

A Checklist of Mushrooms of Cambodia

Nam Kyu Kim¹, Jin Heung Lee³, Jong Won Jo² and Jong Kyu Lee^{3,*}

¹*School of Biological Sciences and Institute of Microbiology, Seoul National University, Seoul 08826, Republic of Korea*

²*Forest Biodiversity Division, Korea National Arboretum, Pocheon 11186, Republic of Korea*

³*Department of Forest Environment Systems, College of Forest and Environmental Sciences, Kangwon National University, Chuncheon 24341, Republic of Korea*

Abstract

Overall, 3,950 mushroom specimens were collected from the Central Cardamom Protected Forest (CCPF) in Koh Kong province, the Kirirom National Park (KNP) in Kampong Speu province, the Seima Biodiversity Conservation Area (SBCA) in Kratie province, the Mondulkiri Protected Forest (MPF) in Mondulkiri province, the Phnom Bokor National Park (PBNP) in Kampot province, the Western Siem Pang Protected Forest (SPPF) in Stung Treng province, the Ream National Park (RNP) in Sihanoukville province of Cambodia from 2009 to 2014, and then they were identified and classified into 302 species, 165 genera, and 64 families by morphological and genetical characteristics. The mushrooms belongs to Ascomycota were classified into 26 species, 14 genera, and 10 families, while those belongs to Basidiomycota were classified into 276 species, 151 genera, and 54 families, respectively. Among these mushrooms, the most species-rich families are Polyporaceae (26.2%), Marasmiaceae (9.1%), Ganodermataceae (7.7%), Hymenochaetaceae (7.5%), and Mycenaceae (7.1%), and comprised 57.5% of the total specimens identified.

Key Words: fungal biodiversity, mushroom collection and identification, mushroom specimen, species-rich family, Cambodia

Introduction

Cambodia is located at the southeastern part of the Indochina peninsula in southeast Asia with the total land territory of approximately 181,035 km², bordered by Thailand to the northwest, Laos to the northeast, Vietnam to the east, and the Gulf of Thailand to the southwest. Cambodia forest areas are well known for rich biodiversity, but information on species biodiversity and richness are still limited. National and international biodiversity experts have been working very hard on wildlife animals, plants, and insects, while no efforts were given on fungal biodiversity so far. Thus, this study was basically conducted for surveying fungal biodiversity in Cambodian forests, and for contri-

buting to the conservation and efficient management of fungal biodiversity in the forest ecosystem of Cambodia.

Materials and Methods

Survey sites. The Central Cardamom Protected Forest (CCPF) in Koh Kong provinc, the Kirirom National Park (KNP) in Kampong Speu province, the Seima Biodiversity Conservation Area (SBCA) in Kratie province, the Mondulkiri Protected Forest (MPF) in Mondulkiri province, the Phnom Bokor National Park (PBNP) in Kampot province, the Western Siem Pang Protected Forest (SPPF) in Stung Treng Province, the Ream National Park (RNP) in Sihanoukville Province of Cambodia (Table 1).

Received: November 29, 2016. Revised: December 6, 2016. Accepted: December 7, 2016.

Corresponding author: Jong Kyu Lee

Department of Forest Environment Systems, College of Forest and Environmental Sciences, Kangwon National University, Chuncheon 24341, Republic of Korea

Tel: 82-33-250-8364, Fax: 82-33-259-5617, E-mail: jongklee@kangwon.ac.kr

Table 1. General descriptions of the survey sites of mushroom diversity in Cambodia

Survey site		Forest type/dominant tree species	Altitude (m)
Name	Province		
Central cardamom protected forest (CCPF)	Koh kong	Evergreen forest	250-500
Kirirom national park (KNP)	Kampong speu	Secondary evergreen forest (<i>dipterocarpa</i> , <i>Pinus merkusii</i>)	320-720
Seima biodiversity conservation area (SBCA)	Kratie	Evergreen forest	150-400
Mondulkiri protected forest (MPF)	Mondulkiri	Evergreen forest	600-900
Phnom bokor national park (PBNP)	Kampot	Evergreen forest with dipterocarp and mixed deciduous forest	100-900
West siem pang protected forest (WSPF)	Sung treng	Secondary evergreen forest (<i>dipterocarpa</i> , <i>Hopera</i>)	50-150
Ream national park (RNP)	Sihanoukville	Evergreen forest	70-360

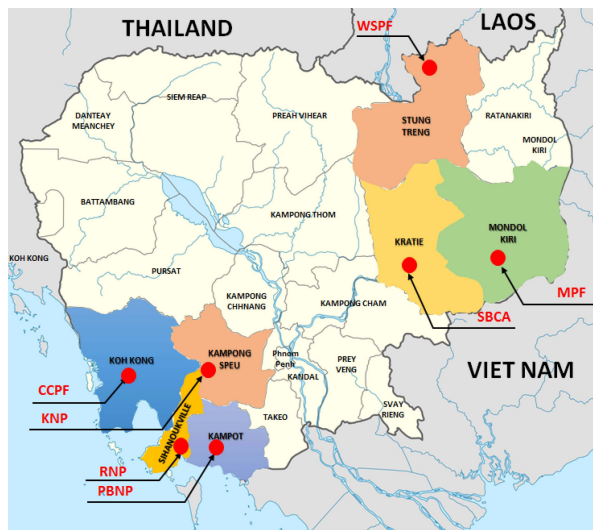


Fig. 1. Surveyed sites of mushroom diversity in Cambodia.

CCPF is located in the center of the Cardamom Mountains Range, covers an area of 401,313 ha, an important constituent of the Indo-Burma Biodiversity Hotspot. KNP extends over the eastern part of the Cardamom Mountains, and pine (*Pinus merkusii*) forest at the high elevation area.

SBCA, which was declared in 2002 as a biodiversity conservation area, is located in eastern Cambodia in Kratie and Mondulkiri provinces, along the border with Vietnam. The site contains variety of forest types, from evergreen hill forests to extensive deciduous forests. The forest remains almost entirely forested, and it forms part of one of the largest remaining relatively undisturbed natural landscape in ma-

inland south east Asia. the area is now managed for conservation of biodiversity, environmental services and livelihoods by the Department of Wildlife and Biodiversity of the Forestry Administration.

PBNP is located at Kampot province in the southern Cambodia, and is one of only two Cambodian ASEAN heritage parks. Bokor’s moist evergreen forest - with dry Dipterocarp and mixed deciduous forests in the north - shelter a wide variety of rare and threatened animals.

SPPF is located at Stung Treng province in the north-eastern Cambodia, and is one of the most important existing natural forest areas in the world for biodiversity conservation and especially endangered wildlife species. The central and southern portions of comprise gently undulating plains overwhelmingly dominated by deciduous Dipterocarp forest. The northern areas in contrast are rugged hills covered in semi-evergreen forest.

Sihanoukville province is located at the coast of the Gulf of Thailand in southern Cambodia, occupying an area of 2,536 km² that includes the foothills of the Elephant mountains and a sizable peninsula (Fig. 1).

Field survey and mushroom collections

Field survey and mushroom collections were mostly conducted during wet season, from May to October, 2 to 3 times annually. Whenever we found a mushroom in the survey sites, the photo was first taken for recording the image of original shape. Next, various data, such as color, single or group, substrate, habitat, etc., were recorded in the

Table 2. A summary statistics of mushroom in Cambodia

Group	Families	Genera	Species
Ascomycota	10	14	26
Basidiomycota	54	151	276
Total	64	165	302

field. The mushroom was wrapped with the small number paper in the cooking hoil and put in the collection bag. Before drying mushroom in the portable mushroom drier, the samll piece from mushroom tissue was taken, and put it in 70% ethanol for DNA extraction and sequencing. Dried mushrooms for 12hrs were kept with Silicagel in Ziploc[®] bags labelled with collection informations (date, location, coordinates, collectors, scientific name, etc.) in the NIBR(National Institute of Biological Resources) specimen herbarium.

Mushroom identification

The collected mushrooms were identified by morphological and genetical characteristics. Morphological identification was done by observing dried specimens and photos according to the identification key (Lowy 1958; Stunz 1973; Imazeki and Hongo 1989; Zhishu et al. 1993; Chandrasrikul et al. 2008; Wannathes et al. 2009; Sanoamuang 2010; Vladmir and Machiel 2010; Whalley et al. 2012; Lee et al. 2015) and Index Fungorum system (www.indexfungorum.org). For the genetical identification, total DNA was extracted from fruiting body, and then ITS (Internal Transcribed Spacer) and LSU (Large SubUnit) regions were amplified by using primers and PCR. The amplified products were sequenced, and the results were BLAST-searched from NCBI GenBank to find the sequence with high similarity.

Results and Discussion

Three thousands and nine hundreds fifty mushroom specimens were collected from seven provinces of Cambodia from 2009 to 2014, and then they were identified and classified into 302 species, 165 genera, and 64 families by morphological and genetical characteristics. The mushrooms belongs to Ascomycota were classified into 26 species, 14 genera, and 10 families, while those belongs to Basidiomycota were classified into 276 species, 151 genera, 54 fami-

Table 3. A list of mushroom families exhibiting high species diversity

Rank	Family	No. of Genera	No of Species	No. of Specimen
1	Polyporaceae	24	47	1,034
2	Marasmiaceae	5	14	358
3	Ganodermataceae	2	8	304
4	Hymenochaetaceae	6	10	297
5	Mycenaceae	5	10	280
6	Russulaceae	2	19	176
7	Xylariaceae	4	15	162
8	Stereaceae	2	7	159
9	Fomitopsidaceae	5	7	146
10	Meruliaceae	8	11	117
11	Agaricaceae	6	12	102
12	Boletaceae	11	12	88
13	Amanitaceae	1	12	77
14	Hygrophoraceae	3	6	75
15	Entolomataceae	3	5	65
16	Phanerochaetaceae	5	6	49
17	Inocybaceae	2	5	41
18	Clavariaceae	3	6	33
19	Omphalotaceae	2	4	28
20	Psathyrellaceae	3	4	27
21	Auriculariaceae	2	4	24
22	Geastraceae	1	3	13
23	Dacrymycetaceae	3	4	7

lies, respectively (Table 2). Among these mushrooms, the most species-rich families are Polyporaceae (26.2%), Marasmiaceae (9.1%), Ganodermataceae (7.7%), Hymenochaetaceae (7.5%), and Mycenaceae (7.1%), and comprised 57.5% of the total specimens identified (Table 3).

Checklist

ASCOMYCOTA

Geoglossomycetes

Geoglossales

Geoglossaceae

Trichoglossum hirsutum (Pers.) Boud.

Habit: on soil

Koh Kong, Mondulkiri, Stung Treng

Trichoglossum octopartitum Mains

Habit: on soil

Koh Kong

Leotiomycetes

Helotiales

Dermateaceae

Mollisia cinerea (Batsch) P.Karst.

Habit: on a dead tree

Koh Kong

Helotiaceae

Bisporella citrina (Batsch) Korf & S.E. Carp.

Habit: on a fallen branch

Kampot, Koh Kong, Mondulkiri, Stung Treng

Pezizales

Discinaceae

Hydnotrya tulasnei (Berk.) Berk. & Broome

Habit: on soil

Koh Kong

Pyronemataceae

Scutellinia scutellata (L.) Lambotte

Habit: on a dead tree

Mondulkiri

Sarcoscyphaceae

Cookeina tricholoma (Mont.) Kuntze

Habit: on a dead tree, on a fallen branch

Kampot, Koh Kong, Mondulkiri, Sihanoukville, Stung Treng

Sarcoscypha coccinea (Gray) Boud.

Habit: on a fallen branch

Kampot

Sordariomycetes

Hypocreales

Cordycipitaceae

Beauveria brongniartii (Sacc.) Petch

Habit: insect

Kampot

Nectriaceae

Nectria cinnabarina (Tode) Fr.

Habit: on a fallen branch

Stung Treng

Ophiocordycipitaceae

Ophiocordyceps formicarum (Kobayasi) G.H.

Sung, J.M. Sung, Hywel-Jones & Spatafora

Habit: insect

Mondulkiri

Xylariales

Xylariaceae

Annulohypoxylon moriforme (Henn.) Y.M. Ju, J.D.

Rogers & H.M. Hsieh

Habit: on a dead tree

Stung Treng

Daldinia concentrica (Bolton) Ces. & De Not.

Habit: on a dead tree, on a fallen branch

Kampot, Koh Kong, Mondulkiri, Sihanoukville, Stung Treng

Glaziella splendens (Berk. & M.A. Curtis) Berk.

Habit: on a dead tree

Stung Treng

Xylaria cornu-damae (Schwein.) Berk.

Habit: on a dead tree

Stung Treng

Xylaria carpophila (Pers.) Fr.

Habit: on a fallen leaf

Kampot, Stung Treng

Xylaria filiformis (Alb. & Schwein.) Fr.

Habit: on a dead tree, on a fallen branch

Koh Kong, Mondulkiri, Stung Treng

Xylaria grammica (Mont.) Mont.

Habit: on a dead tree

Mondulkiri

Xylaria hypoxylon (L.) Grev.

Habit: on a dead tree, on a fallen branch

Kampot, Mondulkiri, Sihanoukville, Stung Treng

Xylaria longipes Nitschke

Habit: on a fallen branch

Kampot, Koh Kong, Kratie, Mondulkiri, Stung Treng

Xylaria mellissii (Berk.) Cooke

Habit: on a dead tree

Mondulkiri

Xylaria obovata (Berk.) Berk.

Habit: on a dead tree

Mondulkiri

Xylaria polymorpha (Pers.) Grev.

Habit: on a dead tree, on a fallen branch

Kampot, Koh Kong, Mondulkiri, Stung Treng

Xylaria schweinitzii Berk. & M.A. Curtis

Habit: on a dead tree

Mondulkiri

Xylaria tabacina (J. Kickx f.) Berk.

Habit: on a dead tree

Mondulkiri

Xylaria telfairii (Berk.) Sacc.

Habit: on a dead tree

Koh Kong

BASIDIOMYCOTA

Agaricomycetes

Agaricales

Agaricaceae

Agaricus silvaticus Schaeff.

Habit: on soil

Stung Treng

Cyathus striatus (Huds.) Willd.

Habit: on a dead tree, on a fallen branch

Koh Kong, Kratie, Mondulkiri, Sihanoukville, Stung Treng

Lepiota castanea Quél.

Habit: on soil

Stung Treng

Lepiota cinnamomea Cleland

Habit: on soil

Kampot, Koh Kong

Lepiota clypeolaria (Bull.) P. Kumm.

Habit: on soil

Stung Treng

Lepiota fusciceps Hongo

Habit: on soil

Stung Treng

Lepiota otsuensis (Hongo) Hongo

syn. *Leucocoprinus otsuensis* Hongo

Habit: on soil

Stung Treng

Lepiota pseudolilacea Huijsman

Habit: on soil

Kampot

Leucocoprinus birnbaumii (Corda) Singer

Habit: on soil

Koh Kong, Stung Treng

Leucocoprinus cygneus (J.E. Lange) Bon

Habit: on soil

Stung Treng

Lycoperdon pyriforme Schaeff.

Habit: on a fallen branch, on soil

Kampot

Macrolepiota procera (Scop.) Singer

Habit: on soil

Kampot

Amanitaceae

Amanita ceciliae (Berk. & Broome) Bas

Habit: on soil

Kampot, Mondulkiri

Amanita excelsa (Fr.) Bertill.

Habit: on soil

Stung Treng

Amanita flavipes S. Imai

Habit: on soil

Kampot

Amanita fulva Fr.

syn. *Amanita vaginata* var. *fulva* (Fr.) Gillet

Habit: on soil

Kampot, Koh Kong, Mondulkiri

Amanita javanica (Corner & Bas) T. Oda, C.

Tanaka & Tsuda

syn. *Amanita hemibapha* subsp. *javanica* Corner & Bas

Habit: on soil

Mondulkiri

Amanita longistriata S. Imai

Habit: on soil

Kampot

Amanita melleiceps Hongo

Habit: on soil

Mondulkiri, Stung Treng

Amanita pseudoporphyria Hongo

Habit: on soil

Kampot, Mondulkiri, Stung Treng

Amanita rufiferruginea Hongo

Habit: on soil

Mondulkiri

Amanita vaginata (Bull.) Lam.

syn. *Amanita vaginata* var. *alba* Velen.

Habit: on soil
Kampot, Mondulkiri, Stung Treng

Amanita verna (Bull.) Lam.

Habit: on soil
Mondulkiri

Amanita volvata (Peck) Lloyd

Habit: on soil
Mondulkiri

Clavariaceae

Clavaria acuta Sowerby

Habit: on soil
Mondulkiri

Clavaria rosea Fr.

Habit: on soil
Mondulkiri

Clavaria vermicularis Batsch

Habit: on soil
Kampot

Clavulinopsis helvola (Pers.) Corner

Habit: on a dead tree, on a fallen branch
Kampot, Koh Kong, Mondulkiri, Stung Treng

Clavulinopsis miyabeana (S. Ito) S. Ito

Habit: on soil
Kampot, Mondulkiri, Stung Treng

Ramariopsis kunzei (Fr.) Corner

Habit: on a dead tree
Kampot

Cortinariaceae

Cortinarius traganus (Fr.) Fr.

Habit: on soil
Kampot

Entolomataceae

Alboleptonia sericella (Fr.) Largent & R.G. Benedict

syn. *Entoloma sericellum* (Fr.) P. Kumm.

Habit: on soil
Koh Kong

Entoloma atrum (Hongo) Hongo

syn. *Entoloma ater* (Hongo) Hongo & Izawa

Habit: on soil
Stung Treng

Entoloma chalybeum (Pers.) Noordel.

Habit: on soil
Kampot, Stung Treng

Entoloma coelestinum (Fr.) Hesler

Habit: on soil
Kampot, Stung Treng

Inocephalus murrayi (Berk. & M.A. Curtis) Rutter & Watling

syn. *Rhodophyllus murrayi* (Berk. & M.A. Curtis)

Singer
Habit: on soil
Stung Treng

Fistulinaceae

Porodisculus pendulus (Fr.) Murrill

Habit: on a dead tree, on a fallen branch
Kampot, Koh Kong, Mondulkiri, Sihanoukville

Hydnangiaceae

Laccaria laccata (Scop.) Cooke

Habit: on soil
Koh Kong, Mondulkiri

Laccaria ohiensis (Mont.) Singer

Habit: on soil
Kampot

Laccaria vinaceoavellanea Hongo

Habit: on soil
Kampot, Mondulkiri

Hygrophoraceae

Cyphophyllus virgineus (Wulfen) Kovalenko

Habit: on soil
Kampot, Stung Treng

Hygrocybe cantharellus (Fr.) Murrill

Habit: on soil
Kampot, Koh Kong, Mondulkiri, Stung Treng

Hygrocybe coccineocrenata (P.D. Orton) M.M. Moser

Habit: on soil
Sihanoukville

Hygrocybe cuspidata (Peck) Murrill

Habit: on soil
Mondulkiri

Hygrophorus camarophyllus (Alb. & Schwein.)

Dumée, Grandjean & Maire
Habit: on soil

Kampot

Hygrophorus russula (Schaeff.) Kauffman

Habit: on soil
Stung Treng

Hymenogastraceae

Gymnopilus aeruginosus (Peck) Singer

Habit: on a dead tree,
Kampot

Gymnopilus dilepis (Berk. & Broome) Singer

Habit: on a dead tree
Koh Kong

Gymnopilus liquiritiae (Pers.) P. Karst.

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri

Hebeloma radicosum (Bull.) Ricken

Habit: on soil
Kampot

Incertae sedis

Plicaturopsis crispa (Pers.) D.A. Reid

Habit: on a fallen branch
Koh Kong

Inocybaceae

Crepidotus sulphurinus Imazeki & Toki

Habit: on a fallen branch
Sihanoukville

Inocybe calospora Quél.

Habit: on soil
Koh Kong, Mondulkiri

Inocybe geophylla (Bull.) P. Kumm.

Habit: on soil
Stung Treng

Inocybe lanuginosa (Bull.) P. Kumm.

Habit: on soil
Mondulkiri

Inocybe rimosa (Bull.) P. Kumm.

syn. *Inocybe fastigiata* (Schaeff.) Quél.

Habit: on soil
Koh Kong, Mondulkiri

Marasmiaceae

Campanella junghuhnii (Mont.) Singer

Habit: on a fallen branch

Koh Kong, Mondulkiri, Sihanoukville, Stung Treng

Crinipellis scabella (Alb. & Schwein.) Murrill

Habit: on a fallen branch
Koh Kong, Mondulkiri

Marasmius aurantioferrugineus Hongo

Habit: on a fallen branch
Sihanoukville

Marasmius cohaerens (Pers.) Cooke & Quél.

Habit: on a fallen branch
Sihanoukville

Marasmius crinis-equi F. Muell. ex Kalchbr.

Habit: on a fallen branch
Kampong Speu, Koh Kong, Sihanoukville

Marasmius graminum (Lib.) Berk.

Habit: on a fallen branch
Mondulkiri

Marasmius leveilleanus (Berk.) Sacc.

Habit: on a fallen branch
Koh Kong

Marasmius maximus Hongo

Habit: on a fallen leaf
Kampot

Marasmius pellucidus Berk. & Broome

Habit: on a fallen leaf
Mondulkiri

Marasmius pulcherripes Peck

Habit: on a fallen branch
Mondulkiri, Sihanoukville

Marasmius purpureostriatus Hongo

Habit: on a fallen branch
Stung Treng

Marasmius sullivanii Mont.

Habit: on a fallen branch
Kampot, Stung Treng

Megacollybia platyphylla (Pers.) Kotl. & Pouzar

syn. *Tricholomopsis platyphylla* (Pers.) Singer

Habit: on soil
Koh Kong

Tetrapyrgos nigripes (Fr.) E. Horak
syn. *Marasmiellus nigripes* (Fr.) Singer
Habit: on a fallen branch, on a fallen leaf
Koh Kong

Mycenaceae

Favolaschia manipularis (Berk.) Teng
syn. *Poromyцена manipularis* (Berk.) R. Heim
Habit: on a dead tree, on a fallen branch
Kampong Speu, Mondulkiri

Favolaschia pustulosa (Jungh.) Kuntze
Habit: on a dead tree, on a fallen branch
Mondulkiri

Hemimycena lactea (Pers.) Singer
syn. *Mycena lactea* (Pers.) P. Kumm.
Habit: on a dead tree, on a fallen branch
Stung Treng

Mycena alphitophora (Berk.) Sacc.
Habit: on a dead tree
Koh Kong

Mycena auricoma Har. Takah.
Habit: on a dead tree
Koh Kong

Mycena haematopus (Pers.) P. Kumm.
Habit: on a dead tree, on a fallen branch
Kampong Speu, Sihanoukville

Mycena pseudoalnicola Singer
Habit: on a fallen branch
Mondulkiri

Mycena stylobates (Pers.) P. Kumm.
Habit: on a dead tree, on a fallen branch
Kampot, Stung Treng

Panellus stipticus (Bull.) P. Karst.
Habit: on a dead tree
Kampong Speu

Xeromphalina tenuipes (Schwein.) A.H. Sm.
Habit: on a dead tree
Koh Kong

Omphalotaceae

Gymnopus androsaceus (L.) Della Maggiora & Trassinelli
syn. *Marasmius androsaceus* (L.) Fr.
Habit: on a fallen leaf

Kampot

Gymnopus termiticola (Corner) A.W. Wilson, Desjardin
& E. Horak
Habit: on a fallen branch
Koh Kong

Marasmiellus candidus (Fr.) Singer
Habit: on a dead tree, on a fallen branch, on a fallen leaf
Kampong Speu, Kampot, Koh Kong, Mondulkiri,
Sihanoukville, Stung Treng

Marasmiellus ramealis (Bull.) Singer
Habit: on a fallen branch
Kampot

Physalacriaceae

Cylindrobasidium evolvens (Fr.) Jülich
Habit: on a fallen branch
Kampot

Hymenopellis radicata (Relhan) R.H. Petersen
Habit: on soil
Kampot, Koh Kong

Xerula radicata (Relhan) Dörfelt
Habit: on soil
Koh Kong

Pleurotaceae

Pleurotus giganteus (Berk.) Karun. & K.D. Hyde
Habit: on a dead tree
Kampot, Mondulkiri

Pleurotus pulmonarius (Fr.) Quéf.
Habit: on soil
Mondulkiri

Pluteaceae

Pluteus leominus (Schaeff.) P. Kumm.
Habit: on a dead tree
Kampot

Pluteus petasatus (Fr.) Gillet
Habit: on a dead tree
Kampot

Volvvariella volvacea (Bull.) Singer
Habit: on soil
Stung Treng

Psathyrellaceae*Coprinellus disseminatus* (Pers.) J.E. Langesyn. *Coprinus disseminatus* (Pers.) Gray

Habit: on a dead tree

Koh Kong, Mondulkiri

Cystoagaricus strobilomyces (Murrill) Singer

Habit: on soil

Sihanoukville

Psathyrella candolleana (Fr.) Maire

Habit: on a dead tree, on soil

Kampot, Koh Kong, Mondulkiri, Stung Treng

Psathyrella rugocephala (G.F. Atk.) A.H. Sm.

Habit: on soil

Koh Kong

Pterulaceae*Pterula complanata* Corner

Habit: on soil

Kampot

Schizophyllaceae*Schizophyllum commune* Fr.

Habit: on a dead tree, on a fallen branch

Kampot, Koh Kong, Sihanoukville, Stung Treng

Strophariaceae*Hypoholoma fasciculare* (Huds.) P. Kumm.syn. *Naematoloma fasciculare* (Huds.) P. Karst.

Habit: on a dead tree

Koh Kong, Mondulkiri

Tricholomataceae*Leucopaxillus giganteus* (Sowerby) Singer

Habit: on a dead tree

Mondulkiri

Resupinatus applicatus (Batsch) Gray

Habit: on a dead tree

Mondulkiri

Auriculariales**Auriculariaceae***Auricularia auricula-judae* (Bull.) Quél.

Habit: on a dead tree

Koh Kong, Kratie, Mondulkiri

Auricularia nigricans (Sw.) Birkebak, Looney & Sánchez-Garcíasyn. *Auricularia polytricha* (Mont.) Sacc.

Habit: on a dead tree

Koh Kong, Kratie, Mondulkiri, Sihanoukville, Stung Treng

Exidia recisa (Ditmar) Fr.

Habit: on a dead tree

Stung Treng

Exidia uvapassa Lloyd

Habit: on a dead tree

Kampot

Incertae sedis*Elmerina hispida* (Imazeki) Y.C. Dai & L.W. Zhou

Habit: on a dead tree

Koh Kong

Gloeotromera alba (Lloyd) Ervin

Habit: on a dead tree

Stung Treng

Boletales**Boletaceae***Boletellus emodensis* (Berk.) SingerHabit: on a dead tree, on a fallen branch, on a fallen leaf,
on soil

Kampot

Boletus auripes Peck

Habit: on soil

Kampot

Boletus subtomentosus L.syn. *Xerocomus subtomentosus* (L.) Quél.

Habit: on soil

Mondulkiri

Harrya chromapes (Frost) Halling, Nuhn, Osmundson &

Manfr. Binder

Habit: on soil

Mondulkiri

Heimioporus japonicus (Hongo) E. Horak

Habit: on soil

Stung Treng

Leccinellum griseum (Quél.) Bresinsky & Manfr. Bindersyn. *Boletus griseus* (Quél.) Sacc. & D. Sacc.

Habit: on soil

Koh Kong

Mycosporium cambodensis (Pat.) Trappe, Lumyoung,

P. Sammee & Zhu L. Yang

Habit: on soil

Mondulkiri

Phylloporus bellus (Masse) Corner

Habit: on soil
Kampot, Koh Kong, Mondulkiri, Stung Treng

Pulveroboletus ravenelii (Berk. & M.A. Curtis) Murrill

Habit: on soil
Koh Kong, Mondulkiri

Retiboletus griseus (Frost) Manfr. Binder & Bresinsky

Habit: on soil
Koh Kong

Tylopilus virens (W.F. Chiu) Hongo

Habit: on soil
Stung Treng

Xanthoconium affine (Peck) Singer

Habit: on soil
Kampot

Calostomataceae

Calostoma japonicum Henn.

Habit: on a dead tree, on soil
Kampot

Gyroporaceae

Gyroporus ballouii (Peck) E. Horak

syn. *Tylopilus ballouii* (Peck) Singer

Habit: on soil
Koh Kong

Paxillaceae

Paxillus involutus (Batsch) Fr.

Habit: on soil
Kampot

Sclerodermataceae

Pisolithus arhizus (Scop.) Rauschert

syn. *Pisolithus tinctorius* (Pers.) Coker & Couch

Habit: on soil
Koh Kong, Kratie, Mondulkiri

Scleroderma citrinum Pers.

Habit: on soil
Mondulkiri

Scleroderma columnare Berk. & Broome

Habit: on soil
Koh Kong

Serpulaceae

Serpula lacrymans (Wulfen) J. Schröt.

Habit: on a dead tree
Koh Kong

Cantharellales

Cantharellaceae

Cantharellus cibarius Fr.

Habit: on soil
Kampot, Koh Kong, Mondulkiri, Stung Treng

Craterellus tubaeformis (Fr.) Quél.

Habit: on soil
Kampot, Stung Treng

Clavulinaceae

Multiclavula clara (Berk. & M.A. Curtis) R.H. Petersen

Habit: on soil
Stung Treng

Hydnaceae

Hydnum repandum L.

Habit: on soil
Kampot, Koh Kong, Sihanoukville

Gastrales

Gastraceae

Gastrum fimbriatum Fr.

Habit: on soil
Kampot

Gastrum saccatum Fr.

Habit: on soil
Kampot

Gastrum triplex Jungh.

Habit: on soil
Koh Kong, Mondulkiri

Gloeophyllales

Gloeophyllaceae

Gloeophyllum sepiarium (Wulfen) P. Karst.

Habit: on a dead tree
Koh Kong, Kratie, Mondulkiri, Stung Treng

Gloeophyllum trabeum (Pers.) Murrill

Habit: on a dead tree
Kampong Speu

Gomphales

Gomphaceae

Phaeoclavulina flaccida (Fr.) Giachini

syn. *Ramaria flaccida* (Fr.) Bourdot
Habit: on soil
Koh Kong, Mondulkiri, Stung Treng

Turbinellus floccosus (Schwein.) Earle ex Giachini & Castellano
syn. *Gomphus floccosus* (Schwein.) Singer
Habit: on soil
Koh Kong, Mondulkiri

Hymenochaetales

Hymenochaetales

Coltricia cinnamomea (Jacq.) Murrill
Habit: on soil
Kampot, Koh Kong, Mondulkiri

Cyclomyces fuscus Kunze ex Fr.
Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri

Hymenochaetopsis intricata (Lloyd) S.H. He & Jiao Yang
syn. *Hymenochaete intricata* (Lloyd) S. Ito
Habit: on a dead tree
Koh Kong

Inonotus scaurus (Lloyd) T. Hatt.
syn. *Onnia scaura* (Lloyd) Imazeki
Habit: on a dead tree
Kampot

Inonotus tabacinus (Mont.) G. Cunn.
syn. *Cyclomyces tabacinus* (Mont.) Pat.
Habit: on a dead tree
Koh Kong

Phellinus adamantinus (Berk.) Ryvarden
Habit: on a dead tree
Kampot, Mondulkiri

Phellinus gilvus (Schwein.) Pat.
Habit: on a dead tree
Kampot, Mondulkiri, Sihanoukville, Stung Treng

Phellinus laevigatus (P. Karst.) Bourdot & Galzin
Habit: on a dead tree
Kampot, Mondulkiri

Phellinus robiniae (Murrill) A. Ames
Habit: on a dead tree
Koh Kong, Mondulkiri

Phylloporia ribis (Schumach.) Ryvarden
Habit: on a dead tree

Kampot, Stung Treng

Incertae sedis

Trichaptum abietinum (Dicks.) Ryvarden
Habit: on a dead tree
Koh Kong, Mondulkiri

Trichaptum fuscoviolaceum (Ehrenb.) Ryvarden
Habit: on a dead tree
Kampot

Schizoporaceae

Hyphodonia tropica Sheng H. Wu
Habit: on a dead tree
Kampot

Incertae sedis

Incertae sedis

Oxyporus similis (Bres.) Ryvarden
Habit: on a dead tree
Mondulkiri

Phallales

Phallaceae

Phallus indusiatus Vent.
Habit: on Soil
Kratie

Polyporales

Fomitopsidaceae

Antrodia heteromorpha (Fr.) Donk
Habit: on a dead tree
Kampot

Antrodia malicola (Berk. & M.A. Curtis) Donk
Habit: on a dead tree
Kampot

Daedalea dickinsii Yasuda
Habit: on a dead tree
Koh Kong, Mondulkiri

Daedalea quercina (L.) Pers.
Habit: on a dead tree
Kampot, Stung Treng

Laetiporus sulphureus (Bull.) Murrill
Habit: on a dead tree
Kampot

Postia stiptica (Pers.) Jülich
syn. *Oligoporus stipticus* (Pers.) Gilb. & Ryvarden

Habit: on a dead tree
Stung Treng

Rhodofomes cajanderi (P. Karst.) B.K. Cui, M.L.
Han & Y.C. Dai, in Han, Chen, Shen, Song, Vlasak, Dai & Cui
syn. *Fomitopsis cajanderi* (P. Karst.) Kotl. &
Pouzar
Habit: on a dead tree
Stung Treng

Ganodermataceae

Amauroderma rude (Berk.) Torrend
Habit: on soil
Kampot

Amauroderma rugosum (Blume & T. Nees)
Torrend
Habit: on soil
Kampot

Ganoderma applanatum (Pers.) Pat.
Habit: on a dead tree
Kampot, Koh Kong, Kratie, Mondulkiri, Sihanoukville,
Stung Treng

Ganoderma chalceum (Cooke) Steyaert
Habit: on a dead tree
Koh Kong

Ganoderma lucidum (Curtis) P. Karst.
Habit: on a dead tree
Kampot, Koh Kong, Stung Treng

Ganoderma neojaponicum Imazeki
Habit: on a dead tree
Stung Treng

Ganoderma orbiforme (Fr.) Ryvarden
Habit: on a dead tree
Mondulkiri

Ganoderma resinaceum Boud.
Habit: on a dead tree
Kampot

Incertae sedis

Crustodontia chrysocreas (Berk. & M.A. Curtis)
Hjortstam & Ryvarden
syn. *Phlebia chrysocreas* (Berk. & M.A. Curtis)
Burds.
Habit: on a dead tree
Koh Kong, Mondulkiri

Meripilaceae

Meripilus giganteus (Pers.) P. Karst.
Habit: on a dead tree
Kampot

Rigidoporus lineatus (Pers.) Ryvarden
Habit: on a dead tree
Koh Kong, Sihanoukville

Rigidoporus microporus (Sw.) Overeem
Habit: on a dead tree
Koh Kong, Kratie, Mondulkiri

Meruliaceae

Abortiporus biennis (Bull.) Singer
Habit: on a dead tree
Koh Kong

Bjerkandera adusta (Willd.) P. Karst.
Habit: on a dead tree
Kampot, Koh Kong

Bjerkandera fumosa (Pers.) P. Karst.
Habit: on a dead tree
Kampot

Cymatoderma elegans Jungh.
Habit: on a dead tree
Kampot, Stung Treng

Hydnophlebia chrysorhiza (Torr.) Parmasto
Habit: on a dead tree
Koh Kong, Mondulkiri

Hyphoderma roseocremeum (Bres.) Donk
Habit: on a dead tree
Stung Treng

Hyphoderma setigerum (Fr.) Donk
Habit: on a fallen branch
Sihanoukville

Irpex lacteus (Fr.) Fr.
Habit: on a dead tree
Koh Kong

Phlebia livida (Pers.) Bres.
Habit: on a dead tree
Stung Treng

Phlebia tremellosa (Schrad.) Nakasone & Burds.
syn. *Merulius tremellosus* Schrad.

Habit: on a dead tree
Koh Kong, Stung Treng

Podoscypa petalodes (Berk.) Boidin

Habit: on a dead tree
Mondulkiri

Phanerochaetaceae

Ceriporia lacerata N. Maek., Suhara & R. Kondo

Habit: on a dead tree
Koh Kong

Climacodon pulcherrimus (Berk. & M.A. Curtis)

Nikol.
Habit: on a dead tree
Mondulkiri

Phanerochaete sordida (P. Karst.) J. Erikss. &

Ryvarden
Habit: on a dead tree
Kampot, Koh Kong, Kratie, Mondulkiri, Stung
Treng

Phanerochaete xerophila Burds.

Habit: on a dead tree
Stung Treng

Phlebiopsis crassa (Lév.) D. Floudas & Hibbett

syn. *Phanerochaete crassa* (Lév.) Burds.

Habit: on a dead tree
Koh Kong

Rhizochaete radicata (Henn.) Gresl., Nakasone & Rajchenb.

syn. *Phanerochaete radicata* (Henn.) Nakasone,

C.R. Bergman & Burds.

Habit: on a dead tree
Kampot, Mondulkiri

Polyporaceae

Cellulariella acuta (Berk.) Zmitr. & Malysheva

syn. *Trametes acuta* (Berk.) Imazeki

Habit: on a dead tree
Koh Kong

Cerioporus squamosus (Huds.) Quéf.

syn. *Polyporus squamosus* (Huds.) Fr.

Habit: on a dead tree
Kampot, Mondulkiri

Cerioporus varius (Pers.) Zmitr. & Kovalenko

syn. *Polyporus varius* (Pers.) Fr.

Habit: on a dead tree

Kampot, Stung Treng

Cellulariella acuta (Berk.) Zmitr. & Malysheva

Habit: on a dead tree
Mondulkiri

Cerrena unicolor (Bull.) Murrill

Habit: on a dead tree
Stung Treng

Coriopsis byrsina (Mont.) Ryvarden

Habit: on a dead tree
Koh Kong

Daedaleopsis nipponica Imazeki

Habit: on a dead tree
Koh Kong, Mondulkiri

Earliella scabrosa (Pers.) Gilb. & Ryvarden

Habit: on a dead tree
Koh Kong, Kratie, Mondulkiri, Sihanoukville

Favolus grammocephalus (Berk.) Imazeki

Habit: on a dead tree
Kampot

Favolus tenuiculus P. Beauv.

Habit: on a dead tree
Mondulkiri

Fomes fomentarius (L.) Fr.

Habit: on a dead tree
Koh Kong, Mondulkiri

Fumalia sanguinaria (Klotzsch) Zmitr. & Malysheva

syn. *Coriopsis sanguinaria* (Klotzsch) Teng

Habit: on a dead tree
Mondulkiri

Hexagonia tenuis (Fr.) Fr.

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri, Stung Treng

Leiotrametes lactinea (Berk.) Welti & Courtec.

Habit: on a dead tree
Koh Kong, Kratie, Mondulkiri

Lentinus arcularius (Batsch) Zmitr.

syn. *Polyporus arcularius* (Batsch) Fr.

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri, Stung Treng

Lentinus brumalis (Pers.) Zmitr.
syn. *Polyporus brumalis* (Pers.) Fr.
Habit: on a dead tree
Stung Treng

Lentinus sajor-caju (Fr.) Fr.
syn. *Pleurotus sajor-caju* (Fr.) Singer
Habit: on a dead tree
Koh Kong, Mondulkiri, Stung Treng

Lentinus squarrosulus Mont.
Habit: on a dead tree
Koh Kong

Lentinus tigrinus (Bull.) Fr.
Habit: on a dead tree
Kampot, Stung Treng

Lentinus velutinus Fr.
Habit: on a dead tree
Kampot, Koh Kong

Lenzites betulina (L.) Fr.
Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri, Sihanoukville, Stung Treng

Loweporus tephroporus (Mont.) Ryvarden
syn. *Perenniporia tephropora* (Mont.) Ryvarden
Habit: on a dead tree
Koh Kong

Microporus affinis (Blume & T. Nees) Kuntze
Habit: on a dead tree
Kampong Speu, Koh Kong, Mondulkiri,
Sihanoukville

Microporus xanthopus (Fr.) Kuntze
Habit: on a dead tree, on a fallen branch
Kampot, Koh Kong, Kratie, Mondulkiri, Sihanoukville,
Stung Treng

Nigroporus vinosus (Berk.) Murrill
Habit: on a dead tree
Kampot

Neofavolus alveolaris (DC.) Sotome & T. Hatt.
Habit: on a dead tree
Kampot

Panus neostrigosus Drechsler-Santos & Wartchow
Habit: on a dead tree
Stung Treng

Panus similis (Berk. & Broome) T.W. May & A.E. Wood
Habit: on soil
Koh Kong

Polyporus badius Jungh.
Habit: on a dead tree
Stung Treng

Polyporus rugulosus Lév.
Habit: on a dead tree
Koh Kong, Mondulkiri

Pycnoporus cinnabarinus (Jacq.) P. Karst.
Habit: on a dead tree
Kampot, Koh Kong

Pycnoporus puniceus (Fr.) Ryvarden
Habit: on a dead tree
Koh Kong

Picipes badius (Pers.) Zmitr. & Kovalenko
Habit: on a dead tree
Stung Treng

Skeletocutis nivea (Jungh.) Jean Keller
Habit: on a dead tree
Kampot, Koh Kong, Sihanoukville, Stung Treng

Trametes cingulata Berk.
Habit: on a dead tree
Stung Treng

Trametes coccinea (Fr.) Hai J. Li & S.H. He
syn. *Pycnoporus coccineus* (Fr.) Bondartsev & Singer
Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri, Sihanoukville, Stung Treng

Trametes elegans (Spreng.) Fr.
Habit: on a dead tree
Koh Kong, Mondulkiri

Trametes gibbosa (Pers.) Fr.
Habit: on a dead tree
Kampot

Trametes hirsuta (Wulfen) Lloyd
Habit: on a dead tree
Kampong Speu, Koh Kong, Mondulkiri

Trametes hirta (P. Beauv.) Zmitr., Wasser & Ezhov
syn. *Hexagonia hirta* (P. Beauv.) Fr.
Habit: on a dead tree

Koh Kong, Kratie

Trametes orientalis (Yasuda) Imazeki

Habit: on a dead tree
Kampot

Trametes suarveolens (L.) Fr.

Habit: on a dead tree
Koh Kong

Trametes trogii Berk.

Habit: on a dead tree
Koh Kong, Mondulkiri, Sihanoukville

Trametes vernicipes (Berk.) Zmitr., Wasser & Ezhov

syn. *Microporus vernicipes* (Berk.) Kuntze
Habit: on a dead tree
Kampot, Koh Kong, Kratie, Mondulkiri, Siem
Reap, Sihanoukville

Trametes versicolor (L.) Lloyd

Habit: on a dead tree
Koh Kong, Sihanoukville

Trametes vespacea (Pers.) Zmitr., Wasser &

Ezhov
Habit: on a dead tree
Mondulkiri

Tyromyces chioneus (Fr.) P. Karst.

Habit: on a dead tree
Kampot, Koh Kong, Sihanoukville

Stereopsidaceae

Stereopsis buriana (Peck) D.A. Reid

Habit: on a dead tree
Koh Kong, Mondulkiri

Russulales

Albatrellaceae

Albatrellus confluens (Alb. & Schwein.) Kotl. & Pouzar

Habit: on soil
Koh Kong

Auriscalpiaceae

Auriscalpium vulgare Gray

Habit: on a pine cone
Koh Kong

Bondarzewiaceae

Heterobasidion annosum (Fr.) Bref.

Habit: on a dead tree

Kampot

Hericiaceae

Dentipellicula leptodon (Mont.) Y.C. Dai & L.W. Zhou

Habit: on a dead tree
Koh Kong

Laxitextum bicolor (Pers.) Lentz

Habit: on a dead tree
Koh Kong

Russulaceae

Lactarius hatsudake Nobuj. Tanaka

Habit: on soil
Kampot

Lactarius lignyotus Fr.

Habit: on soil
Kampot

Lactarius piperatus (L.) Pers.

Habit: on soil
Koh Kong, Mondulkiri

Lactarius vellereus (Fr.) Fr.

Habit: on soil
Koh Kong

Lactarius volemus (Fr.) Fr.

Habit: on soil
Koh Kong, Mondulkiri

Russula alboareolata Hongo

Habit: on soil
Kampot, Koh Kong, Mondulkiri

Russula bella Hongo

Habit: on soil
Koh Kong

Russula compacta Frost

Habit: on soil
Mondulkiri

Russula emetica (Schaeff.) Pers.

Habit: on soil
Koh Kong, Mondulkiri

Russula flavida Frost

Habit: on soil
Kampot, Stung Treng

Russula foetens Pers.

Habit: on soil
Mondulkiri

Russula japonica Hongo

Habit: on soil
Koh Kong, Mondulkiri

Russula kansaiensis Hongo

Habit: on soil
Kampot

Russula nigricans Fr.

Habit: on soil
Kampot

Russula senecis S. Imai

Habit: on soil
Stung Treng

Russula subnigricans Hongo

Habit: on soil
Koh Kong

Russula vesca Fr.

Habit: on soil
Stung Treng

Russula violeipes Quéf.

Habit: on soil
Mondulkiri

Russula virescens (Schaeff.) Fr.

Habit: on soil
Koh Kong

Stereaceae

Stereum complicatum (Fr.) Fr.

Habit: on a dead tree
Kampot

Stereum gausapatum (Fr.) Fr.

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri

Stereum hirsutum (Willd.) Pers.

Habit: on a dead tree
Koh Kong, Mondulkiri, Stung Treng

Stereum ostrea (Blume & T. Nees) Fr.

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri, Stung Treng

Stereum rugosum Pers.

Habit: on a dead tree
Stung Treng

Xylobolus princeps (Jung.) Boidin

Habit: on a dead tree
Kampot

Xylobolus spectabilis (Klotzsch) Boidin

Habit: on a dead tree
Kampot, Koh Kong, Mondulkiri

Thelephorales

Thelephoraceae

Thelephora anthocephala (Bull.) Fr.

Habit: on soil
Kampot, Sihanoukville

Thelephora palmata (Scop.) Fr.

Habit: on soil
Kampot

Thelephora terrestris Ehrh.

Habit: on soil
Koh Kong

Dacrymycetes

Dacrymycetales

Dacrymycetaceae

Calocera cornea (Batsch) Fr.

Habit: on a fallen branch
Kampong Speu, Kampot, Koh Kong

Calocera viscosa (Pers.) Fr.

Habit: on a fallen branch
Koh Kong

Dacrymyces chrysospermus Berk. & M.A. Curtis

syn. *Dacrymyces palmatus* Bres.
Habit: on a dead tree
Sihanoukville

Dacryopinax spathularia (Schwein.) G.W. Martin

syn. *Guepinia spathularia* (Schwein.) Fr.

Habit: on a dead tree
Kampong Speu, Kampot, Koh Kong, Kratie,
Mondulkiri, Sihanoukville, Stung Treng

Tremellomycetes

Tremellales

Tremellaceae

Tremella foliacea Pers.

Habit: on a dead tree
Mondulkiri

Tremella fuciformis Berk.

Habit: on a dead tree
Kampot, Mondulkiri

Acknowledgements

We thank to Drs. Uthaiwan Sangwanit and Tharnrat Kaewgrajang of Kasesart University in Thailand for their helps in identifying tropical mushrooms.

This work was supported by a grant from the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR201604201).

References

- Chandrasrikul A, Suwanarit P, Sangwanit U, Lumyong S, Payapanon A, Sanoamuang N, Pukahuta C, Petcharat V, Sardud U, Duengkae K, Klinhom U, Thongkantha S, Thongklam S. 2011. Checklist of mushrooms (Basidiomycetes) in Thailand. Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment. ONEP Biodiversity Series Vol. 20. 432 pp.
- Chandrasrikul A, Suwanit P, Sangwanit U, Morinaga T, Nishizawa Y, Murakami Y. 2008. Diversity of mushrooms and macrofungi in Thailand. Kasetsart University, Bangkok, Thailand, 505 pp.
- Imazeki R, Hongo T. 1989. Colored illustrations of mushrooms of Japan I, II. Hoikusha Publishing Co., Japan.
- Index Fungorum system. www.indexfungorum.org.
- Kim NK, Lee JH, Jo JW, Bunthoeun R, Ngeth C, Lee JK. 2016. Fungal biodiversity in cardamom protected forests and seima biodiversity conservation area of Cambodia. J For Environ Res 32: 158-163.
- Lee JK, Kim NK, Lee JH, Jo JW, Yoon YH, Kim YT, Ngeth C, Bunthoeun R. 2015. Biodiversity of Cambodia - Mushrooms. National Institute of Biological Resources, Incheon, 280 pp.
- Lee SS, Alias SA, Jones EGB, Zainuddin N, Chan HD. 2012. Checklist of fungi of Malaysia. Research Pamphlet No. 132. Forest Research Institute of Malaysia (FRIM), 556 pp.
- Lowy B. 1951. A morphological basis for classifying the species of Auricularia. Mycologia 43: 351-358.
- Phillips R. 2005. Mushrooms and other fungi of North America. New York, USA.
- Sanoamuang N. 2010. Wild Mushrooms of Thailand: Biodiversity and Utilization. Universal Graphic and Trading Limited Partnership, Bangkok, 424 pp.
- Stuntz DE. 1973. How to identify mushrooms to genus. IV. Keys to families and genera. Mad River Press, Inc., 94 pp.
- Tan YS, Desjardin DE, Perry BA, Vikineswary S, Noorlidah A. 2009. *Marasmius sensu stricto* in Peninsular Malaysia. Fungal Diversity 37:9-100.
- Tan YS, Desjardin DE, Vikineswary S, Abdullah N. 2007. New species and mating studies of *Marasmius* from Malaysia. Fungal Diversity 25: 187-217.
- Vladmir A, Noordeloos ME. 2010. A monograph of marasmoid and collybioid fungi in Europe. IHW-Vorlag.
- Wannathes N, Desjardin DE, Hyde KD, Perry BA, Lumyong S. 2009. A monograph of *Marasmius* (Basidiomycota) from Northern Thailand based on morphological and molecular (ITS sequences) data. Fungal Diversity 37: 209-306.
- Whalley AJS, Phosri C, Ruchikachorn N, Sihanonth P, Sangvichien E, Suwannasai N, Thienhirun S, Whalley M. 2012. Interesting or rare Xylariaceae in Thailand. Rajabhat J Sci Humanit Soc Sci 13: 9-19.
- Zhishu B, Guoyang Z, Taihui L. 1993. The macrofungus flora of China's Guangdong province. The Chinese University Press, 734 pp.