



## The genus *Inocybe* (Inocybaceae, Agaricales, Basidiomycota) in Thailand and Malaysia

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### Abstract

Twenty-five species of Inocybaceae are reported from Thailand and Malaysia. Thirteen are described as new from four different major clades of the family: *I. errata* from the Mallocybe clade, *I. bicolorata* and *I. proxima* from the Inosperma clade, *I. neglecta* from the Pseudosperma clade, and *I. brevisquamulosa*, *I. fragilissima*, *I. latibulosa*, *I. lineata*, *I. ornata*, *I. parvibulbosa*, *I. pileosulcata*, *I. stellata* and *I. thailandica* from *Inocybe sensu stricto*. Nineteen species are documented in full, circumscribed by morphological and molecular (ITS and nLSU sequences) features. Six additional lineages are depicted in a molecular phylogenetic context but at present lack sufficient morphological data for complete description. Illustrations of anatomical features, photographs of basidiomes, and SEM images of basidiospores are presented. A key to 19 species of Inocybaceae from Thailand and Malaysia is provided.

**Key words:** Fungi, Ectomycorrhiza, Fagalean-dipterocarp-pine forests, SE-Asia, Taxonomy

### Introduction

The diversity of basidiomycetous macrofungi in Thailand is high, but their documentation is still relatively limited. From 1902, when the first basidiomycetous fungi were reported from Thailand (Rostrup 1902), until 2004 only about 300 species had been reported, of which 55 were described as new species (Desjardin *et al.* 2004). Since that time a concerted effort has been made to collect and describe both ectomycorrhizal and saprotrophic macrofungi, resulting in numerous new species and new reports for the country (Desjardin *et al.* 2009; Kerekes & Desjardin 2009; Le *et al.* 2007a–c; Sanmee *et al.* 2008; Wannathes *et al.* 2004, 2007, 2009a–b; Van de Putte *et al.* 2010; Zhao *et al.* 2008, 2010).

The genus *Inocybe* (Fr.) Fr. has been studied in Southeast Asia only from Indomalaya and Australasia (Horak 1979, 1980) where 53 species have been reported. Of these, thirteen were reported from Malaysia (peninsular Malaysia and Sabah), of which nine were new species. Five species of *Inocybe* of questionable determination have been reported from Thailand (*viz.*, *I. caesariata* (Fr.) P. Karst., *I. destriata* (Fr.) Quél., *I. infelix* Peck, *I. lutea* Kobayasi & Hongo, *I. splendens* R. Heim) in several mushroom field guides (Chandrasrikul *et al.* 2008; Ruksawong & Flegel 2001; Soytong 1994). We have conducted extensive fieldwork in peninsular Malaysia and Thailand over the past decade in which we encountered numerous species of *Inocybe*, thirteen of which are described as new species herein, and another six are reported for the first time from Thailand. Nineteen species are documented with comprehensive descriptions, line drawings, scanning electron micrographs of basidiospores, and discussion of their phylogenetic affinities. An additional six taxa are depicted as distinct lineages in a molecular phylogenetic context but at present lack sufficient morphological data for complete description. A key to aid in the diagnosis of the 19 species of Inocybaceae from Thailand and Malaysia is provided.