

A new species of *Adiantum* (Pteridaceae) from northern Thailand

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ABSTRACT. The new species *Adiantum membranifolium* S.Linds. & Suksathan from northern Thailand is described and illustrated.

KEY WORDS: *Adiantum*, fern, Pteridaceae, Thailand.

INTRODUCTION

During field work in October 2009 at Doi Ang Khang in Fang district of Chiang Mai several large patches of a tiny *Adiantum* were observed growing in moist areas on a limestone cliff (Fig. 1A). An older collection of the same *Adiantum* from Doi Chiang Dao was also found in BKF and CMU and, very recently, a third collection has been made in Chiang Rai. As these specimens could not be matched to any known *Adiantum* species the new species *Adiantum membranifolium* S.Linds. & Suksathan is here described.

The individual pinnae of *Adiantum membranifolium*, which are deeply cleft, are very similar to the individual pinnules of a few non-Thai specimens of *Adiantum capillus-veneris* L. (a widespread and variable species in Europe, Asia, North America and Australia) but the fronds of *Adiantum membranifolium* typically only have a single pinna (i.e. are simple) or are short and only once-pinnate (Fig. B1). Fronds of *Adiantum capillus-veneris* are almost always bipinnate or tripinnate at least in the lower parts. Most of the single-pinna fronds of *Adiantum membranifolium* are sterile but some are fertile. Fertile fronds of *Adiantum membranifolium* are mostly once-pinnate. *Adiantum membranifolium* also differs from *Adiantum capillus-veneris* in the very thin rhizome (ca 0.7(–1) mm in diam. versus ca 2 mm in *Adiantum capillus-veneris*); the short, narrow, stiff,

dark brown or black and apparently non-clathrate scales (versus mostly longer, wider, paler yellow to golden-brown, clathrate scales of *Adiantum capillus-veneris*) (Fig. 1D–E); the extremely narrow stipe (0.1(–0.4) mm in diam. versus 0.4–4.0 mm in *Adiantum capillus-veneris*); and the very thin translucent lamina (thicker and not translucent in *Adiantum capillus-veneris*).

DESCRIPTION

***Adiantum membranifolium* S.Linds. & Suksathan sp. nov.** *Adiantum capillus-veneris* similis sed rhizomate tenuiore, squamis minoribus rigentioribus et magis fuscis, stipite tenuiore, frondibus e pinna singula compositis vel semel pinnatis et laminis membranaceis differt. Typus: Thailand, Chiang Mai, Fang district, Doi Ang Khang. Limestone cliffs not far from Royal Project, 1 Oct. 2009, Middleton, Lindsay & Suksathan 5031 (holotype QBG; isotypes BCU, BKF, E). Fig. 1.

Rhizome long-creeping, branching, ca 0.7(–1) mm in diam., densely covered with scales; scales narrowly triangular, entire, stiff, dark brown to black, shiny, not obviously clathrate, with a sharply pointed and sometimes crooked terminal cell, this sometimes missing in older scales leaving a notch in the cell(s) below, 0.8–1.8 mm long, 0.15–0.27 mm wide at base. Stipe 2.5–6.0(–12.5) cm by 0.1(–0.4) mm, dark brown, shiny, glabrous,

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Figure 1. *Adiantum membranifolium* S.Linds. & Suksathan: A. habitat at Doi Ang Khang; B. type material from Doi Ang Khang; B1. variation in frond morphology; B2. exceptionally large fronds; C. close up of basal pinna showing venation and sori (scale bar = 1 cm); D. rhizome scale from type material (scale bar = 0.2 mm). *Adiantum capillus-veneris* L.: E. rhizome scale from Middleton *et al.* 4741 (E) from Nang Khruan Waterfall, Kanchanaburi (scale bar = 0.2 mm).

sometimes with a few scales at very base. Fronds usually once-pinnate or reduced to a single pinna, very rarely (and barely) bipinnate as a result of a basal pinna having 2 or 3 small pinnules; fronds, including stipe, to 12(–21) by 3.5(–6.2) cm, more or less oblong in outline; rachis rarely straight, usually zig-zagging between pinnae, dark brown, shiny, glabrous; pinnae 1–6(–8), arranged alternately and widely spaced, more or less equal in size but terminal pinna up to two times larger; pinnae on stalks 1–8(–11) mm long, these the same colour as the stipe and rachis; pinnae flabellate in outline, base forming an angle of 45–80° (exceptionally 90–130°), whole pinna deeply cleft usually to more than half way and forming several long narrow lobes, these often irregularly dentate at apex and margins, especially when sterile, margins smoother when fertile; pinnae 1.0–3.5 by 0.8–2.5(–3.5) cm, pale to mid-green, thin, translucent, glabrous above and beneath; veins conspicuous, dichotomous, free, reaching margin. Sori at apex of lobes, on inner face of reflexed marginal flaps (false indusia), indusia sub-quadrangular, ca 1.0–1.5(–1.8) by 0.5–2.0 mm, glabrous, 2–4(–6) per pinna and never more than one per lobe; sporangia glabrous; spores dark brown, trilete, tetrahedral-globose.

Thailand.— NORTHERN: Chiang Mai [Doi Chiang Dao, north side of Doi Luang, 8 Oct. 1995, Maxwell 95-855 (A, BKF, CAS, CMU, L, MO)]; Doi Ang Khang, Middleton *et al.* 5031 (type: BCU, BKF, E, QBG)]; Chiang Rai [Mae Sai district, Tham Luang – Khun Nam Nang Non forest park, Leang Pha cave, 15 Dec. 2009, La-ongsri 787 (BKF, E, QBG)].

Distribution.— So far only known from Thailand.

Ecology.— On almost vertical karst limestone cliffs in shade with water seepage at altitudes from 480 to 1360 m. At Doi Ang Khang on crumbly limestone with moss. Surrounding vegetation recorded as seasonal mixed evergreen and deciduous hardwood forest or orchard.

IUCN Conservation Status.— Data Deficient (DD). Although this fern has been collected in protected areas it has only been recorded at three sites. More exploration of limestone sites in northern Thailand is necessary to see whether it is more widespread and whether it occurs in areas that are

not protected given the destruction of many limestone sites due to quarrying activities.

Notes.— (1) An isotype of *Adiantum membranifolium* S.Linds. & Suksathan can be viewed on-line via the website of the Royal Botanic Garden Edinburgh (<http://www.rbge.org.uk/>).

(2) Ten species of *Adiantum* were recorded in the *Flora of Thailand* account (Tagawa & Iwatsuki, 1985) and 14 species by Lindsay *et al.* (2009), including two recently described species (Suksathan, 2004; Lindsay & Middleton, 2004). In addition, it has recently come to our attention that *Adiantum gomphophyllum* Baker was overlooked by both Tagawa & Iwatsuki (1985) and Lindsay *et al.* (2009), mainly due to the fact that it had been described in the protologue as being from the “Malay Peninsula” and in *Index Filicum* and IPNI as being from “Malacca”. The type specimen is actually from Phangnga, from where additional collections have also been made. In conclusion, with the addition of *Adiantum membranifolium* and *Adiantum gomphophyllum*, there are now 16 species of *Adiantum* known from Thailand.

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