

## *Lecanopteris pumila* Blume (Polypodiaceae), a new record for Thailand

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ABSTRACT. *Lecanopteris pumila* Blume is newly recorded for Thailand. The species is described and a key to the *Lecanopteris* species of Thailand is presented.

KEY WORDS: Ant-fern, fern, Flora of Thailand, *Lecanopteris*, *Myrmecophila*, *Myrmecopteris*, Polypodiaceae, Thailand.

### INTRODUCTION

The Polypodiaceae for the Flora of Thailand was published in 1989 (Tagawa & Iwatsuki, 1989). In that work two species of *Myrmecophila* Christ ex Nakai (a genus now treated as a synonym of *Lecanopteris* Reinw. (Gay et al., 1994)) were listed. Both of these species, *Lecanopteris crustacea* Copel. and *L. sinuosa* (Wall. ex Hook.) Copel., are members of *Lecanopteris* subgen. *Myrmecopteris* (according to Gay et al., 1994 and Hennipman & Hovenkamp, 1998 – but see note on page 62). All members of this subgenus have rhizomes that are densely covered with imbricate peltate scales. In May 2005 a third species of *Lecanopteris*, *L. pumila* Blume, was discovered in Thailand in the province of Yala. This species belongs to *Lecanopteris* subgen. *Lecanopteris*. All members of this subgenus have rhizomes that are glabrous except for an indument of scattered scales and hairs at the apices and, occasionally, persistent in protected grooves of older parts.

The genus *Lecanopteris* as a whole has 13 species, 12 of which are confined to Malesia. The remaining species, *L. sinuosa*, is found throughout Malesia from Sumatra to Vanuatu, but also extends into southern Taiwan and into northern Australia (Queensland) (Gay et al., 1994; Hennipman & Hovenkamp, 1998).

The rhizomes of all *Lecanopteris* species have chambers in which ants live. The relationship between the ants and the ferns is believed to be mutualistic, the ants being provided with a home and the ferns deriving protection from the presence of the ants as well as a supply of nutrients from their faeces and other debris deposited inside the rhizome (Gay, 1994). *Lecanopteris* species are sometimes referred to as “ant-ferns”.

#### KEY TO THE LECANOPTERIS SPECIES OF THAILAND

- |  |                     |
|--|---------------------|
| 1. Rhizome not covered with peltate scales | <b>L. pumila</b>    |
| 1. Rhizome covered with peltate scales     |                     |
| 2. Fronds simple; rhizome 1–2 cm thick     | <b>L. sinuosa</b>   |
| 2. Fronds pinnatifid; rhizome 3–5 cm thick | <b>L. crustacea</b> |

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Figure 1. Reproduction (with minor modifications) of the type illustration of *Lecanopteris pumila* Blume (Fl. Javae t. 94B. 1851.) showing details of the habit, sori, venation and sporangia. The original illustration, in which the fronds are probably life-sized, is about twice as large.

## DESCRIPTION

**Lecanopteris pumila** Blume, Fl. Javae t. 94B. 1851; Gay et al., Gard. Bull. Sing. 45: 305. 1994 [‘1993’]; Hennipman & Hovenkamp, Fl. Malesiana, ser. II, Ferns and Fern Allies 3: 70, fig. 12c. 1998.— *Lecanopteris carnosa* var. *pumila* (Blume) Alderw., Bull. Dép. Agric. Indes Néerl. 27: 3. 1909; Holttum, Fl. Malaya, vol. II. (Ferns) 210, fig. 110. 1954. — Type: Illustration in Blume, Fl. Javae t. 94B. 1851. Fig. 1.

For further synonymy see Hennipman & Hovenkamp, Fl. Malesiana, ser. II, Ferns and Fern Allies, 3: 70. 1998.

Rhizome creeping and much branched, 1.5–2.5 cm thick, fleshy, hollow and ant-inhabited; bright pale green when young, blackening with age, glabrous except for a few scattered scales and hairs at apices and, occasionally, persistent in protected grooves of older parts. *Rhizome scales* small, dark, somewhat round and with a strongly dentate margin, 0.2–0.4 mm diameter. *Rhizome hairs* also small, 0.1–0.2 mm long, simple or once-branched (“Y” shaped), dark brown and glandular. *Fronds* stalked, pinnatifid, entirely glabrous, 19–40 by 5–9 cm, arising from phyllopodia. *Phyllopodia* hollow, prominent, 0.5–1.5 cm high, sometimes replaced by solid spines. *Stipes* dark brown, glabrous, 7–15 cm by 1.5–5 mm, narrowly winged towards the apex. *Lamina* oblong to slightly obovate, bright green, glabrous, thinly leathery, 12–25 by 5–9 cm, deeply lobed (i.e. pinnatifid) to within 1 or 2 mm of the rachis, lobes separated by about their own width; anastomosing veins with included veinlets but these obscure or invisible in fresh fronds (where only rachis and costae are raised both surfaces and easily visible), visible in dry fronds, sterile lobes 2.0–4.5 cm by 5.5–10 mm, usually widened somewhat above the base, edges entire, apex rounded to acute; fertile lobes 2.5–4.5 cm long, commonly 5–7 mm wide, the edges lobed, lobes rounded, 2–3 mm long and wide, separated by about their own width, each wholly occupied by a deeply sunken sorus and folded backwards towards the upper surface. *Sporangia* ca 0.3 mm long, on stalks to 0.5 mm long. *Spores* monolete, yellow.

Thailand.— PENINSULAR: Yala [Betong District, Hala-Bala Wildlife Sanctuary, on trail up unnamed ‘1490’ mountain reached from the shores of Bang Lang Reservoir. Smaller false summit before reaching the actual summit, 5°58’N, 101°26’E, 24 May 2005, Middleton, Chamchamroon, Lindsay, Phuphat & Pooma 3676 (BKF)].

Distribution.— Peninsular Malaysia, Sumatra, Borneo.

Ecology.— Reported throughout its range as being epiphytic, on branches of trees in mid-montane and montane scrub forest, often in full sunshine. The rhizome can be quite substantial forming what Holttum (1954) described as “a crust” on and around branches. Altitude ca 1050–1700 m; the specimen above was collected at 1450 m altitude.

IUCN Conservation Status.— Least Concern (LC). Although this species is only known from one collection in Thailand it is in an area of extensive forest and is a widespread species in western Malesia.

Notes.— It seems that the description to go with plate 94B in Flora Javae (Blume, 1851) was never published. However, we consider the name *Lecanopteris pumila* Blume to be validly published as the plate itself shows details of the habit, sori, venation

and sporangia (Fig. 1), sufficient to validate the name under Arts. 42.3 and 42.4 of the International Code of Botanical Nomenclature (McNeill et al., 2006).

The generic name *Myrmecopteris* Pic.Serm. was published in 1977 (see Webbia, 31: 239) as a replacement name for the illegitimate *Myrmecophila* Christ ex Nakai (a later homonym of *Myrmecophila* Rolfe). Gay et al. (1994) and Hennipman & Hovenkamp (1998) treated *Myrmecopteris* as a subgenus of *Lecanopteris* but did not fulfil the criteria for valid publication of the combination at the rank of subgenus. As far as we can tell, *Lecanopteris* subgenus *Myrmecopteris* is not yet validly published. It is also worth noting that molecular phylogenetic studies suggest subgenus *Myrmecopteris* is paraphyletic (Hauffer et al., 2003).

The dimensions given in the description have largely been adapted from Holttum (1954), Gay et al. (1994) and Hennipman & Hovenkamp (1998) as the material from Thailand, although sufficient to be confident of the identification, is rather scanty for a detailed description. The single specimen consists of just one small fertile frond (19 cm long, 5 cm wide) attached to a small piece of rhizome. The plant from which this was harvested had some larger fronds and much more rhizome material but unfortunately these were not safely accessible.

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#### REFERENCES

- Blume, C.L. (1851). *Flora Javae nec non insularum adjectantium*, part 40, t. 94B.
- Gay, H., Hennipman, E., Huxley, C.R. & Parrott, F.J.E. (1994 [‘1993’]). The taxonomy, distribution and ecology of the epiphytic Malesian ant-fern *Lecanopteris* Reinw. (Polypodiaceae). *Gardens’ Bulletin Singapore* 45: 293–335.
- Hauffer, C.H., Grammer, W.A., Hennipman, E., Ranker, T.A., Smith, A.R. & Schneider H. (2003). Systematics of the ant-fern genus *Lecanopteris* (Polypodiaceae): testing phylogenetic hypotheses with DNA sequences. *Systematic Botany* 28: 217–227.
- Hennipman, E. & Hovenkamp, P.H. (1998). *Lecanopteris*. *Flora Malesiana ser. II, Ferns and Fern Allies*, 3: 59–72. Rijksherbarium / Hortus Botanicus, Leiden.
- Holttum, R.E. (1954). *Lecanopteris*. *Flora of Malaya*, vol. II (Ferns) 208–210. Government Printing Office, Singapore.

- McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold, K., Nicolson, D.H., Prado, J., Silva, P.C., Skog, J.E., Wiersema, J.H. & Turland, N.J. (eds). (2006). International Code of Botanical Nomenclature (Vienna Code) adopted by the Seventeenth International Botanical Congress, Vienna, Austria, July 2005. *Regnum Vegetabile* 146. A.R.G. Gantner Verlag KG.
- Pichi Sermolli, R.E.G. (1977). *Fragmenta Pteridologiae* – VI. *Webbia*, 31: 237–259.
- Tagawa, M. & Iwatsuki, K. (1989). In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, Vol. 3, part 4. Royal Forest Department, Bangkok.