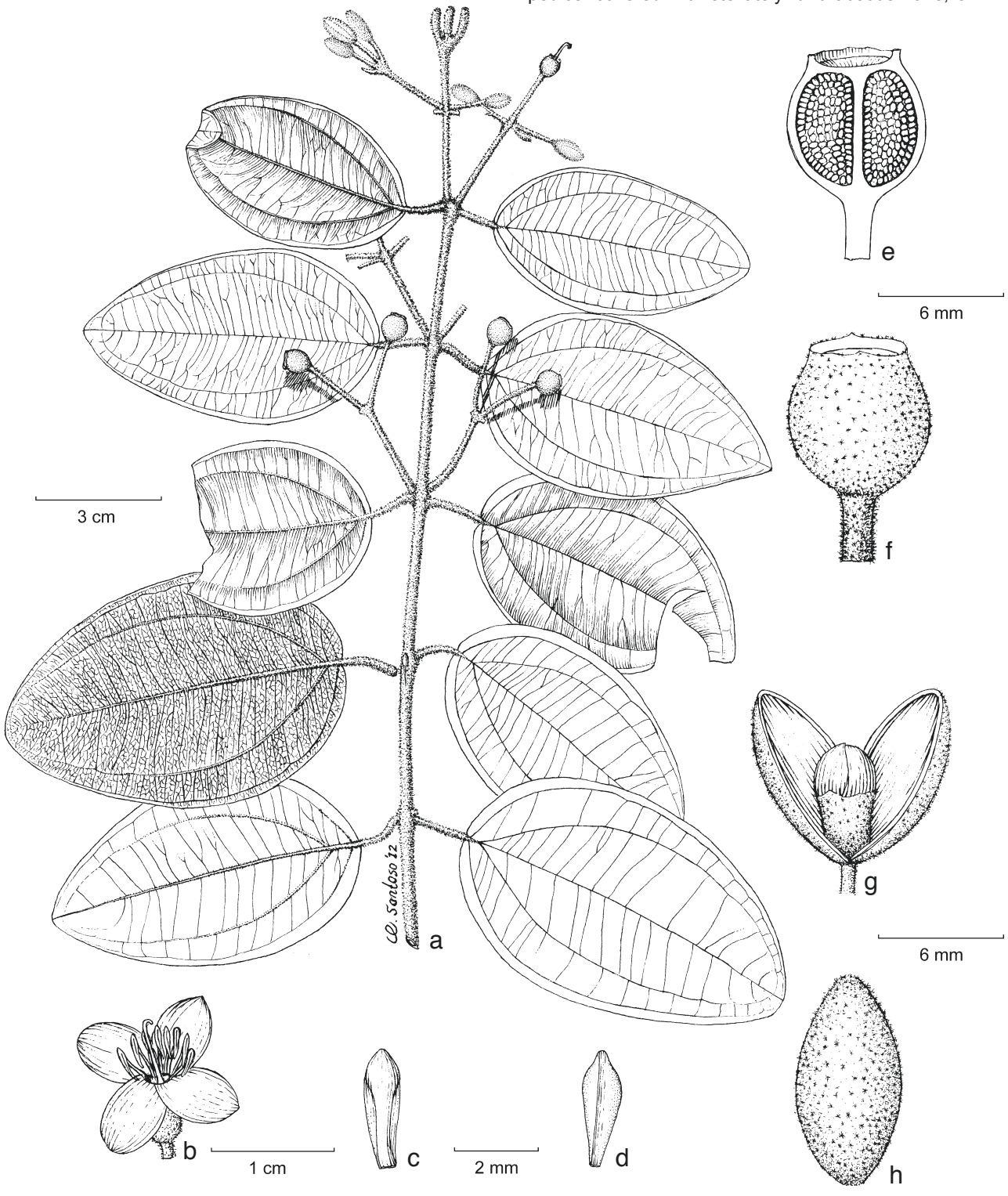
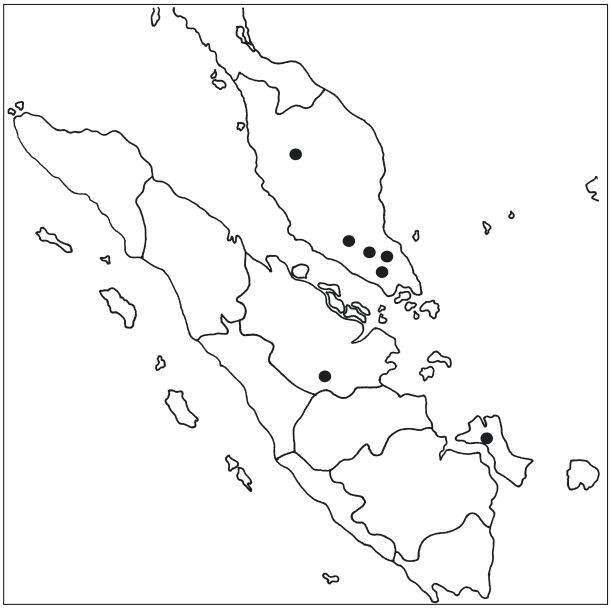


Fig. 1 *Creochiton bibracteatus* (Blume) Blume. a. Habit; b. flower; c, d. stamen in flower bud (c = abaxial; d = adaxial); e. cross section fruit; f. mature fruit; g. flower bud with a pair of bracteoles; h. bracteole (all: *Backer 10623*, BO).



Map 1 Distribution of *Creochiton anomalus*.

long. *Hypanthium* campanulate to nearly urceolate, 4–5 by 2–3 mm, stellate furfuraceous, green, becoming brown when dry; calyx rim truncate, furfuraceous with 4 small undulations 0.5 mm long; petals elliptic, white or pink, 4–5 by 2–2.5 mm. *Stamens* 8, unequal, the alternipetalous ones: filament flat, 3 mm long; anther elongate, yellow, glabrous, 7 mm long; connective with a triangular to sagittate, crest 2 mm long, purple; lateral appendages paired, ligular, 1–1.5 mm long; the oppositipetalous ones: filament flat, 3 mm long; anther elongate, 5 mm long; connective with a ligular crest, 1 mm long; lateral appendages absent; ovary globose, glabrous, 3 mm long; style glabrous, slender, straight, 5–7 mm long; extra-ovarial chambers 8, half as long as the ovary. *Fruits* subglobose, glabrous to sparsely furfuraceous, green to yellowish green, 4–6 by 3–4 mm diam; seeds c. 0.6 mm long.

Distribution — Peninsular Malaysia (Johor, Perak) and Sumatra (Riau, Bangka).

Ecology & Habitat — Lowland or swampy primary rainforest between 100–550 m altitude.

Note — *Creochiton anomalus* differs from all species by the terminal paniculate inflorescences. It has linear bracteoles which partially cover the flower bud. The species has 8 heteromorphous stamens that are similar to those of *C. monticola* from Borneo, but the oppositipetalous stamens are smaller and have no lateral appendages. Similar to *C. brevibracteatus* but differs by its shorter petiole and leaves.

2. *Creochiton bibracteatus* (Blume) Blume — Fig. 1, Map 2

Creochiton bibracteatus (Blume) Blume (1831a) 507; (1831b) 248; Naudin (1852) 154; Miq. (1855) 560; Triana (1871) 85, t. 7, f. 91; Cogn. (1891) 605; Krasser (1893) 178, f. 77a; Koord. (1912) 693; (1923) 212; Bakh.f. (1943) 308; (1963) 362. — *Melastoma bibracteatum* Blume (1826) 1071; DC. (1828) 148. — *Diplectria bibracteata* (Blume) Kuntze (1891) 246, nom. inval. prov. — Lectotype (designated here): *Blume s.n.* (holo L, sh. no. 908.128–2131; iso 908.129–921, -2141, -2146), Java.

Creochiton superbus Naudin (1852) 153; Miq. (1855) 560. — Type: *Zollinger 3009* (holo G; iso L, U), Java, Mt Salak.

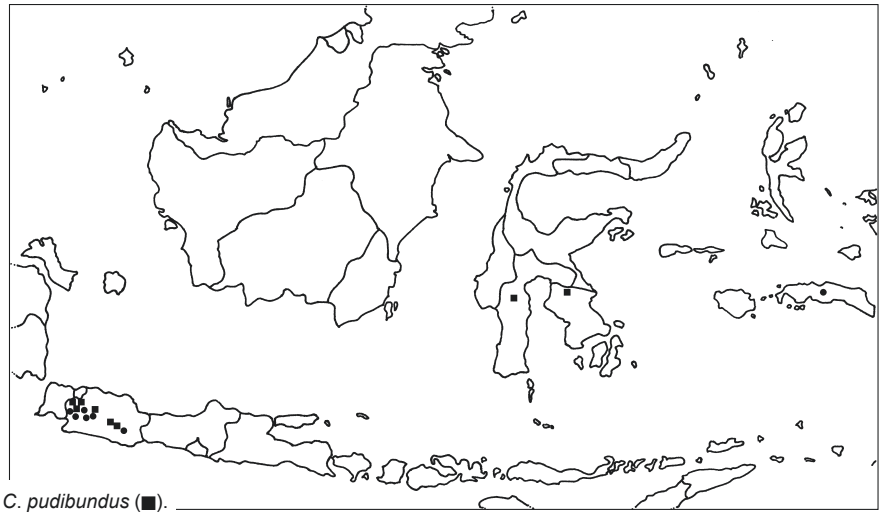
Epiphyte or climber, up to 10–26 m height; branchlets terete, densely brown furfuraceous; nodes thickened by the interpetiolary ridge. *Leaves* thin, ovate to suborbicular, apex acute to rounded, base rounded to subcordate, glabrous above but puberulous near base, midrib sunken, densely stellate furfuraceous to floccose below, 6–12.5 by 3.2–7.5 cm; nervation plinerved with 2 pairs of main nerves arising above the base; petiole densely furfuraceous, 10–27 mm long. *Inflorescences* axillary 4–6 cm long, umbellate with 3–5 flowers; main axis terete, up to 4.5 cm long, densely furfuraceous; bracts oblong, glabrous, 4 mm long; bracteoles obovate, coriaceous, concave, enveloping the flower buds, densely furfuraceous outside, glabrous inside, violet, 6–15 by 4–6 mm; pedicel densely furfuraceous, 10–15 mm long; flower bud 10 mm long. *Hypanthium* campanulate, densely stellate furfuraceous, 3–5 by 2–3 mm; calyx rim truncate with 4 small undulations, 0.5–1 mm long; petals oblong, white, 7–9 by 4 mm. *Stamens* 8, equal; filament flat, 4 mm long; anther elongate, 4–6 mm long; connective with a sagittate crest 1–1.5 mm long; lateral appendages absent; ovary ellipsoid, glabrous, 3 mm long; style glabrous, curved when mature, 6–10 mm long; extra-ovarial chambers shallow about 1/5 as long as the ovary or absent. *Fruits* globose or subglobose, vertically depressed, glabrous, dark green to black, 8–10 by 7 mm diam; stalk densely furfuraceous; seeds c. 1 mm long.

Distribution — Java (west) and Moluccas (Ceram).

Ecology & Habitat — Slope of secondary forest, edge of forest or mossy mountain forest between 1100–1600 m altitude.

Vernacular name — Harendong areuy (Sundanese: used for about every climbing *Melastomataceae*).

Note — *Creochiton bibracteatus* can easily be distinguished from the other species by the densely furfuraceous petioles, rounded to subcordate leave base, large, ovate to suborbicular leaves up to 12.5 cm long, below furfuraceous to floccose, and the densely stellate furfuraceous hypanthium. The axillary umbellate inflorescences and 8 equal stamens in this species are similar to *C. pudibundus* but it differs from the latter by being glabrous or with sparsely stellate hairs in most parts and by the coriaceous leaves. Previously the species was known only



Map 2 Distribution of *Creochiton bibracteatus* (●) and *C. pudibundus* (■).

as epiphytic shrubs or climbers in the western part of Java, but in 1917 one collection was made in Mautipass, Ceram, that is indistinguishable from the Java specimens (*Rutten 1970*, BO).

3. *Creochiton bracteatus* (Quisumb. & Merr.) Veldk. — Map 3

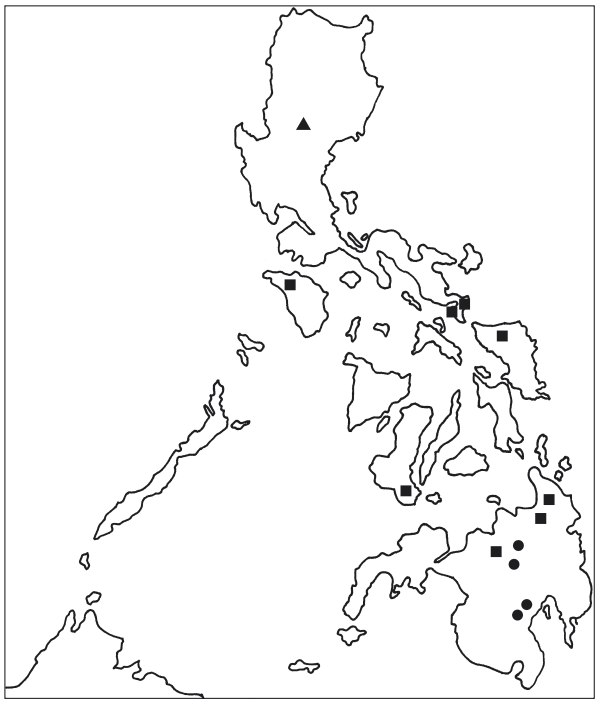
Creochiton bracteatus (Quisumb. & Merr.) Veldk. (1978) 438. — *Eisocreochiton bracteatus* Quisumb. & Merr. (1928) 177, pl. 4; M.P.Nayar (1970) 88 ('*bracteata*'). — Type: *Ramos & Edaño BS 45610* (holo PNH n.v., probably lost; iso BM, BO, K, NY, SING, US), Philippines, Luzon, Nueva Vizcaya Province, Mt Alzapan.

Climbers; branchlets terete, sparsely puberulous, 2 mm diam; nodes with an interpetiolary ridge. *Leaves* thin, ovate, apex acute or acuminate, base cuneate, glabrous above, glabrescent below midrib densely furfuraceous, 3.5–6 by 1.8–3.6 cm; nervation plinerved with two pairs of main nerves arising above the base; petiole densely stellate furfuraceous to floccose, 10–20 mm long. *Inflorescences* axillary, thyrsoid up to 4 cm long, 5-flowered; main axis angular, densely furfuraceous, 2–4 cm long; bracts elliptic, sparsely furfuraceous, 8–11 by 5–7 mm; bracteoles ovate to suborbicular, glabrous to sparsely furfuraceous, thin, 6–7 by 3–4 mm, enveloping the flower buds; pedicel densely stellate furfuraceous, 7–8 mm long. *Hypanthium* campanulate, sparsely stellate furfuraceous, 3–4 by 2–3 mm; calyx rim truncate with 4 shallow undulations, 0.3 mm long; petals ovate, apex acute, base rounded, 3–4 by 3 mm. *Stamens* 4, equal; filament flat, c. 3 mm long; anthers ellipsoid, 4–5 mm long; connective with a triangular crest, 0.75–1 mm long; lateral appendage paired, 0.8–1.5 mm long; ovary globose, glabrous, 2–3 mm long; style glabrous, c. 6 mm long; extra-ovarial chambers deep, half as long as the ovary. *Fruits* and seeds not seen.

Distribution — Philippines (Luzon), only known from the type.

Ecology & Habitat — Climbing on trees on forested slopes at 1700 m altitude.

Note — *Creochiton bracteatus* differs from all congeners by its densely furfuraceous to densely floccose petioles, 10–20 mm long, leaf base cuneate, underneath glabrescent (except midrib) and extra-ovarial chambers half as long as the ovary. Similar to *C. furfuraceus* by its 4 equal alternipetalous stamens, but differs by having glabrescent branchlets and underside of the leaves while the latter has densely furfuraceous branchlets and underside of the leaves. Its bracts and bracteoles are very distinct being large, thin, membranous, and veined. The bracteoles are also not concave and do not fully enclose the flower buds as in the other species.



Map 3 Distribution of *Creochiton bracteatus* (▲), *Creochiton dipterus* (■) and *Creochiton roseus* (●).

4. *Creochiton brevibracteatus* Mansf.

Creochiton brevibracteatus Mansf. (1925) 135. — Type: *Ledermann 8660* (holo B†), New Guinea, E Sepik, Aprilfluβ (April River), Standlager (Main Camp).

Liana; stem as thick as an arm, innovations terete, furfuraceous. *Leaves* ovate, rarely broadly elliptic, 5–7 by 3–4 cm, 5-nerved (excl. marginal nerves), base rounded, apex acute, dark green, above glabrous, below glabrous except for the prominent nerves, petiole 8–15 mm long, furfuraceous. *Inflorescences* paniculate, axillary, up to 5 cm long, incl. the 2 cm long peduncle, axes somewhat furfuraceous; pedicels 7 mm long, about glabrous; bracteoles hardly 1 mm long. *Hypanthium* glabrous, 4 mm long, hardly 4-dentate; petals 4, ovate, shortly before anthesis 5 mm long, white. *Stamens* 8, subequal, filaments 3 mm long, anthers 4 mm long, dorsal appendix 1.5 mm long. *Fruits* and seeds not seen.

Distribution — New Guinea (E Sepik).

Ecology & Habitat — Primary forest with many tree ferns, bamboos, small palms and *Selaginella* up to 1 m, at 100 m altitude.

Note — No specimens have been seen, and the description is after Mansfeld (1925). From this the species seem to differ from all congeners by: Petioles 8–15 mm long, densely furfuraceous. Leaves 5–7 by 3–4 cm wide, underneath glabrous (but for midrib). Inflorescence paniculate. Bracteoles partially covering the flower bud, 1 mm long. Hypanthium glabrous. The type was lost during the Second World War. The description agrees quite well with the Philippine *C. dipterus* which differs mainly by the possibly more pubescent leaves, 3-flowered cymes, bracteoles 5–7 mm long, hypanthium densely stellate furfuraceous, rim truncate with 4 0.3–0.5 mm long lobes.

5. *Creochiton dipterus* Elmer — Map 3

Creochiton dipterus Elmer (1911) 1192; (1939) 3659; Merr. (1923) 190. — Type: *Elmer 9813* (holo PNH n.v.; iso E, MO), Philippines, Negros, Negros Oriental Province, Dumaguete (Cuernos Mts).

Climbers, up to 25 m high; branchlets terete, glabrescent to sparsely brown furfuraceous; nodes thickened with interpetiolary ridge. *Leaves* coriaceous, ovate, apex acute to obtuse, base rounded or subcordate; glabrous above, yellowish green, glabrescent below, midrib densely furfuraceous, 4–7.5 by 2–4.5 cm; nervation plinerved with 1 pair of main nerves arising above the base; petiole densely furfuraceous, 5–17 mm long. *Inflorescences* axillary, a 3-flowered cyme, 1.5–2.5 cm long; main axis terete, densely furfuraceous, 2 cm long; bracts ovate, densely furfuraceous, veined, c. 3 mm long; bracteoles ovate, orbicular to oblong, thin, densely furfuraceous on both sides, veined, yellowish, half enveloping the flower buds, 5–7 by 2–5 mm; pedicel densely furfuraceous, 8–9 mm long. *Hypanthium* campanulate, densely stellate furfuraceous, yellowish green, 3–4 by 2 mm; calyx rim truncate with 4 small distinct lobes, 0.3–0.5 mm long; petals elliptic, apex rounded, 4–5 by 4 mm, white. *Stamens* 8, equal; filament flat, cream, 3–4 mm long; anther elongate, pinkish or purple, 4–5 mm long; connective with a sagittate crest, light cream, c. 1 mm long; lateral appendages absent; ovary 2–3 mm long, glabrous; style glabrous, pink, 9–11 mm long; extra-ovarial chambers not developed. *Fruits* globose, glabrous, c. 5 by 5 mm, green and turning red when ripe; seeds 0.5–0.7 mm long.

Distribution — Philippines (Luzon, Mindanao, Mindoro, Negros).

Ecology & Habitat — Primary or disturbed forest on ridge slope, between 450–1800 m altitude.

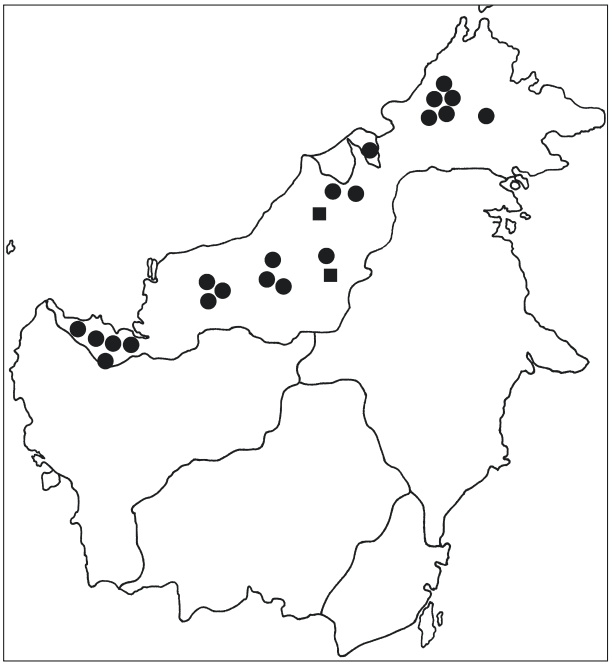
Vernacular name — Buyon-Buyon (Visayan).

Note — *Creochiton dipterus* is distinguished by its coriaceous leaves, underneath glabrescent (but for midrib), the umbellate 3-flowered inflorescence, thin, ovate, orbicular to oblong bracteoles which partially cover the flower bud, and the absence of extra-ovarial chambers. It resembles *C. ledermannii* by the shape of the leaves and fruits but differs by its glabrescent leaves, the single cyme and thin bracteoles, while the latter has densely tomentose leaves, umbellate inflorescences and coriaceous bracteoles. The shape of stamens is similar to *C. novoguineensis* but it differs by the shape and indument of the leaves.

6. *Creochiton furfuraceus* (M.P.Nayar) Veldk. — Map 4

Creochiton furfuraceus (M.P.Nayar) Veldk. (1978) 438. — *Eisocreochiton furfuraceus* M.P.Nayar (1970) 88, pl. 1 ('*furfuracea*'). — Type: *Jacobs 5293* (holo K n.v.; iso L; also in B, CANB, G, S, SAR, US, n.v.), Borneo, Sarawak, 3rd Div., Kapit District, Belaga Subdistrict, Rejang River.

Woody climbers; branchlets angular, becoming terete, densely puberulous with brown hairs; nodes thickened with an interpetiolary ridge. *Leaves* coriaceous, ovate to elliptic, apex acuminate, base rounded; glabrous above with stellate hairs on the midrib, below densely stellate furfuraceous, 4.5–7 by 2.5–3 cm; nervation plinerved with 1 pair of main nerves arising above the base; petiole densely covered with brown puberulous hairs, 8–11 mm long. *Inflorescences* axillary, thyrsoid, 3–10 cm long, with 10–35 flowers; main axis terete, densely stellate puberulous, 2–6 cm long; pedicel densely furfuraceous, 4–5 mm long; bracteoles coriaceous, ovate, concave, apex rounded, 5–6 by 3–4 mm, stellate furfuraceous on both sides, enveloping the flower buds. *Hypanthium* campanulate, 2.5 by 2 mm, stellate furfuraceous, pale brownish; calyx rim truncate; petals ovate, apex acute, base truncate, c. 2.5 by 2 mm, sordidly pink margined, centre white. *Stamens* 4, equal; filament flat, white, 1.5 mm long; anthers elongate, curved, 2 mm long, pale green; connective with a triangular crest, c. 0.75 mm long, lateral appendages paired, c. 0.7 mm long; ovary c. 2 mm long, glabrous, 4-ridged at the top; style glabrous, pinkish, 2–2.5 mm long; extra-ovarial chambers shallow, 1/5 as long as the ovary. *Fruits* globose, stellate furfuraceous, 5 by 5 mm diam; seeds 0.7–0.8 mm long.



Map 4 Distribution of *Creochiton furfuraceus* (■) and *C. monticola* (●).

Distribution — Borneo (Sarawak).

Ecology & Habitat — Primary forest on sandstone substratum hills at below 500 m altitude.

Note — *Creochiton furfuraceus* can be distinguished by its dense furfuraceous indument in most parts, axillary thyrsoid inflorescences with 10–35 flowers, coriaceous bracteoles and 4 equal stamens. It is similar to *C. bracteatus* by having 4 equal stamens and the shape of the anthers but differs by a less dense indument on most parts, smaller inflorescences with only c. 5 flowers, large and thin bracteoles and deep extra-ovarial chambers.

7. *Creochiton ledermannii* Mansf. — Map 5

Creochiton ledermannii Mansf. (1925) 135. — Lectotype (designated here): *Ledermann 12943* (holo B†; iso L), New Guinea, Sepikgebiet, Felsspitze.
Creochiton ledermannii Mansf. var. *turbinatus* auct. non J.F.Maxwell: J.F. Maxwell (1981) 323, quoad paratypi.

Epiphytes or climbers, 2–3 m height; branchlets terete, densely furfuraceous to floccose; nodes thickened with an interpetiolary ridge. *Leaves* coriaceous, obovate, apex retuse, base rounded to cuneate; glabrous above, dark green, densely tomentose below, midrib densely furfuraceous, glossy and paler green, 3.4–4 by 2.4–3 cm; nervation plinerved with 1 pair of main nerves arising from above the base; petiole densely furfuraceous, 2–6 mm long. *Inflorescences* axillary, up to 6 cm long, umbellate with 3 flowers; main axis terete, densely furfuraceous, 2.7 cm long; bracts elliptic, glabrous, 12 by 3 mm; bracteoles coriaceous, orbicular or ovate, concave, glabrous outside, densely furfuraceous inside, enveloping the flower buds, whitish, 4–8 by 6 mm, whitish; pedicel glabrescent to sparsely furfuraceous, 7–18 mm long. *Hypanthium* urceolate, sparsely to densely stellate furfuraceous, 3 by 2 mm, teeth triangular, c. 0.5 mm long; petals elliptic, 3–4.2 by 2 mm, red-purplish. *Stamens* 8, equal; filament flat, 2–2.5 mm long; anthers elongate, 2–3 mm long; connective with a triangular crest, 1.5 mm long; lateral appendages absent; ovary globose, 1.5–1.8 mm long, glabrous; style glabrous, c. 5 mm long; extra-ovarial chambers shallow, c. 1/5 as long as the ovary. *Fruits* subglobose, glabrous to puberulous, greenish white, 4–7 by 4 mm diam; seeds c. 0.5 mm long.

Distribution — New Guinea.

Ecology & Habitat — Rainforest on river bank 200–250 m altitude.

Vernacular name — Apunengapok (Waskuk).

Note — Characteristics of *C. ledermannii* are the retuse apex leaf, axillary umbellate 3-flowered inflorescences, bracteoles coriaceous and concave, hypanthium urceolate, calyx rim distinctly truncate, and 8 equal stamens. It differs from *C. turbinatus* by its dense indument and retuse leaf apex, while the latter is less pubescent with an acute leaf apex. The shape of the stamens is similar to *C. pudibundus*, but this differs by the sparsely puberulous leaves, glabrous petioles and bracteoles, absence of extra-ovarial chambers, and the subglobose fruits. The paratypes of *C. turbinatus* (*Hoogland & Craven 10735*, *Docters van Leeuwen 10382*) were regarded to belong here.

8. *Creochiton monticola* (Ridl.) Veldk. — Map 4

Creochiton monticola (Ridl.) Veldk. (1978) 433; Veldk. & M.P. Nayar (1978) 438. — *Anplectrum monticola* Ridl. (1946) 31. — *Eisocreochiton monticola* (Ridl.) M.P.Nayar (1970) 89, pl. 2. — Type: *Brooks 50* (holo K n.v.; iso BO), Borneo, Sarawak, Mt Ben Kajan.
Creochiton kinabaluensis Heine (1953) 214. — Lectotype (designated here): *Clemens 32646 = 33951* (holo M; iso A n.v., BM, BO, K, L), Borneo, Mt Kinabalu, Mt Nungkok.

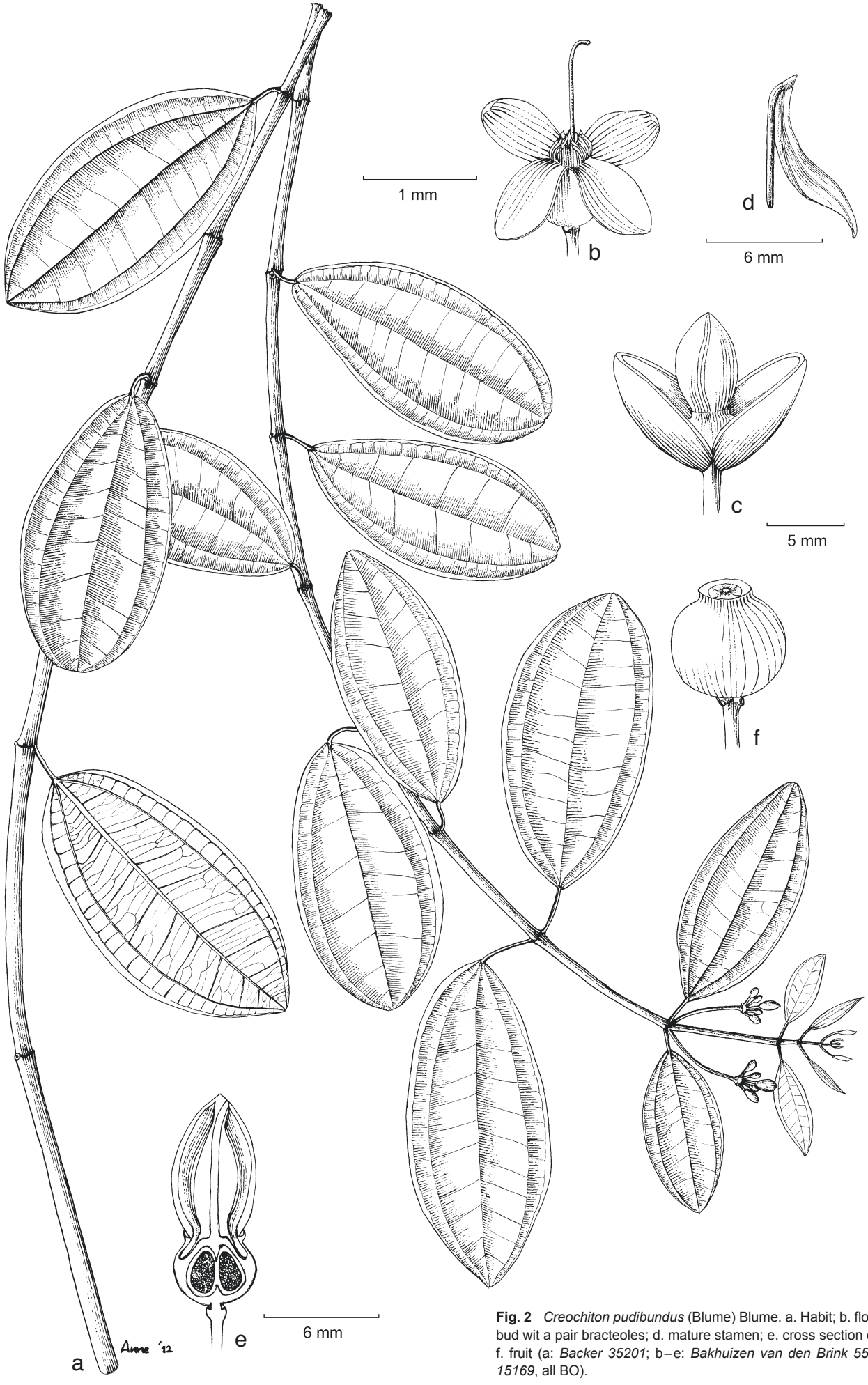


Fig. 2 *Creochiton pudibundus* (Blume) Blume. a. Habit; b. flower; c. flower bud wit a pair bracteoles; d. mature stamen; e. cross section of flower bud; f. fruit (a: *Backer 35201*; b–e: *Bakhuizen van den Brink 5524*; f: *Backer 15169*, all BO).

Climbers, often epiphytic, up to 30 m tall; branchlets angular becoming terete, furfuraceous. *Leaves* coriaceous, elliptic, apex acute to retuse, base cuneate; glabrous on both sides, 2–4.5 by 1.4–2.6 cm; with 1–2 pairs of main nerves arising from above the base; petiole glabrous to furfuraceous, 3–5 mm long. *Inflorescences* axillary, up to 3.5 cm long, paniculate, 4–10-flowered; main axis angular, stellate furfuraceous, 1.5–2.5 cm long; bracts ovate, glabrous, veined, 5–7 by 4 mm; bracteoles thin, pale, obovate, glabrous to sparsely furfuraceous on both sides, veined, 3–7 by 3.4 mm, enveloping the flower buds; pedicel furfuraceous, 2 mm long. *Hypanthium* campanulate, glabrous to sparsely furfuraceous, green, pink, 2–2.5 by 2 mm; calyx rim truncate with 4 shallow undulations; petals oblong to lanceolate, apex acute, c. 4 by 2.5 mm, cream to pink or reddish. *Stamens* 8, unequal, the alternipetalous ones: filaments flat, 2–2.5 mm long; anther elongate, red, c. 2.5 mm long; connective with a triangular crest, 1–1.5 mm long; lateral appendages paired, c. 0.5 mm long; the oppositipetalous ones: filament flat, 1.5 mm long; anthers c. 1.5 mm long, bent; connective with spur-like crest, 0.5 mm long; lateral appendages ligulate, c. 0.75 mm long or absent; ovary globose, glabrous, 1–1.5 mm long; style glabrous, c. 5 mm long; extra-ovarial chambers shallow, about 1/5 as long as the ovary. *Fruits* subglobose, glabrous, whitish, yellowish green, or purple when mature, 2–5 by 1–5 mm diam; seeds 0.75 mm long.

Distribution — Borneo (Sabah, Sarawak).

Ecology & Habitat — Mountain forest between 820–2000 m altitude.

Note — *Creochiton monticola* is easily recognized by its small leaves (< 4.5 cm long), glabrous underneath, axillary paniculate inflorescences and obovate bracteoles. Morphologically it cannot be mistaken for *C. anomalus* which has densely tomentose leaves, acute base, terminal inflorescences with thin bracteoles which partially cover the flower bud, and long extra-ovarial chambers (about half as long as the ovary). The stamens differ by the oppositipetalous ones having lateral appendages c. 1–1.5 mm long while they are 0.5–0.75 mm long or absent in the latter.

9. *Creochiton novoguineensis* (Baker f.) Veldk. & M.P.Nayar — Map 5

Creochiton novoguineensis (Baker f.) Veldk. & M.P.Nayar (Veldkamp 1978) 438. — *Dissochaeta novoguineensis* Baker f. (1923) 21; Mansf. (1925) 114. — Lectotype (Veldkamp 1978): *Forbes 708* (holo BM; iso BM, E, K, L), New Guinea, Central District, Sogeri Region, Mt Wori-Wori.

Creochiton divitiflorus Mansf. (1925) 135. — Type: *Ledermann 9576* (holo B n.v.; iso L), New Guinea, East Sepik District, Etappenberg.

Creochiton schlechteri Mansf. (1925) 134. — Type: *Schlechter 19234* (holo B n.v., iso S), New Guinea, Kaiser Wilhelmsland, Jaduna.

Epiphytes or woody climbers, up to 20 m tall; branchlets terete, glabrous to furfuraceous, young ones more or less densely furfuraceous, up to 5 mm diam; nodes thickened. *Leaves* coriaceous, elliptic to oblong, apex acute, base cuneate; glabrous, dark green above, pale green below, midrib below brown furfuraceous, 7.2–13 by 2.4–6 cm; nervation with 1–2 pairs of main nerves arising above the base close to the margin; petiole sparsely furfuraceous, 10–13 mm long. *Inflorescences* axillary, umbellate to paniculate, up to 14 cm long, up to 35 flowers; main axis terete, furfuraceous; bracteoles coriaceous, obovate, glabrous outside, sparsely stellate furfuraceous inside, white or yellowish, 3–7 by 2–3 mm, enveloping the flower buds. *Hypanthium* campanulate, light green, sparsely stellate furfuraceous, 3–5 by 2–3 mm; calyx rim truncate, with distinct undulations, 1 mm long; petals elliptic, apex acuminate, creamy, white or pinkish, c. 9 by 6 mm. *Stamens* 8, equal; filament flat, 3–4 mm long; anthers elongate, purplish, 4–5 mm long; connective with a sagittate crest, 0.5–1 mm long; lateral appendages absent; ovary glabrous, top concave, 2–3 mm long; style glabrous, c. 6 mm long; extra-ovarial chambers not developed. *Fruits* subglobose, glabrous, 5–6 mm long, dark red turning bluish purple or black; seeds c. 0.7 mm long.

Distribution — New Guinea.

Ecology & Habitat — Ridge forest between 175–2000 m altitude.

Vernacular name — Marendekan (Wagau).

Note — *Creochiton novoguineensis* differs from all congeners by: petioles 10–13 mm long, sparsely furfuraceous, leaves 7.2–13 cm long, base cuneate, underneath glabrous (but for midrib). Inflorescence paniculate, many-flowered, bracteoles completely covering the flower bud, 3–7 mm long, fleshy, and hypanthium sparsely stellate furfuraceous. Similar to *C. ledermannii* in the shape of 8 equal stamens, but differs in the shape of leaves and inflorescences. *Creochiton novoguineensis* has oblong glabrous leaves and paniculate inflorescences, while *C. ledermannii* has obovate leaves underneath densely tomentose and umbellate inflorescences. Contrary to the other species in New Guinea, *C. novoguineensis* has no developed extra-ovarial chambers. The leaves of this species sometimes have basal lateral main nerves close to the margin of the leaf (*Aet & Idjan 296*).

10. *Creochiton pudibundus* (Blume) Blume — Fig. 2, Map 2

Creochiton pudibundus (Blume) Blume (1831a) 506; (1831b) 248; Naudin (1852) 154; Miq. (1855) 560; Triana (1871) 85; Cogn. (1891) 604; Krasser (1893) 178, f. 77b; Koord. (1912) 693; (1923) 212; Bakh.f. (1943) 309; (1963) 363. — *Melastoma pudibundum* Blume (1823) 71; (1826) 1071; DC. (1828) 148. — *Diplectria pudibunda* (Blume) Kuntze (1891) 246, nom. inval. prov. — Lectotype (designated here): *Blume s.n.* (holo L, sh. no. 908.129–971; iso BO, L sh. 908.129–904, -911, -932, -961, -981, -991, -993), Java, G. Salak, Cicelebak.

Creochiton pudibundus (Blume) Blume var. *coriaceus* Naudin (1852) 154; Miq. (1855) 560. — Type: *Zollinger 3196* (holo G n.v.; iso L), Java.

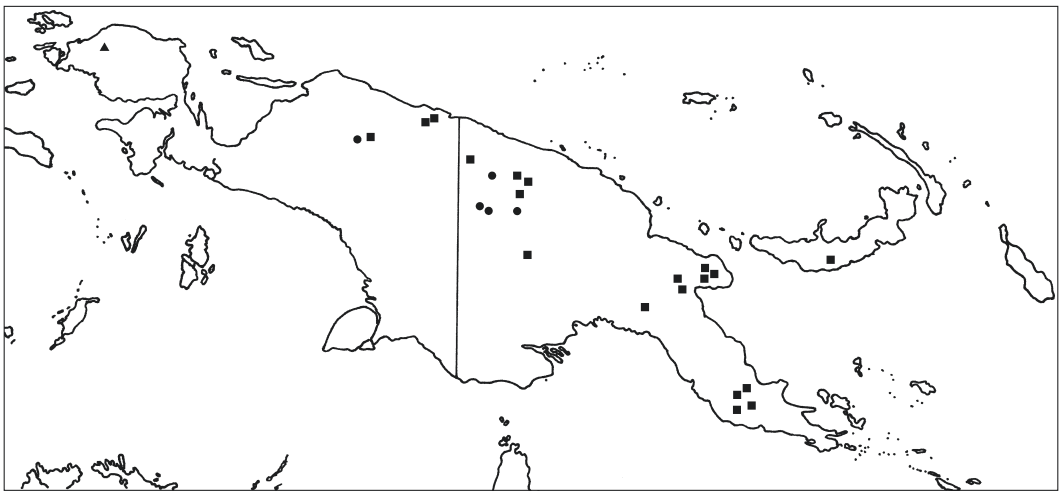
Creochiton emarginatus Miq. (1855) 561. — Type: *Junghuhn s.n.* (holo U, sh. 000543; iso L, sh. 908.129-952), Java, Pengalengan.

Epiphytes, up to 1 m high, or climbers, c. 30 m high; branchlets terete, glabrous to sparsely furfuraceous, 4.5–6.5 mm diam; nodes thickened with an interpetiolary ridge. *Leaves* coriaceous, ovate to elliptic, apex acute, base rounded or cuneate, glabrous above, midrib sunken above, sparsely puberulous to furfuraceous below, 7–10 by 3.7–5.8 cm; nervation plinerved with 2 pairs of main nerves arising from above the base; petiole glabrous to puberulous, terete, 8–15 mm long. *Inflorescences* axillary, umbellate with 4–7 flowers, 3–5 cm long; main axis terete, puberulous, 1.5–3 cm long; bracts ovate, densely stellate hairy, 2–3 mm long; bracteoles glabrous, obovate, cream, concave, enveloping the flower bud, 7–10 by 4–5 mm; pedicel sparsely stellate furfuraceous, 5 mm long. Flower bud c. 11 by 10 mm. *Hypanthium* campanulate, glabrous, rather angular, 2–4 by 2–3 mm; calyx rim truncate with 4 undulations, c. 0.5 mm long; petals ovate, violet or red, glabrous, 6–13 by 6–7 mm. *Stamens* 8, equal; filament flat, 7 mm long; anther elongate, 5–7 mm long; connective with a triangular crest, 0.5–1 mm long; lateral appendages absent; ovary globose, glabrous, c. 3 by 2 mm; style glabrous, curved when mature, c. 10 mm long; extra-ovarial chambers not developed. *Fruits* globose, glabrous, white, 3–5 by 4–6 mm; stalk glabrous 1.5–1.7 cm long; seeds 0.7–0.75 mm long.

Distribution — Java (west) and Celebes (southwest, southeast).

Ecology & Habitat — Edge of primary or secondary forest, edge of river or on a mountain slope between 1000–1400 m altitude.

Vernacular name — Caluncung, Harendong areuy (Sundanese for about any climbing *Melastomataceae*), Harendong areuy putih, Harendong areuy merah.



Map 5 Distribution of *Creochiton ledermannii* (●), *Creochiton novoguineensis* (■) and *Creochiton turbinatus* (▲).

Note — *Creochiton pudibundus* is easily recognized by its coriaceous ovate to elliptic glabrous leaves, underneath sparsely puberulous to densely furfuraceous, axillary umbellate inflorescences, coriaceous, concave bracteoles. Similar to *C. bibracteatus* in the axillary umbellate inflorescence, number and shape of the stamens, but differs in the shape and indument of the leaves which in *C. bibracteatus* are thin, ovate and densely tomentose. *Creochiton ledermannii* differs by the small leaves with a retuse apex and a more dense indument. Apparently not collected in Java after *Bakhuizen 5524* (13 June 1922).

11. *Creochiton roseus* Merr. — Map 3

Creochiton roseus Merr. (1905) 32; (1923) 191. — Type: *Copeland 1297* (holo PNH n.v., probably lost; iso K, NY, US), Philippines, Mindanao, Davao District, Todaya.

Woody climbers, up to 6 m tall; branchlets terete, sparsely furfuraceous, distally floccose, 2–3 mm diam; nodes thickened with an interpetiolary ridge. *Leaves* thin to subcoriaceous, ovate to elliptic, apex acute, base rounded to cuneate; above glabrous, below glabrescent, midrib densely furfuraceous, 6.2–9 by 3.2–4.5 cm; nervation plinerved with 1–2 pairs of main nerves arising from above the base; petiole densely furfuraceous, 1.5–2 cm long. *Inflorescences* axillary, 2–3 cm long, umbellate to paniculate, 3–5-flowered; main axis densely furfuraceous, 1–2.5 cm long; bracts not seen; bracteoles subcoriaceous, obovate to elliptic, veined, apex rounded, glabrous outside, densely stellate furfuraceous inside, enveloping the flower buds, 6–12 by 4–6 mm; pedicel 0.5–1 cm long. *Hypanthium* campanulate or urceolate, densely stellate furfuraceous, 3–5 by 2–3 mm; calyx rim truncate; petals elliptic, apex obtuse c. 7 by 3–4 mm, bluish pink. *Stamens* 8, equal; filament flat, greenish, 4–4.5 mm long; anthers elongate, yellow, 4.5–5 mm long; connective with a triangular crest, purple, c. 1 mm long; lateral appendages absent; ovary 3–4 mm long, glabrous, apex concave; style glabrous, greenish, 8–9 mm long; extra-ovarial chambers not developed. *Fruits* globose, depressed, 6–7 by 8–10 mm, green, glabrous; seeds 0.8–1 mm long.

Distribution — Philippines (Mindanao).

Ecology & Habitat — Primary forest between 800–1200 m altitude.

Vernacular name — Isag (Baguio).

Note — *Creochiton roseus* is distinguished by its floccose branchlets, 3–5-flowered inflorescences, densely stellate furfuraceous hypanthium with a completely truncate calyx rim. *Creochiton dipterus* differs by the coriaceous leaves, and 4 small distinct teeth on the rim of the calyx. Another Philippine species, *C. bracteatus*, has thin bracteoles and only 4 stamens.

12. *Creochiton turbinatus* (J.F.Maxwell) Karton., *comb. & stat. nov.* — Map 5

Creochiton ledermannii Mansf. var. *turbinatus* J.F.Maxwell, Gard. Bull. Singapore 33 (1981) 323, t. 7, quoad typus. — Type: *BW 12260* (*Schram*) (holo L; iso BO; also in A, BRI, CANB, K, LAE, MAN n.v.), New Guinea, E of Sorong, Warsamson Valley, Asbakin.

Epiphytes; branchlets terete, glabrescent, innovations densely furfuraceous; nodes thickened with an interpetiolary ridge. *Leaves* coriaceous, ovate, apex acute, base rounded, above glabrous, light green, below glabrescent midrib densely furfuraceous, 4–6 by 2.2–3.1 cm; nervation plinerved with 1 pair of main nerves arising from above the base; petiole densely furfuraceous, 3–5 mm long. *Inflorescences* axillary, up to 5 cm long, umbellate, 2–5-flowered; main axis terete, densely furfuraceous; bracts ovate, glabrescent, c. 2 by 1 mm; bracteoles coriaceous, orbicular, concave, glabrous, enveloping the flower buds, yellowish green, 5–7 by 3–4 mm; pedicel densely furfuraceous, 5–10 mm long. *Hypanthium* campanulate, glabrescent, 2–3 by 2 mm, calyx rim truncate; petals elliptic, 2–3 by 2 mm. *Stamens* 8, equal; filament flat, c. 2 mm long; anthers elongate, 2–3 mm long; connective with a triangular crest, 1 mm long; lateral appendages absent; ovary globose, 1–1.4 mm long, glabrous; style glabrous, c. 4 mm long; extra-ovarial chambers shallow, c. 1/5 as long as the ovary. *Fruits* globose, glabrous, green, 4–6 by 3–4 mm diam, turbinate with 8 distinct lines; seeds c. 0.5 mm long.

Distribution — New Guinea (Vogelkop).

Ecology & Habitat — Primary forest on humid sandy clay inundated in the wet season, riverbank, between 50–150 m altitude.

Vernacular name — Apunengapok (Waskuk).

Note — *Creochiton turbinatus* differs from all congeners by: petioles 3–5 mm long, leaves ovate, 2.2–3.1 cm wide, base rounded, apex acute, underneath glabrescent (but for midrib). The inflorescences are umbellate with orbicular bracteoles which completely cover the flower bud, 5–7 mm long, fleshy, glabrous. It differs from *C. ledermannii* by having glabrescent leaves with an acute apex, and the turbinate fruits. The umbellate inflorescences of *C. turbinatus* are not 3-, but 5-flowered. This species is only known from the type collected near Sorong in Indonesian New Guinea. The paratypes (*Hoogland & Craven 10735*, *Docters van Leeuwen 10382*) belong to *C. ledermannii*, because the leaves are densely tomentose and have a retuse apex.

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INDEX TO SPECIMENS CITED

Unnumbered and anonymous collections have not been included.

Creochiton					
ano	=	*anomalus*	nov	=	*novoguineensis*
bib	=	*bibracteatus*	pud	=	*pudibundus*
bra	=	*bracteatus*	ros	=	*roseus*
bre	=	*brevibracteatus*	tur	=	*turbinatus*
dip	=	*dipterus*	(LT)	=	lectotype
fur	=	*furfuraceus*	(ST)	=	syntype
led	=	*ledermannii*	(T)	=	type
mon	=	*monticola*	(n.v.)	=	cited in literature but not seen by us

Aet & Idjan 296: nov.
Backer 5617: bib; 10623: bib; 15169: pud; 21533: pud; 25976: pud; 35201: pud – Bakhuizen van den Brink 5524: pud; 7304: bib – Brooks 50 (T): mon – Bruggeman 272: bib – BS 8104 (Merrill): ros; 11640 (Ramos n.v.): dip; 24661 (Amarillas n.v.): dip; 38878 (Ramos & Edaño): ros; 45610 (Ramos & Edaño) (T): bra – Burkill 1792: ano – Buwalda 6431: ano – BW 12260 (Schram; T): tur.
Carr 12728: nov; 15173: nov – Clemens 1116: nov; 1427: nov; 6427: nov; 28616: mon; 28616A: mon; 30389 (A n.v.): mon; 32646 = 33951 (LT): mon; 34455 (ST): mon – Coode & Ferguson 7537: mon – Copeland 1297 (T): ros – Craven & Schodde 1449: nov – Curran 7280 (n.v.): dip.
De Vriese 40: bib; 42: pud; 61: bib; 73: pud; 74: pud; 91: bib; 94: pud – Docters van Leeuwen 9915: nov; 10382: led.
Elmer 9813 (T n.v.): dip; 10563: ros; 14119: dip; 16671: dip – Everett 7280 (n.v.): dip.
FB 19069 (Ramos & Edaño n.v.): dip – Forbes 708 (LT): nov; 809 (ST): nov.
Hassan & Kadim 13: ano – Hoogland & Craven 10735: led.
Jacobs 5293 (T): fur.
King's Collector 1619: pud; 2637: pud; 5779 (T): ano – Koorders 24251: pud; 25873: bib; 25907: bib.
LAE 53969 (Streimann): nov; 54749 (Stevens & Martin): nov – Ledermann 8660 (T): bre; 9576: nov; 12640 (ST n.v.): led; 12943 (LT): led.
NGF 8144 (Gray): nov; 21596 (Sayers): nov; 26480 (Frodin): nov; 28989 (Streimann & Katik): nov; 47207 (Johns): nov; 48158 (Foreman & Kumul): nov.
PNH 2642 (Sulit): dip; 9924 (Sulit): ros; 41952 (Mendoza): dip.
Rutten 1970: bib.
S. 14384 (Othman b. Haron): mon; 16371 (Ilias Paie): mon; 22128 (Sibat ak Luang): mon; 25865 (Ilias Paie): mon; 29293 (Ilias Paie): mon; 35814 (Chai): fur; 36332 (Ilias Paie): mon; 38875 (B. Lee): mon; 40739 (Ilias Paie): mon; 41199 (Ilias Paie): mon; 41645 (Ilias Paie): mon; 45870 (Dyg. Awa & I. Paie): mon; 46770 (Dyg. Awa & P.I. Yii): mon; 58254 (Yii & Abu Talib): mon – SAN 46777 (Mikil) (n.v.): mon; 57814 (Iban Gibot): mon; 87181 (Madani): mon – Sapei 91: bib – Schlechter 19234 (T n.v.): nov – SF 30876 (Corner): ano – SMHI 1162 (Ridsdale): dip.
Takeuchi 5257: nov; 6100: led.
Uchida 73: bib.
Van Royen & Sleumer 6064: nov; 6365: nov – Van Steenis 1154: bib.
Whitmore 400: ano.
Zollinger 3009 (T): bib; 3196: pud.