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# Diversity of mushrooms at Mu Ko Chang National Park, Trat Province

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**Abstract:** Diversity of mushrooms at Mu Ko Chang National Park was carried out by surveying the mushrooms along natural trails inside the national park. During December 2017 to August 2018, a total of 246 samples were classified to 2 phyla Fungi; Ascomycota and Basidiomycota. These mushrooms were revealed into 203 species based on their morphological characteristic. They were classified into species level (78 species), generic level (103 species) and unidentified (22 species). All of them were divided into 4 groups according to their ecological roles in the forest ecosystem, namely, saprophytic mushrooms 138 species (67.98%), ectomycorrhizal mushrooms 51 species (25.12%), plant parasitic mushrooms 6 species (2.96%) termite mushroom 1 species (0.49%). Six species (2.96%) were unknown ecological roles and 1 species as *Boletellus emodensis* (Berk.) Singer are both of the ectomycorrhizal and plant parasitic mushroom. The edibility of these mushrooms were edible (29 species), inedible (8 species) and unknown edibility (166 species). Eleven medicinal mushroom species were recorded in this study. The most interesting result is *Spongiforma thailandica* Desjardin, et al. has been found, the first report found after the first discovery in 2009 at Khao Yai National Park by E. Horak, et al.

**Keywords:** Species list, ecological roles, edibility, protected area, *Spongiforma thailandica*

## Introduction

Mushroom is a group of fungi which has the reproductive part known as the fruit body or fruiting body and develops to form and distribute the spores. The mushrooms are a very large class of organisms which in their structure have some similarities to plants, by they lack chlorophyll and are thus unable to build up the carbon compounds essential to life. Instead, they draw their sustenance ready-made from living or dead plants or even animals, as animal do (Phillips, 2006). They can be epigeous or hypogeous and are divided into two distinct groups according to sexual reproductive forms as Basidiomycetous and Ascomycetous mushrooms. The Basidiomycetous mushrooms are a diverse group of fungi composed of agarics, boletes, tooth fungi, chanterelles, coral fungi, polypores, puffballs, earth stars, stinkhorns, bird's nest fungi and jelly fungi. The Ascomycetous mushrooms are included the cup fungi, morels, truffles, earth tongues, and saddle fungi. There are approximately 1.5 million species of fungi found on earth (Hawksworth, 2001; 2004) and approximately 41,000 species of mushrooms (Deshmukh, 2004). An estimated 1,069 mushroom species have been reported as being used for food purposes (Boa, 2004). According to Sangwanit et al.(2013) the numbers of mushrooms recorded in Thailand were over 2,500 species.

Mu Ko Chang National Park is a big archipelago of over 40 islands in Trat Province, east of Thailand. It became established in 1982 as 45th national park of Thailand. The total area is 650 square kilometers of which two-thirds is marine area. Its landscape is mostly high mountains and stone cliffs. The highest mountain is Khao Salak Phet (743 meters above mean sea level). The forests are very abundant as tropical rain forest, mangrove forest and beach forest. There are many waterfalls on the island such as Than Mayom Waterfall, Khlong Phlu Waterfall, etc. There are many plants, including *Dipterocarpus alatus*, *Anisoptera costala*, *Hopea odorata*, *Terminalia catappa*, *Calophyllum inophyllum* and *Acanthus ebracteatus*. The park's wildlife includes 29 mammal species, 74 types of birds and 42 kinds of reptiles such as Ko Chang Frog (*Limnonectes kohchangae* Smith), the endemic animal of Ko Chang (Department of National Parks, Wildlife and Plant Conservation, 2019). In 1902, Rostrup, the first recorder species of mushroom in Ko Chang, reported 94 species of fungi including 1 rust fungus, 2 Myxomycetes and 91 mushrooms species (Rostrup, 1902). This research is the first mushroom survey and reported after 117 years ago.

## Materials and Methods

### Study areas

The mushroom specimens were collected along the nature trails inside Ko Chang main islands showed in Figure 1. such as Than Mayom Waterfall, Khlong Phlu Waterfall, Khlong Nonsi Waterfall, Salak Phet trail and Ban Bang Bao trail in rainy and winter seasons of the years from 2017 to 2018 (December 2017 to August 2018).

**Mushroom identification**

All collected mushrooms were studied on macroscopic and microscopic characteristics. Macroscopic characters required for identification such as size and color of the pileus and stipe, habit, habitat, substratum, odor, presence or absence of veil and volva were noted from the fresh fruit bodies in the field and photographed in their natural habitat (Largent, 1973). Microscopic characters required such as shape, size, color and ornamented spores, basidia, cystidia and chemical reaction on Melzer's solution (Largent et al., 1977). All characteristics were used to identify all mushrooms into species if possible by various identification keys and books (Corner and Bas, 1962; Dring, 1964; Corner, 1966; 1972; 1981; Lowy, 1951; 1952; Moser, 1973; Pegler, 1986; Largent and Baroni, 1988; Ruksawong and Flegel, 2001; Imazeki et al., 2005; Phillips, 2006; Miller and Miller, 2006; Chandrasrikul et al., 2008 Sanoamuang, 2010; Sangwanit et al., 2013; Bandara et al., 2017). Besides these keys and books, some authentic websites were accessed such as www.mushroomexpert.com. After proper identification, the current name of the identified mushrooms and their taxonomic details were accessed from the website: www.catalogueoflife.org and www.indexfungorum.org (accessed on March 6, 2019). All dried specimens are deposited at the Forest Herbarium (Mushrooms Section), under the supervision of Department of National Parks, Wildlife and Plant Conservation.

## Result & Discussion

The 246 mushroom specimens were collected from various nature trails in Mu Ko Chang National Park in main island. They were classified to 2 phyla; Ascomycota and Basidiomycota. These mushrooms were revealed into 203 species based on their morphological characteristic only. They were classified into species level (78 species), generic level (103 species) and unidentified (22 species) (Table 1.). Since this study used only morphological characteristics for classification. If they were studied more by molecular techniques. The number and species of collected mushrooms may be changed.

All of collected mushrooms were divided into 4 groups according to their ecological roles in the forest ecosystem, namely, saprophytic mushrooms 138 species (67.98%), ectomycorrhizal mushrooms 51 species (25.12%), plant parasitic mushrooms 6 species (2.96%) termite mushroom 1 species (0.49%). Six species (2.96%) were unknown ecological roles and 1 species as *Boletellus emodensis* (Berk.) Singer are both of the ectomycorrhizal and plant parasitic mushroom (Table 1. and Figure 2.).

The edibility of these mushrooms were edible (29 species), inedible (8 species) and unknown edibility (166 species). The eleven medicinal mushroom species were recorded (Table 1. and Figure 3.). Most of edible mushrooms were in the genus *Russula* which were found at least five species such as *R. alboareolata* Hongo, *R. cyanoxantha* (Schaeff.) Fr., *R. delica* Fr., etc. This genus was well known as one of the finest foods derived from the forest especially in the north and northeast of Thailand and had a high price around 270 baht/kg (*Sakolrak et al.*, 2018). According to this study, none of Ko Chang villagers collected wild mushrooms for eating or selling. It is possible that the economic system in this area tied to tourism.

In 1902, Rostrup, the first mushroom species recorder in Ko Chang, reported 94 species of fungi including 1 rust fungus, 2 Myxomycetes and 91 mushrooms species. There were only four mushroom species that were found in this study as *Microporus xanthopus* (Fr.) Kuntze, *Pycnoporus sanguineus* (L.) Murrill, *Schizophyllum commune* Fr. and *Stereum ostrea* (Blume & T. Nees) Fr. So the summary numbers of mushroom species are reported from Mu Ko Chang National Park are 290 species.

The most interesting result is the first report found of *Spongiforma thailandica* Desjardin, et al. outside the Khao Yai National Park, the first discovery in 2009 by E. Horak, et al. (Desjardin et al., 2009). The specimens were collected in December 2017. The research team has tried to track more specimens but still cannot collect more specimens. The macroscopic and microscopic characters of *S. thailandica*, which found at Mu Ko Chang National Park (Figure 4.), has quite similar to previous publication (Desjardin et al., 2009) except some chemical reaction tests for example 10% potassium hydroxide (10% KOH) that it was not tested in this study. The fresh fruit bodies that found at Kho Yai National Park were immediately deep purple to purplish black in 10% KOH (Desjardin et al., 2009). In this occasion, the research team tried to extract DNA according to Desjardin et al. (2009) method. The PCR reaction was performed for internal transcribed spacer (ITS) regions using the primer combinations ITS1-ITS4 and sequencing was done commercially (Marcrogen, Korea). The ITS gene sequencing results were compared with the GenBank database (http://www.ncbi.nlm.nih.gov/) using BLAST search. The resultant ITS gene sequences were aligned using CLUSTAL W software (Larkin et al., 2007) in the program BioEdit (Hall, 2011). The results showed 98.32% similar to *Spongiforma thailandica* BBH DED 7873. However, 98.32% similar is still not strong enough. If we study in more other genes regions. The difference may be found and leading to being a new species in the future.

## Conclusion

This research was the second time to survey diversity of mushrooms at Mu Ko Chang National Park after 117 years ago. Two hundred and three mushrooms species were collected inside Ko Chang island, the main island of Mu Ko Chang National Park, from various nature trails. The consisted of saprophytic mushrooms, ectomycorrhizal

mushrooms, plant parasitic mushrooms, termite mushroom, unknown ecological roles and both of the ectomycorrhizal and plant parasitic mushroom are 138, 51, 6, 6, 1 and 1 species respectively. The twenty nine species of edible mushrooms were recorded in this survey. The most interesting result is that the first report found that *Spongiforma thailandica* Desjardin, et al. were spread outside the Khao Yai National Park after the first discovery in 2009.

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**References**

Bandara, A. R., Karunarathna, S. C., Phillips, A. J. L., Mortimer, P.E., Xu, J., Kakumyan, P., and Hyce, K.D. 2017. Diversity of *Auricularia* (Auriculariaceae, Auriculariales) in Thailand. Phytotaxa 292: 19–34.

Boa, E. 2004. Wild edible fungi: a global overview of their use and importance to people. NonWood Forest Products, No. 17, FAO, Forestry Department, Rome.

Catalogue of Life. 2019. Catalogue of Life: 2018 Annual Checklist. Available Source: http://www.catalogueoflife.org/annual-checklist/2018, March 6, 2019.

Chandrasrikul, A., Suwanarit, P., Sangwanit, U., Morinaga, T., Nishizawa, Y., and Murakami, Y. 2008. Diversity of Mushrooms and Macrofungi in Thailand. Kasetsart University Press, Bangkok.

Corner, E. L. H., and Bas, C. 1962. The genus *Amanita* in Singapore and Malaya. Persoonia 2: 241–304.

Corner, E. L. H. 1966. A monograph of Cantharelloid fungi, Ann. Bot. Mem. 2. Oxford University Press, London.

Corner, E. L. H. 1972. Boletus in Malaysia. The Government Printing Office, Singapore.

Corner, E. L. H. 1981. The agaric genera *Lentinus, Panus* and *Pleurotus* with particular reference to Maraysian species, Beih. Nova Hedwigia 69. J. Cramer, Hirschberg.

Department of National Parks, Wildlife and Plant Conservation (DNP). 2019. Mu Ko Chang National Park. Available Source: http://portal.dnp.go.th/DNP/FileSystem/download?uuid=8d3f6ee9-6e15-468b-ad21-1701b528ae07.pdf, March 5, 2019.

Deshmukh, S. K. 2004. Biodiversity of tropical basidiomycetes as sources of novel secondary metabolites, *pp.* 121–140. *In* P.C. Jain (ed.). Microbiology and Biotechnology for Sustainable Development. CBS Publisher and Distributors, New Delhi.

Desjardin, D. E., Binder, M., Roekring, S., and Flegel, T. 2009. *Spongiforma*, a new genus of gasteroid boletes from Thailand. Fungal Diversity 37: 1–8.

Dring, D. M. 1964. Gasteromycetes of West Tropical Africa, Mycological Paper No. 98. Commonwealth Mycological Institute, Surrey.

Hall, T. 2011. BioEdit: an important software for molecular biology. GERF Bull Biosci. 2: 60–61.

Hawksworth, D. L. 2001. The magnitude of fungal diversity: the 1.5 million species estimate revisited. Mycological Research 105: 1422–1432.

Imazeki, R., Otani, Y., and Hongo, T. 2005. Fungi of Japan, 2nd edition. YAMA-KEI Publisher Co., Ltd., Tokyo. (in Japanese)

Index Fungorum Partnership. 2019. Index Fungorum – Search Page. Available Source: http://www.indexfungorum.org/Names/Names.asp, March 6, 2019.

Kuo, M. 2019. Mushroomexpert.com homepage. Available Source: http://www.mushroomexpert.com, December 20, 2017 – January 31, 2019.

Largent, L. D. 1973. How to Identify Mushrooms to Genus I: Macroscopic Features. Mad River Press, Inc., California.

Largent, L. D., Johnson, D., and Watling, R. 1977. How to Identify Mushrooms to Genus III: Microscopic Features. Mad River Press, Inc., California.

Largent, L. D., and Baroni, T. J. 1988. How to Identify Mushrooms to Genus VI: Modern Genera. Mad River Press, Inc., California.

Larkin, M. A., Blackshields, G., Brown, N. P., Chenna, R., McGettigan, P. A., McWilliam, H., Valenti, F., Wallace, I. M., Wilm, A., Lopez, R., Thompson, J. D., Gibson, T. J., and Higgins, D. G. 2007. Glustal W and Clustal X version 2.0. Bioinformatics 23: 2947–2948.

Lowy, B. 1951. A morphological basis for classifying the species of *Auricularia*. Mycologia 43: 351–358.

Lowy, B. 1952. The genus *Auricularia.* Mycologia 44: 656–692.

Miller, O. K. Jr., and Miller, H.H. 2006. North American Mushrooms: a Field Guide to Edible and Inedible Fungi. Globe Pequot Press, Connecticut.

Moser, M. 1973. Keys to Agaricus and Boleti (Polyporales, Boletales, Agaricales, Russulales). Whitefriars Press Ltd., Tongridge.

Pegler, D. N. 1986. Agaric Flora of Sri Lanka, Kew Bulletin Additional Series XII. Royal Botanic Gardens, Kew.

Phillips, R. 2006. Mushrooms. Pan Macmillan Ltd. Oxford.

Ruksawong, P., and Flegel, T. W. 2001. Thai Mushrooms and Other Fungi. National Center for Genetic Engineering and Biotechnology and National Science and Technology Development Agency, BIOTEC, Bangkok. (in Thai)

Rostrup, E. 1902. Flora of Koh Chang; Contribution to the knowledge of the vegetation in the Gulf of Siam, Part 6. Botanisk Tidsskrift 24: 355–363.

Sakolrak, B., Srisuwun, S., Himaman, W., Duengkae, K., Jangsantear, P. and Pongpanich, K. 2018. Utilization of mushrooms around Nam Phong National Park and Phu Wiang National Park, Khon Kaen Province. Proceeding of the 5th National Meeting on Biodiversity Management in Thailand, July 10th–14th, 2018, Surat Thani, Thailand p. 1–12. (in Thai)

Sangwanit, U., Suwanarit, P., Payappanon, A., Luangsa-ard, J.J., Chandrasrikul, A., and Sakolrak, B. 2013. Checklists of Biological Properties: Mushrooms. Biodiversity-Based Economy Development Office (Public Organization), Bangkok. (in Thai)

Sanoamuang, N. 2010. Wild Mushrooms of Thailand: Biodiversity and Utilization. Universal Graphic and Trading Co., Ltd., Bangkok. (in Thai)

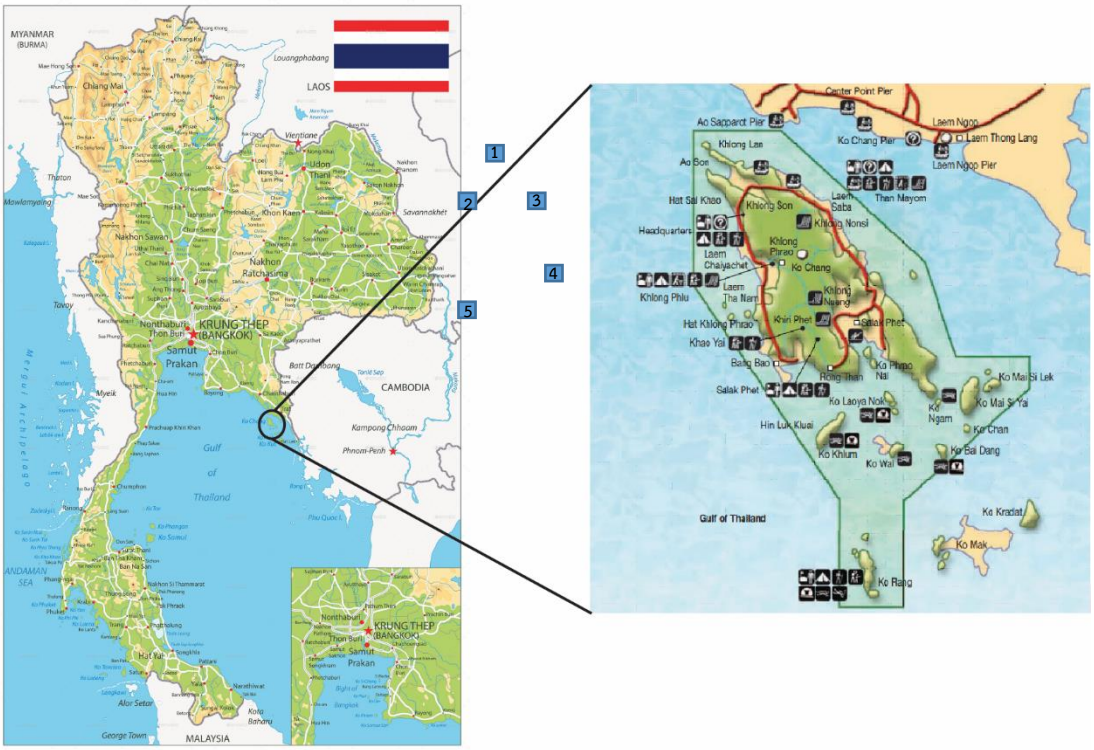


**Figure 1.** Map of Mu Ko Chang National Park (DNP, 2019); 1 = Khlong Nonsi Waterfall, 2 = Khlong Phlu Waterfall, 3 = Than Mayom Waterfall, 4 = Salak Phet trail, and 5 = Ban Bang Bao trail.

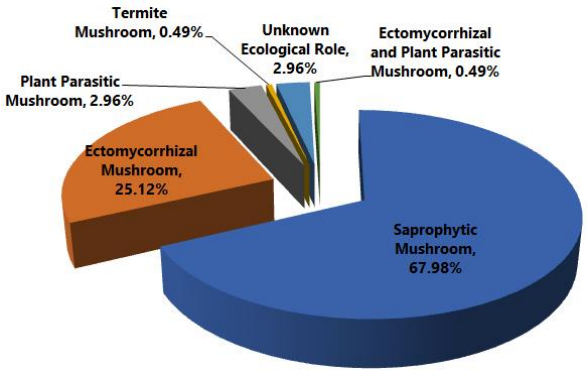


**Figure 2.** The ecological roles of mushrooms collected from Mu Ko Chang National Park.

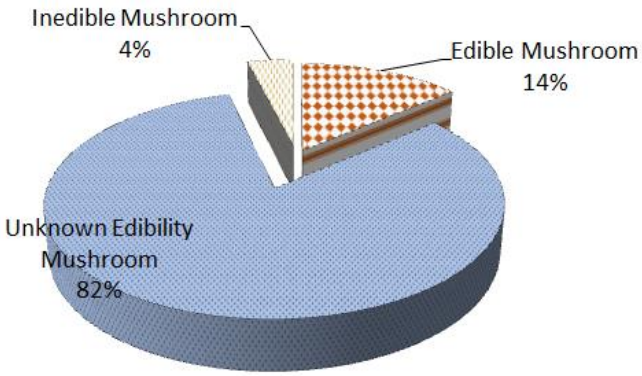


**Figure 3.** The edibility information of mushrooms collected from Mu Ko Chang National Park.

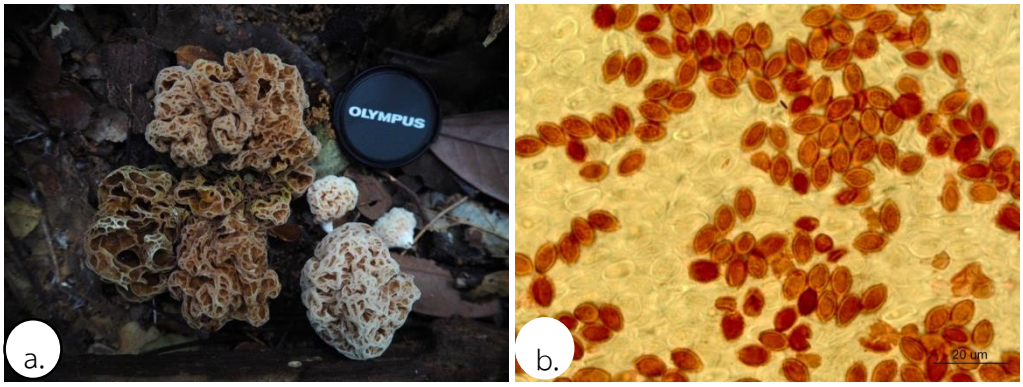


**Figure 4.** *Spongiforma thailandica* were found at Mu Ko Chang National Park; a. fruit bodies, b. basidiospores.

**Table 1.** Species list of mushrooms collected from Mu Ko Chang National Park, Trat Province, their edibility information (EI) and ecological roles (ER).

| Scientific Name | EI | ER |
|---|---|---|
| Phylum Ascomycota | | |
| Class Geoglossomycetes | | |
| Order Geoglossales | | |
| Family Geoglossaceae | | |
| *Trichoglossum hirsutum* (Pers.) Boud. | Une | Unk |
| Class Leotiomycetes | | |
| Order Helotiales | | |
| Family Helotiaceae | | |
| *Bisporella citrina* (Batsch) Korf & S. E. Carp. | Une | Sap |
| Class Pezizomycetes | | |
| Order Pezizales | | |
| Family Pyronemataceae | | |
| *Aleuria luteonitens* (Berk. & Broome) Gillet | Une | Sap |
| Family Sarcoscyphaceae | | |
| *Cookeina sulcipes* (Berk.) Kuntze | Une | Sap |
| *Cookeina tricholoma* (Mont.) Kuntze | Une | Sap |
| Class Sordariomycetes | | |
| Order Xylariales | | |
| Family Xylariaceae | | |
| *Xylaria allantoidea* (Berk.) Fr. | Une/Med | Sap |
| *Xylaria polymorpha* (Pers.) Grev. | Une/Med | Sap |
| *Xylaria* sp.1 | Une | Sap |
| *Xylaria* sp.2 | Une | Sap |
| *Xylaria* sp.3 | Une | Sap |
| Phylum Basidiomycota | | |
| Class Agaricomycetes | | |
| Order Agaricales | | |
| Family Agaricaceae | | |
| *Agaricus trisulphuratus* Berk. | Une | Sap |
| *Agaricus* sp.1 | Une | Sap |
| *Agaricus* sp.2 | Une | Sap |
| *Calvatia gardneri* (Berk.) Lloyd | Edi | Sap |
| *Coprinus* sp.1 | Une | Sap |
| *Cyathus striatus* (Huds.) Willd. | Ine | Sap |

| Scientific Name | EI | ER |
|---|---|---|
| *Cyathus* sp.1 | Une | Sap |
| *Lepiota* sp.1 | Une | Sap |
| *Lepiota* sp.2 | Une | Sap |
| *Leucocoprinus fragilissimus* (Ravenel ex Berk. & M.A. Curtis) Pat. | Une | Sap |
| *Lycoperdon* sp.1 | Une | Sap |
| *Lycoperdon* sp.2 | Une | Sap |
| Unidentified 1 | Une | Sap |
| Family Amanitaceae | | |
| *Amanita javanica* (Corner & Bas) T. Oda, C. Tanaka & Tsuda | Edi | Ect |
| *Amanita mira* Corner & Bas | Une | Ect |
| *Amanita virgineoides* Bas | Edi | Ect |
| *Amanita* sp.1 | Une | Ect |
| Family Clavariaceae | | |
| *Clavaria fumosa* Pers. | Une | Sap |
| *Clavaria* sp.1 | Une | Sap |
| *Clavaria* sp.2 | Une | Sap |
| *Clavaria* sp.3 | Une | Sap |
| *Clavulinopsis helvola* (Pers.) Corner | Une | Sap |
| Family Entolomataceae | | |
| *Entocybe nitida* (Quél.) T.J. Baroni, Largent & V. Hofst. | Une | Sap |
| *Entoloma* sp.1 | Une | Sap |
| *Entoloma* sp.2 | Une | Sap |
| *Entoloma* sp.3 | Une | Sap |
| Family Hygrophoraceae | | |
| *Hygrocybe cantharellus* (Fr.) Murrill | Edi | Sap |
| *Hygrocybe* sp.1 | Une | Sap |
| *Hygrocybe* sp.2 | Une | Sap |
| *Hygrocybe* sp.3 | Une | Sap |
| Family Hymenogastraceae | | |
| *Gymnopilus* sp.1 | Une | Sap |
| *Naematoloma* sp.1 | Une | Sap |
| *Psilocybe* sp.1 | Une | Sap |
| Family Inocybaceae | | |
| *Crepidotus* sp.1 | Une | Sap |
| *Inocybe rimosa* (Bull.) P. Kumm. | Une | Ect |
| Family Lyophyllaceae | | |
| *Termitomyces* sp.1 | Edi | Ter |
| Family Marasmiaceae | | |
| *Campanella junghuhnii* (Mont.) Singer | Une | Sap |
| *Campanella* sp.1 | Une | Sap |
| *Campanella* sp.2 | Une | Sap |
| *Marasmius siccus* (Schwein.) Fr. | Une | Sap |
| *Marasmius* sp.1 | Une | Sap |
| *Tetrapyrgos nigripes* (Fr.) E. Horak | Une | Sap |
| *Trogia infundibuliformis* Berk. & Broome | Une | Sap |
| Family Mycenaceae | | |
| *Mycena* sp.1 | Une | Sap |
| *Mycena* sp.2 | Une | Sap |

| Scientific Name | EI | ER |
|---|---|---|
| *Mycena* sp.3 | Une | Sap |
| *Mycena* sp.4 | Une | Sap |
| *Mycena* sp.5 | Une | Sap |
| *Panellus pusillus* (Pers. ex Lév.) Burds. & O.K. Mill. | Une | Sap |
| *Xeromphalina tenuipes* (Schwein.) A.H. Sm. | Une | Sap |
| Family Omphalotaceae | | |
| *Gymnopus* sp.1 | Une | Sap |
| Family Physalacriaceae | | |
| *Oudemansiella canarii* (Jungh.) Höhn. | Edi | Sap |
| Family Pleurotaceae | | |
| *Pleurotus* sp.1 | Une | Sap |
| Family Psathyrellaceae | | |
| *Psathyrella candolleana* (Fr.) Maire | Edi | Sap |
| Family Pterulaceae | | |
| *Deflexula fascicularis* (Bres. & Pat.) Corner | Une | Sap |
| Family Schizophyllaceae | | |
| *Schizophyllum commune* Fr. | Edi/Med | Sap |
| Family Tricholomataceae | | |
| *Clitocybe* sp.1 | Une | Sap |
| *Collybia* sp.1 | Une | Sap |
| *Collybia* sp.2 | Une | Sap |
| *Collybia* sp.3 | Une | Sap |
| *Collybia* sp.4 | Une | Sap |
| *Collybia* sp.5 | Une | Sap |
| *Resupinatus applicatus* (Batsch) Gray | Une | Sap |
| Unidentified 2 | Une | Sap |
| Unidentified 3 | Une | Unk |
| Unidentified 4 | Une | Unk |
| Unidentified 5 | Une | Sap |
| Order Auriculariales | | |
| Family Auriculariaceae | | |
| *Auricularia nigricans* (Sw.) Birkebak, Looney & Sánchez-García | Edi/Med | Sap |
| *Auricularia thailandica* Bandara & K.D. Hyde | Edi | Sap |
| *Auricularia* sp.1 | Une | Sap |
| Order Boletales | | |
| Family Boletaceae | | |
| *Boletellus emodensis* (Berk.) Singer | Edi | Ect/Sap |
| *Boletus* sp.1 | Une | Ect |
| *Boletus* sp.2 | Une | Ect |
| *Boletus* sp.3 | Une | Ect |
| *Boletus* sp.4 | Une | Ect |
| *Boletus* sp.5 | Une | Ect |
| *Boletus* sp.6 | Une | Ect |
| *Boletus* sp.7 | Une | Ect |
| *Boletus* sp.8 | Une | Ect |
| *Chalciporus piperatus* (Bull.) Bataille | Edi | Ect |
| *Phylloporus bellus* (Massee) Corner | Edi | Ect |
| *Phylloporus* sp.1 | Edi | Ect |

| Scientific Name | EI | ER |
|---|---|---|
| *Spongiforma thailandica* Desjardin, Manfr. Binder, Roekring & Flegel | Une | Ect |
| *Strobilomyces strobilaceus* (Scop.) Berk. | Edi | Ect |
| Family Calostomataceae | | |
| *Calostoma japonicum* Henn. | Une | Ect |
| Family Sclerodermataceae | | |
| *Scleroderma sinnamariense* Mont. | Une | Ect |
| *Scleroderma* sp.1 | Une | Ect |
| *Scleroderma* sp.2 | Une | Ect |
| *Scleroderma* sp.3 | Une | Ect |
| Order Cantharellales | | |
| Family Cantharellaceae | | |
| *Cantharellus* sp.1 | Une | Ect |
| *Craterellus aureus* Berk. & M.A. Curtis | Une | Ect |
| *Craterellus odoratus* (Schwein.) Fr. | Une | Ect |
| Family Hydnaceae | | |
| *Hydnum rufescens* Pers. | Une | Ect |
| Order Geastrales | | |
| Family Geastraceae | | |
| *Geastrum mirabile* Mont. | Une | Sap |
| *Geastrum rufescens* Pers. | Une | Sap |
| *Geastrum* sp.1 | Une | Sap |
| Family Gomphaceae | | |
| *Phaeoclavulina cyanocephala* (Berk. & M.A. Curtis) Giachini | Edi | Ect |
| *Ramaria* sp.1 | Une | Sap |
| *Ramaria* sp.2 | Une | Sap |
| *Ramaria* sp.3 | Une | Ect |
| Order Hymenochaetales | | |
| Family Hymenochaetaceae | | |
| *Coltricia cinnamomea* (Jacq.) Murrill | Ine | Sap |
| *Hymenochaete rubiginosa* (Dicks.) Lév. | Une | Sap |
| *Hymenochaete* sp.1 | Une | Sap |
| *Hymenochaete* sp.2 | Une | Par |
| *Hymenochaete* sp.3 | Une | Par |
| *Hymenochaete* sp.4 | Une | Sap |
| *Hymenochaete* sp.5 | Une | Sap |
| Unidentified 6 | Une | Sap |
| Unidentified 7 | Une | Par |
| Unidentified 8 | Une | Par |
| Order Phallales | | |
| Family Phallaceae | | |
| *Phallus indusiatus* Vent. | Edi | Sap |
| Unidentified 9 | Une | Sap |
| Order Polyporales | | |
| Family Fomitopsidaceae | | |
| *Daedalea* sp.1 | Une | Sap |
| *Daedalea* sp.2 | Une | Sap |

| Scientific Name | EI | ER |
|---|---|---|
| Family Ganodermataceae | | |
| *Amauroderma rude* (Berk.) Torrend | Edi/Med | Sap |
| *Amauroderma rugosum* (Blume & T. Nees) Torrend | Edi | Sap |
| *Ganoderma applanatum* (Pers.) Pat. | Edi | Sap |
| *Ganoderma* sp.1 | Une | Sap |
| *Ganoderma* sp.2 | Une | Sap |
| *Ganoderma* sp.3 | Une | Sap |
| *Ganoderma* sp.4 | Une | Sap |
| Family Meruliaceae | | |
| *Cymatoderma elegans* Jungh. | Ine | Sap |
| *Podoscypha* sp.1 | Une | Sap |
| Family Phanerochaetaceae | | |
| *Byssomerulius corium* (Pers.) Parmasto | Une | Sap |
| Family Polyporaceae | | |
| *Cerioporus mollis* (Sommerf.) Zmitr. & Kovalenko | Une | Sap |
| *Hexagonia tenuis* (Fr.) Fr. | Une | Sap |
| *Lentinus arcularius* (Batsch) Zmitr. | Une | Sap |
| *Lentinus fasciatus* Berk. | Une | Sap |
| *Lentinus squarrosulus* Mont. | Edi/Med | Sap |
| *Microporus xanthopus* (Fr.) Kuntze | Ine | Sap |
| *Nigrofomes* sp.1 | Ine | Sap |
| *Picipes badius* (Pers.) Zmitr. & Kovalenko | Une | Sap |
| *Polyporus grammocephalus* Berk. | Une | Sap |
| *Polyporus retirugus* (Bres.) Ryvarden | Une | Sap |
| *Polyporus* sp.1 | Une | Sap |
| *Polyporus* sp.2 | Une | Sap |
| *Polyporus* sp.3 | Une | Sap |
| *Polyporus* sp.4 | Une | Sap |
| *Polyporus* sp.5 | Une | Sap |
| *Polyporus* sp.6 | Une | Sap |
| *Pycnoporus sanguineus* (L.) Murrill | Ine | Sap |
| *Trametes cingulata* Berk. | Ine | Sap |
| *Trametes versicolor* (L.) Lloyd | Edi/Med | Sap |
| *Trametes* sp.1 | Une | Sap |
| *Trametes* sp.2 | Une | Sap |
| *Trametes* sp.3 | Une | Sap |
| *Trametes* sp.4 | Une | Sap |
| *Trametes* sp.5 | Une | Sap |
| Unidentified 10 | Une | Sap |
| Unidentified 11 | Une | Sap |
| Unidentified 12 | Une | Sap |
| Order Russulales | | |
| Family Peniophoraceae | | |
| *Peniophora* sp.1 | Une | Sap |
| *Peniophora* sp.2 | Une | Sap |
| Family Russulaceae | | |
| *Lactarius piperatus* (L.) Pers. | Edi/Med | Ect |
| *Lactarius* sp.1 | Une | Ect |

| Scientific Name | EI | ER |
|---|---|---|
| *Lactarius* sp.2 | Une | Ect |
| *Lactarius* sp.3 | Une | Ect |
| *Lactarius* sp.4 | Une | Ect |
| *Russula alboareolata* Hongo | Edi/Med | Ect |
| *Russula cyanoxantha* (Schaeff.) Fr. | Edi | Ect |
| *Russula delica* Fr. | Edi/Med | Ect |
| *Russula densifolia* Secr. ex Gillet | Edi | Ect |
| *Russula nigricans* Fr. | Edi | Ect |
| *Russula rosea* Pers. | Une | Ect |
| *Russula violeipes* Quél. | Edi | Ect |
| *Russula* sp.1 | Une | Ect |
| *Russula* sp.2 | Une | Ect |
| *Russula* sp.3 | Une | Ect |
| *Russula* sp.4 | Une | Ect |
| *Russula* sp.5 | Une | Ect |
| *Russula* sp.6 | Une | Ect |
| *Russula* sp.7 | Une | Ect |
| *Russula* sp.8 | Une | Ect |
| *Russula* sp.9 | Une | Ect |
| Family Stereaceae | | |
| *Stereum ostrea* (Blume & T. Nees) Fr. | Ine | Sap |
| *Stereum* sp.1 | Une | Sap |
| Order Stereopsidales | | |
| Family Stereopsidaceae | | |
| *Stereopsis* sp.1 | Une | Sap |
| Order Thelephorales | | |
| Family Thelephoraceae | | |
| *Thelephora vialis* Schwein. | Une | Ect |
| Unidentified 13 | Une | Unk |
| Unidentified 14 | Une | Sap |
| Unidentified 15 | Une | Sap |
| Unidentified 16 | Une | Sap |
| Unidentified 17 | Une | Unk |
| Unidentified 18 | Une | Sap |
| Unidentified 19 | Une | Unk |
| Unidentified 20 | Une | Par |
| Unidentified 21 | Une | Par |
| Unidentified 22 | Une | Sap |
| Class Dacrymycetes | | |
| Order Dacrymycetales | | |
| Family Dacrymycetaceae | | |
| *Calocera viscosa* (Pers.) Fr. | Une | Sap |
| *Calocera* sp.1 | Une | Sap |
| *Dacrymyces minor* Peck | Une | Sap |
| Class Tremellomycetes | | |
| Order Tremellales | | |
| Family Tremellaceae | | |

| Scientific Name | EI | ER |
|---|---|---|
| *Tremella mesenterica* Retz. | Edi/Med | Sap |
| *Tremella* sp.1 | Une | Sap |

Remark: Abbreviations of edibility information (EI): Edi = edible mushroom; Ine = inedible mushroom; Med = medicinal mushroom and Une = unknown edibility and abbreviations of ecological roles (ER): Ect = ectomycorrhizal mushroom; Sap = saprophytic mushroom; Ter = termite mushroom and Unk = unknown ecological role