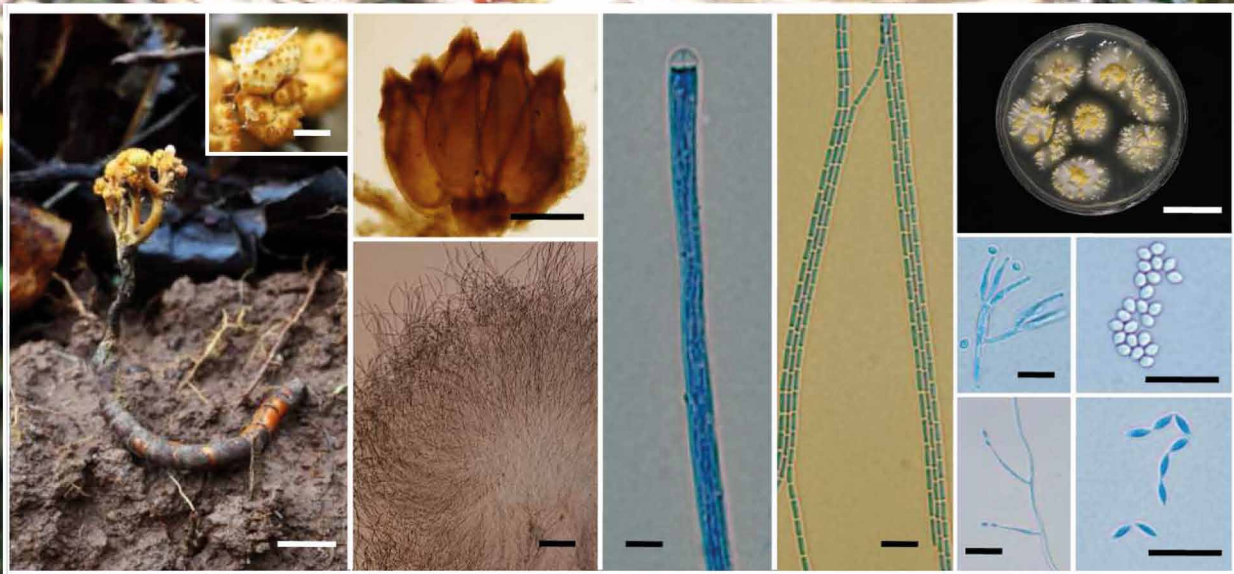


Polycephalomyces phaothaiensis



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Polycephalomyces phaothaiensis Mongkols., Noisripoom, Lamlertthon & Luangsa-ard, *sp. nov.*

Etymology. Named after the place where the species was found – Ban Phaothai community forest, Phitsanulok Province, Thailand.

Classification — *Ophiocordycipitaceae*, *Hypocreales*, *Hypocreomycetidae*, *Sordariomycetes*.

Stromata numerous, 0.5–2.5 mm in length and 1–1.5 mm in breadth, cylindrical, reddish brown. **Rhizoids** flexuous, arising from the head of *Coleoptera* larva, c. 1–3.5 cm long under the ground. Fertile part hemispherical perithecial plates, some terminal, many subterminal, pale yellowish brown, 0.5–4 mm diam, 1–2 mm high. **Perithecia** ovoid with protruding apices, (900–)950–1067(–1100) × (350–)352–429(–450) µm. **Asci** cylindrical, (300–)432–581(–700) × 3–4(–5) µm. **Ascospores** hyaline, filiform, cylindrical, breaking into small truncate part-spores, (3–)3.5–5.5(–6) × 1–1.5 µm.

Culture characteristics — Colonies developed from germinating ascospores. The ascospores germinated within 12 h on PDA. Colonies on PDA moderately growing, c. 1 cm diam in 7 d at 25 °C. Colonies white, cottony and with abundant mycelial density. Synnemata forming after 21 d, solitary, unbranched, up to 2 mm long. Conidial mass produced on subterminal part of synnemata or covering the surface of colony. Two types of phialides present: α -phialides consisting of verticillate branches with phialides in whorls of 2–5. Entire phialides (7–)9–16(–22) × 1–2 µm, with cylindrical basal portion; α -conidia fusoid to globose, 2–3 × 1.5–2 µm, in conidial masses on PDA. β -phialides consisting of erect conidiophores either arising from aerial or vegetative hyphae. Phialides solitary along the hyphae. Entire phialides (12–)15–23(–25) × 2–2.5 µm, awl-shaped; β -conidia fusiform, in chains, (3–)4–6.5(–8) × (1–)1.5–2(–2.5) µm.

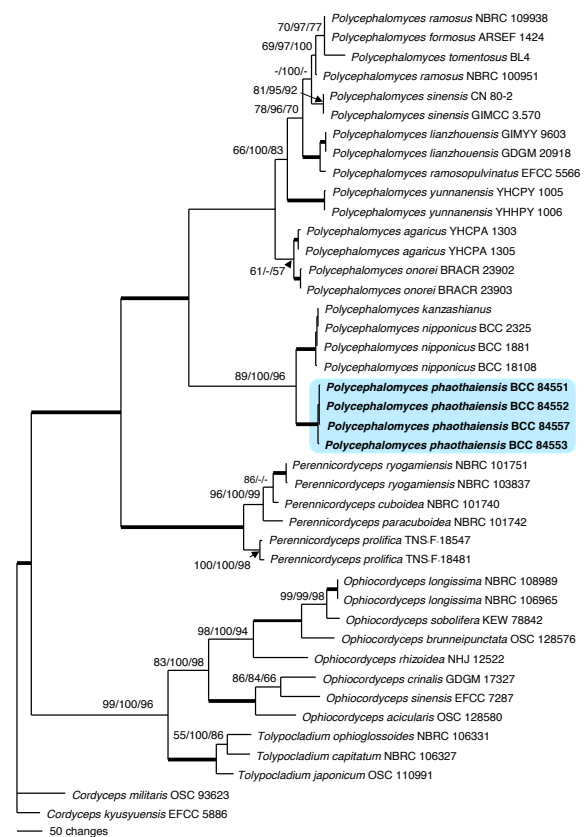
Typus. THAILAND, Phitsanulok Prov., Noen Maprang district, 16.734°N 100.658°E, alt. 520 m, on *Coleoptera* larva, buried in soil, 27 June 2017, S. Lamlertthon (SL), S. Mongkolsamrit (SM), K. Tasanathai (KT) & W. Noisripoom (WN) (holotype BBH42883, culture ex-type BCC84553, ITS, LSU, *tef* and *rpb1* sequences GenBank MF959733, MF959737, MF959742 and MF959745, MycoBank MB822770).

Additional materials examined. THAILAND, Phitsanulok Prov., Noen Maprang district, 16.734°N 100.658°E, alt. 520 m, on *Coleoptera* larvae, buried in soil, 27 June 2017, SL, SM, KT, WN, BBH42881, BCC84551, ITS, LSU, *tef* and *rpb1* sequences GenBank MF959731, MF959735, MF959739 and MF959743, BBH42882, BCC84552, ITS, LSU, *tef* and *rpb1* sequences GenBank MF959732, MF959736, MF959740 and MF959744; 28 June 2017, SL, SM, KT, WN, BBH42884, BCC84557, ITS, LSU, *tef* and *rpb1* sequences GenBank MF959734, MF959738, MF959741 and MF959746.

Notes — Until recently 10 species of *Polycephalomyces* infecting insects have been reported and only five species are reported as hyperparasites. *Polycephalomyces* species are reported from China, Japan, Ecuador and Thailand. The natural samples can be found buried in soil, on fallen leaves and plant stems. Our phylogenetic analyses and morphologi-

Colour illustrations. Type locality – a trail in Ban Phaothai community forest (photo by W. Sangsawang); stromata; fertile part with perithecial plates; perithecia; asci; ascus tip; part-spores; culture on PDA; α -phialides; α -conidia; β -phialides and β -conidia. Scale bars: stromata, culture on PDA = 10 mm, fertile part with perithecial plates = 1 mm, perithecia = 500 µm, asci = 50 µm, ascus, part-spores = 5 µm, phialides, conidia = 10 µm.

cal assessment support the placement of *P. phaothaiensis* in *Polycephalomyces* s.lat. as amended by Kepler et al. (2013). In Thailand, *P. phaothaiensis* was originally identified as a species complex of *P. nipponicus* based on the macroscopic feature of producing multiple stromata with several terminal and sub-terminal perithecial plates. Although the gross morphology of *P. phaothaiensis* resembles *P. nipponicus*, it differs significantly in the sizes of the perithecia and asci. In *P. phaothaiensis*, perithecia and asci are longer and wider than those reported for *P. nipponicus* (800–950 × 300–370 µm; 530–600 × 3.1–3.5 µm) by Kobayasi (1941). Additionally, the results of our phylogenetic study using ITS rDNA, LSU, *tef* and *rpb1* sequences clearly places *P. phaothaiensis* distinctly from *P. nipponicus*.



The phylogenetic tree with *P. phaothaiensis* was constructed on the combined dataset comprising ITS, LSU, *tef* and *rpb1*. The phylogenetic tree was analysed using maximum parsimony (MP), maximum likelihood (ML) and Bayesian inference. ML analysis was run with RAXML-VI-HPC2 v. 8.2.10 (Stamatakis 2014) under a GTR model, with 1000 bootstrap replicates. Bayesian phylogenetic inference was calculated with MrBayes v. 3.0b4 (Ronquist & Huelsenbeck 2003), with 3 M generations and under the same model. Numbers at the significant nodes represent MP bootstrap support values / Bayesian posterior probabilities (multiplied by 100) / ML bootstrap support values. Bold lines in the tree represent branches with values of 99–100 % for all three statistics.

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