

Cyathea arjae Latiff (Cyatheaceae), A New Species of Dwarf Tree-Fern from Sayap, Mt. Kinabalu, Sabah, Malaysia

(*Cyathea arjae* Latiff (Cyatheaceae), Suatu Spesies Baharu Paku Pakis Pohon Kerdil dari Sayap, Gunung Kinabalu, Sabah, Malaysia)

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ABSTRACT

A dwarf tree-fern, *Cyathea arjae* Latiff is described as a new species from Sayap, Mt. Kinabalu, Sabah, Malaysia. This new species belongs to *Schizocaena* group which has basiscopic veins that originate from the costa and not from the costule. It is closely related to *C. capitata* in having simply pinnate fronds of which the apex is a deltoid lamina. Holttum's key was modified.

Keywords: *Cyathea arjae*; dwarf tree-fern; Malaysia; Mt. Kinabalu; Sabah

ABSTRAK

Paku pakis pohon kerdil, *Cyathea arjae* Latiff telah dihuraikan sebagai spesies baru dari Sayap, Gunung Kinabalu, Sabah, Malaysia. Spesies baru ini tergolong dalam kumpulan *Schizocaena* yang mempunyai urat daun basiskopik berasal dari costa dan bukan dari kostul. Ia sangat rapat dengan *C. capitata* kerana mempunyai frond pinat ringkas di mana apeksnya berbentuk deltoid. Kekunci Holttum telah diubahsuai.

Kata kunci: *Cyathea arjae*; Gunung Kinabalu; Malaysia; paku pakis pohon kerdil; Sabah

INTRODUCTION

Holttum (1963) enumerated a total of 191 species of *Cyathea* in Malesia, of which 30 species occur in Borneo, 20 species in Sarawak and 25 species in Sabah. The Malesian Cyatheaceae, was divided into three subfamilies, viz. Cyatheoideae, Cibotioideae and Thyrsopteridoideae and outside Malesia a fourth one Metaxyoideae. Within *Cyathea* there are two subgenera, viz. subgenus *Sphaeropteris* and subgenus *Cyathea*. Subgenus *Sphaeropteris* (Bernh.) Holttum was further divided into sections (sect. *Sphaeropteris* and sect. *Schizocaena* (J. Sm.) Holttum and subsections (subsect. *Sphaeropteris*, subsect. *Fourniera*, subsect. *Schizocaena* and subsect. *Sarcopholus*) accordingly. This new species belongs to sect. *Schizocaena* and subsect. *Schizocaena* in having scales on stipes, one cell thick throughout and the position of the basal basiscopic vein of each group is from the costa (while in *C. moluccana* it is from the midrib of the pinna); the indusial are thin and translucent (not hemiteloid type), fully covering the sori when young, breaking and lost at maturity.

Of the species in Sabah, seven are endemic. Parris et al. (1992) reported a total of 22 species of *Cyathea* from Mt. Kinabalu. Subsequently, Parris and Latiff (1997) enumerated a total of 38 species of *Cyathea* as occurring in Malaysia. Among the Mt. Kinabalu endemic they included *C. acanthophora* Holttum, *C. brachyphylla* Holttum, *C. discophora* Holttum, *C. havilandii* Baker, *C. longipes* Copel. and *C. stipitipinnula* Holttum. During

the Sayap-Kinabalu Park Expedition in 1992, Jaman and Latiff (1995) encountered a population of dwarf tree-ferns at c. 1550 m above sea level which is in the lower montane forest. The specimens collected there possess characters that do not agree with any of the species described earlier (Holttum 1963; Parris & Latiff 1997). I hereby describe it as a species new to science.

Meanwhile, Smith et al. (2006) revised the classification of extant ferns, with emphasis on ordinal and familial ranks and a synopsis of included genera was given. They recognized five genera in the family Cyatheaceae, namely *Alsophila*, *Cyathea*, *Gymnosphaera*, *Hymenophyllopsis* and *Sphaeropteris*. Korall et al. (2007) presented the morphology of the scales and a molecular phylogeny of scaly Cyatheaceae and segregated the group based on the type of scales and indusia as follows. The subgenus *Sphaeropteris* has conform scales and 'sphaeropteroid' indusium (early development all the sori are covered and opened when the sori matured); whereas subgen. *Cyathea* has marginate scale without an apical seta and disc-like or pouch-shaped or 'hemiteloid' indusium or exindusiate. I believe this new species belongs to subgen. *Sphaeropteris* sect. *Schizocaena* and subsect. *Schizocaena*.

CYATHEA ARJAE LATIFF, SPEC. NOV.

In laminis simpliciter pinnatis, apice deltoideo *C. capitatae* similis, trunco aut brevissimo ad 7 cm alto suberecto aut interdum minime praesentia evidente; pinnis infimis ad 1

mm longe petiolatis, pinnis distalibus sessilibus, margine vadose lobato, nervis liberis differt. - Holotypus: *Razali Jaman, Patrick Sungkit & Benedict Gangku, RJ 4067* (UKMB), Malaysia, Sabah, Kota Belud, Sayap-Kinabalu Park, Minodtuhan Ridge. (Isotypi K, KNP)

Trunk: mostly suberect to erect, 67 cm high. *Basal scales*: pale brown, setiferous, firm, up to 10 by 1 mm, rather thick at the base, edges bearing irregular reddish setae. *Stipe*: 5-6 cm long, dark brown, densely covered with pale-brown setiferous scales and short septate setae present in between scales on the abaxial surface of the stipe. *Lamina*: up to 50 cm long, simply pinnate, apex of frond deltoid, deeply lobed. *Rachis*: medium brown in dried specimens but green in living plants, bearing light-brown erect-septate setae on adaxial surface, 5-6 mm long, short; antrorse septate setae on the abaxial surface of the rachis and basal pinnae; rachis narrowly-winged on the abaxial surface of upper lamina. *Frond*: simply pinnate, 39.0-42.0 by 4.0-8.0 cm. *Pinnae*: 24-26 pairs, subsessile, the lower pinnae shortly-stalked c. 1 mm long or less, upper pinnae sessile, joined

by the narrow winged to rachis; largest 5 by 1 cm; lower pinnae gradually reduced, the lowest pinnae 1.9 by 0.7 cm somewhat bending downwards; edges serrate to crenate, lobes less than 1/3 the length of the pinna; apex of pinnae blunt or rounded at end of falcate costule; upper surface bearing the septate hairs. *Veins*: pinnate, 3 pairs, free; basal basis copic veins of each group springing from the costa, not from the costule; covered with bullate scale when young. *Indusium*: thin and translucent, at first covering sorus, later breaking at maturity and not persistent. *Sori*: 1 row on each side of the costa (1-2 sori on each vein-group).

Distribution: Only known from the Sayap area, Mt. Kinabalu, Sabah, Malaysia; possibly endemic.

Habitat: Only known from the lower montane forest of Mt. Kinabalu.

Note: This new species is named after Mr. Razali Jaman or RJ, the collector of the specimens and acknowledging his immense contribution towards pteridology in Malaysia.

TABLE 1. Comparison of *C. capitata* Copel. as described and the newly described *C. arjae* Latiff

	<i>C. capitata</i> (Holtum 1963)	<i>C. arjae</i>
Trunk	1.3 m tall; erect	6-7 cm tall, mostly submerged, procumbent, becoming sub-erect to erect
Frond	trunk bears ca. 12 fronds	trunk bears ca. 9 or 10 fronds
Stipe	dark, smooth, to 40 cm long	dark brown, densely covered with setiferous scale and short septate setae present in between scales on abaxial surface of stipe, 5-6 cm long
Basal scale	pale brown, firm, up to 25 mm × 3-4 mm, rather thick at base, edges bear irregular concolorous setae; pneumathodes 9-15 mm long, rather widely spaced	pale brown, firm, up to 10 mm by 1 mm, rather thick brown at the base, edges bear irregular red setae.
Rachis	dark to medium brown in dried specimens but yellowish brown in fresh specimens, smooth	medium brown in dried specimens but light green in fresh specimens, bearing light brown erect-septate setae on adaxial surface, 5-6 mm long; antrosesepate setae on abaxial of rachis and basal pinnae; rachis narrowly winged on abaxial surface of upper lamina
Lamina	100 cm or more long, simply pinnate, apex of frond deltoid-deeply lobed, lobes grading to upper pinnae	up to 50 cm long, simply pinnate, apex of frond deltoid, deeply lobed
Pinnae	c. 40 pairs, sessile, largest 15-19 by 2-3 cm at base; lower ones somewhat smaller; edges entire except near apex, serrate	ca. 24-26 pairs, sub-sessile, the lower pinnae shortly stalked ca. 1 mm. long or less, upper pinnae sessile, largest 5 by 1 cm; lower pinnae gradually reduced, the lowest pinnae 1.9 by 0.7 cm somewhat bending downward; edges serrate to crenate, lobes less than 1/3 the length of the pinna; apex of pinnae blunt or rounded at end of falcate costule
Veins	pinnate, usually 3 pairs of veinlets, outer veinlets anastomosing to form a single excurrent vein	pinnate, 3 pairs, free; basal basis copic veins of each group springing from the costa, covered with bullate scale when young
Indusium	thin and translucent, at first covering sorus, later breaking irregularly and more or less persistent	thin and translucent, at first covering sorus, later breaks at maturity and not persistent
Sori	2 rows on each side of the costa (3 or 4 sori on each vein-group)	1 row on each side of the costa (1 or 2 sori on each vein-group)

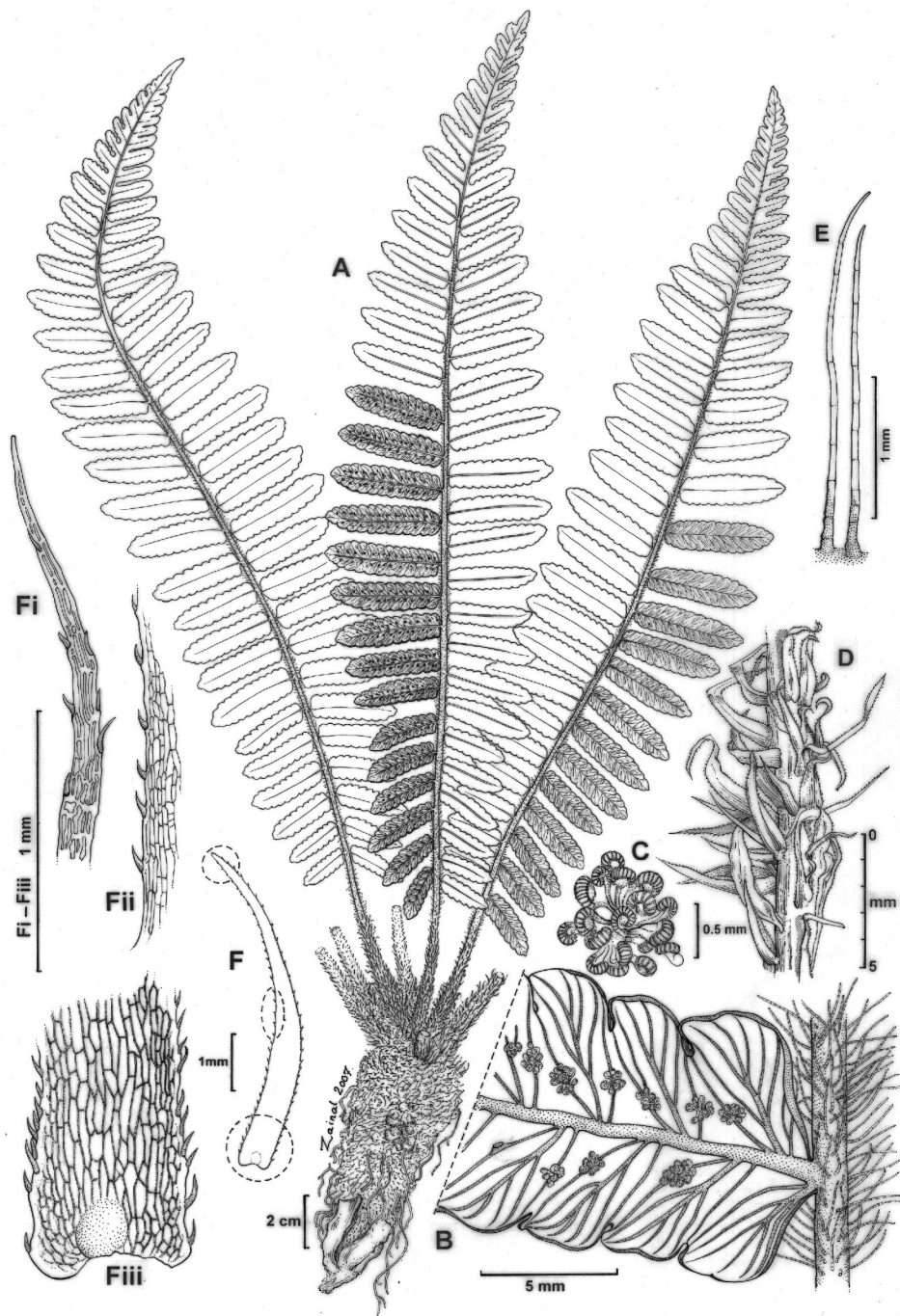


FIGURE 1. *Cyathea arjae* Latiff. (a) General habit, note the scales on the stipe and short trunk, (b) pinnae, note the hairs on the rachis, (c) sporangium (d) scales on the stipe, (e) multicellular hair, (f) scale; Fi. tip of scale, shows the setae; fii. scale margin, shows the setae and fiii. basal scale (drawn from the type specimen, RJ 4067)

It is similar to *C. capitata* Copel. (*Schizocaena* Group) in having simply pinnate fronds and the apex of the frond is a deltoid lamina but differs in having a very short trunk 6-7 cm tall and sometimes no evident trunk at all or sometimes sub-erect ca. 1-3 m as in *C. capitata*; short stipe up to 15 cm long (up to 40 cm long in *C. capitata*) and veins all free not anastomosing on outer veinlets (Table 1).

Other specimen studied: *Razali Jaman RJ 5147* (UKMB). Malaysia, Sabah, Kota Belud, Sayap-Kinabalu Park, Minod Tuhan Ridge; elevation c.1550 m of the lower montane forest; terrestrial in semi-sheltered on ridge slope.

KEY TO THE SPECIES OF *CYATHEA* (SUBSECT. *SCHIZOCAENA*)

[modified from Holttum (1963)]

- 1 a. Frond simply pinnate, pinnae entire or at most serrate-crenate 2
- b. Frond simply pinnate with deeply lobed pinnae, or bipinnate (as in Holttum (1963))
- 2 a. Apex of frond a deltoid deeply lobed lamina. Pinnae sessile or shortly stalked 3
- b. Apex of frond a pinna of same shape as other pinnae. Pinnae usually stalked (as in Holttum (1963))
- 3 a. Outer veins of each group joining to form a single excurrent vein. Pinnae sessile; margin coarsely serrate *C. capitata*
- b. Outer veins of each group free. Upper pinnae sessile, lower pinnae stalked up to 1 mm long, margin shallowly lobed *C. arjae*

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