

# Field Key to the Boletes of California

## Key to the Genera of Boletes

1. Tubes typically disoriented and irregularly arranged; spore deposit not obtainable ..... **Gastroboletus**
1. Tubes more or less vertically oriented and orderly arranged; spore deposit usually readily obtainable ..... **2**
  2. Basidiocarps small (4-7 cm); tubes white when young, becoming bright yellow at maturity; spore deposit yellow; stipe typically hollow in the basal portion with age ..... **Gyroporus castaneus**
  2. Basidiocarps typically larger; tubes yellow when young, or if white at first, then not bright yellow with age; spore deposit olivaceous to brown to reddish brown or flesh or vinaceous color; stipe usually not hollow ..... **3**
3. Basidiocarp with a conspicuous, cottony, bright yellow veil (be sure to check young specimens) ..... **Pulveroboletus ravenelii**
3. Basidiocarps lacking such a veil ..... **4**
  4. Spore deposit flesh color to vinaceous to dark reddish brown; tubes at maturity eventually becoming pink to flesh color to vinaceous to dark reddish brown or even blackish (yellow in *Tylopilus amylosporus*) ..... **Tylopilus**
  4. Spore deposit olivaceous to brown; tubes not colored as above ..... **5**
5. Cap viscid, subviscid, or dry; if dry, then stipe with an annulus; glandular dots usually apparent on stipe; if glandular dots lacking, then stipe annulate and pores radially arranged ..... **Suillus**
5. Cap dry to moist or rarely viscid; if viscid, stipe not annulate; glandular dots not present ..... **6**
  6. Stipe with numerous small squamules, which are white or whitish when young but typically become black or brown with age; tubes white or whitish when young, becoming dull yellow or olivaceous with age ..... **Leccinum**
  6. Stipe glabrous, fibrillose, smooth, ridged or reticulate, dark colored squamules lacking; tubes yellow or white; if white, typically "stuffed" when young ..... **Boletus**

## Key to the Species of *Gastroboletus*

1. Context changing to blue when exposed or injured ..... **2**
1. Context unchanging or at least not changing to blue when exposed ..... **3**
  2. "Cap" red to reddish brown; context changing to an intense blue immediately upon bruising ..... **Gastroboletus turbinatus**
  2. "Cap" brown to olive brown or yellow brown; context change to blue somewhat erratic and often slight ..... **Gastroboletus xerocomoides**
3. "Tubes" covered with a white persistent peridial membrane that is distinct from the cuticle of the cap ..... **Gastroboletus subalpinus**
3. Peridial membrane not formed ..... **4**

- 4. "Cap" brown, with no reddish tones or spots ..... **Gastroboletus suilloides (= Gastrosuillus suilloides)**
- 4. "Cap" buff to tawny, usually with reddish spots or areas irregularly distributed ..... **Gastroboletus amyloideus**

## Key to the Species of Tylopilus

- 1. Basidiocarp, including the tubes, blackish to fuscous to very dark reddish brown; tubes and cap staining wax paper blue green ..... **Tylopilus pseudoscaber (= T. porphyrosporus)**
- 1. Basidiocarp not colored as above; wax paper not stained blue or blue green ..... 2
  - 2. Stipe strongly reticulate for one half to three quarters of length; cap pallid, tan to buff ..... **Tylopilus indecisus**
  - 2. Stipe not reticulate or for only a short distance at the apex; cap pallid to dark brown ..... 3
- 3. Stipe short, poorly developed, often eccentric; sometimes basidiocarp not coming above ground; (known only from a single locality in Jackson State Forest near Mendocino in Mendocino County) ..... **Tylopilus humilis**
- 3. Stipe typically centrally attached and well developed; basidiocarp coming above ground ..... 4
  - 4. Cap pale tan to pale vinaceous; tubes white, becoming flesh colored ..... **Tylopilus ammiratii**
  - 4. Cap dark brown to dark olive brown to gray brown; tubes flesh colored or yellow ..... 5
- 5. Tubes yellow to yellowish at maturity; cap olive brown to gray brown ..... **Tylopilus amylosporus**
- 5. Tubes flesh colored at maturity; cap dark brown ..... **Tylopilus ferrugineus**

## Key to the Species of Suillus

- 1. Cap surface dry, moist, or only subviscid ..... 2
- 1. Cap surface viscid to glutinous ..... 4
  - 2. Cap surface dry, dull red to reddish brown, noticeably fibrillose scaly ..... **Suillus lakei**
  - 2. Cap surface moist to subviscid; brown to dark brown; fibrillose but not strongly fibrillose-scaly ..... 3
- 3. Stipe surface noticeably reticulate ..... **Suillus reticulatus**
- 3. Stipe glandulose, not reticulate ..... **Suillus fuscotomentosus**
  - 4. Stipe with a distinct annulus ..... 5
  - 4. Stipe lacking a distinct annulus ..... 14
- 5. Context changing to blue, at least in base of stipe (change sometimes only slight and erratic) ..... 6
- 5. Context unchanging or at least not changing to blue ..... 9
  - 6. Context of cap first becoming blue, then fuscous when exposed ..... **Suillus lithocarpi-sequoiae**

6. Context of cap usually unchanging; context in base of stipe changing to blue when handled or exposed but not becoming fuscous .....	7
7. Annulus heavy, touch, very viscid, lower surface orange; cap usually reddish brown, often with greenish stains when old .....	<b>Suillus ponderosus</b>
7. Annulus heavy, tough, very viscid, usually white or pallid; cap not colored as above .....	8
8. Cap glabrous, cinnamon to orange cinnamon; associated with spruce and true firs .....	<b>Suillus imitatus</b>
8. Cap with streaks or with scattered appressed fibrils; buff to pale vinaceous; associated with Douglas fir .....	<b>Suillus caeruleus</b>
9. Annulus well developed, often flaring or pendant .....	10
9. Annulus only developed as a fibrillose zone or ring around the stipe .....	11
10. Stipe with a well developed, peronate whitish veil forming an annulus that develops a purplish zone on the lower surface .....	<b>Suillus luteus</b>
10. Stipe not peronate; annulus gray to white, not developing purple color on lower surface .....	<b>Suillus subolivaceus</b>
11. Glands on surface of stipe obscure or not noticeable .....	<b>Suillus pseudobrevipes</b>
11. Glands well developed and apparent during all stages of development .....	12
12. Cap yellow to bright yellow; stipe pallid (tan to buff); cap typically umbonate, at least when young .....	<b>Suillus umbonatus</b>
12. Cap and stipe colored some shade of yellow; cap convex to plane .....	13
13. Cap bright yellow; stipe short, often somewhat eccentric .....	<b>Suillus megaporinus</b>
13. Cap yellow brown; stipe well developed, not eccentric .....	<b>Suillus riparius</b>
14. Context of stipe and cap changing to blue when exposed .....	<b>Suillus tomentosus</b>
14. Context of cap and stipe not changing to blue when exposed .....	15
15. Cap margin with a noticeable cottony or fibrillose roll, at least when young .....	16
15. Cap margin glabrous or only with scattered fibrils .....	24
16. Pores large, up to 5 mm broad, often appearing somewhat lamellose; annulus sometimes present .....	17
16. Pores smaller, more or less angular or only slightly elongated; annulus not present .....	18
17. Cap bright yellow; stipe short, often somewhat eccentric .....	<b>Suillus megaporinus</b>
17. Cap yellow brown; stipe well developed, not eccentric .....	<b>Suillus riparius</b>
18. Cap white when young, then becoming gray and eventually reddish brown when mature; associated with knobcone and Monterey pines .....	<b>Suillus pungens</b>
18. Cap not passing through the various color shades as given above .....	19
19. Cap white, becoming chocolate brown; associated with sugar pine .....	<b>Suillus brunnescens</b>
19. Cap not colored as above; not associated with sugar pine .....	20

20. Cap dark cinnamon brown during all stages; stipe white becoming reddish brown .....	<b>Suillus borealis</b>
20. Basidiocarp not colored as above .....	<b>21</b>
21. Pores 1-2 mm broad; cap dingy yellow; associated with white pine ( <i>Pinus monticola</i> ) .....	<b>Suillus sibiricus</b>
21. Pores less than 1 mm broad; cap not colored as above; not associated with white pine .....	<b>22</b>
22. Glands conspicuous on stipe during all stages of development; associated with Bishop pine ..	<b>Suillus glandulosipes</b>
22. Glands obscure, at least when young .....	<b>23</b>
23. Cap yellow to rust color when young, often spotted or mottled; associated with Jeffrey pine and possibly ponderosa pine .....	<b>Suillus volcanalis</b>
23. Cap white to pallid to pale vinaceous when young; known only from under lodgepole pine in California .....	<b>Suillus albidipes</b>
24. Cap surface with noticeable fibrils or fibrillose scales .....	<b>25</b>
24. Cap more or less glabrous or merely streaked .....	<b>26</b>
25. Cap "brown, pores large"; associated apparently with ponderosa pine (known only from a single collection made near Grass Valley, Calif. in 1914) .....	<b>Suillus californicus</b>
25. Cap ochraceous to rust brown with dark fibrils or streaks; associated with Monterey and Bishop pines .....	<b>Suillus acerbus</b>
26. Stipe 2-4 cm thick, clavate to ventricose .....	<b>Suillus monticolus</b>
26. Stipe more or less equal, up to 2 cm thick .....	<b>27</b>
27. Stipe lacking conspicuous glands, at least when young .....	<b>Suillus brevipes</b>
27. Stipe obviously glandular dotted during all stages .....	<b>28</b>
28. Tubes boletinoid (radiating from the stipe) .....	<b>Suillus punctatipes</b>
28. Tubes not boletinoid .....	<b>Suillus granulatus</b>

## Key to the Species of *Leccinum*

1. Cap some shade of orange to red to brown to maroon; margin with noticeable "flaps" of sterile tissue .....	<b>2</b>
1. Cap grayish to whitish; margin entire, lacking sterile "flaps" of tissue .....	<b>10</b>
2. Context of cap and stipe apex unchanging when exposed, or at least not becoming black or blue black .....	<b>Leccinum constans</b>
2. Context eventually changing to black or blue black when exposed (change may be slow and erratic) .....	<b>3</b>
3. Context of cap and stipe apex changing to reddish or reddish brown before becoming blackish .....	<b>4</b>
3. Context of cap and stipe apex changing directly to blue black or blackish .....	<b>6</b>
4. Basidiocarps typically associated with madrones ( <i>Arbutus</i> ) .....	<b>Leccinum arbuticola</b>

4. Basidiocarps typically associated with aspens ( <i>Populus</i> ) .....	5
5. Surface of cap matted fibrillose, at least when young, dry, rust red to apricot color .....	<b>Leccinum aurantiacum</b>
5. Surface of cap glabrous when young, brown to rust red, dry to subviscid .....	<b>Leccinum discolor</b>
6. Cap dark red to deep reddish brown; associated with madrone, manzanita, or toyon .....	7
6. Cap brown to reddish brown or pallid (pinkish), associated with conifers or hardwoods .....	8
7. Cap viscid during all stages; squamules on stipe coarse; pores white to pallid when young; associated with madrone or manzanita .....	<b>Leccinum manzanitae</b>
7. Cap typically dry, becoming viscid only when wet for prolonged periods or when very old; squamules on stipe small and densely crowded; pores smoke colored; known only from under toyon .....	<b>Leccinum largentii</b>
8. Cap brown or dull reddish brown, dark dull brown when dried .....	<b>Leccinum brunneum</b>
8. Cap pallid (whitish to pale buff or pale pink) or orange to brick red.....	9
9. Cap pallid (whitish to pale buff to pale pink); stipe white during all stages .....	<b>Leccinum armeniacum</b>
9. Cap orange to brick red; stipe white only when young .....	<b>Leccinum insigne</b>
10. Cap gray to gray brown to blackish .....	<b>Leccinum montanum</b>
10. Cap whitish to pale tan or tan .....	<b>Leccinum californicum</b>

## Key to the Species of *Boletus*

1. Pores pink, red, or reddish brown .....	2
1. Pores white or yellow .....	8
2. Pores reddish brown, sometimes obscurely so; taste very acrid (biting) .....	<b>Boletus piperatus (= Chalciaporus piperatus)</b>
2. Taste mild, or at least not acrid; pores red or pink .....	3
3. Surface of cap noticeably tomentose to velutinous or fibrillose; cap gray brown to near fuscous .....	<b>Boletus mendocinensis</b>
3. Surface of cap glabrous or nearly so; cap not colored gray brown or fuscous .....	4
4. Stipe reticulate .....	5
4. Stipe not reticulate .....	6
5. Cap gray to pinkish gray; stipe conspicuously bulbous, pallid with pink overtones .....	<b>Boletus satanas</b>
5. Cap brown to reddish brown; stipe clavate or only subbulbous, brown .....	<b>Boletus eastwoodiae (= B. pulcherrimus)</b>
6. Cap bright, intense yellow .....	<b>Boletus orovillus</b>
6. Cap differently colored .....	7
7. Cap pink to reddish vinaceous; pores pink .....	<b>Boletus amygdalinus</b>

7. Cap dark brown to reddish brown; pores red .....	<b>Boletus erythropus</b>
8. Cap viscid to glutinous; red to reddish brown; pores bright yellow .....	<b>Boletus flaviporus</b>
8. Cap and tubes not as above .....	<b>9</b>
9. Stipe noticeably reticulate for at least one half the distance .....	<b>10</b>
9. Stipe not reticulate, or, if so, only at the very apex .....	<b>17</b>
10. Pores white when young, becoming yellow with age .....	<b>11</b>
10. Pores yellow during all stages of development .....	<b>13</b>
11. Surface of cap strongly reticulate or ridged; brown to dull yellow brown .....	<b>Boletus mottii</b>
11. Surface not as above .....	<b>12</b>
12. Cap pallid (tan to light brown); associated with pines .....	<b>Boletus edulis</b>
12. Cap very dark brown to blackish; associated with oaks and madrone .....	<b>Boletus aereus</b>
13. Cap noticeably fibrillose to fibrillose-scaly, fibrils and scales colored dark brown ....	<b>Boletus fibrillosus</b>
13. Cap not as above .....	<b>14</b>
14. Cap deep rose to rose pink .....	<b>Boletus regius</b>
14. Cap not colored as above .....	<b>15</b>
15. Taste noticeably bitter .....	<b>Boletus calopus</b>
15. Taste mild, or at least not bitter .....	<b>16</b>
16. Cap glabrous; associated with oaks or other hardwoods .....	<b>Boletus appendiculatus</b>
16. Cap often with scattered, appressed fibrillose scales; associated with firs at higher elevations .....	<b>Boletus abieticola</b>
17. Cap dark chocolate brown, surface conspicuously tomentose to fibrillose-scaly; stipe dark brown, sometimes alveolate at the apex .....	<b>Boletus mirabilis</b>
17. Cap and stipe not as above .....	<b>18</b>
18. Cap very dark gray brown to fuscous or blackish .....	<b>19</b>
18. Cap not colored as above .....	<b>21</b>
19. Cap typically rimose or split or checked when old, at least near the margin .....	<b>20</b>
19. Cap not becoming rimose .....	<b>Boletus zelleri</b>
20. Cracks on cap shallow and exposed, context tan to pallid, not red .....	<b>Boletus truncatus</b>
20. Cracks on cap deeper and exposed, context usually assuming reddish tints .....	<b>Boletus chrysenteron</b>
21. Cap red, reddish brown, or reddish with grayish overtones .....	<b>22</b>
21. Cap not colored as above .....	<b>25</b>
22. Cap red to dark reddish brown; surface glabrous to finely velutinous .....	<b>23</b>
22. Cap red to pinkish with grayish overtones; surface tomentose .....	<b>Boletus smithii</b>

23. Stipe short, often flattened at the apex, colored red in the base and yellow in the apical portion; cap reddish brown ..... **Boletus dryophilus**
23. Stipe not as above; cap not reddish brown ..... **24**
24. Stipe red, yellowish at the base; cap glabrous to fibrillose or velutinous .....  
     ..... **Boletus amyloideus**
24. Stipe buff to pale yellow, slight reddish blush sometimes at the apex; cap velutinous to pubescent ..... **Boletus coccypinus**
25. Tubes changing to brick red when bruised (known only from two collections made near Stanford University several years ago) ..... **Boletus tomentipes**
25. Tubes unchanging or, if changing, not becoming red when bruised ..... **26**
26. Cap olive brown; all parts of basidiocarp quickly and intensely changing to blue when bruised or exposed ..... **Boletus pulverulentus**
26. Cap not colored as above; if changing to blue when bruised, change not intense or immediate ..... **27**
27. Cap tan to buff when young; stipe yellow at the apex, red at the base when young, entire stipe red when old ..... **Boletus rubripes**
27. Basidiocarp not colored as above ..... **28**
28. Ammonium hydroxide giving a fleeting blue to blue-green color on the cap surface .....  
     ..... **Boletus spadiceus**
28. Ammonium hydroxide not giving a blue to blue-green reaction on the cap surface ..... **29**
29. Pores up to 3 mm broad ..... **Boletus subtomentosus**
29. Pores up to 1 mm broad ..... **Boletus fragrans**

This key by Dr. Harry Thiers was originally published in:

**Thiers, H.D.** (1975). California Mushrooms--A Field Guide to the Boletes. Hafner Press: New York, NY.

And republished on the web at MykoWeb as part of The Boletes of California:

<http://www.mykoweb.com/boletes/>

There are several species of boletes that have been discovered in California or described as new since the original publication in 1975 that are not included in this key:

*Boletus citriniporus*  
*Boletus haematinus*  
*Boletus spadiceus* var. *furcatus*  
*Chalciporus piperatoides*  
*Gastroboletus brunneus*  
*Gastrosuillus amaranthii*  
*Gyrodon lividus*  
*Suillus anomalus*  
*Suillus brunnescens*