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Common Macroscopic Fungi and Mosses of North Central Mindanao

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ABSTRACT

Macroscopic fungi and mosses are organisms thriving mostly in the forest ecosystem. A study of these groups of fungi and mosses was conducted at the different protected areas and forest reserves in North Central Mindanao from August 2016 to October 2018. The collection and photo-documentation of these organisms were done to determine and account the existing species in the different ecosystems in the area. The Transect Line (TL) Method was used, established from the different areas of North Central Mindanao with 10m x 50m quadrat sampling and with an interval of 50 meters between quadrats. The fungal and moss species within the quadrats along the TLs were identified and recorded. Field sampling of fungi resulted in the identification of 76 families, 122 genera, and 185 species. For mosses, the study revealed 174 species, 97 genera, and 39 families. The discovery of some species previously known only in the other regions of the Philippines and the possible new species implies that the protected areas and watershed, and perhaps other areas not covered by initial surveys, might generate additional species record. Hence, it deserves continuous research to gain more information on Philippine biodiversity, which will serve as a baseline information for conservation efforts

Keywords: macrofungi, mosses, field survey, new records, North Central Mindanao

INTRODUCTION

Philippines is an archipelagic country which has 7,107 islands that is abundant reservoir of flora and fauna including fungi and mosses. These islands, being a tropical nation, is a productive place for any stern studies on mycoflora and bryophyte flora. The good climatic condition and geographical location are conducive to the luxuriant growth of bryophytes and fungi which in a way would always interest the passionate mycologist and bryologist.

A diverse group of organisms in the different protected and non-protected areas belongs to the Kingdom Fungi. Now, recognized as distinct from plants and animals, the fungi are a large group of eukaryotic, spore bearing and achlorophyllous organisms that constitute an abundant element of terrestrial biota in the Philippines. These fungi cannot manufacture food as green plants do, but obtain nutrition by dissolving and deteriorating wood structures produced by the green plants.

These fungi classified into four major groups and that include: Zygomycota, Ascomycota, Basidiomycota and Deuteromycota. The most commonly observed in terrestrial habitats are the macrofungi belonged to ascomycetes and basidiomycetes particularly the wood-decaying fungi that are best known for the temporary shelf-like or bracket-like sporophore bearing sexual spores. These spores are the reproductive structure of the organisms, while the vegetative body of the organisms consists of filamentous fungal structures known as the hyphae which are multicellular and highly branched. These structures may occur in aggregated masses collectively known as mycelium (Eusebio, 1998).

About 72,000 species have been described and recorded for the whole world and more or less 1.5 million for the total number estimated to occur on Earth (Hawksworth, 2004). In the Philippines, about 4,968 species have been described (Tadiosa, 2012) and these mostly belong to the following groups – egg fungi, zygospore forming fungi, sac fungi, club fungi and imperfect fungi. Although many fungal species are economically important, some are considered as disadvantageous to the hosting plant to which they are attached.

The pore fungi, for instance, together with a few-gilled species are largely responsible for decay or rot in living trees, fence posts, and structural timbers. These fungi have caused great losses such as reduction growth and mortality in commercial forest stands. Furthermore, the capacity of these organisms to bring about the decay of organic material is beneficial to man in that they remove

organic wastes from the environment; release large quantities of carbon dioxide to the atmosphere which is used by the green plants for photosynthesis (Uyenco, 1971).

Further, wood-rotting fungi are commonly considered as harmful organisms that cause great economic losses of wood. While that is true they could however be beneficial to the ecosystem. As they weaken older trees, dead trunks and stumps, they also make them vulnerable to windthrow and natural removal from the stand. This permits the growth of young, vigorous trees and thereby play an integral role in maintaining the dynamic and ever-changing nature of the forests. The decayed wood residues become important components in the forest soils and increase water-holding capacity, thereby enhancing the growth of different tree species.

Mosses, on the other hand, belonged to the Division Bryophyta of the Plant Group. These organisms are distinguished from other bryophytes such as the liverworts and hornworts by their leaves which are radially arranged on the stem, their prominent elongated fruiting body, and the presence of mid-vein in their leaves (del Rosario, 1980). Mosses, like other members of bryophytes, are generally small and inconspicuous plants that are hardly noticed and appreciated by the layman. They are a very ancient group of land plants that first migrated and colonized bare land around 450 million years ago during the Silurian period. They are non-vascular plants that have neither flowers nor fruits, and they disperse by spores, instead of seeds (Tan and Boon-Chuan, 2008).

Today, the bryophytes are estimated to be more than 18,000 species worldwide. Estimated to consist of well over 10,000 species, mosses are the second largest plant group of land plants today after the flowering plants. About 2,000 species of mosses occur in Southeast Asia (Tan and Chuan, 2008). About 700 species have been recorded in the Philippines, 111 of which are endemic. The species are presently considered endemic on the basis of an extensive survey of all published scientific articles on geographical distribution of mosses. They cease to be endemic if for sometimes they have been collected and reported in another country. On the other hand, it is believed that there are still many endemic species to be discovered in the various virgin forests and unexplored highland areas all over the country (del Rosario, 1980). In general, mosses prefer to grow in half to fully shaded, humid to wet, places.

Mosses are reliable indicators of air pollution. In the past, people also considered mosses to be a displays of an unhealthy tree, today we know that they cause no damage to the tree itself. Mosses are not parasites, they do not

have roots which dig into the tree's bark and take no nutrients from the trees themselves. Mosses serve as a shelter for a vast array of microorganisms. These range from myxomycetes of tropical rainforests, which display specialized biotypes on epiphyllous liverworts (Schnittler 2001 as cited by Vanderpoorten and Goffinet, 2009) to invertebrates, including aphids, nematodes and rotifers (Merrifield & Ingham 1998 as cited by Vanderpoorten and Goffinet, 2009). In terrestrial environments, the moss habitat is attractive because it provides buffered temperature and humidity conditions. In rivers, aquatic moss cushions reduce water velocity and act as filters of water-borne particles, accumulating large quantities of detritus and periphyton (Vanderpoorten and Goffinet, 2009).

Uncommon and rare species of fungi and mosses are now confined to remote places and accessible areas in North Central Mindanao. This offers little avenue for the majority of the citizens and local residents of this region to be able to appreciate these natural heritage in the field, making their protection and conservation even more difficult. The meager knowledge of the fungal and moss flora in North Central Mindanao has stimulated these authors to collect sufficient samples and to describe, identify, and classify each species based on their morphological and anatomical characteristics. Efforts were made to cite and describe species collected from protected and non-protected areas in North Central Mindanao. Let us take a look positively on the benefits we get from them. To name only a few, they are good sources of or used in making wine, beer, bread, cheese, antibiotics, vitamins, acids, enzymes, feeds and most important, as source of protein.

The aim of this paper is to give some ideas not only on the wonders the fungi can do but also on the great complexity of these organisms especially in terms of forms and fruiting bodies. Further, it aims to disseminate information on fungi and mosses of North Central Mindanao, and to provide a practical reference for the identification of these organisms. Included in this publication are more than 54 species of fungi and mosses, all taken in the field and with information such as the scientific names, synonymies, common names, journal where the species first published, brief descriptions, derivation of species, economic importance, distribution, season, altitude, substratum, local assessment and Mindanao forests where the species occurs. This also include Genus description, derivation and number of species within the genus. Moreover, the Family description, recognition, etymology and number of genus/genera within the family. This publication represents countless hours of work and dedication in the field, and is merely a first step in our continuing efforts to document the unique, yet diverse,

species of fungi and mosses in this island of Mindanao.

This research is a useful contribution to the study of fungal and mosses flora in the country and a significant reference material for students, teachers, and researchers in ecology, taxonomy and field biology. References are provided to major technical works and literature; these can be referred to for more details or for additional references.

OBJECTIVES OF THE STUDY

This study generally aimed to determine the existing macrofungi and mosses at the different protected and non-protected areas in North Central Mindanao. Specifically, to prepare a taxonomic account of each species based on systematic collection and to determine the economic importance, distribution, substrates and habitat.

MATERIALS AND METHODS

Transet line (TL) and quadrat methods were used in the field samplings. Using TL method in samplings, several transect lines were established in the different areas in North Central Mindanao. These were set-up from the baseline toward the peak with 10m x 50m quadrat sampling each transect line with an interval of 50 meters between quadrats.

Fungal and mosses collections were done in the field. Two to three samples of fungi and mosses were collected prior to identification and classification. The species characteristics of each collection such as subtrates, form, texture, size, color, and other noteworthy features were recorded at the time of collection.

All the fungal and mosses species found in each quadrat along the TL's were identified, recorded, and documented. If not possible to identify on site, taxonomic and morphological features of those species were noted.

RESULTS AND DISCUSSION

The sampling of fungi in the different areas in North Central Mindanao resulted to the identification of 76 families, 122 genera, and 185 species. For mosses, the study revealed 174 species, 97 genera and 39 families. However, we included here are the common macrofungi and mosses species in the different protected areas in North Central Mindanao. Hence, 41 species of fungi, belonged to 31 genera and 76 families while 15 species of mosses, associated to 10 genera and 10 families are included in this paper. The discovery of some species previously known only in the other regions of the Philippines and the possible new species implies that the protected areas and watershed in North Central Mindanao, and perhaps other areas not covered by initial surveys might generate additional species record.

FUNGI

Auriculariaceae Fries

Description

The basidiocarp and or fruiting bodies of the majority of the species within this family when moist is gelatinous to leathery; cartilaginous to horny when dry; cup-shaped, and sometimes asymmetrical. The fruiting bodies which may be ear-shaped are conspicuously attached to a substrate primarily wood and bamboo. The spore-bearing surface is smooth, warted, veined decorated like a network or folded into plaits, and normally located on the lower side. The basidia are transversely septate, elongate-cylindric and the sterigmata are terminal. The hymenium is enclosed in a more or less definite peridium in a few genera.

Family Recognition

Family Auriculariaceae was recognized by Gustav Lindau, a German mycologist in 1897 to accommodate the hymenium exposed fungal species and more or less cylindrical basidia and lateral septa. In 1922, Carleton Rea, British mycologist recognized this family accommodating other genera. But in 1984, Robert Joseph Bandoni, an American mycologist, used electron microscopy to examine the ultrastructure of this organism and he found out that hymenium exposed basidia were not closely related to each everyone genus in the family.

Etymology

The family name Auriculariaceae is derived from the Latin word auricula, meaning, "ear", the ear-like structure of this gelatinous fungus.

Number of genus/genera within the family

This family contains seven genera (*Auricularia, Exidia, Exidiopsis, Eichleriella, Fibulosebacea, Heterochaete* and *Pseudostypella*) and over 100 species, and this can be found almost in all continents. Genus *Auricularia* is one of the most common in the Philippines.

Auricularia Bulliard

Description

The basidiocarp and or fruitbody when moist is gelatinous to leathery; cartilaginous, rigid and brittle when dry, reviving when wetted again; semi-circular if resupinate, cup-, leaf- or ear-shaped, more or less stipitate or at least attached by a lateral point; pallid or rosy to dark brown or black in color. The hymenium or the fruiting surface is smooth or marked with veins. The basidia are cylindric forming a definite palisade layer. The sterigmata are unilateral, terminal, or apical sterigmata.

Genus derivation

The generic name *Auricularia* is derived from the Latin word *auricula*, meaning "ear"- the likeness of this fungus. It is found throughout the Philippines, as well as the world over. Almost all species are edible and are grown commercially.

Number of species within the genus

This genus has 28 species as of May 2015 based on Index Fungorum list. Out of 28 species, six are present in the Philippines. These include: *Auricularia auricula-judae* (Hook.) Underw.; *A. polytricha* (Mont.) Sacc.; *A. cornea* Ehrenb.; *A. delicata* (Mont.) Henn.; *A. fuscosuccinea* (Mont.) Henn.; and *A. mesenterica* (Dicks.) Pers.

Auricularia auricula-judae (Hook.) Underw.
Synonyms: *Hirneola auricula-judae* (L.) Berk.; *Tremella auricula-judae* Linn.
Common Name: wood-ear fungus; taingang daga

Auricularia auricula-judae (Hook.) Underw., Pilze Schles. 1 (1885) 28; Reinking, Philip. Journ. Sci. 15 (1919) 480, 16 (1920) 167, 19 (1921) 92.

Description

Auricularia auricula-judae's fruit body is gray, then olivaceous or reddish brown, finally dark brown, laterally attached without stalk, cup-shaped, half-round, concave, then ear-shaped, 3-10 cm across, turning plicate, transparent. The outer surface covered with minutely hair, grayish brown, usually wrinkled veined. The flesh is thin, rubbery, gelatinous, then cartilaginous and tough, no distinctive smell. It revives when soaked in water, assuming the original size and form. The spores is 12-15 x 4-6 µ; sausage-shaped, smooth, colorless. Basidia cylindrical, with cross-walls; spores form on upper surface. Spore print white.

Derivation of Name

The specific epithet *auricula-judae* came from *auricula*, a Latin word meaning, "ear", the ear-like lobes this fungus often forms and judae means, "Judas", the Jew who it is said betrayed Jesus.

Edibility / Economic Importance/Uses

Wood-ear fungus is edible. In the forests, where there are plenty of trees, this species can be collected by basketful. In taste, it does not differ much from the other members of *Auricularia*. In England, this fungus was formerly used as a remedy for dropsy and for sore throat. It is very popular in Chinese chop-suey houses, where it is hardly ever lacking in a soup dish.

Distribution

This species can be occured almost anywhere on the Earth (Asia, Africa, North America, Central America, South America, Europe, Australia, and New Zealand), though so many individuals found in North America and Asia.

Season

This mushroom is found all year round, although it is most abundant from May to September.

Habitat/ Substratum

This fungus usually found in several habitat and that includes mountainous forested areas. This grows on rotten stumps, fallen trunks, and dead branches of trees such as hauili (*Ficus septica* Burm. f).

Mindanao forests this species occurs

Mt. Hamiguitan Range Wildlife Sanctuary (Davao Oriental); Mt. Musuan (Bukidnon); Surigao Forest (Surigao del Norte); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Auricularia polytricha (Mont.) Sacc.
Synonym: *Hirneola polytricha* (Mont.) Fr.
Common Name: tree-ear fungus

Auricularia polytricha (Mont.) Sacc., Misc. Myc. 1 (1884) 12; Sacc., Syll. Fung. 6 (1888) 766; Patouilliard, Leafl. Philip. Bot. 6 (1914) 2240, Philip. Journ. Sci. 10 (1915) Bot. 86; Reinking, op. cit. 15 (1919) 480, 16 (1920) 168, 527, 17 (1920) 363, 19 (1921) 94, Philip. Bur. For. Bull. 22 (1921) Pt. 111, 110; Adriano, Philip. Journ. Agr. 4 (1933) 2.

Description

Auricularia polytricha's fruiting body is thick. It assumes a large size, measuring from 6 to 14 centimeters in diameter, gelatinous when moist, yellow-brown, shape like an open shell, becoming leathery when dry, having round projections at the margin; with or without a very short stalk. Hymenium smooth, or wrinkled, pale brown to dark brown. Hairs thick-walled, up to 0.6 mm long; hyphae bearing clamp connections; basidia cylindrical, hyaline, three-septate, 46-60 x 4-5.5 µm with 1-3 lateral sterigmata. Spores, hyaline, reniform to allantoid, 13-16 x 4.5.5 µm. *A. polytricha* is commonly called "tree-ear fungus" or "taingang- daga". The thickness and the open shell-like basidiocarp with round projections at the margin and being stalkless distinguish this species from A. auricula-judae.

Derivation of name

The specific epithet *polytricha* derived from Latin word poly, means great number or many, and tricha from Greek word, neutral plural of trichos, means hair.

Edibility / Economic Importance/Uses

This mushroom is edible, and can be collected in large quantities, especially during the rainy season. It is often used in Asian cooking, especially in Chinese cuisine. It can be dried and stored. According to Chinese medicine practitioners, eating dried and cooked ear fungus can have health benefits for people with high blood pressure.

Distribution

This species is widely distributed in Asia particularly in China and in moist deciduous to wet evergreen forest of Kerala, India.

Season

This mushroom is found all year round, although it is most abundant from May to September.

Habitat/ Substratum

This is another species very common in the Philippines. This fungus usually found across terrestrial habitat and usually grows in clusters on rotten stumps and trunks and in dried branches and twigs of trees such as rain tree (*Albizia saman* F. Muell.).

Mindanao forests this species occurs

Mt. Hamiguitan Range Wildlife Sanctuary (Davao Oriental); Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

DACRYMYCETACEAE Bref

Description

The basidiocarp and or fruiting body which is typically attached to wood and other woody substrate is relatively minute to small, typically gelatinous, horny when dry, reviving when wet, sometimes waxy, membranous, golden yellow. The hymenium is regularly amphigenous or superior, smooth or somewhat convolute, occasionally enclosed in a more or less definite peridium. The basidia are not septate, cylindric- valvate, with two blunt terminal sterigmata. The spores are mostly simple. The conidia are often present with the spores. Spore print is colored yellow to almost ochraceous.

Family Recognition

Family Dacrymycetaceae was recognized by Julius Oscar Brefeld, a German botanist and mycologist in 1888.

Etymology

The family Dacrymycetaceae is derived from the Latin word Dacry, means "tear" and the Greek word *myceto* meaning "fungus". This family name means "looks like tears fungus.

Number of genus/genera within the family

This family is saprophytic in nature and consists of nine genera and 101 species which is distributed worldwide. This jelly fungi was separated from other fleshy fungus by the yellowish-orange pigments and the Y-shaped basidia.

Dacryopinax Tulasne Fergus

Description

The basidiocarp and or fruiting body is small, stalked club- or petal-like occurring in groups, jelly-like, drying hard, rigid. The color is yellow-orange, drying brownish. They occur as discs, cups, crusts, pustules, clubs, or petal-like forms, and may appear dried or revived after rain.

Genus derivation

The generic name *Dacryopinax* came from the word, Dacry means "a tear as in weeping" and pinax means a "likeness" or "picture". The genus name means "looks like tears".

Number of species within the genus

This genus is widespread and has 15 species that is commonly found in tropical regions. It was circumscribed by George William Martin, an American mycologist in 1948. *Dacryopinax spathularia* is the most common species in the Philippines.

Dacryopinax spathularia (Schwein.) Martin
Synonyms: *Guepiniopsis spathularia* (Schwein.) Pat.; *Cantharellus spathularius* (Schwein.) Schwein.; *Guepinia spathularia* (Schwein.) Fr.; *Merulius spathularius* Schw.
Common Name: fan-shaped jelly fungus

Dacryopinax spathularia (Schw.) Mart., Syst. Orb. Veg. (1825) 92; Elench., Fung. (1828) 32; Bres. and Sydow; Philip. Journ. Sci. 9 (1914) Bot. 352; Graff, op. cit. P.235; Reinking, op. cit. 16 (1920) 168, 19 (1921) 95.

Description

Dacryopinax spathularia's fruit body is ladle-like shaped, flattened on one end, jelly-like, drying hard, rigid, yellowish to orange in color, measuring 0.5 – 2.5 cm. long and 0.5 – 3mm wide, varies in color, stipitate, spatulate with unilateral inferior hymenium; have rounded stalks at the base, are flattened upward, and have an overall fan-shaped to spatula-shaped appearance; basidia cylindrical at first then clavate becoming bifurcate; epi-basidia one spored. The spore deposit is white. Its spores are ellipsoid, smooth-surfaced, hyaline, and measure 7-10 x 3-4 µm. The basidia is forked and has four-spored that are 25-35 x 3-5 µm.

Derivation of name:

The specific epithet *spathularia* has been derived from the word "spathula", the likeness of the shape of the basidiocarp. It is also shaped like a cooking spoon. Few mycologists claimed that this species came from the word spathul means "little spade" or "blade" in reference to the flattened portion of the fruitbody.

Edibility / Economic Importance/Uses:

Inedible. This species is not fit or suitable for eating.

Distribution

It is widely distributed in Asia, and also known in Africa, Australia, Europe, New Zealand, South America, Central America, and North America including Hawaii.

Season

This fungus is found all year round, although it is most abundant from July through October.

Habitat/ Substratum

This can be found in all types of habitats, and usually grows in groups or clusters on rotten trunk such as of ipil-ipil [*Leucaena leucocephala* (Lamk.) de Witt].

Mindanao forests this species occurs:

Mt. Hamiguitan Range Wildlife Sanctuary (Davao Oriental); Dinagat Forest (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

GANODERMATACEAE (Donk.) Bulliard

Description

The basidiocarp and or fruiting body is usually attached to a rotten wood. It is an annual or perennial, bracket-like, sessile or stipitate, but always dorsiventrally pileate. The pileal-surface is frequently forms a crust and the hymenophore is always tabulate, with the tubes being narrow and often stratified, the pores minute. Their context are pallid to dark or purplish brown and their texture is corky to woody. The hyphal system is dimitic to trimitic with skeletal hyphae, and the skeletal hyphae often have arboriform apices, clamp connections, or generative hyphae. The basidia are four-spored with a complex wall structure. The spores are globose to ellipsoid, and brown, but sometimes only faintly so. The wall structure is complex and has a form. The pigmented exoepiporium bears an ornamentation covered by a hyaline periporium. The setae and cystidia are absent.

Family Recognition

Family Ganodermataceae was first recognized by Marinus Anton Donk, a Dutch mycologist and eventually by Jean Baptiste Francois Pierre Bulliard, a French mycologist on 1785.

Etymology

The Family Ganodermataceae is derived from the Latin word gano, meaning "shining", and derma means "skin", the morphological chracteristics of this family which is shining skin.

How many genus/genera within the family

This family includes important wood-rooting fungi, is composed of five genera and 81 species.

Amauroderma Leveille

Description

The basidiocarp and or fruiting body is annual; stipe central, eccentric or lateral. The spores are globose to broadly ellipsoid, not apically differentiated, pale to deep brown.

Genus derivation

The generic name *Amauroderma* is derived from the Latin word amauro, meaning "dark or dusky", and derma, meaning "skin", the physical features of this genus having dark skin.

Number of species within the genus

This genus contains 30 species and is found in almost tropical regions. One of the common species in the Philippines is *Amauroderma rugosum*.

Amauroderma rugosum (Blume & T. Nees) Torrend.
Synonym: Polyporus rugosus Blume & T. Nees
Common Name: long-stalked polypore

Amauroderma rugosum (Blume & T. Nees.) Torrend, Broteria Serie Botanica 18:127 (1920).

Description

Amauroderma rugosum's basidiocarp is woody to corky; cap rough, light brown to brown, circular, 4.5 x 5.0 cm. in diameter, with circular concentric lines; stalk tough and slender, 13-15 cm. long; spores globose, brown; cystidia absent; with clamp connections. The light brown to brown circular cap, with circular concentric lines and with tough and slender stalk (13-15 cm. long) distinguish this species from *A. auriscalpium*.

Derivation of name

The specific epithet *rugosum* is from the Latin word *rugosus*, means "wrinkled", the main characteristics of the cap or pileus.

Edibility / Economic Importance/Uses

Inedible. This species is not fit or suitable for eating.

Distribution

This species found and grows in Southeast Asia.

Season

This fungus is found all year round.

Habitat/ Substratum

This fungus usually found in the forested area particularly on rotten roots of balinghasai (Buchanania arborescens Blume).

Mindanao forests this species occurs

Dinagat Forest (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Ganoderma Karsten

Description

The basidiocarp and or fruiting body is somewhat beaked and shelf-like while attached to the tree, covered with a hard shiny coating. Some of the species in this genus has no stalk, sessile, but in a few species, a short stalk is present. The tubes are rarely single, sometimes composed of many layers.

Genus derivation

The generic name *Ganoderma*, is derived from the Latin word gano, meaning "shining", and derma means "skin".

Number of species within the genus

This genus contains 80 species, many from tropical region. They grow on rotten trunks and roots of the trees, producing root rot. Some of the species attain an extraordinary size. None of the species are edible though others have medicinal properties. They are among the most common wood-destroying fungi in the Philippines. These include *Ganoderma applanatum* and *Ganoderma lucidum*.

Ganoderma applanatum (Pers.) Pat.
Synonyms: *Fomes applanatus* Karst.; *Polyporus applanatus* Fr.; *Boletus applanatus* Pers.
Common Name: artist's conk fungus

Ganoderma applanatum (Pers.) Pat., Bull. Soc. Myc. Fr. 5 (1889) 64; Reinking, Philip. Journ. Sci. 16 (1920) 529; Humphrey and Leus, op. cit. 45 (1931) 514.

Description
Ganoderma applanatum's basidiocarp is woody, perennial polypore and recognized by the flat cap with a hard upper crust, and a white pore surface, sessile; cap 10-50 cm. in diameter, plate-like, with the upper surface forming a dull, hard crust with indistinct concentric zones, at first pale brown then dark grey-brown often covered with a spore deposit, and a thick, sharp margin; tubes distinctly layered, each layer 4-12 mm long per season, brown; often white flecks, corky, thinner than tube layer; pores minute; 4-6 per mm; spores globose, brown; 6.5 - 9.5 x 5-7 µ, broadly elliptical and blunt at 1 end, with thick double wall; cystidia absent; hyphal system present, dimitic; spore deposit cinnamon-brown. *G. applanatum* is commonly called artist's conk. It is among the most common wood-rotting fungi in the Philippines. It has hard shelf-like basidiocarp which are perennial reaching considerable and an extraordinary size. Its pure white undersurface is much like a freshly painted white wall.

Derivation of name
The specific epithet *applanatum* derived from the Latin word *applanatus*, *planus*, meaning "flat/ flattened out or horizontally expanded", the morphological feature of this mushroom.

Edibility / Economic Importance/Uses:
Inedible. This species is not fit or suitable for eating

Distribution
This fungus occurs in Australia, North America, Europe, Northern Asia, Southeast Asia including the Philippines.

Season
This fungus is found all year round.

Habitat/ Substratum

This fungus is common in terrestrial habitat particularly in forested areas. It is usually encountered on dead wood, particularly of trees, but also reported on wounds of living trees. In the Philippines, it is very common on decaying stumps of milipili (*Canarium hirsutum* Willd.).

Mindanao forests this species occurs:

Mt. Hamiguitan Range Wildlife Sanctuary (Davao Oriental); Dinagat Forest (Dinagat Island Province); Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Musuan Forest (Bukidnon); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Ganoderma lucidum (Leys.) P. Karst.
Synonym: *Boletus lucidus* Leys.
Common Name: lacquered bracket fungus

Ganoderma lucidum (Leys.) Karst., Rev. Myc. 3 (1881) 17; Sydow, Ann. Myc. 15 (1917) 166.

Description

Ganoderma lucidum's basidiocarp is woody, corky, annual, thick and tough; cap or pileus almost circular or irregularly semi-circular, 2.5 - 35.5 cm. in diameter, often overlapping, 1-3 cm. thick, surface shiny reddish brown near the stem, pale brown toward the margin, often concentrically ridged, margin pale tan, thick and rounded; context light brown, firm, fibrous, 5-15 mm. thick; pores 30-50 per cm., 5-15 mm. long, tan to brown; stalk 2.5 -10 cm. long, 1.5-3 cm. thick, central eccentric, or lateral, shiny, reddish brown; spores ellipsoid, brown; 7-12 x 6-8µ; spore print brown; cystidia absent; with clamp connection; hyphal system present.

Derivation of name

The specific epithet *lucidum* having derived from the Greek word *lucidus*, means "glossy and or polished". *G. lucidum* produces attractive reddish brown fruiting body whose lateral stem and upper surface are coated with hard, shiny substance resembling sealing wax. Such fruiting bodies are used in decorative arrangement by artistically minded nature lovers.

Edibility / Economic Importance/Uses

This lacqured bracket fungus is widely used in traditional oriental medicine. It is claimed to be effective against a wide range of illnesses, especially liver diseases, and is believed to prolong life. It is commonly taken dried as a tea or a distinctive wine.

Distribution

This species found growing in North America, Europe, South America, and Asia including the Philippines.

Season

This fungus is found all year round but most abundant from May to November.

Habitat/ Substratum

This fungus usually grows in forested areas, at the base of many living trees, especially on rotten trunk and stumps of fire tree (*Delonix regia* (Bojer.) Raf.)

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

GEASTRACEAE Corda

Description

The basidiocarp and or fruiting body is 2.5-5.0 cm. in diameter at the widest part, more or less bulb-shaped, acute at the apex, not stalked, brown or reddish brown, the outer coat splitting at the apex into 4-6 rather uniform segments or rays, spreading back to form a star-shaped and often splitting into two layers of which the inner remains as a sort of cup around the spore case. The spore case is sessile, thin and papery, opening by a conical pore which is different in texture from the rest of the spore case, smooth but somewhat fringed. The spores are brown and globose.

Family Recognition

Family Geastraceae was recognized by August Carl Joseph Corda, a Czech mycologist on 1842.

Etymology

The family Geastraceae is derived from the Greek words ge, which means "earth" and astra, astron, meaning "star". This family name means "earth star, referring to the star-like appearance of the matured fruiting body under this family.

Number of genus/genera within the family

This family of earthstar fungi is consist of eight genera, including *Geastrum*, *Myriostoma* and *Sphaerobolus* and about 64 species. These are similar to puffballs but with a layered coat. The spore dispersal is being attained by having rain drops falling on the inner part of the fruiting body sack and compelling spores out by the pressure in it.

Geastrum (Micheli) Fries

Description

The basidiocarp and or fruiting body is thick, star-like, fleshy rays, and a collar around the spore sac. It grows up to 6 cm. in diameter, in the young, unopened state resembling a tulip bulb. Spore sac 2-4 cm. in diameter, cylindric, greyish brown. The rays are 5-6 thick and fleshy, curved downward, creamy brown, often cracked on the upper surface, greyish on the underside. The spore chamber is almost spherical, 2-4 cm. in diameter, pale grayish brown when fresh, brown to reddish when old, the pore or opening in the top surrounded by a light colored, silky shining area 5-12 mm. in diameter, the margin of the pore projecting upward and fringed.

Genus derivation

The generic name *Geastrum* is derived from the Greek words ge, which means "earth" and astrum, meaning "star" – referring to the star-like appearance of the matured fruiting body.

Number of species within the genus

This genus contains 50 species with an expanded star-like base. The species of this genus are terrestrial, and commonly found in abundance in thickets and under bamboo trees inside the forests. It is very interesting because of star-like form and appearance. None of the species are edible. *Geastrum saccatum* is one of the most common species in the Philippines.

Geastrum saccatum Fr.
Synonym: *Geastrum lloydianum* Rick
Common Name: rounded earthstar

Geastrum saccatum Fr., Syst. Myc. 3 (1832) 16; Bres., Hedwigia 51 (1911) 325; Graff, Philip. Journ. Sci. 9 (1914) Bot. 252.

Description/ Characteristics
Geastrum saccatum's fruitbodies of this species has roundish sac enclosed by starlike rays. The rays are 1.5 – 2 cm long, 5-7 in number, ochre-brown or pinkish, upright, then curved back and down. The spores are 3.5 – 4.5µ, rounded, warted, brown. The spore sac is 0.5 – 2 cm wide, roundish, with small, central, disclike depression abouth mouthlike opening at top, smooth, brownish or sometime nearly white. This species is often found in large quality, usually in all stages of development. When not yet open and it still in incipient stage, it resembles a small puffball; when cut in half, a rubbery outer skin and an interior spore case are revealed.

Derivation of name
The specific epithet *saccatum* came from the word saccate, means having the form or like a sac or bag and or pouch.

Edibility / Economic Importance/Uses
This species according to the report has curative properties for eye infections and diseases such as asthma.

Distribution
This species has worldwide distribution and is found growing on rotting wood. Widely distributed in North and South America, Africa and Asia. A native of Brazil.

Season
This mushroom is found all year round, although most abundant from July to October.

Habitat/ Substratum
In the forested areas, this species can be found at the forest floor with leaf litter under trees.

Mindanao forests this species occurs

Mt. Hamiguitan Range and Wildlife Sanctuary (Davao Oriental)

HYMENOCHAETACEAE Imazeki & Toki.

Description

The basidiocarp and or fruiting body of all species are white-rotters that lack clamp connections and often possess setae. At the ultrastructural level the septal pore cap of the dolipore septum is not perforated, a condition unknown to other members of Aphyllophorales. The basidiocarps of all species are golden brown to reddish brown in color, and the tissues darken permanently with KOH application. The smooth basidiospores are hyaline or brown. This family was once included within the Family Thelephoraceae but now placed in it's own family. Microscopic detail is used to sort this family from other member of the Family Thelephoraceae.

Family Recognition

Family Hymenochaetaceae was recognized by Rokuya Imazeki and S. Toki, two Japanese mycologist in 1954.

Etymology

The Family Hymenochaetaceae is derived from the Greek word hymen, meaning "membrane" and chaite, means long hair. The family most likely has a physical feature such as long-haired membrane.

Number of genus/genera within the family

This family contains 27 genera and 487 species. These species were implicated in many diseases of broad-leaved and coniferous trees, causing canker, heart rot, and root diseases.

Phellinus Schweinitz

Description

The basidiocarp and or fruiting body is typically bracket-like or hoof-shaped, hard and leathery or woody in texture, with rust-brown 'flesh' and a layer of tubes on the underside. The spores are smooth. Many species cause white rot. The fruitbodies, which are found growing on wood, are resupinate, sessile, and perennial. The flesh is tough and woody or cork-like, and brown in color. The clamp connections are absent, and the skeletal hyphae are yellowish-brown.

Genus derivation

The generic name *Phellinus* means "cork".

Number of species within the genus

This genus contains 154 species as of January 2015, based on Index Fungorum list. *Phellinus caryophylli* and *Phellinus rimosus* are the two common species in the Philippines.

Phellinus caryophylli (Racib.) G. Cunn.
Synonyms: *Fomes caryophylli* (Racib.) Bres.; *Fomitiporella caryophylli* (Racib.) T. Wagner & M. Fisch.; *Pyropolyporus caryophylli* (Racib.) Teng.; *Trametes caryophylli* Racib.
Common Name: thinned-brown cap polypore

Phellinus caryophylli (Racib.) G. Cunn., Bulletin of the New Zealand Department of Industrial Research 164:238 (1965).

Description

Phellinus caryophylli's fructification is perennial, sessile effuse-reflexed to pileate, solitary to imbricate,hard, woody, dimidiate; upper surface dark brown, lighter towards margin,sulcate with ridges; hymenial surface brown, pores small, angular, pore tubes stratified; margin brown, blunt,obtuse. Pore surface yellowish brown to brown,even, smooth, glancing; pores small, angular, 7-9 per mm, dissepiments 32-50 um thick; pore mouth velvety, tubes indistinctly stratified, each layer up to 2 mm deep. Context brown, fibrous 3.2 mm thick. Hyphal system dimitic; generative hyphae hyaline, branched, septate, clamps absent; skeletal hyphae brown, thick-walled, unbranched, aseptate with narrow lumen;

setae absent. Basidia clavate, 10.4-12 x 4-5.2 um. Basidiospore light brown, smooth, ellipsoid 4 x 2.5um.

Derivation of name

The specific epithet *caryophylli* came from the word caryo – variant of karyo, refers to the nucleus of a cell, and phylli or Phyllis, a Greek word means green bough or branch. This species was first described on 1965 by Marjan Raciborski, and got its current name of Gordon Herriot Cunningham.

Edibility / Economic Importance/Uses

It was reported in Australia, that aborigines have used this species fruit bodies medicinally. The smoke from burning fruit bodies was inhaled by those with sore throats. Scrapings from slightly charred fruit bodies were drunk with water to treat coughing, sore throats, fevers, and diarrhoae.

Distribution

This species found in South America, Australia, and Asia particularly in Bhutan and the Philippines.

Season

This fungus is found ally year round.

Habitat/ Substratum

This fungus usually found in terrestrial habitat particularly in forest. It usually grows on hardwood trees.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

Phellinus rimosus (Berk.) Pilat
Synonym: *Fomes rimosus* (Berk.) Cooke
Common Name: cracked cap polypore

Phellinus rimosus (Berk.) Pilat, Annales Mycologici 38 (1): 80 (1940); Annals and Magazine of Natural History 3: 324 (1839).

Description

Phellinus rimosus basidiocarp is sessile, woody, brown, concentrically

furrowed, 5-30 cm wide, semicircular, flat to hoof-shaped. The flesh is 0.5 – cm thick, yellow-brown. The tubes are 4-10 cm long, adding 2-4 mm per season. The pores are circular, 4-6 per mm, yellow-brown to deep, rich brown. The spores are round to elliptical, smooth, brownish, 4-6µ wide. The spore print is brownish.

Derivation of name

The specific epithet *rimosus* derived from the English word 'rimose', means cracked.

Edibility / Economic Importance/Uses

This species is reported as a drug used by tribes in Kerala in India.

Distribution

This species found in United States of America particularly in New York, Florida, Texas, and California and other parts of Asia including India and the Philippines.

Season

This fungus is found all year-round.

Habitat/ Substratum

This fungus grows in forested areas particularly on rotten trees and fallen branches.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

MERULIACEAE Rea

Description

The basidiocarp and or fruitbody hymenium spread over veins, with anastomosing pores. The species are crust-like or polyporoid, and often have waxy appearance when dry. The hyphal systems contains only arranged generative hyphae. The hyphae have clamp connections. The spores of this family are smooth and thin-walled. The cystidia are often present in the hymenia layer.

Family Recognition

Family Meruliace was formally circumscribed by Carleton Rea, an English mycologist in 1922. He designated Merulius as the type genus. Several genera formerly classified in this family were moved to Coniophoraceae and lately to Steccherinaceae based on molecular evidence.

Etymology

The family Meruliaceae derived fungi as called by the name of Merulius from Meta, a pillar or boundary-poft with a round top, which the shape resembles.

Number of genus/genera within the family

This family contains 47 genera and 420 species distributed worldwide.

Cymatoderma Jungh.

Description

The sporophores lignicolous, coriaceous, infundibuliform; upper surface of the cap or pileus ornamented with radiating knife-edged ridges, which in certain species are obscured, except towards the margin, by a very thick felt-like tomentum. This tomentum may reach a thickness greatly in excess of that of the flesh of the fruitbody. Hymenial surface thrown into a complex system of folds, ridges, or pseudocentral, either well developed or reduced to a basal tubercle, tomentose. Hyphal structure dimitic or trimitic; generative hyphae frequently thin-walled, hyaline, branched, with clamp connections at the septa.

Genus derivation

The generic name *Cymatoderma*, is derived from the Greek word cymato, meaning “wave”, and derma means “skin”. This refers to the morphological characteristics of the fungal cap.

Number of species within the genus

Cymatoderma is a widely distributed genus. This genus contains 14 species and these include *Cymatoderma africanum, C. blumei, C. caperatum, C. dendriticum, C. elegans, C. fuscum, C. hainanense, C. infundibuliforme, C. plicatum, C. sclerotioides, C. semiresupinatum, C. venezuelae,* and *C. viridans.* The *Cymatoderma elegans* is the most common in the Philippines.

Cymatoderma elegans Jungh.

Synonyms: *Cladoderris elegans* (Jungh.) Fr.; *Cladoderris spongiosa* Fr.; *Thelephora lamellata* Berk. & M.A. Curtis; *Beccariella insignis* Ces.; *Cladoderris australica* Berk.; *Beccariella kingiana* Massee; *Cladoderris roccati* Mattir.; *Cladoderris scrupulosa* Lloyd.

Common Name: leathery goblet fungus

Cymatoderma elegans Jungh., Tijdschr. Nat. Gesch. Physiol. 7: 290 (1840).

Description

Cymatoderma elegans basidiocarp is leathery, has stalked with funnel-shaped fruiting body. The cap has finely hairy, concentrically zoned in pinkish to pale brown, becoming distinctly ridged. The center of the cap is irregular and often open. The margins are wavy, sometimes highlighted violet when young. The cream undersurface is ridged. The creamy to brown, often bushy stem is extremely tough.

Derivation of Name

The specific epithet *elegans* came from the Latin word, elegans, means elegant, with pleasingly graceful and stylish in appearance or manner.

Edibility / Economic Importance/Uses

This leathery goblet, despite its toughness is reported as being eaten by some indigenous in other countries. There is a report that the polysaccharides derived from this fungus have been shown to have potential carcinogenic properties.

Distribution

This species occurs throughout Tropical Africa and Asia, extending into temperate areas in Australia, New Zealand, China, and Japan. This species was originally described from Indonesia.

Season

This fungus grows during rainy season extending during summer months but abundant on January to February.

Habitat/ Substratum

This fungus usually found in several habitat and that include mountainous forested areas.

Mindanao forests this species occurs

Dinagat Forest (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

PEZIZACEAE Dumort.

Description

The basidiocarp and or fruiting body is commonly referred to as cup fungi since this tends to grow in the shape of a cup. The spores are formed on the inner surface of the basidiocarp. The cup and saucer-shaped of this fruiting body typically serves to concentrate raindrops into splashing spores out of the fungus cup. Further, the curvatures enables wind currents to upset the spores out in a diverse manner.

Family Recognition

Family Pezizaceae was recognized by Barthelemy Charles Joseph Dumortier, a Belgian mycologist on 1829.

Etymology

The Family Pezizaceae is derived from Latin word pezica meaning a sessile mushroom.

Number of genus/genera within the family

This family contains of 31 genera and 230 species and found distributed worldwide. One of the common geneus in the Philippines is *Sarcosphaera*.

Sarcosphaera Auersw.

Description

The basidiocarp and or fruitbody characterized by having a whitish or grayish cup fungus. It is well-known further by the manner in which the cup ruptures into lobes from the top downward and forming five to 10 pointed rays reaching up to 10 cm in diameter. The fruitbody is initially like a fleshy hollow ball, and may be erroneously identified as puffball. It has lavender-brown color on the inside surface, and whitish outside, but usually grimy from adhering soil. This genus has smooth, blunt-ended, ellipsoid spores.

Genus derivation

The generic name *Sarcosphaera* comes from the Greek word sarco, meaning "flesh" and skyphos meaning "drinking bowl" and sphaera meaning "a ball, globe, and or sphere".

Number of species within the genus

Sarcosphaera is a monotypic genus, containing the single species, *Sarcosphaera coronaria*. It is commonly found in the mountainous areas under humus on the forest floor.

Sarcosphaera coronaria (Jacq.) J. Schrot.
Synonyms: *Sarcosphaera crassa* (Santi) Pouzar, *Sarcosphaera eximia* (Durieu & Lev.) Maire
Common Name: crown-cup fungus

Sarcosphaera coronaria (Jacq.) J. Schrot., Krypt.-F1. Schles. 32:49, 1893; Misc. Austr. 1:140, 1778., Summa Veg. Scand. 349, 849.

Description/ Characteristics

The fruiting body is ball-like, bowl or goblet-shaped when young, with a small opening near the top; usually splitting into rays by maturity and folding back to be star-shaped; up to 20-30 cm when mature; inner surface whitish becoming pale lilac brown, smooth or finely scaly; outer surface whitish, roughened,sometimes has yellowish stains. The stalk is undeveloped or totally absent. The flesh is whitish to brown, brittle. The spores are elliptical with blunt ends, smooth, 15-20 x 8-10µ. The paraphyses is cylindric, with rounded apices.

Derivation of name

The specific epithet Latin *coronaria* means "used for garlands". It is like flower arrangement consisting of a circular band of foliage or flowers for ornamental purposes. It is like also a surrounding like a crown (especially of the blood vessels surrounding the heart), coronary arteries.

Edibility / Economic Importance/Uses

This species is poisonous. It contains gyromitrin, a pontentially lethal poison, and is therefore best avoided.

Distribution

This speciesis widespread and has been collected in Europe, North Africa, North America, and in Asia including the Philippines.

Season

This fungus is found all year round, but most abundant in the month of July.

Habitat/Substratum

This species grows in the forest and on the grassland, where growing alone, or in clusters, partially submerged in the ground. This is said to be a "missing link" between abound ground *Peziza* and below ground truffles, from an epigeous to a hypogeous growth form proceeds through a semi-immersed stage.

Mindanao forests this species occurs:

Mt. Kambinliw (Dinagat Island Province)

PLEUROTACEAE Kühner

Description

This family has a small to medium-sized basidiocarp and or fruiting body. The species in this family has white spores. Family Pleurotaceae always mistaken for Marasmiaceae species. The best and common species under this family is an oyster mushroom, *Pleurotus ostreatus* (Jacq.ex Fr.) Kummer. Some of the species in Pleurotus and Hohenbuehelia are nematophagous, meaning they derived nutrition by consuming nematodes. This is usually happened through hyphae that may have pasted knobs that attach to passing nematodes and eventually secrete nematoxic compounds.

Family Recognition

Family Pleurotaceae was recognized on 1980 by Robert Kühner, a French mycologist most notable for reviewing many agaric genera.

Etymology

The Family Pleurotaceae is derived from a New Latin word pleuro means "side" and Greek word òtos, genitive of oûs, meaning "ear". The likeness and morphological characteristics of this family.

Number of genus/genera within the family

This family contains four genera and this include *Nematoctonus* that has been synonymized with *Hohenbuehelia* though not all of its species have been moved to valid genera. It has also 94 species that can be found worldwide. Genus *Pleurotus* is the most common in the Philippines.

Pleurotus Fries

Description

The basidiocarp and or fruiting body's cap is fleshy, generally white among the large species, ashy greenish, yellowish, or reddish white in those of medium size, smaller forms are white gray or blackish. The stalk is lateral, eccentric, others are central. The gills are either not easily detached, narrowly attached, or decurrent. The veil is absent. The fungi grow in clusters, or aggregates of individuals, constituting attractive complex brackets. The spores are white.

Genus derivation

The generic name *Pleurotus* is derived from the Greek word pleuron meaning "side," and otus, an "ear." The name suggests the shape of the mushroom, which is like the outside of an ear.

Number of species within the genus

This genus previously belonged to family Tricholomataceae contains 29 species. All species are known to be edible and of pleasant flavor, when properly prepared. Many of the species of this genus emanate light at night like ordinary firefly. The members of this genus grows in clusters, or aggregates of individuals, constituting attractive complex brackets or combs. They grow on decaying trunks and fallen logs of many trees. No species of this genus are suspected of being poisonous. The type of this genus is *Pleurotus ostreatus*.

Pleurotus ostreatus (Jacq. ex Fr.) Kummer
Common Name: oyster mushroom; malaking alitaptap

Pleurotus ostreatus (Jacq.ex Fr.) Kummer, Syst. Myc. 1:178, 1821.

Description

Pleurotus ostreatus cap is 5 to 14 centimeters in diameter, varying from white to gray or brown, fleshy, soft, thick at the center where the stem is attached, becoming thin toward the margin; the surface is moist or dry, smooth, sometimes more or less torn into scale-like appendages. The gills are broad, white, not crowded, narrowed out into veinlike branching lines connecting with each other, decurrent. The stem, when present, is short, firm, white, often thickened upwards, sometimes hairy. The ring and the cap is absent. The spore print on black paper is white to lilac.

Derivation of name

The specific epithet name ostreatus is Latin word, meaning "oyster." The Americans call this species "oyster mushroom," due to its oyster-like form.

Edibility/Economic Importance/Uses

Edible. This is a delicious mushroom, not hard to identify even for the beginner. The young plants only should be used in cooking. After thorough cleaning and washing, they are torn into pieces, dipped in beaten egg, and fried in hot lard.

Distribution

This mushroom found in North America, Europe, and Asia including China, Taiwan, Korea, Japan and the Philippines.

Season

This mushroom is found all year round.

Habitat/Substratum

This mushroom grows in the forest particularly in the stumps and prostrate trunks, including living trees. It appears in crowded clusters, often with caps that overlap each other. Sometimes, the stem is so short that it appears absent; at other times it is very prominent.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

PLUTEACEAE Kotl. & Pouzar

Description

The basidiocarp and or fruiting bodies in this family are of small to medium-sized which have a free gill attachment and has pink spores. Most mushrooms in this family are divided into *Pluteus* and *Volvariella*. The first genus usually observed grows on wood or rotting logs and never produce volva. The second genus on the other hand, grows on a variety of substrates on the ground and always form a volva. Pluteaceae has circular cap or pileus, a central stalk or stipe and free gills that radiate out from the stipe. The species in this family has distinguished angled spores, though sometimes can be mistaken as of family Entolomataceae, which has attached gills.

Family Recognition

Family Pluteaceae was recognized in 1972 by Frantisek Kotlaba and Zdenek Pouzar, both Czech mycologist who published several works about the taxonomy of polypore, corticioid, and gilled fungi.

Etymology

The family Pluteaceae derived from the Latin word pluteus , literally means "barrier", with reference to shape of member species.

Number of genus/genera within the family

This family contains four genera and this include widely distributed *Volvariella* and *Pluteus* and the rare *Chamaeota* and *Volvopluteus*, which was newly described in 2011 as a result of molecular study. Further, it has 364 species according to the 105th edition of The Dictionary of Fungi which was published on 2008.

Volvariella Speg.

Description

The basidiocarp and or fruitbody in this genus is characterized by having the rosy or reddish spores. It was recognized as the presence of the volva and the absence of annulus. The stalk is easily separable from the cap at the junction; in this respect it is similar to *Amanita, Amanitopsis,* and *Lepiota*. The gills are usually

also free from the stem. The species grow in many rotten plants, such as banana, abacá, rice, straw, and wood, on rich manured on the grounds. The species are soft in texture and decay easily.

Genus derivation

The generic name *Volvariella* is taken from the Latin word volva, meaning "wrapper." The member of this genus when young are supported by a sheathlike envelope that eventually becomes the cup or the volva in the mature fungus.

Number of species within the genus

This genus contains 50 species. *Volvariella volvacea* is one of the most common species found in the Philippines.

Volvariella volvacea (Bull.) Sing.
Synonym: *Agaricus volvaceus* Bull.
Common Name: paddy straw mushroom

Volvariella volvacea (Bull.) Sing., Mycologia 65: 355-364 (1971); Lilloa 22: 401 (1951)

Description

The fruiting body is egg-shaped, brownish gray when young, soft, radially streaked with fine hairs, the margin not lined, but often splitting with age, 8-16 cm. The stalk is long, 5-15cm, whitish to brownish, tapering gradually to apex, with a swollen base. The base encased in a thick, sac-like volva that is grayish above and whitish below. The gills are free from the stem, close or nearly crowded, white. The flesh is white in color. The clamp connections are absent. The spores are more or less ellipsoid, smooth, inamyloid, 8-11 x 5-7µ. The spore print is salmon pink in color.

Derivation of name

The specific epithet *volvacea* came from the Latin word *volva*, means wrapper. The structure that surrounds the base of the mushroom before it ruptures.

Edibility / Economic Importance/Uses

Edible tropical or subtropical species commonly cultivated on paddy straws in this part of the world. This mushroom is commercially cultivated on a mixture of banana leaves and rice stalk and harvested in the button or egg stage before the pileus emerges.

Distribution

This mushroom found in Africa, North America, Europe, and Asia including Indonesia and the Philippines.

Season

This mushroom is found all year round.

Habitat/ Substratum

It usually grows gregariously or in clusters in the grassland and rice paddies. Commonly found in woodchips, compost, and gardens.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province)

POLYPORACEAE Fr. ex Corda

Description

The basidiocarp and or fruiting body is an annual or perennial, stipitate, sessile, that is, without a stem, effused-reflexed, or entirely resupinate, cup-like, leathery or woody, exceptionally waxy or gelatinous, consisting of pores arranged regularly or irregularly, sometimes lamelloid. The cystidia are often present. The spores are typically 1-celled, hyaline or colored. The basidiocarp may resemble crusts, shelves, or mushrooms. The shelf-like and mushroom-like forms are, of course, much more conspicuous than the resupinate or effused-reflexed forms. Some may be soft and pliable when young, and no doubt a number of them are edible, at maturity most are generally tough, leathery, corky or woody. Although the hymenium is lamellate in a few species, the basidia typically lined the inner surface of pores and tubes. These pores are circular or angular or even elongated in forms.

Family Recognition

Family Polyporaceae was recognized in 1839 by Elias Magnus Fries, a Swedish mycologist and August Carl Jospeh Corda, a Czech mycologist.

Etymology

The Family Polyporaceae is derived from the Latin word *polyporus*, means having many pores. Fungi in this family do indeed have tubes terminating in pores (usually very small and a lot of them) rather than gills or any other kind of

hymenial surface.

Number of genus/genera within the family

This family contains 109 genera as of July 2017, based on Index Fungorum. This family is quite differs from the family Agaricaceae in having pores, tubes, or reticulations instead of gill.

Coriolopsis Murrill

Description

The basidiocarp and or fruitbody was sessile, pileate and reflexed-effused. The cap or pileus was applanate, concentrically zonate, with round pores and cinnamon context and the hyphal system was trimitic with oblong, yellowish colored spores. The chemical spot tests revealed that the tissue darkened with potassium hydroxide, and reacted with ferric chloride to produce brown colour. It was dextrinoid and produced characteristic colours with ammonium hydroxide, ferrous sulphate and sulphuric acid.

Genus derivation

The generic name *Coriolopsis* is derived from the word 'corium', means "leather, appearance". It was circumscribed by William Alphonso Murrill, an American mycologist in 1905.

Number of species within the genus

This genus contains 20 species which is cosmopolitan in distribution particularly in most tropical countries. These include *Coriolopsis antleroides*, *C. aspera*, *C. bataanensis*, *C. brunneoleuca*, *C. burchellii*, *C. byrsina*, *C. caperata*, *C. daedaleoides*, *C. floccosa*, *C. gallica*, *C. glabrorigens*, *C. helvola*, *C. hostmannii*, *C. occidentalis*, *C. polyzona*, *C. psila*, *C. strumosa*, *C. taylorii*, *C. telfairii*, and *C. tuberculata*. The species common in the Philippines is *Coriolopsis polyzona*.

Coriolopsis polyzona (Pers.) Ryvarden

Synonyms: *Polyporus polyzonus* Pers.; *Polystictus polyzonus* (Pers.) Cooke; *Microporus polygonius* Kuntze

Common Name: multiple-zoned polypore

Coriolopsis polyzona (Pers.) Ryvarden, Norw. J. Bot. 19:230, 1972.

Description

The basidiocarps are annual to biennial, solitary or imbricate, single pilei flabelliform to reniform, up to 10 cm wide and 15 cm long, 2-7 mm thick at the base, coriaceous and flexible to corky; pilear surface yellowish-ochraceous when fresh, soon darker, ochraceous-brown or greyish-brown, tomentose to slightly hispid in numerous sulcate to flat, concentric zones, tomentum 1-3 mm thick, margin thin, flat to undulating, often lobed and incised. The pore surface cream to beige when fresh, darkens to golden-brown or fulvous, pores round to angular, on average 2-3 per mm, tubes concolorous with the pore surface, in section often lighter than the trama, up to 4 mm long, sometimes stratified. The context ochraceous to golden- brown, darker towards the base, duplex, lower part fibrous and semiglossy in section, upper part loose and more faded. Hyphal system trimitic; generative hyphae with clamps, thin-walled and hyaline, 1.5- 2.5 µm wide; skeletal hyphae hyaline to yellow, dominant, thick-walled but with a distinct lumen, 3-8 µm wide, in the context up to 10 wide, in the tomentum solid and agglutinated; binding hyphae more sparingly present, hyaline to slightly yellowish, with short branches, 3-6 µm wide. Basidia clavate, 25-35 x 7-10 µm, with four sterigmata. Basidiospores oblong to subellipsoid, (4.5)5-8.5 x (2)2.5-3.5 µm.

Derivation of name

The specific epithet *polyzona* came from the Latin word *poly*, means "many" and zona, meaning "zone". An observable characteristic which is zone or a beltlike encircling structure in the cap of this fungus.

Edibility / Economic Importance/Uses

It is reported that a personal care product ingredient triclosan using enzyme preparation was derived from this white rot fungus, multiple-zoned polypore.

Distribution

This species is pantropical, particularly common in East Asia known from subtropical China, Japan, and Taiwan. And also in Southeast Asia particularly in Northern Thailand, Vietnam, and the Philipppines.

Season

This fungus grows during rainy season and then extended until summer.

Habitat/ Substratum

This fungus found in terrestrial habitat particularly in forested areas and growing in all kinds of hardwoods.

Mindanao forests this species occurs

Mt. Tendido (Surigao del Norte)

Daedalea Persoon

Description

The basidiocarp and or fruiting body is usually annual, but persisting several years in some species; sessile or effused-reflexed; some species with a stem-like point of attachment; leathery to corky in texture. The tubes are never layered, homogenous with the substance of the pileus and not forming a distinct stratum. The mouths are typically elongated or sinuous in outline, sometimes verging to poroid, and almost gill-like. The spores are oblong or oblong-ellipsoid to cylindric, never globose, hyaline. The cystidia are never conspicuous, usually absent. The setae is absent.

Genus derivation

The mazelike pore surface of this species is the source of its genus name *Daedalea*, which refers to the legendary Greek 'Daedalus', who designed the labyrinth of the Minotaur in Ancient Crete.

Number of species within the genus

This genus contains 36 species. This genus resembles Trametes, except in the firmer, thick dividing walls of the pores, which, when fully developed, are irregularly wavy or complicated in form, often becoming torn or toothed. *Daedalea flavida* and *Daedalea quercina* are the two most common species in the Philippines.

Daedalea flavida Lev.
Synonym: *Hexagona flavida* Lev.
Common Name: labyrinth gill fungus; shell mushroom; kabuteng kapis

Daedalea flavida Lev., Ann. Sci. Nat. Bot. 1112 (1844) 198; Bres., Hedwegia 53 (1912-13) 71; Sydow, Ann. Myc. 15 (1917) 169; Reinking, Philip. Journ. Sci. 16 (1920) 175, 19 (1921) 103.

Description

Daedalea flavida's basidiocarp is leathery to corky, hemispherical, furrowed, light-yellow; margin is nearly sharp; stalk lateral, 6 to 12 mm. in diameter; pores large, at first rounded, becoming much contorted, elongated, deep, wavy, pale, yellow; thick flexible walls or partitions resemble gills, pale yellow, obtuse, and somewhat hairy; 5 to 30 cm. in diameter, and 3 to 21 cm. high. The cap is leathery to corky, hemispherical, naked, furrowed, light yellow. The margin is nearly sharp. The stem is lateral, often very short or absent. The pores are large, at first rounded, becoming much contorted, elongated, deep, wavy, pale yellow. The thick flexible walls or partitions resemble gills, and are pale yellow, obtuse, and somewhat hairy. This mushroom is 5 to 30 centimeters in diameter, and 3 to 21 centimeters high, and its stem is 8 to 12 millimeters in diameter.

Derivation of name

The specific epithet *flavida* is derived from the Latin word flavidum, means "yellowish"

Edibility / Economic Importance/Uses

Inedible. A wood-inhabiting mushroom, causing rot on trees. It is very common in the Philippines. Its hard texture renders it unit for food.

Distribution

This species found in Australia, Costa Rica, Sweden, Thailand, Indonesia and the Philippines.

Season

This fungus is found all year round.

Habitat/ Substratum

This fungus grows very common in groups on rotten stumps and trunks of

molave (*Vitex parviflora* Juss.) tree in the forest.

Mindanao forests this species occurs
Mt. Kambinliw (Dinagat Island Province)

Daedalea quercina (L.) Pers.
Synonyms: *Agaricus quercinus* L.; *Lenzites quercina* (L.) P. Karsten
Common Name: maze-gill fungus

Daedalea quercina (L.) Pers., Synopsis Meth. Fung. (Gottingen): 500 (1801).

Description
Daedalea quercina's basidiocarp are tough, , convex to flat, 5-15cm wide, with thick margin, fine hairs, and white to brownish pores. The tubes are mazelike, sometimes gill-like, whitish to brownish. The flesh is thick, white to light brown, 0.5-1.5 cm thick. The spores are smooth, colorless, elliptical to cylindrical. The spore print is white.

Derivation of name
The specific epithet *quercina* came from the Latin word quercinus means "oak-like".

Edibility / Economic Importance/Uses
Inedible. This species is not fit or suitable for eating, it has a very hard texture.

Distribution
This species found in North America, North Africa, Europe and Asia.

Season
This fungus is found growing throughout the year.

Habitat/ Substratum
This fungus is usually found in several habitat and that includes mountainous forested areas particularly grows on stumps and logs, singly or in groups.

Mindanao forests this species occurs
Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

Earliella Murrill

Description

The basidiocarp and or fruiting body is resupinate, effused reflexed to more rarely distinctly pileate, often widely effused as shelflike, tough and coriaceous, upper surface glabrous, zoned, at first white to cream, soon covered by a reddish cuticle starting from the base, individual pilei up to 1 cm thick at the base. Pore surface white to cork colored, pores angular to semi-daedaleoid, especially on sloping parts of the basidiocarp, 2-3 per mm, but individual elongated pores up to 6 mm long, tubes concolorous, up to 5 mm deep, context white, tough up to 3 mm thick, in section with a distinct dark line where covered with the reddish to bay colored cuticle. Hyphal system trimitic, generative hyphae with clamps, thin-walled, 1.5-4 µm wide, skeletal hyphae dominate, thick-walled to solid, hyaline, 3-6 µm wide, binding hyphae as skeletal hyphae but branched. Basidiospores cylindrical to oblong ellipsoid, thin-walled and hyaline, IKI-, 8-12.5 × 3.5-5 µm.

Genus derivation

The generic name Earliella was derived to commemorate Franklin Summer Earle, an American mycologist who published 'The Genera of the North American gill fungi'.

Number of species within the genus

Earliella is a monotypic genus containing the single species, *Earliella scabrosa*.

Earliella scabrosa (Pers.) Gilb. & Ryvarden
Synonym: *Polyporus scabrosus* Pers.; *Fomes scabrosus* (Pers.) Cooke; *Scindalma scabrosum* (Pers.) Kuntze
Common Name: rough hymenial polypore

Earliella scabrosa (Pers.) Gilbn. & Ryv., Mycotaxon 22: 364. 1985.

Description

Earliella scabrosa's fruit body is resupinate, effused reflexed to more rarely distinctly pileate, often widely effused as shelflike, tough and coriaceous, upper surface glabrous, zoned, at first white to cream, soon covered by a reddish cuticle starting from the base, individual pilei up to 1 cm thick at the base. Pore surface white to cork colored, pores angular to semi-daedaleoid, especially on sloping parts of the basidiocarp, 2-3 per mm, but individual elongated pores up to 6 mm

long, tubes concolorous, up to 5 mm deep, context white, tough up to 3 mm thick, in section with a distinct dark line where covered with the reddish to bay colored cuticle. Hyphal system trimitic, generative hyphae with clamps, thin-walled, 1.5-4 µm wide, skeletal hyphae dominate, thick-walled to solid, hyaline, 3-6 µm wide, binding hyphae as skeletal hyphae but branched. Basidiospores cylindrical to oblong ellipsoid, thin-walled and hyaline, IKI-, 8-12.5 × 3.5-5 µm.

Derivation of name

The specific *scabrosa* came from Latin word *scabrosus*, means "rough". The observable characteristics of the cap of this fungus.

Edibility / Economic Importance/Uses

There is a report that this fungus has an antioxidant property.

Distribution

This species is widespread in tropics and subtropics. It is very common in Malaysia, the Philippines and other parts of Southeast Asia.

Season

This fungus last for only one season.

Habitat/ Substratum

This fungus usually found in mountainous forested areas where rotten stumps, fallen trunks, and dead branches are abundant.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Hexagonia Fries

Description

The basidiocarp and or fruiting body is annual, sessile or having a short stalk in a few species, corky to woody, typically sub-circular or reniform, growing on wood, pliant, thin and flexible, the surface strongly zoned. The context is avellaneous to umber, thin; tubes shallow. The mouths are hexagonal to sub-circular, usually 1 mm. The spores are cylindric and hyaline.

Genus derivation

The generic name *Hexagonia* is derived from the Latin name "hexagon", the honeycomb shape formation of the pores in the hymenial layer of the fruitbody.

Number of species within the genus

This genus has a widespread distribution, especially in tropical regions, and contains 16 species. *Hexagonia apiaria* and *Hexagonia tenuis* are the two species abundant in the Philippines.

Hexagonia apiaria (Pers.) Fr.
Synonym: *Polyporus apiarius* Pers.
Common Name: hairy hexagon fungus

Hexagona apiaria (Pers.) Fr., Epicr. Syst. Myc. (1836) 497; Bres., Hedwegia 53 (1912-13) 72; Graff, Bull. Torr. Bot. Club 49 (1922) 227.

Description

Hexagonia apiaria's basidiocarp annual, a little hollow, thick, yellow-brown, 6 to 10 cm. in diameter, 6 to 10 mm. thick, surface smooth, but sometimes the surface is densely shielded with coarse, dark hairs which are movable; stalk very short; tubes shallow; the mouths hexagonal to sub-circular, usually 1 mm. The pores are wide, regular, usually greenish blue, covered with tiny trichomes (very fine sharp hairs) that are hardly visible to the naked eye. The spores are cylindric; hyaline. The cystidia are present. The distinguishing characteristic of this species is the leathery, kidney-shaped and smaller than the H. tenuis (6-10 cm. in diameter) but thicker (5- 10 mm.).

Derivation of name

The specific epithet *apiaria* came from a Latin word *apiarium*, means "apiary, bee-house, beehive".

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating. There is a report that the triterpenoid constituents may have potentials as anti-inflammatory agents.

Distribution

This species found in Australia and Southeast Asia including the Philippines.

Season

This species can be found all year round, but is more developed during the rainy season.

Habitat/ Substratum

This fungus usually found in forested mountainous areas particularly on rotten trunks of kakawate (*Gliricidia sepium* (Jacq.) Kunth. ex Walt.).

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

Hexagonia tenuis (Hook.) Fr.
Synonym: *Favolus tenuis* Hook.
Common Name: hexagon fungus

Hexagona tenuis (Hook.) Fr., Epicr. Syst. Myc. (1836-38) 498; Reinking; Philip. Journ. Sci. 16 (1920) 175, 19 (1921) 104.

Description

Hexagonia tenuis basidiocarp leathery to woody, sessile, semi-circular or fan-shaped, whitish to yellow, thin, 8 to 12 cm. in diameter, 2 to 5 mm. thick; the surface rough, having concentric zones; pores narrow, regular, usually greenish brown; hexagonal mouths not so distinct; hairs fine sharp; cystidia present; spores cylindric.

Derivation of name

The specific epithet *tenuis* is a Latin word means "thin, fine, slender", the characteristics of the basidiocarp of this fungus.

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating.

Distribution

This species has a widespread distribution, especially in tropical regions including the Philippines.

Season

This fungus grows throughout the year.

Habitat/ Substratum

Commonly grows in the mountainous areas particularly on rotten branches of mango tree (*Mangifera indica* Linn.). *H. tenuis*, aside from being fan-shaped, as indistinct hexagonal mouths which make it different from *H. apiaria*. It usually grows in groups and or clustered on the substratum.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Musuan (Bukidnon); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Microporus P. Beauv.

Description

The basidiocarp and or fruiting body is annual, semi-circular to kidney-shaped, light-darker brown in color, leathery to corky, with or without stalk. The surfaces are with or without concentric lines. The underside is smooth.

Genus derivation

The generic name *Microporus* has been derived from the Latin word *micro*, meaning "to small" and porus means "pores".

Number of species within the genus

This genus is previously known as Polystictus and contains 12 species. It has widespread distribution and these include *Microporus affinis*, *M. affinis-microloma*, *M. atroalbus*, *M. atrovillosus*, *M. concinnus*, *M. incomptus*, *M. internuntius*, *M. longisporus*, *M. luteoceraceus*, *M. nipponicus*, *M. subvernicipes*, and *M. xanthopus*.

Microporus affinis (Blume & T.Nees) Kuntze
Synonyms: *Polystictus affinis* (Nees.) Fr.; *Polyporus affinis* Nees.
Common Name: saucer-shaped polypore

Microporus affinis (Blume & T. Nees) Kuntze, Leafl. Philip. Bot. 6 (1940) 2244, Philip. Journ. Sci. 10 (1915) Bot. 90; Reinking, op. cit. 15 (1919) 484.

Description

Microporus affinis basidiocarp annual, papery to leathery, kidney-shaped, reddish brown, thin but hard; surface shiny, smooth, with lines coming from the base; underside smooth; pores very fine; with long stalk; spores globose, smooth, hyaline; cystidia present.

Derivation of name

The specific epithet *affinis*, meaning related (related to another species). This is a very common species that grows on rotten trunks and stumps o trees. It has long stalked.

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating. It is reported that this species has important source of physiologically active compounds.

Distribution

This species has widespread distribution. This found growing in Europe, North America, Central America, South America, Africa, Austrialia and Asia including the Philippines.

Season

This fungus covers the months of dry and wet seasons in tropical environment though most abundant during the month of July to October.

Habitat/Substratum

This fungus found in several habitats and that includes forested mountainous areas particularly on rotten branches and stumps of binunga (*Macaranga tanarius* (L.) Muell.-Arg.).

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental);

Mt. Kibanlaw (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Microporus xanthopus (Fr.) Kuntze
Synonym: *Polystictus xanthopus* Fr.; *Mycroporus xanthopus* Pat.; *Polycarpus xanthopus* Fr.
Common Name: yellow-footed polypore

Microporus xanthopus Pat., Leafl. Phil. Bot. 6 (1914) 2244, Philip. Journ. Sci. 10 (1915) Bot. 90; Reinking, op. cit. 15 (1919) 485, 16 (1920) 533.

Description

Microporus xanthopus basidiocarp is annual, funnel-shaped, papery, thin, shiny top, units concentric lines light to darker brown; pores very fine; with short stalk; cystidia present; spore typically 1-celled, hyaline.

Derivation of name

The specific epithet *xanthopus* is derived from two Greek words xantho, means "yellow" and pous means "foot", literally means "yellow foot". The morphological feature of the stalk of this fungus.

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating but very important for decorative use. It has featured on postage stamps from several tropical countries.

Distribution

This species is very common in Australia, Asian and African tropics, but is absent in the American tropics.

Season

This fungus covers the dry and wet seasons in a tropical environment.

Habitat/ Substratum

This fungus usually found in forested areas particularly on rotten branches of kupang (*Parkia roxburghii* G. Don).

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt.

Kambinliw (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Polyporus (Micheli) Fr.

Description

The basidiocarp and or fruiting body is annual and perennial, occasionally reviving for two or three years; stipitate, sessile, or effused-reflexed; fleshy to tough, leathery or woody in texture. The tubes are typically in a single distinct layer, usually sunken into context to equal depths so their bases form a straight line. The pores are circular to angular; rarely daedaloid; spores white to brown, smooth or rough, variable in shape. The cystidia are present or absent. The setae is present or absent.

Genus derivation

The generic name *Polyporus* was derived from the Greek word *polus* meaning "many" and *poros* meaning "pore". The species of this genus are characterized by the presence of many pores.

Number of species within the genus

This genus contains 40 species usually growing on wood, causing destruction of their hosts. Many of them are found in the Philippines.

Polyporus alveolaris (DC.) Bondartsev & Singer
Synonyms: *Favolus alveolaris* (DC.) Quel., *Favolus canadensis* Kl., *Cantharellus alveolaris* (DC.) Fr.; *Polyporus mori* Pollini; *Favolus alveolaris* Quel.; *Neofavolus alveolaris* (DC.) Sotome & T. Hatt.
Common Name: hexagonal-pored polypore

Polyporus alveolaris (DC.) Bondartsev & Singer, Annales Mycologici 39 (1): 58 (1941).

Description

basidiocarp are fleshy, tough, semi-circular to kidney shape, somewhat scaly, 5-10 cm wide. The flesh is white, 05-2 mm thick. The tubes are slightly descending stalk, 1-5mm long. The pores are white, yellowish when dry, 6-sided to diamond or honey-combed shape, 0.5-3 x 0.5-22mm. The stalk is lateral, 0.5-1 cm long, 1.5-5mm thick. The spores are smooth, cylindrical, colorless. The

spore print is white.

Derivation of name

The specific epithet *alveolaris* is a Latin word means "with small pits or hollows", the characteristics of this fungus particularly in the hymenial layer.

Edibility / Economic Importance/Uses

This species is edible but usually too tough to be palatable.

Distribution

This species is very common in Australia and some part of Southeast Asia including the Philippines.

Season

This fungus grows all year round though very conspicuous in May to November.

Habitat/ Substratum

It usually grows in the forested areas particularly on rotten stump of trees, solitary to group on fallen branches.

Mindanao forests this species occurs

Mt. Calayo (Bukidnon); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Polyporus grammocephalus Berk.
Synonym: *Polyporus platolis* Berk. & Broome; *Leucoporus grammocephalus* Pat.
Common Name: fan-shaped polypore

Polyporus grammocephalus Berk., Lond. Journ. Bot. 1 (1842) 148; Murr. Bull. Torr. Bot. Club 34 (1907) 472, 35 (1908) 403; Bres., Hedwegia 51 (1911) 309, 53 (1912-13) 52; Sydow, Leafl. Philip. Bot. 6 (1913-14) 1919; Ricker, Philip. Journ. Sci. 1 (1906) Suppl. 288; Bres. and Syd., op. cit. (1914) Bot. 346; Reinking, op. cit. 16 (1920) 172, 530, 17 (1920) 367, 19 (1921) 99; Sydow, Ann. Myc. 15 (1917) 166.

Description

Polyporus grammocephalus basidiocarp fleshy to fleshy leathery, corky, fan-

shaped, shelf occurring singly or in small groups; short stalk present; upper surface threads dark-brown, or the top may be blackish with pale coloured threads above; the radiating lines of threads fanning out on the upper surface; the underside yellowish-brown and in cross section; pores present across the lower surface; spores cylindric, smooth, hyaline; cystidia not present; clamp connection absent.

Derivation of name

The specific epithet *grammocephalus* derived from the Latin word grammo means "confounding of two things" and cephalus, means "head".

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating.

Distribution

This species is common in Australia, New Zealand, and Asia particularly in Siberia, India, Sri Lanka, and the Philippines

Season

This fungus grows throughout the year, but most often during rainy season.

Habitat/ Substratum

This fungus grows in tropical forests across different habitat. Normally found on rotten stump and trunks of ipil-ipil (*Leucaena leucocephala* (Lamk.) de Witt.). The diagnostic feature of this species is the yellowish-brown lower part of the basidiocarp and the pores found across the lower surface.

Mindanao forests this species occurs

Mt. Tendido (Surigao del Norte)

Polyporus squamosus (Huds.) Fr.
Synonym: *Boletus squamosus* Huds.
Common Name: pheasant's back mushroom; dyad's saddle

Polyporus squamosus (Huds.) Fr., Systema Mycologicum 1:343 (1821).

Description

The basidiocarp are large, tough, circular to kidney-shaped, single or in overlapping clusters, flat to sunken, The stalk is stublike, lateral, black at base, 2-5 cm long, 2-4 mm thick. The flesh is white, 0.5-3.5 thick. The tubes are large, 4-8mm long. The pore is white to yellowish, angular. The spores are smooth, colorless, elliptical to cylindrical, 12-16 x 4-6µ. The spore print is white.

Derivation of name

The specific epithet *squamosus* derived from a Latin word squamose, meaning "covered with appressed scales".

Edibility/Economic Importance/Uses

Edible. The tender edges of the caps can be pickled, sautéed, or fried. There was a report, that this species can be a source of natural insecticides. More recently, it has been used in craft paper-making. Its metabolites have been shown to absorb iron from solution, making it of potential use in heavy metal bioremediation.

Distribution

This species found in Africa, Europe, North America, Canada, and Asia including the Philippines.

Season

This species grows on the month of May to November but most common in May.

Habitat/ Substratum

Common in forested areas particularly on rotten wood and fallen branches.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province)

***Pycnoporus* P.** Karst.

Description

The basidiocarp or fruiting bodies are typically sessile, corky, slightly tomentose to glaborose. On fallen hardwood logs, but can be on coniferous trees as well. These fungi live in diverse habitats, but are typically located near a source of water. Pileus length x width x height (thickness) can range from 1-9 cm (l) x 1-7 cm (w) x 0.2-2 cm (h). Colors range on the scale of paprika red to flame orange but almost always are vibrant. Spores are white, oblong, somewhat pointed, 2-3 x 4-6 um. KOH reactions yield a dark brown to black color for most specimens but can bleach out (turn white) the pileus of a few specimens over longer time periods. Specimens typically retain their strong red-orange color for long periods of time, especially when dried and stored properly. Yet some turn dingy brown or gray and fade in color over time. The red colour of *Pycnoporus* species comes from pigments that are chemically related to phenoxazinone, including cinnabarin, tramesanguin and cinnabarinic acid.

Genus derivation

The generic name *Pycnoporus* is derived from the Latin word *pycno*, meaning "dense or close" and *porus*, means "pore".

Number of species within the genus

This genus contains five distinct species and these include *Pycnoporus cinnabarinus*, *P. coccineus, P. palibini, P. puniceus,* and *P. sanguineus*. This genus is well-known from most other polypores because of its brilliant red-orange color. *Pycnoporus sanguineus* is the most common in the Philippines.

Pycnoporus sanguineus (Fr.) Murr.
Synonym: *Pycnoporus coccineus* (Fr.) Bondartsev & Singer
Common Name: cinnabar bracket fungus

Pycnoporus sanguineus Fr., Syst. Myc. 1 (1821) 371; Nees von Esenbeck, in Presl's Retiquiae Haenkeanae (1825) 1; Reinking, Philip. Journ. Sci. 16 (1920) 531; Humphrey, op. cit. 46 (1931) 193.

Description

Basidiocarp somewhat kidney-shaped to shell-shaped, shiny, with furrows that have a common center. It is 3 to 12 centimeters in diameter, porous, and the pores are barely visible to the naked eye. Sometimes they are very conspicuous near the center, disappearing toward the margin. The stem is only 4 to 6 millimeters long, sometimes it is absent. Sessile or alternate at the base and appearing substipate, coriaceous when fresh and usually somewhat flexible when dry; pileus bright red to reddish orange, rarely fading, finely tomentose to glabrous, rough and even; the margin very thin; context red; the tubes 0.5-1.5 mm. long; mouths angular, rather thin-walled, entire averaging 2-4 per mm.; spores oblong or short cylindric, hyaline; cystidia none; hyphal pegs rather abundant; hyphae flexuous, the cross walls and clamps. This species is a beautiful blood-red mushroom. It is commonly called "oong nalabasit" in Ilocano; "kabuteng mapula" in Tagalog and "red mushroom" in English because of the observable color and appearance of this species.

Derivation of name

The specific epithet derived from a Latin word *sanguineus*, meaning blood red.

Edibility/Economic Importance/Uses

Inedible, not fit or suitable for eating. It is tough but not poisonous. In West Africa, the species was traditionally used to create orange and brown dyes, but nowadays has been widely tested as a source of metabolites to do just the opposite - break down and remove dyes. The fungus has also been used in traditional medicine, a modern research has confirmed that cinnabarin, a compound produced by the fungus, has some potentially useful antibacterial and antiviral properties.

Distribution

Southern North America, Africa, Central and South America, Australia, New Zealand, and Asia including the Philippines

Season

It is usually found all year round on rotten wood, causing destruction of the hosts.

Habitat/Substratum

Grows generally in the forest. It is found in groups of many.On rotten branches of lanutan puti (*Polyalthia suberosa* (Rox.) Thw.)

Mindanao forests this species occurs

Agusan Marsh and Wildlife Sanctuary Peatland Forest (Agusan del Sur); Mt. Kambinliw (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Trametes Fries

Description

The basidiocarp and or fruiting body is annual or perennial. The cap is woody, leathery to corky; sessile or in some species almost resupinate; context punky extending unchanged into the wall of the tubes, hence the tubes typically extend to uneven depths into the context. The tubes do not form a distinct layer, somewhat spherical, more or less elongated radially. The pore mouths are circular to angular, usually quite regular and entire, never daedaloid or lamellae. The spores are cylindric, hyaline. The cystidia is not present. The setae is rarely present.

Genus derivation

The generic name Trametes comes from the prefix tram, meaning "thin", hence the fruitbodies of this fungus genus are thin in section. This genus was first described by Elias Magnus Fries in 1835.

Number of species within the genus

This genus has a widespread distribution and contains about 50 species. Several species of this genus are found in the Philippines. They grow on wood in a more or less overlapping formation, resembling that of tiled roof. Trametes hirsuta is one of the common species in the Philippines.

Trametes hirsuta (Wulf.) Lloyd
Synonym: *Polyporus hirsutus* (Wulf.) Fr.; *Daedalea polyzona*, *Boletus hirsutus* Wulfen; *Coriolus hirsutus* (Wulfen) Quel, and *Polystictus hirsutus* (Wulfen) Cooke.
Common Name: hairy bracket fungus

Trametes hirsuta (Wulf.) Lloyd, Atlas Champ. Eur., Polypor., B: 265 (1939)

Description

Trametes hirsuta's basidiocarp is leathery, kidney-shaped, 2-10 cm wide, 2-6 cm long, and up to 2.5 cm thick. The upper surface is densely hairy, grayish to brownish, often with light brown margin, zonate and usually with concentrically grooved. The pore surface is grayish, 3-4 per mm.

Derivation of name

The specific epithet *hirsuta*, is a Latin word means, "hairy", with rather coarse, erect or ascending hairs. This hairy bracket fungus was described scientifically by Franz Xavier von Wulfen, an Austrian mycologist on 1789, who also gave it the binomial name, *Polyporus hirsutus*. In 1924, Curtis Gates Lloyd, an American mycologist transferred this species to the genus *Trametes*, establishing its currently-accepted scientific name *Trametes hirsuta*.

Edibility/Economic Importance/Uses

Inedible, not fit or not suitable for eating.

Distribution

This species is widely distributed in North America. Fairly common and widespread in Britain and Ireland, this hairy bracket fungus is also plentiful in Asia including the Philippines.

Season

It is found all year round and persists due to its leathery nature.

Habitat/Substratum

It is found in the forested habitat where dead and rotten wood of hardwood and softwood trees are abundant.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental);

Mt. Calayo (Bukidnon); Mt. Tendido (Surigao del Norte); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

PSATHYRELLACEAE Vilgalys, Moncalvo & Redhead

Description

The basidiocarp and or fruiting body of this family generally soft and fragile and characterized by having black, dark brown spore prints, so the named family of dark-spored agarics. About 45-50% species of this family yielded fruiting bodies that can soften into ink-like ooze when the spores are mature via autodigestion. Aforementioned to phylogenetic study and based upon DNA evaluations, most of the species that autodigested were categorized as family Coprinaceae, which contained all of the inky-cap mushrooms.

Family Recognition

Family Psathyrellaceae was described by Rytas J. Vilgalys, mycologist and a professor at Duke University in North Carolina; Jean-Marc Moncalvo, the Senior Curator of Mycology in the Department of Natural History at the Royal Ontario Museum, and Scott Alan Redhead, mycologist and Curator of the Canadian National Mycological Herbarium.

Etymology

The Family Psathyrellaceae derived from the genus *Psathyrella,* the diminutive form of Psathyra, which comes from the Greek word psathuros, meaning "straw-like, fragile or friable". It is a reference to the crumbly nature of the caps, gills and stems of mushrooms in this family.

Number of genus/genera within the family

This family contains 14 genera. *Coprinellus, Coprinopsis,* and *Parasola* are the common genera in the Philippines.

Coprinellus P. Karst.

Description

The basidiocarp and or fruitbody's cap is initially 1–2.5 cm in diameter, oval to cylindrical, but expands to become bell-shaped, sometimes with an umbo (a central nipple-like protrusion); finally it flattens somewhat, becoming convex. When expanded, the cap diameter reaches 0.8–3.0 cm with the margin torn

into rays and turned upwards slightly. The color is yellow-brown or tan often with a darker center, then pale yellow or buff from the margin inwards. The cap margin is prominently grooved almost all the way to the center; the grooves mark the positions of the longer gills on the underside of the cap. When young, the cap surface is covered with white or whitish shiny particles, remnants of the universal veil that covers immature specimens. The particles are loosely attached and easily washed away, so that older specimens are often smooth. The gills are crowded together closely, and have an adnexed (narrow) attachment to the stem. Initially white, they change color to dark brown then eventually black as the spores mature. Expansion of the cap causes the gills to split open down their median planes, tearing the cap margin into rays.

Genus derivation

The generic *Coprinellus* comes from the word *Coprinus*, means "living on dung" and *ellus,* means "little". This refers to this organism living and grows on cow and carabao dung. This genus was circumscribed in 1879 by Peter Karsten.

Number of species within the genus

This genus contains 62 species as of January 2016 according to Index Fungorum. Majority of the species belongs to *Coprinellus* were transferred from large genus Coprinus. Coprinellus disseminatus is one of the most common in the Philippines.

Coprinellus disseminatus (Pers.) J.E Lange
Synonym: *Coprinus disseminatus* (Pers.) Gray
Common Name: fairy ink cap; non-inky cap

Coprinellus disseminatus (Pers.) J.E. Lange, Dansk botanisk Arkiv 9 (6): 93 (1938)

Description

Coprinellus disseminatus fruit body is small, bell-shaped, deeply pleated, white to grayish, 0.5 – 1.5 cm wide. The gills are attached, nearly distant, white and becoming black upon maturity. The stalk is fragile, white to grayish, hollow, smooth having minutely hair, 2-3 cm long, 0.5 – mm thick.

Derivation of name

The specific epithet *disseminatus* came from the word *dissemino*, meaning "to scatter". This species seems found everywhere.

Edibility / Economic Importance/Uses

Inedible, not fit nor suitable to eat.

Distribution

This species found growing in North America, South America, Africa, Australia, and Asia including the Philippines

Season

This mushroom is found all year round but most abundant on May to October.

Habitat/Substratum

Often found in lawns and grassy areas. In great numbers, on soil and in wood debris.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

Coprinopsis P. Karst.

Description

The basidiocarp and or fruiting body measures 3–7 cm (1.2–2.8 in) in diameter, the greyish or brownish-grey cap is initially bell-shaped, is furrowed, and later splits. The colour is more brownish in the centre of the cap, which later flattens before melting. The very crowded gills are free; they are whitish at first but rapidly turn black and easily deliquesce. The short stipe measures 7–17 cm (2.8–6.8 in) high by 1.5 cm in diameter, is grey in colour, and lacks a ring. The spore print is dark brown, and the almond-shaped spores measure 8–11 by 5–6 µm. The flesh is thin and pale grey in color.

Genus derivation

The generic name *Coprinopsis* derived from the Latin word *Coprinus,* meaning "living on dung" and *opsis*, means "appearance, sight".

Number of species within the genus

This genus contains 123 species. The genus *Coprinopsis* was split out of the genus *Coprinus* based on molecular data. *Coprinopsis atramentaria* is one of the common species in the Philippines.

Coprinopsis atramentaria (Bull.) Redhead, Vilgalys & Moncalvo
Synonym: *Coprinus atramentarius* (Bull. ex Fr.) Fr.
Common Name: common ink cap mushroom; alcohol inky

Coprinopsis atramentaria (Bull.) Redhead, Vilgalys & Moncalvo, Taxon 50 (1): 226 (2001)

Description

Coprinopsis atramentaria's fruit body is fleshy, egg-shaped, smooth, whitish to grayish, radially lined cap with inky gills,5-7.5 cm wide. The gills are free, broad, white at first, then become grayish and blackish upon maturity, inky, darkening from margin to stalk. The stalk is white to grayish, hollow, silky-fibrous, 8-15 cm long, 0.5 -2 cm thick. The veil is fibrous, white, leaving evanescent ring near the stalk base. The spores are smooth, elliptic, with pore at tip, 8-11 x 4-6µ. The spore print is black.

Derivation of name

The specific epithet *atramentaria* is derived from Latin word *atramentum*, means "inky". Jean Baptiste Bulliard, when first describing the species in the eighteenth century, noted that ink could be made from its liquefying gills.

Edibility / Economic Importance/Uses

This is a good, meaty edible species, but one should take no alcoholic beverages or 1-2 days after eating it. About 30 minutes after drinking alcohol, one may experience flushing on the face and neck, tingling of fingers and toes, headache, and sometimes nausea. The alcohol causes this transient illness, because the mushroom inactivates an enzyme that detoxifies alcohol in the system. Recovery is spontaneous within a couple of hours.

Distribution

This species found in North America, Central and South America, Europe, South Africa, Australia, New Zealand and Asia including the Philippines.

Season

This mushroom grows all year round but most abundance on May to September.

Habitat/Substratum

Common in grassland, pasture, meadows, disturbed ground, and open terrain areas. Usually found in clusters in soil and in wood debris and near buried wood.

Mindanao forests this species occurs

Initao - Libertad Protected Landscape and Seascape (Misamis Oriental) and Mt. Timpoong-Hibokhibok Natural Monument (Camiguin)

Parasola Redhead, Vilgalys & Hopple

Description

The basidiocarp and or fruitbody cap is 1.5-3.5 cm broad at maturity, at first narrowly ovoid to ellipsoid, margin incurved, then decurved, eventually level; the gills are free, close to subdistant in age, narrow, pallid, eventually grey to blackish, not deliquescing. The stalk and or stipe is 2.5 – 6.5 cm long, 1-2 mm thick, round, fragile, more or less equal except for a sub-bulbous base; partial veil absent. The spores are 8.0 -11.0 x 7.0 – 9.5 x 5.0 – 7.5 µm, heart to apple-shaped to weakly angular in face view, smooth, thin-walled, blackish in deposit.

Genus derivation

The generic name *Parasola* derived from Italian *parasole,* from para meaning "protecting against" and *sole* means "sun". This species is like small light umbrella used as protection from the sun.

Number of species within the genus

This genus contains six species. These include *Parasola auricoma*, *P. kuehneri*, *P. leiocephala*, *P. lilatincta*, *P. miser*, and *P. plicatilis*.

Parasola plicatilis (Curtis) Redhead, Vilgalys & Hopple
Synonym: *Coprinus plicatilis* (Curt.) Fr.
Common Name: pleated ink cap mushroom; kabuteng may pliegues

Parasola plicatilis (Curtis) Redhead, Vilgalys & Hopple, Taxon 50 (1): 235 (2001)

Description

Parasola plicatilis cap is conical, membranous, fragile, plicate, brown to bluish gray, 2.5 - 5 cm in diameter, at first egg-shaped to bell-shaped, then expanded, at length depressed at the center, 2.5 – 5 cm in diameter. The stalk is white,

hollow, slender, cylindrical, rarely crooked, at the base somewhat swollen, white somewhat silky, shiny, 6 - 9 cm long, 2 - 4 mm thick. The gills are free, somewhat distant, linear, free, and white to grayish, becoming black but not inky. The flesh is very thin, white, odorless. The spores are smooth, broadly oval, 10-13 x 6.5-10µ. The spore print is black.

Derivation of name

The specific epithet *plicatilis* is a Latin name means "folded, pleated, and or foldable". This is observable characteristics in this species which is like fan or umbrella that is easy to fold.

Edibility / Economic Importance/Uses

Inedible, not fit nor suitable to eat.

Distribution

This species is widely distributed in North America, Central and South America, Europe, North Africa, Australia, New Zealand, and Asia including the Philippines.

Season

It is found from May to November though prevalent during the month of May to September.

Habitat/Substratum

Commonly found in grassland and lawns. This mushroom grows single to numerous, on horse dung and heavily manures ground in pastures. This is one of the more common species in urban and suburban areas.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental)

RUSSULACEAE Lotsy

Description

The basidiocarp and or fruiting body has granular flesh, thick gills, spiny spores, and milky hyphae. The genera *Lactarius*, *Lactifluus, Multifurca*, and *Russula* are the important group in this family that are root-symbiotic ectomycorrhizal fungi in the forest around the world. The fruiting body has three major types and

these are laterally stiped (agaricoid and pleurotoid) that forms cap, gills and stipe; closed (gasteroid), or crust-like forms (corticioid).

Family Recognition

Family Russulaceae was validly named by Johannes Paulus Lotsy, Dutch mycologist in 1907. He included three genera, the *Lactarius, Russula,* and *Russulina* (now considered as synonym of *Russula*).

Etymology

The Family Russulaceae derived from a Latin word *russus,* means "red". This refers to the color of the cap or pileus of this species.

Number of genus/genera within the family

Russulaceae contains a diverse family with roughly 1,900 known species with worldwide distribution.They comprise mushroom-forming fungi that includes brittle gills and the milk-caps including some edible species.

Russula Fries

Description

The basidiocarp and or fruiting body's cap is fleshy and regular, then depressed. The gills are fragile, rigid, attached more or less squarely to the stem; the edge of the gills are acute, the trama composed of cells shaped like gall bladders. The stem is fleshy, central. The spores in mass are white or yellow, rarely greenish.

Genus derivation

The generic name *Russula* is derived from the Latin word *russulus*, which means "reddish." The caps of many of the species are reddish brown to bright red.

Number of species within the genus

This genus contains around 750 worldwide species. They are typically common, fairly large, and brightly colored – making them one of the most recognizable genera among mycologists and mushroom collectors.This genus is closely allied to *Lactarius*, except that *Russula* does not exude milk. The species of this genus in the Philippines are found in the forests, where the temperature is cool and the air is humid.

Russula rosea Pers.
Synonym: *Russula lepida* Fr.
Common Name: brittle gill mushroom; rosy russula

Russula rosea Pers., Observationes mycologicae 1: 100 (1796)

Description

Russula rosea's fruiting body is fleshy, fragile. The cap is rounded when young then becomes flat upon maturity, mostly bright cinnabar to light red; often with yellowish spots and up to 12 cm in diameter. The gills is usually rosy carmine, but can be pure white. The flesh is hard and bitter tasting. The gills are brittle, and occasionally with a red edge at the edge of the cap, pale straw-yellow. The spores are pale-cream.

Derivation of name

The specific epithet *rosea* derived from Latin adjective meaning "rose, rosy or pink".

Edibility / Economic Importance/Uses

Inedible, not fit nor suitable to eat

Distribution

This species found in Europe, North America and Asia including the Philippines.

Season

This species found all year round.

Habitat/Substratum

This mushroom is commonly found in mountainous forest where forest litter is very thick and with abundant substrate.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province)

SARCOSCYPHACEAE Le Gal ex Eckblad

Description

The basidiocarp and or fruiting body form generally large stipitate, often brilliantly colored apothecia. The ascus possesses a thickened apical ring capped by a plug or hinged operculum, its opening often oriented obliquely. The asci are long and slender, with a flexible base. The ascospores are colorless, variously ornamented, but never septate.

Family Recognition

Family Sarcoscyphaceae was erected and validly published by Finn-Egil Eckblad but his description was based on an earlier description by Marcelle Louise Fernande Le Gal in 1947.

Etymology

The Family Sarcoscyphaceae comes from the Greek word *sarco*, meaning "flesh" and *skyphos*, meaning "drinking bowl".

Number of genus/genera within the family

This family contains 13 genera and 102 species that has cosmopolitan in distribution. Some of the species found in both tropical and temperate regions.

Cookeina Kuntze

Description

The basidiocarp and or fruiting body of *Cookeina* have a deep, cup-shaped to funnel-shaped fruiting bodies. The hymenial layer is brightly colored, yellow to red, though upon drying, the color will be faded upon drying. The outer surface is less is not brightly as compared to outer one.

Genus derivation

The generic name *Cookeina* derived in honor for Mordecai Cubitt Cooke, an English mycologist who worked as a curator at the India Museum. Cooke received the Victoria Medal of Honour from the Royal Horticultural Society in 1902 and the Linnaean Medal from the Linnaean Society of London in 1903.

Number of species within the genus

This genus contains eight species. This species can be found in tropical and

subtropical regions of the world. The species may be found and collected on rotten branches, trunk, and stump of the trees. The two most common species in the Philippines are, *Cookeina sulcipes* and *C. tricholoma*.

Cookeina sulcipes (Berk.) Kuntze
Synonym: *Trichoscypha sulcipes* (Berk.) Cooke; *Peziza sulcipes* Berk.; *Cookeina* **notarisiana (Bagnis) Kuntze; Pilocratera sulcipes (Berk.) Sacc. & Traverso**
Common Name: scarlet cup fungus; smooth tropical goblet

Cookeina sulcipes (Berk.) Kuntze, Revisio generum plantarum 2:849 (1891)

Description

Cookeina sulcipes fruitbody is fleshy, goblet to funnel-shaped, grow solitary on wood, 3-5 cm in diameter and 1.5 – 3 tall. The outer surface is smooth with only an outlying of small white hairs around the margin cup, pink to reddish in color, the hymenial surface is less brightly colored. The stalk is slender, 2-4 cm long and 3-4 mm thick. The ascospores are ellipsoid in shape, shielded with minute longitudinal lines, 26-32 x 16-18µm.

Derivation of name

The specific epithet *sulcipes* derived from the Latin word *sulcus*, pl. sulci, meaning "linear groove, furrow, or slight depression" and pes, means foot.

Edibility / Economic Importance/Uses

It was reported that this species used as food and also as a bait for fishing, where it is rubbed against the hook by the Temuans of Peninsular Malaysia.

Distribution

This species is distributed through the lowlands of Central America, Mexico, the Caribbean, South America, Africa, and Asia including the Philippines.

Season

This fungus is found throughout the year depending on the rainfall pattern.

Habitat/Substratum

This fungus usually grows in the forested area's forest floor where twigs and rotten tree limbs are present.

Mindanao forests this species occurs
Mt. Kambinliw (Dinagat Island Province)

Cookeina tricholoma (Mont.) Kuntze
Synonyms: *Pilocratera tricholoma* (Mont.) Henn.; *Peziza tricholoma* Mont.; *Lachnea tricholoma* (Montagne) Pat.; *Trichoscypha tricholoma* (Mont.) Cooke
Common Name: hairy tropical goblet

Cookeina tricholoma (Mont.) Kuntze, Revisio generum plantarum 2: 849 (1891)

Description
Cookeina tricholoma's fruit body cup is supported on a stem. Cup is deep goblet-shaped, 50mm in height, 20 mm diameter. The inner surface is smooth, pink-orange to orange. The outer surface is pale pink-orange in color, with conspicuous pale bristly hairs, base obliquely seated on stalk. The stalk is bright pink, the central part measuring 40-45 mm long, 2-3mm in diameter, tapering downwards, with bristly hairs towards upper half.

Derivation of name
The specific epithet tricholoma derived from the Greek word trichos, meaning "hair" and loma, means "fringe or border". This is observable characteristics in this species having 'with hairs on the edge'.

Edibility / Economic Importance/Uses
Hairy tropical goblet is said to be eaten by some indigenous peoples in Malaysia and Mexico.

Distribution
This species found in Southern North America, Central and South America, Africa, Australia, and Asia including the Philippines.

Season
This species grows throughout the year but most abundant during the rainy and wettest months.

Habitat/Substratum
This fungus usually grows in wet tropical forests, scattered or in clusters. Normally grows on soil with thick forest litter and on dead and rotten wood.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province)

SARCOSOMATACEAE Kobayasi

Description

The basidiocarp and or fruiting bodies of the members of the traditional family Sarcosomataceae are characterized by dark colored (brown to black), tough-textured, shallow to deep cup-shaped apothecia, with or without stipes (stalks), growing in the early summer on rotting wood, humus or soil. The sterile tissue of the exterior underside is typically dark colored.

Family Recognition

Family Sarcosomataceae was recognized by George S. Kobayashi in 1937. Kobayashi served in various official capacities in the American Society for Microbiology and the Medical Mycological Society of America.

Etymology

The Family Sarcosomataceae comes from the Greek word *sarco*, meaning "flesh" and *skyphos*, meaning "drinking bowl".

Number of genus/genera within the family

This family contains 10 genera and 57 species. Most of the species can be found in temperate areas, and are naturally grows on rotten wood. Genus *Galiella* is most common in the tropical areas.

Galiella Nannf. & Korf

Description

The basidiocarp and or fruit body is a gelatinous flesh that gives fungus a rubbery peel, cuplike fungus, the cup is closed at early stage, opening to form narrow cup with incurved edges, 2-4 cm wide. The outer surface is hairy, brownish to dark brown. Sometimes stalk is present, when present it is 0.5 – 1 cm long, 3-5mm thick, and attached by dense mass of black hairs. The spores is elliptic, with tremendously narrow ends and fine warts, 12 x 20µ.

Genus derivation

The generic name *Galiella* was described by Richard Korf and John Axel

Nannfeldton on 1957. The generic name honors Marcelle Louise Fernande Le Gal, a French mycologist.

Number of species within the genus

This genus contains eight species and this is widely distributed in northern temperate regions.

Galiella rufa (Schwein.) Nannf. & Korf.
Synonym: *Bulgaria rufa* Schwein.
Common Name: hairy rubber cup

Galiella rufa (Schwein.) Nannf. & Korf., Mycologia 49 (1): 108 (1957)

Description

Galiella rufa has small to medium, thick, brown, more or less top-shaped to shallowly cup-shaped. Cup margin incurved, thin, irregularly toothed; teeth lighter than exterior. Upper surface smooth, pale reddish to reddish brown or fading to yellowish brown. Outer surface blackish brown; velvety below to sparsely scaly toward margin. Interior gray; firm and gelatinous but not fluid, giving flesh a rubbery feel. Stalk is short and thick when present; occasionally lacking. Technical notes: cup up to 3 cm across. Stalk 0.5-1.5 cm (up to 2.5 cm) long, when present. Spores warty, elliptic; 20 x 10 µm. Flesh stains (turns blue) in cotton blue dye.

Derivation of name

The specific epithet ***rufa*** is a Latin word means "rusty" or reddish-brown", and refers to the color of the hymenium of this pecies.

Edibility / Economic Importance/Uses

There was a study that a compound called galiellalactone has been isolated from fruitbodies and it may have some potential in treating prostate cancer.

Distribution

This species found in North America and Asia including the Philippines.

Season

This fungus is found throughout the year but most abundant during July to September.

Habitat/ Substratum

This fungus found in forested areas and in grassland ecosystem, wherein grows in cluster on dead and rotten roots and branches of trees.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Dinagat Forest (Dinagat Island Province)

SCHIZOPHYLLACEAE Quel.

Description

The basidiocarp and or fruiting body is fan-shaped, gray, leathery, usually small, ranging less than 1 cm. to about 4 cm. in diameter. It is laterally attached to decaying logs, branches or sticks. No stalk is present. The hymenial layer consists of thick lamellae that are split longitudinally with both edges folded back. In some instances the split may be shallow and resemble only a groove.

Family Recognition

Family Schizophyllaceae was recognized on 1888 by Lucien Quélet, a French mycologist, who discovered several species and was founder of the Société mycologique de France, a society devoted to mycological studies.

Etymology

The family Schizophyllaceae has been derived from the Greek word *schizo*, meaning "to split," and phylo, means "leaf." The unique physical feature of the species belonged in this family.

Number of genus/genera within the family

This family contains two genera and seven species. These species cause white rot in hardwoods. The most common genus is *Schizophyllum* and species, *Schizophyllum commune*, a species found in all continents.

Schizophyllum Fries

Description

The basidiocarp and or fruiting body is thin, leathery, tough when dry, reviving in wet weather, sessile by a narrow base, fan-shaped, very hairy, brownish-gray when wet, almost white when dry. The gills are radiating from the point of attachment, edge of gills split longitudinally, margins revolute. The spores are

white in mass. The genus is distinguished by its white spores and gills that are divided along the edge into halves which curl up in dry weather. When a dry fruit body is moistened, the gill halves unroll slowly and soon begin to produce spores again. The basidiocarp remains viable for at least several months. The members of this genus are flexible and fresh, but tough when dry. The spore are white. The gills are split along the edge and generally strongly rolled back. The cap is thin and leathery. The stem is lateral or absent.

Genus derivation

The generic name *Schizophyllum* has been derived from the Greek word *schizo,* meaning "to split," and *phylo* or *philo*, means "leaf." The name is appropriately given because of the shape of the fungus, which is that of a leaf, and the gills are split.

Number of species within the genus

This is a very interesting genus, consisting of only a few species, of which is only one is known in the Philippines, *Schizophyllum commune*.

Schizophyllum commune Fr.
Synonym: *Schizophyllum alneum* L.
Common Names: common split gill fungus; sigdot; cudet

Schizophyllum commune Fr., Syst. Myc. 1 (1821) 233; Bres., Hedwegia 5, (1911) 307; 53 (1912-13) 51; Sydow, Leafl. Philip. Bot. 6 (1913-14) 1919; Reinking, Philip. Journ. Sci. 15 (1919) 485, 16 (1920) 176, 533, 17 (1920) 370, 19 (1921) 105; Graff, Bull. Torr. Bot. Club 49 (1922) 231.

Description

Schizophyllum commune's fruit body is small, white to grayish in color, 2-4 cm in diameter, fan –shaped, hairy or with coarse, white hair, often much lobed at the margin, toward the minute stalk commonly forming a stemlike base.The gills are white to grayish, woolly, branching out toward the margin of the cap like the radiation of a fan, deeply split along the edge and strongly rolled backward. The flesh is gray, hairy. The spore is cylindrical, smooth, whitish to pinkish white,in mass, 2-4 x 1-1.5µ. The spore print is white.

Derivation of name

The specific epithet *commune* derived from a Latin adjective communis,

meaning "very common". This refers to the presence throughout the world of this species and can usually be collected every month of the year.

Edibility / Economic Importance/Uses

Edible. This species is prepared like the species of Auricularia, it is soaked in water before cooking. It is rather tough but makes excellent soup. During the dry weather this mushroom is much shrunken and curled up, but in rainy weather it expands quickly and looks very beautiful. Moreover, it's fruiting body readily in the laboratory and used for experimental genetics research.

Distribution

This species is widely distributed in all continents. It survives loss of moisture by curling back the outer sides of its folds and rolling the cap margin inward. It revives in wet weather.

Season

It is found all year round, although mostly abundant during rainy season. A very common mushroom in the Philippines, growing on wood and bamboos.

Habitat/Substratum

This species is commonly found in the grassland and forested areas. It normally occurs on rotten trunks and branches of molave (*Vitex parviflora* Juss.)

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province); Agusan Marsh and Wildlife Sanctuary Peatland Forest (Agusan del Sur); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

SCLERODERMATACEAE Corda

Description

The basidiocarp and or fruitbodies are mostly above ground, very rare found underground, more or less are spherical in shape, with or without irregular root-like stem. The outerwall is mostly simple, firm, membranous, breaking open irregularly or in lobes or decaying, skimpy gleba. This brown gleba, turns purple to brownish purple in age, crumbles to a powder of spores and crumbling tissues at maturity. This gleba has sharply defined basidia which are roughly clavate and club-like in shape. The color of spores are brown, shape is roughly spherical,

thick-walled, with spines or warts, or with a network-like appearance. These spores are spread by wind, by predators, and or washed into the soil by rainwater.

Family Recognition

Family Sclerodermataceae was described by August Carl Joseph Corda, a Czech mycologist in 1842.

Etymology

The Family Sclerodermataceae is derived from the Greek words *scleros,* meaning "hard", and *derma* meaning "skin. The observable characteristics of this family.

Number of genus/genera within the family

This family contains several genera of unusual fungi that somewhat resemble to boletes. The species also includes commonly known 'hard-skinned earthballs that is widespread in both tropical and temperate regions. The best known genera are *Scleroderma*, *Pisolithus* and *Calostoma*.

Scleroderma Persoon

Description

The basidiocarp and or fruit body is sessile, or prolonged with a short stemlike base. The wall is firm, leathery or corky, smooth, warted, scaly or granular, breaking irregularly, and in more or less stellate manner. The gleba is tranversed by sterile veins and finally becomes powdery. All the species of this genus are terrestrial.

Genus derivation

The generic name *Scleroderma* comes from the Greek words *scler* – meaning hard, and derma meaning skin. Earthballs certainly do have hard and thick skins.

Number of species within genus

This genus contains 57 species. The best known species are *Scleroderma citrinum* and *S. verrucosum*

Scleroderma verrucosum (Bull.) Pers.
Synonyms: *Lycoperdon verrucosum* Bull.; *Scleroderma maculatum* (Peck.) Lloyd.
Common Name: scaly earth balls

Scleroderma verrucosum (Bull.) Pers., Synopsis methodica fungorum 1:154 (1801)

Description

Scleroderma verrucosum's basidiocarp is rounded, attains 5-7cm across and 4-6cm tall, color is dirty brown, and the surface is covered with scaly warts that eventually marsh off to leave a relatively smooth surface. It is attached to a longitudinally grooved stem-like structure of infertile material. The outer skin (peridium) is reddish brown, 0.5-1mm thick, covered by small isolated angular scales. These outer skin tends to shed its scales as the fruitbody matures. At maturity the top of peridium ruptures leaving an irregulalr opening via which the rain disperse the spores. The spores are spherical, and covered with minute warts and measure about 10-12µm in diameter when fully mature. The spore mass which is inside the earthball is cream at first but soon turns purplish brown.

Derivation of name

The specific epithet *verrucosum* comes from Latin word *verrucosus*, covered with warts (verrucae) and refers to the scaly-warty patches on the outer skin of this earthball. Hence, the specific epithet *verrucosum* means "warted". This species was first described scientifically in 1791 by Pierre Bulliard as Lycoperdon verrucosum. In 1801, it was Christian Hendrik Persoon in his Synopsis Methodica Fungorum publication transferred this species to the genus *Scleroderma*.

Edibility / Economic Importance/Uses

Inedible, not fit or suitable for eating. This species appears to cause poisoning to some people, so it cannot be recommended for consumption.

Distribution

This species has a cosmopolitan in distribution. This has been found in North America, South America, Europe, Australia, Africa and Asia including the Philippines.

Season

This species is found all year round though most abundant from July to December.

Habitat/ Substratum

This species openly grown in forested and grassland habitats particulalrly develops in the ground in nutrient-rich, well drained, sandy soils.

Mindanao forests this species occurs:

Initao- Libertad Protected Landscape and Seascape (Misamis Oriental)

STEREACEAE Pilat

Description

The basidiocarp and or fruiting body is stipitate, coriaceous, semi-upright or resupinate, sessile, effused-reflexed, tough to coriaceous, rarely somewhat waxy, corky or hard. The hymenium is smooth to slightly roughened or radially ribbed. The basidiospores are globose, hyaline, and smooth. The basidia are 1-celled. The cystidia are present and the setae is absent.

Family Recognition

Family Stereaceae was described by Albert Pilat, Czech mycologist on 1930. He joined the National Museum, and eventually becoming head of the Mycological Department, and in 1960 a corresponding member of the Academy. He was the author of many popular and scholarly publications in the field of mycology and mountain flora. He also served as the main editor of the scientific journal Czech Mycology, and described several species of fungi.

Etymology

The Family Stereaceae derived from Greek word *stereòs,* where it meant "solid", used with reference to hardness, solidity of this species.

Number of genus/genera within the family

This family contains 22 genera and has 125 species according to the Dictionary of the Fungi (10th edition, 2008).

Stereum Persoon

Description

The basidiocarp is occurring on the ground or on bark or decorticated wood; stipitate, sessile, effused-reflexed, but not normally resupinate; tough to coriaceous, rarely somewhat waxy, occasionally corky or hard. The hymenium on the lower surface is smooth to slightly roughened or radially ribbed. The basidia are 1-celled, 4-spored. The basidiospores are globose to cylindric, hyaline and smooth. The cystidia, gloeo- cystidia, or vesicular bodies are present. The setae is absent.

Derivation of genus

The generic name Stereum derived from Greek word stereòs means "solid". This has reference to the hardness and solidity of the species in this genus.

Number of species within the genus

This family contains 27 species that widespread distribution. *Stereum hirsutum* is the commonest species in the Philippines.

Stereum hirsutum (Willd.) Pers.
Synonyms: *Thelephora hirsuta* Willd., *Thelephora papyracea* Vahl, and *Thelephora ramealis* Schwein.
Common Name: hairy parchment fungus

Stereum hirsutum (Willd.) Pers., Obs. Myc. 1:35, 1797.

Description

Stereum hirsutum basidiocarp is 2-3 cm wide, semi-circular, leathery with coarse densely stiff-hair, with concentrically zoned and radially lined, cream toned, becoming grayish. The flesh is 1-1.5mm thick. The fertile surface is smooth, yellowish. The spores are cylindrical, smooth, colorless, 6-8 x 3-5µ. The spore print is white.

Derivation of name

The specific epithet hirsutus derived from a Latin word hirsuta, means "hairy, shaggy or bristly". The observable characteristics of this species.

Edibility / Economic Importance/Uses

Inedible, not fit nor suited to eat.

Distribution

This species found in Africa, North America, Central and South America, Europe, Australia, New Zealand, and Asia including the Philippines.

Season

This is conspicuous fungi throughout the year. This persists for several years.

Habitat/Substratum

This species found in terrestrial habitat particularly in mountainous region.

Grows on dead wood, especially in pioneering and premium trees; sometimes on bamboo.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Musuan (Bukidnon); Surigao Forest (Surigao del Norte); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

SUILLACEAE Besl & Bresinsky

Description

The basidiocarp and or fruiting body has cylindrical stipe, cap, soft flesh and tubular hymenium. The cap cuticle which is often slimy and sticky when moist, the presence of darkly staining, clustered, sterile cells called cystidia that give the tube mouths or the stipe surface a speckled or glandular appearance, spores that are usually cinnamon brown or chocolate brown in mass, and obligate mycorrhizal relationships primarily with members of the Pinaceae. The pores are bright yellow in *S. collinitus*, cinnamon in *S. variegatus* and grey in *S. viscidus*; in shape they are round in *S. luteus* and angular in *S. bovinus*. The flesh is white to yellow in *S. luteus*, while it is pallid in *S. variegatus* with a tendency to turn blue when exposed to air. Young *S. luteus* and *S. grevillei* bear partial veils whose remnants remain as annuli hanging from the stipe; in S. granulatus the stipe is bare. S. viscidus and S. grevillei occur under larch (Larix) only, while S. sibiricus is restricted to a few species of 5-needled pine (Pinus).

Family Recognition

Family Suillaceae was described on by Helmut Besl and Andreas Bresinsky, German mycologist who published ' A Colour Atlas of Poisonous Fungi'.

Etymology

The Family Suillaceae derived from the Latin word *suillus*, an ancient term for "fungi", and is derived from the word "swine".

Number of genus/genera within the family

This family contains several genera and these include boletus-like Suillus, small truffle-like Truncocolumella, and the genus Psiloboletinus and has 54 species.

Suillus Gray

Description

The basidiocarp and or fruiting body of this genus has centrally placed stipe, a distinct ring, a circular cap, and tubes that are stuck together. They have been commonly called "slippery jacks' because the cap of the fruiting body is sometimes slimy.

Genus derivation

The generic name *Suillus* is derived from the Latin word sus, meaning "pig".

Number of species within the genus

This genus contains 99 species as of May 2016 based on Index Fungorum. The species are mostly distributed in temperate locations in the Northern Hemisphere, although some species have been introduced to the Southern Hemisphere.

Suillus granulatus (L.) Roussel
Synonyms: *Boletus lactifluus* Sowerby, *Leccinum lactifluum* (Sowerby) Gray, *Ixocomus granulatus* (L.) Quel., and *Suillus lactifluus* (Sowerby) A.H.
Common Name: dotted-stalk suillus

Suillus granulatus (L.) Roussel, Flore du Calvados et terrains adjacents, composée suivant la méthode de Jussieu: 34 (1806)

Description

Suillus granulatus fruiting body cap is 6-14 cm wide; broadly convex, slimy when wet, smooth, with spotted or streaked appearance. The flesh is whitish, then become yellowish. The tubes are attached, the color is pale yellow. The pores are small, cream to pale yellow color. The stalk is 4-8 cm long and 2-3 cm thick, whitish, covered with pinkish to brownish dots. The spore are elliptic, smooth, 8-10 x 3-4µ. The spore print is greyish cinnamon.

Derivation of name

The specific epithet granulatus derived from the word granular, means "formed of small grains, fine grain". If you look carefully you will see that instead of gills, there is a lacy network in the hymenial layer of this fungus.

Edibility / Economic Importance/Uses

This is an edible mushroom. Like other Suillus species, the tubes are best removed before cooking. It is sometimes included in commercially produced mushroom preserves. The fruitbodies – low in fat, high in fiber and carbohydrates, and a source of nutraceutical compounds.

Distribution

This species is common in Britain, Europe, Korea and North America. A native to the Northern Hemisphere, the fungus has been introduced into Australia. It is also found in Africa, New Zealand, Hawaii, Southern Chile, and other Asian countries including the Philippines.

Season

This fungus usually grows during the month of June to November.

Habitat/Substratum

This fungus usually grows and associated with pine trees on both calcareus and acid soils, and sometimes occurs in large numbers. Suillus granulatus is the most widespread pine-associating Suillus species in warm climates.

Mindanao forests this species occurs

Initao - Libertad Protected Lanscape and Seascape (Misamis Oriental)

TREMELLACEAE Fr.

Description

The basidiocarp and or fruiting bodies of this family are more or less gelatinous. The species are covered on the surface by the whole fruiting layer. Sometimes this layer is confined to only one side. When dry, the fruiting bodies are rigid and horny, regaining their original form when moistened or soaked in water. Majority of the species grow on rotting wood, such as prostrate trunks and branches of trees, varying in color from gray, yellow-orange, and reddish, to brownish. They assume various forms, are often very irregular, leaflike, or strongly folded and uneven.

Family Recognition

Family Tremellaceae was created by Elias Magnus Fries, a Swedish mycologist on 1821. His basis was on macromorphology of fruit bodies. In 1900 Patouillard

radically revised the family by switching the emphasis to the micromorphology of fruit bodies. For Patouillard, the Tremellaceae was limited to genera and species in which the basidia were "tremelloid" (globose to ellipsoid with vertical or diagonal septa), whether or not the fruit bodies were gelatinous.

Etymology

The Family Tremellaceae derived from the Latin word tremere, meaning to "tremble".Tremella was one of the original genera created by Linnaeus in his Species Plantarum of 1753.

Number of genus/genera within the family

This family comprises 18 genera and consists of around 250 species that are cosmopolitan in distribution, though individual species may be restricted to tropical and temperate regions. The most common genera include Tremella having two species of which are edible and cultivated in other parts of the world.

Tremella Pers.

Description

The basidiocarp and or fruiting bodies, when produced, are gelatinous and are colloquially classed among the "jelly fungi".

Genus derivation

The genus Tremella was one of the original genera created on 1753 by Carolous Linnaeus in his Species Plantarum. The name comes from the Latin tremere meaning "to tremble".

Number of species within the genus

This genus contains 100 species. Two species, Tremella aurantialba and Tremella fuciformis, are commercially cultivated for food.

Tremella fuciformis Berk.

Synonyms: *Nakaiomyces nipponicus* Kobayashi

Common Name: white jelly mushroom; snow fungus; silver ear fungus

Tremella fuciformis Berk., Hook. Journ. Kew Gard. Misc. 8 (1856) 277; Bres., Hedwigia 53 (1912-13) 79; Reinking, Philip. Journ. Sci. 17 (1920) 365, 19 (1921) 94, Philip. Bur. For. Bull. 22 (1921) Pt. III, 114.

Description

The basidiocarp and or fruitbodies are gelatinous, white, up to 8.5 cm across, and composed of thin but erect, seaweed-like branching fronds. The hyphae are clinched and occur in a dense gelatinous medium. The clamp connections are present. The basidia are 4-spored, ellipsoid with oblique septa, 12-14 x 8-10µm. The basidiospores are ellipsoid, smooth, 6-8 x 4-6 µm. The spore print is white.

Derivation of name

The generic name fuciformis associated with the silver-ear, white, gelatinous fruitbodies that are seaweed like (fuciform), producing a rosette of thin, wavy fronds, often branched and crisped toward the outer margin. This species was first described by Miles Joseph Berkeley, an English mycologist in 1856. This was based on the collections by Richard Spruce, the Brazilian botanist and explorer.

Edibility / Economic Importance/Uses

Edible. This fungus is commercially cultivated and is one of the most popular fungi in the cuisine and medicine in China. Most commonly, it is used to make a dessert soup. It is used also in women's beauty products in China and Japan. This fungus is also cultivated in other East Asian countries.

Distribution

This fungus is widespread. This species is mainly tropical and subtropical but extends into temperate areas in Asia and, South America, Central America, North America, Australasia, Oceania, and Africa. This is popular in China, Japan and Taiwan.

Season

This fungus grows throughout the year but abundant during rainy season.

Habitat/Substratum

This species found in the terrestrial habitat particularly in the forest where fruit bodies are typically found on dead wood, attached or recently fallen branches of trees.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

XYLARIACEAE Tul. & C. Tul.

Description

The basidiocarp and or fruiting body form their ascocarps embedded in a true stroma composed entirely of fungal tissue with only the perithecial ostioles protruding. Their asci bear a crown at the apex when examined in unstained preparations and, characteristically, an amyloid. This family has dark-colored ascospores typically bear a longitudinal slit that may be elongated, or poroid.

Family Recognition

Family Xylariaceae was described 1861 by Louis René Ėtienne Tulasne and Charles Tulasne, French mycologist. They collaborated on numerous scientific publications on fungi.

Etymology

The Family Xylariaceae derived from the word xylaria, a Greek noun meaning "wood". The observable characteristics of this family which is hard and solid.

Number of genus/genera within the family

This family contains 87 genera and over 1300 known species. The most common genera are Daldinia and Xylaria. They are family of mostly small ascomycetous fungi. The most frequently encountered groups of ascomycetes throughout tropical and temperate regions of the world. The species belonged here are typically found on rotten wood, seeds, fruits and plant leaf.

Daldinia Ces. & de Not.

Description

The distinctive character of this genus is the zonate arrangement of the stroma (the cushionlike fruiting body) which consists of white or pale pithy layers alternating with narrow black carbonaceous layers. These zones are different textures and color. When young and growing, the members of this genus are covered with an iron-rust-colored conidial layer. This is the usual condition during the dry weather. In maturity this layer disappears and the surface becomes black, smooth, and shiny.

Genus derivation

The generic name Daldinia derived in commemoration to Padre Agostino

Daldini (1817-1895), a Swiss presbyter and botanist.

Number of species within the genus

This genus contains 28 species. Daldinia concentrica is the common species in the Philippines where you can found all over the country.

Daldinia concentrica (Bolt.) Ces. & de Not.
Synonym: *Sphaeria concentrica* Bolton
Common Name: King's Alfred cakes; carbon balls; cramp balls; kabuteng matigas at mabilog

Daldinia concentrica (Bolt.) Ces. & de Not., Comm. Critt. Ital. 1 (1863) 198; Sacc., Syll. Fung. 1 (1882) 393; Ricker, Philip. Journ. Sci. 1 (1906) Suppl. 280; P. Henn., op. cit. 3 (1908) Bot. 50; Sydow, op. cit. 5 (1910) Bot. 164; Yates, op. cit. 13 (1918) Bot. 378; P. Henn., Hedwigia 47 (1908) 250; Sydow, Ann. Myc. 15 (1917) 212; Reinking, Philip. Agr. 9 (1920-21) 134.

Description

Daldinia concentrica's fruiting body is usually small, roundish, hard, not stalked, varying from 2 to 4 centimeters in diameter. It is brown at first, then reddish brown, finally black and shiny. It appears open in groups, although generally single. When this fungus is sliced in half, its striking concentric zoned flesh are revealed. The flesh is dark purplish-brown, fibrous and with 10-40 darker concentric layers. Each layer represents a season of reproduction. The spores is 12-17 x 6-9µ, elliptical, with one flattened side, smooth and black. The spore print is brown to black.

Derivation of name

The epicific epithet concentrica derived from the word "concentric" (con, together; centrum, center), having a common center, as a series of rings, one within another. Further, this refers to the concentrical zoned interior. If cut, the hard context is dark brown to black and marked by a series of paler concentric rings.

Edibility / Economic Importance/Uses

Inedible.This mushroom is too hard and brittle to be edible. Cramp balls have been used as a fungal dye to produce a range of brown to grayish greens.

Distribution

This fungus found in North America, South America, Europe and Asia including the Philippines.

Season

This species found all year round though very common from June to September.

Habitat/Substratum

This is a hard mushroom in terrestrial habitat, a very common and abundant on old trunks of trees, decaying wood and rotten bamboos.

Mindanao forests this species occurs

Mt. Kambinliw (Dinagat Island Province); Initao-Libertad Protected Landscape and Seascape (Misamis Oriental); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

Xylaria Hill

Description

The basidiocarp and or fruit body is black, erect or ascending, cylindrical, club-shaped or threadlike, often compressed, simple or branched, corky or leathery.

Genus derivation

The generic name *Xylaria* is taken from the Greek word xylon, meaning "wood," and refers to the texture of the members of this genus.

Number of species within the genus

This genus contains 199 species of cosmopolitan fungi. The species of this genus usually grow on or near wood. Two of the common species of the genus are Xylaria hypoxylon and Xylaria polymorpha.

Xylaria polymorpha (Pers.) Grev.
Synonym: *Xylosphaera polymorpha* (Pers.) Dumort.
Common Name: dead man's finger

Xylaria polymorpha Grev., Scot. Crypt. Flor. Edinb. (1824) 3454; Sacc.,Syll. Fung. 1 (1882) 309; P. Henn., Hedwigia 32 (1893) 224, Warb.,Mons. 1 (1900) 27; Ricker, Philip. Journ. Sci. 1 (1906) Suppl. 281; Rehm, Leafl. Philip. Bot. 6 (1914) 2211.

Description

Xylaria polymorpha's fruitbody has very short-stalk, fingerlike clubs, 2-8 cm high and 1-3 cm thick; powdery white to buff at first when coverd with asexual spores, becoming black at maturity. The flesh is white and tough. The spores are narrow, rod-shaped, with one flattened side, 25-30 x 6-10µ. Spore print grayish to black.

Derivation of name

The specific epithet polymorpha derived from the two Greek words, poly means "many" and morph means forms. This is very appropriate since individuals of this fungus comprises many forms.

Edibility / Economic Importance/Uses

Inedible, very hard. Not fit nor suitable for eating.

Distribution

This species found in North America, Europe, and Asia including the Philippines.

Season

This fungus found all year round though most abundant in the month of June to October.

Habitat/Substratum

Usually in clusters grows in the forest particularly on rotting woods, at bases of stumps, especially molave and dipterocarps.

Mindanao forests this species occurs

Initao-Libertad Protected Landscape and Seascape (Misamis Oreintal); Mt. Timpoong and Hibok-hibok Natural Monument (Camiguin)

MOSSES

DICRANACEAE Schimp.

Family Description

Small to robust. Stems usually branched. Leaves lanceolate, often slenderly acuminate, erect, second or crispate. Costa single, usually extending to or beyond leaf apex. Basal cells rectangular, alar group often strongly differentiated; upper cells small, subquadrate, rarely elongate. Seta usually elongate, straight or cygneous; capsule ovoid or cylindrical, erect or curved, smooth or furrowed, sometimes strumose; peristome single, composed of 16 reddish teeth, cleft to about middle into 2 or 3 lanceolate-subulate forks, often vertically and obliquely striolate below on outer surface, papillose at tips; lid conicrostrate.

Campylopus Brid.

Dioicous; small or robust, densely tufted plants. Stem erect, radiculose or tomentose. Leaves crowded, erect-spreading, with slender, flexuose or second points; costa broad below, occupying more than 1.3 of leaf base, percurrent or excurrent, often ridged or lamellose on back; basal cells narrow, frequently with pitted or sinuous lateral walls, alar cells usually hyaline or reddish and inflated, forming conspicuous auricles, upper cells rhomboidal. Seta arcuate or cygneous when moist; capsule small, ovoid, sulcate when dry; peristome teeth cleft to or below middle, striolate on outer surface annulus large; lid conicrostrate; calyptra usually cucullate and generally laciniate or fringed at base.

Campylopus ericoides (Griff) Jaeg

Description

Closely resembling C. caudatus in size and appearance. Leaf margins sharply serrulate about one-third of the way down; alar cells slighty more inflated and paler, usually hyaline.

Altitude	:1053-2280 masl
Habitat	:Cyathea trunk/soil
Present Status	:NEW TO MINDANAO
Local Assessment	:Widespread
Distribution:	Philippines (Luzon: Bagui, Mt. Makiling)
	Himalayas, Ceylon, Java

Mindanao forests this species occurs

Mt. matutum, South cotabato Province;Mt. Malambo, Marilog Davao Province

Holomitrium Brid.

Genus Description

Genus tufted plants. Stems branched, tomentose. Leaves crispate when dry; lanceolate from an erect base; costa percurrent; basal cells linear, alar group well defined, upper cells rounded. Inner perichaetial leaves setaceous from a long, convolute base, strongly differentiated from stem leaves, capsule erect, cylindric; peristome teeth 16, reddish brown, usually perforate along median line, lid conic-rostrate.

Holomitrium cylindraceum (P. Beauv.) Wijk. & Marg.
Syn. *H. vaginatum* (Hook.) Brid.

Description

Pseudoauticous; dwarf male plants attached to tomentum of fertile stems. Tufts dense, pale brown or yeloowish above, darker brown below. Stems about 1 cm long, densely foliate. Leaves with inrolled points when dry, widely spreading from an erect base when moist, 2 to 3 mm long, oblong-lanceolate from a short, oblong base, deeply carinate, short-acuminate, margins erect, essentially entire; costa percurrent or slightly excurrent; basal cells rectangular, incrassate, shorter toward margins, alar cells pale brown, subquadrate, merging on inner side with a group of delicate, hyaline cells extending to costa, upper cells rounded, 6 to 8 µ in diameter, smooth, incrassate. Perichaetial leaves conspicuous, inner rect, about 5 mm long, subulate-acuminate from a long sheathing base;

Altitude	: 1660-2500 masl
Habitat	: tree / logs
Present Status	: NEW TO MINDANAO
Local Assessment	: Widespread
Distribution	: Philippines (Luzon: Bataan: Mt. Maraviles, Mindoro: Puerto Galera Bay.) Java, New Caledonia, Tahiti
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

LEUCOBRYACEAE Schimp.

Family Description

Small to robust, palre-green or whitish plants often tinged with brown. Stems, usually branched, radiculose below. Leaves crowded, often fragilem strict or curved; costa broad, in cross section showing a median row of small chlorophyllose cells (chlorocysts) covered on both sides by one or more layers of large, hyaline cells (leucocysts), porose on inner walls, with or without a strand of stereid cells; cells of true lamina large, hyaline mostly confined to basal portion of leaf near margins. Seta erect, solitary; capsule erect and subcylindric or inclined, asymmetrical and strumose; peristome teeth 8 or 16, entire or cleft above; lid rostrate, calyptra cucullate.

Octoblepharum Hedwig

Genus Description

Autoicous; male buds minute, axillary. Compactly tufted, glossy plants, whitish green tinged with brown. Leaves crowded rigid, often fragile, consisting chiefly of broad, thick, ligulate costa bordered at base by delicate, hyaline cells of rudimentary lamina. Seta erect; capsule erect, symmetrical; peristome teeth 16, in 8 pairs, faintly striolate; lid conic-rostrate; calyptra cucullate, entire at base.

Octoblepharum albidum Hedw.

Description

Fragile rather glossy plants, up to 3 cm high, in dense tufts or cushions. Leaves crowded, widely spreading or recurved rigid, ligulate, from an oblong or narrowly obovate, concave base, rounded and apiculate at apex, up to 8 mm long, serrulate near apex, costa broad and thick, occupying half of leaf base and entire blade, in cross section near middle showing a median row of small, triangular chlorocysts with 3 or 4 layers of leucocysts on both dorsal and ventral sides; hyaline lamina cells rectangular, up to 30 µ wide, narrower and rhomboidal toward margins. Perichaetial leaves smaller than stem leaves.

Altitude	: 1660 masl
Habitat	: tree
Local assessment	: Rare
Distribution	: Philippines (Widespread) Tropical Regions

Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Leucophanes Hampe

Genus Description

Slender, pale-green or whitish plants. Stem branched. Leaves rather crowded, erect or widely spreading, narrowly lanceolate, strongly keeled, costa broad and thin, with a median strand of stereid cells, usually nearer dorsal side, either smooth or toothed on back near apex, leucocysts in two layers throughout leaf or in 3 or more layers near base; bordered all around with a narrow band of very elongate cells with thickened, yellowish walls, lamina cells few, usually confined to marginal part of leaf base. Seta very slender, terminal, soon becoming lateral, capsule erect, cylindric, glossy; peristome teeth 16, entire, papillose; lid erect, long-subulate, calyptra cucullate, entire at base.

Leucophanes glaucum (Schwaegr.) Mitt.
Syn: *L. glaucum* C. Mull, *L. albescens* C. Mull

Description

Medium-sized, glossy plants, rather loosely tufted. Stems up to 3 cm high. Upper leaves crowded, more distant below, slightly contorted and undulate on edges when dry, erect-spreading when most, linear-lanceolate, 5 mm long and 0.5 mm wide, carinate-concave the entire length, distantly serrate near apex with teeth often in pairs; costa with a median bundle of stereid cells ending in apex and minutely spine on back about halfway down, in cross section showing 2 or 3 layers of leucocysts on dorsal side and one layer on ventral side of chlorocysts in the thicker parts near base, and a single row of leucocysts on each side higher in leaf, lamina cells rather conspicuous, extending about halfway up the leaf, quadrate or short rectangular with the delicate wall soften sinuose, 4 to 5 rows wide below, narrower above. The keeled leaves, spinose on the bank of the median stereid strand, and the paired marginal teeth make this an easy species to segregate.

Altitude	: 1660-2035 masl
Habitat	: Tree trunk / logs
Local Assessment	: Widespread
Distribution	: Philippines (Luzon: Zambales, Mt. Lalol, Rizal,

	Antipolo, Mt. Makiling, Quezon, Polillo. Palawan. Panay: Iloilo, Siargao. Mindanao: Agusan Norte, Surigao Sur, Mt. Sibulan).
	Siam, Java, Celebes, New Guinea, Borneo
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

POTTIACEAE Hampe

Family Description

Small or medium-sized, densely tufted plants, mostly rupestrine or terrestrial. Stems erect, usually branched. Leaves crowded, more or less crispate when dry; costa strong, excurrent or ending near apex; upper cells small, papillose, often obscure, basal cells larger, rectangular, frequently hyaline. Seta erect, elongate, smooth; capsule erect, cylindric or ovoid-cylindric, symmetrical.

Hyophila Brid.

Genus Description

Dioicous; medium-sized plants in dense tufts or mats, usually on damp rocks. Leaves incurved and twisted when dry, oblong-lingulate, obtuse; margin involute, especially when dry, usually toothed toward apex; costa strong, percurrent or short-excurrent; basal cells rectangular, pellucid, upper cells small, papillose. Seta slender, elongate; capsule erect, cylindric; peristone none. Usually with clusters of chlorophyllose gemmae at tips of branched filaments in axils of comal leaves.

Hyophila involuta (Hook.) Jaeg.

Syn. *H. flavipes* Broth.; *H. dozy-molkenberi* Fleisch.; *H. commutata* Broth.; *H. micholotzii* Broth.; *H. involuta var. flavipes* (Broth) Bartr.; *H. javanica* (Nees & Blume) Brid.

Description

Tufts dark green, reddish brown below. Stem erect, 1 to 1.5 mm high, radiculose below, uniformly foliate. Leaves contorted when dry, widely spreading when moist, up to 3 mm long and a scant 1 mm wide, oblong-lingulate, concave, from a clasping base, blunt at apex; margins strongly involute when dry; costa strong tapering, smooth, percurrent; upper cells rounded, slightly incrassate, lightly

papillose, basal cells, pellucid, shorter and subquadrate toward margins.

Altitude	: 2680 masl
Habitat	: Rotten logs
Local assessment	: Rare
Distribution	: Philippines (Widespread) India, Eastern china
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Hyophila rosea Williams

Description

Diocous, in thin mats. Stems 1 to 1.5 cm high, radiculose below, with leaves often in interrupted tufts, Leaves strongly contorted when dry, widely spreading when moist, up to 3.5 mm long, oblong-ovate from short, scarcely below evident base, concave, acute; margins narrowly recurved below, erect above, minutely papillose-crenulate but not toothed, costa often excurrent in a minute point, papillose on back about halfway down, cells rounded, slightly incrassate, papillose, gradually elongate and pellucid extreme base. Seta 2.5 mm long; peristome none; annulus broad; lid 1 mm long.

Altitude	: 2288 masl
Habitat	: tree/logs
Local assessment	: Rare
Distribution	: Philippines (Luzon: Bontoc, Benguet, Bataan, Lanao R. Rizal. Lubang)
Mindanao forests this species occurs	: Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

BRYACEAE Schwägr.

Family Description

Plants of variable size, usually tufted. Stems erect radiculose below, often with subfloral innovations. Lower leaves small, upper larger, lanceolate; costa ending in or near apex; ells linear or rhomboidal, thin-walled, smooth, often narrower in several rows at margins. Seta elongate; capsule inclined or pendulous, rarely erect, clavate or pyriform with a distinct, tapering neck; peristome normally double,

outer composed of 16 lanceolate teeth, inner rudimentary or composed of 16 keeled segments alternating with teeth and 1 to 3 intermediate cilia; lid convex, apiculate

Rhodobryum (Schimp.) Limpr.

Genus Description

Large stoloniferous plants in extensive lax mats. Stems erect from subterraneous stolons, naked below or with small, appressed leaves, upper leaves larger, usually in a conspicuous terminal rosette, long-spathulate, serrate above; costa tapering from a broad base, ending in or near apex. Seta often 2 or 3 from one perichaetium; capsule large, pendulous; peristome large.

Rhodobryum giganteum (Hook.) Schimp.

Description

Synoicous and dioicous; large conspicuous deep-green plants in loose tufts or mats. Stems erect, densely radiculose below. Lower leaves small, scattered, appressed, the upper abruptly much larger, widely spreading to form a broad terminal rosette, flexuose when dry, spathulate, from a narrow base, short-acuminate, up to 15 mm long; margins narrowly recurved below, spinose-serrate in upper half with teeth often in pairs; costa broad below, ending just below apex; cells long-hexagonal, narrower towards margins in several rows, rectangular at base with marginal rows narrower. Setae often clustered, up to 8 cm long; capsules large, pendulous, up to 9 mm long, oblong-cylindric with a short neck; peristome large, perfect; lid conic, bluntly apiculate.

Altitude	: 1660-1820 masl
Habitat	: Logs
Local assessment	: Widespread
Distribution	: Philippines (Luzon: Bontoc, Mt. Pukis, Ifugao, Mt. Polis, Mountain, Mt. Data, Benguet, Mt. Santo tomas, Mt Makiling, Mt. Banahao, Mt. San Cristobal. Negros: Lake Balinsasayao, Mt. Canlaon; Mindanao: Mt. Apo) Himalayas, Sumatra, Java, Borneo, China, Japan, Hawaii
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

SPIRIDENTACEAE Kindb.

Family Description

Very Large, fine, lustrous plants growing in dense colonies. Stems up to 40 to 50 cm long, horizontally or pendulous, irregularly and sparingly branched. Leaves scariose, crowded, widely spreading-in all directions, gradually narrowed from a clasping base to a long, lanceolate- acuminate, tapering point; margins thickened, spinose-serrate costa excurrent; upper cells rounded, smooth, gradually elongate below and narrowly linear at base. Sporophyte lateral; capsule large on very short set; lid conicrostrate; peristome double, teeth spirally inrolled when dry. This group comprises the largest of the moss plants and has a wide distribution throughout the islands in Malaysia, Melanesia, and Polynesia

Spiridens reinwardtii Nees.
Syn. *S. longifolius* lindb

Description

Dioicous; secondary stems from a short rhizomatous base, densely foliate, golden green tinged with brown, flexuose at tips, about 2 cm wide with leaves. Lower leaves small, gradually larger upward, upper leaves abruptly squarrose-spreading from a short, clasping base, gradually tapering to a slender acuminate point, bordered all around with a thick band of elongated cells; margins erect, distantly spinose-serrate from a leaf shoulder to apex; costa excurrent, toothed on back above; basal cells linear, gradually shorter upward, upper cells small, smooth, irregularly hexagonal, with firm pale walls. Sporophyte lateral, shorter than subtending leaves; seta long; capsule glossy ovoid, curved, about 5 mm long; annulus none; lid conic-rostrate, curved, shorter than urn; peristome teeth inrolled when dry, segments of endostome as long as teeth, cilia none; spores finely papillose.

Altitude	: 1150-2035 masl
Habitat	: Rotten Logs
Local assessment	: Widespread
Distribution	: Philippines (Widespread) Java, Timor Celebes, Borneo, New Guinea.
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Malambo, Marilog, Davao Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

THUIDIACEAE Schimp.

Family Description

Slender or robust plants without lustre. Stems copiously branched, often reguraly 2 or 3 pinnate, usually with paraphyllia. Leave often dimorpous, branch leaves smaller and well differentiated, ovate, concave, short-pointed; costa single, stout; cells small, rounded, papillose, seta elongate, smooth, rarely papillose; capsules mostly horizontal, seldom erect, peristome double, perfect, hypnoid in structure; lid conic-rostrate; calyptra usually naked, rarely pilose or hispid.

Thuidium Br. and Schimp.

Genus Description

Slender or robust plants without lustre, growing in flat, feathery mats. Stems creeping, Bipinnate and tripinnate, with abundant paraphyllia. Leaves dimorphous; stem leaves larger, from a broad, cordate base, long-acuminate; branch leaves small, ovate, concave, short-pointed, costa single, cells rounded, papillose; capsule usually inclined or horizontal; lid beaked; peristome double, perfect; calyptra cucullate, mostyl naked.

Thuidium cymbifolium (Dozy & Molk.) Dozy & Molk.

Syn. *Hypnum casuarinum* (C. Mull)
Thuidium casuarinum (C. Mull) Jaeg.

Description

Dioicous; large plants in laix intricate mats, dark green or brownish. Stems elongate, arched and ascending, irregularly bipinnate and tripinnate, densely felted with multiform paraphyllia. Stem leaves erect-spreading, plicate, from a broad cordate-ovate base abruptly narrowed to a long capillary point formed by the excurrent costa, 2 or 3 mm long; leaves of ultimate branches much smaller, ovate, short-acuminate, apical cell with 2 or 3 papillae, costa ending below apex, cells rounded, with a single sharp papilla over lumens. Perichaetial leaves strongly ciliate in upper half; costa excurrent in a long, flexuose, capillary point; seta 3 or 4 cm long, smooth; capsule horizontal, oblong-cylindric, urn 2.5 to 3 mm long; calyptra cucullate, naked.

Altitude : 1705-2260 masl

Habitat	: Logs/tree trunk/Rocks
Distribution	: Philippines (Widespread) Wide in Malaysia, Formosa, Lord Howe Island, New Guinea, China, Japan
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Thuidium glaucinum (Mitt) Bosch. & Lac.

Syn. *T. glaucinoides* Broth.

Description

Dioicous; robust plants, pale or yellowish green, in lax mats. Stems arched, regularly bipinnate, often radiculose at tips; paraphyllia numerous, filiform, branched. Stem leaves 1 to 1.5 mm long, lightly plicate, broadly acuminate from an ovate base; margins nearly plane; costa ending in base of acumen. Branch leaves smaller, ovate, deeply concave, acute; costa slender, ending below apex; cells distinct, oval-hexagonal, papillae with stellate tips over lumens. Perichaetial leaves toothed; capsule suberect (sporophyte not seen).

Altitude	: 1273-2700 masl
Habitat	: Tree branches/Logs
Local assessment	: Widespread
Distribution	: Philippines (Luzon: Apayao, Mt. Magnas, Bontoc, Mt. Data, Baguio, Rizal, Mt. Makiling. Negros: Mt. Katugasan, Mt. Talinis. Mindanao: Bukidnoon, Mt. Candoon, Mt. Apo.) Himalayas, Southern India, Ceylon, Java, Assam, Japan.
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnon Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

HYPNACEAE Schimp.

Family Description

Small or moderately robust, usually glossy plants growing in intricate mats. Stems creeping, often pinnate or subpinnately branched. Leaves ovate or ovate-lanceolate, acuminate, often more or less falcate secund; costa short and double or none; cells mostly linear, prosenchymatous, smooth or slightly papillose, alar cells small and poorly differentiated. Seta elongate, slender, smooth; capsule ovoid, more or less asymmetrical, usually horizontal or pendulous; peristome usually double, teeth striolate, segments of endostome keeled, from a high basal membrane. Usually with intermediate cilia; lid short, apiculate calyptra cucullate.

Ectropothecium Mitt

Genus Description

Slender or robust glossy plants in extensive think mats. Stems elongate, creeping, more or less regularly pinnate. Leaves symmetrical, usually falcate-secund, ovate-lanceolate, acuminate; costa none or short and double; cells linear, small and poorly differentiated at basal angles. Seta smooth, elongate; capsule horizontal or pendulous, short, ovoid, strongly constricted under mouth when dry; peristome double, normal; lid conical, apiculate' calyptra cucullate.

A large genus with many taxonomic difficulties, abudantly represented in the Philippines

Ectropothecium ferrugineum (C. Müll) Jaeg.

Syn. *Hypnum ferrugineum* C. Müll.

Description

Heteroicous; moderately robust plants, but slenderer than *E. buitenzorgii*; usually with a brownish cast, slightly glossy, in dense mats. Stems to 6 cm. long or longer, regularly pinnate, forming a narrow frond, branches widely spreading, hooked at tips. Branch leaves crowded, ovate-lanceolate, gradually acuminate, to 1.5 mm long, sharply serrate in upper half; cells linear-rhomboidal, 5 μ wide and 6 to 10 times as long, slightly papillose at apical angles, marginal row shorter, rhomboidal and usually well differentiated, alar cells few and irregular with a single large hyaline cell at basal angles.

Altitude	: 2036 masl
Habitat	: Logs / Tree trunk
Present Status	: Philippine Endemic
Local assessment	: Rare
Distribution	: Philippines (Luzon: Baguio, Mt. Santos Tomas, Mt. Makiling. Quezon, Mt. Binuan. Mindoro: Puerto Galera Bay. Panay: Capiz, Mt. Bulilao. Mindanao: Bukidnoon) Endemic
Mindanao forests this species occurs	: Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Ectropothecium ichnotocladum (C. Müll) Jaeg.

Syn. *Hypnum callichroides* C. Müll
Ectropothecium callichroides (C. Müll) Jaeg

Description

Dioicous; slender, yellowish plants in extensive mats, slightly glossy. Stems to 4 cm long, closely, more or less irregularly pinnate, branches hooked at tips. Leaves crowded, strongly falcate, narrowly ovate-lanceolate, acuminate, concave, to 1.4 mm long and 0.3 mm wide, serrulate in upper half; cells linear, smooth, marginal row slightly wider and rhomboidal toward apex, not or scarcely differentiated at basal angles. Perichaetium large, seta to 1.5 cm long.

Altitude	: 2273 masl
Habitat	: Soil
Local assessment	: Rare
Distribution	: Philippines (Luzon: Mt. Polis, Benguet, Mt. Santo Tomas, Baguio, La Trinidad Valley, Nueva Ecija, Aurora, Zambales, Mt. Marayep, Mt. Pinatubo, Rizal, Mt. Makiling, Albay, Mt. Mayon. Mindanao: Lanao, Pugaan Hill, Davao, Sibuyan R.) Sumatra, Java, Borneo, Celebes, Amboina, Annam
Mindanao forests this species occurs	: Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

POLYTRICHACEAE Schwägr.

Family Description

Medium-size to very robust terrestrial plants with erect, simple or sparingly branched stems. Leaves narrow, mostly rigid, blade usually well differentiated from sheating base; costa strong, percurrent or excurrent, often tooth on back above, usually broader on ventral surface and covered with thin, parallel, longitudinal lamellae. Seta elongate; capsule erect or inclined, cylindrical or angled; peristome single, teeth 32 or 64, solid, not barred, triangular in cross section, columella bearing an expanded shield like membrane at apex covering mouth of capsule; calyptra cucullate, usually more or less pilose with erect or deflexed hairs.

Pogonatum P. Beauv

Genus Description

Mostly dioicous; small to very robust plants, laxly tufted. Stems erect, stiff, often tought and woody, mostly simple, densely foliate. Lower leaves small, larger upward, more or less spreading and often strongly contorted when dry, lanceolate from a more or less sheathing base, serrate above, usually with numerous longitudinal lamellae on ventral face; costa dilated upward, often toothed on back near apex; basal cells elongate, narrowly rectangular, mostly hyaline. Seta long, smooth; capsule erect or inclined, cylindrical; lid rostrate; calyptra densely felted with long, deflexed hairs; peristome teeth 32.

Pogonatum cirratum ssp. cirratum (Sw.) Brid.

Description

Plants medium-sized to robust, erect stems stiff. Plants light green to olivaceous above, brownish-green to dark green below, pentagonal in cross-section with polytrichoid central strand. Leaves linear-lanceolate, fairly distant, erect to widely spreading and contorted when dry, plane when moist bistratose (sometimes partly unistratose), with marginal elamellate cell-rows, dentate of the blade-lenght, multicellular, laminar cells round to transversely ovate.

Altitude	: 1800-2288 masl
Habitat	: Logs/Soil
Present status	: NEW TO MINDANAO
Local assessment	: Widespread

Distribution	: Philippines (Luzon) Borneo, Java, Papua New Guinea, Sumatra
Mindanao forests this species occurs	: Mt. Matutum, South Cotabato Province Mt. Kalatungan, Bukidnoon Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

LEUCOBRYACEAE Schimp.

Family Description

Small to robust, pale-green or whitish plants often tinged with brown. Stems usually branched, radiculose below. Leaves crowded, often fragile, strict or curved; costa broad, in cross section showing a median row of small chlorophyllose cells (chlorocysts) covered on both sides by one or more layers of large, hyaline cells (leucocysts), porose on inner walls, with or without a strand of stereid cells; cells of true lamina large, hyaline mostly confined to basal portion of leaf near margins. Seta erect, solitary; capsule erect and subcylindric or inclined, asymmetrical and strumose; peristome teeth 8 or 16, entire or cleft above; lid rostrate, calyptra cucullate.

Leucobryum Hampe

Genus Description

Small or medium-sized plants, pale or glaucous green tinged with brown. Stems branched, radiculose below. Leaves crowded, strict or curverd, from a small ovate base narrowed to a subtubulose point; costa broad, occupying all of upper part of leaf, often rought on back toward apex, composed of two or more layers of leucocysts enclosing a median row of small chlorocysts. Seta terminal, erect; capsule inclined, asymmetrical, furrowed when dry; peristome teeth 16, reddish, striolate below, divided to about middle into two pale, papillose forks.

Leucobryum aduncum Dozy & Molk.

Description

This is a fairly common species. It occurs as greyish loose tufts on the surface of moist rocks and tree trunks. It is smaller than *L. javense* and is characterized by having lanceolate leaves which end in an acute tip. Stem most unbranched. Leaves falcate secund, arranged in 5 rows along the stem; long lanceolate, becoming narrower and smaller towards the pointed apex; leaf cells spinose-prorate from

the apex, to almost midleaf; leaf margin bordered by three (3) rows of rectangular cells; alar cells quadrate.

Altitude	: 2040 masl
Habitat	: Tree trunk
Present status	: NEW TO MINDANAO
Local assessment	: Rare
Distribution	: Philippines (Luzon: Baguio, Mt. Maraviles) Widely distributed in East Asia and Melanesia
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnoon Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Leucobryum javense (Brid.) Mitt.

Description
Robust plants growing in deep tufts, glaucous green tinged with yellow or brown. Stems up to 6 cm long or longer. Leaves very crowded, usually falcate-secund, up to 14 mm long and 2.5 mm wide, gradually lanceolate from a large, concave base, deeply grooved in the point, apiculate, very rugose on back in upper half; costa in cross section near base showing one layer of leucocysts on both sides of chlorocysts in median portion and 2 or 3 layers on both sides in thicker parts of leaf; lamina cells in 4 to 6 rows, narrowly rectangular and 10 to 12 µ wide next to costa, linear toward margins.

Altitude	: 1016-1075 masl
Habitat	: Rotten logs/Tree trunk
Local assessment	: Widespread
Distribution	: Philippines (Widespread) Southern India, Ceylon, Malaysia, New Guinea Yunnan, Hongkong
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnoon Province Mt. Malambo, Marilog Davao Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

HYPNODENDRACEAE Broth

Family Description

Distinctive, handsome plants with a frondose habit. The branches are clustered at the top of a tall, erect, woody stope.

Dioicous; usually robust plants, often with a metallic lustre. Primary stems creeping, rhizomatous, secondary stems erect, woody, naked or tomentose below, branches crowded near the top and often forming a frondlike head. Lower leaves of stipes small, upper and branch leaves large, ovate, acuminate, sharply serrate; costa often toothed on back, excurrent; cells elongate smooth or minutely papillose at apical angles. Seta elongate.

Hypnodendron Mitt.

Genus Description

Robust, dendroid plants laxly associated in colonies. Secondary stems naked or tomentose only at extreme base, branches crowded at top of stipe, usually flattened forming a more or less dense frond. Stipe leaves small, scattered, erect or squarrose-recurved, upper leaves large, more or less complanate, ovate, sharply serrate with single or paired teeth; costa ending in or near apex, toothed on back above; cells linear, smooth, often minutely papillose by projecting ends, scarcely differentiated at basal angles. Capsules large, nodding, on elongate seta; lid long-rostrate; peristome double.

Hypnodendron dendroides (Brid.) Touw.

Syn. *Hypnum wallisii* C. Müll
Mniodendron divaricatum (Reinw. & Hornsch.) Lindlb.
M. wallisii (C. Müll) Jaeg.
M. divaricatum var. wallisii (C. Müll) Bartr.

Description

Plants to 8 cm high, mostly umbellate but occasionally palate, with branches to 4 cm long, green to dull green, not very glossy, erect to ascending with a well-defined stipe which has strongly reflexed leaves mostly hidden among the brown to rich red brown rhizoids. Upper stipe laves to 3.5 mm long, not very keeled, distant, triangular to deltoid from a prominent auriculate base, often acuminate near apex. Ultimate branch leaves approximate to imbricated, not complanate, smooth to very lightly plicate when dry, erect to ascending, sometimes slightly

secund, broadest near the base and only gradually contracted to the acumen. Median laminal cells to mostly more, usually smooth but occasionally slightly prorate, mostly rather thick-walled, with lumen wall. Alar cells in a poorly defined group distinctly largely and more clear than the median laminal cells forming distinctive usually dentate auricles, especially on the stem leaves. Costa mostly slightly excurrent, dorsally smooth or with a few low teeth. Marginal cells, especially of branch leaves, often rather clear and green. Margins plane at base but somewhat down-flexed in distal portions of leaf, serrate nearly throughout, with teeth seldom composed of more than one cell, never geminate teeth. Seta to 4.5 cm long, red-brown, mostly at least somewhat flexed distally. Operculum inclined rostrate often nearly as long as urn.

Altitude	: 1735-2040 masl
Habitat	: Logs/Cyathea tree trunk
Local assessment	: Rare
Distribution	: Philippines (Widespread) Sri Lanka, Thailand, Vietnam, Indonesia, Malaysia Papua New Guinea
Mindanao forests this species occurs	: Mt. Kalatungan, Bukidnoon Province Mt. Matutum, South Cotabato Province Mt. Timpoong and Mt. Hibok-hibok, Camiguin

Suitability of growth and factors affecting the diversity of fungi and mosses in North Central Mindanao

The relationship between factors such as temperature, wind speed, humidity, and faunal statistics is responsible for the diversity of fungal nad moss specimens collected at the study sites. As organism that rely heavily on spore dispersal and high moisture content of the environment, it is logical to think that these species will thrive in areas that are always almost humid.

Wind speed assists in the rapid dispersal of spores were bringing them to other plants that can support their development to adulthood. Season of collection directly influences the number of fungal and moss organisms that can be collected and observed. During dry season, where humidity is low, and it is usually hot, diversity of macrofungi and mosses tend to decrease as compared to the wet season where enough moisture is received by substrate tree tissue and soil to support the proliferation and development of varying macrofungi and mosses.

The variaty of insects feeding on fungal fruiting bodies also dictates the kinds of fungi that can be surveyed for a particular period.

Factors affecting the growth of macroscopic fungi

One of the important factors that contribute in the occurrence and abundance of macroscopic fungal species is tree species richness (Schmit et al., 2005). This relationship explained the significant function of trees in the fungal existance (Vlasenko, 2013). Most of macroscopic fungal species recorded in North Central Mindanao protected and non-protected areas and as well as in Watershed are saphrophytes inhabiting on rotten trees, trunks and branches. The prevailing meteorological parameters also contribute in the distribution of macroscopic fungi.

The growth of fungi is greatly affected by climatic condition patterns, wherein decomposition of fungal species is higher in war m climates (Osono, 2011). Therefore, rainy season specifoed cooler climate and is responsible for the ample growth of fungi as observed during the study period. It is also confirmed by the climatic data taken from record of Philippines Atmospheric Geophysical Services Administration (PAGASA), Climatic data used in the course of this study consisted of rainfall, temperature and relative humidity which verified the relationship of macroscopic fungal growth to this climatic factors.

Factors affecting the growth of mosses

Many species of mosses are commensally epiphytic (Sterry, 2007). Mosses are abundant and ubiquitous across a diverse array of biomes and latitudes (Mezaka, Brumelis, & Piterans, 2012). Ecologically they house and sustain rich biodiversity as habitats (Helle & Aspi, 1983; Lindo & Gonzales, 2010). However, the growth and distribution decreases due to their susceptibility to atmospheric pollution (Larsen et al., 2007), and habitat disturbance (Couvreur, San Martin, & Sotiaux, 2016; Lubos, 2010;2015)

CONCLUSIONS

A total of 185 species of macroscopic fungi identified at North Central Mindanao Protected Areas and Watershed represented by 41 species. Ascomycetes with five families, six genera and seven species and Basidiomycetes has 15 families, 25 genera, and 34 species. For mosses, the study revealed 174 species, 97 genera, and 39 families represented by 15 species, 10 genera, and 10 families. The study sites provide a wide range of habitat and substrate of macroscopic fungal and moss species. This are compose of rotten fallen tree trunks and branches, leaving trees, timber, trails, grassland, pasture land, fence posts, wood chips, stumps and leaf litters. The bountiful number of collected and classified macroscopic fungi and mosses truly established the relationship of climatic factors specially temperature, humidity and rain fall in the existance or lost of ecological functional important organisms. Climatic factors where undeniably playing a crucial role in macroscopic fungal and moss life cycle. Consequently, other factors like a flora and fauna in the study sites with biophysical factors like nitrogen, oxygen and carbon dioxide might also affect the growth of macroscopic fungal and moss species. The authors recommend futher research in relation to the existence of macroscopic fungi and mosses in the Philippines and to enhance knowledge in the status of the species distribution in the country. The discovery of some species previously known only in the other regions of the Philippines and the possible new species implies that the protected areas and watershed, and perhaps other areas not covered by initial surveys migh generate additional species record. Hence, it deserves continuous research to gain more information on Philippine Biodiversity which will serves as a baseline information for convervation efforts.

Trametes hirsuta (Wulf.) Lloyd

Polyporus alveolaris (DC.) Bondartsev & Singer

Microporus xanthopus (Fr.) Kuntze

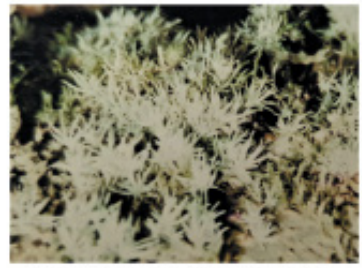
Russula rosea Pers.

Stereum hirsutum (Willd.) Pers.

Coprinopsis atramentaria (Bull.) Redhead, Vilgalys & Moncalvo

Plate 1. Some common fungi of North Central Mindanao

Hyophila involuta (Hook.) Jaeg.



Leucobryum aduncum Dozy & Molk.

Pogonatum cirratum ssp. cirratum (Sw.) Brid

Leucophanes glaucum (Schwaegr.) Mitt.

Holomitrium cylindraceum (P. Beauv.) Wijk. & Marg.

Ectropothecium ferrugineum (C. Müll) Jaeg.

Plate 2. Some common mosses of North Central Mindanao

LITERATURE CITED

Akiyama, H., Koponen, T., & Norris, D. H. (1991). Bryophyte flora of the Huon Peninsula, Papua New Guinea. XLV, Neolindbergia (Prionodontaceae, Musci). *Acta Bot. Fennica* 143: 77-89.

Alexopoulos, C. J., Mims, C. W., & Blackwell, M. (1996). *Introductory Mycology, 4 Edition*. John Wiley & Sons, Inc. New York, USA.

Bartram, E. B. (1939). Mosses of the Philippines. *Philippine Journal of Science*. 68:1-425.

Couvreur, J. M., San Martin, G., & Sotiaux, A. (2016). Factors Affecting the Presence and the Diversity of Bryophytes in the Petrifying Sources Habitat (7220) in Wallonia and the Brussels-Capital Region, Belgium, *International Journal of Agronomy*.

Del Rosario, R. M. (1980). *Moss Endemism in the Philippines*. Botanical Papers No.3, National Museum, Manila, Philippines.

Eusebio, M. A. (1998). Pathology in Forestry. Ecosystem Research and Development Bureau. Department of Environment and Natural Resources. *College, Laguna*.pp.15-31.

Gradstein, R., Yong, K. T., Suleiman, M., Putrika, A., Apriani, D., Yuniati, E., ... & Lubos, L. C. (2010). Bryophytes of Mount Patuha, West Java, Indonesia. *Reinwardtia*, *13*(2), 107-123.

Hall, R. (1998). *The plate tectonics of Cenozoic SEAsia and the distribution of land and sea*, pp. 99-131. In: R. Hall & J. D. Holloway(eds.), Biogeography and Geological Evolution of SE Asia. Backhuys Publisher,Leiden.

Hawksworth, D. (2004). Fungal Diversity and its Implication for Genetic Resource Collection. *Studies in Mycology*, 50 (1).

Hemmes, D. E., & Desjardin, D. E. (2002). *An Identification Guide of Mushrooms of Hawaii*. Ten Speed Press, Berkeley/Toronto, Canada.

Koon, T. T. (1990). *A Guide to Tropical Fungi*. Singapore Science Centre, Science Center Road, Singapore.

Lincoff, G. H. (1995). *National Audubon Society Field Guide to North American Mushrooms*. Chanticleer Press, Inc., Broadway, New York, NewYork.

Lubos, L. C. (2000). *Taxonomy, Species Richness and Distribution of Mosses in Selected Mountains in Mindanao.*

Lubos, L. C. (2010). Species Richness, Distribution, and Status of Mosses in Selected Mountains in Mindanao, Philippines. *Asian Journal of Biodiversity*. 1(1): 63-82.ISI.

Magill, R. (1980). A monograph of the genus Symphysodontella (*Pterobryaceae*, Musci). *J. Hattori Bot. Lab*, *48*, 33-70.

Noguchi, A. (1976). A taxonomic revision of the family *Meteoriaceae* of Asia. *J. Hattori Bot. Lab, 41*, 231-357.

Norris, D. H., & Koponen, T. (1996). Bryophyte flora of the Huon Peninsula, Papua New Guinea. LVIII. Hypnodendron (*Hypnodendraceae*, Musci). *Acta Bot. Fennica 156*, 23-48.

Pegler, D. & Spooner, B. (1994). *Identifying Mushrooms: The new compact study guide and identifier*. Quintet Publishing Ltd., The Apple Press, London.

Philippine Institute of Volcanology and Seismology. 2012.

Philippine Standard Geographic Code Interactive. 2012.

Quimio, T. H. (1988). *Illustrated Philippine Fungi. Techguide Series* No. 24. National Bookstore, Inc., 24K Printing, Co., Inc. Marulas, Valenzuela, Metro Manila.

Quimio, T. H. (2001). *Common Mushrooms of Mt. Makiling* (Philippines), Museum of Natural History, University of the Philippines, Los Baños, College, Laguna.

Roberts, P., Evans, S. (2011). *The Book of Fungi: A Life-size guide to six hundred species from around the world.* The Ivy Press Limited. East Sussex, United Kingdom.

So, M. L. (1995). *Mosses and liverworts of Hong Kong*. Hong Kong: Heavenly People Depot.

Tadiosa, E. R., & Briones, R. U. (2013). Fungi of Taal Volcano Protected Landscape, Southern Luzon, Philippines. *Asian Journal of Biodiversity*, 4:46-54.

Tadiosa, E. R. (2012). The Growth and Development of Mycology in the Philippines. Fungal Conservation, *Journal of the International Society for Fungal Conservation*, Issue 2, April 2012. Germany.

Tan, B. C. (1984). A reconsideration of the affinity of Philippine moss flora. 3. *Hattori Bot. Lab. 55*, 13-22.

Tan, B. C. (1992). Philippine muscology (1979-1989). In: T. Koponen and J. Hyvönen (eds.). Proceedings of the Congress of East Asiatic Bryology, Helsinki, August 12-19, 1990. *Bryobrothera* 1: 137-141.

Tan, B. C. (1994). The bryophytes of Sabah (North Borneo) with special reference to the BRYOTROP transect of Mount Kinabalu. XIX. The genus Acroporium (Sematophyllaceae, Musci) in Borneo, with notes on species of Java and the Philippines. *Willdnowia, 24*, 255-294.

Tan, B. C. (1998). *Noteworthy disjunctive patterns of Malesian mosses*, pp. 235-241. In: R. Hall & J. D. Holloway (eds.), Biogeography and Geological Evolution of SE Asia. Backhuys Publisher, Leiden.

Tan, B. C., & Iwatsuki, Z. (1991). A new annotated Philippine moss checklist. Harvard Papers Bot. 3: 1 Tan BC, LC Lubos, Uwe Schwarz. 2000. New and Biogeographically Noteworthy Records of Philippine Mosses from Mindanao Island. *Tropical Bryology, 18*, 27-38,

Tan, B., Ho, B., Lim, Y. H. (2008). *A Guide to the Mosses of Singapore. Science Center, Singapore*.

Tan, B. C., Koponen, T., Norris, D. H. (2007). Bryophyte Flora of the Huon Peninsula, Papua New Guinea. LXX. Sematophyllaceae (Musci) 1. *Acanthorrhynchium*, *Acroporium*, *clastobryophilum*, *Pseudopiloecium*, *Radulina*, and *Trichosteleum*. *Ann. Bot. Fennici, 44,* 35-78.

Tan, B. C., Jia, Y. (1999). A Preliminary Revision of Chinese Sematophyllaceae. *J. Hattori Bot. Lab.*, *86*, 1-70.

Tan, B. C., Schofield, W. B., Ramsay, H. (1998). Miscellanies of Australian Sematophyllaceae with a new genus, Meiotheciella. *Nova Hedwigia, 67*(2), 13-223.

Teodoro, N. G. (1937). An Enumeration of Philippine Fungi. Comm. Phil. Dept. Agri., *Manila Tech. Bull*, 41-568.

Touw, A. (1971). A taxonomic revision of the Hypnodendraceae (Musci). *Blumea, 19*, 211-354.

Touw, A. (1992). A survey of the mosses of the Lesser Sunda Islands (Nusa Tenggara), Indonesia. 3. *Hattori Bot. Lab.*, *71*, 289-366.

Uyenco, F. R. (1971). Plants of the Philippines (Bacteria, Fungi and Lichens). *U.P. Science Education Center*, Quezon City, 390-401.

Vanderpoorten, A., & Goffinet, B. (2009). *Introduction to Bryophytes.* Cambridge University Press, United Kingdom.

Yamaguchi, T. (1993). A revision of the genus Leucobryuin (Musci) in Asia. 3. *Hattori Bot. Lab., 73*: 1-123.

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