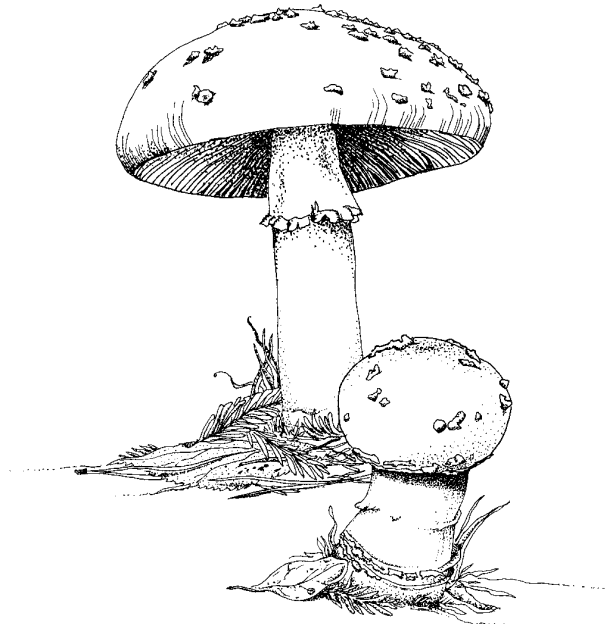


Common Mushrooms and Other Fungi of Salt Point, California



PP 135
Field Identification of Mushrooms

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These keys are designed to be used with *Mushrooms Demystified* by David Arora (Ten Speed Press, Berkeley, Second Edition, 1986). Where taxa have changed since 1986, names in current use are provided in parentheses. The keys target the common genera of mushrooms and other fungi found in December near Salt Point, California, and on the UC Davis campus. Because only a limited number of species is described in each genus, other references should be consulted for the identification of species and information on their edibility.

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Spores produced on basidia **Basidiomycetes** (below)

Spores produced inside asci **Ascomycetes** (page 52)

Fruiting bodies resembling miniature puffballs with or without minute stalks, produced from a slime body (plasmodium); the spore mass powdery and readily released from a fragile peridium **(Slime Molds) Myxomycetes** (page 56)

Basidiomycetes

Basidia and spores borne externally on exposed gills, spines, pores, etc.; spores forcibly discharged at maturity. **Hymenomycetes** (below)

Basidia and spores borne internally (inside the fruiting body or inside a spore case; spores not forcibly discharged **Gasteromycetes** (page 49)

Hymenomycetes

1. Gills present **Agarics** (page 5)

1. Gills absent (but spines, warts, folds, or wrinkles may be present) 2

2. Pores present 3

2. Pores absent. 4 (page 4)

3. Fruiting body fleshy, rapidly decaying; stalk typically central **Boletes**

	<i>Boletus spp.</i>	<i>Leccinum spp.</i>	<i>Suillus spp.</i>
Stalk	Fleshy, sometimes bulbous, often reticulated	Fleshy, usually tough, pale, roughened by small, dark tufted hair or scales (scabers)	Equal, resinous brown glandular dots or smears usually present
Cap	Usually dry	Viscid or dry	Usually viscid
Pores	White, yellow, red, brown, or gray; sometimes blueing	Whitish to pale brown	White, yellow, few red; sometimes radially arranged; rarely blueing
Veil	Absent	Absent	Often present

(Also see *Tylopilus*, page 4)

Boletus spp.

(1) Stalk at least partially red	2
(1) Stalk whitish to yellow to brown	9
(2) Pores orange to red	3
(2) Pores yellow or brownish	5
(3) Stalk not bulbous (but may be slightly thicker at base) nor reticulated; cap 5-15 cm broad, brownish, quickly staining blue-black; flesh of cap, pores, and stalk blueing very quickly when exposed; stalk 4-15 cm long, 2-4 cm thick, yellowish but usually coated by red or orange granules	B. erythropus
(3) Stalk swollen at base or bulbous, reticulated	4
(4) Stalk with a massive, exaggerated bulb; cap 7-30 cm broad, gray to buff, convex, dry, usually smooth, flesh white to yellow, blueing when exposed; pores blueing when bruised; stalk 6-15 cm long, 2-6 cm thick at apex, grayish above, reddish at least below (but fading in age), bulb up to 15 cm thick	B. satanas
(4) Stalk with a swollen base but not bulbous; cap 8-25 cm broad, brown to reddish brown, convex, dry, smooth (but velvety when young), flesh yellow, blueing when exposed; pores blueing when bruised; stalk 7-20 cm long, 2-5 cm thick at apex, red above, yellowish to reddish-brown below, bulb up to 10 cm thick	B. pulcherrimus
(5) Growing on wood; cap 5-15 cm broad, brown to maroon-brown, convex, plush-like; pores not blueing; stalk 7-20 cm long, 1-3.5 cm thick, maroon with yellow streaks, roughened	B. mirabilis
(5) Growing on the ground	6
(6) Taste bitter; size robust	7
(6) Taste mild; size moderate	8
(7) Stalk not reticulate but may be streaked; cap 6-20 cm broad, tan, flesh quickly blueing; pores yellow, blueing when bruised; stalk 7-13 cm long, 1-4 cm thick, yellow above and reddish below, becoming all dark red in age, equal or clavate	B. rubripes
(7) Stalk finely reticulate, at least the upper half; cap 10-30 cm broad, olive-brown to brown, flesh quickly blueing; pores yellow, blueing quickly; stalk 6-15 cm long, 3-7 cm thick, yellow and red, equal or bulbous	B. calopus
(8) Cap brownish, conspicuously areolate (fissured) at maturity (pink in cracks), 3-11 cm broad, flesh usually blueing slowly when exposed; pores yellow but brownish in age, large (about 1 mm in diameter), usually staining blue; stalk 4-13 cm long, 0.5-1.5 cm thick, yellow and red, equal	Boletus (Xerocomus) chrysenteron (B. truncatus is similar but has truncate spores)
(8) Cap black (but reddening in age), 3-16 cm broad, convex to plane, dry, flesh sometimes blueing when exposed; pores may stain blue; stalk 4-12 cm long, 0.5-3 cm thick, red with yellowish background to all red in age, equal	B. zelleri
(9) Stalk usually smooth and equal	10
(9) Stalk reticulated above and usually bulbous.	13
(10) Cap usually <5 cm broad, orange-brown, taste <u>peppery</u> ; pores yellow-brown to cinnamon, not blueing when bruised; stalk 2-8 cm long, 0.5-2 cm thick, buff to orange-brown, smooth, flesh of stalk base bright yellow, base coated with bright yellow mycelium	B. piperatus (Chalciporus piperatus)
(10) Cap usually >5 cm broad; taste mild; stalk base without yellow mycelium	11

- (11) Cap viscid, 4-15 cm broad, reddish-brown to chestnut brown, smooth; pores brilliant yellow, not bruising blue; stalk 6-15 cm long, 0.6-2 cm thick, variable but usually yellow above and reddish-brown below, smooth **B. flaviporus**
 (11) Cap dry. 12
- (12) Cap 4-12 cm broad, brown to blackish; pores brilliant yellow; stalk whitish to buff, sometimes with a yellow apex **B. citriniporus**
 (12) Cap 5-15 cm broad, yellowish to brown, velvety, flesh blueing weakly or not at all; pores large (1-3 mm in diameter), yellow, blueing weakly or not at all; stalk thin (4-14 cm long, 1-2 cm thick), yellow to buff, often stained brown **B. subtomentosus**
- (13) Pores yellow, usually bruising blue; cap 6-20 cm broad, yellow to brown to rusty brown, sometimes with reddish blushes, dense, flesh usually slowly bruising blue; stalk 5-15 cm long, 2-6 cm thick at apex, yellow but sometimes with brownish stains, upper part finely reticulated, usually somewhat bulbous
 **B. appendiculatus** (**B. regius** is similar but has a rose colored cap)
 (13) Pores white to yellow, not staining blue. 14
- (14) Cap whitish, 6-25 cm broad, convex, dry, flesh whitish, usually not blueing; pores whitish becoming yellow; stalk 6-20 cm long, 2-6 cm thick, colored like cap, upper part reticulated **B. barrowsii**
 (14) Cap darker 15
- (15) Cap dark brown when young and covered with a white bloom, later reddish-brown and often blotched with lighter areas, 5-15 cm broad, flesh white, not blueing; pores white at first, later yellow to greenish-yellow; stalk 5-15 cm long, 2-5 cm thick, whitish but brown in age, reticulated above, bulbous but often equal in age; under oaks
 **B. aereus** (**B. mottiae**)
 (15) Cap brown or reddish-brown, 8-30 cm broad, flesh white, not blueing; pores white at first, later yellow to brown; stalk robust (8-25 cm long, 2-7 cm thick), white to buff, reticulated at least over upper portion, bulbous but often equal in age; usually with pines
 **B. edulis** (**B. fibrillosus** is similar but has a brown fibrillose cap)

Leccinum spp.

- Cap reddish to brown, 7-20 cm broad; stalk hard, tough, 8-20 cm long, 1.5-4 cm thick (sometimes thicker towards base); pores whitish to olive; associated with manzanita or madrone **L. manzanitae**

Suillus spp. (always associated with conifers)

- (1) Stalk glandular dots absent; mostly associated with Douglas-fir. 2
 (1) Stalk glandular dots present; associated with pine 5
- (2) Cap smooth, reddish-brown, viscid; pores yellowish, not blueing; veil absent; stalk white, equal, not blueing. **S. brevipes**
 (2) Cap slightly or very fibrillose; veil usually present 3
- (3) Cap covered with red fibrils, cap background yellowish; pores yellow bruising brown; stalk base turning blue when cut **S. lakei**
 (3) Cap with only scattered fibrils (but may later appear smooth) 4
- (4) Cap orange-brown to yellowish, viscid; pores may stain brown; ring slight to distinct, yellow-orange to brown in age; stalk base turning blue when cut **S. caerulescens**
 (4) Cap yellow to reddish-brown, almost smooth, viscid; similar to *S. caerulescens* but veil viscid and brighter yellow **S. ponderosus**

- (5) Cap smooth 6
- (5) Cap fibrillose 7
- (6) Cap white, becoming olive-gray, olive, orange, cinnamon, etc. as it ages, very viscid; pores white when young (often with milky droplets), becoming yellow to brown; stalk white to yellow with brown to red dots *S. pungens*
- (6) Cap orange-brown, viscid, shiny; pores yellow; stalk yellow, may be stained reddish below, glands reddish-brown *S. granulatus*
- (7) Cap yellowish to orange, with brown to red fibrils or scales, surface dry but viscid in age or in wet weather, flesh blueing; pores brownish, usually bruising blue; stalk without a veil *S. tomentosus*
- (7) Cap tan with brown fibrils, surface dry but viscid in age or in wet weather; pores orange-buff, not blueing when bruised; resembles *S. tomentosus* but does not stain blue *S. fuscotomentosus*

Tylopilus pseudoscaber, cap and stalk brown (bruising darker brown), cap 5-16 cm broad; stalk equal, longitudinally streaked; pores brown (may stain blue; often staining wax paper blue in transport); spore print reddish brown

3. Fruiting body tough, usually growing on wood; stalk often absent, off-center or lateral **(Polypores) Aphyllophorales** (see page 44)

4. Fruiting body gelatinous or rubbery, usually growing on wood; basidia septate or forked **Jelly Fungi**

- (1) Fruiting body light colored 2
- (1) Fruiting body dark colored 5
- (2) Fruiting body gelatinous and convoluted when fresh, hard when dry and shriveled. . 3
- (2) Fruiting body rubbery and more or less erect 4
- (3) Fruiting body yellow; stalk tiny, white; basidia bifurcate; spores long and septate *Dacrymyces palmatus*
- (3) Fruiting body yellow; stalk absent; basidia longitudinally septate; spores simple *Tremella mesenterica*
- (4) Fruiting body yellow to orange, erect (2-7 cm tall), viscid, branched (antler-like) or unbranched, tips usually forked; basidia Y-shaped; clustered on wood . *Calocera viscosa*
- (4) Fruiting body translucent white, 1-6 cm tall; stalk lateral; underside of cap lined with minute spines *Pseudohydnum gelatinosum*
- (5) Fruiting body rubbery (when fresh), thin, brown, ear-like, 2-15 cm broad *Auricularia auricula*
- (5) Fruiting body gelatinous 6
- (6) Fruiting body black, lobed, and gelatinous, small but fusing with others to form rows; basidia longitudinally septate *Exidia glandulosa*
- (6) Fruiting body brown, wavy, and seaweed-like (not ear-like) *Tremella foliacea*

4. Fruiting body with spore-bearing teeth (**Hydnums**), coral-like (**Coral Fungi**), vase-shaped with thick, blunt gills (**Chanterelles**), or crustlike or sheetlike and usually on wood (**Crust Fungi**); basidia not as above **Aphyllophorales** (see page 38)

Agarics

1. Spore print white to yellow (green in one)	2
1. Spore print another color	7 (page 16)
2. Universal veil present, forming a volva (but in <i>Limacella</i> , the slimy universal veil does not form a volva) and often leaving warts or patches on cap <i>Amanita</i> spp.	
(1) Volva collar-like	2
(1) Volva sac-like.	11
(2) Ring absent	3
(2) Ring present.	4
(3) Cap gray, striate; volva constricted, flaring at top. <i>A. constricta</i>	
(3) Cap yellow to creamy, margin striate or not; ring present or absent <i>A. gemmata</i>	
(4) All tissue bruising reddish (often slowly); cap 3-15 cm broad, white but soon flushed red to reddish-brown, cap margin not striate; gills white but staining reddish; ring white, often with reddish tints; stalk 5-15 cm long, 1-4 cm thick	
. <i>A. novinupta</i> (<i>A. rubescens</i> in Arora)	
(4) Tissue not bruising reddish	5
(5) Partial and universal veils yellow; cap yellow to brown; stalk white to yellow	
. <i>A. aspera</i> (<i>A. franchetii</i>)	
(5) Partial veil not yellow (or if yellow then cap red or orange)	6
(6) Cap white	7
(6) Cap creamy to brown to red	8
(7) Cap 5-12 cm broad, covered with soft, cottony universal veil tissue; stalk white with powdery scales, ring obvious or indistinct <i>A. silvicola</i>	
(7) Cap 7-20 cm broad, covered with obvious erect warts (up to 2 cm broad); stalk deeply rooted, ring skirtlike	
. <i>A. magniverrucata</i> (<i>A. cokeri</i> is similar but has smaller warts (up to 5 mm broad))	
(8) Cap bright red (fading orange) with white warts, striate; volva scaly; ring skirt-like; gills white <i>A. muscaria</i>	
(8) Cap creamy to gray to brown	9
(9) Cap yellow to creamy, 4-10 cm broad, white universal veil tissue as warts or patches, margin striate or not; ring present or absent <i>A. gemmata</i>	
(9) Cap tan to brown or gray	10
(10) Cap gray to grayish-brown, often with a faint lilac cast, 3-12 cm broad, warts usually grayiish, sometimes wearing off, margin not striate or faintly so; ring skirtlike; stalk gray, at least below ring; volva round and soft <i>A. porphyria</i>	
(10) Cap tan to brown, 5-15 cm broad, margin usually striate; ring skirtlike; stalk white; volva with or without a free rim. <i>A. pantherina</i>	
(11) Ring absent	12
(11) Ring present.	14

- (12) Cap orange-buff or paler, 3-12 cm broad, covered partially by white patches, striate *A. velosa*
 (12) Cap gray or brown 13
- (13) Cap brown, 7-20 cm broad, deeply striate; rusty stains often present on the very large volva *A. pachycolea*
 (13) Cap gray, deeply striate; similar to *A. pachycolea* but smaller (cap 3-10 cm broad) and cap gray rather than brown *A. vaginata*
- (14) Fruiting body all white (but discoloring in age); cap not striate *A. ocreata*
 (14) Cap yellow-brown to greenish to orange; cap striate or not 15
- (15) Cap orange to yellow-brown, striate, covered with a thick, cottony, white volval patch; ring skirt-like *A. calyprata (A. lanei)*
 (15) Cap greenish to yellow-green to brownish-olive, but variable; cap bald or with a thin white patch, margin not striate; ring skirt-like *A. phalloides*
2. Volva not present 3
3. Gills free, cap dry, partial veil usually leaving a ring on stalk
 ***Lepiota* spp. and *Chlorophyllum* sp.**
 Note: *Chlorophyllum*- spores with a germ pore, clamp connections present; *Leucoagaricus*- spores with a germ pore, clamp connections absent; *Lepiota*- spores without a germ pore, clamp connections present.
- (1) Spores green; fruiting body large (cap 10-30 cm broad); in lawns, inland
 *Chlorophyllum molybdites*
 (1) Spores white 2
- (2) Fruiting body medium-sized to large (cap 4-20 cm in diameter) 3
 (2) Fruiting body small to medium-sized (cap less than 8 cm in diameter) 4
- (3) Cap 4-10 cm broad, usually smooth, white to buff; some specimens stain or age yellow or brown; in grass *L. naucina (Leucoagaricus leucothites)*
 (3) Cap 5-20 cm broad, smooth when young, soon breaking up into brown to reddish scales; stalk flesh bruising reddish; stalk terminating in a swollen base or bulb
 *L. rachodes (Chlorophyllum rachodes)*
- (4) Fruiting body bright yellow; in gardens, greenhouses, flower pots.
 *L. lutea (Leucocoprinus birnbaumii)*
 (4) Fruiting body basically whitish, usually with a brown, black, or red center 5
- (5) Fruiting body bruising reddish 6
 (5) Fruiting body not discoloring red when bruised. 7
- (6) Cap whitish with dark brown scales and dark brown center; all parts of fruiting body bruising reddish (then often dark brown) *L. roseifolia (Leucoagaricus roseifolius)*
 (6) Similar to *L. roseifolia* but gills not staining when bruised
 *L. flammeotincta (Leucoagaricus flammeotinctus)*
- (7) Stalk shaggy, cottony, or scaly below the ring 8
 (7) Stalk smooth above and below the ring 9
- (8) Stalk shaggy or cottony below the veil; cap whitish with a smooth brown center,

- otherwise coarsely scaly, 2-8 cm broad; ring not well developed
- ***L. clypeolaria* (*L. magnispora*, synonym=*L. ventriosospora*)**
- (8) Stalk covered with distinct, small brown scales below the ring, which quickly disappears; cap covered with brownish scales on an ochre background, cap 1-3 cm broad ***L. castanea***
- (9) Cap at first pink, then breaking up into radiating red fibrils on whitish background, center reddish, smooth; ring persistent . . . ***L. rubrotincta* (*Leucoagaricus rubrotinctus*)**
- (9) Cap center black, brown, tan or pale. 10
- (10) Cap white with black fibrils, center blackish, cap 1-5 cm broad; stalk 2.5 cm long, 3-7 mm thick ***L. atrodisca* (*Leucoagaricus atrodiscus*)**
- (10) Cap center brown or tan 11
- (11) Cap surface breaking up into brown scales that are often concentrically zoned, center remaining brown; cap 2-7 cm in diameter; stalk 2-8 cm long, 2-5 mm thick, ring fragile. ***L. cristata***
- (11) Cap smooth and white (but may be tan in center); cap 2-4 cm in diameter; stalk 2-7 cm long, 2-5 mm thick, ring membranous . ***L. sequoiarum* (*Leucoagaricus sequoiarum*)**
3. Veil absent, or if present then gills usually attached to stalk 4
4. Gills decurrent and fold-like, fruiting body vase-shaped **Chanterelles** (page 39)
4. Gills blade-like 5
5. Fruiting body rigid and brittle (snaps clean like chalk due to sphaerocysts), often robust; spores with amyloid warts or ridges **Russulaceae**
- (1) Gills and/or flesh exuding a latex when broken ***Lactarius* spp.**
- (1) Latex red or orange 2
- (1) Latex white or watery-white 3
- (2) Latex orange, cap viscid but soon dry, orange, often zoned, greenish stained in age ***L. delectosus***
- (2) Latex red; cap viscid, orange or tan, often zoned, greenish stained in age ***L. rubrilacteus***
- (3) Latex yellowing after exposure to air 4
- (3) Latex unchanging 7
- (4) Latex quickly changing to yellow (within 45 seconds) 5
- (4) Latex slowly changing to yellow (more than 90 seconds) 6
- (5) Cap 2-8 cm broad, cinnamon-buff to reddish, faintly zoned or azonate, dry to slightly viscid; stalk 2-8 cm long, 7-15 mm wide, not scrobiculate; taste mild or slightly acid ***L. chrysorheus* and *L. vinaceorufescens* (*L. xanthogalactus*)**
- (5) Cap pale yellow to ochre, 5-15 cm broad, margin bearded or not; stalk scrobiculate (pitted with spots); taste mild or acid ***L. scrobiculatus***
- (6) Cap 2-5 cm broad, orange to brownish-orange, azonate, viscid; stalk 4-8 cm tall, 5-10 mm wide, dry; taste slowly slightly acid ***L. substriatus***
- (6) Cap dark grayish brown to light brown, azonate, 3-8 cm broad, viscid; gills whitish, slowly staining brown when cut or in age; stalk colored like cap, smooth, viscid to slimy

- *L. pseudomucidus*
- (7) Cap flesh bruising lilac; latex staining wounded tissue lilac 8
(7) Cap neither colored nor bruising lilac 9
- (8) Cap buff to lilac-gray, viscid, 3-10 cm broad, sometimes faintly zoned; stalk viscid when moist but soon dry *L. uvidus*
(8) Cap and stalk white and viscid, cap 3-10 cm broad *L. pallescens*
- (9) Fruiting body pink, reddish, rusty-orange, or orange. 10
(9) Fruiting body lacking red or orange tones 14
- (10) Cap margin bearded at least when young; cap 4-12 cm broad, pinkish-orange, orange, to brownish-orange, fibrillose, zonate, pileipellis an ixocutis; taste very acrid; latex scanty *L. subvillosus*
(10) Cap margin not bearded, cap smooth, azonate; pileipellis not an ixocutis but may be viscid; taste mild or acrid 11
- (11) Cap viscid, 2-5 cm broad, bright red when young fading to orange to orange-brown, pileipellis an ixotrichodermium with inflated basal cells; latex white; taste slowly, slightly acrid; under oaks and pines. *L. subflammeus*
(11) Cap dry to moist but not viscid; pileipellis not as above 12
- (12) Cap 1.5-4 cm broad, rusty-brown, dry, pileipellis a palisade of clavate cells; latex watery-white; stalk often hollow, brittle; taste mild; odor like maple syrup, especially upon drying *L. fragilis (L. rubidus)*
(12) Latex white (not watery white); odor indistinctive. 13
- (13) Cap 3-7 cm broad, reddish-brown, pileipellis a palisade of clavate cells; taste slightly acrid; under oaks *L. rufulus*
(13) Cap 3-10 cm broad, reddish-brown, pileipellis a simple cutis; taste very acrid; under Bishop pine *L. rufus*
- (14) Stalk dry or moist but not viscid 15
(14) Stalk viscid to slimy 16
- (15) Cap yellow-brown to light brown, 7-25 cm broad, faintly zoned, viscid; latex white, staining wounded tissue dingy brown; gills whitish becoming buff or darker; stalk white or buff, sometimes with yellow-brown stains; taste slowly acrid *L. argillaceifolius*
(15) Cap yellow, 5-20 cm broad, zonate, viscid; latex white (slowly staining tissue yellow); stalk spotted yellow-brown; taste very acrid *L. alnicola*
- (16) Cap dark grayish brown to light brown, azonate, 3-7 cm broad, viscid; latex white, slowly drying yellow, slowly staining gills brownish; stalk colored like cap, smooth, up to 1.5 cm wide *L. pseudomucidus*
(16) Cap brown to dark brown, azonate, 5-15 cm broad, viscid; latex white, slowly drying gray-green; gills pale orange, staining light brown where cut; stalk scrobiculate, light orange to grayish orange, up to 3 cm wide *L. kauffmanii*
- (1) Flesh not exuding a latex *Russula spp.*

(in this key, pileocystidia by definition stain gray to blue in sulfovanillin, primordial hyphae possess incrustations that retain the red color of basic fuchsin after destaining with hydrochloric acid, and free hyphal tips of the pileopellis, which do not generally stain distinctively, are rarely used as a diagnostic feature. See page 58 for spore descriptions)

- (1) Short gills of varying lengths (i.e., not fully extending between stalk and cap margin) regularly alternating with long gills and fruiting body hard and rigid (especially the stalk); cap cuticle generally inseparable 2
- (1) Short gills absent or if present, not regularly alternating with long gills; fruiting body typically not hard and rigid; cap cuticle usually, but not always, separable 9
- (2) Context not changing color when bruised; cap and stalk mostly white 3
- (2) Context changing color to pink, red, gray, or black when bruised; cap whitish when young and uninjured but soon becoming gray, brown, or black 6
- (3) Fruiting body all white (sometimes with brownish spots in age) 4
- (3) Fruiting body with greenish tints on gills or a greenish band at the apex of the stalk . 5
- (4) Cap 5-12 cm broad with depressed center; gills adnate to decurrent, white; taste quickly and strongly acrid; spores 6.5-8.2 X 5.5-6.58 μm , A2-B2, ornaments 0.6-1.0 μm high ***R. cascadenis***
- (4) Cap 7-30 cm broad with depressed center; gills adnate to decurrent, white; taste slowly acrid; spores 8-10.5 X 6.5-9 μm , A3-B3, ornaments 0.3-1.3 μm high . ***R. brevipes***
- (5) Fruiting body 7-30 cm broad (similar to *R. brevipes* in all respects except green tints, which may fade to white). ***R. chloroides***
- (5) Fruiting body 5-12 cm broad (tentative estimation); the greenish tinge to gills or at the apex of the stalk may fade to white; spores A3-B3 ***R. brevipes* var. *acrior***
- (6) Gills pinkish at maturity, bruising reddish-brown but not blackening, close to subdistant; pileus 6-10 cm broad, white aging gray to black, usually dry (aerolate in some); pileocystidia present; stipe usually eccentric, white, becoming pinkish and finally brown with pink tones, context pink ***R. eccentrica***
- (6) Gills when bruised changing directly to black or changing to red then black; pileocystidia absent 7
- (7) Context changing to dark gray or black when bruised (no red interphase); cap surface unpolished with a matted finish (sometimes areolate in age), 6-17 cm broad; context rapidly darkening; cuticle 25-150 μm thick; spores 7-10 x 5-7 μm , warts < 0.2 μm high, C1 ***R. albonigra***
- (7) Context changing to pink or red then gray or black when bruised 8
- (8) Gills thick and distant (2-3 mm apart); cap 8-20 cm broad, white but soon black, subviscid drying to a dull, matted finish, often areolate in age, cuticle <150 μm thick, hyphae of cuticle embedded in a gel matrix; taste variable; spores 6-8 x 5-7 μm , warts to 0.4 μm high, D1 ***R. nigricans***
- (8) Gills close to crowded; cap 5-12 cm broad, white but soon black, viscid, shiny when dry, cuticle generally greater than 150 μm thick, hyphae embedded in a gel matrix, few free hyphal tips; spores 7.5-9.5 x 6.5-7.5 μm , warts to 0.5 μm high ***R. densifolia***
- (9) Spores white to cream 10
- (9) Spores yellow. 17
- (10) Taste mild; pileocystidia present or absent 11
- (10) Taste acrid; pileocystidia present 13

Spores white, taste mild:

- (11) Cap uniformly dark yellow-brown or gray-brown, becoming dark brown, 6-12 cm broad; pileocystidia absent; some gills forked and anastomosed near stalk; stalk white, sometimes with purplish tints in age; spores A1-B1 ***R. brunneola***

(11) Cap lilac or purple or a mixture of purple, blue, olive, and wine	12
(12) Cap robust (8-14 cm broad), lilac, but becoming a mixture of lilac, olive, and wine in age, margin smooth; pileocystidia present, primordial hyphae absent; gills white to cream (some short), soft and flexible; stalk white or white tinged lilac; spores B1	
	<i>R. cyanoxantha</i>
(12) Cap smaller (3-8 cm broad), light purple, center often darker, striate, fragile; pileocystidia absent, incrustations on primordial hyphae present; stalk white; spores very pale yellow (which can appear white in a light deposit), A2-B1-B2	
	<i>R. lilacea</i>
<i>Spores white, taste acrid:</i>	
(13) Cap white to yellow	14
(13) Cap pink to red	16
(14) Cuticle thick, rubbery, elastic, and translucent, cap cream to yellow, 3-8 cm broad; not or slightly striate; stalk white; cap, stalk, and context bruising brown; spores A2-B2	
	<i>R. crassotunicata</i>
(14) Cuticle not thick and rubbery; tissue unchanging when bruised	15
(15) Cap white (becoming pale yellow in age), 4-8 cm broad, smooth to slightly striate, cuticle slightly or not easily separable; stalk white; spores cream to very pale yellow, C2	
	<i>R. albidula</i>
(15) Cap pale yellow, 4-10 cm broad, margin usually striate in age, cuticle separable _ the distance to the center of cap; stalk white; spores B1-B2	
	<i>R. cremoricolor</i>
(16) Cap bright pink with or without red tinges or blotches, 4-10 cm broad, margin usually striate in age, cuticle separable _ the distance to the center of cap; stalk white; spores B1-B2	
	<i>R. cremoricolor</i> (pink phase)
(16) Cap red fading to yellow in age, 4-10 cm broad, margin usually striate in age, cuticle separable _ the distance to the center of cap; stalk white; spores B1-B2	
	<i>R. cremoricolor</i> (red phase)
(17) Taste mild; primordial hyphae present or absent	18
(17) Taste acrid; primordial hyphae absent	41
<i>Spores yellow, taste mild:</i>	
(18) Cap green, yellow, or brown.	19
(18) Cap pink, red, or purple.	26
(19) Cap greenish	20
(19) Cap yellow or brown	21
(20) Cap olive-green to pale yellow-brown, 6-15 cm broad, margin smooth or weakly striate in age, cuticle separable 1/3 the distance to the center of cap; pileocystidia present; gills brown in age; odor of fish or shrimp; FeSO ₄ staining surface of stalk dark gray to dark green; stalk pink, white, or white tinged pink or purple, context slowly staining yellow then brown; spores B3	
	<i>R. elaeodes</i>
(20) Odor mild; cap olive-green or olive-brown, purple to wine-red in age, 10-30 cm broad, robust, very firm, margin smooth, cuticle separable only at margin; pileocystidia absent; gills cream to pale yellow; stalk white or tinged pink, often with rusty spots near base; spores 8-12 x 6.5-9 μm, A2-A3	
	<i>R. olivacea</i>
(21) Cap yellowish	22
(21) Cap brownish	24

- (22) Cap yellow, 5-9 cm broad, margin smooth or weakly striate in age, cuticle separable 1/3 the distance to the center of cap; pileocystidia present; gills brown in age; odor of fish or shrimp; FeSO₄ staining surface of stalk dark gray to dark green; stalk pink, white, or white tinged pink or purple, context slowly staining yellow then brown; spores B2 ***R. grundii***
 (22) No odor of fish; context not bruising brown 23
- (23) Cap pale yellow to dingy-white, sometimes with pinkish or orange tones (or pink throughout when young) and developing brown blotches in age, 4-9 cm broad, margin smooth, often firm, cuticle separable for only a short distance (1/4 or less to center of cap); pileocystidia present; gills usually forking abundantly at the stalk; taste bitter; stalk white or occasionally tinged pink; spores C1-D1 ***R. basifurcata***
 (23) Gills not forking; cap yellow, often with undertones of lilac and/or gray, 3-8 cm broad, fragile, striate when older; pileocystidia absent, incrustations on primordial hyphae present; odor mild to fruity; stalk white, sulfovanillin-positive caulocystidia present; spores C2-D2 ***R. amygdaloides***
- (24) Cap deep brown, fading lighter brown with a purplish cast, 4-14 cm broad, margin not or slightly striate; pileocystidia few, incrustations on primordial hyphae present; stalk white, spotted brownish at base in age; spores A3 ***R. integra***
 (24) Incrustations on primordial hyphae absent 25
- (25) Cap and stalk very firm; cap reddish-brown fading to yellow-brown to yellow, smooth to matte, 8-12 cm broad; pileocystidia scarce and weakly sulfovanillin-positive; stalk dry, whitish; spores C1-C2 ***R. mustelina***
 (25) Cap fragile, yellow-brown to brown, 3-8 cm broad, sticky, conspicuously striate; pileocystidia absent; stalk whitish, often brownish near base; odor fruity but becoming unpleasant in age, taste mild to mildly acid; spores C1-C2 ***R. amoenolens***
- (26) Cap pink with yellow blotches in age or yellow overall with a pink or lilac band around margin, 3-8 cm broad, striate when older, fragile; pileocystidia absent, incrustations on primordial hyphae present; odor mild to fruity; stalk white, sulfovanillin-positive caulocystidia present; spores C2-D2 ***R. amygdaloides***
 (26) Cap red or purplish, at least in young specimens 27
- (27) Cap red or burgundy 28
 (27) Cap purplish or vinaceous. 32
- (28) Cap red or burgundy, 6-15 cm broad, margin smooth or weakly striate in age, cuticle separable 1/3 the distance to the center of cap; pileocystidia present; gills brown in age; odor of fish or shrimp; FeSO₄ staining surface of stalk dark gray to dark green; stalk pink, white, or white tinged pink or purple, context slowly staining yellow then brown; spores B2 ***R. xerampelina***
 (28) Cap red, typically less than 9 cm broad, no odor of shrimp. 29
- (29) Pileocystidia present, incrustations on primordial hyphae absent 30
 (29) Pileocystidia absent, incrustations on primordial hyphae present 31
- (30) Cap bright red, sometimes with yellow areas in age, 4-7 cm broad, cuticle separating to center; stalk pink to red; taste mild, slowly becoming weakly acid; spores C1-C3 ***R. rhodopoda***
 (30) Cap deep red to rosy-purple, 3-8 cm broad, margin smooth, slightly striate in age, cuticle separable 2/3 the distance to the center of cap; stalk white; spores dark yellow, C2-D2. ***R. cessans***

- (31) Cap red mixed with yellow, 3-8 cm broad, fragile, strongly striate, at least in age; odor mild to fruity; stalk white, sulfovanillin-positive caulocystidia present; spores C2-D2 ***R. amygdaloides***
- (31) Cap rose but usually developing yellow areas, sometimes becoming mostly yellow with just small areas of red, 4-10 cm broad, not fragile, not striate or only slightly so; stalk white sometimes with pale lavender tints toward the base; spores pale yellow, B1 ***R. rosea***
- (32) Cap purple (but variable- generally uniformly purple or grayish purple, sometimes with yellow areas in age), 6-15 cm broad, margin smooth or weakly striate in age, cuticle separable 1/3 the distance to the center of cap; pileocystidia present; gills brown in age; odor of fish or shrimp; FeSO₄ staining surface of stalk dark gray to dark green; stalk pink, white, or white tinged pink or purple, context slowly staining yellow then brown; spores B2 ***R. xerampelina***
- (32) No odor of shrimp 33
- (33) Cap 10-30 cm broad, robust, very firm, vinaceous with olive tints, margin smooth, cuticle separable only at margin; pileocystidia absent; gills cream to pale yellow; stalk white or tinged pink, often with rusty spots near base; spores 8-12 x 6.5-9 μm, A2-A3 ***R. olivacea***
- (33) Cap smaller; either pileocystidia or incrustations on primordial hyphae present. 34
- (34) Pileocystidia absent, incrustations on primordial hyphae present 35
- (34) Pileocystidia present, incrustations on primordial hyphae absent 37
- (35) Spores very pale yellow (sometimes almost white); cap light purple, reddish purple, or light maroon, center often darker, 3-7 cm broad, striate, fragile; stalk white; spores A2-B1-B2 ***R. lilacea***
- (35) Spores dark yellow 36
- (36) Cap vinaceous or reddish-violet, 7-10 cm broad, short striate, cuticle separable _ the distance to the center of cap; stalk white (not staining or aging brown), iodoform odor sometimes present at stalk base; spores C1-C2 ***R. turci***
- (36) Cap violet to vinaceous, 6-10 cm broad, short-striate, cuticle separable _ the distance to the center of cap; stalk white, sometimes staining brown when bruised or with age; spores B1-B2 ***R. amethystina***
- (37) Cap pink or variegated, a mixture of reddish purple or greenish-purple or rosy-brown with a brown, blackish, or olive center, 3-7 cm broad, striate; pileocystidia present; stalk white; spores bright yellow-ochre, B2 ***R. abietina***
- (37) Cap not pink or variegated 38
- (38) Cap grayish purple (fading in age and sometimes becoming olivaceous at center) with a white surface bloom, resulting in a delicate velvet-like layer (pruinose), 4-6 cm broad, surface dry (matte finish), not or only slightly striate; stalk white; spores very pale yellow (cream), C2-D2 ***R. parazurea***
- (38) Cap not obviously pruinose 39
- (39) Cap solid deep purple, margin smooth, 2-7 cm broad; pileocystidia present; stalk white; spores yellow, C1-D1 ***R. murrillii***
- (39) Cap color may be primarily purple, but other colors present (rose or wine or yellow) 40
- (40) Cap rosy-purple, 3-8 cm broad, margin smooth, slightly striate in age, cuticle separable 2/3 the distance to the center of cap, pileocystidia present; stalk white; spores dark yellow, C2-D2 ***R. cessans***

(40) Cap purplish-red or vinaceous-violet with yellow blotches in center, 6-10 cm broad, depressed in age, margin inrolled becoming lobed, cuticle hardly separable; pileocystidia present but few; spores yellow, C2 **R. curtipes**

Spores yellow, taste acrid:

(41) Cap white, yellow, or brown; pileocystidia present or absent 42
 (41) Cap pink, red, wine, or purplish; pileocystidia present 46

(42) Cap whitish; pileocystidia present 43
 (42) Cap brownish; pileocystidia present or absent 45

(43) Cap white to grayish-white or white with a slight tinge of lilac, 3.5-10 cm broad, slightly striate; stalk white; usually fruiting on well-rotted conifer logs; spores very pale yellow, B2 **R. stuntzii**
 (43) Cap lacking gray or lilac tinges; generally not fruiting on rotted logs. 44

(44) Cap white (becoming pale yellow in age), 4-8 cm broad, smooth to slightly striate, cuticle not easily separable; stalk white; spores cream to very pale yellow, C2
 **R. albidula**
 (44) Cap white to grayish white or pale yellow, often with a narrow rose margin; cuticle not easily separable or for only a short distance; cap margin smooth; stalk white, rarely tinged pink; taste weakly acrid; spores pale yellow, B2 **R. exalbicans**

(45) Cap 5-15 cm broad, yellow-brown, flat, conspicuously striate; pileocystidia present; stalk whitish, becoming brownish stained; taste bitter at first, then acrid; odor strongly of almonds, fetid in age; spores C2-C3 **R. fragrantissima**
 (45) Cap yellow-brown to smoky-brown, 3-8 cm broad, sticky, conspicuously striate; pileocystidia absent; stalk whitish, often brownish near base; odor fruity but becoming unpleasant in age, taste mild to mildly acrid; spores C1-C2 **R. amoenolens**

(46) Cap pinkish with yellow blotches 47
 (46) Cap red, wine, or purplish 49

(47) Cap generally < 4 cm broad, pink to rose with yellow blotches, plane to depressed in age, striate, cuticle not separating or barely so; stalk white, 4-5 cm long; spores B2 **R. ellenae**
 (47) Cap 6-10 cm broad 48

(48) Cap light red to pink to peach with a broad yellow or yellowish-peach center; stalk white, sometimes with pink blush; ; taste slowly very acrid spores pale yellow, B1-B2 **R. tenuiceps**
 (48) Cap rosy to grayish white or pale yellow, often with a narrow rose margin; cuticle not easily separable or for only a short distance; cap margin smooth; stalk white, rarely tinged pink; taste weakly acrid; spores cream to very pale yellow, B1-C1 **R. exalbicans**

(49) Stalk distinctly pink, red, or purple 50
 (49) Stalk white or may have slight tinge of pink 53

(50) Cap reddish-purple to purple, becoming variegated (yellow, white, and/or wine) but remaining purplish in center, 4-10 cm broad, margin slightly striate, cuticle separable 2/3 the distance to the center of cap; stalk red or purple, sometimes lightly so; odor fruity; taste slightly acrid to acrid; spores pale yellow, A2-A3 **R. queletii**
 (50) Cap coral or red, stalk pink to red 51

(51) Cap coral (red with yellow blotches in age), 3-6 cm broad, margin striate in age, cuticle not easily separable or for only a short distance; stalk white with a bright coral

- blush; odor fruity; taste slowly very acrid; spores pale yellow, warts 0.5-0.7 μm high, B2
 **R. sp.** (undescribed)
 (51) Cap red 52
- (52) Cap red to scarlet, 4-10 cm broad, smooth to striate in age, cuticle separating with
 difficulty; stalk pink to red; spores A2-B2 **R. sanguinea**
 (52) Cap bright red, sometimes with yellow areas, 4-7 cm broad, cuticle separating to
 center; stalk pink to red; taste mild, slowly becoming weakly acrid; spores C1-C3
 **R. rhodopoda**
- (53) Cap purple gray or purple-brown, fading to olive in places, 3-7 cm broad;
 pileocystidia present; stalk white spores yellow to ochre, A3-A2 (B3) **R. firmula**
 (53) Cap red 54
- (54) Cap brick red (with yellow spots in age), 6-15 cm broad; taste acrid but mild in age;
 stalk white but grayish in age or where bruised; especially common under Monterey
 pines and may be limited to that tree, so it is not expected to be present at Salt Point;
 spores C2 **R. californiensis**
 (54) Stalk not bruising or aging gray; cap brick red, becoming yellow in center, 6-11 cm
 broad, striate in age; stalk white or tinged pink, not changing where bruised; all tissue
 very fragile in age; taste slowly very acrid; spores pale yellow, B1-B2 **R. tenuiceps**
(R. corinthiirubra is identical except for a purplish-red cap; **R. punicea**, which may be
 limited to Sitka spruce forests and therefore not to be expected at Salt Point, is also
 identical except for an all white stalk with little if any yellowing in cap. The ornaments
 on its spores are shorter (0.3-0.7 μm) than those of *R. tenuiceps* (0.7-1.5 μm))

5. Flesh usually fibrous or cartilaginous or thin and fragile 6

6. Gills waxy (basidia long and narrow) **Hygrophoraceae**

(note: *Hygrophorus*, *Hygrocybe*, and *Camarophyllus* possess divergent, parallel, and
 interwoven gill trama tissue, respectively)

- (1) Cap yellow, orange, pink, or red, at least in part 2
 (1) Cap another color, including white or creamy 12
- (2) Cap yellow or orange, at least in part 3
 (2) Cap pink or red. 7
- (3) Fruiting body whitish except for yellow flakes on cap (especially margin) and/or stalk
 apex; cap 2.5-8 cm broad, viscid; stalk 3-10 cm long, 0.5-2 cm thick, sometimes yellow
 throughout **Hygrophorus chrysodon**
 (3) Cap yellow or orange (but staining black in one species) 4
- (4) Gills decurrent (at least in age) to adnate; cap orange fading to yellow-orange, 2-6 cm
 broad, convex to centrally depressed in age, viscid; stalk white to yellow, 3-10 cm long,
 sometimes with a slight ring **H. speciosus**
 (4) Gills adnexed to free; cap yellow or orange 5
- (5) Cap convex to plane (not conical), bright yellow, viscid, 2-7 cm broad; gills yellow . .
 **Hygrocybe flavescens**
 (5) Cap conical 6
- (6) Cap yellow, conical, viscid, 2-7 cm broad; gills yellow **H. acutoconica**
 (6) Cap yellow (to orange), conical, viscid, 1-6 cm broad; fruiting body staining black
 when handled **H. conica**

(7) Cap pink to salmon, sharply concial, umbonate in age, 2-7 cm broad	
	<i>H. calyptraeformis</i>
(7) Cap red or at least streaked reddish	8
(8) Cap more than 4 cm broad	9
(8) Cap less than 4 cm broad	10
(9) Cap 4-12 cm broad, bright red fading orange, viscid; gills yellow to red; stalk red or yellow, dry, longitudinally striate and fibrillose, base white or sometimes yellow.	
	<i>H. punicea</i>
(9) Cap 5-13 cm broad, vinaceous-pink streaked with vinaceous fibrils, viscid when wet; gills white, pink in age; stalk dry, white, soon stained pink.	<i>Hygrophorus russula</i>
(10) Cap minute (less than 1.5 cm broad), scarlet to orange, slightly viscid; gills decurrent, whitish to pale yellow; stalk thin (2 mm); under redwoods	
	<i>Hygrocybe subminiata</i>
(10) Cap 1-4 cm broad; stalk >2 mm thick; gills not decurrent or barely so.	11
(11) Cap bright red (not fading appreciably), convex to plane, 1.5-4 cm broad, dry or tacky; stalk red with a yellow base, dry, smooth (unlike <i>H. punicea</i> , above)	<i>H. coccinea</i>
(11) Cap bright red fading orange to yellow, convex to plane, often less than 2.5 cm broad (but to 4 cm) hygrophanous but not viscid; stalk red then fading orange, dry	<i>H. miniata</i>
(12) Cap green	13
(12) Cap another color	14
(13) Cap 1-2 cm broad, viscid; stalk 2-4 mm thick	<i>H. psittacina</i>
(13) Cap 2-5 cm broad, moist but not viscid; stalk 4-8 mm thick	<i>H. virescens</i>
(14) Cap white.	15
(14) Cap dull orange to brownish	18
(15) Stalk viscid	16
(15) Stalk not viscid	17
(16) Cap (2-7 cm broad) and stalk (4-15 cm long, 0.3-1 cm thick) white and very viscid	<i>Hygrophorus eburneus</i>
(16) Cap (4-10 cm broad) and stalk (2-6 cm long, 1-2.5 cm thick) white to creamy, viscid, the cap often yellowish toward the center (stalk thicker and stouter than <i>H. eburneus</i>)	<i>H. gliocyclus</i>
(17) Cap (1-3 cm broad) and stalk white, not viscid; gills decurrent; stalk (3-10 cm long, 2-5 mm thick) often sinuous, odor of cedar	<i>Camarophyllus russocoriaceus</i>
(17) Cap larger (5-20 cm broad) and viscid (but soon dry), tinged buff in age, margin at first inrolled; stalk 6-10 cm long, 1.5-4 cm thick	<i>Hygrophorus sordidus</i>
(18) Cap dull orange, convex, not viscid, 2-9 cm broad; gills decurrent	<i>C. pratensis</i>
(18) Cap brownish and viscid	19
(19) Cap 4-15 cm broad, reddish-brown to yellow-brown, the margin often paler; gills white to tinged pink, usually decurrent; stalk 4-15 cm long, white to tinged pink, dry; odor of almonds	<i>H. bakerensis</i>
(19) Stalk viscid; no odor of almonds	20
(20) Cap brownish but usually with yellowish or olive tones, 2-8 cm broad; gills cream to pale yellow, decurrent; lower stalk viscid; associated with pines	<i>H. hypothejus</i>
(20) Cap brown to yellow-brown, 3-12 cm broad; gills white; stalk whitish above annular	

zone, colored like cap below, with a fibrillose layer below a viscid layer (the fibrils breaking up into irregular bands in age); under redwoods or spruce *H. persoonii*

6. Gills not waxy **Tricholomataceae** (page 23)

7. Spores pink to red 8

7. Spores some other color 11

8. Universal veil present **Pluteaceae**

Free gills; no ring; volva present; cap 5-15 cm broad, grayish; often fruiting in cultivated soils *Volvariella speciosa*

8. Universal veil absent 9

9. Gills free, partial veil absent, growing on wood **Pluteaceae**

(1) Cap whitish with small brown fibrils, firm, 4-14 cm broad; gills broad, white for a long time, then pink; in clusters on wood chips in gardens, along roads, etc.

. *Pluteus petasatus*

(1) Cap brownish; growing in woods 2

(2) Stalk yellow (at least in age) 3

(2) Stalk not yellow 4

(3) Cap brown to olive-brown, 2-5 cm broad, smooth or wrinkled; stalk pale yellow with a brighter yellow base, 2-7 cm long; on rotting hardwood *P. lutescens*

(3) Cap brown fading to yellow with a brown center, 2-7 cm broad, velvety to minutely granulose; stalk whitish when young becoming yellow in age, 4-11 cm long; on rotting hardwood *P. flavofulgineus*

(4) Cap brownish-gray, streaked, 3-12 cm broad; gill edges dark brown; on conifer wood *P. atromarginatus*

(4) Cap brown; gills not marginate, 3-12 cm broad; horned cystidia on gill faces; on wood *P. cervinus*

9. Gills attached 10

10. Spores pale pink, not angular **Tricholomataceae**

(1) Cap 4-14 cm broad, purple, lubricous, cap margin inrolled, stalk purple, base covered with purplish mycelium *Clitocybe nuda* (*Lepista nuda*)

(1) Fruiting body like *C. nuda* except watering brown to tan *C. brunneocephala* (*L. brunneocephala*)

(also see Tricholomataceae, page 23, for other species with pale pink spores)

10. Spores deeper red, angular **Entolomataceae**

(1) Gills decurrent (but sometimes adnate); cap white to gray; stalk central or off-center, often tapered to a narrow base; odor of fresh meal *Clitopilus prunulus*

(1) Gills generally adnate, adnexed, or notched 2

- (2) Stalk slender and cartilaginous; fruiting body smallish (cap less than 7 cm broad) . . . 3
 (2) Stalk fleshy; fruiting body size moderate to robust (cap to 12 cm or more broad) . . .
 **Entoloma spp.**
- (a) Cap blue-gray, streaked, often broadly umbonate; stalk blue-gray, lighter towards base **E. madidum (E. bloxami)**
 (a) Cap gray to tan; stalk whitish b
- (b) Cap gray to brown, convex becoming plane; odor bleach-like **E. nidorosum**
 (b) Cap tan, smooth, often broadly umbonate; odor mild **E. rhodopolium**
- (3) Stalk hollow and easily splitting; cap smooth, grayish or brownish, usually umbonate
 **Nolanea spp.**
- (a) Odor mild; cap 2-4 cm broad, becoming plane or with a slight umbo, smooth, hygrophanous, brownish when moist, paler or grayer with a silky, often streaked appearance when dry; stalk short (3-6 cm), fragile, longitudinally striate; on lawns but sometimes in woods **N. sericea**
 (a) Odor farinaceous or like cucumbers b
- (b) Cap 2.5-7 cm broad, gray to brown, conical to convex, usually with a distinct umbo; stalk long (5-15 cm) and straight, splitting easily; spores elliptical-angular; in woods **N. stricta**
 (b) Cap 2-5 cm broad, dark brown to gray-brown, conical to bell-shaped (convex or umbonate in age); spores star-shaped **N. staurospora**
- (3) Not as above 4
- (4) Cap and stalk metallic blue to black (but some drab) **Leptonia spp.**
- (a) Stalk 5 mm or more thick; cap and stalk deep indigo-blue, cap 2.5-7 cm broad, fibrillose; stalk fibrillose **L. carnea**
 (a) Stalk 5 mm or less thick b
- (b) Fruiting body violet-black; cap 1-3.5 cm broad; gills whitish to pink; stalk whitish at apex **L. nigroviolacea**
 (b) Cap bluish-black to black, 1-4 cm broad; stalk bluish-gray c
- (c) Gills whitish to pink **L. parva**
 (c) Gills white to gray with black serrated edges **L. serrulata**
- (4) Cap and stalk white (yellowing in age); cap to 4 cm broad; gills attached, adnate to slightly decurrent, becoming pink in age; stalk cartilaginous, 1-4 mm thick; in woods
 **Alboleptonia servicella**
11. Spore print purple-brown to chocolate brown to black 12
 11. Spore print rusty-orange to rusty-brown to dull-brown to bright brown 18
12. Gills decurrent; spore print black **Gomphidiaceae**
- (1) Cap viscid (when moist) to dry, context yellowish to pale orange 2
 (1) Cap very viscid, context whitish to grayish; lower stalk flesh intensely yellow 4

- (2) Cap covered with flattened woolly fibrils (which may be vinaceous tinged), dull orange to yellow-orange, dry; gills colored like cap; stalk 4-18 cm long, 0.5-1.5 cm thick, equal or tapered below ***Chroogomphus tomentosus***
 (2) Cap smooth or nearly so with a clean, crisp appearance, viscid when wet 3
- (3) Cap yellow-orange to ochre ***C. ochraceus***
 (3) Cap wine-colored; stalk orange to wine-colored; under pines ***C. rutilus***
 (***C. vinicolor*** is similar but has pleurocystidia which are thick-walled, at least in the midportion, whereas those of *C. rutilus* are thin-walled; *C. vinicolor* is common under Monterey pines)
- (4) Cap pink to red, 3-7 cm broad ***Gomphidius subroseus***
 (4) Cap color variable- whitish to vinaceous-gray to reddish-brown, 3-15 cm broad, stained blackish in age 5
- (5) Gills soft to waxy; veil disappearing; spores over 14 µm long; solitary to scattered ***G. glutinosus***
 (5) Similar to *G. glutinosus* but always cespitose; stalk rooting; spores less than 14 µm long ***G. oregonensis***
12. Gills free to adnate 13
13. Gills usually autodigesting; spore print black ***Coprinus spp.***
- (1) Cap 15 cm or more tall, cylindrical, shaggy, with white or brown scales . ***C. comatus***
 (1) Cap not cylindrical and/or shorter 2
- (2) Cap up to 8 cm broad, fairly robust, roundish to oval in shape, becoming bell-shaped, silky, lead gray to brownish; usually in clusters ***C. atramentarius***
 (2) Cap less than 5 cm broad, generally fragile 3
- (3) Cap grayish 4
 (3) Cap whitish to tan 5
- (4) Cap deeply pleated and ribbed, to 3 cm broad; stalk white, 1-3 mm thick; fruiting body very fragile; gills wither rather than deliquesce; short-lived ***C. plicatilis***
 (4) Cap striate nearly to center, to 5 cm broad, at first hairy; stalk white, very fragile; fruiting bodies lasting only a few hours; in leaf litter and woody debris ***C. lagopus***
- (5) Cap minute, 0.5-1.0 cm broad, striate, off-white to honey-brown, bell-shaped; gills not deliquescing; on woody debris ***C. disseminatus***
 (5) Cap generally larger 6
- (6) Cap to 5 cm broad, bell-shaped to convex, tan to yellow-brown (surface with minute glistening white particles when young), striate; cap margin tattered at maturity; stalk white, 2-6 mm thick; gills sometimes only partially deliquescing; gregarious or in clusters on woody debris or buried wood ***C. micaceus***
 (6) Cap 1-5 cm broad, oval, whitish to buff (covered with white fibrils when young), striate nearly to center; stalk white, 3-10 mm thick; on wood chips, in gardens, etc. ***C. domesticus***
13. Gills not autodigesting 14
14. Gills free, usually pink when young, veil present, usually forming a ring; spore print chocolate brown ***Agaricus spp.***

(1) Odor of very base of stalk like phenol or library paste when crushed	2
(1) Odor of very base of stalk sweet or like almonds or without an odor.	5
(2) Flesh in base of stalk bruising bright yellow; cap, especially the margin, bruising yellow; cap white to gray or white with tan center, smooth; flesh of cap and stalk staining yellow then brownish; cap surface staining yellow in KOH; gills whitish at first; ring large; widespread	<i>A. xanthodermus</i>
(2) Flesh in base of stalk not bruising bright yellow (if bruising pale yellow, then cap scaly	3
(3) Cap flesh slowly bruising vinaceous-brown (more pronounced in wet weather); cap scales gray-brown to dark brown; cap surface staining yellow in KOH; stalk smooth, base bruising yellow; veil thick; common under redwoods	<i>A. praeclaresquamosus</i>
(3) Cap flesh not bruising vinaceous	4
(4) Cap white, brownish in center, smooth or fibrillose; flesh unchanging when bruised (or rarely yellowing); cap yellowing in KOH; gills white when young; ring with thickened margin; phenol odor very faint; stalk equal or slightly enlarged at base, not yellowing; widespread, especially suburbia	<i>A. californicus</i>
(4) Cap with flattened pale lilac-brown scales; flesh unchanging when bruised or rarely yellowing; cap surface staining yellow in KOH; stalk smooth above and below the thick felt-like ring; stalk base bulbous, turning pale yellow when bruised; in woods	<i>A. hondensis</i>
(5) Flesh quickly staining red when bruised; cap 6-10 cm broad, white becoming brownish, fibrillose, especially towards margin; lower surface of the large ring often like a “cogwheel”; stalk white, fibrillose or scaly below ring, bruising red at least in the upper part; odor fruity; under cypress and occasionally pines	<i>A. benesi</i>
(5) Flesh not staining red when bruised	6
(6) Cap smooth or slightly scaly.	7
(6) Cap fibrillose	8
(7) Cap white, smooth (but slightly scaly when dry); flesh not staining when bruised; cap surface not staining yellow in KOH; gills pink when young; ring poorly defined; odor mild or none; in grass	<i>A. campestris</i>
(7) Cap white, 5-12 cm broad, mostly smooth, aging yellowish, surface staining yellow in KOH; flesh yellowing slightly when crushed; stalk smooth or with small cottony scales below ring; odor sweet (like anise or almond extract); ring skirt-like; stalk base not staining yellow; in woods	<i>A. silvicola</i>
(8) Odor like almond extract	9
(8) Odor not as above	10
(9) Cap 8-32 cm broad, yellowish with brown fibrils; young caps marshmallow-shaped; flesh staining yellow; stalk shaggy or scaly; ring large; in clearings in woods, disturbed areas	<i>A. augustus</i>
(9) Cap 4-7 cm broad, pink to brown with a darker brown center, fibrillose, becoming bright yellow when bruised, especially near margin; stalk white, becoming yellow when bruised; in woods, especially under oak	<i>A. semotus</i>
(10) Cap 2-7 cm broad, whitish with a brown layer of fibrils; ring poorly defined or disappearing; stalk short; odor mild; in grass and disturbed areas, often in poor soils	<i>A. cupreobrunneus</i>

- (10) Cap to 20 cm broad, whitish covered with purple-brown fibrils; flesh not staining when bruised; cap surface staining greenish in KOH; stipe with conspicuous cottony scales below the ring; odor mild or slightly fruity; in woods *A. subrutilescens*
14. Not as above 15
15. Cap brightly colored (yellow, red, etc.) **Strophariaceae**
- Naematoloma (Hypholoma) spp.*, cap not viscid; veil usually not leaving a ring; spore print purple-brown; usually growing on wood, often in large clusters
- (1) Cap orange to red; growing scattered to gregarious on wood chips, mulch, etc. *N. aurantiaca*
- (1) Cap yellow to greenish-yellow to orange brown. 2
- (2) Cap bright yellow to greenish-yellow to yellow-orange; gills at first yellow to greenish-yellow then purple-brown; taste bitter; growing in tufts or dense clusters on rotting conifers or hardwoods *N. fasciculare*
- (2) Cap yellow to orange-brown; gills at first gray, then purple-brown; taste mild; growing in clusters on rotting conifers *N. capnoides*
- Stropharia spp.*, cap viscid, typically convex to plane; veil forming a ring; spore print purple-black; usually growing on ground in rich humus
- (1) Cap yellow, margin with veil remnants; stalk with cottony white scales below ring; in woods *S. ambigua*
- (1) Cap yellow, rounded (at least when young), margin with veil remnants; stalk smooth below the fragile, fibrillose ring, which sometimes disappears; on rich soils in gardens, manure, straw, etc. *S. semiglobata*
15. Cap dull (brown, gray, white, etc.) 16
16. Gills decurrent, cap margin inrolled when young; stalk central or off-center (or absent in one); spore print brown **Paxillaceae**
- (1) Stalk lateral to absent; cap fan-shaped, buff, 1.5-10 cm broad, minutely hairy becoming smooth; gills light brown staining dark brown, usually forked; on wood *Paxillus panuoides* (synonym= *Tapinella panuoides*)
- (1) Stalk central to off-center 2
- (2) Cap brown, viscid when moist; gills staining brown; stalk solid, firm *Paxillus involutus*
- (2) Cap dry, velvety brown (exactly like *Boletus subtomentosus*); gills thick, bright yellow, usually bruising blue; stalk yellow to reddish-brown *Phylloporus rhodoxanthus*
16. Not as above 17
17. Cap viscid; cap cuticle filamentous **Strophariaceae**
- (1) Parts of fruiting body staining blue; cap brown, gray, or buff; spore print purple-brown; in grassy areas and moss and on wood chips and dung. *Psilocybe spp.*
- (1) Fruiting body not staining blue; cap tawny with small scales often arranged concentrically, 3-8 cm broad; spore print purple-brown; stalk colored like cap, slender with small scales below the annulus; in riparian environments *Stropharia squamosa*

17. Cap not viscid; cap cuticle cellular; fruiting body fragile **Coprinaceae**

Panaeolus spp., cap generally brownish; gills brown and mottled; cap conical to bell-shaped; stalk thin and fragile; spore print black (rarely brown); dung and grass inhabiting

Fruiting body brown; gills brown and mottled; cap conical to bell-shaped; stalk long and thin; spore print dark brown; growing in grass *P. foenisecii*

Psathyrella spp., cap tan to brown, conical to convex to plane, often hygrophanous; stalk slender, fragile, whitish; gills often light colored at first but becoming dark brown to black; spore print deep brown or purple-brown; growing on wood or humus

- (1) Growing scattered or in clusters in gardens, woody debris, mulch, grass, etc. . . 2
- (1) Growing in the woods 3

(2) Cap 1.5-5 cm broad, yellowish-brown to tan or whitish as it dries, convex in age; cap margin often with veil remnants; stalk 6-10 cm long, 3-5 mm thick
. *P. candolleana*

(2) Cap 1-4 cm broad, brown, fading lighter, translucent-striate, campanulate in age; veil absent; stalk 4-10 cm long, 1-3 mm thick. *P. gracilis*

(3) Cap 2-4.5 cm broad, brown, with appendiculate veil fragments that in age become colored with maturing spores; clustered at the base of hardwood stumps
. *P. hydrophilla (P. piluliformis)*

(3) Cap 2.5-4 cm broad, brown, fading to whitish as it dries, campanulate in age; cap margin striate, with evanescent white veil fragments; stalk 6-12 cm long, 3-6 mm thick; on ground or debris in woods *P. longipes*

18. Fruiting body small, fragile, often withering quickly, cap conical or bell-shaped, in grass, gardens, or woods; cap cuticle cellular; spore print rusty brown . . . **Bolbitiaceae**

(1) Cap pale lilac or grayish, deeply striate, 2-4 cm broad; gills pink to cinnamon-brown; stalk 3-7 cm long, 2-3 mm thick, fragile, powdery white to yellow; in woods, on rotting wood, especially oak and madrone *Bolbitius aleuriatus*

(1) Cap otherwise colored, fruiting on the ground in grassy areas, humus, or on dung . . 2

(2) Cap yellow, viscid, soft, and fragile, to 7 cm broad but often much smaller; in grass, on dung, etc. *B. vitellinus*

(2) Cap neither yellow nor viscid, to 2.5 cm broad. 3

(3) Cap creamy, conical; gills cinnamon-brown; stalk long, thin, and fragile; on lawns *Conocybe lactea*

(3) Cap brownish, conical to bell-shaped; gills rusty brown; in grass, woods, and disturbed areas. *C. tenera*

18. Not as above 19

19. Fruiting body small to medium-sized, some fairly robust; cap rounded to convex to plane in age, yellowish-buff to tan, smooth but often cracked or fissured in age; spore print brown; cap cuticle cellular; growing in grass, gardens, or woods . . . **Bolbitiaceae**

Agrocybe spp., cap creamy, smooth or cracked, dry; spores smooth, often with a broad apical pore

- (1) Cap small (up to 3 cm broad), sometimes with whitish veil remnants on margin; stalk 1-3 mm thick, no ring; in lawns, cultivated ground, etc. ***A. pediades***
- (1) Cap 3-10 cm broad; veil leaving remnants on cap margin and sometimes a ring; stalk base usually with white mycelium; scattered or in groups on wood chips, in gardens, woods, etc. ***A. praecox***

19. Not as above; cap cuticle typically filamentous; spore print orange-brown to rusty-brown to dull-brown; largely sylvan **Cortinariaceae** (see page 31)

Tricholomataceae

1. Stalk absent (or if present then off-center to lateral); growing on wood
 - ***Pleurotus* and relatives and *Lentinellus***
 - (1) Gill edges serrated (toothed); cap fan-shaped, dry, brown, hairy . ***Lentinellus ursinus***
 - (1) Gill edges entire (not serrated) 2
 - (2) Cap and stalk violet when young, fading to tan; cap smooth; gills decurrent; stalk short, central, eccentric, or lateral ***Panus conchatus***
 - (2) Fruiting body without violet tones 3
 - (3) Cap pale orange, fuzzy; stalk absent; spores pale pinkish; odor unpleasant
 - ***Phyllotopsis nidulans***
 - (3) Cap smooth 4
 - (4) Cap brown, shoehorn-like shaped; gills crowded; stalk off-center and continuous with cap; flesh pliant; on lignin-rich soil and wood chips ***Hohenbuehelia petaloides***
 - (4) Cap white to tan; oyster-or fan-shaped. 5
 - (5) Cap white to tan, 6-25 cm broad; flesh tender; stalk lateral; on hardwoods.
 - ***Pleurotus ostreatus***
 - (5) Cap white, smaller (2-6 cm broad); on conifer wood ***P. porrigens***
1. Stalk present 2
2. Ring present 3
2. Ring absent 6
3. Cap and stalk below ring covered with a layer of powdery granules . ***Cystoderma* spp.**
 - (1) Cap 2-5 cm broad, yellowish, often radially wrinkled; stalk below the evanescent or slight ring yellowish, white above ring ***C. amianthinum***
 - (1) Cap 2-5 cm broad, rusty-orange; stalk below the prominent ring rusty-orange, pallid above ring ***C. fallax***
3. Cap and stalk not covered with a layer of granules 4
4. Growing saprophytically or parasitically on wood (sometimes buried); dark rhizomorphs often present ***Armillaria* spp.**
 - (1) Growing in small or massive clusters on stumps or living trees; cap 3-15 cm broad, honey-colored, with scattered fibrils; ring cottony-membranous; stalk fibrous; no clamp connections at base of basidia ***A. mellea***
 - (1) Growing singly or gregariously but not clustered; at least some basidia basally clamped 2
 - (2) Cap 3-12 cm broad, tan to pinkish brown, hairy; ring cobwebby; stalk base commonly swollen, sometimes staining yellow where bruised; solitary (but sometimes gregarious) on soil (but sometimes on stumps) ***A. gallica***
 - (2) Cap 3-10 cm broad, orange-brown, hairy; stalk orange brown to rich brown but whitish near the annulus; gregarious ***A. nabsnona***

4. Growing on the ground saprophytically or in mycorrhizal symbiosis 5
5. Growing in mycorrhizal symbiosis; spores not amyloid **Tricholoma spp.**
- (1) Cap orange to orange-brown, 4-15 cm broad; gills white, staining orange-brown in age; stalk 4-13 cm long, 1-3 thick, pallid above the ring, scaly with orange or brown stains below the ring **T. zelleri (T. focale)**
- (1) Fruiting body whitish with brownish stains, robust, cap 5-20 cm broad; veil thick, sheathing the stalk; odor spicy, like cinnamon . **A. ponderosa (Tricholoma magnivelare)**
5. Growing saprophytically(?); spores amyloid; cap yellow or brown in the center and yellow at the margin, 5-12 cm broad; gills white or yellow; stalk 2-8 cm long, 1-3 cm thick, white above the ring, scaly and white/yellow below the ring. **Floccularia albolaripes**
6. Stalk fleshy or fibrous (usually greater than 5 mm thick). 7
6. Stalk cartilaginous or fragile and thin 15
7. Fruiting body reddish-tan, cinnamon, or purplish; gills thickish and well-spaced; stalk fibrous; cap convex to plane; spores spiny **Laccaria spp.**
- (1) Cap purple when fresh, fading brown; gills retaining purple color **L. amethysteo-occidentalis**
- (1) Cap pinkish to orange (violet tones absent); gills reddish-tan **L. laccata**
7. Not as above 8
8. Fruiting body robust; cap and stalk dry, dull, and unpolished; cap white or brown, stalk and gills white; copious white mycelial mat usually present at base of stalk; spores with amyloid warts **Leucopaxillus spp.**
- (1) Cap and stalk whitish, buff in age; taste mild or bitter **L. albissimus**
- (1) Cap brown; stalk white, sometimes developing brownish stains at the base; taste very bitter **L. amarus (L. gentianeus)**
8. Not as above 9
9. Cap 3-12 cm broad, gray to brown, with soapy feel when moist; robust fruiting bodies growing in dense clusters in disturbed soil; gills and stalk whitish . **Lyophyllum decastes**
9. Not as above 10
10. Gills adnate to decurrent 11
10. Gills typically notched or adnexed 13
11. Cap, gills, and stalk gray-brown; cap (2-7 cm broad) smooth, hygrophanous, and moist; flesh and gills staining black where bruised and developing black spots in age; stalk 3-7 cm long, 0.5-1.5 cm thick, and longitudinally striate; odor and taste rancid . . . **Lyophyllum semitale**
- (note: basidia of **Lyophyllum** species contain siderophilus granules that darken when heated in acetocarmine)

11. Not as above; fruiting body not bruising or staining black 12

12. Fruiting body bright yellow to orange, but usually toned with olive; cap broadly convex to depressed, 6-20 cm broad; stalk central to off-center, fleshy; growing in clusters on hardwood trees, stumps and roots ***Omphalotus olivascens***

12. Fruiting body color less intense, often but not always whitish or with light tones (if brightly colored, then not in clusters on wood), small to large; cap convex to plane to funnel-shaped in many; stalk central, usually fleshy but often slender . . . ***Clitocybe* spp.**

(1) Cap and (usually) all parts of fruiting body blue-green, fading in age, cap 2-10 cm broad, odor of anise ***C. odora***

(1) Cap otherwise colored 2

(2) Cap 2-10 cm broad, depressed to funnel-shaped in age, dull orange; gills decurrent, colored like cap but paler; stalk 3-10 cm long, 4-8 mm thick, colored like cap . ***C. inversa***

(2) Cap otherwise colored 3

(3) Odor anise-like; cap 1-6 cm broad, whitish to buff; gills adnate to slightly decurrent; stalk 2-7 cm long, colored like cap. ***C. deceptiva***

(3) Odor not anise-like 4

(4) Cap large (6-25 cm broad), grayish (often darker in center), depressed (at least in age); stalk base often enlarged; spore print pale yellow; odor rancid ***C. nebularis***

(4) Cap smaller (generally <6 cm broad); odor mild 5

(5) Growing in humus or on rotten logs in the woods; cap 2.5-8 cm broad, gray to brown, centrally depressed with an inrolled margin, becoming funnel-shaped in age; gills pale to gray, adnate becoming strongly decurrent; stalk 5-12 cm long, 0.4-1 cm thick, light gray to brown, fibrillose, often with whitish down at base; in woods, especially under redwoods ***C. cyathiformis (Pseudoclitocybe cyathiformis)***

(5) Growing in grassy areas, fields, compost piles, etc.; stalk usually shorter 6

(6) Cap 1-6 cm broad, brownish or grayish, sometimes with a faint lilac tinge, convex with an inrolled margin, plane, or broadly funnel-shaped; gills brown to gray; stalk 2-6 cm long, 3-8 mm thick, colored like cap; spore print pale pinkish; in grassy areas, fields, compost piles, etc. ***C. tarda (Lepista tarda)***

(6) Cap 1-4 cm broad, whitish to gray, sometimes tinged pink; gills colored like cap; stalk 1-4 cm long, 2-7 mm thick, colored like cap, smooth, tough; in grassy areas . ***C. dealbata***

13. Cap (3-12 cm broad) and stalk yellow but covered with red fibrils; flesh and gills yellow; growing on or near wood ***Tricholomopsis rutilans***

13. Not as above 14

14. Cap smooth, whitish to brown, often with a low broad umbo, 2-7 cm broad; stalk stiff, straight, semi-cartilaginous; spores amyloid, warted; cystidia on gill edges harpoon-like; growing in grass, in wood chips, and in woods, solitary to gregarious

. ***Melanoleuca melaleuca***

14. Cap variously colored; stalk fleshy; spores not amyloid; gills usually with cystidia; growing mycorrhizal in woods ***Tricholoma* spp.**

(1) Cap yellow to greenish-yellow, at least at margin 2

(1) Cap not yellow at the margin 4

- (2) Odor strongly repulsive; cap 2-8 cm broad, yellowish, often tinged brownish at center or more strongly brownish throughout; stalk yellowish or olive-yellow . . . ***T. sulphureum***
 (2) Odor farinaceous or like coconut 3
- (3) Cap smooth, yellow but may brown towards the center, 4-15 cm broad ***T. flavovirens***
 (3) Cap with radiating dark brown or black fibrils or streaks, 3-8 cm broad . ***T. sejunctum***
- (4) Cap dry, its color variable but usually greenish to olive-gray, sometimes shaded with brown, or grayish at center and pallid at margin, surface smooth or cracking, but without differently colored fibrils or hairs, 4-12 cm broad; base of stalk pinkish; odor soapy . . .
 ***T. saponaceum***
 (4) Cap not greenish, base of stalk not pinkish 5
- (5) Cap less than 5 cm broad, gray, purplish-gray or whitish with gray to blackish fibrils (hairy or felty), dry; stalk mostly smooth, less than 1 cm thick ***T. terreum (T. myomyces)***
 (5) Cap and stalk generally larger than above 6
- (6) Cap 5-15 cm broad, reddish-brown, viscid when moist; gills white but often developing reddish stains; stalk 4-10 cm long, 1-3 cm thick, white but developing reddish stains in age ***T. pessundatum***
 (6) Cap otherwise colored or if brown, then dry; fruiting body lacking reddish stains . . 7
- (7) Cap up to 12 cm broad, dry, dull brown with flattened fibrils that may break up into scales in age (but smooth when young); gills white, discoloring brown in age; stalk up to 3 cm thick, white, becoming brown and fibrillose in age; odor mild or faintly farinaceous ***T. imbricatum***
 (if the odor is strongly repulsive, see *T. sulphureum* above)
 (7) Cap whitish to gray to purplish-gray 8
- (8) Cap 5-20 cm broad, whitish with small dark gray fibrils, at least at center, dry; stalk 1.5-3 cm thick, white or tinged gray ***T. pardinum***
 (8) Cap up to 12 cm broad, pale gray to purplish-gray, the center dark (almost black), smooth but streaked, viscid when moist; stalk 1-2.5 cm thick, equal, white or sometimes tinged yellow ***T. portentosum***

15. Fruiting body minute to small; cap conical or campanulate when young (but may expand in age), often translucent-striate when moist, margin not usually incurved when young; microscopically, the cap possesses a layer of inflated cells immediately below the surface layer; stalk thin and usually hollow, fragile or cartilaginous, not polished or tough ***Mycena spp.***

- (1) Growing on the ground (or fallen leaves, needles, etc.) 2
 (1) Growing on wood (bark, logs, fallen branches, etc.) 12
- (2) Odor bleach-like 3
 (2) Odor not bleach-like 4
- (3) Gills edges pink (marginate); cap 1-2 cm broad, gray-brown; stipe to 6 cm tall; on rotting conifer needles ***M. capillaripes***
 (3) Gills not marginate; cap 1-2 cm broad, gray-brown; stipe to 6 cm tall; on rotting conifer needles, sticks ***M. leptcephala*** (also see *M. alcalina*, below)
- (4) Fruiting body with lilac tones 5
 (4) Fruiting body without lilac tones 6

- (5) Cap conic becoming campanulate, dark purple fading to lilac, conspicuously striate in age, 0.5-2.5 cm broad; gills edges purple (marginate); stalk 1-4 mm wide; on buried pine cones, occasionally other debris, fruiting singly or often in tufts . . . *M. purpureofusca*
- (5) Cap convex to plane, hygrophanous, 2-4 cm broad; gills lighter than cap, edges pallid; stalk 2-7mm wide, up to 6 cm tall; on ground in woods, usually solitary or in groups and occasionally in small tufts . . . *M. pura*
- (6) Cap <1 cm in diameter, bright yellow fading paler; stalk up to 2.5 cm tall, thread-like, inserted in conifer needles and leaves of hardwoods . . . *M. oregonensis*
(*M. acicula* is similar but the cap is red fading to yellow)
- (6) Cap >1 cm in diameter . . . 7
- (7) Base of stalk exuding red juice when cut; cap to 2 cm broad, reddish-brown; gills whitish, the edges reddish-brown; stalk up to 7 cm tall, thin, base with white hairs; on ground under oaks. . . *M. californiensis* (syn. *M. elegantula*) (*M. sanguinolenta* in Arora)
- (7) Base of stalk not exuding a red juice when cut . . . 8
- (8) Gills yellow with orange edges (marginate); cap 1-2 cm broad, brownish with an orange margin; stalk up to 7 cm tall, yellowish, base with orangish hairs; on conifer duff . . . *M. aurantiomarginata*
- (8) Gills not marginate . . . 9
- (9) Stalk not viscid . . . 10
- (9) Stalk viscid . . . 11
- (10) Cap to 2.5 cm broad, gray; gills whitish, with reddish spots in age; stalk up to 8 cm long, 1-2 mm thick, gray, paler above; stalk base with white hairs, exuding a clear liquid when cut; on ground under conifers . . . *M. atroalboides*
- (10) Cap 1-3 cm broad, gray to brown; gills grayish or lighter, without reddish spots; stalk 3-8 cm long, 1-4 mm thick, gray with pallid apex; on needle duff . . . *M. murina*
- (11) Cap 5-10 cm broad, tan fading whitish, dry; gills white; stalk 2-5 cm tall, white . . . *M. rorida*
- (11) Cap 1-2 cm broad, yellow to olive, fading in age, viscid; gills white or tinged yellow; stalk 5-9 cm tall, yellow; on needle duff . . . *M. epipterygia*
- (12) Odor bleach-like; cap 1-4 cm broad, gray to grayish-brown; in groups or tufts on decaying conifer wood, sometimes on conifer duff . . . *M. alcalina*
- (12) Odor not bleach-like . . . 13
- (13) Base of stalk exuding red juice when cut; cap 1-3 cm broad, pinkish-brown, conspicuously striate, cap margin extending beyond gills, margin scalloped in age; base of stalk with coarse hairs; on decaying logs and stumps (mostly hardwoods) . . . *M. haematopus*
- (13) Base of stalk not exuding a red juice when cut . . . 14
- (14) Cap <1 cm in diameter . . . 15
- (14) Cap >1 cm in diameter . . . 16
- (15) Cap 2-4 mm broad, translucent-striate, coated with white granules when young; gills broad, whitish, edges minutely fringed; stalk less than 1 cm tall, whitish, with a swollen, disc-like base; on fallen branches . . . *M. tenerrima* (*M. adscendens*)
- (15) Cap 4-7 mm broad, white to gray, fluted; stalk white, up to 2.5 cm tall, with a small basal disc; on mossy bark . . . *M. clavularis*
- (16) Cap 1-2.5 cm broad, convex, the center slightly depressed in age, lilac when young but soon yellow, viscid; gills usually decurrent, pale lilac becoming whitish to pale

yellow; stalk 1-4 cm long, pale lilac becoming yellow, viscid, stalk base often with lilac mycelium; on rotting conifers	<i>M. lilacifolia</i>	
(16) Cap brownish to gray, stalk 4-14 cm tall, not viscid		17
(17) Cap 2-5 cm broad, convex in age, brownish-gray; gills pinkish in age; stalk up to 14 cm tall, 2-5 mm wide, its base hairy and rooting into substrate; on hardwood logs and stumps	<i>M. galericulata</i>	
(17) Similar to <i>M. galericulata</i> but cap and gills developing reddish-brown spots in age; stalk hairy and rooting; on conifer stumps and logs	<i>M. maculata</i>	
15. Not as above		16
16. Cap generally less than 2.5 cm broad, becoming depressed to funnel-shaped; gills decurrent and well-spaced, yellow, orange, or pink		
<i>Omphalina, Xeromphalina, and relatives</i>		
(1) Stalk tough, wiry, yellowish above, reddish-brown below		2
(1) Stalk not wiry, yellow to orange, like cap; gills strongly decurrent		3
(2) Cap orange to orange-brown, convex, then with a depressed center; gills orange; stalk smooth, polished, yellow above, reddish-brown below, usually curved, tough; growing in dense clusters on rotting conifers	<i>Xeromphalina campanella</i>	
(2) Cap reddish brown, fading yellowish; gills adnate to decurrent, yellow; stalk 2-8 cm long, thin, tough, often with a small, fuzzy basal bulb; black rhizomorphs present; densely gregarious on conifer needles	<i>X. caudicinalis</i>	
(3) In groups on rotting conifers		4
(3) On moss, grass, and soil		5
(4) Fruiting body orange; cap funnel-shaped in age, less than 2.5 cm broad; gills waxy-looking, peach to orange	<i>Omphalina luteicolor (Chrysomphalina aurantiaca)</i>	
(4) Cap apricot-brown over a yellow base, finely fibrillose, 1-5 cm broad; gills yellowish; stalk colored like cap, glabrous	<i>Omphalina chrysophylla</i>	
(5) Cap yellow or paler, margin striate, often wavy, first with an incurved margin, becoming funnel-shaped; gills tinged pinkish, fading to yellow; stalk yellowish	<i>Omphalina pyxidata</i>	
(5) Cap yellow-orange, margin striate, pileocystidia present (absent in <i>Omphalina</i> spp.); gills subdistant, cream-colored; stalk yellowish	<i>Rickenella fibula</i>	
16. Not with all the above features; gills usually adnexed to adnate (sometimes slightly decurrent or if distinctly decurrent then gills orange); stalk thin and pliable, tough, cartilaginous, or wiry (if thick then with a tough outer cartilaginous rind).		17
17. Stalk with underground “tap root”; cap tan to yellow-brown, umbonate, dry, 3-15 cm broad; gills whitish; associated with redwoods	<i>Caulorhiza umbonata</i>	
17. “Taproot” absent		18
18. Growing on Douglas-fir cones.		19
18. Not exclusively on Douglas-fir cones		20
19. Cap 0.5-2.5 cm broad, light brown; gills buff; stalk light brown	<i>Baeospora myosura</i>	

19. Cap to 1.5 cm broad, whitish to pinkish; stalk base yellowish, with orange-brown hairs *Strobilurus trullisatus*
20. Cap bright orange-brown, smooth, viscid and sticky, 1-6 cm broad; stalk dark brown and velvety (at least below); in clusters or tufts on wood *Flammulina velutipes*
20. Not with all the above characteristics 21
21. Cap plane or somewhat depressed, orange to brown (especially the center), 2-8 cm broad; gills bright orange, forked; in humus or on rotting wood *Hygrophoropsis aurantiaca*
21. Gills not bright orange and forked 22
22. Cap smooth, white to tan, 2-4 cm broad; gills well-spaced; growing in grass, especially lawns *Marasmius oreades*
22. Not as above; growing in woods 23
23. Stalk thin, stiff, black, bristle-like 24
23. Stalk not as above (but may be thin) 25
24. Cap 4-12 mm broad, reddish-brown; stalk black, stiff, and bristle-like, black rhizomorphs at base; growing on twigs, needles, and leaves of redwood and pines *Marasmius androsaceus*
24. Cap 2-6 mm broad, light brown, striate-wrinkled; gills white; stalk black, stiff, and bristle-like, dark rhizomorphs at base; on oak and tanbark leaves *Marasmius quercophilus*
25. Cap <1.0 cm broad 26
25. Cap >1.0 cm broad 27
26. Cap 6-12 mm broad, light brown; stalk to 1.5 mm thick, cleft, dark brown, orange above, pubescent, institious; black rhizomorphs few or none; on redwood needles *Micromphale sequoiae*
26. Cap <10 mm broad, brownish; stalk to 1.25 mm thick, brown, base dark brown; odor strongly of garlic; in swarms on the base of madrones. *Micromphale arbuticola*
27. Cap white 28
27. Cap another color. 29
28. Cap 0.8-4.0 cm, shiny white, often aging pinkish; gills very widely spaced; stalk short (7-20 mm), white with black base, pubescent; growing on sticks, etc. *Marasmiellus candidus*
28. Cap 1.2-4.5 cm broad, white, striate, flat or depressed with an uplifted margin in age; gills well spaced; stalk white, glabrous; densely gregarious under conifers *Marasmius calhouniae*
29. Cap 0.8-2.4 cm broad, brown, striate-wrinkled; stalk minutely hairy, brown, lighter towards top, 1-4 mm thick; odor garlic-like; gregarious on oak leaves

.....	<i>Marasmius copelandii</i>	
29. Not as above		30
30. Cap olive-yellow (with reddish-brown tones in age), 1.5-6.5 cm broad; gills yellow; stalk colored like cap or darkening to reddish-brown in age, 0.3-1 cm thick, often flattened; after specimens have dried, the colorless spores and some hyphae have reddish internal pigment bodies in 3% KOH; growing on rotten wood		
.....	<i>Callistosporium luteo-olivaceum</i>	
30. Not as above		31
31. Cap reddish-brown fading tan, lubricous, 3-8 cm broad; gills nearly free, with irregular edges; spores creamy or pink tinted; stalk often longitudinally striate; near conifers	<i>Rhodocollybia butyracea</i>	
31. Spores white, not tinted pink		32
32. Cap 1-4 cm broad, dark reddish-brown, conical to convex, margin even, becoming striate; cells in the upper layer of the cap cuticle hymeniform; gills widely spaced, white to buff; stalk long (6-9 cm), thin (2-3 mm), polished, dark brown, white mycelial hairs at base; reviving when moistened; gregarious in humus under trees.	<i>Marasmius plicatulus</i>	
32. Not as above; cells in the upper layer of the cap cuticle not hymeniform; generally not reviving in water after desiccation	<i>Gymnopus</i> spp. (<i>Collybia</i> in Arora)	
(1) Often growing in compact clusters		2
(1) Usually growing in scattered groups or gregariously, but sometimes clustered		3
(2) Cap (1-4 cm broad) and stalk reddish-brown fading pale; gills close; stalk paler above, finely hairy below, 4-12 cm long; in compact bundles on wood.	<i>G. acervatus</i>	
(2) Cap 1-3 cm broad, dark brown fading to tan, hygrophanous, striate in age; gills close, broad; stalk buff, pubescent, 2-5 cm long, round, flat, or grooved; odor mild; clustered under conifers	<i>G. villosipes</i>	
(3) Cap 2-3 cm broad, bright reddish brown, fading to tan, especially along the margin; gills broad, colored like cap or lighter but with lighter margins in any case; stalk cartilaginous, dark brown to black but lighter above, pruinose, with coarse yellow hairs at base, tubular, often compressed and grooved; odor fetid; scattered on twigs	<i>Gymnopus</i> sp. (<i>undescribed species</i>)	
(3) Odor mild		4
(4) Cap 2-5 cm broad, tan to chestnut brown, wavy, hygrophanous; gill edges smooth; stalk colored like cap but often paler, smooth; gregarious or in rings near oaks	<i>G. dryophilus</i>	
(4) Cap 2-4 cm broad, brown to purplish-brown, striate to near center disc, slightly umbonate; gill edges pruinose; stalk slightly pubescent, 2-5 cm long; on ground and rotten logs	<i>G. subpruinosis</i>	

Cortinariaceae

- 1. Growing on wood 2
- 1. Growing on the ground 6

- 2. Stalk poorly developed (lateral to off-center) or absent ***Crepidotus* spp.**
 - (1) Cap kidney-shaped to round, white, hairy, small (to 2 cm broad). ***C. herbarum***
 - (1) Cap shell-shaped, to 5 cm broad, gelatinous, tan fading whitish, sparsely hairy ***C. mollis***

- 2. Stalk well developed 3

- 3. Spore print rusty-orange to bright rusty-brown; gills yellow to rusty-orange
 - ***Gymnopilus* spp.**
 - (1) Cap 2-12 cm broad, red, scaly, flesh lavender; gills yellowish; ring hairy; on wood chips ***G. luteofolius***
 - (1) Cap yellow-orange to rusty-brown; lavender tints absent in flesh 2

 - (2) Cap large and robust (to 40 cm broad), yellow-orange to rusty-orange; ring usually present; growing in clusters on stumps ***G. spectabilis***
 - (2) Cap 1-8 cm broad; ring disappearing 3

 - (3) Cap 1-2 cm broad, orange-brown, smooth, flesh yellow; on conifer wood . ***G. bellulus***
 - (3) Cap 2-6 cm broad 4

 - (4) Cap orange-brown to rusty brown, smooth (but streaked upon drying); flesh buff; odor none; on conifer wood ***G. luteocarneus***
 - (4) Cap yellow-orange to tawny, with fibrillose patches; flesh yellow; stalk bruising orange-brown; odor spicy; on conifer wood ***G. sapineus***

- 3. Spore print differently colored (not as bright) 4

- 4. Veil usually not leaving a ring; cap usually <5 cm broad. ***Pholiota* and *Tubaria***
 - (1) Cap bright pinkish-orange, context orange to yellow; gills yellow; stalk 5-12 cm long, fibrillose; partial veil leaving remnants on cap margin or disappearing; scattered or in small clusters on rotting conifers ***Pholiota astragalina***
 - (1) Cap reddish brown fading tan, convex becoming plane, surface smooth, hygrophanous, sometimes with whitish veil flecks when young; growing on woody debris in woods and landscaped areas 2

 - (2) Cap 1-3 cm broad; stalk 1-4 cm long, veil evanescent; gregarious ***Tubaria furfuracea***
 - (2) Cap 1-5 cm broad; stalk 2-8 cm long, ring membranous, sometimes disappearing; gregarious to clustered ***T. confragosa***

- 4. Veil usually leaving a ring 5

- 5. Fruiting body medium size to large (cap usually >4 cm broad); spore print dull brown to cinnamon brown; cap viscid and/or scaly; stalk scaly below veil; often on wood in large clusters ***Pholiota* spp.**

- (1) Growing in dense clusters on logs and stumps 2
- (1) Growing singly or gregariously 3

- (2) Cap 2-6 cm broad, orange-brown to reddish-brown, fading and becoming lighter in center, lubricous or slightly viscid, smooth, hygrophanous; gills pallid becoming brown; stalk 3-10 cm long, 2-10 mm thick, whitish above ring, brownish below, covered with small, recurved scales *P. mutabilis*
- (2) Cap 3-15 cm broad, yellow, orange or tawny, viscid or dry, smooth; gills yellowish becoming brown; stalk yellowish above, darker below, fibrillose but not scaly *P. malicola*

- (3) Cap 5-16 cm broad, golden-orange to rusty-orange with darker scales, viscid and gelatinous; gills pallid becoming brown; stalk 4-15 cm long, 0.5-2.5 cm thick, colored like cap or paler, dry, smooth above fibrillose ring, scaly below; gregarious on live or dead wood *P. aurivella*
- (3) Cap 3-10 cm broad, reddish-brown or brown, smooth, viscid-slimy; stalk 5-10 cm long, 0.5-1.5 cm thick, colored like cap or paler, smooth above viscid ring, scaly below; solitary or gregarious on woody debris *P. velaglutinosa*

5. Fruiting body small (cap usually <4 cm broad) ***Galerina and Tubaria***

- (1) Spore print rusty brown; in woods *Galerina* spp.
 - (a) Cap brownish fading to tan, margin striate, 1-4 cm broad; stalk 2-6 mm thick, ring thin and whitish, turning brown in age; scattered or tufted on rotting wood *G. autumnalis*
 - (a) Cap yellow-orange, translucent striate, to 2 cm broad, fragile; stalk 1-4 mm thick, ring absent; often on moss *G. heterocystis*
- (1) Spore print ochre-brown to brown; in woods or landscaped areas *Tubaria* spp.
 - (a) Cap 1-3 cm broad; stalk 1-4 cm long, veil evanescent; gregarious on ground and woody debris *T. furfuracea*
 - (a) Cap 1-5 cm broad; stalk 2-8 cm long, ring membranous, sometimes disappearing; gregarious to clustered on rotting logs and woody debris *T. confragosa*

6. Veil present as a cobwebby or silky cortina which often leaves hairs on stalk; cap viscid or dry; spore print rusty-brown to cinnamon brown; gills similarly colored in age (sometimes brightly colored when young); stalk fleshy ***Cortinarius* spp.**

- (1) Cap viscid 2
- (1) Cap dry 20

- (2) Stalk equal or clavate (but base may be swollen) 3
- (2) Stalk with a rimmed basal bulb when young (but may disappear in age). 14

- (3) Stalk whitish (or just tinged cap color) 4
- (3) Stalk not completely white 8

- (4) Stalk dry 5
- (4) Stalk viscid 7

- (5) Gills sooty olive to olive aging cinnamon brown; cap 4-13 cm broad, dark olive to sooty-olive becoming tawny or yellow-brown, margin sometimes wavy and/or faintly zoned; stalk 3-13 cm long, 0.5-2.5 cm thick, equal or enlarged slightly below, whitish or

- tinged cap color) often olive-brown toward base *C. infractus*
(5) Gills whitish becoming tan and finally rusty-brown 6
- (6) Distinct ring present; cap 4-12 cm broad, tawny, viscid; stalk white to light yellow, clavate, swollen below, scaly bands may be present along with the ring; scattered to cespitose *C. turmalis*
(6) Ring absent or just a few hairs from the cortina; cap 4-12 cm broad, yellow-orange, sometimes with light rusty tinges in center, smooth, context white; stalk white discoloring tan, 4-10 cm long and 1-2.5 cm thick *C. multiformis*
- (7) Cap 2-4 cm broad, orange-brown (fading tan), broadly campanulate to convex, smooth, context whitish, taste bitter; gills whitish becoming cinnamon-brown; stalk 2-7 cm long, 3-10 mm thick, usually thickened below *C. vibratilis*
(7) Cap 4-10 cm broad, reddish-brown to bright orange-brown (fading tan), broadly campanulate to convex, smooth, context whitish, taste mild; gills whitish becoming cinnamon-brown; stalk 4-15 cm long, 1-2 cm thick, equal *C. mucosus*
- (8) Cap deep brown to black, conical, 4-10 cm broad, context pallid to cinnamon-buff; gills pallid to brown when young; stalk violet, viscid, deeply rooted (8-20 cm long), sometimes with concentric rings of universal veil tissue *C. vanduzerensis*
(8) Cap not blackish and stalk without concentric bands (or if present, then cap orange-brown to tawny) 9
- (9) Cap 3-10 cm broad, orange-brown to tawny but margin may be violet when young; broadly campanulate to convex, smooth, context whitish to buff; gills bluish-gray then brown; stalk 5-15 cm long, 0.5-2 cm thick, equal and usually rooting, viscid, whitish but lower portion with scaly brown or (rarely) violet concentric bands
. *C. collinitus (C. trivialis)*
(9) Lower portion of stalk without concentric bands. 10
- (10) Cap, gills, and/or stalk with bluish or lavender tinges 11
(10) Externally, cap and stalk without any bluish or lavender tinges 13
- (11) Fruiting body very slimy; cap 3-12 cm broad, at first violet, then brownish, convex, often becoming broadly umbonate, context violet tinged becoming whitish; gills at first bluish-gray then brown; stalk 5-15 cm long, 1-2.5 cm thick, lavender, equal or fusiform, viscid (at least lower part) *C. cylindripes (C. muscigenus)*
(*C. iodoides* has a purple cap that doesn't fade much to brown)
(11) Fruiting body not slimy but cap may be viscid; stalk never viscid 12
- (12) Cap 4-12 cm broad, bluish-gray, often streaked with yellowish fibrils, becoming cinnamon in age, viscid when moist, margin sometimes yellowish-olive and often wavy, context pallid to gray to lilac, becoming yellowish in age; gills bluish-gray darkening rusty; stalk 4-10 cm long, 1-3 cm thick, violet to bluish, brownish in age, with a rimmed bulb when young but the bulb becoming poorly defined in age, solid, dry *C. glaucopus*
(12) Cap 6-20 cm broad, lavender becoming brown but margin remaining lavender, smooth or sometimes streaked, viscid but soon dry, cap context with or without lavender tinges; gills violet when young; brown in age; stalk 5-12 cm long, 2-4 cm thick, lavender becoming brownish-stained in age, equal, firm, solid, dry *C. balteatus*
- (13) Cap 10-25 cm broad, yellowish-brown with small, flattened, brown scales, convex, margin of cap usually yellowish, often inrolled, context thick, firm, whitish to buff; gills yellowish-brown, finally rusty-brown; stalk 8-20 cm long, 3-7 cm thick, yellowish-brown, often fibrillose, clavate, solid, firm, viscid when moist, context lilac-tinged
. *C. ponderosus*
(13) Cap 4-8 cm broad, yellowish, convex, smooth, margin inrolled when young, context yellow, odor sweet; gills yellowish becoming brown; stalk 4-10 cm long, 0.7-1.5 cm

thick, yellowish, equal or clavate, dry, fibrillose, firm *C. percomis*
(*C. luteoarmillatus* has a buff to yellow to ochre cap with white context and a white stalk)

(14) Fruiting body without any hints of lilac 15
(14) Fruiting body with lilac or blue tones at least when young 18

(15) Cap olive to dark olive-brown or sometimes brighter green, often with a browner center, 3-10 cm broad; gills olive to greenish-yellow becoming brown in age; stalk 4-10 cm long, 0.5-1.5 cm thick, rimmed bulb becoming obscure in age, greenish or yellowish, the bulb often brighter yellow *C. scaurus*
(15) Cap otherwise colored (lacking olive tones) 16

(16) Stalk with a distinct ring; cap 4-12 cm broad, tawny, viscid; stalk white to light yellow, dry, clavate, swollen below, scaly bands may be present along with the ring; scattered to cespitose *C. turmalis*
(16) Ring indistinct or absent 17

(17) Cap 5-15 cm broad, yellow to rusty orange, the center sometimes with brown scales, cap red in KOH, context yellowish; gills yellow then rusty-brown; stalk short and stout (3-7 cm long and 1-3 cm thick), yellowish, dry *C. fulmineus* (*C. alcalinophilus*)
(17) Cap 4-12 cm broad, yellow-orange, sometimes with light rusty tinges in center, smooth, context white; gills whitish becoming tan and finally rusty-brown; stalk 4-10 cm long and 1-2.5 cm thick, white, dry *C. multiformis*

(18) Cap 5-15 cm broad, yellow when young, later cinnamon-brown (but margin may remain yellow), convex to plane, smooth, context lilac under cuticle; immature gills yellow, brownish in age but often with an intermediate lavender phase; stalk 4-12 cm long, 1.5-3 cm thick, lavender or yellow, becoming rusty-stained in age, bulb usually yellow, dry, flesh lilac in stalk, yellow in bulb. *C. cedretorum*
(18) Cap lilac to bluish when young 19

(19) Cap 3-8 cm broad, lilac when young, becoming brown, the margin remaining violet, convex to plane, smooth, context whitish, taste bitter; immature gills violet, later brown with violet edges; stalk 2.5-8 cm long, 0.5-2 cm thick, violet becoming brown (but apex remaining violet even in age), dry, context violet tinged at top of stalk, yellowish in basal bulb *C. sodagnitus*
(19) Cap 4-12 cm broad, viscid when moist, bluish-gray, often streaked with yellowish fibrils, becoming cinnamon in age, margin sometimes yellowish-olive and often wavy; context pallid to lilac, becoming yellowish in age; gills bluish-gray darkening rusty; stalk 4-10 cm long, 1-3 cm thick, with a rimmed bulb when young but the bulb becoming poorly defined in age, violet to bluish, brownish in age, dry, firm *C. glaucopus*

(20) Fruiting body with lilac tones 21
(20) Fruiting body without lilac tones 22

(21) Cap 3-8 cm broad, silvery-violet, campanulate to broadly umbonate, silky, context pallid to pale violet; gills violet, tinged brown; stalk 4-12 cm long, 0.5-1 cm thick, pale violet with whitish silky fibrils, clavate, dry *C. alboviolaceus*
(21) Cap 4-13 broad, lilac, convex to broadly umbonate, smooth, silky to fibrillose, context tawny, odor sweetish; gills cinnamon; stalk 5-12 cm long, 1-3 cm thick, lilac, finely fibrillose, clavate, dry *C. traganus*

(22) Cap 3-10 cm broad, obtuse to convex, covered with small black scales (especially towards center) on yellow-brown background, context brownish; gills yellow-brown becoming cinnamon; stalk 4-15 cm long, 0.8-3 cm thick, yellowish, tawny below, equal to thicker at base, dry *C. cotoneus*
(22) Cap without scales 23

- (23) Immature gills colorful (red or yellow); stalk yellow but brown in age 24
 (23) Immature gills brownish; stalk usually brown 25
- (24) Cap 2.5-8 cm broad, reddish-brown, convex to broadly umbonate, silky, context reddish under cuticle, otherwise yellow; immature gills red becoming brown; stalk 3-10 cm long, 0.4-1.2 cm thick, yellowish, equal, dry ***C. phoenicious* var. *occidentalis***
 (24) Cap 1.5-6 cm broad, yellow-olive to yellow-brown, finely fibrillose, conical to umbonate, context yellowish; immature gills yellow to orange becoming rusty; stalk 2.5-10 cm long, 3-5 mm thick, yellow to yellow-brown, equal, often curved, finely fibrillose, cortina often disappearing ***C. cinnamomeus***
- (25) Cap 3-8 cm broad, tan to yellowish brown, context (especially in the stalk) bruising yellow then orange; stalk 1-3 cm thick, yellowish brown ***C. rubicundulus***
 (25) Context not discoloring when bruised 26
- (26) Cap generally greater than 4 cm broad, stalk greater than 1 cm thick 27
 (26) Cap generally less than 4 cm broad, stalk less than 1 cm thick 28
- (27) Cap 3-12 cm broad, brown to cinnamon, hygrophanous, fading as it loses moisture, convex, context whitish to brown; gills cinnamon; stalk cinnamon to brown with a covering of whitish fibrils (at least when young), 3-10 cm long and 1-3 cm thick, often enlarged at base, solid and firm, cortina disappearing ***C. laniger***
 (27) Cap 6-15 cm broad, brownish, sometimes with a vinaceous tinge, often appearing streaked, with white, fibrillose universal veil tissue at least when young, dry; context pallid or tinged vinaceous; gills brownish; stalk pallid or tinged cap color, 6-16 cm long, 2-3.5 cm thick, fibrillose, with a large, abrupt and/or rimmed bulb, dry ***C. regalis***
- (28) Cap 1-4 cm broad, brown fading tan, usually with a blunt umbo, context brownish; gills brown; stalk 4-8 cm long, 2-6 mm thick, colored like cap or paler (even whitish in age), equal ***C. obtusus***
 (28) Cap 1-5 cm broad, ochre to dull orange-brown, umbonate, context yellowish; gills ochre to brown; stalk 3-10 cm long, 3-6 mm thick, colored like cap, cortina yellow, often leaving yellow hairs on the stalk but often disappearing, stalk equal ***C. gentilis***
6. Not with all the above features 7
7. Partial veil absent; cap often conical or umbonate, usually viscid; stalk with a long, tapered, rooting base; gregarious under conifers or mixed woods . . . ***Phaeocollybia* spp.**
- (1) Cap orange to rusty brown, 3-7 cm broad; under conifers. ***P. californica***
 (1) Cap olive-green, fading olive-buff, 3-11 cm broad; under conifers or mixed woods ***P. olivacea***
7. Not with all the above features; partial veil absent or present 8
8. Spore print dull brown; stalk fleshy or fibrillose 9
 8. Spore print ochre-brown or cinnamon brown; stalk thin, fragile or cartilaginous, usually hollow 11
9. Ring present; stalk fibrillose or scaly; often growing in clusters on lignin-rich humus ***Pholiota* spp.**
- (1) Cap 2-8 cm broad, tawny, usually scaly, viscid or dry; stalk 3-10 cm long and 4-10 mm thick, buff to brown, equal, small scales below ring; growing in clusters on lignin-

- rich ground. *P. terrestris*
 (1) Cap 2-6 cm broad, olive-brown becoming brown but yellowish at the margin, smooth or streaked, viscid, context yellow or greenish-yellow; gills yellow to pale greenish-yellow becoming brown; stalk 3-7 cm long and 4-6 mm thick, yellowish above, brown below, fibrillose but not scaly; ring whitish, fibrillose, often disappearing; solitary, scattered, or tufted under conifers *P. spumosa*
9. Ring absent 10
10. Cap usually viscid; gill edges minutely scalloped; apex of stalk powdery with small granules; spores typically roughened; odor radish-like; in woods and near planted trees *Hebeloma spp.*
- (1) Cap smooth, white to tan (pie-colored), 3-11 cm broad; gills brownish; stalk colored like cap *H. crustuliniforme*
 (1) Cap smooth, brown to reddish-brown, 4-13 cm broad; gills pallid becoming brown; stalk whitish with brownish fibrils or scales *H. sinapizans*
10. Cap dry, often umbonate and/or with easily splitting margin, surface usually silky, hairy, or scaly; stalk usually slender, apex sometimes powdery; spores smooth or angular-nodulose; odor sometimes like green corn; growing in woods *Inocybe spp.*
- (1) Stalk base or lower portion dull bluish-green or greenish; cap scaly, dark brown, 1-4 cm broad, bell-shaped to convex, margin not usually splitting; stalk scaly *I. calamistrata*
 (1) Stalk base not greenish; cap smooth or fibrillose but not scaly 2
- (2) Cap with lilac tones, fading in age, 1.5-5 cm broad, usually umbonate . . . *I. lilacina*
 (2) Cap without lilac tones 3
- (3) Cap vinaceous to red; cap 2-8 cm broad, conical or umbonate, radially fibrillose, context vinaceous; stalk whitish or colored like cap *I. jurana*
 (3) Fruiting body otherwise colored (but may be white bruising pink) 4
- (4) Odor fruity or spicy; cap 2-7 cm broad, white with ochre to brownish fibrils, sometimes pinkish-stained in age; stalk white or colored like cap, sometimes developing pinkish stains *I. pyriodora*
 (4) Odor not fruity but may be pungent, like green corn, mild, etc. 5
- (5) Cap 2-8 cm broad, whitish, nearly smooth, bruising and aging pink or orange; stalk white, but discoloring like cap; odor unpleasant *I. pudica*
 (5) Cap not bruising or aging pink or orange 6
- (6) Cap white, 1-3 cm broad, umbonate; gills brown; stalk whitish; odor unpleasant *I. geophylla*
 (6) Cap creamy to yellow to brown, to 10 cm broad 7
- (7) Cap 2-8 cm broad, brown, conical, becoming convex with an obtuse umbo, fibrillose; stalk 3-10 cm long, white or brownish; odor usually mild *I. maculata*
 (7) Cap yellow to yellow-brown; odor pungent, like green corn 8
- (8) Cap 2-10 cm broad, creamy to yellowish, conical to umbonate, fibrillose; stalk relatively long (3-14 cm), colored like cap *I. sororia*
 (8) Cap 2-10 cm broad, yellow-brown to brown (at least at center), conical to umbonate; *I. fastigata*

11. Cap less than 5 cm broad, reddish brown fading tan, convex becoming plane, surface smooth, hygrophanous, sometimes with whitish veil flecks when young; growing in woods and landscaped areas ***Tubaria* spp.**

(1) Cap 1-3 cm broad; stalk 1-4 cm long, veil evanescent; gregarious. ***T. furfuracea***

(1) Cap 1-5 cm broad; stalk 2-8 cm long, ring membranous, sometimes disappearing; gregarious to clustered ***T. confragosa***

11. Cap less than 2 cm broad, yellow to pale cinnamon and translucent-striate when moist, smooth, hygrophanous, conical becoming bell-shaped or convex; spore print cinnamon brown; often growing on moss ***Galerina* spp.**

Aphylophorales

1. Fruiting body with a layer of downward-pointing spines or teeth on the underside of a cap or cushion **Hydnums**

(1) Growing on decaying conifer cones; fruiting body small; cap kidney-shaped, hairy, brown; stalk laterally attached, hairy, brown *Auriscalpium vulgare*
 (1) Not as above 2

(2) Fruiting body rubbery and flexible; cap small, translucent white; stalk lateral; spines minute (see *Pseudohydnum gelatinosum*, page 4)
 (2) Not as above 3

(3) Growing on wood; fruiting body a cushion of tissue from which icicle-like spines are suspended *Hericium spp.*

- (a) Unbranched mass of long white spines *H. erinaceus*
- (a) Short spines arrange in rows on branched fruiting body *H. ramosum*

(3) Growing on the ground 4

(4) Fruiting body spongy when young, tough in age; mature cap may be lumpy, sometimes encompassing needles and debris as it grows; stalk continuous with cap and sometimes not well defined; indeterminate growth 5

(4) Fruiting body fleshy or leathery, not typically encompassing needles, etc. as it grows; stalk usually well defined 7

(5) Cap 3-12 cm broad, surface felty, with matted hairs in age, light blue when young, becoming brown, cap flesh zoned blue and brown, context in lower stalk reddish-orange broad; spines short, decurrent, whitish when young or tinged blue, becoming brown *Hydnellum caeruleum*
 (5) Context not zoned bluish 6

(6) Cap surface orange to cinnamon, lumpy, 3-15 cm broad; flesh in cap and stalk orange *Hydnellum aurantiacum*

(6) Cap surface white, brown in age, 3-15 cm broad; cap beaded with bright red droplets in wet weather; taste acrid. *Hydnellum peckii*

(7) Fruiting body tough and fibrous; cap smallish (cap 1-5 cm broad), usually zoned; stalk slender; spines short *Phellodon spp.*

- (a) Fruiting body purple-black *P. atratus*
- (a) Fruiting body yellow-brown *P. tomentosus*

(7) Not as above; fruiting body fleshy and usually larger 8

(8) Flesh violet; spore print brown 9

(8) Flesh another color; spore print white or brown 10

(9) Fruiting body deep violet; cap 4-18 cm broad, plane to centrally depressed, dry *Hydnum (Sarcodon) fuscoindicum*

(9) Cap vinaceous-brown, 4-18 cm broad; spines brownish; taste acrid; flesh gray in the base of the stalk *Hydnum (Sarcodon) fuligineo-violaceum*

(10) Cap convex to plane or depressed, usually smooth; cap, stalk, and spines pale orange; spore print white *Dentinum spp.*

- (a) Cap 2-17 cm broad; stalk 1-3 cm thick . . . *D. repandum (Hydnum repandum)*
- (a) Cap <5 cm broad, umbilicate; stalk <1 cm thick
- *D. umbilicatum (Hydnum repandum)*

(10) Prominent brown scales on cap; fruiting body and spines brown; cap 5-20 cm broad, often centrally depressed; spore print brown *Hydnum (Sarcodon) imbricatum*

- 1. Fruiting body without teeth 2
- 2. Fruiting body with a layer of pores **Polypores (page 44)**
- 2. Fruiting body without a layer of pores 3
- 3. Fruiting body coral-like, vase-shaped, or with a cap and stalk 4
- 3. Fruiting body bracket-like, crust-like, or sheet-like (i.e., usually without a stalk and often without a cap); growing on wood 5
- 4. Fruiting body with a cap (often vase-shaped) and a stalk; hymenial surface smooth or wrinkled or with shallow blunt gills **Chanterelles**

- (1) Cap dark gray to black when fresh 2
- (1) Cap brighter and lighter in color. 3

- (2) Cap 2-5 cm broad, underside of cap with shallow gills; cap funnel-shaped
- *Craterellus cinereus*
- (2) Cap 2-8 cm broad, underside of cap smooth or wrinkled; cap often tubular
- *Craterellus cornucopioides*

- (3) Cap tan, up to 15 cm broad, flesh thick, in fused clusters; fertile surface purple when fresh *Gomphus clavatus*
- (3) Not as above 4

- (4) Cap vase-shaped, orange to red, with large scales, up to 15 cm broad; underside buff *G. floccosus*
- (4) Not as above. 5

- (5) Cap moderate size (usually less than 7 cm broad), yellow to brown; gills yellowish or purple-tinged; stalk slender, hollow, yellow; on soil and wood
- *Cantharellus infundibuliformis (C. tubaeformis)*
- (5) Cap usually larger; stalk robust and solid 6

- (6) Moderate to large size (cap 3-20 cm broad), orange with wavy margin, firm, white flesh *C. cibarius (C. formosus)*
- (6) Similar to *C. cibarius* but dull whitish *C. subalbidus*

- 4. Coral-like, finger-like, or a rosette of petal-like lobes **Coral Fungi**
- (1) Fruiting body unbranched 2
- (1) Fruiting body usually profusely branched 3
- (2) Fruiting body tough, the flesh pithy; apex often enlarged *Clavariadelphus spp.*

- (a) Fruiting body 6-20 cm tall, club-shaped, yellow-brown to pinkish-brown, staining brown; apex yellowish at first, rounded *Clavariadelphus pistillaris (C. occidentalis)*
- (a) Fruiting body 5-15 cm tall, club-shaped, yellow-brown with brighter, flattened top *C. truncatus*
- (2) Fruiting body fragile, small, cylindrical; apex not enlarged . *Clavaria spp. and Allies*
- (a) Slender white “fingers” (3-5 mm thick), growing in clumps *Clavaria vermicularis*
- (a) Fruiting body gray, yellow, or orange b
- (b) Fruiting body gray or yellowish-gray, often wrinkled, 2-7 mm thick, usually in clusters *C. fumosa*
- (b) Fruiting body yellow or orange c
- (c) Fruiting body yellowish to brownish, very thin (1 mm) *Macrotiophula juncea*
- (c) Fruiting body orange, single or in tufts, often flattened, grooved, or twisted, 1-5 mm thick *Clavulinopsis laeticolor*
- (3) Fruiting body a compact mass of flattened, wavy, ribbon-like segments or leafy lobes arising from a common base, white to buff to tan *Sparassis crispa*
- (3) Not as above 4
- (4) Stalk usually slender, not fleshy, mycelial mat at base absent; fruiting body whitish or yellow, generally less than 8 cm tall (but one species ashy-gray and up to 11cm tall); spores whitish, mostly smooth; spore bearing surface not staining green in ferric sulfate *Clavulina spp. and others*
- (a) Fruiting body ashy-gray to purple-gray, 2-11 cm tall and wide, abundantly branched, the branches smooth to flattened *Clavulina cinerea*
- (a) Fruiting body not ashy-gray to purple-gray b
- (b) Fruiting body yellow to buff c
- (b) Fruiting body whitish e
- (c) Branch tips crown-like; fruiting body 5-12 cm tall and 2-8 cm wide, dull yellow to tan, sometimes tinged pink; on dead hardwood . *Clavicornia pyxidata*
- (c) Branch tips not crown-like; growing on the ground or dead wood d
- (d) Fruiting body 2-5 cm tall and wide, yellow, tips acute; sometimes sparingly branched; on ground or on dead wood *Clavulinopsis corniculata*
- (d) Fruiting body 2-5 cm tall and wide, buff to brown; stalk with several primary branches *Clavulinopsis umbrinella*
- (e) Fruiting body profusely branched, erect and spreading, white, tinged pink in age, very fragile; stalk short and fragile; spores spiny *Ramariopsis kunzei*
- (e) Not as above f
- (f) Fruiting body sparsely branched, 2-7 cm tall; branches somewhat flattened, erect, tough, whitish (to buff), sometimes with a pinkish tinge; tips whitish when young; stalk long (1/2 the height of the fruiting body) *Tremellodendropsis tuberosa*
- (f) Branches brittle to fragile g

- (g) Fruiting body 2-7 cm tall; branch tips finely toothed or crested (tips darkening in age); spores smooth *Clavulina cristata*
 - (g) Fruiting body 2-7 cm tall; branch tips rounded, sparingly branched and knobby and wrinkled *Clavulina rugosa*
- (4) Stalk thick, or if thin then an extensive mat of mycelial threads usually present at base and in substrate; branches often brightly colored; spores yellowish and spiny; spore bearing surface staining green in ferric sulfate **Ramaria spp.**
- (a) Growing on wood; branches upright and parallel, yellowish to tan with slender pale-yellow tips, 4-12 cm tall *R. stricta*
 - (a) Growing on the ground b
 - (b) Fruiting body with reddish tones or reddish stains c
 - (b) Fruiting body without reddish tones or reddish stains f
 - (c) Fruiting body whitish or yellowish with reddish branch tips or discoloring reddish somewhere on branches and/or stalk d
 - (c) Fruiting body generally pinkish or reddish throughout e
 - (d) Fruiting body large (7-20 cm tall and 6-30 cm wide), very compact (less so in age), whitish, tips wine-red (fading in age); stalk thick (to 6 cm); spores longitudinally striate *R. botrytis*
 - (d) Fruiting body 4-25 cm tall and wide; branches erect, whitish or pale yellow, tips creamy to yellow; lower branches and stalk bruising reddish . *R. sanguinea* (for species descriptions of other rubribrunnescent *Ramaria*, see p. 118 in Tylutki, E. E. 1987. Mushrooms of Idaho and the Pacific Northwest: Vol. 2 -- Non-Gilled Hymenomyces. Univ. of Idaho Press)
 - (e) Fruiting body bright coral red to magenta, fading to pink or orange, 4-13 cm tall and 3-10 cm wide; abundantly branched, tips red to yellow. . . *R. araiospora*
 - (e) Fruiting body pinkish tan to salmon, fading to pinkish-buff and eventually brown in age, 5-20 cm tall and wide; abundantly branched, tips yellow when young or colored like branches (some species staining brown or vinaceous) *R. formosa* group
 - (f) Fruiting body yellowish to dull orange, abundantly branched from fleshy base, 5-15 cm tall and wide; gelatinous pockets in stalk . . . *R. flavigelatinosa*
 - (f) Stalk solid (without gelatinous pockets) g
 - (g) Branches thin, yellow-olive, greenish when handled or in age, irregularly divided, the tips relatively short, fruiting body 2-10 cm tall; branches sometimes bruising bluish-green or developing greenish tones in age; flesh tough; taste bitter *R. abietina*
 - (g) Fruiting body not bruising green h
 - (h) Fruiting body yellow to tan (tips same color), smallish (2-6 cm tall); abundantly branched from slender base, branches slender, spreading; conspicuous mat of white mycelium attached to base *R. myceliosa*
 - (h) Fruiting body greater than 5 cm tall i
 - (i) Fruiting body yellow-brown or brown, usually with a violet tinge to lower branches, taller than wide (6-18 cm tall and 5-12 cm wide) with 2-4 primary branches *R. fennica*
 - (i) Fruiting body without tinges of violet anywhere j

- (j) Fruiting body creamy yellow (pale orange in age); often large (5-40 cm tall and wide), abundantly branched; base flesh solid white ***R. rasilispora***
- (j) Fruiting body pinkish tan to brown in age, 5-20 cm tall and wide; abundantly branched, tips yellow when young or colored like branches (some species staining brown or vinaceous) ***R. formosa*** group

5. Cap small (1-4 cm broad), leathery, whitish, hairy, fan-shaped; “gills” split (actually two adjacent plates that separate and roll up in dry weather). ***Schizophyllum commune***
 5. Not as above 6

6. Fruiting body pileate, fan-like, purple-brown to dark brown, dry; caps 2-5 cm broad, in clusters to 12 cm broad; stalk when present lateral to central; spore-bearing smooth, brown; basidiospores brownish and echinulate ***Thelephora spp.***

- (1) Cap with radiating silky fibrils, growing in rosettes, often climbing up plant stems; odor mild ***T. terrestris***
- (1) Cap branches flattened; odor garlic-like, becoming fetid in age ***T. palmata***

6. Not as above 7

7. Fruiting body thin, leathery, bracket-like (but sometimes effused-reflexed or effused); spore-bearing surface smooth ***Hymenochaete and Stereum spp.***

- (1) Cap surface gray to bluish, zonate, hirsute; hymenial surface smooth, smoky violaceous ***Stereum ostrea***
- (1) Cap surface whitish to yellowish- to orange-brown; hymenial surface without violet tints (or if hymenial surface has violet tones, then setae present) 2
- (2) Cap effused-reflexed (reflexed up to 2 cm) to resupinate; upper surface of pileus on reflexed specimens floccose, azonate, yellowish-brown; hymenial surface smooth, purple-brown to brown, *setae abundant*; resembles *S. hirsutum* in shape and color but flesh permanently darkening in KOH ***Hymenochaete tabacina***
- (2) Hymenial surface buff to orange to chestnut-brown; setae absent 3
- (3) Cap wavy, matted with grayish hairs which wear away in zones to reveal orange-brown cap cuticle; cap margin often orange-yellow; on hardwood logs ***S. hirsutum***
- (3) Cap whitish to buff to pale brown, shelf-like or cup-like, faintly zoned, covered with long, loosely arranged white hairs; on hardwood twigs ***S. ochraceo-flavum* (= *S. striatum* in Arora)**

7. Basidocarp resupinate (effused or effused-reflexed); hymenophore smooth, hydnceous, or at the base of pits if meruloid **Crust Fungi**

- (1) Fruiting body effused, arachnoid to tomentose, yellowish to reddish to brownish, annual; hyphae pigmented, loosely arranged; basidiospores pigmented and echinulate **(Thelephoraceae) *Tomentella spp.***
- (1) Hyphae hyaline or pigmented, loosely to compactly arranged; basidiospores usually hyaline and smooth 2
- (2) Hymenial layer toothed; hyphal system dimitic with thick-walled, incrusting cystidia; fruiting body resupinate to effused-reflexed to semipileate, leathery and tough; hymenial surface white to light orange to pale purplish **(Steccherinaceae) *Steccherinum spp.***
- (2) Hymenial layer smooth, meruloid, or if toothed, hyphal system not dimitic; incrusting cystidia present or absent 3

Corticiaceae:

- (3) Subicular hyphae large, up to 8 to 10 μm in diameter, with right angle branching; basidiocarp cottony and soft, whitish to cream to olive; many sterigmata per basidium; anamorph = *Haplotrichum* spp., light-colored to orange ***Botryobasidium* spp.**
(3) Subicular hyphae smaller, without right angle branching 4
- (4) At least some hyphae ampullate at the septa; basidiocarp effused, cottony and soft or thin and pliable, whitish to pale yellowish ***Trechispora* spp.**
(4) Hyphae not ampullate at the septa 5
- (5) Subicular hyphae gelatinizing, not readily separable from each other. 6
(5) Subicular hyphae not gelatinizing, hyphae distinct from each other. 7
- (6) Basidiocarp typically effused-reflexed or sometimes dimidiate, often imbricate, fleshy, waxy, or cartilaginous, hard when dry, with a white, cottony upper surface, annual; hymenial surface meruloid and pore-like and often brightly colored (yellow to red) ***Merulius* spp.**
(6) Basidiocarp effused to effused-reflexed, waxy-soft, irregularly bumpy, light or dark colored (sometimes orange to pinkish), dense wax-like trama; hymenial surface smooth to wrinkled ***Phlebia* spp.**
- (7) Hymenial layer forming a distinct pellicle; lower subiculum with a basal layer of loosely arranged hyphae parallel to substrate 8
(7) Hymenial layer usually not pellicular (may appear tomentose to pilose); lower subiculum hyphae rarely parallel to substrate 9
- (8) Basidiocarp effused, tough, waxy or crustaceous, often buff to pinkish; hymenial surface usually smooth; incrusted cystidia usually present; many species with incrusted subiculum hyphae. ***Phanerochaete* spp.**
(8) Basidiocarp effused, cobwebby or soft, often in patches, whitish; hymenial surface smooth and often easily separable from substrate; incrusted cystidia absent . ***Athelia* spp.**
- (9) Basidiocarp effused or effused-reflexed, tough and leathery, pliable (membranous), or somewhat waxy (crustose when dry), pink to brown to purplish, tightly attached to substrate but margins loose in many species; incrusted cystidia and gloeocystidia usually present; hymenial layer smooth to somewhat tuberculate. ***Peniophora* spp.**
(9) Basidiocarp fully resupinate, usually tightly attached to substrate, sometimes in patches, waxlike to thin and pliable, whitish to ochre; hymenial surface mostly smooth; gloeocystidia absent, incrusted cystidia often present; basidia large (7 to 8 μm in diameter), broadly clavate, usually with a median constriction ***Hyphoderma* spp.**

Polypores

- 1. Spore-bearing surface composed of separate tubes; fruiting body fleshy, often exuding red water droplets when moist; cap 7-30 cm broad *Fistulina hepatica*
- 1. Spore-bearing surface composed of pores 2
- 2. Stalk present; annual 3
- 2. Stalk absent; annual or perennial 4
- 3. Flesh brown, darkening in KOH; pores colored like flesh; fruiting body smallish (cap 1-5 cm broad); cap thin, silky reddish-brown; stalk brown . . . *Coltricia cinnamomea*

Note: if large and fruiting body consists of several tiers of caps, see *Phaeolus schweinitzii*, below;
if medium-sized (cap 3-12 cm) and consists of a single cap, see *Inonotus tomentosus*, below

3. Flesh whitish, not typically darkening in KOH; pores colored like flesh; on ground or wood **Stalked Polypores**

- (1) Growing on wood 2
- (1) Growing on the ground (rarely on wood) 3

(2) Cap reddish-brown to chestnut-brown to blackish, 4-20 cm broad; stalk usually black; on hardwood stumps and logs *Polyporus badius*

(2) Cap tan to yellowish-brown, 2-7 cm broad; stalk base black, lighter above; on hardwood sticks and twigs *P. elegans*

(3) Fruiting body growing from a large, dark, underground tuber about the size of a potato or larger; the exterior of the tuber is rough and irregular, its interior full of debris and dirt; cap 4-15 cm broad, tan to brown with brown fibrillose scales; pores 1-3 per mm, white to tan, usually somewhat decurrent; stalk up to 15 cm long, brownish *P. tuberaster*

(3) Underground tuber absent 4

(4) Cap white becoming buff (cinnamon-brown in old specimens), single or often clustered (the clusters up to 30 cm long), crisp and breaking cleanly when fresh, soft and fragile when dry; 2-4 pores/mm; stalk central (but sometimes lateral to sessile); odor not pleasant; on grass roots (e.g., lawns) and wood *Amyloporus campbellii*

(4) Cap otherwise colored 5

(5) Cap dark brown, hairy, 5-18 cm broad; pores white, 1-2 per mm; stalk off-center, hairy, brown; taste very bitter; odor sometimes like iodine *P. hirtus (Jahnoporus hirtus)*

(5) Cap smooth or scaly in age (but not hairy); stalk central or off-center 6

(6) Cap brown, dry, covered with small scales, 5-20 cm broad; pores large, angular, 1-2 mm or more in diameter, white, sometimes pink in age with greenish stains; flesh thick, tough, white, bruising slowly pinkish; stalk 2.5-8 cm, 1-3 cm thick, often enlarged below, usually off-central, white to brown; taste mild *Albatrellus pescaprae*

(6) Pores tiny (1-5 per mm) 7

(7) Cap blue to blue-gray (but sometimes blue-green), developing yellow to reddish stains in age, 5-20 cm broad; pores white but developing yellow to reddish stains in age, decurrent; stalk 5-15 cm long, up to 4 cm thick, white to bluish-gray or aging yellowish to reddish; growing singly or in fused clusters *Albatrellus flettii*

- (7) Cap without bluish tints 8
- (8) Cap yellow, whitish, pinkish, to tan (purplish-gray in some), smooth or scaly in age, becoming areolate, dry, wavy, usually single, 4-15 cm broad; pores white but bruising or aging yellow, decurrent; flesh thick, white; stalk more or less central, whitish or tinged cap color, 3-10 cm long, 1-3 cm thick; odor pleasant *Albatrellus ovinus*
- (8) Cap purplish gray to blackish, smooth to fibrillose to scaly in age, 4-15 cm broad, often appearing streaked; pores white but aging brownish (but not staining yellow); flesh white or tinged cap color; stalk whitish or colored like cap, central or off-center, 4-13 cm long, 1-4 cm thick *Boletopsis subsquamosa*
4. Pore surface completely enclosed by a tough membrane (beetles eventually bore holes in membrane); fruiting body 2-8 cm broad *Cryptoporus volvatus*
4. Pore surface exposed 5
5. Fruiting body resupinate (but sometimes pileate); pores white or at least light colored **Resupinate Polypores**
- (1) Fruiting body resupinate to pileate, upper surface white to gray to brown and hairy; pore surface white to orange to pink, cartilaginous; spores 4 x 1 µm or less in size; generative hyphae often incrustated *Skeletocutis* spp.
- (1) Fruiting body all white to creamy; spores 4 x 1 µm or more; generative hyphae generally not incrustated 2
- (2) Fruiting body resupinate, widely effused, usually annual, white; generally fewer than 4-6 pores/mm. *Antrodia* spp.
- (2) Fruiting body resupinate to pileate, perennial (i.e., with more than one tube layer), white to creamy; 4-6 or more pores/mm *Perenniporia* spp.
5. Fruiting body normally with a cap, but sometimes resupinate, especially if growing on the underside of logs 6
6. Spore-bearing surface with pocket-like or maze-like pores or plate-like gills *Lenzites, Daedalea, and Gloeophyllum* spp.
- (1) Flesh brown; cap concentrically zoned, brown with brighter (yellow or orange) zones; gills yellow-brown, plate-like to poroid; usually on conifers . . *Gloeophyllum saepiarium*
- (1) Flesh whitish 2
- (2) Cap hairy, zoned with various colors; gills white, plate-like; cap in old age greenish with algae; usually on hardwoods *Lenzites betulina*
- (2) Cap not hairy or slightly so when young, zoned whitish to tan (but darkening in age); pores pocket or maze-like, whitish to buff, tube walls thick *Daedalea quercina*
6. Spore-bearing surface with pores 7
7. Fruiting body corky, hard, or woody, medium-sized to very large and thick; usually perennial, but if annual, then often with a varnished surface crust **Conks**
- (1) Pore surface pink; flesh pinkish when fresh *Fomitopsis cajanderi*
- (1) Pore surface not pink 2

- (2) Cap with a surface crust that appears varnished, at least when young; flesh brown, lightweight or punky; fresh pore surface white but turning brown if bruised; annual; on conifers. ***Ganoderma oregonense***
- (2) Not with all the above characteristics. 3
- (3) Flesh brown 4
- (3) Flesh white or yellowish (but may be brownish in age). 8
- (4) Pore surface white when fresh but turning brown when scratched; cap with a hard surface crust; perennial. ***Ganoderma applanatum***
- (4) Pore surface brown; flesh darkening in KOH; setae often present among basidia . . . 5
- (5) Fruiting body annual (i.e., with only one tube layer) but may be large (see ***Phaeolus*** and ***Inonotus spp.***, below)
- (5) Fruiting body perennial 6
- (6) Fruiting body usually effused-reflexed but often sessile (then cap shelf-like) or entirely resupinate; pore surface yellow brown; setae abundant ***Phellinus viticola***
- (6) Fruiting body with a well developed, hoof-like cap 7
- (7) On conifers; cap crusty; pores sinuous, caps often in columns up and down living or recently dead trees ***Phellinus pini***
- (7) On hardwoods; cap semi-circular in outline; rusty-brown with a velvety yellow-brown growing margin ***Phellinus gilvus***
- (8) Cap white becoming grayish, hoof-shaped to cylindrical, perennial, sometimes massive, often high above ground; flesh chalky and very bitter tasting; on conifers ***Fomitopsis officinalis***
- (8) Not as above 9
- (9) Cap context very dense and heavy, becoming bone-hard when dry; cap white to gray, 2-10 cm broad, usually in clusters; pores tiny; on dead conifers ***Osteina obducta***
- (9) Fruiting body larger or a different color, and not drying bone-hard 10
- (10) Cap surface usually at least partly reddish, slightly varnished, margin blunt and light colored when growing; perennial; usually on dead conifers ***Fomitopsis pinicola***
- (10) Cap surface roughened, knobby, ridged, etc.; cap brown to grayish-brown with a pallid growing margin, but sometimes reddish-brown or whitish when very young, racket-like to resupinate or irregular; flesh white; pores white to yellowish; usually growing at the base of conifers ***Heterobasidion annosum***
7. Fruiting body usually annual, small to medium-sized, but if large then fleshy or spongy when young and fresh 8
8. Flesh brownish, darkening in KOH; pores colored like flesh; setae often present among basidia ***Phaeolus*** and ***Inonotus spp.***
- (1) Fruiting body usually effused-reflexed but often sessile (then cap shelf-like) or entirely resupinate; pore surface yellow brown; setae abundant ***Phellinus viticola***
- (1) Cap or conk well developed 2
- (2) Cap yellow to rusty-orange when young, becoming dark brown when old; fruiting body usually compound; growing on or around dead and living conifers, appearing terrestrial ***Phaeolus schweinitzii***
- (2) Fruiting body usually simple (one cap rather than several) 3

- (3) Single, velvety brown, fan-shaped cap 3-12 cm broad; stalk short or absent; on ground under conifers but sometimes on stumps ***Inonotus tomentosus***
- (3) Cap (5-20 cm broad) with hairs that may wear away, yellowish-brown, becoming dark brown in age, soft at first but tougher in age; with a thick granular core between the upper fibrous tissue and the tube layer; growing shelf-like on living hardwood trees ***I. dryophilus***

Note: other ***Phellinus* spp.** appearing annual will key out here (see above).

- 8. Flesh whitish, not darkening in KOH 9
- 9. Cap yellow to orange (up to 50 cm broad), usually in overlapping clusters; pores bright yellow ***Laetiporus sulphureus***
(= ***L. gilbertsonii*** on hardwoods and eucalyptus and ***L. conifericola*** on conifers)
- 9. Not as above 10

- 10. Cap thin, tough, and leathery, typically tearing easily in a radial direction; cap surface usually hairy and often concentrically zoned; shelf-like; pores tiny
. ***Trametes, Trichaptum, and Bjerkandera* spp.**

- (1) Pores violet; on conifers . ***Trichaptum abietinum*** (synonym= ***Hirschioporus abietinus***)
- (1) Pores another color 2

- (2) Pores gray to smoky-brown 3
- (2) Pores white to buff 4

- (3) Pores white then gray to black; cap 1.5-7 cm broad, white to tan, velvety to nearly smooth, thin (1-6 mm); spores 4-6 x 2.5-3 µm; on dead hardwoods . ***Bjerkandera adusta***
- (3) Pores gray to smoky brown; cap buff colored, finely tomentose to smooth, up to 1 cm thick; spores large (9-12 x 4-4.5 µm); odor of anise; on dead hardwoods
. ***Trametes suaveolens***

- (4) Cap gray with multicolored zones (the velvety zones alternating with smooth zones), 2-7 cm broad; fruiting in shelving masses on hardwoods ***Trametes versicolor***
- (4) Cap zoned like ***T. versicolor*** but hairy throughout, somewhat masking the zones, cap 2-10 cm broad; sometimes entire upper surface green with algae ***Trametes hirsuta***

- 10. Cap soft, watery, spongy, or fleshy when fresh (but often tough in age); cap 2-10 cm broad and often thick (up to 1 cm or more) ***Tyromyces* spp. and *Amyloporus* sp.**

- (1) Fruiting body tinged blue or bluish-gray, soft but tougher when dry; cap 1-6 cm broad; spores pale blue ***T. caesius (Oligoporus caesius)***
(***T. perdelicatus*** is similar but the cap is 1-2 cm broad and has a bitter or sour taste)
- (1) Fruiting body white or white stained reddish; spores white 2

- (2) Fruiting body white becoming buff (cinnamon-brown in old specimens), single or often clustered, crisp and breaking cleanly when fresh, soft and fragile when dry; 2-4 pores/mm; stalk absent, lateral, or central); odor not pleasant; on wood and grass roots ***A. campbellii***
- (2) Fruiting body tough when dry; odor sweet 3

- (3) Fruiting body white, spongy when fresh and quickly staining reddish when handled or in age; usually on dead conifers ***T. fragilis (Oligoporus fragilis)***
- (3) Fruiting body white, not staining; odor fragrant when fresh; usually on hardwoods ***T. chioneus (Oligoporus chioneus)***

Gasteromycetes

1. Fruiting body a small funnel-shaped cup (usually less than 1 cm broad) containing one or more small egg-like peridioles **Bird's Nest fungi**

(1) Exterior of cup dark gray (but tan when young), finely hairy, mouth flaring when mature; inner surface smooth and blackish in age; peridioles gray, attached by a cord *Cyathus stercoreus*

(1) Exterior of cup whitish to brown 2

(2) Exterior tawny, velvety but smooth in age; peridioles whitish, attached by a cord *Crucibulum laeve*

(2) Peridioles gray to brown, imbedded in a sticky gel 3

(3) Exterior of cup whitish beneath shaggy brown to gray layer *Nidula candida*

(3) Exterior of cup whitish beneath shaggy white layer *N. niveotomentosa*

1. Not as above 2

2. Fruiting body with a volva, stalk, and head, the latter covered with a slimy, foul-smelling spore mass **Stinkhorns**

(1) Fruiting body cylindrical (up to 10 cm tall), cap reticulated; stalk white; solitary or in clusters in lawns, gardens, cultivated soil, etc. *Phallus impudicus*

(1) Cap divided into thick, reddish arms; stalk white; in gardens *Lysurus cruciatus*

2. Not as above 3

3. Fruiting body with a stalk below the spore case or "cap" 4

3. Stalk absent or rudimentary or present simply as a sterile base 5

4. Stalk of fruiting body reaching top of spore case (percurrent); fruiting body reminiscent of an unopened agaric; fertile tissue consisting of plates or contorted gills **Gasteroid Agarics**

Agaricus-like; chocolate-brown spore mass partially exposed at maturity; flesh bruising yellow; growing in disturbed areas, irrigated fields, etc. *Longula texensis*

4. Fruiting body with a puffball-like spore case on a long and well-developed stalk (not percurrent) **Stalked Puffballs**

Small round spore case with an apical pore; stalk slender; in sandy soils *Tulostoma* spp.

5. Spore case rupturing at maturity, spore mass solid at first, powdery when mature; columella (internal stalk) usually absent; fruiting body usually round to oval or outer skin splitting into starlike rays, fruiting above ground **Puffballs and Earthstars**

(1) Outer layer(s) of fruiting body splitting into several star-like rays which unfold or bend under (at least in wet weather) to expose inner spore case **Earthstars**

- (a) Outer wall splitting into 6 to 15 hygroscopic rays (closing when dry, opening when wet); pore irregular or poorly defined . . . *Astraeus hygrometricus*
- (a) Outer wall not changing with changes in humidity; pore well defined . . . b

- (b) Outer wall splitting into 4 to 8 rays, which bend back under the spore case in age; apical pore surrounded by a groove *Geastrum saccatum*
- (b) Outer wall splitting into 6 to 10 rays, which lie flat; apical pore round and fringed with hairs; mycelial layer under fruiting body incrustated with debris. *G. coronatum*

- (1) Not as above 2

- (2) Spore mass containing numerous seed-like peridioles; fruiting body large, crumbly and protruding from the ground at maturity; found mostly in poor soil *Pisolithus tinctorius*
- (2) Not as above; peridioles absent, spores produced in a single large chamber 3

- (3) Spore case hard or tough with a thick rind-like skin at least when young; immature gleba firm and deeply colored; capillitium absent (Hard-rind Puffballs or Earthballs) *Scleroderma* spp.
- (3) Spore mass white when young and softening as it darkens, then becoming powdery; capillitium usually present 4

- (4) Sterile base present. 5
- (4) Sterile base absent or rudimentary 6

- (5) Fruiting body medium to large-sized, rupturing irregularly in old age. . *Calvatia* spp.
 - (a) Fruiting body white, 10-25 cm broad; top flat; sterile base large; mature spore mass brown *C. bovista*
 - (a) Fruiting body white but brownish in age, 5 to 20 cm broad; mature spore mass purple; size of sterile base variable *C. cyathiformis*

- (5) Fruiting body small to medium-sized, rupturing through an apical pore *Lycoperdon* spp.
 - (a) Exterior of fruiting body covered with blackish spines when young (yellowing in age); fruiting body 1.5-4 cm broad; spore mass olive-brown at maturity *L. foetidum (L. nigrescens)*
 - (a) Exterior of fruiting body whitish to tan when young (but may darken in age) b

 - (b) Growing on wood or lignin-rich humus; exterior smooth or with a few inconspicuous spines or granules; fruiting body 1-5 cm broad, 2-6 tall; spore mass olive-brown at maturity; sterile base small, stem-like, with white, radiating rhizomorphs; often growing in dense clusters *L. pyriforme*
 - (b) Growing on the ground c

 - (c) Exterior with white to brown cone-shaped spines (leaving scars when they fall off in age); fruiting body pear-shaped or top-shaped, 2-6 cm in diameter; spore mass olive-brown at maturity; sterile base large *L. perlatum*
 - (c) Exterior white when young, the outer layer with short spines which peel away in sheets, exposing the dark inner layer; fruiting body often broader than tall, 1-5 cm in diameter; spore mass olive-brown at maturity; sterile base chambered, usually, but not always, well-developed *L. marginatum*

(6) Fruiting body small to large-sized, rupturing irregularly in old age . . . *Calvatia* spp.

(a) Fruiting body softball- to basketball-sized, white; in open fields, woods *C. gigantea*

(a) Fruiting body golfball-sized or a little larger; outer skin white becoming brownish; spore mass white then olive-brown with a cottony texture *C. lycoperdoides*

(6) Fruiting body marble- to golfball-sized (sometimes a little larger), outer layer peeling away, inner layer paper thin, opening through a large pore; spores mass white then olive-brown then deep brown; growing in grass *Bovista* spp.

(a) Attached to ground with white fibers *B. plumbea*

(a) Attached to the ground with a small cord *B. pila*

5. Spore case remaining intact a long time; spore mass often chambered, firm, rubbery, spongy, or slimy but not powdery at maturity; columella present or absent; subterranean (hypogeous) and potato-like (tuberous) in form, 1-8 cm in diameter. . . . **False Truffles**

(1) Fruiting body yellow to olive-yellow, smooth; columella branched or stump-like, yellowish; stalk a thick narrow base; associated with Douglas-fir

. *Truncocolumella citrina*

(1) Stalk and columella absent 2

(2) Fruiting body white to yellowish in age, staining pink to red when bruised, sometimes overlaid with a few rhizomorphs; associated with conifers, especially pines *R. rubescens*

(2) Fruiting body yellowish to tawny, overlaid with reddish mycelial strands; associated with conifers *Rhizopogon ochraceorubens*

Ascomycetes

1. Asci borne in minute flasks (perithecia), which are often produced in a stroma 2
1. Asci typically borne in a layer (hymenium) on a fruiting body or in channels or chambers within a potato-like underground fruiting body 4

Pyrenomycetes and Loculosascomycetes:

2. Growing on wood; fruiting bodies sometimes in a black or gray stroma (often charcoal-like) ***Daldinia* spp. and relatives**

Fructification moderate sized:

- Daldinia* spp.**, perithecia imbedded in a large, subglobose to globose, superficial stroma with a smooth surface (concentrically zoned in section)
- Hypoxylon* spp.**, perithecia imbedded in the periphery of a crust-like or globose stroma with a rough surface (without concentric zones within or faintly zoned)
- Xylaria* spp.**, perithecia on apex of erect, stalked, usually forked stroma (finger or antler-like), the fertile surface often gray, stalk black

Fructification small to minute:

- Chaetomium* spp.**, brown, superficial perithecia clothed with hairs
- Diatrypella* spp.**, perithecia immersed in a disk-like, hemispherical stroma; asci containing many ascospores
- Eutypa* spp.**, perithecia dark, solitary or in small groups, in stroma immersed in host tissue, with blackened crust; ascospores allantoid, hyaline
- Eutypella* spp.**, perithecia dark, numerous, forming a dense circular cluster imbedded in an erumpent stromatic pustule; ascospores allantoid, hyaline
- Hysterographium* spp.**, perithecium a small, black, superficial, oblong stroma opening by a longitudinal slit; ascospores brown dictyospores
- Nectria* spp.**, perithecia red or orange, with or without a stroma; ascospores 2-celled
- Pleospora* spp.**, black perithecia immersed in host tissue; ascospores brown dictyospores
- Rosellinia* spp.**, black perithecia gregarious on a felt-like cushion of dark hyphae; ascospores brown, elliptical, with a longitudinal germ slit

2. Not growing on wood 3
3. Growing on insects or truffles, fruiting body club-like or threadlike . . ***Cordyceps* spp.**

Cordyceps capitata, fertile “head” brown, round, up to 2 cm broad, stalk yellowish, up to 8 cm long, 0.5 to 1.5 cm thick; growing from underground truffles (*Elaphomyces* spp.)

3. Growing on other mushrooms; fruiting body a pimped layer of tissue that covers or partially covers its host, often red, green, etc. ***Hypomyces* spp.**

- H. chrysospermum***, white, later bright yellow; on boletes
- H. cervinigenus***, white or pinkish; on *Helvella lacunosa*
- H. lactifluorum***, red; on *Russula* and *Lactarius* spp.
- H. luteovirens***, yellow-green to green; on *Russula* and *Lactarius* spp.

Tuberales:

4. Fruiting body hypogeous and tuberous in form; the interior with channels, veins, or cavities; young fruiting body fleshy and brittle when sectioned **Truffles**

- (1) Fruiting body 2-5 cm broad, yellow-brown; skin thick and rind-like, covered with tiny warts; interior purple-gray to black, powdery *Elaphomyces granulatus*
- (1) Fruiting body cinnamon, 0.5-3 cm broad, exterior smooth or broken into patches; interior solid and marbled; under live oaks *Tuber rufum*
4. Not as above; spore-bearing surface exposed at maturity 5
5. Fruiting body with a well-defined cap; cap cup-like (then stalk absent or present only as a narrowed base), disk-like, wrinkled, brain-like, saddle-shaped, pitted, honeycombed, or thimble-like (i.e., usually with a sterile underside or sterile hollow interior); asci operculate 6
5. Fruiting body club-like or with an enlarged or flattened “head”, but lacking a distinct cap with a sterile underside *or* cap rounded or lobed, often brightly colored, flesh gelatinous and surface viscid *or* disc-like and minute; asci inoperculate 12
- Pezizales:**
6. Fruiting body cup-shaped; stalk absent or present only as a narrowed base 7
6. Fruiting body with a stalk and a cap or “head” 9
7. Fruiting bodies consistently slit down one side, usually erect or semi-erect (often standing on one end like a rabbit’s ear), up to 10 cm tall; often clustered . . . *Otidea spp.*
- (1) Interior orange, often pink-tinged; exterior orange to yellowish, ear-like . . *O. onotica*
- (1) Interior yellowish or brown 2
- (2) Interior and exterior brown, cup-like and distorted, growing in clusters . . *O. alutacea*
- (2) Interior yellowish and exterior brown, ear-like *O. leporina*
7. Not as above 8
8. Fruiting body large to fairly small but not minute, often flattened (disk-like) or spreading at maturity *Peziza spp.*
- Cap 4-15 cm broad, brown; on wood *P. repanda*
- Cap 1-4 cm broad, violet; on burnt ground (campfire sites, etc.) *P. violacea*
8. Fruiting body fairly small to minute, remaining cup-shaped at maturity; often brightly colored (but black in one). *Aleuria spp. and allies*
- (1) Fruiting body bright orange 2
- (1) Fruiting body another color 3
- (2) Stalk absent; cup 1-6 cm broad *Aleuria aurantia*
- (2) Stalk present; cup 1-3 cm broad *Aleuria rhenana (Sowerbyella rhenana)*
- (3) Fruiting body a black cup, 1-2.5 cm broad, on decaying sticks . . *Plectonia melastoma*
- (3) Fruiting body not black 4
- (4) Interior of cup bright red 5
- (4) Interior of cup another color 6

- (5) Exterior whitish; cup 2-5 cm broad *Sarcoscypha coccinea*
 (5) Exterior and margin of cup fringed with black hairs; disk-like in age, 2-12 mm broad .
 *Scutellinia scutellata*
- (6) Cup small (3-10 mm broad), nearly round, interior pale yellow, exterior paler; spores
 without oil droplets *Geopyxis vulcanalis*
 (6) Cup grayish tan throughout (3-10 mm broad); stalk tiny; spores with two large oil
 droplets *Tarzetta cupularis*
9. Cap honeycombed with ridges and pits or smooth to wrinkled; cap intergrown with
 stalk or only upper part of cap intergrown with stalk 10
 9. Cap brain-like, saddle-shaped, etc., cap margin free or attached to stalk but not
 intergrown with the stalk 11
10. Cap with pits and ridges; nearly all of cap intergrown with stalk; up to 15 cm tall . .
 **Morels**
- (1) Ridges dark brown to black, pits vertically arranged *Morchella elata*
 (1) Pits and ridges yellow to tan; pits irregularly arranged or slot-like and vertical
 *M. esculenta*
10. Cap smooth to wrinkled or shallowly pitted, sitting on the stalk like a thimble (i.e.,
 attached only to very top of stalk, the sides hanging free like a skirt); up to 15 cm tall . .
 *Verpa spp.*
- (1) Cap wrinkled or pitted, brown; stalk smooth *V. bohemica*
 (1) Cap relatively smooth, brown; stalk smooth to roughened *V. conica*
11. Cap brain-like to irregularly convoluted or wrinkled, or if saddle-shaped then spores
 with two oil droplets; fertile surface brownish **(False Morels) Gyromitra spp.**
- Cap reddish-brown, 3-12 cm broad and high; stalk colored like cap or paler, stalk more or
 less smooth *G. infula*
11. Cap saddle-shaped, lobed, cup-shaped, plane, etc., but the surface only slightly
 wrinkled if at all, cap 2-8 cm broad and high; spores typically with one oil droplet; fertile
 surface white to brown to black **(Elfin Saddles) Helvella spp.**
- (1) Cap gray to black; stalk deeply fluted *H. lacunosa*
 (1) Cap brown; stalk deeply fluted *H. maculata*
- Helotiales:**
12. Fruiting body with a cap and stalk, the cap rounded or knobby, often gelatinous,
 variously colored, 0.5-3.0 cm broad *Leotia spp.*
- (1) Green head and yellow stalk, in groups in humus or on rotten wood *L. viscosa*
 (1) Yellow head and yellow stalk, in groups in humus or on rotten wood *L. lubrica*
12. Fruiting body variously shaped, not with a distinct cap 13

13. Flesh very rubbery, fruiting body variously shaped; blackish; growing in large clusters on wood. *Bulgaria inquinans*
 13. Not as above 14
14. Fruiting body minute, cup-like or disk-like, bright yellow, in swarms on rotten wood *Bisporella citrina*
 14. Fruiting body erect and club-like or with an enlarged “head”. 15
15. Fruiting body black . . **(Black Earth Tongues) *Geoglossum* and *Trichoglossum* spp.**
- (1) Fruiting body club-like, often twisted, 2-6 cm tall; fertile portion not sharply differentiated from stalk *Geoglossum nigratum*
 (1) Fertile “head” spade-like, usually distinct from stalk; surface velvety (especially the stalk); fruiting body 2-8 cm tall *Trichoglossum hirsutum*
15. Fruiting body lighter or brighter . . **(Colorful Earth Tongues) *Microglossum* spp.**
- Fruiting body green, 1.5-5 cm tall; fertile “head” spatula-shaped *M. viride*

Myxomycetes (Slime Molds)

1. Spores borne externally on individual, erect, simple or branched columns up to 10 mm high (but sometimes not erect); usually white or yellowish; spores white in mass; plasmodium watery, yellow or tinted with pink or green *Ceratiomyxa fructiculosa*
1. Not as above; spores borne internally in fructifications 2

2. Sporophores sessile 3
2. Sporophores stalked 6

3. Sporophore a large aethalium 2 to 20 cm broad, 1 to 3 cm thick, covered with a whitish to ochre to violet, dry, limy crust; spores purple-brown; plasmodium usually yellowish; on rotten wood, vegetative litter, and soil *Fuligo septica*
3. Sporophore smaller 4

4. Spores in mass dark (purple-brown); sporangia to 0.5 mm broad, white to gray, subglobose; the lower portion of the peridium remaining as a shallow cup; peridium usually limy; spores purple-brown; plasmodium watery-white; gregarious or crowded on vegetative litter and living plants *Physarum cinereum*
4. Spores in mass pallid or brightly-colored 5

5. Sporangia globose or club-shaped, 0.5 to 1.0 mm in diameter, yellowish-brown to olivaceous, sessile (or occasionally with a short black stalk); free capillitium abundant in the form of sculptured threads with spiral bands; lower part of peridium persisting; spores yellow; plasmodium white; gregarious or crowded on dead wood *Trichia varia*
5. Sporangia larger, like a small puffball, to 15 mm in diameter, pink to yellow-brown to black; spores pinkish, then pallid in mass; plasmodium coral-red; scattered or crowded on dead wood *Lycogala epidendrum*

6. Sporangia globose 7
6. Sporangia cylindrical 8

7. Sporangia reddish brown, 0.4 to 0.7 mm in diameter, nodding on a long stalk; portions of the delicate peridium persisting as stout longitudinal ribs connected by delicate transverse bands to form a globose net; spores reddish to purplish; plasmodium purple-black; gregarious on dead wood *Dictydium cancellatum*
7. Sporangia changing from red to orange to brown and finally yellow, top-shaped, to 3 mm in diameter; capillitium yellow; stalk short, reddish-brown; spores yellow; plasmodium yellow to red; scattered to crowded on dead wood *Hemitrichia calyculata*

8. Spores black; sporangia to 20 mm tall, reddish-brown; stalk shiny black; peridium evanescent but replaced with a surface net; capillitium densely netted; columella reaching apex of sporangia; plasmodium white; clustered on dead wood and leaves *Stemonitus fusca*
8. Spores yellowish or reddish; sporangia up to 12 mm tall but usually shorter 9

9. Spores red or red-brown; sporangia reddish-brown, 0.4 to 1.2 mm wide, up to 6 mm tall; peridium evanescent; reddish capillitium abundant as sculptured threads with half rings, persistent; stalk slender, reddish, 0.5 to 1.5 mm long; plasmodium white; gregarious to crowded on dead wood *Arcyria denudata*
9. Spores yellow-brown; sporangia bright yellow then buff, 2 mm tall but expanding to 12 mm; as peridium breaks away, the yellowish capillitium expands and droops; stalk short; crowded on dead wood *Arcyria nutans*