

Syngamma minima Holttum (Pteridaceae, subfam. Pteridoideae), a new record for Thailand

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ABSTRACT. *Syngamma minima* Holttum, a new record for Thailand, is described and illustrated.

KEY WORDS: Fern, Pteridaceae, *Syngamma*, Thailand.

INTRODUCTION

Syngamma J.Sm. is a small tropical fern genus of approximately 15 species occurring in Cambodia, Southern Vietnam, Peninsular Thailand, Malesia, the Solomon Islands and the Caroline Islands (Palau) but is in need of revision (H. Schneider, pers. comm.). The genus was placed in the Parkeriaceae in the Flora of Thailand but is now included in the Pteridaceae, subfamily Pteridoideae (Smith et al., 2006, 2008; Christenhusz et al., 2011).

Syngamma is currently only known from one species in Thailand, *Syngamma alismifolia* (C.Presl) J.Sm. (Tagawa & Iwatsuki, 1985; Lindsay et al., 2009). Although there have been many additions to the fern flora of Thailand since the Flora of Thailand accounts were published (see Lindsay et al., 2009, 2010; Suksathan et al., 2010) there have been no new additions to *Syngamma* in Thailand. A recent collection by the first author and the discovery of an older collection at BKF have highlighted the existence of a second species in Thailand. These collections key out as *Syngamma minima* Holttum in Holttum (1955) although neither specimen quite fits the description of the species as given by Holttum. The two Thai collections have rather larger fronds with less denticulate margins. Holttum's protologue and

later descriptions, however, are based on very few collections and consequently could have encompassed rather little of the natural range of variation of the species. Confirmation of our species concept, or the possibility of an even broader species concept including *Syngamma dayi* (Bedd.) Bedd. (a species currently only recognized in Peninsular Malaysia but which would have nomenclatural priority if it was synonymized with *S. minima*), must await a revision of the genus. Either one of these species concepts would involve a new record for Thailand which we thus present here under the name *Syngamma minima*.

DESCRIPTION

Syngamma minima Holttum, Gard. Bull. Straits Settle. 4: 56. 1927; Holttum, Rev. Fl. Malaya 2: 585, fig. 345. 1955 [‘1954’]. Type: Peninsular Malaysia, Gunong Panti, 14 Feb. 1926, Holttum [SFN] 17498 (Lectotype: **BM** (Barcode: BM000066405), designated here; isolectotypes: **BM** (Barcode: BM000066788), **K**, **SING**, **US**). Fig. 1.

Lithophyte (but also recorded, possibly mistakenly, as terrestrial). *Rhizome* short, creeping, 1.5–3 mm diam. when fresh, 1–1.5 mm diam. when dry, bearing crowded fronds, densely covered with bristles; bristles stiff, multicellular, 0.5–1.5 mm

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long, dark brown but slightly translucent and very shiny. *Fronde*s monomorphic, simple. Stipes not articulate to rhizome, 1–3 cm long, narrowly and shallowly grooved above, very narrowly winged, green or sometimes purplish brown, densely covered with bristles (like those on the rhizome) at the base. *Laminae* coriaceous, rigid, narrowly oblong to linear-oblong or spatulate, 2–11 by 0.35–1 cm, olive green, glabrous, apex rounded, base attenuate, margin cartilaginous, lateral margins varying from almost entire to strongly denticulate, apical margin always crenate or denticulate; midrib slightly raised above, strongly raised below, narrowly and shallowly grooved above when fresh but grooves indistinct when dry, green or sometimes purplish brown; veins simple or once forked, all (except sometimes the most basal ones) joining an intramarginal vein, slightly raised on the upper

surface, sometimes inconspicuous especially in old fronds. *Fertile fronds* soriferous for their entire length. Sori exindusiate, linear along the veins, extending from about half way to near the apical part of veins, 0.5–2 mm long; soral paraphyses present and conspicuous, terminal cells enlarged, reddish brown or red, translucent and shiny; sporangia subsessile (but at lower magnifications appearing sessile), 0.15–0.2 mm diam., glabrous; annulus vertical, interrupted by the sporangial stalk. *Spores* trilete, tetrahedral, subglobular, 35–40 μm diam., rough, irregularly tuberculate, pale yellow.

Thailand.— PENINSULAR: Yala [Betong district, Ban Chantharat, 18 Feb. 2007, *J. Wai* 984, 5° 47' N 101° 12' E (PSU)]; Narathiwat [Sukhirin district, Khao Nakharat, 20 Oct. 1996, *Niyomdham* 4845 (BKF)].



Figure 1. A-D. *Syngramma minima* Holttum, A Habitat, B. Habit, C. Rhizome and stipes, D. Fertile laminae with sori.

Distribution.— Peninsular Malaysia.

Ecology.— *J. Wai 984* was collected on cliffs in shady areas near the top of quartzitic phyllite ridges at an altitude of 650 m. *Niyomdham 4845* is reported to have been terrestrial at 665 m but with no other habitat information. The type material (*Holttum* [SFN] 17498) was found growing among liverworts on a vertical rock face at approximately 488 m (“1600 ft”) but the precise nature of this rock is uncertain, having been described first as “sandstone” (Holttum, 1927) then later as “quartzite” (Holttum, 1955).

IUCN Conservation Status. — Data Deficient (DD). The species is known from very few collections which are quite widely separated and its precise distribution is unclear. The few collections suggest it is rarely encountered but the lack of good distribution data leaves us to conclude it must be given a DD status.

Note.— Until its discovery in Thailand *Syngramma minima* Holttum was known only from the type locality in Peninsular Malaysia.

ACKNOWLEDGEMENTS

We thank Dr Harald Schneider (BM) for his advice on *Syngramma* taxonomy, Dr David J. Middleton (E) and an anonymous reviewer for their comments on our manuscript, and Mr Nopadol Sae Wai for his help in the field. This work was supported in Thailand by a TRF/BIOTEC Special Program for Biodiversity Research and Training grant T_149011 and the Graduate School, Prince of Songkla University (JSW & KS) and in the UK by a grant from the Leverhulme Trust (SL).

REFERENCES

- Christenhusz, M.J.M., Zhang, X-C. & Schneider, H. (2011). A linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa* 19: 7–54.
- Holttum, R.E. (1927). A new fern from the Malay Peninsula. *Gardens' Bulletin Straits Settlement* 4: 48–56.
- _____. (1955 [‘1954’]). A Revised Flora of Malaya, Vol. II. Ferns. Government Printing Office, Singapore.
- Lindsay, S., Middleton, D.J., Boonkerd, T. & Suddee, S. (2009). Towards a stable nomenclature for Thai ferns. *Thai Forest Bulletin (Botany)* 37: 64–106.
- Lindsay, S., Suksathan, P. & Middleton, D.J. (2010). A new species of *Adiantum* (Pteridaceae) from Thailand. *Thai Forest Bulletin (Botany)* 38: 67–69.
- Smith, A.R., Pryer, K.M., Schuettpelz, E., Korall, P., Schneider, H. & Wolf, P.G. (2006). A classification of extant ferns. *Taxon* 55: 705–731.
- _____. (2008). Fern Classification. Pp. 417–467. In: Ranker, T.A. & Haufler, C.H. (eds), *Biology and Evolution of Ferns and Lycophytes*, CUP, Cambridge.
- Suksathan, P., Lindsay, S. & Middleton, D.J. (2010). *Polystichum hookerianum* (C.Presl) C.Chr. (Dryopteridaceae), a new record for Thailand. *Thai Forest Bulletin (Botany)* 38: 120–123.
- Tagawa, M. & Iwatsuki, K. (1985). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 2. Royal Forest Department, Bangkok.