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Agarics of the Louisville area : a taxonomical problem.

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AGARICS OF THE LOUISVILLE AREA: A TAXONOMICAL PROBLEM

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INTRODUCTION

This paper is presented as a record of the Agarics occurring in the Louisville Area. Even though gilled-mushrooms are common in this area no record could be found of any study having been made of them. This paper is the culmination of two years of collecting and classifying. More extensive study is necessary to determine whether or not this paper contains all species of the area.

The author is deeply indebted to Dr. P. A. Davies, Head of the Department of Biology at the University of Louisville, for his criticisms and untiring guidance throughout the writing of this paper. The author is also grateful to the many students who have aided in collecting specimens.

AGARICS OF THE LOUISVILLE AREA: A TAXONOMICAL PROBLEM

The agarics, or gilled mushrooms, as they are commonly called, belong to the botanical group known as fungi. Since the fungi possess no true roots, stems, leaves, flowers, pollen, or seeds, it is readily seen why they belong to this group.

Among the mushrooms are to be found the puffballs, club-fungi, coral fungi, hedgehog fungi, truffles, trembling fungi, morels, stinkhorns, tube-bearing fungi, and the group toward which this paper is directed, the gilled fungi. All fungi, whether they are yeasts, molds, bacteria, or the agarics, lack chlorophyll and this differentiates them from the higher plants. Chlorophyll is the green pigment found in leaves of trees and herbs. With the aid of chlorophyll, plants are able to combine the elements, carbon, hydrogen, oxygen and sunlight, producing their own food. Fungi containing no chlorophyll must secure their nourishment from living or dead organic material. Loam, rotting trees and decaying leaves furnish the organic nourishment for the majority of mushrooms.

PROPAGATION AND SPORE DISSEMINATION

Higher plants (spermatophytes) are propagated by seeds. Seed formation involves the union of two gametes. Mushrooms possess no gametes so reproduction is by asex-

ual methods.

In mushrooms the method of propagation, although more simple than in seed plants, is no less remarkable. Each species of mushroom reproduces its own kind by means of microscopic spores. These are dropped or thrown from mature fruiting plants. According to Krieger (1947) "Vegetative reproduction is the formation of fruiting bodies from cells of the plant other than the spores." He also states that Dugger's tissue culture, for the reproduction of commercial mushroom spawn, is based upon this vegetative method of propagation.

A spore consists of a tiny bit of living protoplasm enclosed within a wall or membrane, as a bird's egg is enclosed in its shell. Single spores cannot be seen without the use of a microscope but in mass they appear as dust. They may possess any one of several colors. Spore color affords an important means of classifying gilled fungi into genera. The spores are exceedingly light in weight and are dropped from the surface of the gills in vast numbers. Krieger says that Buller (1909, 1924) has found that a large specimen of the giant puff-ball, Calvatia gigantea, produces approximately 7,000,000,000,000 spores. A single specimen of the meadow mushroom, Psalliota campestris, may develop as many as 16,000,000,000 spores.

When a cast-off spore falls upon a favorable habi-

tat, it begins to germinate. First, a tiny hyphal thread grows from the spore and penetrates the earth or wood upon which it rests. This hypha absorbs nourishment from organic matter in which it is growing and forms a mycelium. Commercially it is spoken of as "spawn". Weeks, months, or even years, must pass before the mycelial threads will grow and mature sufficiently to develop a fruiting structure.

When the proper time has arrived, little knots or enlargements appear at one or many places on the mycelium. These swellings increase in size until they project above the soil. Each knob is destined to develop into a spore-bearing structure.

IMPORTANT FEATURES OF GILLED MUSHROOMS

The place of growth of gilled mushrooms varies within well-defined limits. Many species grow only in moist, shady areas, some in open spaces, and others occur in both habitats. Certain species grow upon wood, or in the ground. A few are found under particular kinds of trees, such as beech or elm, while others occur in manure heaps.

Season of growth is a distinguishing feature of mushrooms. Since many species appear only in specific months this feature is important in classification.

The taste of many mushrooms is mild or unnotice-

able, but it may be acrid, peppery, or in some cases, nutty.

Pileus or Cap

The pileus is the expanded part of a gilled mushroom which attracts the most attention. It is covered with a skin or peel beneath which is the flesh. This flesh or trama is composed of interwoven hyphae. The pileus of many species has a water-soaked or soggy appearance when moist, but when dry becomes opaque and lighter in shade. Such a pileus is hygrophanous, a feature which aids in identifying these species.

Gilled mushrooms exhibit great variations in the shape of the pileus. Many species have a conical or bell-shaped pileus, while in others, it is flat or funnel-shaped. The pileus in the majority of species is convex when young but as the plant matures it usually expands and becomes flat or evenly depressed at the center. The edge may be regular, lobed or wavy. The surface may be smooth, dry, sticky or covered with scales.

If the pileus has a knob protruding from the center it is said to be umbonate, but if a small pit is present, it is umbilicate. In this paper when the shape is not mentioned, it is assumed that the pileus is convex when young and flat or nearly so when mature.

Color

While the color of filled mushrooms is one of their most striking characteristics, it is not always a reliable index for identification. Individuals in a species exhibit great variation in color.

Lamellae

Lamellae are thin, knife-like blades attached by their upper edge to the undersurface of the pileus and extend like the spokes of a wheel from the stipe to the margin. They always grow with their flat surfaces vertical. Upon these gill-surfaces the spore are formed. In many species are to be found lamellae which are adnexed, adnate or free from the stipe. Lamellae which extend down the stipe are termed decurrent, while those with the edge notched near the stipe are sinuate or emarginate.

In Cantharellus the lamellae are not thin, but are blunt and narrow, and the free edges instead of being knife-edged are serrated or undulated.

The spore-bearing surface of the lamellae and the space between the lamellae is called the hymenium. The hymenium is composed of elongated cells known as basidia and paraphyses, which project at right angles to the surface. Four sterigmata project from the free end of a basidium and each bears a spore at its apex. The paraphyses are sterile pavement cells and bear no spores.

Color possessed by spores gives the hue to the lamellae in mature plants. This characteristic is important in identification.

Spores vary in shape, being either globular, angular, elliptical, or ellipsoidal. They also vary in size, ranging from 2 to 20 microns in diameter. The spores are so light in weight that when cast off from the sterigmata, they fall slowly and any current of air propells them for a long distance.

Stipe or Stem

The stipe is usually attached at the center of the under surface of the pileus but may be attached at the margin, or between margin and center.

Stipes are short or long, thick or thin, and many are solid or hollow. In some species the stipe is entirely absent.

If a gilled mushroom in the button stage is cut sagittally from top to bottom, the pileus, lamellae and stipe will be observed enclosed in an outer membrane or veil. The pileus is folded and the lamellae lie close along the stipe, giving the appearance of a closed umbrella. The outer veil usually disappears as the pileus expands, but in some species part of it persists as a sheath or volva enclosing the base of the stipe. In Agaricus arvensis part of the outer veil may be seen in the form of flakes sticking to the upper surface of the

mature pileus. Both volva and flakes are present in the fly mushroom, Amanita muscaria, and furnish a means of rapid identification.

During the button stage of their development gilled mushrooms are provided with another veil or membrane which extends from the stipe to the margin of the pileus. This inner or secondary veil often persists, at least in part, and serves as a means of identifying the species. When this veil remains after the rupture or disappearance of the outer membrane it hides the lamellae. As the sporophore develops, the inner veil may break away from the edge of the pileus and remain as the annulus or collar around the stipe.

FIGURE 1.
PROBABLE SEASONAL OCCURRENCE OF GILLED MUSHROOMS

GENUS	Dec. Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Amanita					x	x	x	x	
Amanitopsis				x	x	x	x	x	
Armillaria						x	x	x	x
Clitocybe			x	x	x	x	x	x	
Clitopilus					x	x	x	x	
Collybia				x	x	x	x	x	
Coprinus		x	x	x	x	x	x	x	
Cortinarius				x	x	x	x	x	x
Entoloma					x	x	x	x	
Flammula					x	x	x	x	
Galera			x	x	x	x	x	x	
Hebeloma					x	x	x	x	
Hygrophorus				x	x	x	x		
Hypholoma				x	x	x	x	x	x
Inocybe					x	x	x	x	
Lepiota				x	x	x	x	x	
Marasmius			x	x	x	x	x	x	
Mycena				x	x	x	x	x	
Naucoria			x	x	x	x	x	x	
Omphalia			x	x	x	x	x	x	x
Panaeolus			x	x	x	x	x	x	x
Panus	x	x	x	x	x	x	x	x	x
Pholiota			x	x	x	x	x	x	
Pleurotus				x	x	x	x	x	x
Pluteus			x	x	x	x	x	x	x
Psathyrella			x	x	x	x	x	x	x
Psilocybe				x	x	x	x	x	x
Stropharia				x	x	x	x	x	x
Tricholoma					x	x	x	x	x
Volvaris					x	x	x	x	x

--Reproduced from Krieger, 1947

FIGURE 2.
TABULAR VIEW OF THE GENERA OF AGARICAE

LEUCOSPORAE (White)	RHODOSPORAE (Pink)	OCHROSPORAE (Brown)	PORPHYROSPORAE (Purple)	MELANOSPORAE (Black)
AMANITA AMANITOPSIS	VOLVARIA			
LEPIOTA			AGARICUS (PSALLIOTA)	COPRINUS
	PLUTENS			
ARMILLARIA		PHOLIOTA CORTINARIUS	STROPHARIA	
TRICHOLOMA	ENTOLOMA	HEBELOMA INOCYBE	HYPHOLOMA	PANAEOLUS
HYGROPHORUS CLITOCYBE	CLITOPILUS	FLAMMULA		
PLEUROTUS PANUS		CREPIDOTUS		
COLLYBIA MARASMIUS	LEPTONIA	NAUCORIA	PSILOCYBE	
MYCENA	NOLANEA	GALERA		PSATHYRELLA
OMPHALIA				

--Reproduced from William S. Thomas, 1928

FIGURE 3.
KEY TO GENERA OF GILL FUNGI

SPORE COLOR	WHITE	PINK	YELLOW	PURPLE	BLACK
Flesh vesiculose					
Juice milky	Lactarius				
Juice not milky	Russula		Russula		
Flesh not vesiculose					
Caps fleshy or membranous					
Stem central					
Gills free					
Volva and ring present	Amanita				
Volva not present	Amanitopsis	Volvaria			
Ring only present	Lepiota			Agaricus	Coprinus
Neither volva nor ring present		Plúteus	Pluteolus		Coprinus
Gills attached					
Stem fleshy					
Ring present	Armillaria		Pholiota		
Ring not present					
Gills adnate or sinuate	Tricholoma	Entoloma	(Inocybe (Heboloma	Hypholoma	(Panaeolus (Psathyrella
Gills mostly decurrent					
Gills much forked	Cantherellus				
Gills not much forked	Clitocybe		Flamula		
Stem cartilaginous					
Not reviving					
Gills adnate					
Cap expanded	Collybia			Psilocybe	
Cap conical	Mycena				
Gills decurrent					
Reviving	Marasmius				
Stem eccentric or absent	Pleurotus	Claudopus	Crepidotus		
Caps touch					
Gills serrate	Lentinus				
Gills entire					

--Adapted from McDougall, 1925

DESCRIPTION OF GENERA AND SPECIES OF THE COMMON GILLED MUSHROOMS OF THE LOUISVILLE AREA

THE GENUS AGARICUS

The genus Agaricus contains species having the lamellae free from the stipe, an annulus, and brown spores. All grow in the ground.

SPECIES OF AGARICUS

1. Agaricus arvensis: (Horse Mushroom, Meadow Mushroom) PLATE I.

Pileus

Smooth or with a few flakes upon its surface, white or slightly yellowish, 5 to 10 cm. broad.

Lamellae

Free from the stipe and close together. At first white or slightly pink, later turning dull pink and then blackish brown.

Stipe

Stout, hollow, thick and bulbous toward the base; white or yellowish; 5 to 11 cm. long. A double veil is present.

Spores

Brown, elliptical, 7.5 to 10 microns in diameter.

The horse mushroom is found in pastures and open fields. It may be found singly or in groups and is common from June to September. Edible.

2. Agaricus campestris: (Common Mushroom) PLATE II.

Pileus

Silky or with scales, 3.5 to 7.5 cm. broad. In young plants the pileus is globular or hemispherical but becomes flat with age. White or with a dingy appearance; flesh white but becomes pink when cut.

Lamellae

Close together and free from stipe; pink when young, turning brown and then black with age; they do not extend to margin of pileus.

Stipe

Smooth, white or slightly pink, short, solid, cylindrical, 5 to 7.5 cm. long, annulus when young.

Spores

Brown, elliptical, 6.2 to 7.5 microns in diameter.

Agaricus campestris is found growing in grassy places, in pastures and in manured soil. This mushroom is never found in thick woods. It grows singly or in

--Adapted from Pray, 1936

PLATE I. Agaricus arvensis: (Field Mushroom)

groups. July to September. Edible.

3. Agaricus silvicola: (Forest Mushroom) PLATE III.

Pileus

Convex or expanded, often umbonate; 5 to 12.5 cm. broad; smooth or silky; white or tinged with pink; flesh white or tinged with pink.

Lamellae

Free from stipe and close together, very thick, rounded near stipe, pinkish when young, becoming darker when old, finally brown or blackish brown.

Stipe

Smooth; white; long and bulbous at base; 10 to 15 cm. long; hollow or pithy; an annulus which may be double.

Spores

Brown, elliptical, 7 to 9 microns in diameter.

The Agaricus silvicola is found growing on the ground in thickly wooded areas. It grows singly or in scattered groups. August to September. Edible.

PLATE II. Agaricus campestris: (Pasture Mushroom)

--Adapted from Krieger, 1947

PLATE III. Agaricus silvicola: (Forest Mushroom)

THE GENUS AMANITA

All species of the genus Amanita have a volva at the base of the stipe. The young plants are entirely enclosed in a universal (outer) veil which is ruptured by the growth of the plant. That part of the outer veil which persists at the base of the stipe is the volva. Part of this outer veil also persists as patches or warts on the mature plants. The lamellae are free from the stipe. An annulus is present.

SPECIES OF AMANITA

1. Amanita muscaria: (Fly Amanita, False Orange, Fly Poison) PLATES IV and V.

Pileus

Bright red or orange when young, fading to yellow when mature, occasionally white; smooth or minutely furrowed on the margin; white or yellow warts occasionally present; 7.5 to 20 cm. broad.

Lamellae

White, free from stipe, rarely tinged with yellow.

Stipe

Annulus is present, volva occasionally scaly, white or tinged with yellow, 10 to 15 cm. long.

Spores

White, broadly elliptical, 7.5 to 10 microns in diameter.

The fly amanita is a common poisonous species. infusions of it are used in medicines and as a fly poison. The poisonous properties are due to a substance known as muscarin. The antidote to this poison is atropin, an alkaloid extracted from the belladonna plant.

It is found growing on the ground in wooded areas or in open fields. July to October. Poisonous.

2. Amanita phalloides: (Poison Amanita, Destroying Angel) PLATE VI.

Pileus

Bell-shaped or almost globular when young, nearly flat when mature; 3.7 to 12.5 cm. broad; smooth (slightly viscid when fresh), occasionally warty; margin rare striated; white, yellow, gray, brown, or black.

Lamellae

White; free from stipe, rarely adnexed; broad.

Stipe

Sharply bulbous at the base, with a wide annulus near the upper end; usually white; smooth or slightly scaly; hollow or pithy; 6.5 to 15

--Adapted from Krieger, 1947

PLATE IV. Amanita muscara: (Fly Mushroom)

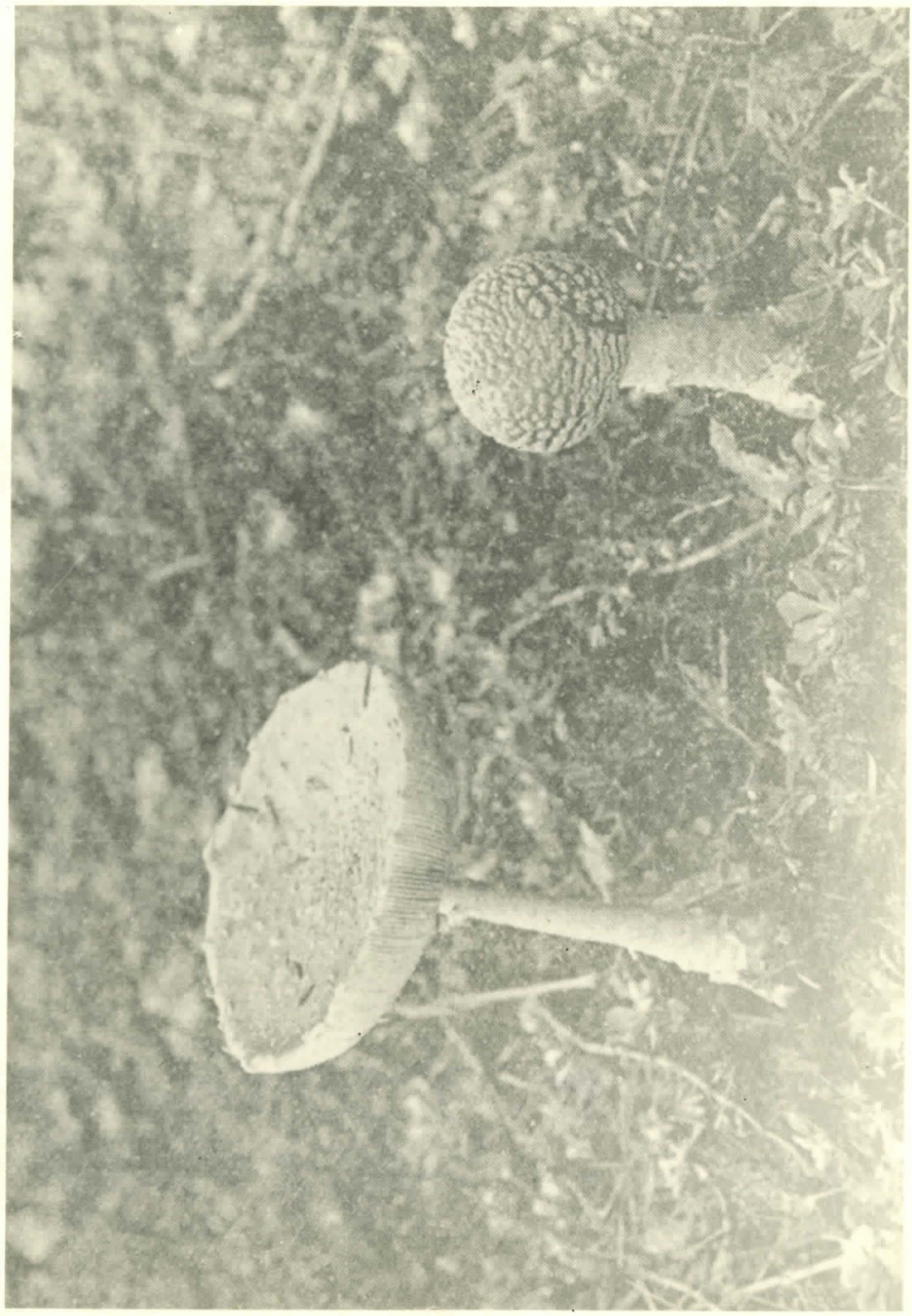


PLATE V. Amanita muscara: (Fly Mushroom)

cm. long.

Spores

White, smooth, globular, hyaline, 7 to 10 microns in diameter.

The destroying angel is found growing on the ground in wooded areas. July to October. Poisonous.

THE GENUS AMANITOPSIS

This genus resembles the genus Amanita in having a volva but differs from it in having no annulus. The spores are also white and the lamellae free from the stipe.

SPECIES OF AMANITOPSIS

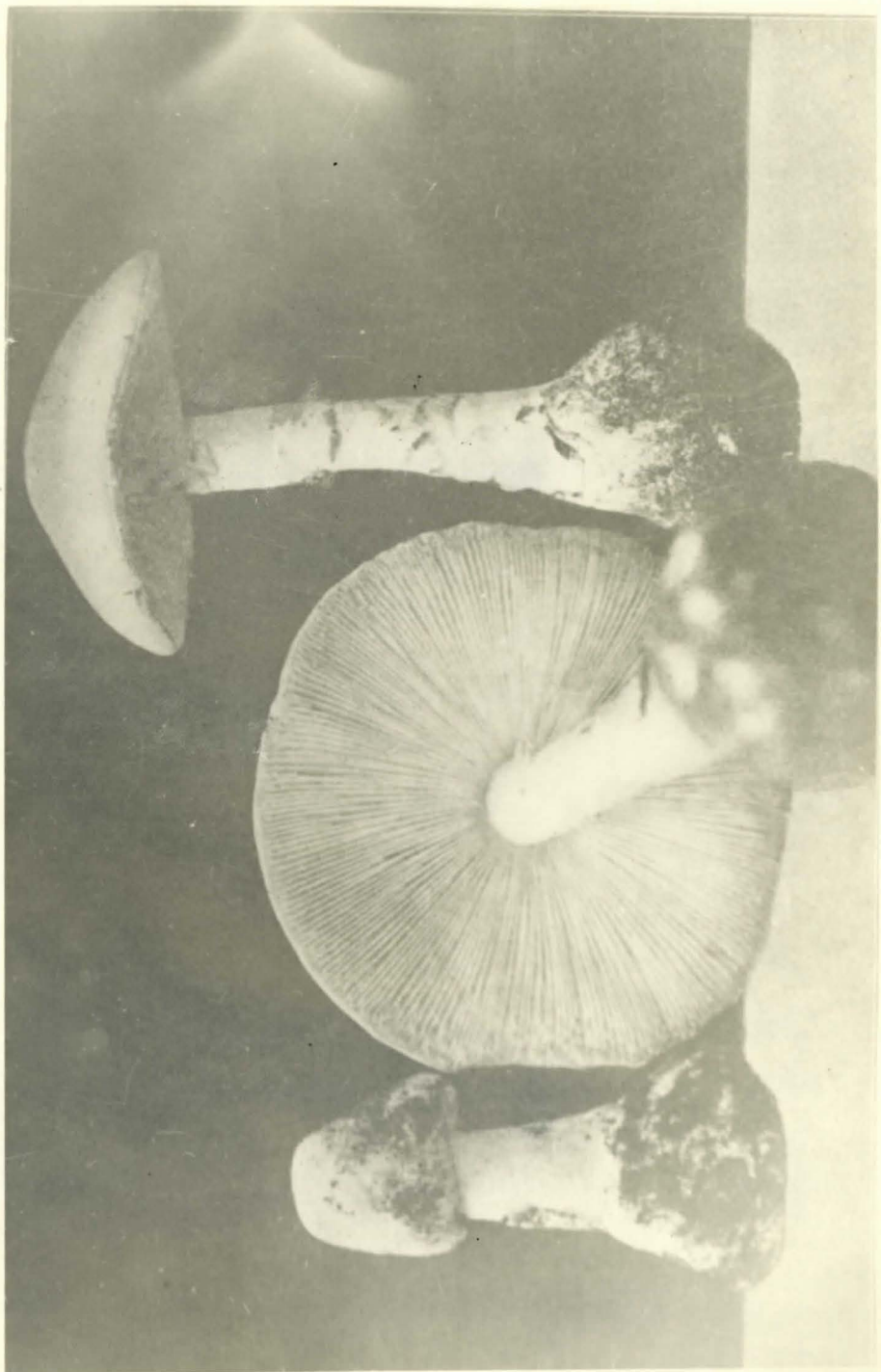
1. Amanitopsis vaginata: (Sheathed Amanitopsis)

Pileus

Thin; smooth or covered with a few adherent fragments of the veil; bell-shaped or expanded, sometimes umbonate; deeply furrowed at the margin; fragile; variable in color, ranging from reddish-white to reddish-brown; 5 to 10 cm. broad.

Lamellae

Free from stipe, white, very fragile.



--Adapted from McDougall, 1925

PLATE VI. Amanita phalloides: (Destroying Angel)

Stipe

Long, volva thin, no annulus, hollow or pithy, 7.5 to 12.5 cm. long and 1.3 cm. thick.

Spores

White, globular, smooth, hyaline, 8 to 10 microns in diameter.

The sheathed amanitopsis is found growing in the ground or on decayed wood, singly or scattered in wooded areas or in open places. June to October. Edible.

2. Amanitopsis volvata: (Large-sheathed Amanitopsis)

Pileus

Hemispheric when young but flat when mature; 2.5 to 7.5 cm. broad; dull-white, yellow or rarely reddish-brown; powdery or flaky surface; fragile.

Lamellae

Free from stipe and close together, white, rounded near the stipe, broad.

Stipe

Slender, cylindrical or tapering upward, enlarged at the base; white; pithy or solid; large volva, more or less lobed.

Spores

White, elliptical, waxy, 6 to 7 microns in diameter.

The most noticeable feature of this species is its immense volva. It is found growing on the ground in wooded areas. July to October. Poisonous.

THE GENUS ARMILLARIA

This genus has white spores and gills attached to the stipe by their inner extremities. The stipe is fibrous, not easily separated from the pileus and has an annulus but no volva as in the genera Amanita and Amanitopsis.

SPECIES OF ARMILLARIA

1. Armillaria mellea: (Honey Colored Mushroom)

Pileus

Convex to expanded; 2.5 to 15 cm. broad; smooth or tufted with brown or black hairs, pale yellow to reddish-brown, when old the margin is striated, taste unpleasant.

Lamellae.

Adnate or decurrent, white, becoming discolored or spotted with age.

Stipe

Veil on its upper portion; white, honey-colored or reddish-brown; thin, firm, fibrous without and spongy within; occasionally flaked or scaled; 2.5 to 15 cm. long.

Spores

White, elliptical, smooth and hyaline, 7 to 10 microns in diameter.

Found growing on the ground or decaying wood in wooded areas or in open fields. Its clustered habit, the prominent annulus and sharp, black scales on the center of the pileus make it easy to identify. Spring to autumn. Edible.

THE GENUS CANTHARELLUS

The genus Cantharellus is distinguished by its lamellae which are narrow, decurrent, branched and with blunt edges.

SPECIES OF CANTHARELLUS

1. Cantharellus aurantiacus: (Orange Chantarelle) PLATE VII.

Pileus

Fleshy; 2.5 to 7.5 cm. broad; flat or depressed at the center, minutely tomentose on top; yel-

lowish-orange, or brown in the center; flesh white or yellow.

Lamellae

Narrow, decurrent and close together, repeatedly forked, reddish-orange.

Stipe

Cylindrical or tapering upward, solid, smooth, yellowish-orange, 2.5 to 7.5 cm. long.

Spores

White, slightly elliptical, 6 to 10 microns in diameter.

The orange chantarelle is distinguished by its bright orange lamellae which are regularly forked. It is abundant and found growing in the ground or on rotting longs. July to October. Edible.

2. Cantharellus cibarius: (Common Chantarelle)

Pileus

Fleshy; firm; convex, becoming expanded or depressed at the center; 2.5 to 7.5 cm. broad; smooth; yellow; the margin spreading or wavy.

Lamellae

Decurrent and far apart, thick, narrow and forked, yellow.

--Adapted from Krieger, 1947

PLATE VII. Cantharellus aurantiacus:
(Orange Chantarelle)

Stipe

Firm, smooth, solid, yellow, sometimes curved, 2.5 to 5 cm. long.

Spores

Pale yellow, elliptical, 7.5 to 10 microns in diameter.

The common chantarelle is found growing on the ground in woods and open places. This mushroom differs from orange chantarelle in having a paler and more yellow pileus. Edible.

3. Cantharellus cinnabarinus: (Cinnabar Chantarelle)

Pileus

Firm, convex or slightly depressed in the center, 1.2 to 3.7 cm. broad, sometimes irregular in shape, margin wavy or lobed, smooth, red, flesh white.

Lamellae

Narrow and far apart, blunt on edges, branched, decurrent, red.

Stipe

Cylindrical or tapering downward, smooth, solid or pithy, red.

Spores

White, elliptical, 7.5 to 10 microns in diameter.

The cinnabar chantarelle is easily recognized by its color. Externally all parts ared red while the flesh is white. The color fades in dried or preserved specimens. It grows in wooded areas and in open places. July to September. Edible.

4. Cantharellus dichotomus: (Dichotomous Chantarelle)

Pileus

Conical when young, becoming convex, flat or depressed at the center when mature; 1.7 to 3.7 cm. broad; involute; fleshy, soft and flexible; color is variable; grayish-white, grayish-brown, or blackish-brown.

Lamellae

Narrow and close together, forked 1, 2 or 3 times, decurrent, white or tinged with yellow.

Stipe

Tapers upward, solid; white or grayish-brown, smooth or with fibrils, 2.5 to 7.5 cm. long.

Spores

White, elliptical, 7.5 to 10 microns in diameter.

The dichotomous chantarelle is found growing on the ground in wooded areas. July to September. Edible.

THE GENUS CLITOPILUS

The species of this genus have fleshy stipes, decurrent lamellae and pink spores. Mushrooms with similar lamellae and stipes but white spores belong to the genus Clitocybe. Species of this genus having pink lamellae are distinguished from the pink-gilled Agaricus campestris by their pink hue when old, not turning brown or black. Many pink-spored mushrooms, in this genus and in other genera, have white lamellae when young, but a pinkish hue when old, due to ripening of spores on the hymenium.

SPECIES OF CLITOPILUS

1. Clitopilus abortivus: (Abortive Clitopilus) PLATE VIII.

Pileus

Fleshy; firm; convex, flat or slightly depressed at the center; 5 to 10 cm. broad; margin regular, occasionally wavy and irregular; dry; silky when young, smooth when old; gray or slightly brownish; flesh white.

Lamellae

Thin and close together; attached to stipe, may be decurrent; white or pale gray when young, changing to salmon pink with age.

Stipe

Solid, slightly downy or fibrous, grayish or brown, 3.7 to 7.5 cm. long.

Spores

Salmon pink, angular, one nucleus, 6 to 7 microns in diameter.

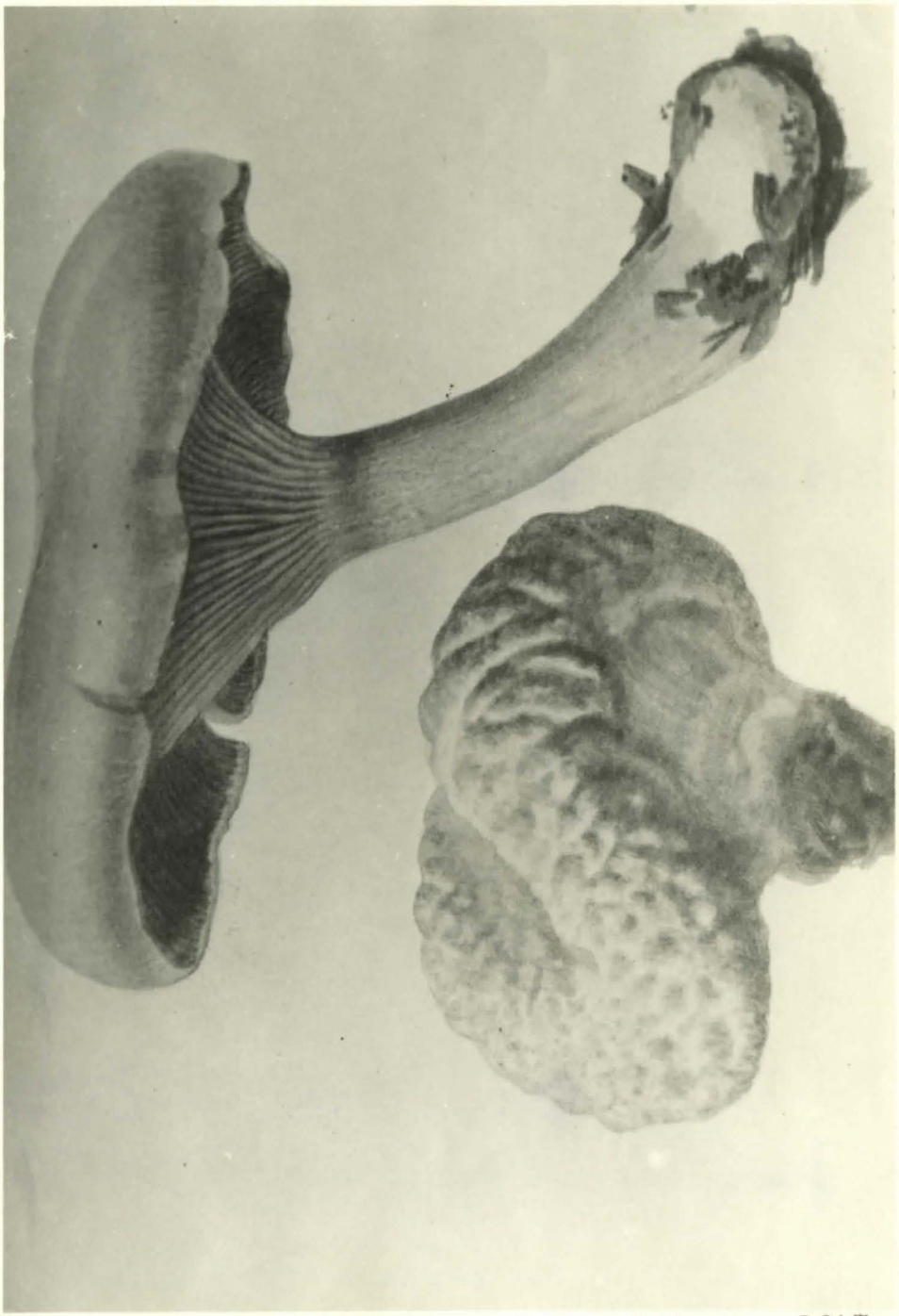
The abortive clitopilus grows with an imperfect form in which there is no distinction of pileus, stipe or lamellae. It is an irregular mass of white cellular tissue.

The well-developed form is a neat appearing mushroom. It is found growing on the ground or on decayed wood in wooded areas or open fields. Commonly found in groups, occasionally single or tufted. August to October. Edible.

2. Clitopilus prunulus: (Plum Clitopilus, Prune Clitopilus) PLATE IX.

Pileus

Fleshy; broadly convex or nearly flat, occasionally depressed at the center; dry; white or gray; margin wavy; flesh white; 5 to 7.5



--Adapted from Krieger, 1947

PLATE VIII. Clitopilus abortivus: (Abortive Clitopilus)

cm. broad.

Lamellae

Far apart and decurrent; white when young, later salmon pink.

Stipe

White, solid, smooth, 2.5 to 5 cm. long.

Spores

Salmon pink, elliptical, pointed ends, 10 to 12.5 microns long.

The plum clitopilus is found growing in wooded areas in warm, wet weather. Found solitary or in groups. July to August. Edible.

THE GENUS COLLYBIA

All species of the genus Collybia have white spores and lamellae free from the stipe.

SPECIES OF COLLYBIA

1. Collybia acervata: (Tufted Collybia)

Pileus

Fleshy; convex, becoming expanded or flat; 2.5 to 5 cm. broad; smooth; pale tan or flesh-red when wet, white when dry.

--Adapted from Krieger, 1947

PLATE IX. Clitopilus prunulus: (Plum Clitopilus)

Lamellae

Narrow and close together, thin, rounded near the stipe, adnexed or free, white.

Stipe

Cylindrical and slender, hollow, smooth, glaucous, ridged and brittle, reddish-brown, 5 to 7.5 cm. long.

Spores

White, elliptical, 5 to 7.5 microns in diameter.

The tufted collybia is found growing in wooded areas of hilly regions. It grows in dense tufts on decaying trunks of trees. August through September. Edible.

2. Collybia dryophila: (Oak-loving Mushroom)

Pileus

Dark tan or yellow; tough; convex or flat, occasionally depressed at the center; 1.7 to 5 cm. broad; margin wavy and involuted when young; surface smooth and dry; flesh thin.

Lamellae

Adnexed and serrated near the stipe, close together, white or yellow.

Stipe

Cartilaginous, smooth, brown, bulbous near base, 2.5 to 7.5 cm. long.

Spores

White, egg-shaped, hyaline, 10 to 12 microns long.

The oak-loving collybia grows in wooded areas and pastures. It is common under oak and beech trees. Early spring to late autumn. Edible.

3. Collybia platyphylla: (Broad-filled Collybia)

Pileus

Thin, fragile, convex or flat, 7.5 to 12.5 cm. broad, margin occasionally upturned, grayish-brown or blackish-brown, flesh white.

Lamellae

Broad and far apart, serrated near the stipe, white.

Stipe

Stout and fleshy but with a cartilaginous rind, pithy, white, 7.5 to 12.5 cm. long.

Spore

White, nearly globular, 7.5 to 10 microns in diameter.

This species has an agreeable odor similar to anise, but when old has a disagreeable odor. They are found growing about stumps, on rotting trees, or in open fields. May to November. Edible.

THE GENUS COPRINUS

The genus Coprinus is easily distinguished by the lamellae of the mature plant. These assume a black color and slowly dissolve into an inky fluid. The thin pileus soon wastes away. An annulus is present in most species and the spores are black, rarely brown. Most species are small, thin, and perishable.

SPECIES OF COPRINUS

1. Coprinus atramentarius: (Inky Coprinus, Common Inkcap)

Pileus

Egg-shaped when young, expanded with age; 2.5 to 7.5 cm. broad; smooth or scaly in center; grayish-brown or yellow; margin notched or lobed; flesh white but soon liquifying.

Lamellae

Close together, white when young, becoming black and liquifying with age.

Stipe

Slender, smooth, hollow, white, annulus soon disappears, 5 to 10 cm. long.

Spores

Black, elliptical, 7.5 to 10 microns long.

The inky coprinus is abundant on lawns and open places. Late summer to autumn. Edible.

2. Coprinus comatus: (Shaggy-mane Mushroom) PLATE X.

Pileus

Cylindrical, bell-shaped or expanded, 3.5 to 7.5 cm. long before expanding, margin split, white or with yellow scales.

Lamellae

Close together; white, later becoming pink, then black and liquefying.

Stipe

White, smooth, hollow, long, annulus soon disappears, 7.5 to 12.5 cm. long.

Spores

Black elliptical, 12.5 to 17.5 microns long.

The shaggy-mane coprinus is found growing on lawns and in pastures. Late summer to late autumn. Edible.

--Adapted from Pray, 1936

PLATE X. Coprinus comatus: (Shaggy-mane Mushroom)

3. Coprinus micaceus: (Glistening Coprinus, Glistening Ink-cap) PLATE XI.

Pileus

Bell-shaped or expanded; 2.5 to 5 cm. broad; thin; striated from margin to center; smooth or glistening with shining particles when young, black or brown when old.

Lamellae

Close together; white when young, becoming pink, brown, black, then liquefying.

Stipe

White, slender, fragile, smooth, hollow, 2.5 to 7.5 cm. long.

Spores

Brown (which is unusual in this genus since other species have black spores), elliptical, 5 to 7 microns in diameter.

The glistening coprinus is a common species found growing on lawns or in pastures. In wet weather, it deliquesces into an inky fluid, but remains firm in dry weather. Summer to autumn. Edible.

THE GENUS CORTINARIUS

The genus Cortinarius is distinguished by its

PLATE XI. Coprinus micaceus: (Glistening Coprinus)

rusty-brown spores and secondary veil. The lamellae of all species are attached by their inner ends while the free edges are bent or serrated.

SPECIES OF CORTINARIUS

1. Cortinarius alboviolaceus: (Pale Violet Cortinarius)

Pileus

Convex or umbonate; 2.5 to 7.5 cm. broad; pale violet, buff, or silvery white with a violet tint; smooth; dry and shining; retrorse.

Lamellae

Adnate or decurrent; occasionally notched; broad and close together; pale violet when young, turns brown with age.

Stipe

Thick and tapering downward; violet above, occasionally stained rusty by falling spores; 5 to 11.5 cm. long.

Spores

Rusty-brown, slightly rough, elliptical, 5 to 7.5 microns in diameter.

The pale violet cortinarius is found growing on the ground in wooded areas. Good specimens are rare because insects are fond of this species. Late summer

through autumn. Edible.

2. Cortinarius cinnamomeus: (Cinnamon Cortinarius)

Pileus

Thin; convex, expanded or umbonate; 2.5 to 5 cm. broad; dry; smooth and silky; rusty or tawny-brown; flesh yellow or cinnamon brown.

Lamellae

Thin, adnate and close together, yellow.

Stipe

Slender and long, cylindrical, pithy or hollow, yellow or tawny-brown, 2.5 to 7.5 cm. long.

Spores

Ochre, elliptical, 7.5 microns long.

The cinnamon cortinarius is found growing on the ground in wooded areas. Has odor of radishes. Summer to autumn. Edible.

3. Cortinarius corrugatus: (Corrugated Cortinarius)

Pileus

Coarsely corrugated; bell-shaped or convex; 5 to 10 cm. broad; viscid; bright yellow, reddish-yellow, tawny or rusty; flesh white.

Lamellae

Attached to stipe, close together and undulated on free edges, tawny or rust-colored.

Stipe

Long and cylindrical, hollow; bulbous at base, viscid, pale yellow, 7.5 to 12.5 cm. long.

Spores

Ochraceous, broadly elliptical, rough, 7.5 to 10 microns in diameter.

The corrugated cortinarius is easily recognized by the corrugated pileus and viscid stipe. It is found growing on the ground in wooded areas, usually in groups. June to September. Edible.

THE GENUS CREPIDOTUS

Mushrooms of the genus Crepidotus have a wedge-shaped or spatulate-shaped pileus. All species are of small size, thin and soft. If a stipe is present, it is attached at the margin of the pileus. The genus resembles Pleurotus among the white-spored genera and Claudopus among the pink-spored genera.

SPECIES OF CREPIDOTUS

1. Crepidotus applanatus: (Flattened Agaric)

Pileus

Thin; flat, convex, wedge- or spatulate-shaped; 1.7 to 2.5 cm. broad; white; striated; margin attached to decaying trees.

Lamellae

Narrow and close together; white or cinnamon brown; decurrent, if stipe is present.

Stipe

Either absent or attached at margin of the pileus.

Spores

Rusty, Globular, 5 to 7.5 microns in diameter.

The flattened agaric is found growing on decayed stumps and trees. Found singly or in clusters. July to September. Edible.

2. Crepidotus malachius: (Soft-skinned Crepidotus)

Pileus

Fleshy; thick at margin; convex, flat, or wedge-shaped; 2.5 to 6.5 cm. broad; hygrophanous; white; striated; flesh white.

Lamellae

Thin and close together, rounded near stipe, white or rust-colored.

Stipe

Short and attached at margin of pileus, occasionally absent.

Spores

Rusty, globular, 5 to 7.5 microns in diameter.

The soft-skinned crepidotus is found growing on damp decaying wood in shady areas. It is distinguished from other species of the genus by the smooth pileus and hygrophanous appearance. June to September. Edible.

THE GENUS ENTOLOMA

Mushrooms of this genus have neither annulus nor volva. The lamellae are attached, decurrent, and pink. The color is due to rose-colored spores. They resemble the genus Agaricus but differ in the color of the lamellae.

SPECIES OF ENTOLOMA

1. Entoloma commune: (Common Entoloma)

Pileus

Thin; convex when young, flat, depressed and irregular when old; 2.5 to 5 cm. broad; dry; striated or lobed; brown or rich tan.

Lamellae

Rose-pink, notched at stipe.

Stipe

Short and twisted; white or tan; glabrous below, glaucous above; 3.7 to5cm. long.

Spores

Pink, angular, 6 to 8 microns in diameter.

The common entoloma is found growing in wooded areas in groups or tufts. Taste branny. July to September. Poisonous.

2. Entoloma grayanum: (Gray Entoloma)

Pileus

Thin; convex when young, flat when mature; 2.5 to 7.5 cm. broad; smooth; white or brownish-gray; flesh white.

Lamellae

Decurrent; rounded at stipe; white when young, pink when mature.

Stipe

Cylindrical; solid, pithy, or hollow; white; 3.7 to 7.5 cm. long.

Spores

Pink, angular, 7.5 to 10 microns in diameter.

The gray entoloma is found growing on the ground in wooded areas. It grows in groups, clusters, or singly. The lamellae remain pink when mature, never turning black as in Coprinus. July to September. Edible.

THE GENUS FLAMMULA

Practically all mushrooms of the genus Flammula grow on decaying wood. The lamellae are decurrent and attached to the stipe. The spores are rust-colored.

SPECIES OF FLAMMULA

1. Flammula flavida: (Bitter Flammula)

Pileus

Thin and fleshy, convex or flat, 2.5 to 5 cm. broad, smooth, viscid, pale yellow or white.

Lamellae

Adnate; pale yellow when young, rust-colored when mature.

Stipe

Smooth, curved, hollow, white or pale yellow, 2.5 to 7.5 cm. long.

Spores

Rust-colored, elliptical, 6 to 8 microns in diameter.

The bitter flammula is found growing on the ground or on decaying wood in wooded areas. The taste is bitter. Early summer to late autumn. Edible.

THE GENUS GALERA

The genus Galera resembles the genus Mycena except for rust-colored spores. Mushrooms of this genus have neither annulus nor volva.

SPECIES OF GALERA

1. Galera hypnorum: (Brownie CapP

Pileus

Thin; conical or bell-shaped; 0.6 to 1.2 cm. broad; smooth; rust, yellow, or buff colored; striated when moist.

Lamellae

Adnate and far apart, broad, tawny or cinnamon colored, occasionally glaucous on edges.

Stipe

Slender, hollow, smooth, rust or yellow, 2.5 to 5 cm. long.

Spores

Rusty, elliptical, 10 to 12 microns long.

The brownie cap is found growing on the ground or on decaying trees in wooded areas. Common in hilly areas. June to September. Edible.

2. Galera tenera: (Slender Coenocybe)

Pileus

Conical or bell-shaped, 1.2 to 2.5 cm. broad, smooth or slightly glaucous, hygrophanous, tan or brown.

Lamellae

Adnexed and close together, tawny.

Stipe

Slender, cylindrical, smooth; hollow, tan or brown, 7.5 to 11.2 cm. long.

Spores

Dark rusty, smooth, elliptical, 6 to 8 microns in diameter.

The slender coenocybe is found growing on lawns and in pastures. It grows in clusters or singly. Spring to autumn. Edible.

THE GENUS HEBELOMA

Mushrooms of this genus have clay-colored spores but are classified with the rusty-spored genera. The lamellae extend to the stipe but are not attached. An annulus is present in young plants.

SPECIES OF HEBELOMA

1. Hebeloma precox: (Early Hebeloma)

Pileus

Convex, expanded, or umbonate; 3.7 to 5 cm. broad; smooth; margin involute; tawny or rust colored; flesh white.

Lamellae

Arched and close together; notched at stipe; pallid when young, tawny when mature.

Stipe

Fleshy, brittle, pithy or hollow, cream-colored, 2.5 to 5 cm. long.

Spores

Pale yellow, ovoid, smooth, 3 to 4 microns in diameter.

The early hebeloma is found growing on the ground in wooded areas. It is uncommon and is found only in

June. Poisonous.

THE GENUS HYGROPHORUS

Mushrooms of the genus Hygrophorus have white spores and soft, waxy lamellae which are decurrent and notched near the stipe. This genus resembles the genus Clitocybe but the lamellae are thicker and farther apart in the Hygrophorus.

SPECIES OF HYGROPHORUS

1. Hygrophorus cantharellus: (Chantarelle Hygrophorus)

Pileus

Thin; convex or umbilicate; 1.2 to 2.5 cm. broad; smooth or scaly; red, orange, or yellow.

Lamellae

Broad and far apart; waxy; arched; decurrent; white or yellow, occasionally tinged with red.

Stipe

Slender and fragile, smooth, pithy or hollow, orange or yellow, 2.5 to 7.5 cm. long.

Spores

White, elliptical, 7.5 to 10 microns in diameter.

The chantarelle hygrophorus is found growing in

damp soil in wooded areas and open fields. It usually grows in clusters. June to August. Edible.

2. Hygrophorus chlorophanus: (Sulphury Hygrophorus)

Pileus

Thin and fragile; convex, flat, or irregular; 2 to 4.5 cm. broad; margin split or lobed; pale yellow.

Lamellae

Thin and far apart, broad, extend to stipe, pale yellow.

Stipe

Smooth, cylindrical, hollow, viscid, pale yellow, 3.75 to 7.5 cm. long.

Spores

White, ovoid, hyaline, 5 to 7.5 microns in diameter.

The sulphury hygrophorus is found growing on the ground in damp places. July to September. Edible.

3. Hygrophorus conicus: (Conical Hygrophorus)

Pileus

Thin and fragile; waxy; viscid; conical, with an acute apex; 1.2 to 3.7 cm. broad; margin

often lobed; red or yellow.

Lamellae

Free from stipe and close together, waxy, narrow, yellow.

Stipe

Fragile, hollow, yellow, 5 to 10 cm. long.

Spores

White, elliptical, 6 to 8 microns in diameter.

The conical hygrophorus is distinguished by its conical pileus with the acute apex. Found growing on moist ground in wooded areas and open places. August to October. Edible.

4. Hygrophorus pratensis: (Meadow Hygrophorus)

Pileus

Firm; convex, flat, or irregular; 2.5 to 7.5 cm. broad; smooth; tawny or white.

Lamellae

Thick and far apart, decurrent, waxy, white or yellow, spaces between lamellae are often veined.

Stipe

Cylindrical, smooth, pithy or hollow, tawny

or white, 5 to 7.5 cm. long.

Spores

White, ellipsoid, hyaline, 5 to 6 microns in diameter.

The meadow hygrophorus is found growing on the ground in pastures and grassy places. Grows in groups, tufts, or scattered. July to September. Edible.

THE GENUS HYPHOLOMA

The genus Hypholoma is distinguished by fragments of the outer veil adhering to the pileus. The species usually grow on decaying wood. They are cespitose. Spores are brown or purple-brown. This genus resembles, in structure, the white-spored genus Tricholoma, the pink-spored genus Entoloma, and the rusty-spored genus Hebeloma.

SPECIES OF HYPHOLOMA

1. Hypholoma appendiculatum: (Appendiculate Hypholoma)

Pileus

Convex or flat, 2.5 to 5 cm. broad, thin; fleshy, smooth and hygrophanous, yellow or tawny-brown.

Lamellae

Adnate and close together; white or cream-colored when young, turning purplish-brown with age.

Stipe

Slender, cylindrical, smooth, hollow, white, 5 to 7.5 cm. long.

Spores

Purplish-brown, ovoid, smooth, 5 to 7 microns in diameter.

The appendiculate hypholoma is found growing on decaying wood. It grows in dense tufts, and is very hygrophanous. August to October. Edible.

2. Hypholoma incertum: (Uncertain Hypholoma) PLATE XII.

Pileus

Thin and fragile; convex or flat; 2.5 to 7.5 cm. broad; hygrophanous; surface radically wrinkled; white, tinged with yellow; flesh white.

Lamellae

Adnate and close together; thin and narrow; white, turning purplish-brown with age.

Stipe

Cylindrical, hollow, splits easily, white, 2.5 to 7.5 cm. long.

Spores

Purplish-brown, elliptical, 8 to 10 microns in diameter.

The uncertain hypholoma is found growing on lawns and near roadsides. This species differs from appendiculate hypholoma in having larger spores, paler pileus, and a gregarious habit. May to September. Edible.

THE GENUS INOCYBE

Mushrooms of the genus Inocybe are small, brown and have rust-colored spores. The spores are round, angular, or rough. The lamellae of all species extend to the stipe but are not attached.

SPECIES OF INOCYBE

1. Inocybe rimosa: (Cracked Inocybe)

Pileus

Thin; convex, bell-shaped, or expanded; 2.5 to 5 cm. broad; surface silky, with radiating cracks; yellowish-brown.

--Adapted from Krieger, 1947

PLATE XII. Hypholoma incertum: (Uncertain Hypholoma)

Lamellae

Adnate and close together, pallid or tan.

Stipe

Cylindrical, firm, solid, enlarged at base, 2.5 to 5 cm. long.

Spores

Dull-rusty, elliptical, 7 to 9 microns in diameter.

The cracked inocybe is found growing on the ground in wooded areas. It grows singly or clustered. July to August. Edible.

THE GENUS LEPIOTA

Mushrooms of the genus Lepiota resemble those of Amanita and Amanitopsis in having white spores and lamellae free from the stipe but differ in having no volva or warts. There is an annulus.

SPECIES OF LEPIOTA

1. Lepiota americana: (American Lepiota)

Pileus

Convex, expanded, or umbonate; 2.5 to 10 cm. broad; white or tinged with red.

Lamellae

Close together and free from stipe, forked or joined near inner end, white.

Stipe

Has an annulus, hollow, enlarged at base, white, 7.5 to 12.5 cm. long.

Spores

White, elliptical, one nucleus, 7.5 to 10 microns in diameter.

The american lepiota is found growing in grassy places and on decaying trees. July to October. Edible.

2. Lepiota procera: (Parasol Mushroom, Tall Lepiota) PLATE XIII.

Pileus

Thin; convex or umbonate, 7.5 to 12.5 cm. broad, brown or reddish-brown, occasionally scaly, flesh soft and white.

Lamellae

Close together, inner ends free from stipe, white or yellow.

Stipe

Has a thick, movable annulus; hollow or pithy; bulbous near the base; 12.5 to 25 cm. long.

Spores

White, elliptical, 12 to 17 microns long.

The tall lepiota is found growing on the ground in thinly wooded areas. Occasionally expanded but usually convex like an open umbrella. July to September. Edible.

THE GENUS MARASMIUS

Mushrooms belonging to the genus Marasmius are distinguished by their tough, leathery pileus and white spores. They all have a faint odor of garlic and do not decay.

SPECIES OF MARASMIUS

1. Marasmius campanulatus: (Bell-shaped Marasmius)

Pileus

Thin, convex or bell-shaped, 0.6 to 1.2 cm. broad, smooth or radially striated, rusty red.

Lamellae

Few and far apart, narrow near stipe, free or slightly attached, white.

Stipe

Tough, smooth and shining, hollow, blackish-

--Adapted from McDougall, 1925

PLATE XIII. Lepiota procera: (Parasol Mushroom)

brown, 2.5 to 5 cm. long.

Spores

White, oblong, 2 to 4 microns in diameter.

The bell-shaped marasmius is found growing on the ground in wooded areas. July to September. Edible.

2. Marasmius oreades: (Fairy-ring Mushroom)

Pileus

Firm and tough; convex, expanded or umbonate; 2.5 to 5 cm. broad; buff or tawny; flesh thin and white.

Lamellae

Broad and far apart; free from stipe, white or yellow.

Stipe

Tough, smooth, hollow or pithy, blackish-brown, 2.5 to 5 cm. long.

Spores

White, elliptical, 7.5 to 10 microns long.

The fairy-ring mushroom has received its name from the tendency to grow in rings or circles. Found growing on the ground in Open fields. May to October. Edible.

THE GENUS NAUCORIA

Mushrooms of this genus have dark rusty spores and resemble the genus Collybia. The stipe is not distinctly ringed but sometimes a spore-stained band marks the place of the obsolete annulus.

SPECIES OF NAUCORIA

1. Naucoria semiorbicularis: (Common Naucoria)

Pileus

Hemispherical, convex, or flat; 2.5 to 5 cm. broad; surface often cracked with age; viscid; tawny or rust-colored.

Lamellae

Adnexed or adnate, broad and close together, rust-colored.

Stipe

Tough, smooth, enlarged at base, pithy, yellowish-brown or reddish-brown, 7.5 to 10 cm. long.

Spores

Rusty, smooth, elliptical, 5 to 7 microns in diameter.

The common naucoria is found growing on the ground

in pastures and open fields. May to November. Edible.

THE GENUS OMPHALIA

Mushrooms of the genus Omphalia have white spores, decurrent lamellae, cartilaginous stipes, and a thin pileus. The pileus is usually umbilicate.

SPECIES OF OMPHALIA

1. Omphalia campanella: (Bell-shaped Omphalia)

Pileus

Thin and rather tough, convex and umbilicate, 0.6 to 2.5 cm. broad, striated; hygrophanous, dull yellow to rusty.

Lamellae

Narrow, decurrent, arched, yellow.

Stipe

Slender, hollow, pale brown, tufts of hairs at base, 1.2 to 3.7 cm. long.

Spores

White, elliptical, smooth, hyaline, 10 to 12 microns in diameter.

The bell-shaped omphalia is found growing on rotting trees in wooded areas. It is recognized by its yellow-red pileus, dark brown stipe, and tufts of hairs on stipe. June to October. Edible.

2. Omphalia fibula: (Common Omphalia)

Pileus

Thin, umbilicate, 0.3 to 0.6 cm. broad, smooth; yellow or pale orange.

Lamellae

Narrow, arched and close together, decurrent; white.

Stipe

Slender, smooth, hollow, white, 2.5 to 5 cm. long.

Spores

White, elliptical, smooth, 2 to 3 microns in diameter.

The common omphalia is found growing on the ground in pastures and open fields. June to October. Edible.

THE GENUS PANAEOLUS

Mushrooms of the genus Panaeolus have black spores and lamellae that are black-spotted but have white edges. The veil which extends from pileus to stipe is prominent in all species.

SPECIES OF PANAEOLUS

1. Panaeolus campanulatus: (Bell-shaped Panaeolus)

Pileus

Oval, bell-shaped, or umbonate; 1.2 to 2.5 cm. broad; brownish, with a grayish tint; margin scalloped.

Lamellae

Adnate; reddish when young, dusted with black spores when old.

Stipe

Slender, hollow, glaucous, reddish, 10 to 15 cm. long.

Spores

Black, elliptical, 12 to 14 microns in diameter.

The bell-shaped panaeolus is found growing on the ground in open areas. June to July. Edible.

2. Panaeolus retirugis: (Wrinkled Panaeolus)

Pileus

Conical or bell-shaped, umbonate, 1.2 to 3.7 cm. broad, viscid, gray or brownish, with a network of cracks near center.

Lamellae

Adnate, broad, unevenly colored and mottled with black or brown.

Stipe

Slender and hollow, glaucous, gray or reddish-brown, 5 to 15 cm. long.

Spores

Black, elliptical, smooth, 9 to 11 microns in diameter.

The wrinkled panaeolus is found growing on the ground in open fields. Easily recognized by the netted and wrinkled pileus. Early spring to late summer. Edible.

THE GENUS PANUS

Mushrooms of the genus Panus are leathery, tough, and have white spores. If a stipe is present, it is attached at the margin of the pileus. Lamellae are decurrent. All mushrooms of this genus are firm when young.

SPECIES OF PANUS

1. Panus stypticus: (Astringent Panus)

Pileus

Tough, shell or kidney shaped, 0.6 to 1.8 cm. broad, scaly, margin lobed, tawny, flesh white.

Lamellae

Narrow and thin, close together and connected, tawny.

Stipe

Short and solid, marginal, buff or dull white.

Spores

White, elliptical, 2 to 4 microns in diameter.

The astringent panus is found growing on decaying trees in wooded areas. It is phosphorescent and produces an astringent effect when eaten. Earily autumn to early winter. Edible.

THE GENUS PHOLIOTA

Mushrooms of the genus Pholiota have rusty or ochraceous spores. The stipe and pileus are continuous and hard to separate.

SPECIES OF PHOLIOTA

1. Pholiota adiposa: (Fat Pholiota)

Pileus

Fleshy but firm; conical, expanding when mature; 2.5 to 10 cm. broad; viscid; surface scaly; yellow; flesh white.

Lamellae

Adnate and close together; yellow, becoming rusty with age.

Stipe

Cylindrical, flaky annulus, yellow or reddish toward base, 5 to 10 cm. long.

Spores

Rusty, elliptical, 7.5 to 10 microns in diameter.

The fat pholiota is found growing on decaying trees in wooded areas. It grows singly or in tufts. September to November. Edible.

2. Pholiota discolor: (Fading Pholiota) PLATE XIV

Pileus

Thin, convex or flat, 2.5 to 5 cm. broad, hygrophanous, cinnamon-colored, flesh white.

Lamellae

Adnate; narrow and close together; pallied, becoming rusty with age.

Stipe

Cylindrical or tapering upward, a persistent annulus, fibrous, pallid or brown, 2.5 to 6.5 cm. long.

Spores

Rusty or brown, elliptical, 5 to 8 microns in diameter.

The fading pholiota is found growing on decaying trees in wooded areas. July to October. Edible.

3. Pholiota precox: (Early Pholiota)

Pileus

Convex, flat, or umbonate; 2.5 to 5 cm. broad; soft and smooth; white, later tinged with rusty brown; flesh white.

Lamellae

Adnexed and close together; white, turning rusty-brown with age.

Stipe

Slender, pithy or hollow, smooth, annulus near top, white or rusty brown, 3.7 to 7.5 cm. long.

Spores

Rusty-brown, elliptical, 10 to 12.5 microns long.

The early pholiota is found growing on the ground in grassy places. The annulus and habitat distinguish it from similarly colored species. Early spring to mid-summer. Edible.

--Adapted from Krieger, 1947

PLATE XIV. Pholiota discolor: (Fading Pholiota)

THE GENUS PLEUROTUS

Mushrooms of the genus Pleurotus grow only on rotting wood. They resemble the genera Tricholoma and Clitocybe but have laterally attached stipe. The lamellae are rounded or notched near the stipe in most species but occasionally are decurrent.

SPECIES OF PLEUROTUS

1. Pleurotus sapidus: (Sapid Pleurotus)

Pileus

Convex or concave; 5 to 12.5 cm. broad; smooth; white, yellow, or dull lilac; flesh white.

Lamellae

Broad and far apart, decurrent and branching, white or yellow.

Stipe

Tufted, several growing from common base, solid, laterally attached, white, 2.5 to 5 cm. long.

Spores

Pale lilac, oblong, 7.5 to 10 microns long.

The sapid pleurotus is found growing on rotting trees. They are easily distinguished by the lilac tint of the spores. Even though the spores are lilac this

species is classified with the white-spored mushrooms.

2. Pleurotus ulmarius: (Elm Pleurotus)

Pileus

Convex or flat, 7.5 to 12.5 cm. broad, firm, smooth, white or tinged with yellow, flesh white.

Lamellae

Adnexed, broad and far apart, notched near stipe, white or tinged with yellow when old.

Stipe

Firm and solid, laterally attached, smooth but glaucous near the base, 5 to 10 cm. long.

Spores

White, globular, 5 to 7.5 microns in diameter.

The elm pleurotus is found growing in dead organic material under elm, maple or poplar trees. September to November. Edible.

THE GENUS PLUTENS

Mushrooms of the genus Pluteus have pink spores. They resemble the white-spored Lepiotas but have no annulus or volva. This genus has only pink-spored ones with lamellae free from the stipe.

SPECIES OF PLUTEUS

1. Pluteus cervinces: (Fawn-colored Pluteus)

Pileus

Bell-shaped or expanded; 5 to 6.2 cm. broad; smooth or slightly fibrous; brown, white, or yellow; viscid.

Lamellae

Broad and free from stipe, pink or flesh-colored.

Stipe

Cylindrical or enlarged at base, solid and smooth, brittle, white, 5 to 15 cm. long.

Spores

Flesh-colored, elliptical, smooth, 5 to 8 microns in diameter.

The fawn-colored pluteus is found growing on the ground on decaying wood in moist places. This species is common but not abundant. May to October. Edible.

THE GENUS PSATHYRELLA

Mushrooms of the genus Psathyrella have black spores. The pileus lies against the stipe, when young. The lamellae are of uniform color, not spotted as in

the genus Panaeolus.

SPECIES OF PSATHYRELLA

1. Psathyrella disseminata: (Disseminating Psathyrella)

Pileus

Thin and fragile, ovoid or bell-shaped, 0.6 to 1.2 cm. broad, margin striated, white or grayish-brown.

Lamellae

Few and far apart; adnexed; white, turning purple, then black with age.

Stipe

Slender and fragile, hollow, white, 2.5 to 7.5 cm. long.

Spores

Black, oblong, 8 to 10 microns in diameter.

The disseminating psathyrella is found growing on the ground and on decaying wood in wooded areas. Usually grows in tufts. They resemble small species of Coprinus in becoming black and soft, but the lamellae do not deliquesce. Late spring to late autumn. Edible.

THE GENUS PSILOCYBE

Mushrooms of the genus Psilocybe grow in the ground and are very small. In all species, the margin of the pileus is involuted when young.

SPECIES OF PSILOCYBE

1. Psilocybe foenisecii: (Harvest Mushroom)

Pileus

Conical, convex or bell-shaped; 1.2 to 2.5 cm. broad; smooth; hygrophanous; smoke-brown or reddish-brown.

Lamellae

Adnate and broad, far apart, brown.

Stipe

Slender and cylindrical, hollow and fragile, smooth or pruinose, pallid or brownish, 5 to 7.5 cm. long.

Spores

Brown, smooth, elliptical, 6 to 9 microns in diameter.

The harvest mushroom is found growing on decaying organic matter in open places. Early spring to late autumn. Edible.

THE GENUS STROPHARIA

Mushrooms of the genus Stropharia have purplish-brown spores, lamellae free from stipe, and an annulus. There is no volva.

SPECIES OF STROPHARIA

1. Stropharia semiglobata: (Hemispheric Stropharia) PLATE XV.

Pileus

Hemispherical, 1.2 to 3.7 cm. broad, smooth, viscid, fleshy, light yellow.

Lamellae

Broad and adnate; yellow when young, purplish-brown or black when old.

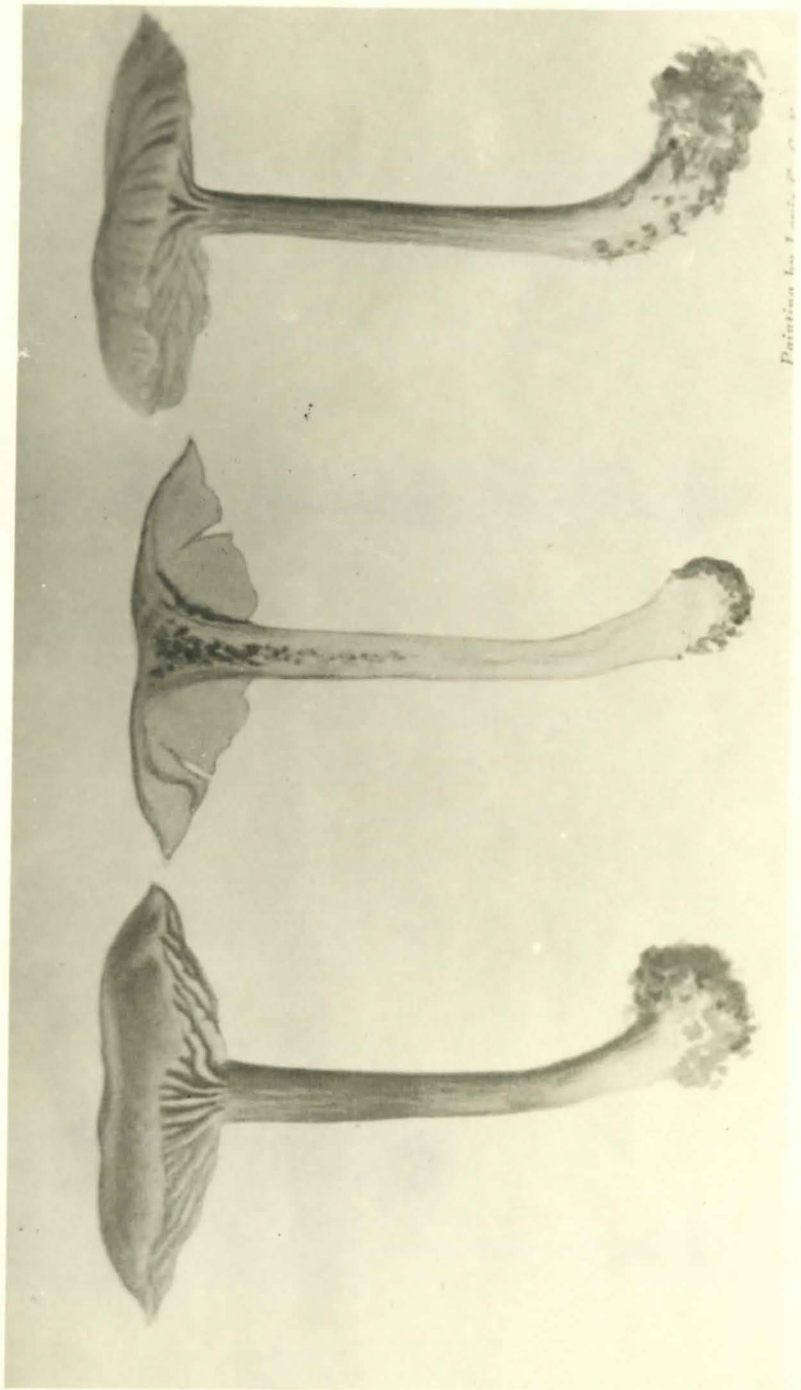
Stipe

Slender and smooth, viscid, cylindrical or with a volva, annulus near top, hollow, light yellow, 5 to 12.5 cm. long.

Spores

Brownish-purple, elliptical, smooth, 9 to 10 microns in diameter.

The hemispheric stropharia is found growing on the ground in open fields. The pileus is as perfect a hemisphere as can be found among living plants. May to Sep-



--Adapted from McDougall, 1925

PLATE XV. Stropharia semiglobata:
(Hemispheric Stropharia)

tember. Poisonous.

THE GENUS TRICHOLOMA

Mushrooms of the genus Tricholoma have white spores and notched lamellae which are attached to the stipe. There is no annulus.

SPECIES OF TRICHOLOMA

1. Tricholoma personatum: (Masked Tricholoma)

Pileus

Convex or expanded; 5 to 12.5 cm. broad; smooth; firm; thick; white, lilac or violet.

Lamellae

Close together and rounded near the stipe; free; white, lilac or violet.

Stipe

Stout and bulbous at base, glaucous, lilac or violet, 2.5 to 7.5 cm. long.

Spores

Dull white, elliptical, smooth, 7 to 10 microns in diameter.

The masked tricholoma is found growing on the ground in thinly wooded areas. Occurs singly or in groups. September until the first frost. Edible.

2. Tricholoma russula: (Reddish Tricholoma)

Pileus

Fleshy but firm, 5 to 12.5 cm. broad, smooth or dotted with small scales, pale pink or red, viscid.

Lamellae

Rounded or notched near the stipe; decurrent; white, becoming red-spotted when old.

Stipe

Solid, firm, white or reddish, top scaly, 2.5 to 5 cm. long.

Spores

White, elliptical, 5 to 7.5 microns in diameter.

The reddish tricholoma is found growing on the ground in wooded areas. It grows in groups or clusters. August to October. Edible.

3. Tricholoma sejunctum: (Separating Tricholoma)

Pileus

Convex, expanded, or umbonate; 2.5 to 7.5 cm. broad; viscid; fleshy; white or yellow; flesh white.

Lamellae

Broad and far apart, rounded or notched near stipe, white.

Stipe

Solid and stout, often irregular, white, 2.5 to 7.5 cm. long.

Spores

White, nearly spherical, 7.5 microns in diameter.

The separating tricholoma is found growing in sandy soil of wooded areas. They usually grow under oak or beech trees. August to October. Edible.

THE GENUS VOLVARIA

Mushrooms of the genus Volvaria are entirely enclosed in a volva when young. The genus is characterized by rosy or reddish-colored spores. There is no annulus.

SPECIES OF VOLVARIA

1. Volvaria bombycina: (Silky Volvaria)

Pileus

Globular when young, bell-shaped or convex when mature; 5 to 20 cm. broad; white; glau-

cous; flesh white.

Lamellae

Broad and close together, free from stipe, flesh-colored.

Stipe

Smooth, solid; volva large, thick at base; white; 7.5 to 15 cm. long.

Spores

Rosy-pink or flesh-colored, elliptical, 5 to 7 microns in diameter.

The silky volvaria is found growing in open areas on the ground and on rotting wood. It resembles the genus Amanitopsis in having a volva and no annulus but differs in the spore color. June to October. Edible.

GLOSSARY

Adnate. Growing into or fast to; said of gills that are attached broadly to the stipe.

Adnexed. Gills which are adjacent to the stipe but not broadly attached to it.

Agaric. Mushrooms having a fleshy cap, on the under side of which are gills.

Annulus. The collar or ring on the stipe of a mushroom formed by the separation of the veil from the margin of the cap.

Astringent. Puckery to the taste.

Basidia. Mother cells on the spore-bearing surface of agarics and certain other fungi, from which the spores are borne.

Bulbous. Stem of a mushroom when it has a bulb-like swelling at the base.

Campanulate. Bell-shaped.

Cartilaginous. Firm and tough, gristly.

Cespitose. Growing in tufts or clusters.

Convex. Elevated and regularly rounded.

Decurrent. Gills which extend down the stem of a mushroom.

Deliquescent. Mushrooms that liquefy or melt when old.

Dichotomous. Dividing into two, gills that are regularly forked.

Elliptical. Parallel-sided and rounded on the ends.

Flesh. Inner substance of the cap or body of a fungus.

Floccose. Downy; wooly; flaky.

Gills. Plates attached to the lower surface of a pileus or cap.

Globular. Nearly spherical.

Gregarious. In groups (not tufts).

Hyaline. Transparent, clear, like glass.

Hygrophanous. Water-soaked appearance when moist but opaque when dry.

Hymenium. Spore-bearing surface covering each side of the gill.

Hypha. Cylindrical thread of the mycelium.

Lamella. A gill.

Leucosporae. Group of mushrooms having white spores.

Mycelium. Spawn of fungi; rootlike threads resulting from the germination of spores.

Ochraceous. Color of ochre.

Pallid. Pale, deficient in color.

Pileus. Cap or head of a mushroom.

Porphyrosporae. Group of mushrooms that have purple or purplish-brown spores.

Rhodosporae. Group of mushrooms that have pink or rosy spores.

Rimose. Cracked.

Ring. Part of the partial veil adhering to the stem of a mushroom like a collar; annulus.

Sapid. Savory; agreeable to the taste.

Sessile. Attached by the base and without a stem.

Spore. Minute cell, the reproductive body of mushrooms.

Stipe. Stem of a mushroom.

Tawny. Color of tanned leather.

Umbilicate. Provided with a pit or central depression; a navel-like depression at the center.

Umbonate. With a central knob.

Universal veil. Outer wrapper or membrane which envelops a sporophyte in its youngest stage.

Viscid. Moist and sticky; glutinous.

Volva. Cup-like structure at the base of the stipe.

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