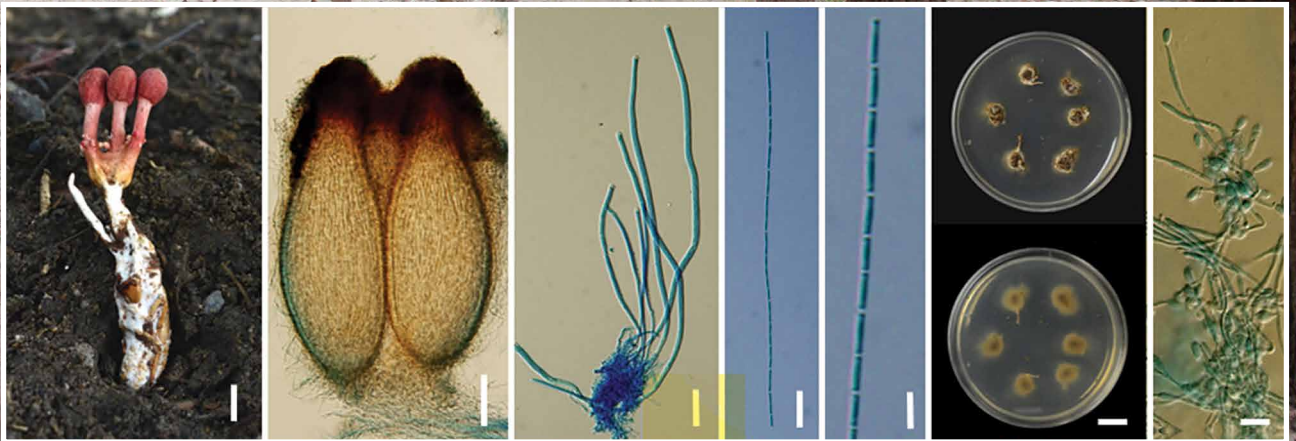


Ophiocordyceps khonkaenensis



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***Ophiocordyceps khonkaenensis* Tasan., Thanakitp. & Luangsa-ard, sp. nov.**

Etymology. Named after the location where the species was collected, Khon Kaen Province, Thailand.

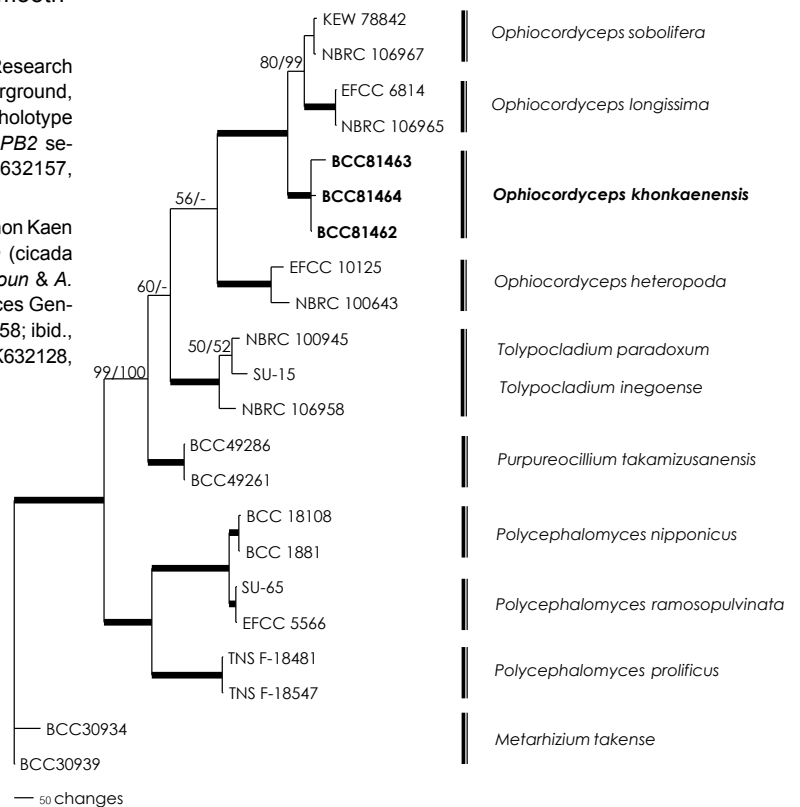
Classification — *Ophiocordycipitaceae*, *Hypocreales*, *Hypocreomycetidae*, *Sordariomycetes*.

Stromata variable in number, solitary to three, 20–30 mm tall and 2–3 mm wide. *Rhizoids* flexuous, c. 2 cm long, arising from the head of cicada nymphs living underground. Fertile part distinctly terminal, globose, pinkish red, sterile stroma beneath the fertile part cylindrical, pale pink. *Ascomata* perithecial, completely immersed, ovoid, (590–)615–675(–700) × (200–)216–263(–300) µm. *Asci* cylindrical, (237.5–)252–326(–337.5) × 5–5.8(–6) µm with cap, 5 × 5 µm. *Ascospores* filiform, (300–)314–353(–360) × 1.5–2 µm readily breaking into 32 part-spores, (7–)9–11.5(–13) × 1.5–2 µm.

Culture characteristics — Colonies developed from germinating ascospores. The ascospores germinated within 24 h on potato dextrose agar (PDA). Colonies relatively slow-growing, attaining a diameter of 5 mm in 30 d at 25 °C, dark brown with cream edges. Colonies produce brown synnemata after 1 mo with a pruinose area bearing conidiogenous cells and conidia. *Conidiogenous cells* phialidic, hirsutella-like, (5.5–)6.4–8.6(–11) × 2–2.7(–3) µm. *Conidia* hyaline, fusiform, smooth-walled, (3–)3.7–4.9(–5.5) × (1–)1.5–2.3(–3) µm.

Typus. THAILAND, Khon Kaen Province, Khon Kaen Field Crop Research Center, 16.484°N 102.831°E, on *Hemiptera* (cicada nymph) underground, 27 May 2016, *W. Noisripoom*, *S. Wongkanoun* & *A. Klaysuban* (holotype BBH45360, culture ex-type BCC81462, SSU, *TEF*, *RPB1* and *RPB2* sequences GenBank MK632126, MK632075, MK632168 and MK632157, MycoBank MB830259).

Additional materials examined. THAILAND, Khon Kaen Province, Khon Kaen Field Crop Research Center, 16.484°N 102.831°E, on *Hemiptera* (cicada nymph) underground, 27 May 2016, *W. Noisripoom*, *S. Wongkanoun* & *A. Klaysuban*, BCC81463, SSU, LSU, *TEF*, *RPB1* and *RPB2* sequences GenBank MK632127, MK632102, MK632076, MK632169 and MK632158; *ibid.*, BCC81464, SSU, LSU, *TEF*, *RPB1* and *RPB2* sequences GenBank MK632128, MK632103, MK632077, MK632170 and MK632159.



Notes — *Ophiocordyceps khonkaenensis* produces ascospores on the terminal part of the stroma. Their hosts are cicada nymphs that can be found buried in soil. This species was only found in Khon Kaen Field Crops Research Center, Khon Kaen Province during the rainy season. It is nested in a clade together with *O. longissima* and *O. sobilifera* (Sung et al. 2007). It shares similarity with *O. longissima* in the colour of the fertile part. However, in *O. longissima* and also in *O. sobilifera*, the shape of the fertile part is clavate with a pointed end. *Ophiocordyceps khonkaenensis* produces broadly ellipsoidal fertile heads and ovoid perithecia but in *O. sobilifera* the fertile head is cream, not red, and the perithecia are stouter (500–600 × 220–260) compared to *O. khonkaenensis*. It shares similarities with *O. heteropoda* in the ovoid shape of the fertile area (Sung et al. 2007). However, it differs in the colour of the fertile head, which is mustard yellow to dark brown in *O. heteropoda*, and the perithecia are ampullaceous, completely immersed, 610–660 µm long, around 210 µm wide.

Colour illustrations. Type locality – a small plot in Khon Kaen Field Crop Research Center. Fungus on cicada nymph producing three stromata; ovoid perithecia; asci; ascospore; part-spores; obverse and reverse of colonies on PDA; hirsutella-like asexual morph on PDA. Scale bars = 10 mm (plate culture), 7 mm (stromata), 110 µm (perithecia), 30 µm (asci and ascospore), 10 µm (part-spores), 8 µm (hirsutella-like asexual morph on PDA).

Phylogenetic reconstruction using the Maximum Parsimony (MP) and Maximum Likelihood (ML) (RAxML v. 8.2.10, Stamatakis 2006) multi-locus phylogenetic analyses based on nuclear ribosomal small and large subunits (SSU and LSU), the largest and second largest subunits of RNA polymerase II (*RPB1* and *RPB2*) and elongation factor 1- α (*TEF*) revealed that *Ophiocordyceps khonkaenensis* is closely related to *O. sobilifera* and *O. longissima*. Molecular data of these specimens formed a separate clade from other species of *Ophiocordyceps* with full bootstrap support (100 %), thus a new species *Ophiocordyceps khonkaenensis* is introduced.