GROUP A: FERNS

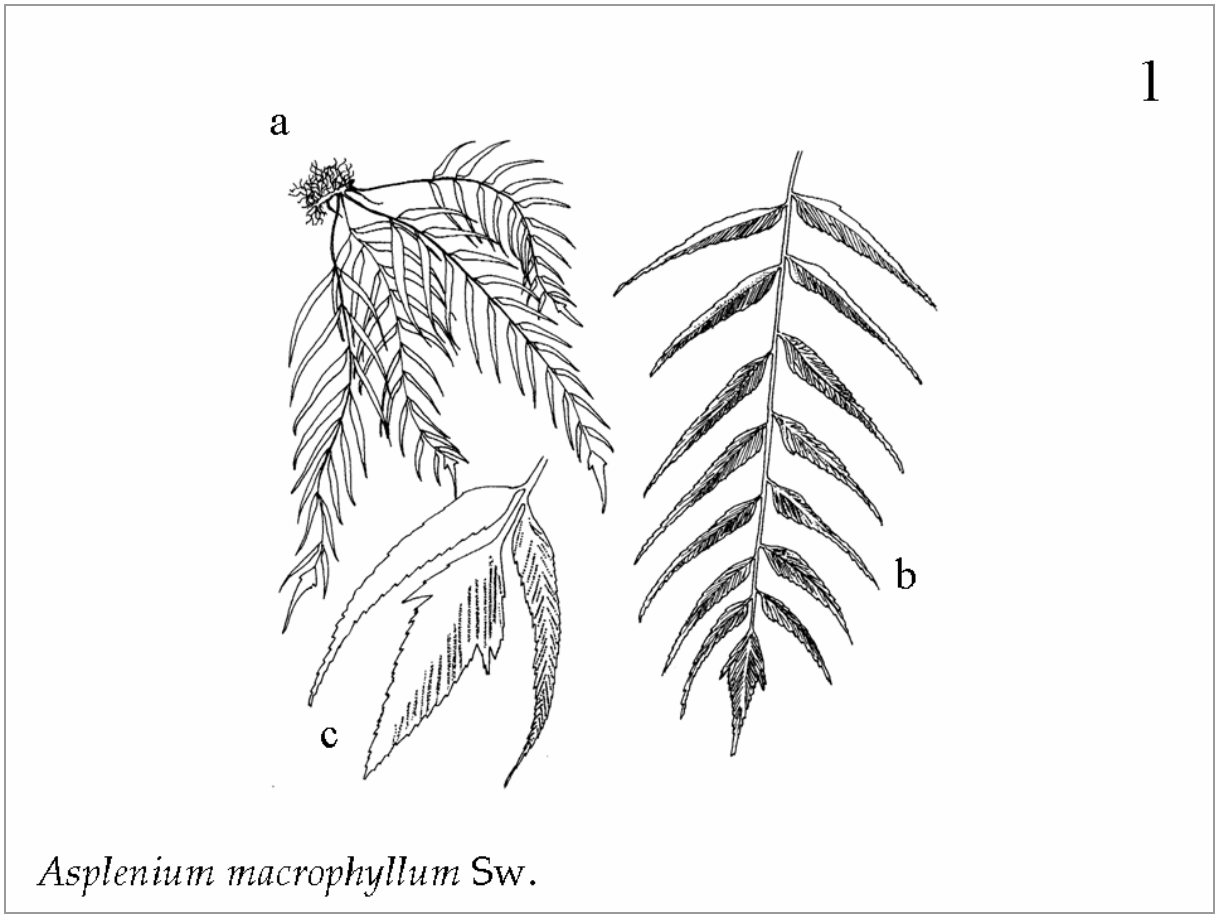

Fig. 1. *Asplenium macrophyllum* Sw. (a) Habit, (b) fertile frond, (c) detail of fertile frond showing the sporangia.

ASPLENIACEAE

1

***Asplenium macrophyllum* Sw.**

Synonyms : *Asplenium adiantioides* C.Chr., *Asplenium canaliculatum* Bl., *Asplenium falcatum* Lamk., *Asplenium oxyphyllum* Cuming, *Asplenium polyodon* Forst., *Asplenium simile* Bl., *Tarachia. canaliculata* Presl., *Tarachia falcata, Tarachia oxyphylla* Presl.

Vernacular name(s) : Unknown.

Description : Epiphytic fern, 15-80 cm tall, with a short, creeping rhizome, bearing a tuft of fronds. The leaf stalks are rather slender and almost black when dry, up to about 20 cm long. Leaves are 20-50 cm long, 10-20 cm wide, and have one set of leaflets at the base. Veins are very obliquely slanted, once or twice-forked, and hardly visible on the upper surface. The sori (containing the spores) are long, often stretching almost from the base to the end of the veins. The spores themselves are dark. A highly variable species.

Ecology : Usually occurs on rocks, especially on limestone, from sea level up to an altitude of 1,700 m, on moderately to very shaded sites. Spores are borne all year round. Mangrove associate species.

Distribution : Occurs from Madagascar throughout Southeast Asia to Australia and Polynesia. In a northerly direction, its range stretches to Assam, India.

Abundance : Relatively common.

Use(s) : Unknown.

Source of illustration : Piggott (1988).

Reference(s) : Backer & Posthumus (1939), Holttum (1966), Piggott & Piggott (1988).

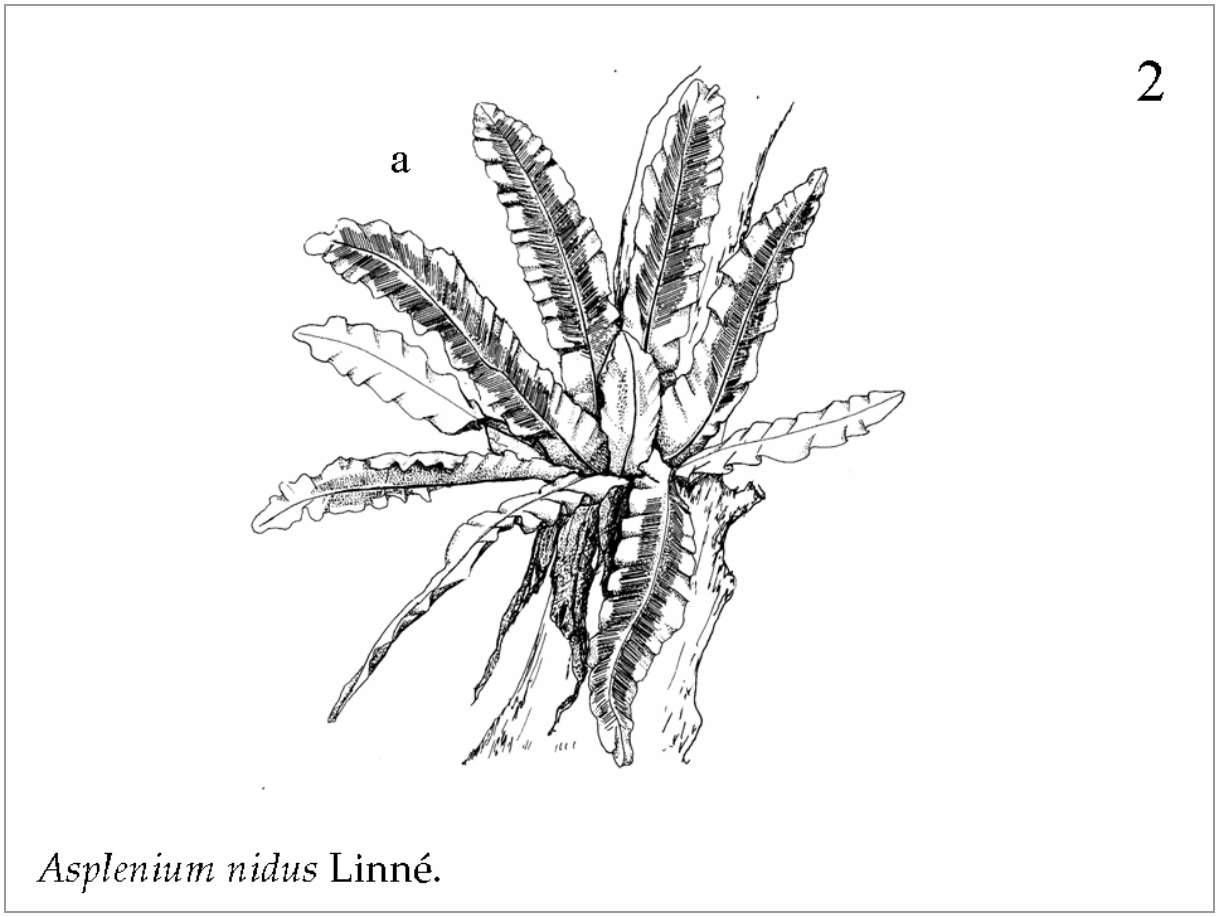

Fig. 2. *Asplenium nidus* Linné. Entire plant, with some leaves upturned showing the sporangia underneath.

ASPLENIACEAE

2

***Asplenium nidus* Linné**

Synonyms : *Asplenium antiquum* Makino, *Asplenium australiasicum* (J.Sm.) Hook., *Asplenium filicifolium* Goldm., *Asplenium pachyphyllum*, *Neottopteris maritania* Fée, *Neottopteris musaefolia* J.Sm., *Neottopteris nidus* (L.) J.Sm., *Neottopteris rigida* Fée, *Phyllitis arborea* Rumph., *Thamnopteris nidus* Presl., *Thamnopteris pachyphylla*

Vernacular name(s) : Bird's-nest Fern (E), Paku Pandan (Mal.), Matonda, Tutu pupu - *Paku sarang burung* (Ind.)

Description : Epiphytic fern with a stout, erect rhizome, bearing a rosette of leaves at the top. The plant has a large mass of roots, with many persistent, brown root hairs. The leaf stalks are stout and almost black, up to 5 cm long. The leaf is simple, up to 150 cm or more long and up to 20 cm wide. It narrows gradually, tapering both towards the pointed tip and towards the base. The veins are usually once-forked, sometimes twice-forked; the first forking is often near the midrib. Veins are straight, slightly at an angle to the midrib, and unite to form a continuous vein about 0.5 mm from the margin. The sori (containing the spores) are narrow, and occur on every vein of the top half of the frond. Spores are light brown, transparent when fresh and opaque when old.

Ecology : The nest-shaped rosette of fronds traps dead leaves that are held firmly between the bases of successive new leaves. This forms a spongy humus, which is effective in holding a lot of water after rains. Other epiphytes share this water, growing on *Asplenium. Nidus*' roots or on the tree beneath them. Occurs from sea level up to an altitude of about 1,700 m. It is particularly common above 250m altitude. Occurs in shaded and not too dry localities. Mangrove associate species.

Distribution : Tropics of the Old World. Found throughout Southeast Asia.

Abundance : Abundant.

Use(s) : Common pot plant (Europe) and garden ornamental (tropics). It's leaves – in combination with rasped coconut – are used a shampoo.

Source of illustration : Live specimen & Sastrapradja *et al.* (1979).

Reference(s) : Backer & Posthumus (1939), Heyne (1950), Holttum (1966), Piggott & Piggott (1988).

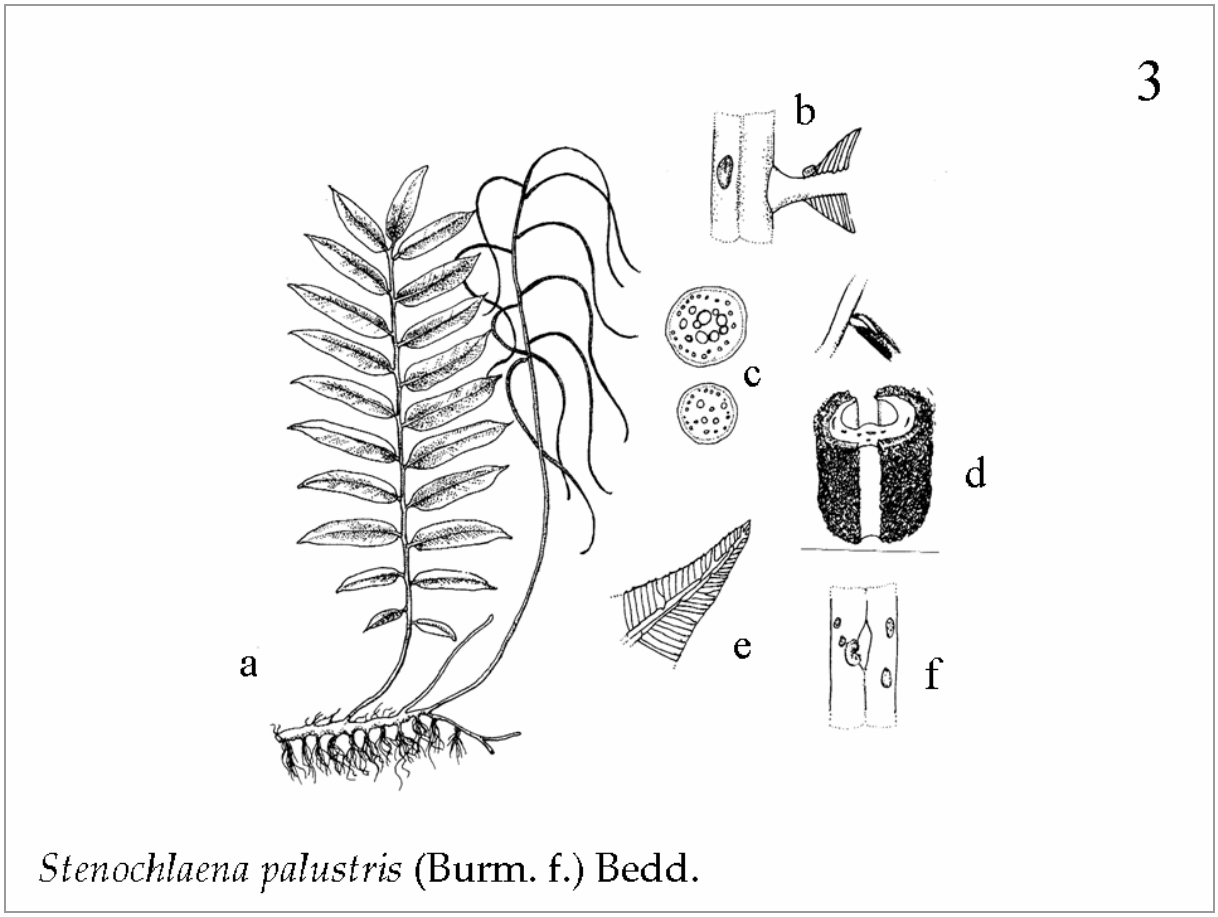

Fig. 3. *Stenochlaena palustris* (Burm. f.) Bedd. (a) Sterile (left) and fertile leaf frond (right), (b) detail of gland at the base of each leaflet, (c) cross-sections of stem, (d) cross section of fertile leaflet covered with sporangia, (e) detail of tip of sterile leaflet, and (f) detail of grooved leaf axis.

BLECHNACEAE

3

***Stenochlaena palustris* (Burm. f.) Bedd.**

Synonyms : *Acrostichum palustre* (Burm.f.) C.B. Clarke, *Acrostichum scandens* (Sw.) Hook., *Lomaria scandens* (Sw.) Willd., *Lomariopsis palustris* (Burm.f.) Kuhn, *Lomariopsis scandens* (Sw.) Mett., *Lonchitis volubilis* Rumph., *Olfersia scandens* (Willd.) C. Presl., *Onoclea scandens* Sw., *Polypodium palustre* Burm.f., *Pteris scandens* (Willd.) Roxb., *Stenochlaena scandens* (Sw.) J.Sm., *Thelypteris palustris* (A.Gray) Schott.

Vernacular names : Paku midung, Paku akar, Paku naga, Paku ramu (Mal.), Akar Pakis, Lemiding, Melat, Miding, Paku Ramiding, Paku Hurang, Pakis Bang, Bampesu, Lambideing – *Paku hurang* (Ind.), Choại (Viet.)

Description : Ground fern with a creeping or climbing, up to 10 m-long, green rhizome that is scale-less when mature. Only the growing end is covered with overlapping, round to shield-shaped, brown scales. The 15-20 cm-long leaf stalks are well-spaced on the rhizome and are smooth and hairless except when they are very young. The leaf axis is slightly grooved on the upper surface. Mature leaves are particularly stiff, leathery and dark green, while young leaves are pale reddish-green. There are two types of leaf frond: sterile and fertile. Both types are 40-80 cm long, and have 8-15 pairs of leaflets and one terminal leaflet. The upper leaflets are somewhat reduced in size. The lateral leaflets usually have ear-like lobes, but this is absent in the terminal leaflet. The sterile fronds are smooth and glossy, and paler underneath; they have narrowly elliptical and short-stalked leaflets. Although varying much in size and shape, they are commonly about 15 by 3 cm. Their edges are colourless and sharply toothed. There is a gland present on the edge of each leaflet, close to the base. The fertile fronds have narrowly linear leaflets, measuring about 20 cm by 3 mm, and their lower surface is covered with sporangia except for narrow marginal bands. The spores have a 2-sided symmetry, are colourless and transparent.

Ecology : Occurs everywhere in the lowlands, in open places and secondary forests where there is enough moisture, in both brackish- and freshwater. Most common in (peat-)swamp forests. As a climber, it can densely festoon a tree, for example in areas where the forest canopy has been disturbed. Mangrove associate species.

Distribution : Occurs from India through Southeast Asia (where it is found throughout) to Polynesia and Australia.

Abundance : Common and abundant.

Use(s) : A very durable rope can be made from the stems, that reportedly is more durable in seawater than rattan. The young ‘reddish’ leaves are eaten as a vegetable and sold on local markets in Indonesia.

Source of illustration : Backer & Posthumus (1939), Sastrapradja *et al.* (1979), Piggott (1988).

Reference(s) : Heyne (1950), Holttum (1966), Piggott (1988), Said (1990)

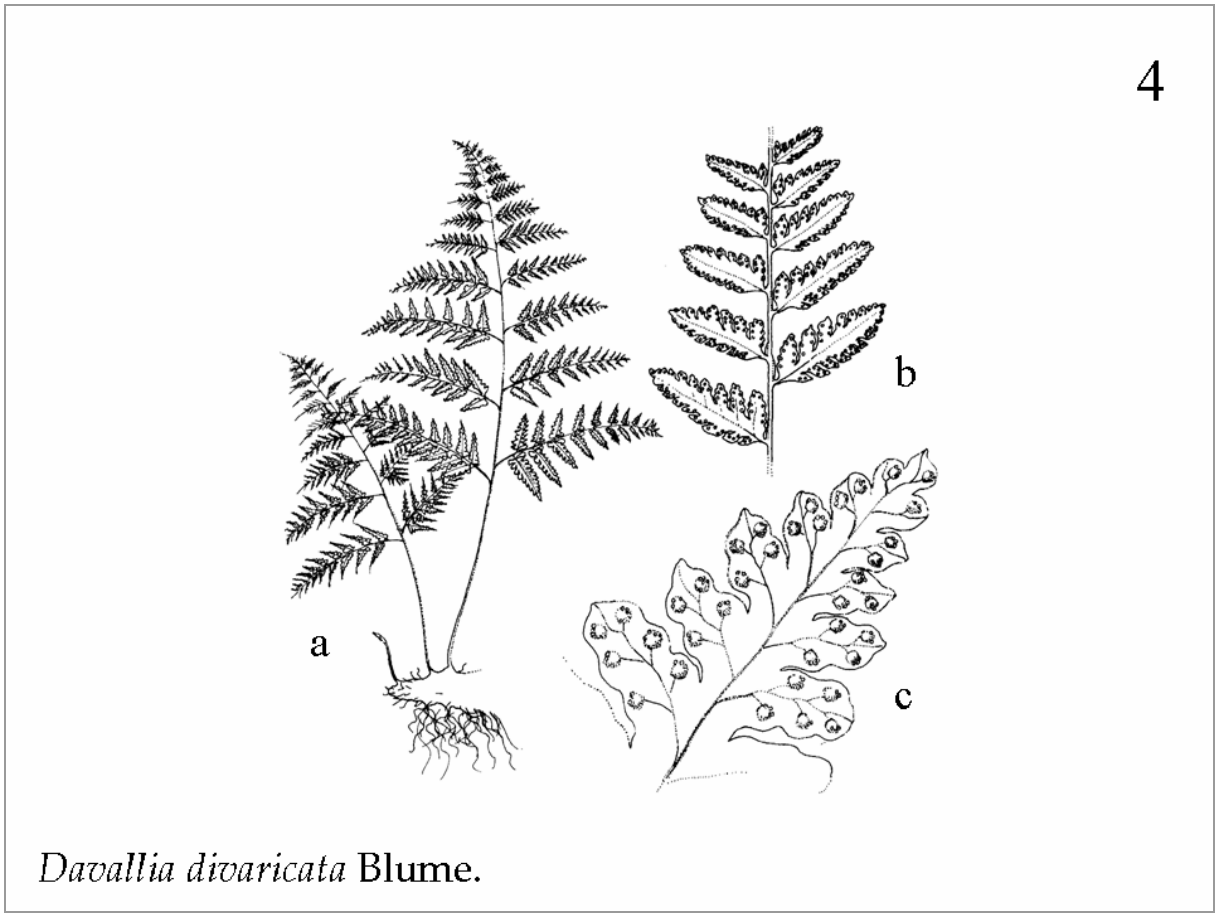

Fig. 4. *Davallia divaricata* Blume. (a) Habit, (b) detail of fertile frond, (c) detail of a single fertile leaflet depicting round sporangia at the end of each vein.

DAVALLIACEAE

4

***Davallia divaricata* Blume**

Synonyms : *Araiostegia davaricata* (Blume) M. Kato, *Davalia mucronata* Bl., *Davalia polyantha* Hook.

Vernacular name(s) : Hare's Foot Fern (E)

Description : Epiphytic fern with compound leaves. Rhizome stout, densely covered with thin, brown scales that are about 1-2 cm long and up to 2 mm or more wide. Leaf stalks are stout, 15-60 cm long and smooth. The large, up to 60 cm-long leaves are broadly triangular, bifurcating four times, each time into smaller leaflets. Leaves are dark crimson when young. Sterile and fertile leaves are different. Lobes of sterile leaflets are elliptic, entire to shallowly toothed; when dry, they discolour to a dark reddish-brown. Lobes of fertile leaflets are elliptic-oblong, and deeply lobed with an undulating margin. The sori (clusters of spores) are located on the tip of each vein.

Ecology : Grows both in shaded forests as well in agricultural areas. In Peninsular Malaysia this species has been collected at several localities in mountainous areas at 700-1,300 m elevation. In Java it is reported to occur from lowland to 1,300 m. Usually collected on rocky substrates, but it is probably equally abundant as an epiphyte on trees. Mangroves associate species.

Distribution : Southeast Asian species, recorded from Southern China, Myanmar, Thailand, Peninsular Malaysia and Indonesia (Java).

Abundance : Common.

Use(s) : Unknown.

Source of illustration : Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), Piggott (1988).

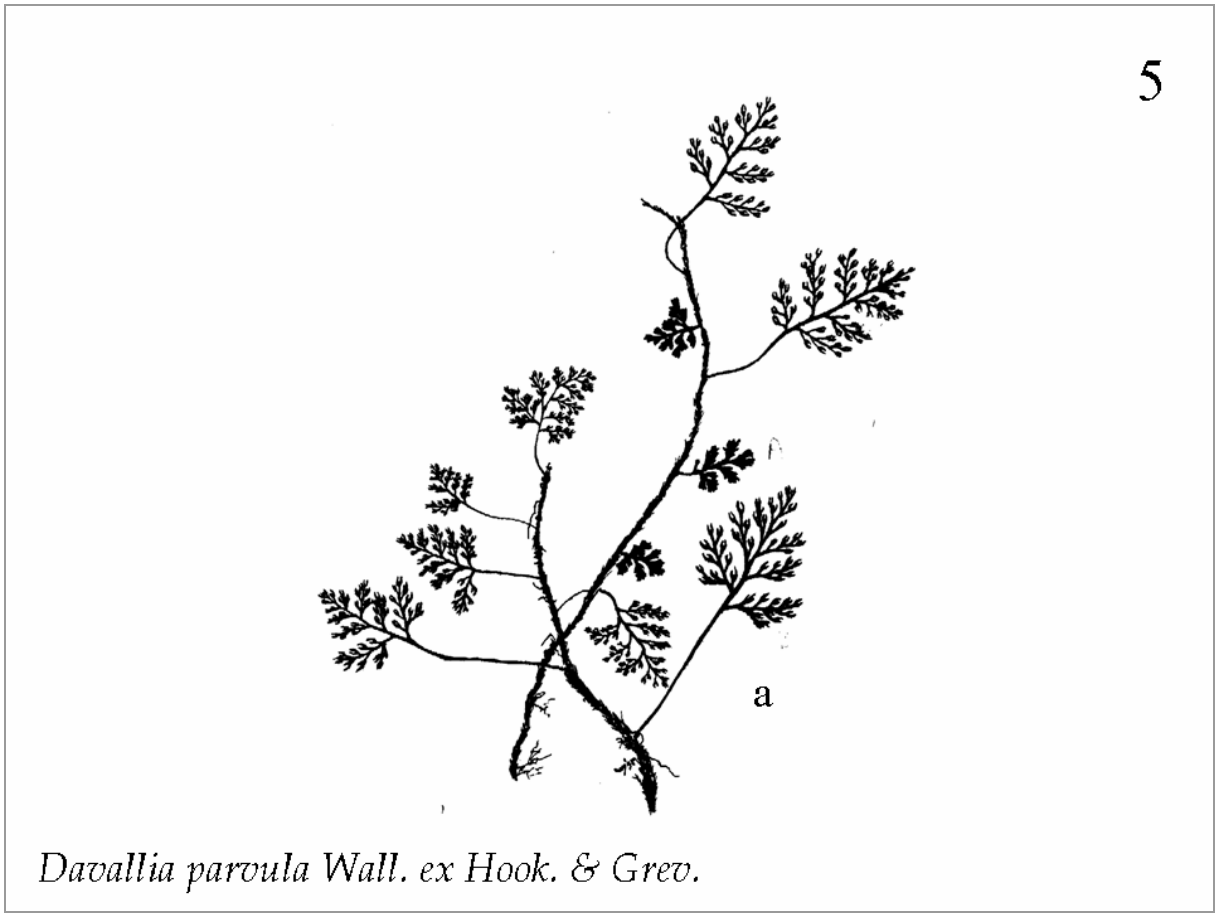

Fig. 5. *Davallia parvula* Wall. ex Hook. & Grev. (a) Habit.

DAVALLIAVEAE

5

***Davallia parvula* Wall. ex Hook. & Grev.**

Synonyms : *Acrophorus parvula* Bedd., *Davallia parvula* Wall., *Humata parvula* (Wall.) Mett., *Leucostegia parvula* J. Sm.

Vernacular name(s) : Paku Lumut Batu (Mal.)

Description : Epiphytic fern with simple, but deeply-lobed leaves. Rhizomes are very slender, only a little over 1 mm in diameter. Leaves are about 0.5-1.0 cm apart. Scales on the rhizome are chestnut-brown with a slightly paler, entire edge, about 3 mm long, and are narrowed evenly from the heart-shaped base to the pointed tip. Leaf stalks are very slender, 1-3 cm long. Leaves are up to 2.5 cm long and 2.5 cm wide. They are narrowly triangular in shape, with the blade so deeply dissected as to leave only a very narrow wing along each vein. Sori (containing the spores) are borne at the base of the terminal fork in the leaf blade, with the (usually unequal) arms of the fork extending beyond the sorus by 1-1.5 mm.

Ecology : Occurs on old, mossy mangrove trees. Mangrove associate species.

Distribution : Southeast Asian species, recorded from Peninsular Malaysia and Indonesia (Bogor Herbarium has specimens from Borneo, Sumatra, Sulawesi, Papua and the Moluccas). Not (yet) confirmed from Java.

Abundance : Relatively common.

Use(s) : Unknown.

Source of illustration : Drawn from herbarium specimen, Bogor Herbarium.

References : Holttum (1966), http://www.sdfern.com/ferncat.htm

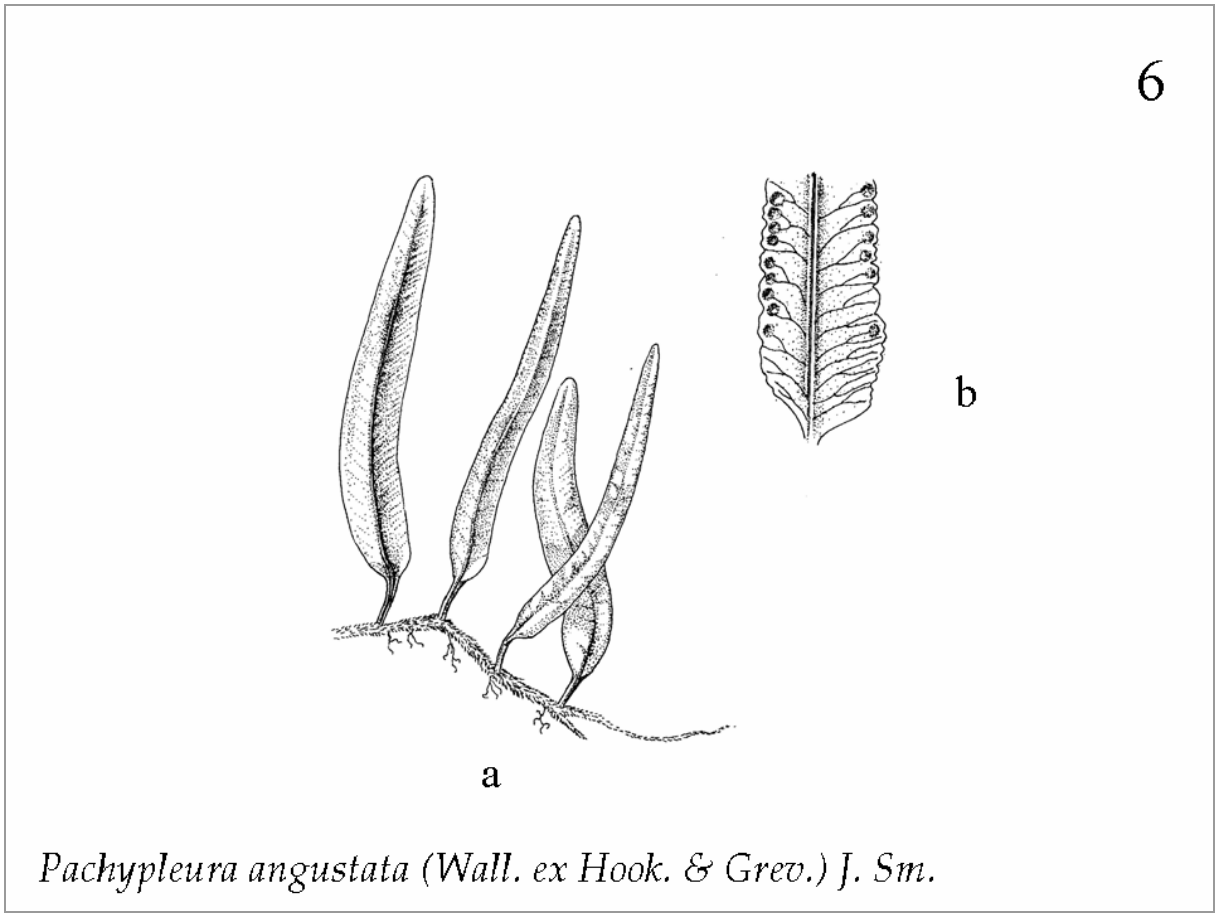

Fig. 6. *Pachypleuria angustata* (Wall. ex Hook. & Grev.) J. Sm. (a) Habit: end of creeping frond, (b) detail of fertile leaflet depicting sporangia at the end of each vein.

DAVALLIACEAE

6

***Pachypleuria angustata* (Wall. ex Hook. & Grev.) J. Sm.**

Synonym(s) : *Davallia angustata* Wall., *Humata angustata* (Wall.) J.Sm., *Humata angustata* (Wall. ex Hook. & Grev.) J.Sm.

Vernacular name(s) : Unknown.

Description : Epiphytic fern. The rhizome is slender, long and creeping, covered with chestnut-brown scales. The scales are about 5 mm long, and are evenly-narrowed from base (about 1 mm wide) to tip, with entire edges. Leaves occur about 1-2 cm apart. There are two types of leaf: sterile and fertile, and both have an undivided, simple structure. Leaf stalks are 0.5-6 cm long and deeply grooved. Leaf blades are leathery, about 10-20 cm long; sterile leaves are 2 cm wide, while fertile leaves are wider. The leaf-base is unequal, always slightly extending down the stalk. Leaves are gradually narrowed up to the blunt tip. Edges of sterile leaves are rather irregularly toothed, with one tooth located opposite the end of each vein. Leaf-edges are sometimes slightly and irregularly lobed. Veins are not prominent but visible on both leaf surfaces, emerging nearly at a right angle to the midrib, and are usually once-forked in sterile leaf fronds. Veins are somewhat more widely spaced in fertile than in sterile leaves. Sori (containing the spores) occur at the end of each vein, while teeth along the edge of the leaf are notched opposite each sorus. This sometimes gives the appearance that the teeth (or small lobes) occur between the sori.

Ecology : Common epiphyte in mangroves. Occurs in lowlands along forest streams, and on mossy rocks and fallen trees in the hills. Unlike *Humata heterophylla*, this species does not occur in exposed places. Mangrove associate species.

Distributions : Southeast Asian species, recorded from Peninsular Malaysia, Thailand and Indonesia (Sumatra).

Abundance : Unknown.

Use(s) : Unknown.

Source of illustration : Holttum (1966)

References : Holttum (1966), Piggott (1988), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

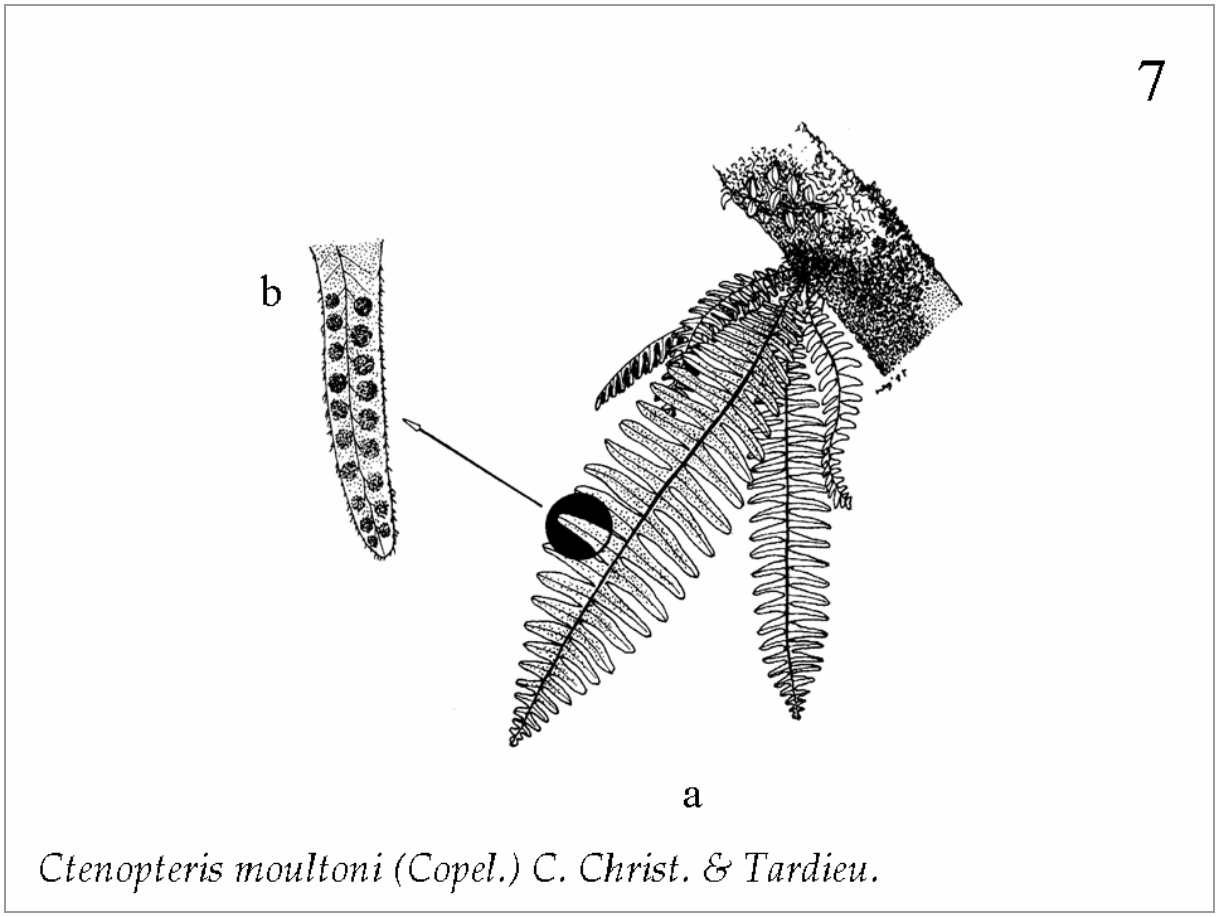

Fig. 7. *Ctenopteris moultoni* (Copel.) C. Christ. & Tardieu. (a) Habit, (b) detail of fertile leaflet depicting the sporangia.

GRAMMITIDACEAE

7

***Ctenopteris moultoni* (Copel.) C. Christ. & Tardieu**

Synonyms : *Ctenopteris moultoni (Copel.)* Hollt., *Polypodium decorum, Polypodium moultoni* Copel.

Vernacular name(s) : Unknown.

Description : Epiphytic fern with a short rhizome, creeping or nearly erect, with a densely scaly tip. Scales are light brown, 3 mm long, narrowed evenly to a blunt tip. The leaf stalk is about 5 mm long, almost black, and bears hairs. Leaves are about 10-20 cm long, 1-2.5 cm wide, with a dark midrib and a blade that is narrowed gradually to both base and tip. Leaflets bear scattered, stiff, star-shaped hairs on the lower surface, and have entire leaf edges that extend almost at right angles to the midrib. Leaflets are attached to the midrib by the whole of their (broad) bases, that virtually touch each other and are 3-4 mm wide. Sori (containing the spores) are located in shallow depressions, with about eight occurring on each side of the midrib of a leaflet. The sori are (almost) round and each individual sorus extends nearly from midrib to the edge of the leaflet.

Ecology : Occurs in lowlands, on trees in old mangroves and along rivers in primary forest. It is also found on trees and rocks on various isolated mountains. Mangrove associate species.

Distribution : Southeast Asian species, recorded in Thailand, Peninsular Malaysia and Western Indonesia (Borneo, Sumatra).

Abundance : Common.

Use(s) : Unknown.

Source of illustration : Holttum (1966).

Reference : Holttum (1966), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

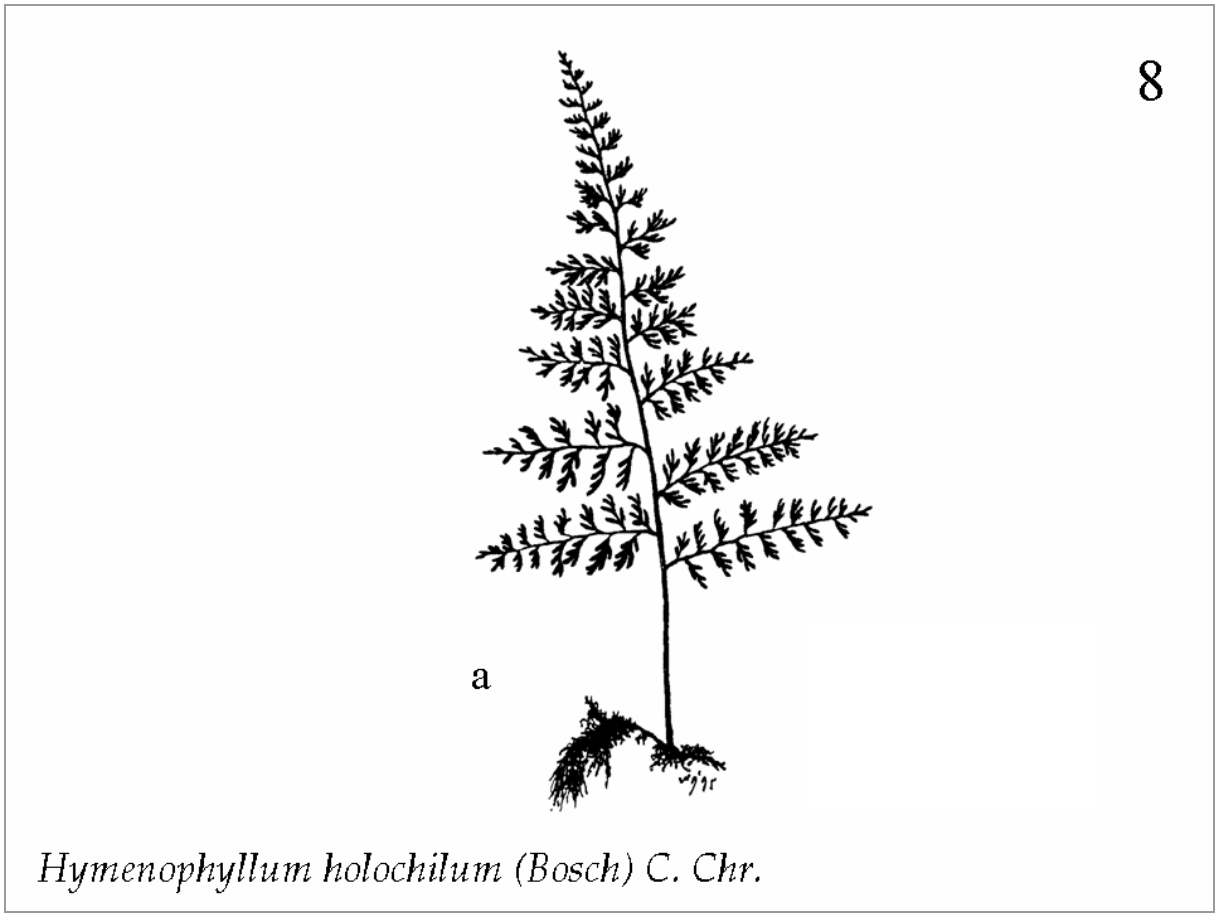

Fig. 8. *Hymenophyllum holochilum* (Bosch) C. Chr. (a) Habit.

HYMENOPHYLLACEAE 8

***Hymenophyllum holochilum* (Bosch) C. Chr.**

Synonyms : *Didymoglossum affine* v.d.B., *Didymoglossum holochilum* Bosch, *Hymenophyllum smithii* Hook, *Leptocionium affine* v.d. B., *Leptocionium holochilum* (Bosch) Bosch, *Meringium holochilum* (Bosch) Copel.

Vernacular name(s) : Unknown.

Description : An epiphyte or rock-plant, with long, creeping, hairy rhizomes. Leaf stalks 1-4 cm long, bearing scattered hairs, and usually narrowly winged in the upper part. Leaves are divided into leaflets, 4-10 cm long and 2.5-4 cm wide. The leaf axis is hairy on the lower surface and usually winged. Leaflets lie close to the leaf axis, and the largest leaflets have 4-6 lobes on each side. These lobes are forked or sometimes divided into three parts, the outer segments of which are about 1 mm wide with sharply toothed edges. Sori (containing spores) occur towards the tips of the leaflet lobes. The base of the sori are hollow, inversely conical, more or less winged, with 1-3 low, longitudinal ridges (sometimes ending in hairs) at the base on the lower surface.

Ecology : Widely distributed in lowlands, especially along rivers, in well-developed mangroves and on trees in freshwater swamp forest. Occurs from sea level up to an altitude of 2,100 m, in shaded, moist forests. Mangrove associate species.

Distribution : Found from Southeast to Southern China, Taiwan and Southeast Asia. It is widely distributed in Thailand, Malaysia and Indonesia (Sumatra, Java, Kalimantan, Sulawesi, the Moluccas, the Lesser Sundas and Papua). Highly likely to occur in Cambodia, Vietnam and Papua New Guinea.

Abundance : Common.

Use(s) : Unknown.

Source of illustration : Drawn from herbarium specimen, Bogor Herbarium.

References : Backer & Posthumus (1939), Holttum (1966), Johnson (1977), http://mobot.mobot.org/W3T/Search/index/focaH.html (Flora of China), http://www.geocities.com/fernparadise/Hymenophyllaceae/Hymeno.html

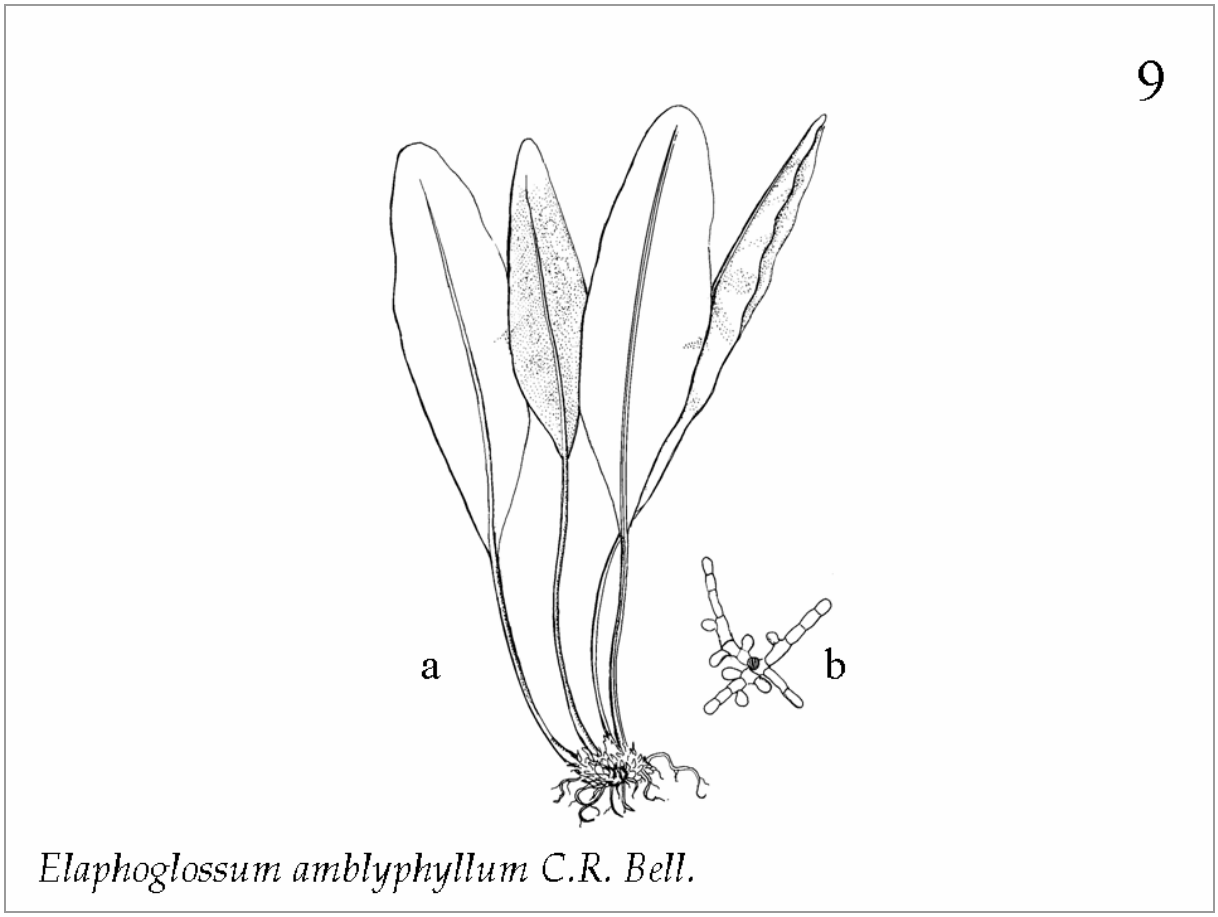

Fig. 9. *Elaphoglossum amblyphyllum* C.R. Bell. (a) Habit, and (b) detail of germinating spore.

LOMARIOPSIDACEAE

9

***Elaphoglossum amblyphyllum* C.R. Bell.**

Synonyms : *Acrostichum decurrens* (*non* Desv.) Bl., *Acrostichum obtusifolium* (*non* Willd.) Bl., *Elaphoglossum decurrens* Moore, *Elaphoglossum obtusifolium* Bell., *Olfersia blumeana* Presl., *Olfersia decurrens* Presl.

Vernacular name(s) : Unknown.

Description : Epiphytic, or more rarely a ground-dwelling fern. Creeping rhizome with pale brown scales that are 10-12 mm long and 2 mm wide at base, with edges that are more or less hairy. Leaves are simple and have an entire leaf edge. Sterile leaves have a 7-15 cm-long stalk and a leathery blade, measuring up to 29 by 8.5 cm. Leaves have broadly rounded tips, and a distinctly pale edge. Fertile fronds have leaf stalks that measure 20 cm, and a leaf blade that measures up to 20 by 4 cm. Rhizomes are short.

Ecology : Epiphyte or ground-dwelling fern, occurring in shaded, moist sites, on old (mangrove) trees and steep, moist riverbanks, at altitudes of 0-800 m. Mangrove associate species.

Distribution : Southeast Asian species, recorded from Brunei, Malaysia (Peninsular and Sarawak) and Indonesia (Sumatra, Java, Borneo, the Moluccas).

Abundance : Relatively common.

Use(s) : Unknown.

Source of illustration : Holttum (1978).

References : Backer & Posthumus (1939), Holttum (1978).

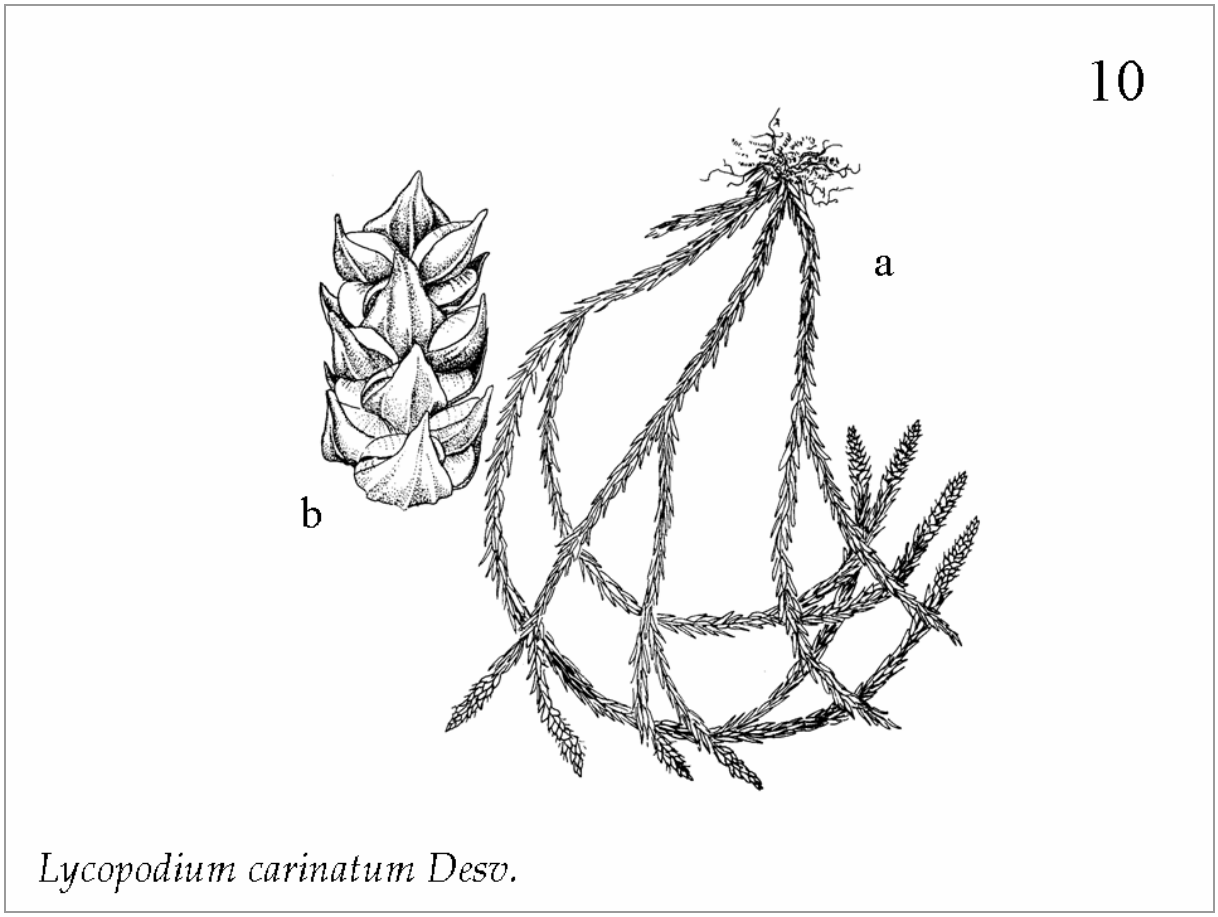

Fig. 10. *Lycopodium carinatum* Desv. (a) Habit, and (b) detail of spore-bearing end of leaflet.

LYCOPODIACEAE

10

***Lycopodium carinatum* Desv**.

Synonyms: *Huperzia carinata* (Desv. ex Poir.) Trevis., *Lycopodium laxum* Spring., *Phlegmariurus carinatus* (Desv.) Ching., *Urostachys carinatus* (Desv.) Herter ex Nesse.

Vernacular name(s): Wolfsklauw (NL), Kumpai Lubang – *Paku kawat* (Ind.)

Description: Epiphytic fern, with hanging, 0.1-1 m-long, dichotomously branching stems. Leaves are closely, spirally arranged in groups of three, more or less concave, or flat with a slight keel on the lower side, 6-19 mm long. Sori (bearing the spores) occur in terminal spikes that may be up to 25 cm long.

Ecology: Epiphyte, growing from sea level up to an altitude of 1,000 m, on trunks of trees, both in natural forests such as mangroves, and in cultivated areas. Mangrove associate species.

Distribution: Pan-tropical species, found throughout Southeast Asia.

Abundance: Common.

Use(s): Planted as an ornamental. People in Java have been reported to use an extract of the plant to stimulate hair growth. Reportedly difficult to propagate artificially.

Source of illustration : Sastrapradja *et al.* (1979)

Reference(s): Backer & Posthumus (1939), Heyne (1950), Sastrapradja *et al.* (1979)

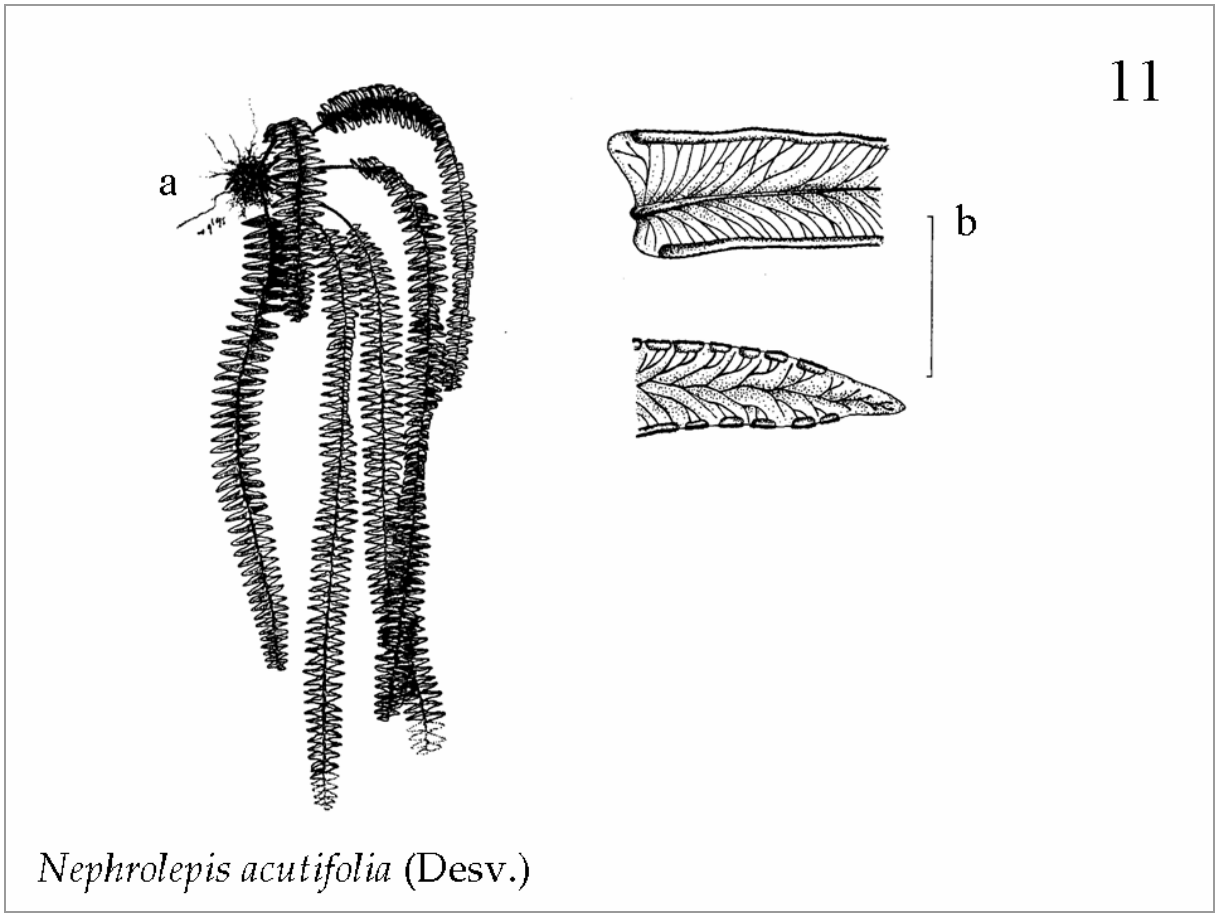

Fig. 11. *Nephrolepis acutifolia* (Desv.) H. Christ. (a) Habit and (b) detail of fertile leaflet.

NEPHROLEPIDACEAE

11

***Nephrolepis acutifolia* (Desv.) H. Christ.**

Synonyms : *Isoloma lanuginosa* Sm., *Lindsaya acutifolia* Desv., *Lindsaya lanuginosa* Wall. ex Hook.

Vernacular name(s) : Unknown.

Descriptions : Epiphytic fern. The rhizome is long, and creeps along on tree trunks. It has a dense tuft of leaves and a compact, scaly tip. It is covered with dark brown scales and has short hairs along the edges, especially at the base. Leaf stalks are up to 30 cm long and are densely scaly when young. Leaves bear leaflets at the base, and have a densely scaly midrib with very narrow, hair-like scales. The leaf blade is up to 100 cm or more long and 12 cm wide. Leaflets are very numerous and inserted at right angles to the midrib. Fertile leaves are much narrower than the sterile ones, and are densely covered with brown hairs on both surfaces when young. Later they are more or less smooth on the upper surface. Fertile leaflets measure up to about 7 by 1 cm, and are relatively more widened and equal at the base than sterile leaflets. Sterile leaflets measure up to about 6 by 1.5 cm, and have a slightly leathery texture. Leaf veins are usually once-forked. The sori (containing the spores) are located in the continuous groove along the underside of the margins of the leaflets. Towards the end of the leaf, the sori may end abruptly.

Ecology : An epiphyte on old trees, especially on mangroves, but it may also occasionally be found on oil palm. In Indonesia it is rarely recorded outside coastal areas, although it has once been recorded at 200 m above sea level. Spores are formed all year round. Mangrove associate species.

Distribution : Found from Tropical Africa through Southeast Asia to northern Australia (Northern Territory, Queensland) and Polynesia. In Southeast Asia recorded in Thailand, Cambodia, Vietnam, Malaysia, Indonesia (Java, Borneo).

Abundance : Locally common, but reportedly rare in Indonesia (once found in West Java in the early 1800s; further collected in Central Java [Nusa Kambangan] and Kutai, East Borneo).

Use(s) : Unknown.

Source of illustration : Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), Piggott (1988), Missouri Botanical garden TROPICOS database (http://mobot.mobot.org/, http://www.mekonginfo.org/ http://www23.brinkster.com/fernsiam/Nephrolepidaceae/Neph.html, http://www.anbg.gov.au/apni/apniN.html;

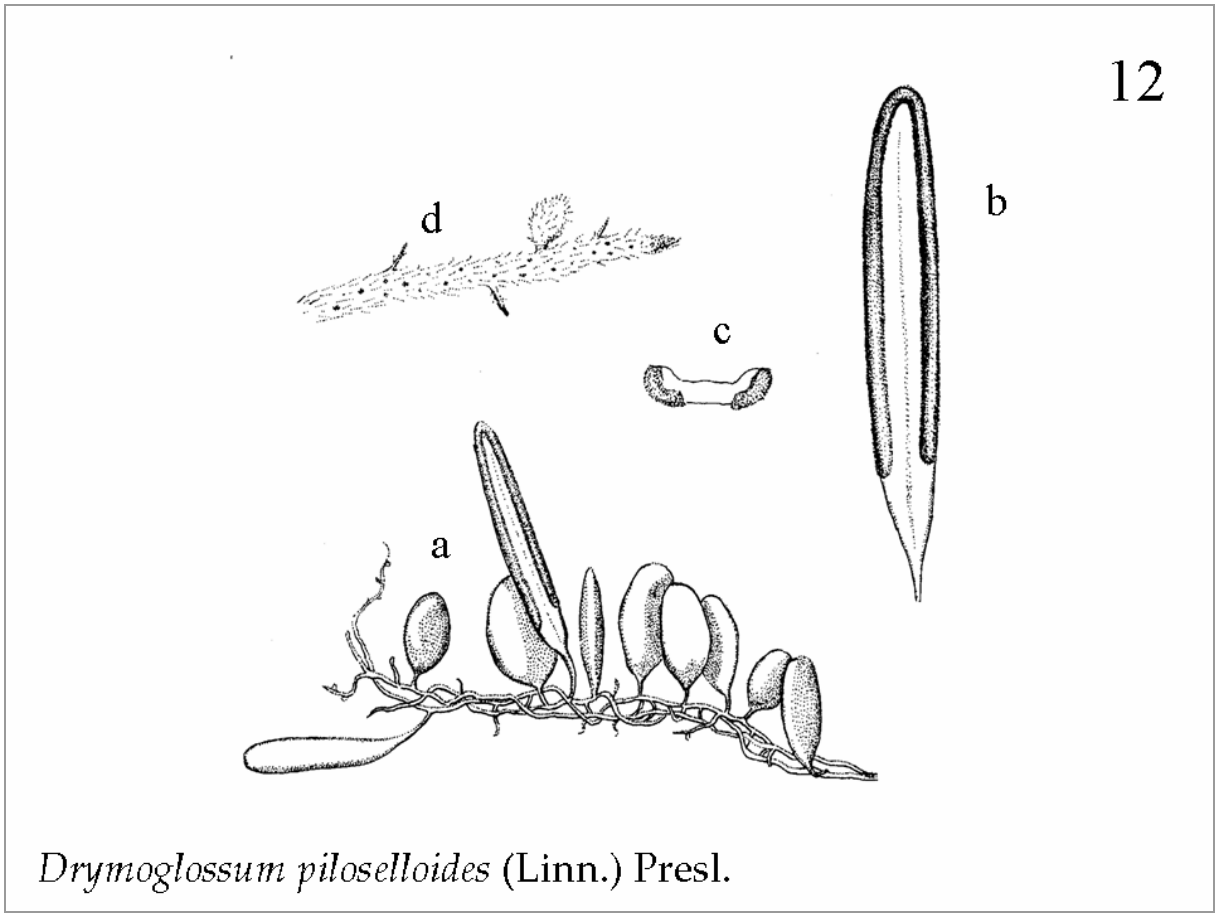

Fig. 12. *Drymoglossum piloselloides* (Linn.) Presl. (a) Habit, with sterile and fertile leaves, (b) fertile leaf, with sporangia along the leaf margins, (c) cross-section of leaf showing the position of the sporangia, and (d) detail of tip of rhizome.

POLYPODIACEAE

12

***Drymoglossum piloselloides* (Linn.) Presl.**

Synonyms : *Acrostichum heterophyllum* L., *Drymoglossum heterophyllum* C. Chr., *Notochlaena piloselloides* Kaulf., *Oetosis piloselloides* O.K., *Pteris piloselloides* O.K., *Taenites piloselloides* R. Br.

Vernacular name(s) : Duitvaren, Duiteblad (NL), Sakat ribu-ribu, Daun seberneh panjang, Sisek naga (Mal.), Pakis Duitan, Pijisan, Sakat Ribu-ribu – *Sisik Naga* (Ind.)

Description : Small epiphyte. Rhizome is long and creeping, with a diameter of barely 1 mm and is covered with small, almost round or heart-shaped scales. Scales have a dark centre and paler edges, with relatively long hairs that are white when very young, but soon turn brown. Leaves are simple and entire. Sterile leaves are without stalks, nearly circular, and about 1 cm across. Occasionally they are broadly elliptic. Sterile leaves are very fleshy and have a smooth surface. Fertile leaves are very different from the sterile ones. They have a stalk of about 1cm length and are elongated, measuring 3-12 cm by 5-8 mm. Sometimes the ends of the fertile leaves are branching. The sori (containing the spores) are arranged in a broad band along the edge of the leaf that may be about 2.5 mm wide when mature.

Ecology : One of the commonest epiphytic ferns in the lowlands of Southeast Asia. It occurs everywhere on old trees including those in the mangroves. Found in fairly exposed places, including gardens, from sea level up to an altitude of about 1,000 m. Mangrove associate species.

Distribution : From Northeastern India, throughout Southeast Asia to Papua New Guinea and northern Australia.

Abundance : Very common.

Use(s) : Leaves pounded with gypsum may be applied to irritating rashes, whilst a decoction is used in a lotion for smallpox. This species is also used as a poultice for headaches.

Source of illustration : Drawn from live specimen.

References : Backer & Posthumus (1939), Heyne (1950), Holttum (1966), Piggott (1988)

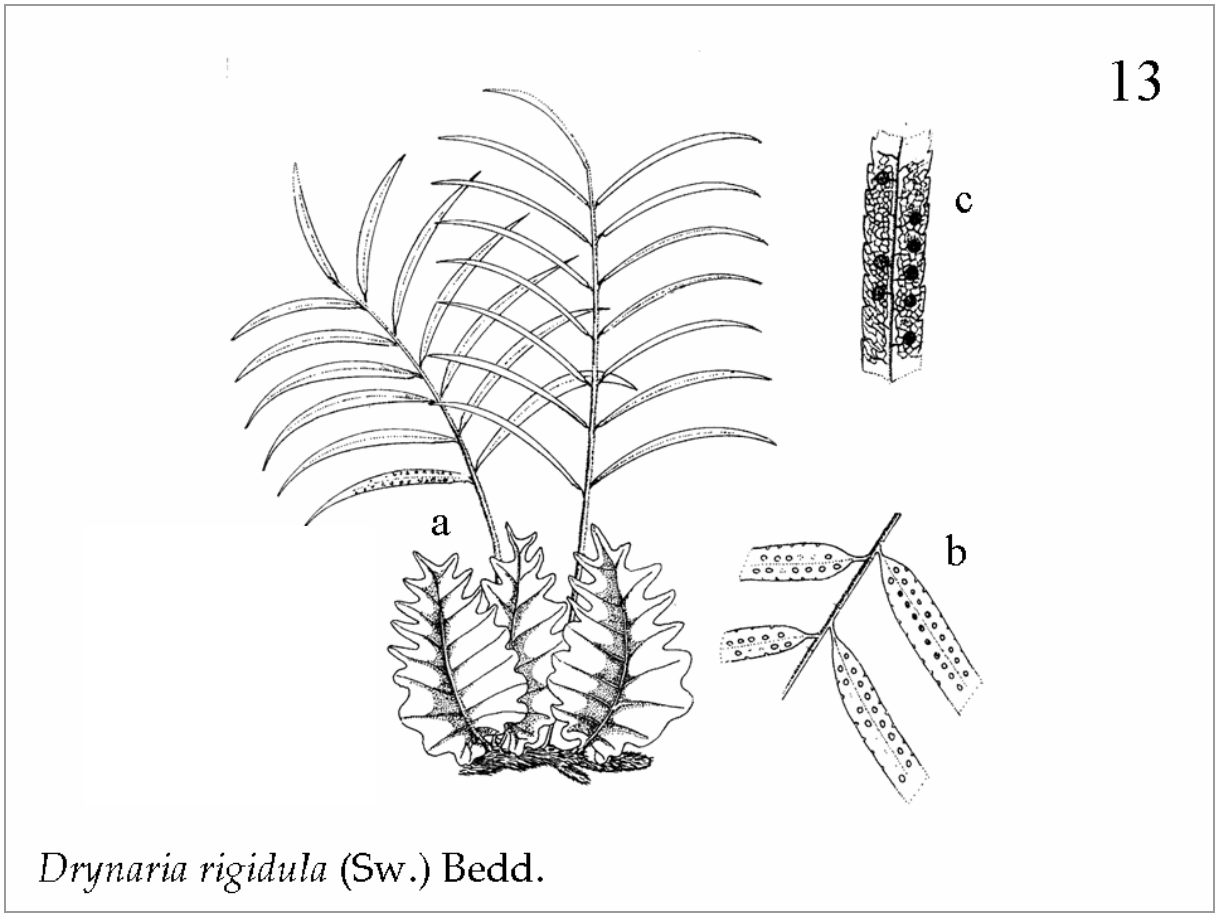

Fig. 13. *Drynaria rigidula* (Sw.) Bedd. (a) Habit, depicting sterile leaves at the base, and fertile leaves emerging, (b) detail of fertile leaf showing (part of) four fertile leaflets, and (c) detail of a single fertile leaflet showing the sporangia.

POLYPODIACEAE

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***Drynaria rigidula* (Sw.) Bedd.**

Synonyms : *Goniophlebium rigidulum* Moore, *Polypodium diversifolium* R. Br., *Polypodium gaudichaudi* Bory., *Polypodium rigidulum* Sw, *Polypodium rigidum, Polypodium speciosum* Bl.

Vernacular name(s) : Bird's nest fern, Oak-leaf fern (E), Eikebladvaren (NL), Paku Kayakas, Simbar Layangan – *Pasilan kelapa* (Ind.)

Description : Epiphytic bird's-nest fern, with two distinct types of leaf: short-stemmed oak leaf-like 'nest' leaves and long-stemmed fertile leaves that bear leaflets. The rhizome creeps and is about 1 cm in diameter. It is densely covered with 7 mm-long scales that are reddish-brown, rather thin, and narrowed gradually from the dark, heart-shaped base. Nest-leaves measure 15-30 by 7-10 cm, tapering to the top, and lobed about half-way to the midrib. Lobes are usually about 1 cm wide, are tapering and sometimes pointed. The whole nest-leaf is covered with star-shaped hairs when young. Fertile leaves may be up to 200 cm or more long, and bear leaflets throughout their entire length. The leaf stalk is about 30 cm long. Leaflets are usually about 15 cm by 8-12 mm. However, they may be up to 25 cm long, and if the leaflet is sterile (occasionally the case on a fertile leaf) it may be more than 2 cm wide. Sori (containing the spores) are solitary, and located between adjacent main veins, usually nearer the midrib than the edge, at a junction of veins. The sorus is located in a small depression, and appears as a small, round lump on the upper surface.

Ecology : Common epiphyte on old trees, occurring from lowland hills to lower mountains, from sea level up to about 800 m. Also occurs in mangroves. The rhizome creeps more or less horizontally, and often completely surrounds the trunk of the tree, forming a cup-shaped depression. Prefers sunny to moderately shaded sites. Rarely occurs on the ground. Mangrove associate species.

Distribution : Occurs from Southeast Asia to Polynesia (Fiji) and Australia. In Southeast Asia is has been recorded from Malaysia, Thailand, Indonesia (throughout) and Papua New Guinea.

Abundance : Locally common.

Use(s) : In Java the rhizome of this plant is known as 'pasilan kelapa', a traditional medicine.

Source of illustration : Sastrapradja *et al.* (1979), Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966),
http://www.fernfactory.com/shop/mixed/drynaria.asp
http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

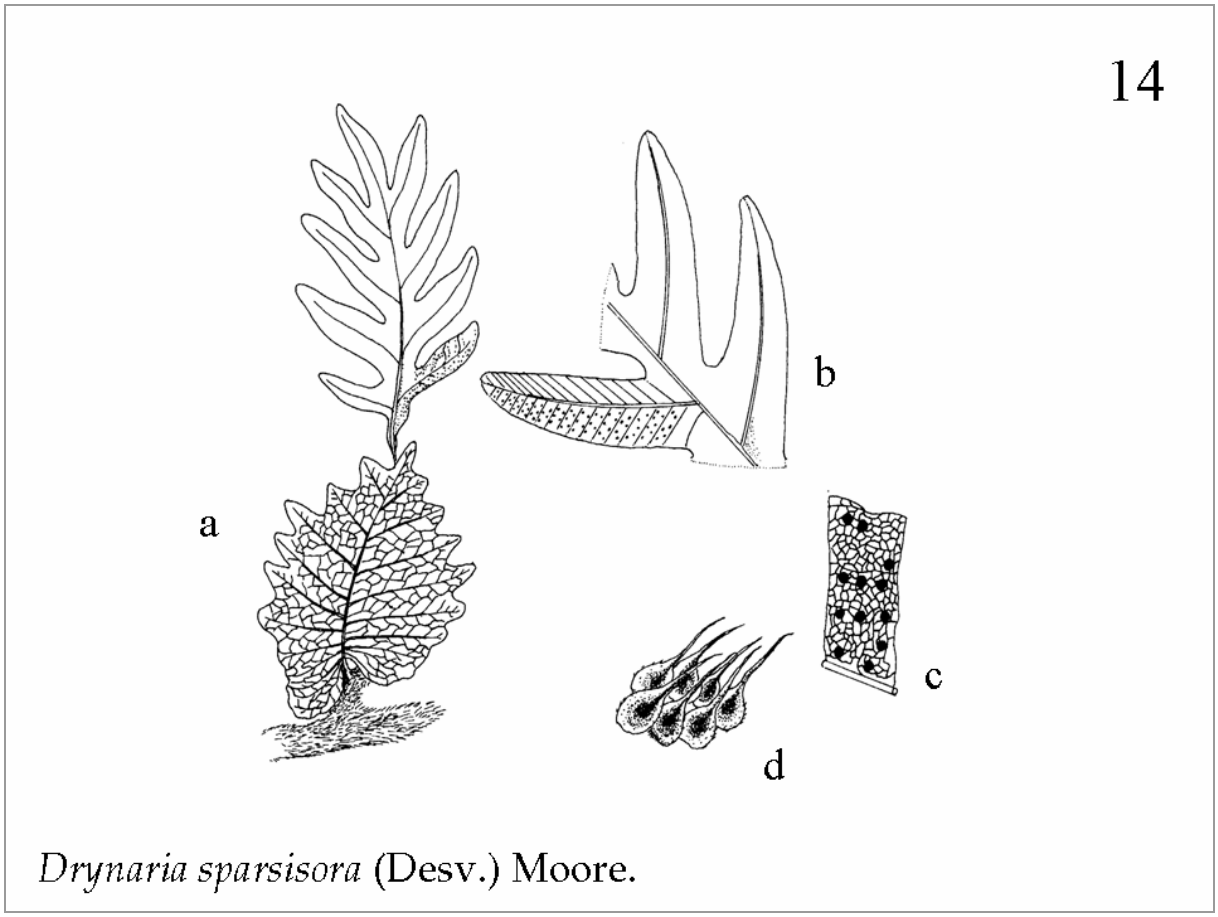

Fig. 14. *Drynaria sparsisora* (Desv.) Moore. (a) Habit, depicting sterile leaf at the base, and fertile leaf emerging, (b) detail of fertile leaf, (c) detail of fertile leaflet, depicting sporangia, and (d) detail of scales on rhizome.

POLYPODIACEAE

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***Drynaria sparsisora* (Desv.) Moore**

Synonyms : *Drynaria linnaei* Bory., *Polypodium linnaei* Bory, *Polypodium sparsisorum* Desv.

Vernacular name(s) : Basket fern, Oak leaf fern (E), Eikebladvaren (NL), Akar Kusu, Paku Latig Layangan, Simbar Layangan, Simbar, Barang-barang, Lilanga – *Paku layang layang* (Ind.)

Description : Epiphytic bird's-nest fern, with two distinct types of leaf: erect nest leaves and fertile foliage leaves. The rhizome is fleshy, creeping and scaly. Scales have a broad base and a stiff, narrow point that soon breaks off from the base so that old rhizomes appear to have almost round scales. Nest leaves are up to about 20 cm long, with many, sometimes rather pointed lobes. Foliage leaves are stiff and leathery, up to about 70 cm long including the stalk, and deeply lobed up to 1 cm from the central vein. Sori (containing the spores) are small and numerous, occurring in irregular rows at the junction of veins, often with some sori irregularly placed between the rows. Closely resembles *Drynaria quercifolia*, but the whole plant is usually smaller.

Ecology : Occurs in old trees in the lowlands, and can probably tolerate exposed places. Also common in mangroves. Mangrove associate species.

Distribution : From Sri Lanka, through Southeast Asia to Malaysia to Polynesia and tropical Australia. In Southeast Asia it is recorded from Malaysia, Thailand, Singapore, Indonesia and Papua New Guinea.

Abundance : Common.

Use(s) : An extract of the rhizome is used to treat eye infections. Mixed with other plants it is used to cure many diseases, including gonorrhoea.

Source of illustration : Sastrapradja *et al.* (1979), Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), Johnson (1977)
http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

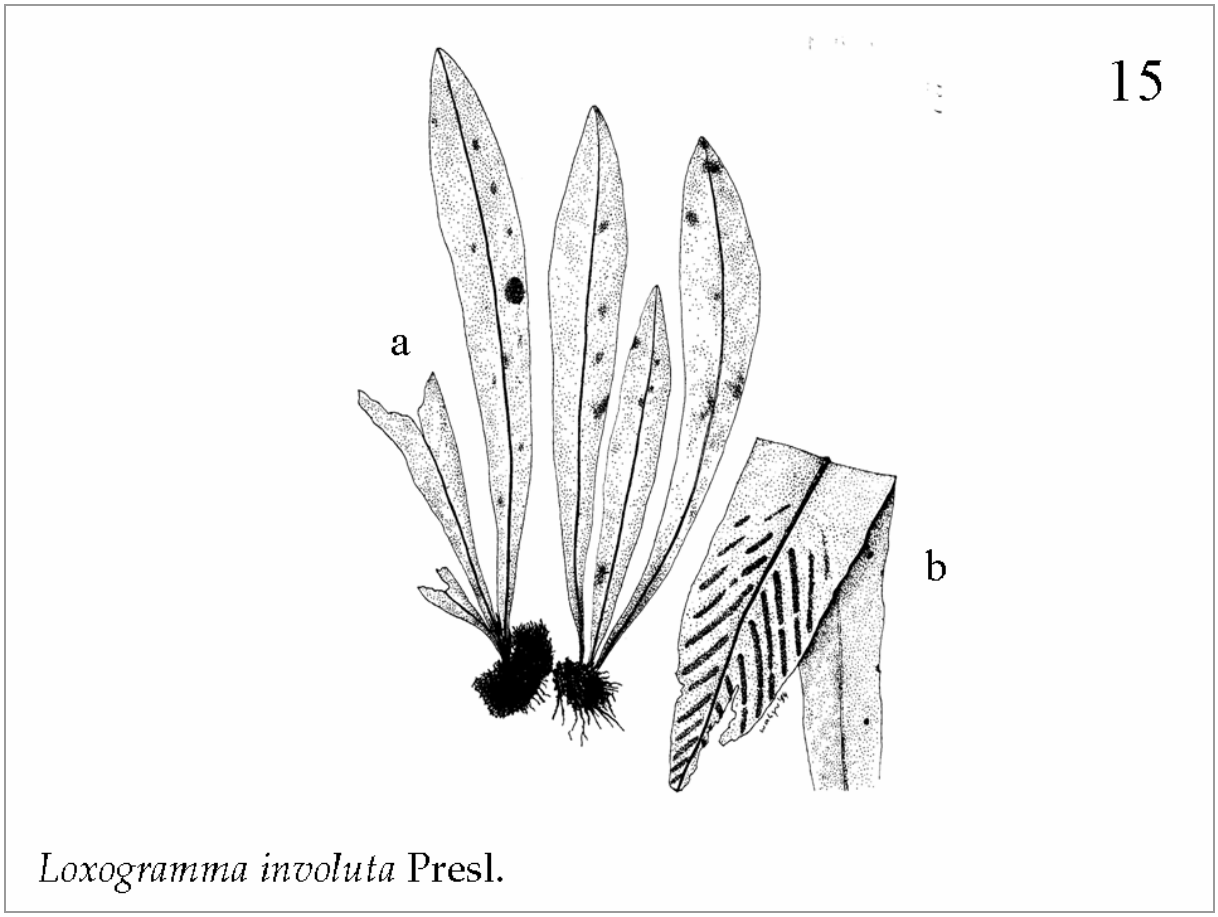

Fig. 15. *Loxogramma involuta* Presl. (a) Habit, and (b) detail of fertile leaf, showing sporangia.

POLYPODIACEAE

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***Loxogramma involuta* Presl.**

Synonyms : *Antrophyum involutum* Bl., *Grammitis involuta* Don., *Gymnogramma involuta* Hook., *Polypodium scolopendrinum* C. Chr.

Vernacular name(s) : Unknown.

Description : Epiphytic fern, 15-50 cm, with a creeping rhizome that is covered with large, brown, lanceolate scales. Leaf stalks are short and thick. Leaves are entire, lanceolate, with a pointed tip and a wedge-shaped base, 15-75 by 2-10 cm. They are thick, leathery, and have a smooth surface. The midrib is broad and flat on the upper leaf surface, while it is prominent and has a keel on the lower surface. Sori (containing the spores) occur in lines that extend, at an angle, from the midrib to the edge of the leaf.

Ecology : Occurs in mangroves and inland forests, including low hills, and prefers places with sufficient shade. Leaf margins roll up during dry spells. Mangrove associate species.

Distribution: Limited to Indonesia, where it is reported to occur in Sumatra and Java. Bogor Herbarium has specimens from Java, the Lesser Sundas, Sumatra and the Moluccas.

Abundance : Unknown.

Use(s): Leaves are smoked with tobacco (reported for Sumatra in 1927).

Source of illustration : Drawn from herbarium specimen, Bogor Herbarium.

Reference(s): Burkill (1935), Backer & Posthumus (1939)

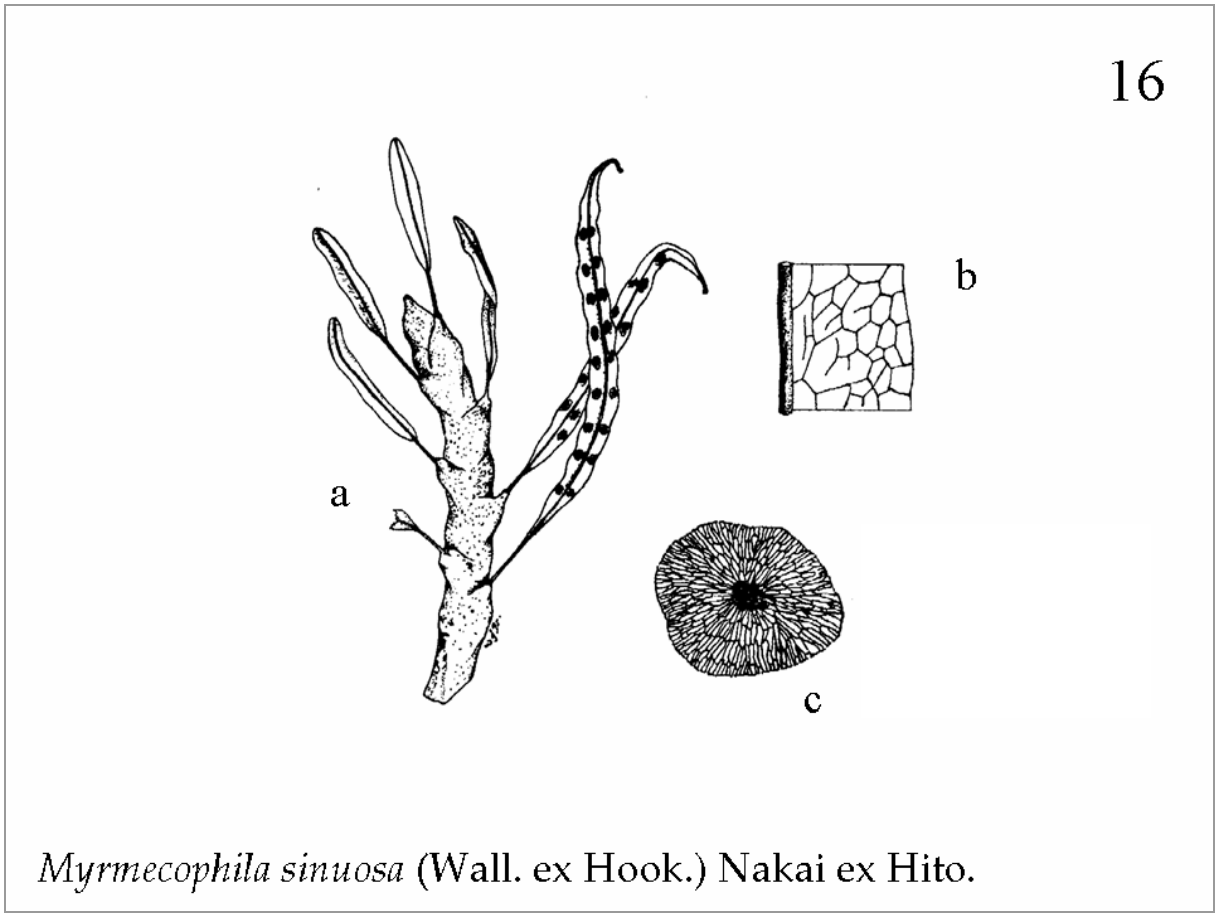

Fig. 16. *Myrmecophila sinuosa* (Wall. ex Hook.) Nakai ex Hito. (a) Habit, with fertile and sterile leaves, (b) detail of leaf venation, and (c) detail of rhizome scale.

POLYPODIACEAE

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***Myrmecophila sinuosa* (Wall. ex Hook.) Nakai ex Hito**

Synonyms : *Lecanopteris sinuosa* Copel., *Phymatodes sinuosa* (Wall.) J. Sm., *Phymatodes sinuosa* Wall. ex Hook., *Pleopeltis sinuosa* (Wall. ex Hook.) Bedd., *Polypodium sinuosum* Wall. ex Hook.

Vernacular name(s) : Pakis sarang semut (Mal., Ind.)

Description : Epiphytic fern, with simple leaves. The rhizome is usually 1-1.5 cm in diameter, fleshy, hollow and ant-inhabited. It bears two rows of leaves, attached to swollen conical bases that are about 1 cm high and 1-2 cm apart. The whole rhizome and stalk-bases are covered with scales that are almost circular, 1-3 mm in diameter, pale with a dark centre. Leaf stalks are about 2-7 cm long. Leaves are simple, about 15-30 cm by 1.5-2.5 cm, with a very narrow base and a rounded tip. Leaf edges are thickened, smooth, and wavy-indented. Each indentation is located next to a sorus (containing the spores). Sterile leaves are often shorter than the fertile ones. Sori are large and occur in a single row on each side of the midrib. This is usually about half-way or slightly closer to the leaf edge, sunken in sharply defined but shallow, elliptic depressions that are up to 3-5 mm wide. These are most conspicuous on the upper surface.

Ecology : One of Southeast Asia's most unusual ferns, and intriguing because of its close association with ants that dwell in the hollow rhizome. The species found are most commonly *Crematogaster deformis, Crematogaster yappii, Iridomyrmex cordatus (=Iridomyrex myrmecodiae)* or *Technomyrmex albigaster* (Hölldobler & Wilson, 1990). It is often accompanied by other ant-plants. A typical lowland plant (though occcasionally reported up to 1000 m asl), occurring on trees in moderately exposed places and usually not in densely shaded spots. Mangrove associate species.

Distribution : Found from Thailand and Malaysia through Indonesia – where it is found throughout – to Papua New Guinea, the New Hebrides and the Solomon Islands.

Abundance : Common.

Use(s) : Unknown.

Source of illustration : Backer & Posthumus (1939).

References : Backer & Posthumus (1939), Holttum (1966), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

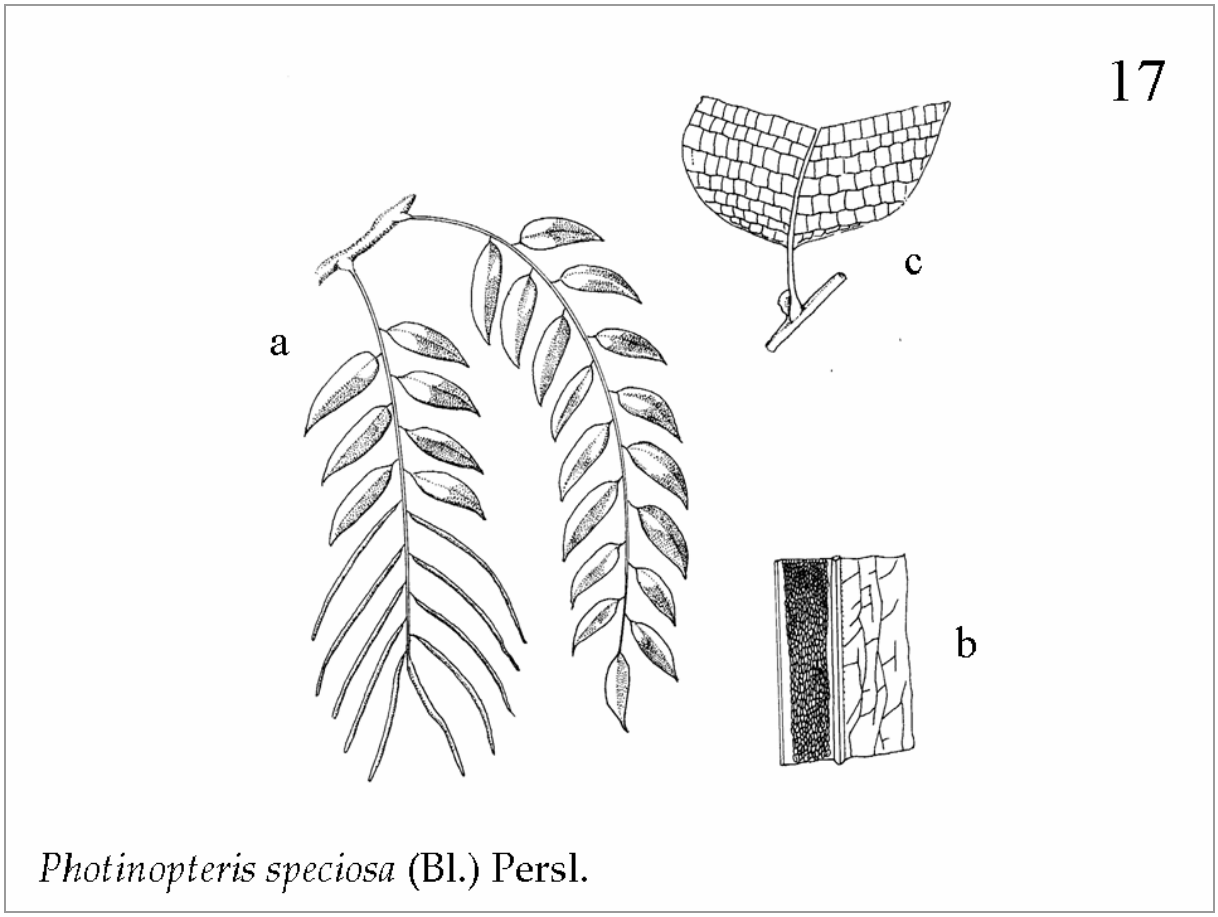

Fig. 17. *Photinopteris speciosa* (Bl.) Persl. (a) Habit, with fertile (terminal) and sterile leaves, (b) detail of fertile leaf, showing sporangia, and (c) detail of leaf venation.

POLYPODIACEAE

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***Photinopteris speciosa* (Bl.) Persl.**

Synonyms : *Acrostichum lineare* Hassk., *Acrostichum rigidum* Wall., *Dryostachyum speciosum* Kuhn, *Lomaria mollis* Zoll, *Lomaria speciosa* Bl., *Photinopteris acuminata* (Willd.) C.V. Morton, *Photinopteris horsfieldii* J. Sm., *Photinopteris rigida* Bedd.

Vernacular name(s) : Unknown.

Description : Epiphytic fern. The rhizome is thick, long and creeping, 1 cm or more in diameter. When the plant is young the rhizome is green, but later it is bluish-green or white, and scaly. Scales are narrow, about 8 mm long, thin, transparent when young, dull brown when old, and with many short hairs along the edges. Leaves are large, up to about 70 cm long, with many leaflets. Leaf stalks are 12-30 cm or more long, bearing small, flattened appendages similarly spaced as the leaflets. The sterile leaf has up to about 10 pairs of leaflets, 10-4.5 cm by 25-10 cm, more or less ovate and with a similar terminal leaflet. In exposed places, leaflets have white spots on the upper surface. In fertile leaves, the top part bears more closely-spaced and more numerous fertile leaflets. Fertile leaflets are 10-25 cm long and are up to about 6 mm wide. The lower surface is covered with sori (bearing the spores), except for the midrib and a narrow band near the edge.

Ecology : Occurs in mature mangroves and along rivers, from sea level up to an altitude of about 1,500 m. Usually occurs in partially shaded or in open situations, including exposed places on rocks. Mangrove associate species.

Distribution : Southeast Asian species, recorded from Cambodia, Vietnam, Thailand, Malaysia, and the Philippines, throughout Indonesia, and in Papua New Guinea.

Abundance : Probably common.

Use(s) : Unknown.

Source of illustration : Piggott (1988).

References : Holttum (1966), Piggott (1988), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

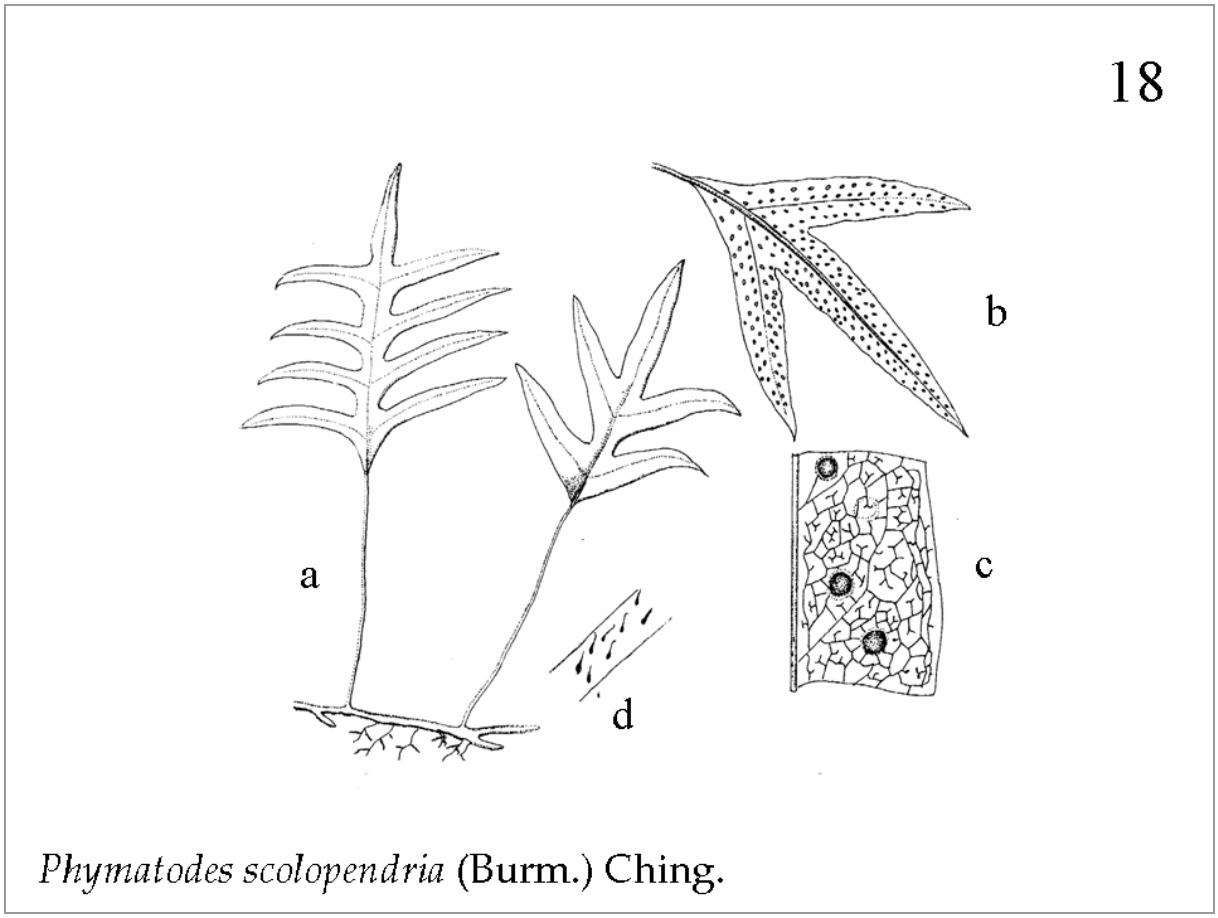

Fig. 18. *Phymatodes scolopendria* (Burm.) Ching. (a) Habit, (b) detail of fertile leaf, showing sporangia underneath, (c) detail of leaf section and sporangia, and (d) detail of hairs on rhizome.

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***Phymatodes scolopendria* (Burm.) Ching.**

Synonyms : *Phymatodes vulgare* Presl., *Phymatosorus scolopendria* (Burm.) Pichi Serm., *Pleopeltis phymatodes* Moore, *Polypodium forbesii* v.A.a.R., *Polypodium phymatodes* L., *Polypodium scolopendria* Burm.

Vernacular name(s) : Paku Wanggi, Sakat Hitam (Mal.), Paku Ular, Paku Cacing (Ind.)

Descriptions : Epiphytic fern. It has a long, creeping rhizome that measures up to about 7 mm diameter, is fleshy green and bears scattered, very dark brown scales. The latter have a length of 3-4 mm, and edges that are finely toothed in the narrow part. Simple, lobed leaves occur up to about 5 cm apart on leaf stalks that are smooth and up to about 30 cm long. Leaves are light green and thinly leathery, up to about 40 cm long and deeply lobed (to 1-2 cm from midrib), with 1-4 (rarely more) pairs of lobes. Leaf edges are smooth, and veins are not raised but are visible when the frond is held up to the light. Sori (containing the spores) usually occur in two (1-3) irregular rows on either side of midrib of each lobe. They sometimes also occur on the wing on either side of midrib of the leaf. Sori are round or somewhat elliptic, 3-4 mm across, and a ripe sorus is orange-yellow.

Ecology : Occurs on old trees, including mangroves, clumps of bamboo, and on palms in plantations. Sometimes it may also occur on rocks and on the ground in open places, withstanding exposure to full sunlight. Mangrove associate species.

Distribution : From tropical Africa through Sri Lanka, Southeast Asia, southern China to Polynesia and Australia. Occurs throughout Southeast Asia.

Abundance : Very common.

Use(s) : The leaves contain ‘coumarin’, a fragrance that has been used to perfume clothes and to scent coconut oil. Planted as an ornamental fern. The rhizome can be used to treat gecko bites and to accelerate childbirth.

Source of illustration : Based on Holttum (1966) and Piggott (1988).

References : Backer & Posthumus (1939), Heyne (1950), Holttum (1966), Piggott (1988).

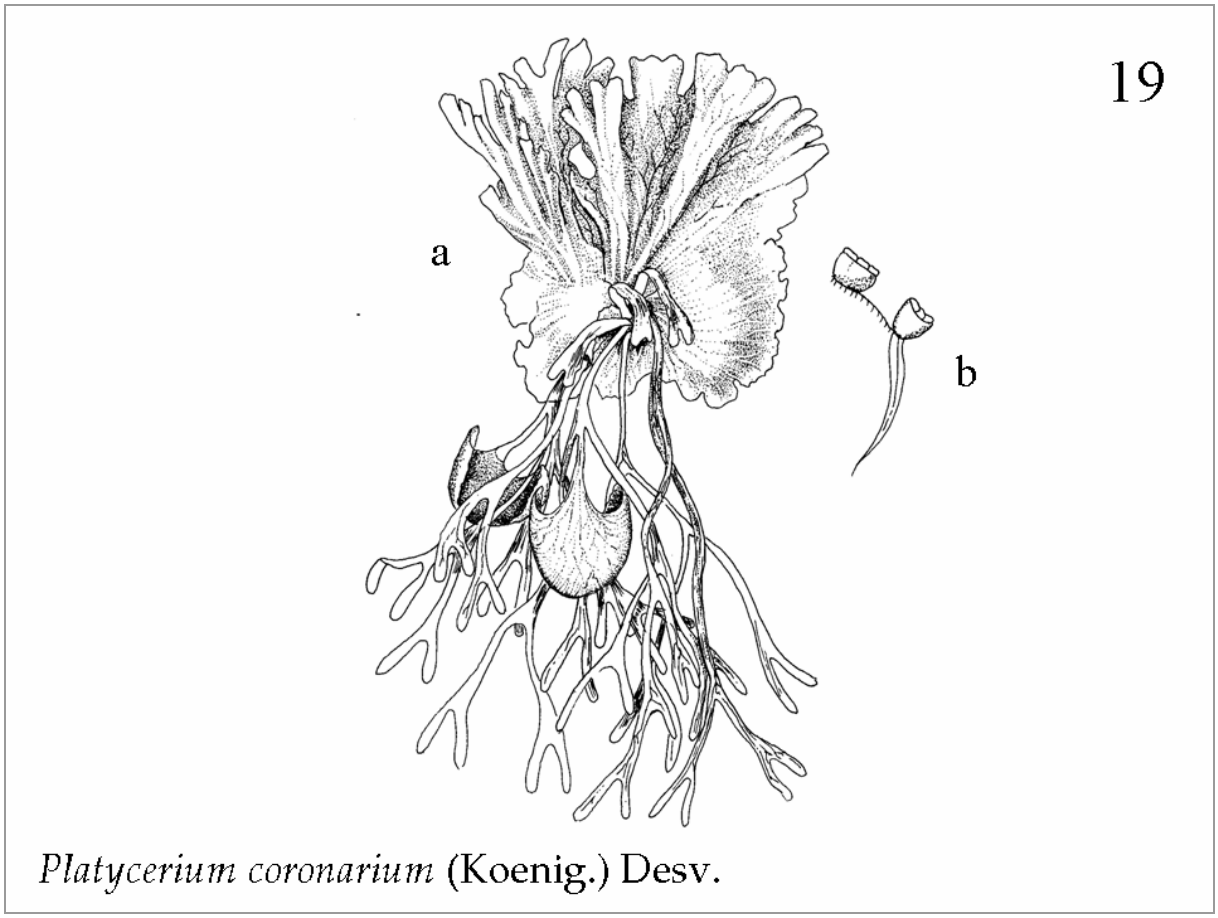

Fig. 19. *Platycerium coronarium* (Koenig.) Desv. (a) Habit, and (b) detail of two sporangia, viewed from one side.

POLYPODIACEAE

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***Platycerium coronarium* (Koenig.) Desv.**

Synonyms : *Acrostichum biforme* Sw., *Neuroplatyceros biformis* Fée., *Osmunda coronaria* J. König, *Platycerium biforme* (Sw.) Blume

Vernacular name(s) : Stag's Horn Fern (E), Semun bidadari (Mal.), Pakis Menjangan, Pakis Tanduk Rusa – *Simbar menjangan* (Ind.)

Description : Epiphyte with a short, fleshy-branched rhizome that, together with the roots, is covered by 'nest-leaves'. Young parts of the rhizome are covered with broad scales. There are two kinds of leaves: sterile nest-leaves and fertile leaves. The nest-leaves are erect when living, with free upper edges, measuring up to 60 cm or more, and are dichotomously lobed. The deepest lobes are about 25 cm deep, while the end lobes are rounded and about as wide as long. The main veins are prominent and dichotomous, and the base of the leaf is very thick and fleshy. Fertile leaves measure up to 200 cm or more, are limp and pendulous, and repeatedly dichotomous. All branches of the fertile leaves are narrow, the widest being about 4 cm across, and end lobes about 2-3 cm wide. The first three forkings are very unequal, producing a short, sterile branch on each side and a single, heart-shaped, fertile lobe in the centre. This is paired with a very long branch, which is undivided for 60 cm or more, then repeatedly dichotomous. Fertile lobes are shortly stalked, semi-circular to deeply heart-shaped, up to about 25 cm wide. All parts of young leaves are densely covered with (branched) hairs.

Ecology : Occurs on old trees in the lowlands, both on wayside and village trees. Also found on the upper branches of the tallest trees in primary forest, and in many types of lowland forest, including mangroves. Old nest-leaves are an almost-perfect litter trap, providing nutrients and storing water for this epiphytic plant. Mangrove associate species.

Distribution : Southeast Asian species, found throughout western Indonesia (Sumatra, Java, Borneo), Brunei, Singapore, Peninsular Malaysia and northwards to Thailand and Tenasserim (Myanmar).

Abundance : Locally abundant.

Use(s) : Used as ornamental plant in tropical gardens and indoors (in temperate regions), and as medicine.

Source of illustration : Sastrapradja *et al.* (1979), Piggott (1988)

References : Backer & Posthumus (1939), Holttum (1966), Said (1990), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

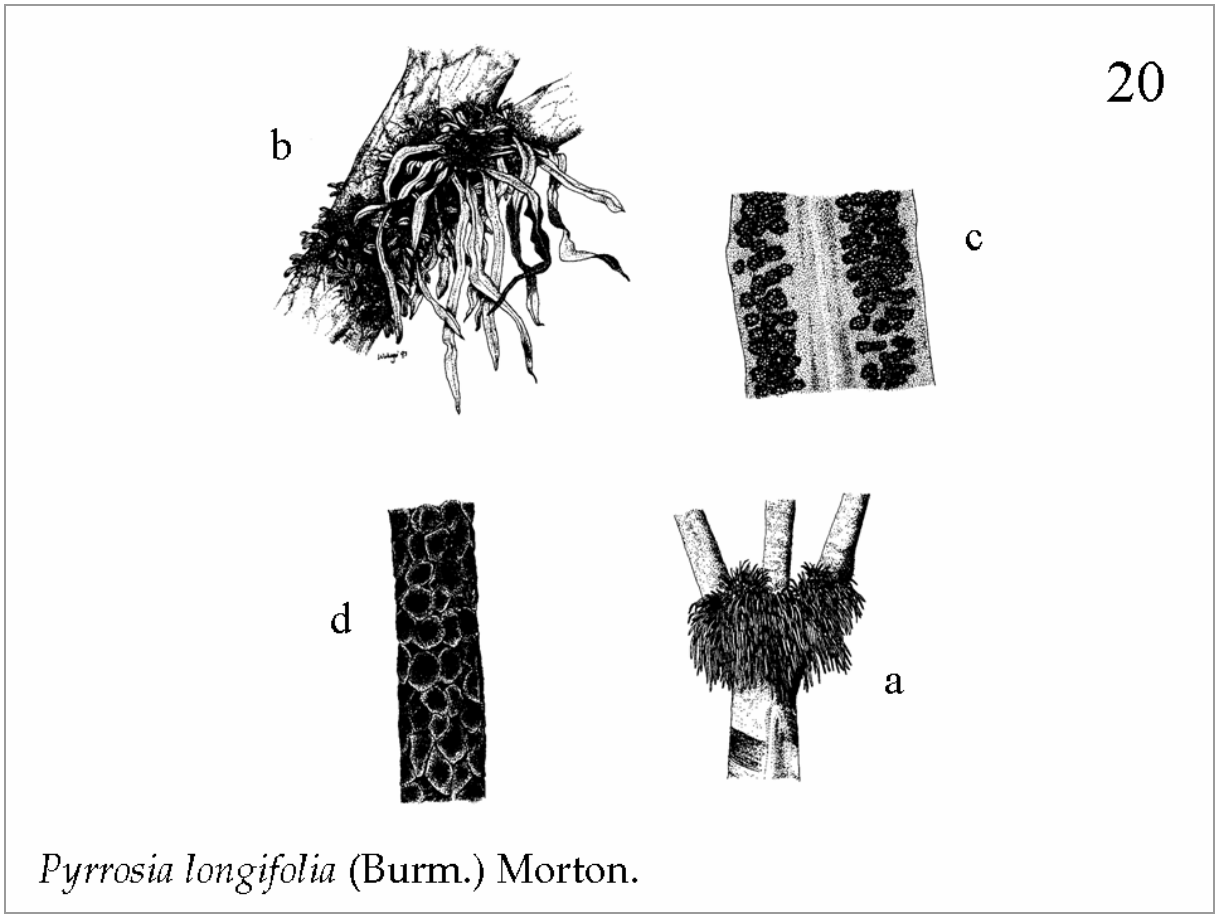

Fig. 20. *Pyrrosia longifolia* (Burm.) Morton. (a) Habit, showing dense cluster in tree, (b) habit, somewhat closer, (c) detail of underside of fertile leaf, showing sporangia, and (d) detail of rhizome showing the scales.

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***Pyrrosia longifolia* (Burm.) Morton.**

Synonyms : *Acrostichum lanceolatum* Burm., *Acrostichum longifolium* Burm. f., *Cyclophorus acrostichoides* (G. Forst.) Presl., *Cyclophorus cinnamomeus, Cyclophorus longifolius* Desv., *Gyrosorium cinnamomeus, Gyrosorus fissum Bak., Niphobolus acrostichoides* (G. Forst.) A.Richt., *Niphobolus cinnamomeus, Niphobolus fissus Bl., Niphobolus longifolium* Spr., *Niphobolus puberulus* Bl., *Polypodium acrostichoides* G. Forst., *Polypodium cinnamomeus, Pyrrosia acrostichoides* G. Forst.

Vernacular name(s) : Unknown.

Description : Epiphytic fern with simple, entire leaves. The rhizome is long and creeping, 2-3 mm thick and scaly throughout. Scales are usually almost round, about 1 mm diameter, almost black, and with pale, entire edges. Occasionally they may be twice as long as broad. Leaf stalks are up to about 10 cm long, gradually broadening into the narrow base of the leaf blade. Leaves are usually 20-60 cm long, sometimes up to 120 cm, 1-2(-2.5) cm wide in the sterile basal part. The fertile part towards the end of the leaf is usually narrower, and rarely more than 1 cm wide. Leaves are very fleshy, about 1 mm thick, with an upper surface that is smooth and hairless. The lower surface is covered with a thin layer of grey, star-shaped hairs. The midrib is grooved above and strongly raised below. Sori (containing the spores) are very compact, less than 1 mm in diameter, and covering the whole lower surface in the upper part of the leaves. They occur in about 4-8 irregular rows between midrib and leaf edge.

Ecology : Growing on old trees in open places, or in the crowns of forest trees, including mangroves. Never occurs in very shaded sites. Also found in rubber plantations. Occurs up to an altitude of 600 m. In Java it is found growing on *Heritiera littoralis*. Small plants in very exposed places may have stiff leaves, but are recognizable at once by the round rhizome-scales. Mangrove associate species.

Distribution : From Thailand and Peninsular Malaysia to northern Australia (Queensland), Papua New Guinea and Polynesia. Occurs throughout Indonesia.

Abundance : Very common.

Use(s) : Concoctions from plants pounded in cold water are administered to ease labour pains in childbirth.

Source of illustration : Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), Piggott (1988), Hennipman (pers. comm. 1994), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

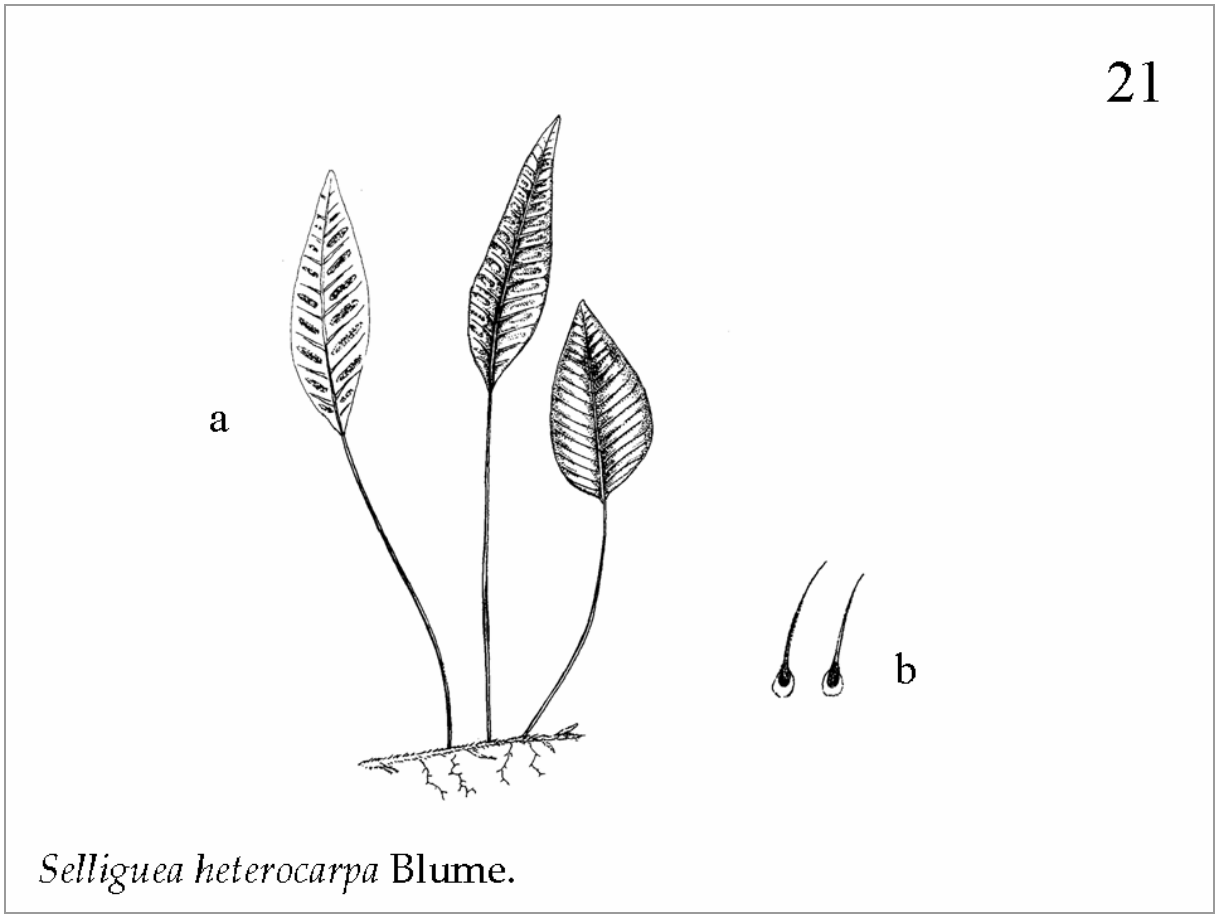

Fig. 21. *Selliguea heterocarpa* Blume. (a) Habit, showing fertile (left) and sterile (right) leaves, and (b) detail of two rhizome scales.

POLYPODIACEAE

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***Selliguea heterocarpa* Blume**

Synonyms : *Grammitis heterocarpa* Bl., *Gymnogramma heterocarpa* Bl., *Pleopeltis heterocarpa* v.A.bv. R., *Pleopeltis schoutenii* v.A.v.R., *Polypodium heterocarpum* Mett., *Polypodium mettenianum* Cesati, *Polypodium schoutenii* v.A.v.R., *Selliguea feei* Bory, *Selliguea metteniana* var. *lateritium* (Baker) Tardieu & C.Chr.

Vernacular name(s) : Unknown.

Description : Epiphytic, creeping fern, measuring 20-50 cm. Rhizomes are about 2 mm in diameter, bearing fronds about 5-10 mm apart. The younger parts are often densely covered with scales that are reddish-brown, stiff and almost bristle-like. They are about 6 mm long and are abruptly narrowed above the base, where the scale is less than 1 mm wide. Leaf stalks are slender, 5-25 cm long, being longest in sterile leaves. Leaves are simple, with an entire edge, and very variable in shape and size. Sterile leaves are usually shorter and proportionally broader than the fertile ones. Sterile leaves measure about 6 by 2-5 cm to 14 by 8-5 cm, are ovate to elliptic, shortly pointed or rounded at the tip. They are thinly leathery, have thickened edges and a glossy surface, with main lateral veins raised on both surfaces. The fertile leaves are about 7 by 1 cm to 15 by 5 cm, evenly elliptic or widest near the base, usually with a pointed tip. Leaf texture and venation is as with the sterile fronds. The sori (containing the spores) are linear and occur in single lines between adjacent main veins. These lines are sometimes interrupted, and do not reach the midrib or edge. When mature, the sori are about 2 mm wide, occurring in a rather shallow groove that appears as a low ridge on the upper surface.

Ecology : Common in lowlands to about 1,700 m. Especially occurring on old mangrove trees or on trees along rivers. Plants sometimes grow on rocks or on the ground. In Java most commonly recorded from 800-1,700 m. Mangrove associate species.

Distribution : Southeast Asian species, found in Thailand, Peninsular Malaysia and Indonesia (Sumatra, Java).

Abundance : Common.

Use(s) : Unknown.

Source of illustration : Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), http://www.forest.go.th/Botany/Flora/Pteridophytes.htm

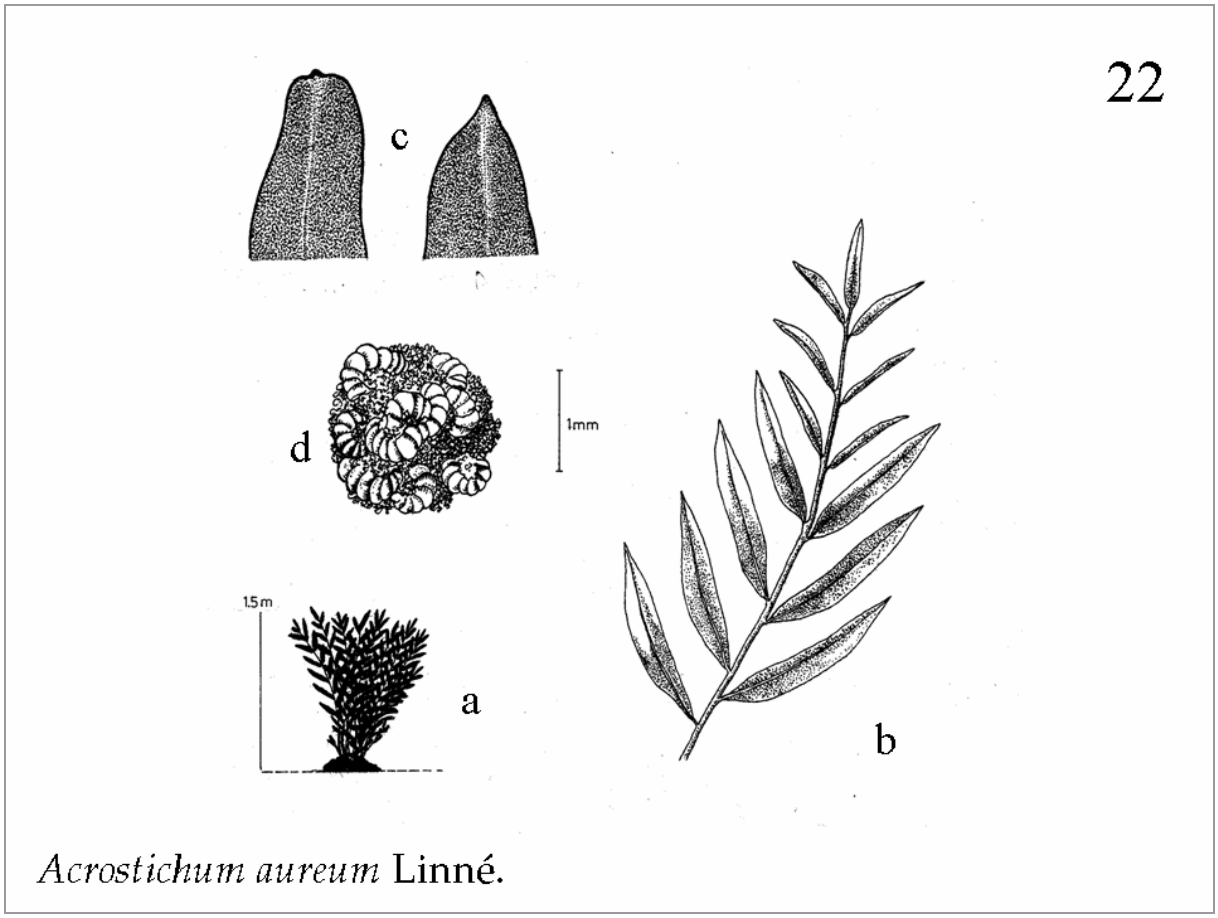

Fig. 22. *Acrostichum aureum* Linné. (a) Habit, (b) detail of leaf frond, (c) detail of leaf tip, with left *A. aureum* and right *A. speciosum*, and (d) detail of sporangia.

PTERIDACEAE

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Acrostichum aureum Linné

Synonym : *Acrostichum inaequale* Willd., *Acrostichum obliquum* Blume, *Acrostichum spectabile* Zoll.,*Chrysodium aureum* Mett., *Chrysodium inaequale* Fée., *Chrysodium vulgare* Fée.

Vernacular name (s) : Mangrove fern (E), Mangrove Varen (NL), Piai Raya (Mal.), Hata Diuk, Paku Tjaj, Kala Keok, Wikakas, Krakas, Wrekas, Paku Laut – *Paku hata* (Ind.), Ráng (Viet.), Brong (Camb.), Prong thale (Thai)

Description : Large, clump-forming terrestrial fern, up to 4 m tall. Stems are stout and erect, covered with large scales. They are thickened towards the base, dark brown with a broad, pale, thin margin, mixed with narrow, thin scales. The very distinctive, tall leaves are 1-3 m long, but do not have more than 30 leaflets. The latter may be spaced far apart and are often irregularly distributed. The lowest leaflets are always widely spaced, with long stalks that measure up to 3 cm. The tops of fertile leaves are rusty-brown coloured, later turning dark brown. The undersides of these 10-20 topmost leaflets are uniformly covered with large sporangia. Tips of the longer, sterile leaflets are abruptly rounded or blunt, with a short tip. Spines (= midrib of shed leaflet) are frequent and black. Leaf venation is net-like. The broad scales, up to 1 cm long, are restricted to the base of the fronds; they have a thickened middle, an entire edge and leave no prominent scar. Spores are large and have a tetrahedral shape. The species is often confused with the closely related *Acrostichum speciosum*. In general, *Acrostichum aureum* is taller than *Acrostichum speciosum*, and the young plants are more reddish than the brownish *Acrostichum speciosum*. The easiest diagnostic feature are the leaf tips, which are generally blunt, but with a small point in *Acrostichum aureum*, and elongate-pointed in *Acrostichum speciosum* (see figure).

Ecology : Perennial and most common ground dwelling fern in mangroves, on bunds in brackish-water fish ponds *tambak*), long brackish creeks and rivers, and drainage canals. It does not tolerate as much inundation by sea-water as *Acrostichum speciosum*, and is found on the inland side of mangroves. It often occurs in places that have been seriously disturbed, and can often be a nuisance in logged-over mangroves, as it forms dense stands that prevent forest regeneration. Unlike *Acrostichum speciosum*, it prefers bright, sunny areas. Mangrove species.

Distribution : Pan-tropical. Occurs throughout Southeast Asia.

Abundance : Locally very abundant.

Use(s) : Rhizome and old leaves are used for medicinal purposes. Leaves used for thatching and as litter for cattle. Young leaves are reportedly eaten in East Timor and Indonesia (North Sulawesi).

Source of illustration : Piggott (1988), Holttum (1954), and live material.

References : Watson (1928), Heyne (1950), Holttum (1966), Tomlinson (1986), Piggott (1988), Aksornkoae (1993), Marschke (2000)

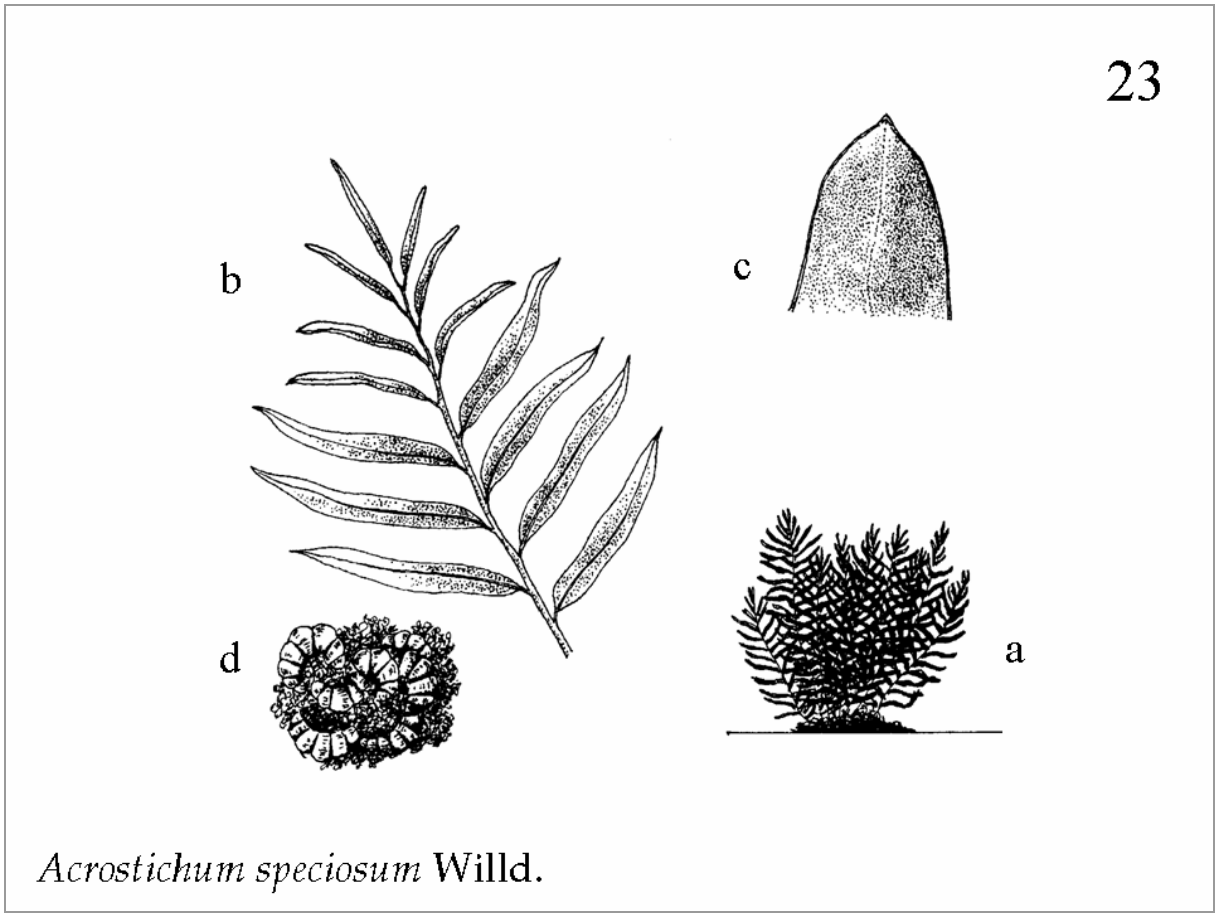

Fig. 23. *Acrostichum speciosum* Willd. (a) Habit, (b) detail of leaf frond, (c) detail of leaf tip, and (d) detail of sporangia.

PTERIDACEAE

23

***Acrostichum speciosum* Willd.**

Synonyms : *Acrostichum aureum* var. *schmidtii* (Christ) C.Chr., *Chrysodium aureum* var. *schmidtii* Christ, *Chrysodium speciosum* Fée

Vernacular name(s) : Mangrove fern (E), Piai laut (Mal.), Piai Lasa (Ind.), Brong, Khnag n (Camb.), Prong nuu (Thai)

Description : Terrestrial fern, forming coarse clumps to 1.5 m tall. Scales on the rhizome are up to about 8 mm long. The very distinctive leaves are commonly less than 1 m long and have rusty, fertile leaflets at the top. These are uniformly covered with large sporangia. Leaflets measure about 28 by 10 cm, and the tips of the smaller, sterile leaflets are narrowly pointed. The species differs from *Acrostichum aureum* by its smaller total size, smaller leaflets, brownish-green young leaves, pointed leaflets, and the dark brown lower surface of fertile leaflets covered with sporangia. Leaf venation is net-like. The broad scales, up to 1 cm long, are restricted to the base of the leaves. Scales have a thickened middle and an entire margin. Spores are large and tetrahedral in shape.

Ecology : Perennial fern. Occurs in parts of mangroves that are more frequently inundated by tides. It especially occurs on heaps of mud raised by lobsters and crabs above the general level of the ground. Usually prefers shaded areas. Like the mangrove trees themselves, the fern is often supported by prop roots. Fertile fronds are produced from August to April. 'Seedlings' (actually, 'sporelings') are abundant from January to April (in Java). Mangrove species.

Distribution : Tropical Asia and Australia. Throughout Southeast Asia.

Abundance : Locally abundant.

Use(s) : A high-quality thatch.

Source of illustration : Wightman (1989).

References : Watson (1928), Holttum (1966), Tomlinson (1986), Wightman (1989), Aksornkoae (1993), Marschke (2000)

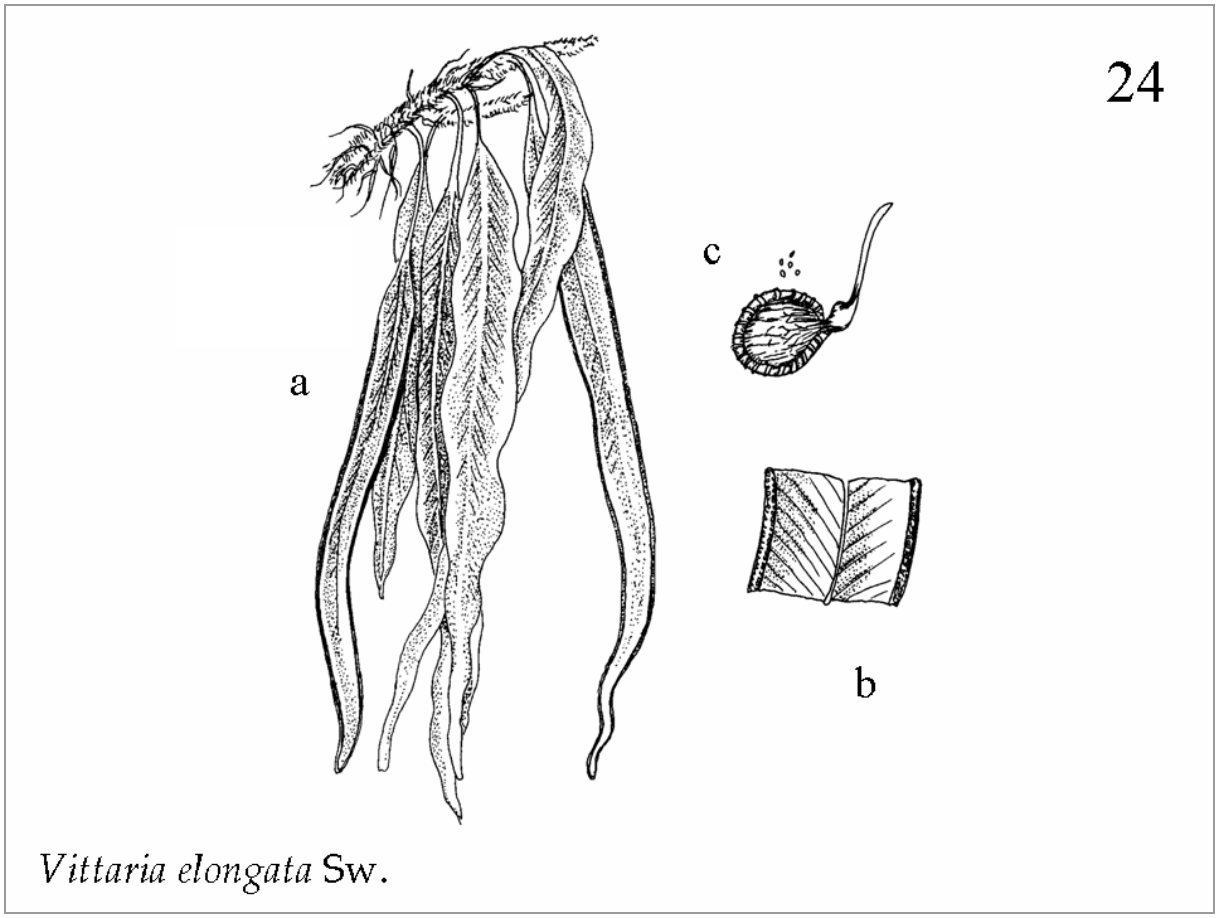

Fig. 24. *Vittaria elongata* Sw. (a) Habit, (b) detail of leaf, showing sporangia in the marginal groove, and (c) detail of sporangium.

VITTARIACEAE

24

***Vittaria elongata* Sw.**

Synonyms : *Vittaria loricea* Fée, *Vittaria planipes* Kunze

Vernacular name(s) : Ribbon Fern (E)

Descriptions : Epiphyte or growing on rocky substrates. The rhizome is rather long, creeping and scaly, with a nearly black, about 1 cm long, hair-like tip. It bears leaves at intervals of about 1 cm. Leaves are distinctly stalked and measure (20-)30-60(-180) cm by 0.7-2 cm. They are gradually tapered towards both base and tip, and have a single midrib that is distinct on the upper surface, but usually less distinct on the lower surface. Veins are often distinct in the broader specimens, very slanted, with up to about six veins occurring between midrib and margin. Sori (containing the spores) occur in a deep, almost marginal groove that is more or less curled back towards the lower surface at maturity.

Ecology : A common epiphytic fern in the lowlands, including mangroves. It may also grow on rocks, particularly in moderately shaded places, and occurs up to an altitude of 2,200 m in primary forest. Spores are found all year round. Abundant on older palms in oil palm plantations. Mangrove associate species.

Distributions : Occurs from East and Southern Africa, through India and Southeast Asia to Southern China, Taiwan, Japan, Australia and Polynesia. Found throughout Southeast Asia.

Abundance : Locally common.

Use(s) : Ornamental.

Source of illustration : Holttum (1966) and Piggott (1988).

References : Backer & Posthumus (1939), Holttum (1966), Johnson (1977), Piggott (1988).