

TWO PANTROPICAL FUNGI, *LYCOGALOPSIS SOLMSII* AND *MORGANELLA FULIGINEA* (BASIDIOMYCOTA, AGARICALES, LYCOPERDACEAE), NEW TO THAI MYCOBIOTA

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ABSTRACT

Two pantropical lycoperdaceous fungi, *Lycogalopsis solmsii* and *Morganella fuliginea*, were collected in southern Thailand. These are new records for the Thai mycobiota. Macro- and microscopic features are described and illustrated, and brief notes on known distributions and comparisons with some related taxa of present species are given.

Key words: *Lycogalopsis solmsii*, *Morganella fuliginea*, mycobiota, new record, Thailand.

The family Lycoperdaceae (Basidiomycota, Agaricales) comprises 13 genera with a worldwide distribution. The Lycoperdaceae have been intensively studied in Africa (BOTTOMLEY, 1948; DISSING & LANGE, 1962; DRING, 1964), Central Asia (SHVARCMAN & FILIMONOVA, 1970), Europe (KREISEL, 1962; CALONGE, 1998; CALONGE & DEMOULIN, 1975), North America (COKER & COUCH, 1928; BOWERMAN, 1961), Mexico (CALDERÓN-VILLAGÓMEZ & PÉREZ-SILVA, 1989) and Oceania (CUNNINGHAM, 1944). However, this family is poorly documented in the tropical monsoon Asia. Thailand is located in the central part of this region, and is ecologically diverse and consequently supports a rich biodiversity (TANTICHAREON, 2004). Therefore, Thai mycobiota are also considered to be diverse (JONES & HYDE, 2004). Although 8 species belonging to 4 genera of Lycoperdaceae were hitherto recorded for Thailand (DISSING, 1963; ELLINGSEN, 1982; PHANICHAPOL, 1968; RUKSAWONG & FLEGEL, 2001), this family has not yet been comprehensively studied. Recently, some specimens of small lycoperdaceous fungi growing on dead trunks were collected from southern Thailand, and are identified as *Lycogalopsis solmsii* E. Fisch. and *Morganella fuliginea* (Berk. & M. A. Curtis) Kreisel & Dring. Both are pantropical Lycoperdaceae and new records for Thailand. In this article, we describe and illustrate morphological features of *L. solmsii* and *M. fuliginea* based on the Thai specimens. We also give brief notes on known distributions and compare morphological characters of the present species with some related taxa.

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The studied specimens are deposited in the herbaria of the National Science Museum, Tokyo, Japan (TNS) and Department of Microbiology, Faculty of Science, Prince of Songkla University, Thailand (DNC). Macroscopic characters were described by observations on dried materials. For light microscopic observations, free-hand sections of gleba and peridium were mounted in water, 3% KOH (w/v), and 1% cotton-blue lactophenol on glass slides. Forty or 50 randomly selected basidiospores were measured for each specimen under a light microscope. The surface features of basidiospores were observed by scanning electron microscopy (SEM). For SEM, small portions of gleba were dusted onto specimen holders attached with double-sided adhesive tape and then coated with platinum-palladium with an E-1030 Ion Sputter Coater (Hitachi, Tokyo, Japan). They were examined with a S-4200 SEM (Hitachi, Tokyo, Japan) operating at 15.0 kv.

Lycogalopsis solmsii E. Fisch.

Figs. 1–2

Basidiomata 3–7 mm broad, depressed globose to subglobose, white when young, later cream to pale ochraceous, seated on well-developed, white-to-pale-ochraceous, smooth, felty subiculum, attaching to the substrate. Exoperidium made of very thin, smooth, white-to-cream membrane, shiny, flaking away at maturity. Endoperidium papery, cream to pale ochraceous, fragile when mature, covered with minute farinaceous granules. Gleba cottony, pale ochraceous to yellowish brown when mature, lacking pseudocolumella. Subgleba absent. Dehiscence by an irregular apical pore.

Basidiospores globose to rarely subglobose, minutely echinulate, spines up to 0.5 μm high, conical to subconical under the SEM, 2.5–3.5 μm broad excluding ornaments or 3.5–4.5 μm including ornaments, yellowish-brown, pedicel lacking. Basidia not observed. Capillitium *Lycoperdon*-type, rarely dichotomously branched, surface gelatinized, frequently septate with clamp-connections, hyaline, 2.5–5.5 μm broad, pores not abundant, small; walls of capillitium 0.5–1.0 μm thick, not pitted. Paracapillitium absent.

Habitat.—On trunks of decayed wood in tropical rain forests.



Figure 1. Mature basidiomata of *Lycogalopsis solmsii* (TNS-F-11946). Scale bar: 10 mm.

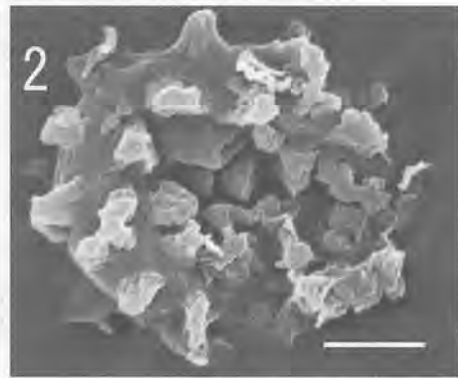


Figure 2. Basidiospores of *L. solmsii* by SEM (TNS-F-11946). Scale bar: 1.0 μm .

Specimens examined.—Thailand, Narathiwat Province, Bala Forest, Evergreen forest in Hala-Bala Wildlife Sanctuary, 5° 50' N, 101° 49' E, 548 m elevation, July 1998, coll. S. Phongpaichit s.n., DNC-9; Thailand, Songkhla Province, Ton Nga Chang Waterfall, Evergreen forest in Ton Nga Chang Wildlife Sanctuary, 6° 50' N, 100° 16' E, 292 m elevation, September 2002, coll. S. Phongpaichit s.n., TNS-F-11946.

Remarks.—The genus *Lycogalopsis* E. Fisch. was established in 1886 by specimens collected in Java, Indonesia (FISCHER, 1886). Later, this genus was monographed by MARTIN (1939) and *L. solmsii* was the only pantropical species with records from Indonesia (PATOULLARD, 1898), Malaysia (MASSEE, 1908), North, Central, and South America (CALONGE *ET AL.*, 2004; DENNIS, 1953; MARTIN, 1939; REID, 1977), Africa (DRING, 1964; HARIOT & PATOULLARD, 1909; PATOULLARD, 1927) and Pacific Islands (WAKEFIELD, 1920). This species is characterized by the presence of well-developed subiculum, hyaline capillitium with septa and clamp-connections. Morphological characters of the Thai specimens are in agreement with the descriptions of *L. solmsii* (FISCHER, 1886; MARTIN, 1939; REID, 1976).

Morganella fuliginea (Berk. & M.A. Curtis) Kreisel & Dring
Figs. 3–4

Basidiomata 5–10 mm broad, depressed globose to subglobose, yellowish-brown to dark brown, with a white, thin rhizomorph at the base, attaching to the substrate. Exoperidium made of minutely, conical spines or conical tubercles, brown to dark brown above to yellowish-brown to ochraceous at the base, not sloughing off at maturity. Endoperidium smooth, papery, cream. Gleba purverulent, olivaceous-brown to brown at maturity, with indistinct pseudocolumella. Subgleba compact, small, 1–4 mm broad, yellowish-brown to cream. Dehiscence by an irregular apical pore.

Basidiospores globose, echinulate, spines up to 1.5 μm high, rigid, conical to subconical under the SEM, 3.0–4.5 μm broad excluding ornaments or 4.0–5.0 μm including ornaments, olivaceous-brown, pedicel lacking. Basidia not observed. Capillitium absent. Paracapillitium thin-walled, branched, surface smooth, septate, hyaline, 2.5–6.5 μm broad, with an abundant amorphous, pitted, superficial substance.



Figure 3. Mature basidiomata of *Morganella fuliginea* (TNS-F-11947). Scale bar: 5 mm.



Figure 4. Basidiospores of *M. fuliginea* by SEM (TNS-F-11947). Scale bar: 1.5 μm .

Habitat.—On trunks of decayed wood in tropical rain forests.

Specimen examined.—Thailand, Narathiwat Province, Bala Forest, Evergreen forest in Hala-Bala Wildlife Sanctuary, 5° 50' N, 101° 49' E, 548 m elevation, July 1998, coll. S. Phongpaichit s.n., TNS-F-11947.

Remarks.—The genus *Morganella* Zeller was established in 1948 (ZELLER, 1948), and later, was emended by KREISEL & DRING (1967). This genus comprises 11 species and is widely distributed in the tropical to temperate areas of the world (PONCE DE LEON, 1971; SUÁREZ & WRIGHT, 1996). Species of *Morganella* usually grow on decayed wood. There are 2 species of *Morganella* known to have exoperidium made with conical spines or conical tubercles like *M. fuliginea*: *M. purpurescens* (Berk. & M. A. Curtis) Kreisel & Dring and *M. samoensis* (Bresadola & Pat.) P. Ponce (PONCE DE LEON, 1971). However, *M. fuliginea* is clearly distinguished from both *M. purpurescens* and *M. samoensis* by its smooth endoperidium and echinulate basidiospores. Morphological characters of the Thai specimen are in agreement with the descriptions of *M. fuliginea* (KREISEL & DRING, 1967; PONCE DE LEON, 1971; SUÁREZ & WRIGHT, 1996). This species was originally described from Cuba (BERKELEY & CURTIS, 1869) and later frequently recorded from North, Central, and South America (PONCE DE LEON, 1971; REID, 1976; SUÁREZ & WRIGHT, 1996), Africa (PONCE DE LEON, 1971) and Europe (PONCE DE LEON, 1971), especially from tropical to subtropical areas of the world. Previously, only 2 species of *Morganella*, *M. compacta* (Cunn.) Kreisel & Dring and *M. pyriformis* (Schaeff.: Pers.) Kreisel et D. Krueger have been recorded from Thailand (ELLINGSEN, 1982).

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