The Boletales
Boletaceae, Gomphidiaceae, Paxillaceae, Coniophoraceae, Sclerodermataceae, and other gastroid taxa
Characteristics of the “Boletaceae” (polyphyletic family)

- Fleshy tubed mushrooms, or gilled with interwoven tube-like gills
- Moderate to large sized with bun-shaped pileus
- Divergent gill(tube) trama
- Often bruising: blue, red, black or green (pulvinic acids, and others)
- Usually with elongate spores
- Usually ectomycorrhizal
Typical bolete spores
Boletoid clade

(Boletus, Leccium, Tylopilus, Pulveroboletus, and others)

Paxillus and Chalciporus

Coniophoraceae and wood decaying Paxillaceae

Gyrodontoid clade

Scleroderma, Pisolithus, and others

Suilloid clade

Suillus, Rhizopogon, Gomphidius, Chroogomphus, and others)
Boletus versus Suillus

- Tubes rounded, uniform
- Cystidia of various types, but not causing incrustations
- Spores sometimes very long
- Not slimy, and no veil
- Stipe never glandular
- Mushrooms moderate to huge in size
- With both hardwoods and conifers

- Tubes angular, compound
- Cystidia in clusters leaving brown incrustation
- Spores relatively short
- Often slimy, and with a veil
- Stipe often glandular
- Mushrooms small to moderate in size
- With Pinaceae (2 known exceptions)
Characteristics used to separate species

- Fresh color (tubes, pileus, stipe)
- Color changes
- Stipe surface (reticulate?)
- Habitat (host)
- Spore size, color
- Pileus cuticle
- Cystidia types

Boletus edulis

Boletus frostii
Example of a reticulate stipe surface

Found in some *Boletus, Tylopilus*, and *Austroboletus*

Photos from Bessette et al.
Boletus satanas
red tube mouths
reticulate stipe
huge bulbous stipe base
whitish pileus and stipe
flesh changing blue

Photo from Bessette et al

B. rubripes
whitish tan pileus
red at base of stipe
yellow at apex of stipe
no reticulation
bluing
bitter taste

Photo from Arora
“Xerocomoid boletes” moderate size, velvety caps tubes often compound and larger

*B. subtomentosus*

*B. Zelleri*

In *chrysenteron* complex

Photos from Bessette et al
**Boletus mirabilis**
textured pileus
distinctive color
striate stipe
Often on well rotted stumps
huge spores!!

Photo from Arora
Leccinum

Stipe scabrous
Example of a scaberous stipe surface, found in *Leccinum* and rarely *Tylopilus*

the scabers are clusters of caulocystida

Photo from Bessette et al.
*Calciporus*

small to moderate-size
Our species are brown with bright yellow at base of stipe, and have peppery tastes

*C. piperatoides* - changes blue on tubes

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*Calciporus piperatus*

Photos from Bessette et al.
Pulveroboletus ravenellii
Bright yellow with a veil
Phylloporus - a gilled member of the boletoid clade

Photo from Bessette et al.
Paxillus involutus gr. photo from mykoweb
And there are gasteroid taxa

*Gastroboletus*

a gastroid *Boletus*

*Melanogaster*

A hypogeous boletoid genus
Boletoid clade
(Boletus, Leccium, Tylopilus, Pulveroboletus, and others)

Paxillus and Chalciporus

Coniophoraceae and wood decaying Paxillaceae

Gyrodontoid clade
*Scleroderma, Pisolithus, and others

Suillloid clade
*Suillus, Rhizopogon
*Gomphidius, Chroogomphus, and others)
The suilloid clade
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Suillus cystidia

Suillus spore print colors
glandular and annulate stipe surfaces found in *Suillus*

Photos from Bessette et al.
Suillus pungens

Suillus brevipes
Suillus tomentosus
*Suillus ponderosus* and *S. caerulescens*

two very common Douglas-fir associates

gelatinous orangish annulus
*S. ponderosus*

dry white annulus
*S. caerulescens*

Photos from Bessette et al
Suillus lakei a distinctive Douglas-fir associate

Photo from Bessette et al
*Gomphidius smithii*

*Chroogomphus tomentosus*

*Gomphidius subroseus*
Rhizopogon sp.
suillus-like spores
no columella
they bounce

Truncocolumella
Boletoid clade

(Boletus, Leccium, Tylopilus, Pulveroboletus, and others)

Paxilloid clade

Paxillus and Chalciporus

Coniochoraceae and wood decaying Paxillaceae

Gyrodontoid clade

Scleroderma, Pisolithus, and others

Suilloid clade

Suillus, Rhizopogon

Gomphidiis, Chroogomphus, and others)
Gyroporus

Spores small
Stipe hollow

Gyroporus cyanescens

Gyroporus purpureescens
*Scleroderma* -
A hard puffball, with dark, ornamented spores

Related to *Pisolithus* and *Gyroporus*
**Pisolithus** -
Spores initially in peridioles
(rice crispies in tar)
Boletoid clade

(Boletus, Leccium, Tylopilus, Pulveroboletus, and others)

Paxilloid clade

Gyrodontoid clade

Coniochoryceae and wood decaying Paxillaceae

Suilloid clade

Suillus, Rhizopogon
Gomphidiaceae, Chroogomphus, and others)
*Tapinella (Paxillus) atrotomentosus*
Brown-spored, gills separable from pileus and with interweavings on wood causing a brown rot
Hygrophoropsis aurantiaca - “false chantharelle”
White-spored, forked gills with interweavings on wood causing a brown rot - photo from Mykoweb
Coniophora - a resupinate wood decay fungus with brown, bolete-like spores