

**Trial Key to Common Agaricus Species
of the
Central California Coast***

By Fred Stevens

A. **Cap and stipe lacking color changes** when cut or bruised, **odors not distinctive; not yellowing with KOH** (3% potassium hydroxide). Also keyed out here are three species with faint or atypical color reactions: ***Agaricus hondensis*** and ***A. californicus*** which yellow faintly when bruised or with KOH, and ***Agaricus subrutilescens***, which has a cap context that turns greenish with KOH. **Key A**

AA. **Cap and stipe flesh reddening or yellowing when bruised or injured, the yellowing reaction enhanced with KOH; odors variable** from that of ***anise, phenol, brine, to that of "mushrooms."*** **B**

B. **Cap and stipe context reddish-brown, orange-brown to pinkish-brown when cut or injured;** not yellowing in KOH with one exception: the cap and context of ***Agaricus arorae***, turns pinkish-brown when cut, but also yellows faintly with KOH, this species is also keyed out here. . . . **Key B**

BB. **Cap and stipe yellowing when bruised, either rapidly or slowly;** yellowing also with KOH; odor either pleasant of anise or almonds, or unpleasant, like that of phenol **C**

C. **Cap margin and/or stipe base yellowing rapidly when bruised, but soon fading; odor unpleasant, phenolic or like that of library paste;** yellowing reaction enhanced with KOH, but not strong in ***Agaricus hondensis*** and ***A. californicus***; **Key C**

CC. **Cap and stipe yellowing slowly when bruised, the color change persistent; odor pleasant: of anise, almonds, or "old baked goods;"** also yellowing with KOH; **Key D**

Key A – Species lacking obvious color changes and distinctive odors

A. Found in mixed hardwood-conifer woods **B**

AA. Found in open areas, grass or under trees in urban parks **C**

B. Cap 7.0-13.0 cm broad, with appressed dark-brown to deep vinaceous-brown fibrils or appressed squamules, blackish-brown at the disc; stipe conspicuously floccose to cottony below the ring; veil cottony-membranous, relatively thin; gills rufescent when bruised; cap context green with KOH; fruiting early in the mushroom season; common; edible, but may be mistaken for ***Agaricus hondensis*** which is toxic ***Agaricus subrutilescens***

BB. Cap 8.0-15.0 cm broad, buff-brown to pale pinkish-tan, innately squamulose towards the margin, uniformly tan-brown at the disc; stipe clavate to bulbous, glabrous, not floccose below the ring, the base usually bruising pale yellow when injured, yellowing in KOH; odor of phenol at stipe base typically faint; veil thick, with a felt-like texture, forming a conspicuous pendulous annulus; in mixed hardwood-conifer woods, fruiting during the mid-winter months; common and toxic. ***Agaricus hondensis***

C. Cap 5.0-25.0 cm broad, white; fruiting body short, stocky, often only partially emergent, veil sheathing from the base, annulus usually flaring; found in open areas like roadsides, trails, etc., in packed, heavy soils; uncommon. ***Agaricus bitorquis***

CC. Fruiting body not stocky, veil variable but not sheathing, cap brownish or white; found in lawns, pastures etc., or in impoverished grass, waste areas, occasionally in wood chips **D**

D. Cap 4.0-6.0 cm broad, cap uniformly light brown to medium-brown, shaggy tomentose, becoming fibrillose-squamulose; veil white membranous forming a narrow band on the stipe; stipe base blunt not pointed as in ***Agaricus campestris***; fruiting in waste areas or impoverished pastures, sparse grass, early in the mushroom season; locally common; edible. ***Agaricus cupreo-brunneus***

DD. Cap 4.0-10.0 cm broad, white or whitish with a brown disc, not tomentose when young, fruiting in a variety of habitats, e.g. lawns, under trees in parks etc... **E**

E. Cap 4.0-10.0 cm broad, cap white, glabrous to appressed squamulose in

dry weather; partial veil single, thin, membranous, the margin not thickened, forming an inconspicuous, often evanescent annulus; stipe base pointed, not blunt; fruiting early in the mushroom season in grass, e.g. pastures, lawns; not as common in the coastal zone as ***A. californicus***, with which it is often confused; edible. ***Agaricus campestris***

EE. Cap 5-9 cm broad, dull-brown at the disc, lighter near the margin; surface innately fibrillose to squamulose, the margin and stipe base faintly yellowing; veil similar to ***Agaricus xanthodermus***, i.e. the margin blunt with a double edge; odor faintly of phenol; common in a variety of habitats, especially grassy areas in urban parks, under trees, occasionally on well rotted wood chips; along with ***Agaricus xanthodermus*** one of most frequently encountered *Agaricus* species; mildly toxic
. ***Agaricus californicus***

Key B – Species with stipe and cap tissue that reddens (orange-red to pinkish-brown) when cut and the stipe sometimes brownish with handling; odors variable; KOH negative or positive.

A. Occurring in grass or sandy soils, occasionally with cypress; sporocarp white, usually short, stocky, cap 6.0-21.0 cm broad, at first nearly glabrous, at maturity typically ornamented with conspicuous pale-grey to brown-tipped erect scales or erect warts; veil usually sheathing but may be broken up into bands on the stipe; flesh reddish-orange when cut; odor strongly of brine; sometimes mistaken for ***Agaricus bitorquis*** because of a robust short stature; common; edible but considered undesirable by many due to a strong iodine taste ***Agaricus bernardii***

AA. Associated with trees **B**

B. Found with Monterey cypress and Monterey Pine, stature normal to robust **C**

BB. Found with various conifers and hardwoods, but not Monterey Cypress; stature slender; cap brown, glabrous at the disc, becoming appressed fibrillose to squamulose towards the margin; cap surface yellowing faintly with KOH; context of cap and stipe pinkish-brown when cut or injured; veil membranous white, forming a pendulous annulus, lower stipe with scattered patchy scales; fruiting early in the mushroom sea son; edible ***Agaricus arorae***

C. Fruiting body with distinctive thin, mottled, coco-colored veil (not colored by spores), cap 4.0-9.0 cm broad, often somewhat conic during

development, with brownish fibrils or scales over a pallid ground color, tending to fruit in cespitose clusters under Monterey pine and cypress; uncommon in most years; edible, but lacking texture, often riddled with fly larva **Agaricus fuscovelatus**

CC. Veil variable, usually pallid, membranous to cottony, sometimes with buff-brown floccose scales, or the veil margin pale to lilac-brown. **D**

D. Sporocarp with circular, brownish, scaly rings at base of stipe, associated with Monterey cypress. **E**

DD. Stipe base lacking scaly rings at base of stipe **F**

E. Sporocarps moderate-sized; cap 5-10 cm broad, chestnut-brown to ruddy-brown, innately fibrillose to squamulose, veil relatively thick, pallid, often with a light-brown to lilac-brown margin, forming a pendulous annulus, conspicuous light-brown scaly rings at the stipe base; fruiting under Monterey cypress from mid to late winter months; common and a good edible **Agaricus fuscofibrillosus**

EE. Sporocarps stocky, more robust than **A. fuscofibrillosus**, cap 6.0-15.0 cm broad, medium-brown, fibrillose to squamulose; veil membranous, pallid, with light-brown floccose warts; brown scaly rings often at base of stipe, the latter usually well buried in the substrate; locally common in old stands of Monterey cypress near the coast; fruting during the mid-winter months; edible with excellent texture **Agaricus pattersonae**

F. Cap 5.0-9.0 cm broad, white, convex, expanding to plano-convex, the disc sometimes brownish; flesh pinkish-orange when cut; veil white, membranous, forming a short pendulous annulus, often leaving scattered squamules on the lower stipe, fairly common under Monterey pine and cypress during the mid-winter months; edible.. **Agaricus benesi**

FF. Cap with brown to grey-brown appressed fibrils or squamules **G**

G. Sporocarp large, robust, stocky, the cap, with appressed brown to greyish-brown fibrils or flattened squamules, the surface sometimes lustrous and yellowing with age or in cold weather, yellowing in KOH; context firm, slowly rufescent; stipe thick, the veil white, membranous, sometimes leaving patches on the stipe below the annulus; associated with Monterey cypress; uncommon; an excellent edible, with unusually firm texture **Agaricus lilaceps**

GG. Sporocarps of moderate size; cap with buff to light-brown, appressed scales over a pallid ground color, not yellowing with KOH; flesh reddening slowly (several minutes); veil cottony-membranous, sometimes partially sheathing or leaving whitish bands on the lower stipe, associated with Monterey cypress; uncommon, fruiting after periods of warm weather; edible. **Agaricus bisporus**

Key C – Species that yellow rapidly when bruised, the color change may sometimes be faint (check base of stipe, margin of young cap); yellow coloration soon fading; odor unpleasant, phenolic or like library paste

A. Cap margin or base of stipe, bright yellow when bruised, odor strongly of phenol **B**

AA. Cap margin or base of stipe weakly yellow when bruised, odor of phenol sometimes faint **C**

B. Cap 5.0-13.0 cm broad, covered with grey-brown appressed scales, disc dark grey-brown, stipe base equal to sub-bulbous, chrome yellow when injured, cap bruising yellowish, then becoming reddish-brown; odor strongly phenolic; in hardwood-conifer woods, especially with Coast Redwood, and Douglas Fir; fruiting early in the mushroom season, common north of San Francisco along the coast; toxic **Agaricus praeclaresquamosus**

BB. Cap 7.0-12.0 cm broad, buff-brown to tan-brown at the disc shading to a pale margin; surface innately fibrillose, occasionally scaly or cracked in dry weather, cap margin and stipe base of young specimens yellowing quickly; veil conspicuous, the margin blunt with a double edge, white rhizomorphs at stipe base; found abundantly in grass under trees, common in parks; mildly toxic **Agaricus xanthodermus**

C. Cap 8.0-15 cm broad, covered with pale-buff to pale-tan, innate squamules, light-brown at the disc, stipe clavate to bulbous, bruising pale yellow when injured; odor of phenol faint; veil thick, with a felt-like texture and a double edged margin, forming a conspicuous pendulous annulus; in mixed hardwood-conifer woods, fruiting during midwinter, common, perhaps the most toxic of California Agaricus **Agaricus hondensis**

CC. Cap 5.0-9.0 cm broad, medium-brown at the disc, lighter toward the margin, appressed fibrillose to squamulose depending on weather

conditions, cap margin and stipe base faintly yellow when bruised; veil similar to *Agaricus xanthodermus*, blunt at the margin with a double edge; stipe more or less equal, not clavate, the tip not pointed as in *Agaricus bisporus*; common in lawns, playing fields, occasionally in forested areas, unusually large well-rooted specimens sometimes seen in wood chips; mildly toxic. ***Agaricus californicus***

Key D – Species that yellow slowly when bruised, the yellowing persistent; yellowing reaction enhanced with KOH; odor of anise or almonds

A. Growing in grass **B**

AA. Growing in parks or natural woodlands **G**

B. Cap small, up to 5.0 cm broad **C**

BB. Caps larger, 6.0-35.0 cm broad **D**

C. Cap 2-5 cm broad, white to cream-colored with sparse brown fibrils near disc, otherwise glabrous, veil thin, white, membranous with buff-colored floccose scales, some adhering to the lower stipe; spores 4.5-4.8 x 3.3-3.7 microns; fruiting in grass before the fall rains, uncommon.
 ***Agaricus comptulus***

CC Cap 2-4 cm broad, whitish, covered with pinkish-red, then greyish-brown, innate fibrils; cap margin sometimes appendiculate; veil white, fibrillose-membranous; stipe more or less glabrous below the annulus at maturity; fruiting in grass; spores 4.6-4.9 x 3.5-3.8 microns; uncommon; edible. ***Agaricus micromegathus***

D. Caps 8.0-32.0 cm broad, with conspicuous hazel-brown to medium brown appressed scales over a cream-colored background, cap slowly yellowing where bruised, stipe below the veil covered with whitish floccose scales when young; context with distinct odor of anise; spores 7.7-9.4 x 5.1-6.0 microns; fruiting in grass or duff under conifers like Coast Redwood, Monterey Cypress, Monterey Pine; fruiting during the warmer months of the year; fairly common; excellent edible ***Agaricus augustus***

DD. Caps white to cream, moderate to large (7.0-35.0 cm), if possessing scales or warts, not of a contrasting color **E**

E. Caps large, up to 35.0 cm broad, whitish, not yellowing, surface cracked or with large warts at maturity, stipe short often with scaly rings at the base; spores 8.8-9.9 x 6.3-6.8 microns growing in coastal grasslands; uncommon; edible **Agaricus crocodilinus**

EE. Caps smaller, up to 15 cm broad, white to cream-colored, glabrous to appressed fibrillose-squamulose, warted occasionally in dry weather, normal stature, usually yellowing slightly when bruised or with age **F**

F. Cap 7.0-14.0 cm broad, whitish, glabrous to appressed fibrillose-squamulose; may or may not yellow when bruised; veil cogwheel type, leaving conspicuous circularly arranged pointed scales on the lower stipe; stipe solid, usually not stuffed; spores: 6.0-6.5 x 4.6-5.1 microns; fruiting in coastal grassy areas; edible; locally common; fruiting from mid to late winter; distinguished from **Agaricus arvensis** by smaller spores, whiter cap, usually solid stipe and more pronounced scales on the lower stipe **Agaricus osecanus**

FF. Cap 10.0-15.0 cm broad, white to cream-colored, glabrous to appressed fibrillose-squamulose; slowly yellowing when bruised or injured; unbroken veil cogwheel type with buff-colored floccose warts arranged radially over a thin, cream-colored membranous layer; stipe stuffed to hollow, glabrous below the ring except for a scattering of short pointed scales at the base; spores 7.4-8.0 x 5.3-5.6 microns **Agaricus arvensis**

G. Caps small, 3.0-7.0 cm broad **H**

GG. Caps large 7.0-30.0 cm broad. **I**

H. Cap 4.0-7.0 cm broad, often with a broad umbo, innately fibrillose to squamulose, the ornamentation pinkish to vinaceous-brown over a whitish background; bruising yellowish or becoming so in age; odor of almonds; stipe equal to club-shaped, the lower portion initially covered with whitish fibrils and squamules, becoming glabrous in age, white rhizomorphs frequently at the base; under hardwood and conifers; spores 4.7-5.5 x 3.3-3.8 microns **Agaricus semotus**

HH. Cap 1-3 cm broad, not umbonate, surface of appressed lilac-brown fibrils and squamules over a pallid background, fibrils and squamules concentrated at the disc, slowly yellowing where bruised; odor of almonds; stipe slender, more or less equal, fragile, surface of lower portion covered with soft white fibrils, eventually nearly glabrous; veil white, thin, membranous, forming a fragile, narrow

annulus on the upper stipe; spores 4.9-5.4 x 3.6-3.9 microns; fruiting solitary to scattered in mixed hardwood-conifer woods early in the mushroom season; fairly common but inconspicuous; likely to be mistaken for a species of **Lepiota**.

..... **Agaricus diminutivus**

I. Cap 8-12 cm broad, white to cream-colored, surface glabrous to appressed fibrillose-squamulose, the ornamentation concolorous with the pallid background color; stipe more or less glabrous below the ring; occasional, in mixed hardwood-conifer woods; similar to **A. arvensis** but with smaller spores; uncommon; edible **Agaricus silvicola**

II. Cap hazel-brown, tawny-brown or greyish-brown with appressed fibrils or squamules **J**

J. Cap 8-17 cm broad, the surface greyish-brown fibrillose-squamules, odor of anise faint; stipe more or less glabrous, not scaly- floccose below the ring; yellowing faintly when bruised; growing with a variety of trees including Monterey cypress, Eucalyptus and Monterey Pine; similar in aspect to Agaricus augustus but somewhat smaller, the scales more greyish-brown than hazel-brown; spores: 6.4-7.4 x 4.3-4.7 microns; fruiting from after the fall rains to mid-winter; uncommon; edible; note: **Agaricus praeclaresquamosus** is superficially similar, but differs in having a darker, more squamulose cap, a smooth, not floccose veil, a stipe base that yellows quickly, and a distinct phenol odor **Agaricus perobscurus**

JJ. Caps with hazel-brown to tawny-brown scales, moderate to large in size **K**

K Caps 8.0-32.0 cm broad, with conspicuous hazel-brown to medium-brown appressed scales over a cream-colored background, cap slowly yellowing where bruised, stipe more or less equal, covered below the annulus with whitish floccose scales when young; context with distinct odor of anise; spores 7.7-9.4 x 5.1-6.0 microns; fruiting in grass or duff under conifers, occasionally with hardwoods; appearing during the warmer months of the year; fairly common; an excellent edible. **Agaricus augustus**

KK Caps 8-13 cm broad, with tawny-brown to orange-brown, appressed fibrils and squamules; slowly darkening when bruised or in age; odor of almonds; stipe bulbous, the lower portion covered with white fibrils, but not floccose; spores 7.4-8.3 x 5.0-5.6 microns; fruiting shortly after the fall rains under conifers, fairly common with Sitka Spruce from Mendocino northward;

similar in appearance to ***Agaricus augustus***, but smaller and lacking
conspicuous squamules on stipe. ***Agaricus smithii***

*Cap and spore measurements **from: Kerrigan: a Monograph of Agaricus
in the Agaricales of California –Mad River Press**

Agaricus species in this key (26)

- arorae
- arvensis
- augustus
- benesi
- bernardii
- bisporus
- bitorquis
- californicus
- campestris
- comptulus
- crocodilinus
- cupreobrunneus
- diminutivus
- fuscifibrillosus
- fuscovelatus
- hondensis
- liliceps
- micromegathus
- osecanus
- pattersonae
- perobscurus
- praeclaresquamosus
- semotus
- smithii
- subrutescens
- xanthodermus