

***Adiantum alleniae*, a new species, and *Adiantum siamense*, a new record, for Peninsular Malaysia**

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ABSTRACT. A new fern species, *Adiantum alleniae* S.Linds., is described from Peninsular Malaysia and *Adiantum siamense* Tagawa & K.Iwats. is reported from Peninsular Malaysia for the first time.

Keywords. Adiantaceae, conservation assessment, Langkawi, Perak, Pteridaceae subfamily Vittarioideae

Introduction

In preparation for the account of the vittarioid ferns and *Adiantum* L. for the *Flora of Peninsular Malaysia*, the genus *Adiantum* in the region has been revised. Descriptions of the species and a key will appear in the forthcoming treatment, which will be published as the Adiantaceae but which is recognised as Pteridaceae subfamily Vittarioideae by PPG I (2016). A new species and a new record for Peninsular Malaysia have been discovered during the course of this work and they are both published here.

There are about 225 species (PPG I, 2016) of *Adiantum* from tropical and warmer temperate parts of the world. Holttum (1955) included six species (one with two varieties) for Peninsular Malaysia: *Adiantum capillus-veneris* L., *A. caudatum* L. (plus var. *subglabrum* Holttum, nom. nud.), *A. flabellulatum* L., *A. philippense* L., *A. soboliferum* Wall. ex Hook. and *A. stenochlamys* Baker. In a second edition of this work (Holttum, 1968) he treated *A. caudatum* var. *subglabrum* as a synonym of *A. zollingeri* Mett. ex Kuhn and split *Adiantum caudatum* into two species: *A. caudatum*, and *A. malesianum* J.Ghatak. He also noted that “Mrs Allen has found another species of similar habit...on the limestone of G. Tempurong in southern Perak”. He compared it to *Adiantum rhizophorum* Sw., a species of the Mascarenes and Africa, but did not formally describe it. Having studied the material highlighted by Holttum (two specimens at K), I agree that this material is indeed a distinct species and describe it here as *Adiantum alleniae* S.Linds.

In addition, there is a single specimen of *Adiantum siamense* Tagawa & K.Iwats. from Langkawi at KEP. This is a new record of this species for Peninsular Malaysia.

Including the two species presented here, the *Flora of Peninsular Malaysia* will recognise 13 species of *Adiantum*, 10 native and 3 naturalised.

New species

Adiantum alleniae S.Linds., sp. nov.

Similar to *Adiantum caudatum*, *A. malesianum* and *A. rhizophorum*, but differs in the mature pinnae having only one hair type below and these hairs very dense, small (unicellular), straight, patent and pale (vs two hair types differing in size and colour and the small ones hooked in *A. caudatum*; two hair types differing in size (and sometimes colour) and the small ones not hooked in *A. malesianum*; and glabrous in *A. rhizophorum*). Also similar to *Adiantum zollingeri* but that usually has glabrous pinnae and when hairs are present below they are sparse, multicellular (uniseriate), brown, and usually restricted to the cuneate base of pinnae. – TYPE: Peninsular Malaysia, Perak, Gunong Tempurong [Gunung Tempurung], 1500 ft. [457 m], 13 August 1959, *Molesworth Allen 4392* (holotype K [K001262546]).

Lithophyte. **Rhizome** short, erect, bearing a dense tuft of simply pinnate fronds and old stipe bases; rhizome scales long, narrow, dark brown in the centre, paler at the edges, margins entire. **Fronds** to c. 36 cm long and 3.3 cm wide; stipes brittle and slender (c. 1 mm diameter at base), 11–19 cm long (as long as or slightly longer than the rachis), terete (not grooved above), dark-reddish brown (castaneous) to nearly black and very shiny, sparsely scaly and sparsely hairy on all sides at the base, becoming glabrous upwards, the scales like those on the rhizome, the hairs long, uniseriate, 2–6-celled, reddish-brown and patent; rachises terete (not grooved above), dark-reddish brown and shiny, glabrous below and at the sides, but densely hairy above, the hairs short, stiff, acicular uniseriate, 2(–3) celled, reddish-brown, patent and brittle (easily broken when dry); laminae glaucous beneath, linear-oblong in outline, 12–24 × 2.8–3.3 cm, simply pinnate with 10–24 pairs of alternately arranged pinnae, spaced at 8.5–12 mm in middle of the lamina, basal pinnae 15.5–24 mm from next lowest pinnae, pinnae articulate to their stalks, caducous with age, stalks and rachis persistent; pinnae stalks dark brown or black, glabrous on all sides, very short, typically less than 1 mm long, basal pinnae with stalks up to c. 2 mm long; pinnae shape variable, most pinnae deltoid-rhomboid, 1.5–1.7 × 0.9–1 mm, cuneate at base and broadly rounded at the apex, the basal pair of pinnae flabellate, and the apical pinna deltoid-obovate, lower and inner margin of each pinna entire, upper margin 4–6-lobed, each lobe with smaller incisions, reducing towards apex, apical pinnae 2-lobed, each lobe with smaller incisions, above with few long (0.4–0.64 mm), brown, acicular, uniseriate hairs, glabrescent with age, below densely hairy with very short (0.15–0.2 mm), pale, patent, acicular unicellular hairs (few longer brown hairs towards margin, similar to those above, when juvenile but these caducous with age); veins slightly raised above, not raised below, free, close, more-or-less straight, several times dichotomously branched, radiating from the bases of the pinnae and reaching the margins. **Sori** at the apices of the pinnae lobes on the undersurface of small reflexed marginal flaps, 1–5 per pinna, including on basal pinnae, rarely more than one per major lobe; indusia dark brown at maturity, glabrous, 0.9–1.1 × 1.2 mm.

Distribution. Only known from Peninsular Malaysia, Perak, Gunung Tempurung.

Habitat and ecology. Recorded as growing on vertical limestone cliffs in moss surrounded by tall forest.

Etymology. Named after Betty Molesworth Allen, the collector of the type. The type of *Calciphilopteris alleniae* (R.M.Tryon) Yesilyurt & H.Schneid., also named after her, was collected at the same locality.

Provisional IUCN conservation assessment. Data Deficient (DD). This species has not been collected since the 1950s and its current status is unknown. There is now some disturbance at the collection locality due to mass tourism for the cave system within the mountain.

Additional specimens examined. PENINSULAR MALAYSIA: **Perak:** Gunung Tempurung, 1500–2000 ft. [457–610 m], 12 Jan 1959, *Molesworth Allen 4104* (K [K000491545]).

New record for Peninsular Malaysia

Adiantum siamense Tagawa & K.Iwats., Acta Phytotax. Geobot. 25: 20 (1971). – TYPE: Thailand, Nakhon Si Thammarat, Thung Son, *Tagawa T-7890* (holotype KYO; isotype BKF).

This species was formerly a Thai endemic found only on limestone sites in the southern provinces of Nakhon Si Thammarat and Krabi (Lindsay & Middleton, 2012 onwards). The discovery of this species in Langkawi is not only a new record for Peninsular Malaysia but extends the distribution of the species considerably further to the south.

The specimen *Nor Ezzawanis et al. FRI 84909* (KEP) is a mixed collection of *Adiantum siamense* and *A. malesianum*. The *Adiantum siamense* parts of the specimen are the left and bottom two plants.

A full description will be provided in the forthcoming *Flora of Peninsular Malaysia* account. However, a description based on the one in the *Flora of Thailand* (Tagawa & Iwatsuki, 1985), along with photographs, is available in the *Ferns of Thailand, Laos and Cambodia* website (Lindsay & Middleton, 2012 onwards). *Adiantum siamense* is easily distinguished from other *Adiantum* species in Peninsular Malaysia by having pinnae that are very sparsely hairy above and on the margins below, these hairs acicular uniseriate (2–4-celled), pale brown, and up to 1.5 mm long.

Distribution. Peninsular Thailand (Nakhon Si Thammarat, Krabi), Peninsular Malaysia (Langkawi).

Habitat and ecology. On limestone cliffs and rocks at low altitudes.

Provisional IUCN conservation assessment. Lindsay & Middleton (2012 onwards) suggested a global IUCN conservation assessment of Endangered EN B1ab(ii)(iii). Using EOO, the discovery of this species in Malaysia would take it above the threshold for EN. It nevertheless still qualifies as Endangered EN B2ab(ii)(iii) as it is now known from only three sites with a total AOO of considerably less than 500 km².

Additional specimens examined. PENINSULAR MALAYSIA: **Kedah:** Langkawi, Selat Panchor Forest Reserve, 24 m, 3 Aug 2016, *Nor Ezzawanis et al. FRI 84909* (KEP [left and bottom two plants; barcode KEP256545]).

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