



Phyllagathis nanakorniana (Melastomataceae), a new species from Thailand

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Key words

Melastomataceae
Phyllagathis
Sonerileae

Abstract A new species of *Phyllagathis* (Melastomataceae), *P. nanakorniana*, from Thailand is described and illustrated from recently collected material. The morphological characteristics are discussed in view of a wider generic concept that allows the inclusion of *P. nanakorniana* in *Phyllagathis*. A key to the Thai species is provided.

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INTRODUCTION

Phyllagathis Blume (Melastomataceae, Sonerileae) is an Old World genus endemic to Southeast Asia and comprising approximately 56 species (Cellinese 1997, 2002). Its distribution ranges from South China, Vietnam, Laos, Thailand, and West Malaysia to Sumatra and Borneo. It was originally described as tetramerous with two whorls of four stamens (Blume 1831a, b). However, merosity in the genus is a proven unstable character (Hansen 1992, Cellinese 1997, 2002), and a few species display a switch from tetramerous to pentamerous flowers (e.g., *P. prostrata* C.Hansen, *P. rotundifolia* (Jack) Blume, and *P. scortechinii* King) sometimes even within the same species (Cellinese, pers. observ.), and from diplostemony to haplostemony (e.g. *P. tetrandra* Diels). Cellinese (1997, 2002) provided a comprehensive synopsis of *Phyllagathis* and its morphological characteristics, and proposed a wider concept of the genus to include several pentamerous and tetramerous monotypic and diatypic genera. Among these are *Kerriothyrsus* C.Hansen (Hansen 1988), endemic to Laos, and *Tylanthera* C.Hansen (Hansen 1990), endemic to Thailand.

Tylanthera has been included in *Phyllagathis* (Cellinese & Renner 1997) and comprises two species, *Phyllagathis tuberosa* (C.Hansen) Cellin. & S.S.Renner and *P. siamensis* Cellin. & S.S.Renner, both acaulescent with tetramerous, haplostemonous flowers.

The monotypic *Kerriothyrsus* displays flowers that can be either haplostemonous or diplostemonous with 4 antepetalous sterile staminodes (Hansen 1988). In general, the switch from diplostemonous to haplostemonous androecia is not uncommon in *Phyllagathis* and can be observed in other species (Hansen 1992, Cellinese & Renner 1997), and other genera in the family (Renner 1989, 1993). The only species of *Kerriothyrsus*, *K. tetrandrus* (M.P.Nayar) C.Hansen, is found in a few localities of Laos. Based on its morphological characteristics, *K. tetrandrus* should be moved into *Phyllagathis* (Cellinese, in prep.).

Phyllagathis nanakorniana is morphologically similar to *P. tuberosa* and *P. siamensis* from Thailand, and the neighbouring *K. tetrandrus*.

MATERIALS AND METHODS

This work is based upon the study of specimens collected by Khanit Wangwasit and Monthon Norsaengsri in the Nongkai Province, Northeastern Thailand. Measurements of the vegetative and reproductive parts were taken from their collected material. Fruits and flowers were studied using a dissecting microscope. Data on the distribution and ecology were taken in the field.

KEY TO THE SPECIES OF THAILAND

1. Caulescent herb 2
1. Acaulescent herb 3
2. Upper leaf surface hispid; inflorescences ebracteate; hypanthium hispid; stamens dimorphic *P. hispida*
2. Upper leaf surface glabrous; inflorescences bracteate; hypanthium subglabrous; stamens isomorphic *P. rotundifolia*
3. Stamens 8, dimorphic (4 sterile staminodes)
..... *P. nanakorniana*
3. Stamens 4, isomorphic (all fertile) 4
4. Leaves 25–30 by 17–20 cm; inflorescence an umbel, peduncle up to 16 cm long *P. siamensis*
4. Leaves 2–5 by 1–3 cm; inflorescence a scorpioid cyme, peduncle up to 6 cm long *P. tuberosa*

DESCRIPTION

Phyllagathis nanakorniana Wangwasit, Norsaengsri & Cellin.,
sp. nov. — Fig 1; Map 1

Plantae rhizomate tuberoso, cyma scorpioidea, *Phyllagathide siamensi* similis sed antheris octo inaequalibus quatuor fertilibus et quatuor staminodialibus differt. — Typus: *K. Wangwasit & M. Norsaengsri 070705-30* (holo QBG), Phu Wua Wild Life Sanctuary, 5 July 2007.

Acaulescent herb, 8–19 cm tall, glabrous in all of its parts, with a tuberous rhizome. Leaves one, broadly cordate to reniform, 2.7–10.5 by 3.7–15 cm, base cordate to very broadly cordate, apex subacute, round or obcordate, margin entire to slightly

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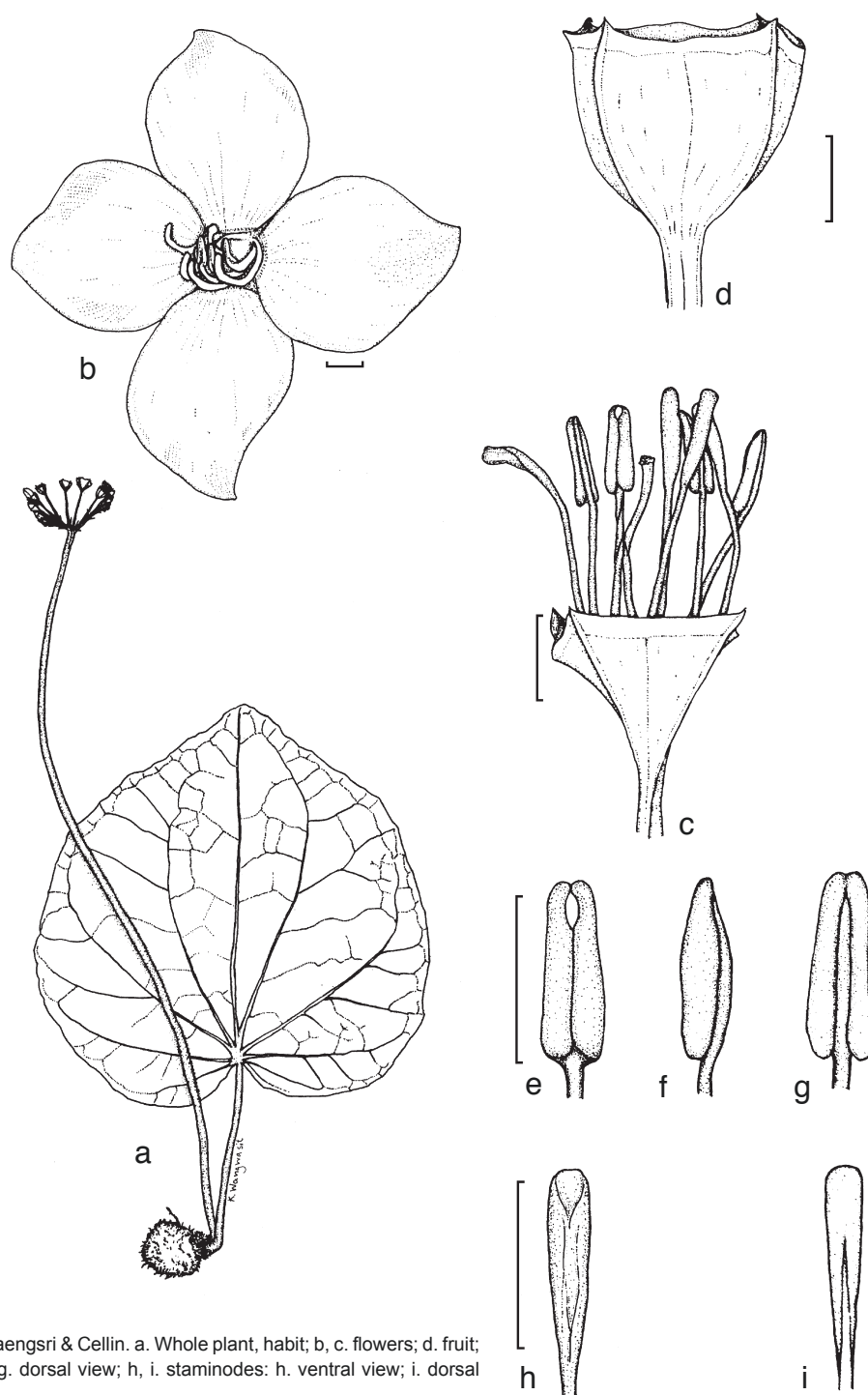


Fig. 1 *Phyllagathis nanakorniana* Wangwasit, Norsaengsri & Cellin. a. Whole plant, habit; b, c. flowers; d. fruit; e–g. fertile stamen: e. ventral view; f. lateral view; g. dorsal view; h, i. staminodes: h. ventral view; i. dorsal view. — Scale bars = 1 mm.

denticulate, lamina with 3–5 pairs of lateral primary veins, membranaceous, lower surface often red in colour. *Petioles* reddish (0.5–)1.5–4.5 cm long. *Inflorescence* a contracted scorpioid cyme, peduncle 7–15 cm long, quadrangular. *Flowers* 4-merous, subtended by two subulate bracts, 1–1.5 mm long, pedicel 4–11 mm long. *Hypanthium* campanulate, 4-ridged, 1–2 by 3 mm, glabrous. *Sepals* about 0.2–0.3 mm long, triangular. *Petals* ovate, 0.5–0.6 mm long, acute, pink. *Stamens* 8, dimorphic, filaments 2 mm long, fertile stamens 4, antesealous, anthers 1 mm long, connective enlarged dorsally, ventral appendages absent, pore 1, apical, more or less oblique on the ventral side, staminodes 4, antepetalous, anthers undeveloped, slightly longer than the fertile stamens. *Ovary* 4-locular, c. 0.2 mm long, partially adnate to the hypanthium, crown with 4-ridged corners, anther pockets absent, styles c. 2 mm long, stigma slightly enlarged. *Capsules* subquadrangular, cup-shaped,

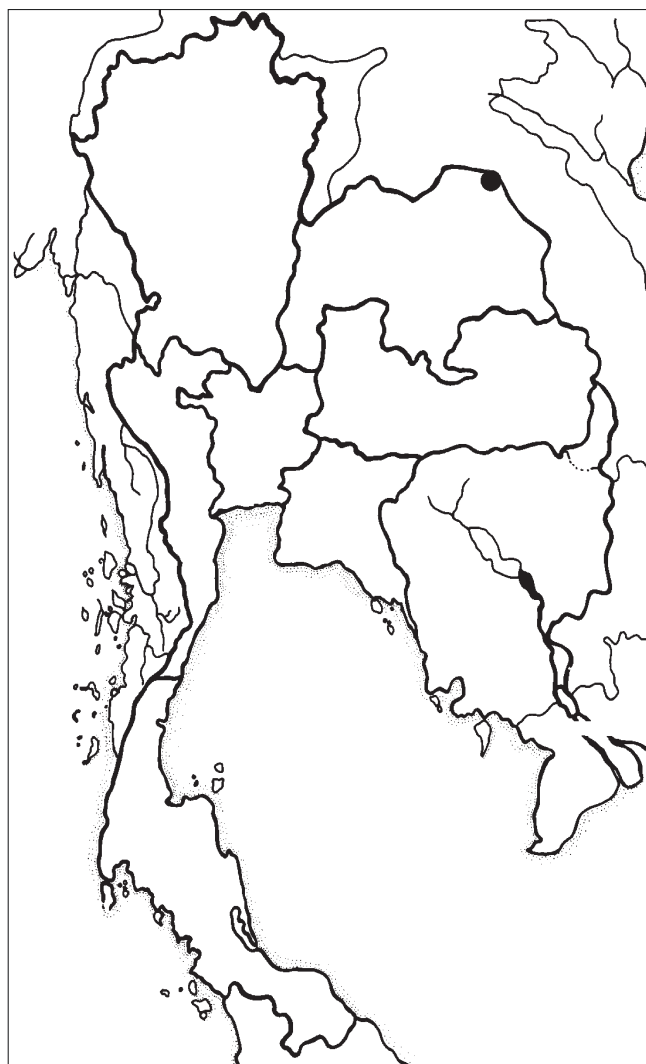
about 2.5–3 by 2 mm, crown persistent. *Seeds* numerous, 0.2–0.5 mm long, narrowly conical or cuneate, tuberculate, with a small chalazal beak, light brown, raphe distinct, brown, slightly equal to seed length.

Distribution — Known only from Northeastern Thailand: Nongkai, Phu Wua Wild Life Sanctuary.

Habitat — On sandstone rock in dry evergreen forest.

Etymology — We name this species in honour of Dr. Weerachai Nanakorn, former Director of the Queen Sirikit Botanic Garden in Chiang Mai, Thailand.

Note — Similar to *P. siamensis* but differs by having 8 dimorphic stamens, which include 4 fertile stamens and 4 staminodes. In addition, the leaf apex is subacute to round and obcordate, distinctly different from the narrowly acuminate leaves of *P. siamensis*.



Map 1 Distribution of *Phyllagathis nanakorniana* Wangwasit, Norsaengsri & Cellin.

DISCUSSION

Phyllagathis nanakorniana is an acaulescent, small herb, with a tuberous rhizome, very much resembling both *P. siamensis* and *P. tuberosa* in habit. *Phyllagathis tuberosa* has also similar scorpioid inflorescences, but it is much smaller and covered with glands and soft, patent hairs. *Phyllagathis siamensis* is a much larger herb with umbellate inflorescences, covered with a sparse indument. Although similar in the overall habit, *P. nanakorniana* is clearly distinguished for having diplostemonous flowers, with four fertile stamens, and four staminodes.

Diplostemonous flowers arranged in scorpioid cymes are also observed in *Kerriothyrsus tetrandrus*. This is a subcaulescent herb, overall similar in habit, sparsely covered with hairs and glands, and with opposite, isomorphic leaves. It lacks tuberous rhizomes and interestingly, some specimens exhibit haplostemonous flowers, with a loss of the staminodial whorl. Because all of the above species are known from a few localities and a limited number of specimens, their intraspecific variation cannot be assessed at this stage. However, it is important to point out their morphological affinities and potential phylogenetic relationship to one another.

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REFERENCES

- Blume CL. 1831a. Über einige ostindische und besonders javanische Melastomataceen. *Flora* 14: 507.
- Blume CL. 1831b. Over eenige Oostindische, bijzonder Javaansche Melastomataceae. *Bijdragen tot de Natuurkundige Wetenschappen* 6: 248.
- Cellinese N. 1997. Notes on the systematics and biogeography of the *Sonerila* generic alliance (Melastomataceae) with special focus on fruit characters. *Tropical Biodiversity* 4: 83–93.
- Cellinese N. 2002. Revision of the genus *Phyllagathis* Blume (Melastomataceae: Sonerileae). I. The species of Burma, Thailand, Peninsular Malaysia and Sumatra. *Blumea* 47: 463–492.
- Cellinese N, Renner S. 1997. New species and combinations of *Sonerila* and *Phyllagathis* (Melastomataceae) from Thailand. *Novon* 7: 106–112.
- Hansen C. 1988. *Kerriothyrsus*, a new genus of Melastomataceae. *Willdenowia* 17: 153–157.
- Hansen C. 1990. *Tylanthera* (Melastomataceae), a new genus of two species endemic to Thailand. *Nordic Journal of Botany* 9: 631–635.
- Hansen C. 1992. The genus *Phyllagathis* (Melastomataceae): characteristics, delimitations. The species in Indo-China and China. *Bulletin du Muséum National d'Histoire Naturelle. Section B, Adansonia* 3–4: 355–428.
- Renner SS. 1989. A survey of reproductive biology in neotropical Melastomataceae and Memecylaceae. *Annals of the Missouri Botanical Garden* 76: 496–518.
- Renner SS. 1993. Phylogeny and classification of the Melastomataceae and Memecylaceae. *Nordic Journal of Botany* 13: 519–540.