Boletus spp. sect. boletus – morphology, ecology and some applications

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**Boletus spp. sect. boletus** (true ceps) – common features

**Common macroscopic features:**
- flesh white (or pale yellow), specific (for the group *s.l.*) mild-tasting (specific odor for the section), flesh does not change color when exposed to air;
- stipe with enlarged base, clavate or very rarely cylindrical and with netted pattern, at least in the upper part;
- tubes are small, +white, cream, pale yellow, lemon yellow, olivaceous green to olivaceous brown for oldest individuals and respectively spores mass that are either yellow-brown or olive-brown, pores are concolour;
- tubes are notched to the stipe;
- cap is usually dry, vary rare slightly viscous and cap cuticle can be detached hardly;
- very often „water painting“ spots on cap and + wrinkled surface toward the margin.

**Common microscopic features:**
- hyphae of the flesh in the stipe base inamyloid with Melzer’s reagent;
- pileipellis – trichoderm type of interwoven septate hyphae (perpendicular to the cap surface);
- cells of the hyphae are cylindrical, not encrusted.

**Common ecological features:**
- all of them participate in obligate, symbiotic ectomycorrhizal associations;
- usually they form LD - ET of ectomycorrhiza (according to Agerer with most evolved type F rhizomorphs);
- most of them have a wide host range of photobionts;
- wide spread in northern hemisphere from subarctic to near equator.
Boletus spp. sect. boletus (true ceps) – microscopic features
**Boletus edulis** Bull. – 52 forms, subs. and varieties
(according indexfungorum.org)
CAP: 12-25 cm, broadly hemispherical, then convex, flat convex or flat, +viscid, darker in the center, paler towards the margin, beige, pale brown, hazel brown to dark brown (very rare).
STIPE: club-shaped, +cylindrical, bulbously swollen or rooting, white or whitish to pale ochre, with + white network, often buried in soil or forest litter (sometimes more than $2/3$). CAP diameter : STIPE length – 1:3 to 1:6 (very rare up to 1:8)
HYMENIUM: Tubes first whitish, then cream, pale yellow to yellow with olivaceous tint (comparing to other species from this section here is the lightest tubes). Small holes around pores.
Smell distinctive – like ceps but very delicate and weak comparing to other spp.
Boletus edulis Bull.
Boletus pinophilus Pilát & Dermek

Boletus pinophilus Pilát & Dermek. – 5 forms and varieties (according indexfungorum.org)
CAP: 15-35 cm, widely hemispherical, later convex, flattened, rarely flat, usually wrinkled near margin, dry to slightly viscid, vinaceous brown to bricked brown (reddish and/or grayish tint).
STIPE: swollen, clavate, vary rare cylindrical, pale ochre to concolorous, but paler than cap – ochre instead reddish tint, with ± white network.
HYMENIUM: Tubes first whitish, then cream, pale yellow to yellow with olivaceous tint. Smell not distinctive – like ceps.
This is the biggest cep from the section.
Boletus pinophilus Pilát & Dermek
Boletus aureus Schaeff.

CAP: 10-20 cm, widely hemispherical then convex, flat-convex, flat and sometimes flat-depressed, dry, velvety, later smooth, black brown, dark brown to chestnut brown, in young fruitbodies more or less uniformly colored, later with irregular paler brown, bronze or orange brown like „water painting“ spots.
STIPE: clavate or rarely cylindrical, beige ochre, orange brown to chestnut brown, rarely whitish, with fine network darker than stipe color, most clear in upper part.
HYMENIUM: Tubes whitish, then cream, pale yellow, lemon yellow, olivaceous green to olivaceous brown tint. Smell distinctive – very strong. (Strongest smell from this section)
ECOLOGY: Quercus frainetto Ten. and Quercus cerris L., rare other Quercus spp. or Castanea sativa Mill. (Fagaceae) This is the species with the most narrow host range and the most xerophytic one.
Boletus aureus Schaeff.
**Boletus reticulatus** Schaeff.

**Boletus reticulatus** Schaeff.
CAP: 8 to 20 cm, widely hemispherical, then convex, flat convex or flat, dry or very rare slightly viscid, finely to coarsely cracked, pale ochre brown to brown, sometimes discoloured to ochraceous, greyish ochraceous or almost entirely whitish, often wrinkled at the margin.
STIPE: club-shaped or cylindrical, almost concolorous with the cap, with fine white network in upper part.
HYMENIUM: Tubes whitish, then cream, pale yellow, lemon yellow, olivaceous green to olivaceous brown tint. Smell not distinctive – like ceps.
ECOLOGY: *Quercus frainetto* Ten., *Quercus cerris* L. (rare than previous sp.), other *Quercus* spp. or *Castanea sativa* Mill. (Fagaceae), *Fagus* spp. (very often – probably another ecotype), ect. broad host range.
**Boletus reticulatus** Schaeff.

These images are taken from **boleta.com**, author of images – Boris Assyov from Institute of Biodiversity and Ecosystem Research, IBER at the Bulgarian Academy of Sciences, http://www.iber.bas.bg/*
Ectotrophic status of *Boletus* spp.
Some applications

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THANK YOU

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