THAI FOREST BULL., BOT. 52(1): 49–55. 2024.
DOI https://doi.org/10.20531/tfb.2024.52.1.06

A new record of *Asplenium simaoense* (Aspleniaceae) for Thailand

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ABSTRACT

Asplenium simaoense is reported as a new record for Thailand. Thai material previously identified as *Asplenium interjectum* is here assigned to *A. simaoense*.

KEYWORDS: Ferns, Flora of Thailand.

Accepted for publication: 23 May 2024. Published online: 28 June 2024

INTRODUCTION

Tagawa & Iwatsuki (1979, 1985, 1988, 1989) published accounts of the fern families of Thailand but applied some names that are today considered to be inappropriate as our knowledge of South-East Asian ferns develops. Later studies reported new taxa or records for Thailand (Mitsuta, 1985; Iwatsuki *et al.*, 1998; Parris, 1998; Hovenkamp *et al.*, 1998; Nooteboom, 1998; Boonkerd & Pollawatn, 2000, 2002a, 2002b, 2004, 2006; Boonkerd & Nooteboom, 2001; Lindsay & Middleton, 2004, 2009; Lindsay *et al.*, 2004, 2008; Suksathan, 2004; Boonkerd, 2006). Lindsay *et al.* (2009) listed approximately 670 pteridophyte taxa from Thailand, including several new records, and also reported 42 species in the genus *Asplenium* L. A few other studies have also reported additional *Asplenium* species (Boonkerd, 2009; Boonkerd & Suksathan, 2009; Lindsay *et al.*, 2013; Kanemitsu *et al.*, 2017).

More recently, however, the identities of *Asplenium* species in Eastern and South-Eastern Asia have been updated (Xu, 2018; Xu *et al.*, 2019, 2021, 2022). Xu *et al.* (2019) described a new species, *Asplenium simaoense* K.W.Xu, Li Bing Zhang & W.B.Liao (Fig. 1), from limestone mountains in Yunnan Province of South-West China. When we visited the herbarium of Kyoto University (KYO) we found several specimens of *A. simaoense* (Fig. 2) which were previously identified as *A. interjectum* Christ. In addition, specimens from Thailand labelled as *A. interjectum* in other herbaria were also found to be *A. simaoense*. The distinguishing characters of *A. simaoense* can be found in Xu *et al.* (2019) but is particularly distinct from *A. interjectum* (Fig. 3) in the more deeply serrated pinnules. Here, we list specimens collected from Thailand that were previously labelled as *A. interjectum* but should be annotated as *A. simaoense*. True *A. interjectum* does not occur in Thailand.

We provide a description for *Asplenium simaoense* based on the protologue and with updates from the Thai material. There are, however, no significant morphological differences between the specimens from China and those from Thailand. All specimens listed below have been seen unless indicated.

Asplenium simaoense K.W.Xu, Li Bing Zhang & W.B.Liao, Syst. Bot. 44: 495. 2019. Type: China, Yunnan, Pu'er City, Simao District, Liushun Xiang, elev. 1,300 m, 22°36′24.44″N, 100°42′37.94″E, in a tropical limestone mountain monsoon forest, on exposed slopes of a limestone mountain, April 19, 2017, *Ke Wang Xu & Lei Jiang XKW317* (holotype **SYS** [SYS00236326]; isotypes **MO**, **SYS**). Fig. 1.

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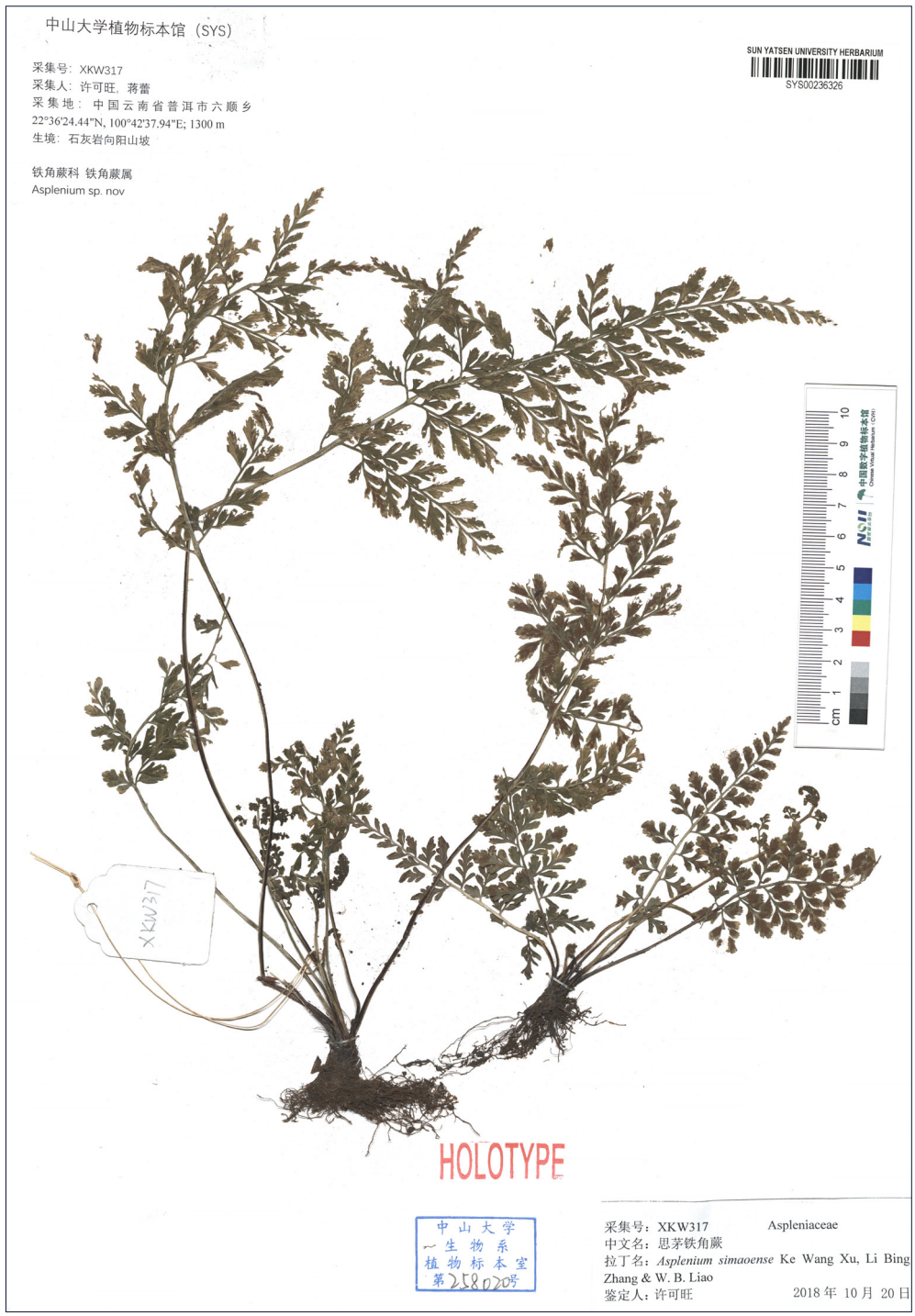


Figure 1. Holotype of *Asplenium simaoense* K.W.Xu, Li Bing Zhang & W.B.Liao from Yunnan Province, China (SYS00236326). Some pinnules are damaged but several specimens of *A. simaoense* collected from Thailand fit within the morphological variation of this species.



Figure 2. A specimen of *Asplenium simaoense* from Thailand (*Murata, Iwatsuki & Pengklai T-14956*, **KYO**), originally misidentified as *A. interjectum* Christ but differing from that (Fig.3) in having more deeply serrated pinnules.



Figure 3. Holotype of *Asplenium interjectum* Christ from Mont Kao-tchay, Tsin-gay, Guizhou Province, China (E00413970).

Plants 8–35(–40) cm tall. *Rhizomes* erect, densely scaly at apex, 1–3 cm tall. *Scales* dense on basal part of stipe, sparse on upper part of stipe, clathrate, black or dark brown, narrowly triangular to linear, 2–4.5 × 0.1–1 mm, margins entire. *Fronds* caespitose, herbaceous, green or greyish-green when dry, 1–6 per rhizome; stipes semiterete, 5–25 cm long, adaxially green and sulcate, abaxially castaneous; rachises semiterete, green, sulcate adaxially, often brown or castaneous at base abaxially, green at apex, finely scaly when young, glabrous when older; laminae usually narrowly triangular or seldom ovate, 8–25 × 5–18 cm, width/length = ⅗ to ¾, bipinnate at middle or upper part, tripinnate at base, acute or acuminate at apex; pinna stalks 2–8 mm long, pinnule stalk on lowest basiscopic pinnule on lowest pinna 0.1–1(–2) mm long; pinnae 8–16 pairs, alternate at middle and upper part of blade, often opposite at lower part of blade; largest pinnae slightly asymmetrical, triangular or ovate, 3–10 × 1.5–3(–4) cm, acute or acuminate at apex; pinnules 4–7(–9) pairs in the largest pinnae, alternate, anadromous, deeply serrated at apex and middle part; lowest basiscopic pinnule on lowest pinna largest, triangular, 8–25(–40) × 7–13(–20) mm; secondary pinnules obovate, 6–10 × 3–4 mm, triangular, decurrent to costule, entire at base, often deeply serrated in the upper part to the apex, rarely obtuse at apex. *Veins* inconspicuous, slightly raised adaxially when dry, anadromously forked, not reaching margins. *Sori* 2–7 per secondary pinnule, submedian to median on subtending veins, oval to linear, (1–)2–3(–4.5) mm; indusia translucent, linear, membranous, entire, opening toward costule or costa, persistent.

Thailand.— NORTHERN: Mae Hong Son [Pang Ma Pha, Tham Lot cave area, on karst limestone in deep shade, 19°33′39″N, 98°16′43″E, 670 m alt., 23 Sept. 2009, *Middleton et al. 4974* (**QBG** [72579, photo]); Pang Ma Pha, limestone hill next to Huai (stream) Nam Iang, near Wa Na Luang (Black Lahu) village, Tham Lot Subdistrict, 650 m alt., 16 Aug. 2012, *Maxwell 12-272* (**QBG** [69990, photo])], Chiang Mai [Chiang Dao, limestone crevice in deep shade, 1,950 m alt., 25 July 1996, *Suksathan 568* (**QBG** [15020, photo]); Chiang Dao, Kio Phawok border checkpoint, mixed deciduous forest on limestone, 19°46′6.0″N, 98°57′0.0″E, 750 m alt., 30 Sept. 2009, *Middleton et al. 5018* (**QBG** [72560, photo]); Doi Chiang Dao, deciduous forest rich in bamboo and *Dillenia*, in limestone crevices, 19°25′N, 98°55′E, 550–1,100 m alt., 3 Dec. 1965, *Hennipman 3184* (**KYO**, **L** [L3510924, photo]); foot of Doi Chiang Dao, crevices of wet limestone in forest, 500–600 m alt., 11 Sept. 1967, *Tagawa et al. T-9757* (**KYO**, **L** [L3510928, photo], **TI** [TI00235767], **US** [US2981571, photo]); mid-elevation of Doi Chiang Dao, shady limestone flanks in dense forest, 1,500 m alt., 15 Sept. 1967, *Shimizu & Hutoh T-10189* (**KYO**, **L** [L3510929, photo]); mid-elevation of Doi Chiang Dao, in deciduous forest mixed with bamboo on moist calcareous rocks, 600–1,300 m alt., 25 Sept. 1971, *Murata et al. T-14956* (**BKF** [BKF50619, photo], **KYO**, **P** [P01555970, photo]); mid-elevation of Doi Chiang Dao, crevices of wet limestone in forest, 500–600 m alt., 12 Sept. 1967, *Tagawa et al. T-9827* (**KYO**, **L** [L3510930, photo], **US** [US2981573, photo]); higher elevation of Doi Chiang Dao, crevices of wet limestone in dense forest, 1,100–1,800 m alt., 12 Sept. 1967, *Tagawa et al. T-9989* (**KYO**, **L** [L3510927, photo]); along the road in Fang, limestone outcrops, in rock crevices, 400 m alt., 27 July 1968; *Larsen et al. 2759* (**BKF** [BKF153271, photo], **KYO**, **L** [L3510932, photo], **P** [P01555858, photo])], Chiang Rai [Phaya Nak cave, Tham Luang-Khun Nam Nang Non Forest Park, Mae Sai, on rocky plate in evergreen forest, 500 m alt., *Norsaengsri & Tathana 7297* (**QBG** [48546, photo])], Nan [Tham Sakoen NP, Song Khwae, on limestone bedrock in deciduous forest, 19°23′N, 100°32′E, 600 m alt., 5 Dec. 2006, *Srisanga et al. 2894* (**QBG** [31219, photo]); Tham Sakoen NP, Song Khwae, in forest on limestone, 19°22′83.0″N, 100°32′14.0″E, 732 m alt., 15 Dec. 2010, *La-ongsri & Romkham 1197* (**QBG** [51524, photo]); Tham Sakoen NP, Song Khwae, in forest on limestone, 19°22′86.8″N, 100°32′7.5″E, 756 m alt., 15 Dec. 2010, *La-ongsri & Romkham 1203* (**QBG** [51530, photo]); Tham Sakoen NP, Song Khwae, in evergreen forest, 19°22′12.24″N, 100°31′39.12″E, 713 m alt., 26 July 2011, *La-ongsri et al. 1790* (**QBG** [54797, photo])]; NORTH-EASTERN: Loei [interior of Nam Thop, on the eastern slope of Phu Luang, on a dry mountain slope in dense evergreen forest, 400–850 m alt., 7 Dec. 1965, *Tagawa et al. T-1907* (**KYO**, **US** [US2981579, photo])].

Distribution.— SW China (Yunnan).

Habitat and ecology.— Crevices and sides of moist calcareous rocks in forest; 300–1,950 m alt. Temperate evergreen or deciduous forest.

Vernacular.— No Thai vernacular name known but in China it is Si-mao tie-jiao-jue (思茅铁角蕨).

Preliminary conservation status.— Least Concern (LC) globally based on the IUCN Red List categories and criteria (IUCN, 2022). The species has been recorded from several localities from SE China and N and NE Thailand, with an estimated extent of occurrence (EOO) of 91,261 km^2 (Bachman *et al.*, 2011).

ACKNOWLEDGEMENTS

We thank Mr S. Nemoto of Tokyo University (TI) and Dr S. Fuse of Kyoto University (KYO) for support on herbarium visits and Dr Prachaya Srisanga of the Queen Sirikit Botanic Garden (QBG) for providing photographs of specimens.

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