

## *Asplenium contiguum* Kaulf. (Aspleniaceae), a new record for Thailand

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ABSTRACT. *Asplenium contiguum* Kaulf., a new record for Thailand, is described and illustrated.

KEY WORDS: Fern, *Asplenium*, Aspleniaceae, Thailand.

Since the ferns were completed for the *Flora of Thailand* (Tagawa & Iwatsuki, 1979, 1985, 1988, 1989) many new records and species have been recorded in the country (see Lindsay et al., 2009, 2010, 2012a, 2012b; Suksathan et al., 2010), including four additional species of *Asplenium* (Boonkerd et al., 2004; Boonkerd, 2009; Boonkerd & Suksathan, 2009; Boonkerd & Pollawatn, 2012). Three further species of *Asplenium*, provisionally reported in Lindsay et al. (2009), could not be verified and are currently excluded from the list of 37 species found in Thailand (see Lindsay & Middleton, 2012 onwards).

A collection made at Phu Luang Wildlife Sanctuary in October 2009 has been identified as *Asplenium contiguum* Kaulf., a very widespread species but one which was previously unknown in Thailand.

*Asplenium contiguum* Kaulf., Enum. Filic. 172. 1824; Hooker & Arnott, Bot. Beechey Voy. 106. 1841; Brackenridge, U.S. Expl. Exped., Atlas Filic. 158. 1855; Hooker, Sp. Fil. (Hooker) 3: 156, t. CXCIV, f. 1 (1860); Palmer, Hawaii's Ferns and Fern Allies 57. 2003; Illustrated Flora of Ferns & Fern-Allies of South Pacific Islands 138, t. 49.5a & b. 2008.— Type: Hawaii, Oahu, *Chamisso s.n.*, 1827 (P [P00642985]). Fig. 1.

*Asplenium filiforme* Kaulf., Enum. Filic. 172. 1824; Hooker & Arnott, Bot. Beechey Voy. 106.

1841; Brackenridge, U.S. Expl. Exped., Atlas Filic. 158. 1855.— *Asplenium contiguum* var. *filiforme* (Kaulf.) Hooker, Sp. Fil. (Hooker), 3: 156, t. CXCIV, f. 2–4. 1860.— Type: Hawaii, Oahu, *Chamisso s.n.* (n.v.).

*Asplenium lepturus* J.Sm. ex C.Presl, Epimel. Bot. 72. 1851; Tardieu & C.Chr., Fl. Indo-Chine 7(2): 223. 1940.— *Asplenium contiguum* var. *lepturus* (J.Sm. ex C.Presl) Hooker, Sp. Fil. (Hooker), 3: 156, t. CXCIV, f. 5–7. 1860.— Type: Philippines, Luzon, *Cuming 211, 1836–1841*. (B [B200017192], BM (x2) [BM001045201, BM001045202], E [E00210804], MICH [MICH1190073], P [P00642967], PRC (n.v.), US [US00135099]).

Epiphytic or lithophytic (occasionally terrestrial). *Rhizomes* long-creeping, 4–7 mm diam., densely covered with scales; scales, orange to dark brown, clathrate, 3.5–5.5 × 0.5–1.1 mm, basifixed, narrowly triangular with a hair-pointed apex (this often missing on older scales), margin entire, sometimes with a few small irregular projections. *Fronds* close, 0.5–2 cm apart, monomorphic, (30–) 50–85(–136) cm long; stipes dull, dark brown to almost black, (12–)20–44 cm long, slightly sulcate above, subglabrous (or can be covered with small glandular and eglandular hairs in non-Thai material), scales only at base; lamina pinnate, oblong or narrowly ovate in outline (occasionally elliptic), (18–)30–60(–103) × (9–)12–20(–31) cm, lowermost pinnae hardly reduced, terminal part consisting of reduced pinnae merging into a pinnatifid caudate

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apex, subcoriaceous, mid to dark-green and slightly shiny above, hardly paler beneath, glabrous, 12–41 pairs of free pinnae, alternate, rarely subopposite; rachises subglabrous (in Thai material), grooved above, same colour as stipes; pinnae with short green stalks less than 3 mm long, narrowly ovate and slightly falcate, longest pinnae in the bottom third of the lamina, longest pinnae (5–)7–13(–16.5) × (0.6–)0.8–1.6 cm, base asymmetrical with acroscopic side broadly cuneate to truncate and basiscopic side narrowly cuneate to very narrowly cuneate resulting in lamina appearing to be absent, apex

caudate, margin irregularly incised and serrate, costa slightly raised beneath, slightly grooved above; veins prominent, free, forked once or more, almost parallel. Sori on acroscopic veins on both sides of costa, linear, 8–16 mm long, from very near costa to less than half way to margin, often almost parallel to costa; indusia linear, margin entire, glabrous.

Thailand.— NORTH-EASTERN: Loei [Phu Ruea, Phu Luang Wildlife Sanctuary, Pha Yuaeng Trail, 1430 m alt., 16 Oct. 2009, *Middleton, Karaket, Lindsay, Phutthai & Suddee 5163 (BKF, E)*].

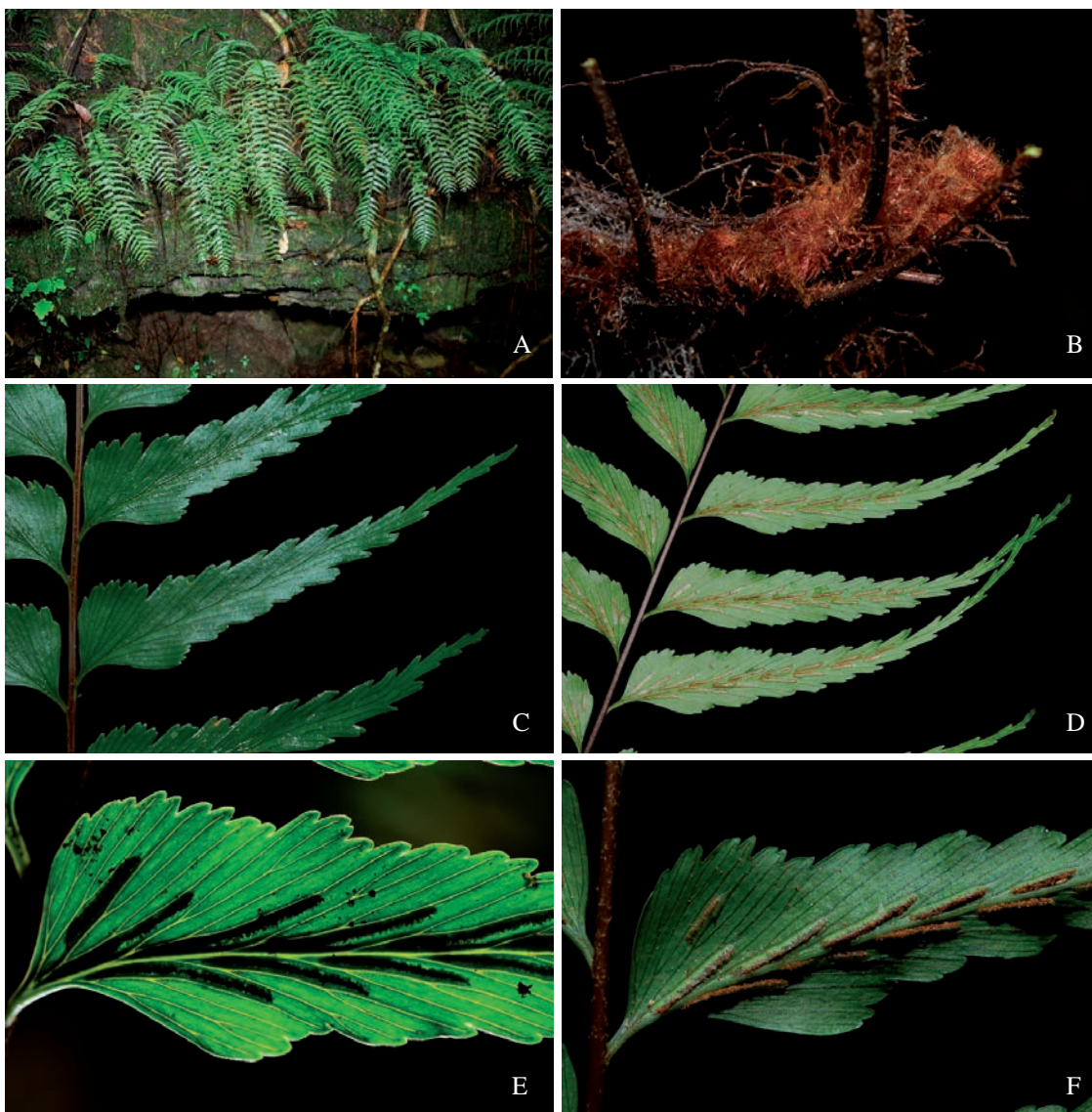


Figure 1. *Asplenium contiguum* Kaulf. A. Habit; B. Rhizome; C. Upper surface of pinnae; D. Lower surface of pinnae; E. Venation; F. Sori. A, D, E by Preecha Karaket, B, C, F by Thammarat Phutthai.

Distribution.— Laos, Vietnam, China (Hainan), Philippines, Vanuatu, Hawaii.

Ecology.— In Thailand only known from one collection growing on the vertical side of a large boulder in thin soil and leaf litter in hill evergreen forest on sandstone; outside of Thailand it is usually epiphytic but occasionally terrestrial.

Proposed IUCN conservation assessment.— Least Concern (LC). This species is extremely widespread and although only known from one collection in Thailand this is in a well-protected area.

Notes.— Similar to *Asplenium polyodon* G.Forst. but differing particularly in the much longer rhizome and the narrower pinnae. There are no other *Asplenium* species in Thailand with long creeping rhizomes except, sometimes, *Asplenium batuense* Alderw. which has simple fronds. The remaining species of *Asplenium* with long creeping rhizomes in Tagawa & Iwatsuki (1985) have all been removed to *Hymenasplenium*. *Hymenasplenium* is recognised by a suite of morphological and anatomical characters but in Thailand is most easily distinguished from *Asplenium contiguum* by the dimidiate to subdimidiate pinnae.

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#### REFERENCES

- Boonkerd, T. (2009). *Asplenium inaequilaterale*: A new record for Thailand. *ScienceAsia* 35: 386–387.
- Boonkerd, T. & Suksathan, P. (2009). *Asplenium gueinzianum* Mett. ex Kuhn (Aspleniaceae), newly discovered in Thailand. *The Natural History Journal of Chulalongkorn University* 9(1): 95–98.
- Boonkerd, T. & Pollawatn, R. (2012). *Asplenium cardiophyllum*, a species of fern newly discovered in Thailand. *ScienceAsia* 38: 125–128.
- Boonkerd, T., Lindsay, S., Middleton, D.J. & Suddee, S. (2004). Additions to the Pteridophyte flora of Thailand. *Thai Forest Bulletin (Botany)* 32: 6–11.
- Lindsay, S. & Middleton, D.J. (2012 onwards). Ferns of Thailand, Laos and Cambodia. <http://rbg-web2.rbge.org.uk/thaiferns/>
- Lindsay, S., Suksathan, P. & Middleton, D.J. (2010). A new species of *Adiantum* (Pteridaceae) from northern Thailand. *Thai Forest Bulletin (Botany)* 38: 67–69.
- 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., Phutthai, T., Sridith, K., Chanthanaotrapint, S. & Middleton, D.J. (2012a). *Actinostachys wagneri* (Schizaeaceae), a new record for Thailand. *Thai Forest Bulletin (Botany)* 40: 14–16.
- Lindsay, S., Middleton, D.J. & Suksathan, P. (2012b). A new species of *Rhachidosorus* (Rhachidosoraceae), a genus new to Thailand. *Thai Forest Bulletin (Botany)* 40: 102–104.
- Suksathan, P., Lindsay, S. & Middleton, D.J. (2010). *Polystichum hookerianum* (C.Presl) C.Chr., a new record for Thailand. *Thai Forest Bulletin (Botany)* 38: 120–123.
- Tagawa, M. & Iwatsuki, K. (1979). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 1. Royal Forest Department, Bangkok.
- . (1985). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 2. Royal Forest Department, Bangkok.
- . (1988). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 3. Royal Forest Department, Bangkok.
- . (1989). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 4. Royal Forest Department, Bangkok.