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## The genus *Cortinarius*

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### IDENTIFICATION

To make this paper as useful to the beginner as possible, and at the same time further the study of the plants of this interesting genus, it will be necessary to point out a few matters relating to their collection and study. It is sometimes desirable to send away one's specimens for identification, and a lack of certain observations that should have been made in the field may prevent any one from giving them much attention.

It is absolutely useless to pick up an old, dried specimen of *Cortinarius*, and ask any one to recognize it. Once in a while some easily known plant may be recognized in that way, but in the majority of cases old plants of different species look so much alike that it is mere guessing to say anything about them. The first thing to remember is that young, unexpanded plants must be examined as well as mature ones. Next a careful description must be made, *with special reference to the difference in the color of the gills in the young and old plants*. Then a similar comparison of the color of pileus and stem; and then a search for an annulus or universal veil, and its character. Finally, a careful test of the pileus and stem for gluten or viscosity. (One must remember that old, dry plants may lose this character.) These points are absolutely essential. In addition to the above, the following characters are often useful: the shape of the pileus; the size of the parts; the smoothness of the surface of pileus and stem; the character of the edge of the gills; the nature of the bulbous base of the stem; the appearance of the flesh. In fact, the notes cannot be too full, *provided they contain the essential facts mentioned first*.

### SPECIES

In working over the material, it was found that the chief difficulty lay in the lack of an extensive key to the American species.

It is true that Professor Earle \* has compiled one from the descriptions of the authors; and although his key sometimes gave me a clue to a species, it also led me astray. This is not so much a reflection on the key — which is admittedly a compilation — it rather shows how unsatisfactory are studies which are made from the descriptions alone. The key which is here presented, although worked out and tested on fresh plants alone, must necessarily have many shortcomings. The possibility of mistaking descriptions of species, especially of European origin, is great. Photographs and colored drawings have been made of all the species presented in the key. These, with the dried specimens, have been compared with the type specimens of Professor Peck at Albany, or with European exsiccati in the Cryptogamic Herbarium of Harvard University. The writer here wishes to acknowledge the kindness and courtesy shown him by both Professor Farlow and Professor Peck.

The species included in this key are only such as were found in the vicinity of Ithaca, N. Y., and which could, with a high degree of certainty, be identified. Almost as many more, not included in the key, need further study. It is hoped that the list may not be less useful to students in other localities, even if it is local. Most of the European species included have been reported for New York by Professor Peck.

The natural relationships of the species have been more or less violated in the key, since its maker has had in mind not a final grouping, but a help for beginners.

#### A PARTIAL KEY TO THE CORTINARII IN THE VICINITY OF ITHACA, N. Y.

- A. Pileus with a gelatinous cuticle, more or less viscid or glutinous when moist, as is also the stem in some species. [*Myxaciium* and *Phlegmacium*.]
- (a) Pileus coarsely corrugate. *C. corrugatus* Pk.
- (aa) Pileus not corrugate.
- (b) Taste of the surface of the pileus extraordinarily bitter; plants small.  
*C. vibratilis* Fr.  
*C. amarus* Pk.
- (bb) Taste not very bitter.
- (c) Spores large, 10 to 16  $\mu$  long.
- (d) Stem cylindrical and long; entire plant very viscid.

\* Torreyia 2 : 169, 180. 1902.

- (e) Stem with evanescent scales, or none.  
*C. cylindripes* sp. nov.
- (ee) Stem with broken, concentric rings of floccose scales.  
*C. collinitus* (Pers.) Fr.
- (dd) Stem bulbous or short.  
(e) Spores 10-12  $\mu$  long.  
(f) Color very pale yellow with olivaceous tinge.  
*C. olivaceus-stramineus* sp. nov.  
(ff) Color yellow to orange-ochraceous; no olivaceous tinge.  
*C. multifornis* Fr.
- (ee) Spores 13-16  $\mu$  long; stem violaceous to blue.  
*C. Atkinsonianus* sp. nov.
- (cc) Spores smaller, 6-9  $\mu$  long.  
(d) Pileus with dark olivaceous tinge.  
*C. anfractus* Fr.
- (dd) Pileus with a violaceous or purple color.  
(e) Flesh and gills turning purple when bruised.  
*C. purpurascens* Fr.
- (ee) Flesh not turning purple.  
(f) Stem with marginate bulb.  
*C. caerulescens* Fr.
- (ff) Stem clavate or slightly bulbous. (Pileus sometimes almost pale yellow.)  
*C. Berlesianus* Sacc. & Cub.
- (fff) Stem subequal; plants small.  
*C. croceo-caeruleus* (Pers.) Fr.
- (ddd) Pileus some shade of yellow; no tinge of violet.  
(e) Pileus covered by gluten; stem viscous when moist.  
*C. sphaerosporus* Pk.
- (ee) Pileus not covered by gluten; pileus deep tawny-orange; stem marginate-bulbous.  
*C. fulgens* (Alb. & Schw.) Fr.
- (dddd) Pileus some shade of drab. *C. sterilis* sp. nov.
- B. Cuticle of pileus not composed of gelatinous fibers, hence never viscid nor gelatinous. [*Inoloma*, *Telanonia*, *Dermocybe*, and *Hydrocybe*.]
- (a) Spores 10-12  $\mu$  long; plants not whitish nor violaceous.  
(b) Plants small, 2-4 cm. tall. *C. badius* Pk.
- (bb) Plants longer, about 8 cm. tall.  
(c) Stem with cinnabar-colored, persistent, concentric rings.  
*C. armillatus* (Alb. & Schw.) Fr.
- (cc) Stem sheathed by the veil, *i. e.*, peronate.  
*C. torvus* Fr.
- (aa) Spores 4-9  $\mu$  long; if longer, plants are whitish or violaceous.  
(b) Stem and pileus scaly or shreddy.  
(c) Scales red (scarlet to vermilion). *C. bolaris* (Pers.) Fr.
- (cc) Scales brown to blackish.  
(d) Plant large, watery-spongy, soon dark chocolate-colored.  
*C. squamulosus* Pk.
- (dd) Plants of medium size, wood-brown.  
*C. pholideus* Fr.

- (bb) Stem not scaly.
- (c) Stem with more or less persistent annular rings or peronate.
- (d) Plants large, 1-8 cm. or more tall; pileus proportionately broad.
- (e) Pileus ochraceous, clay-colored, or tawny.
- (f) Stem at first peronate by the white universal veil; pileus at first buff.  
*C. flavifolius* Pk.
- (ff) Stem at first peronate by the tawny-yellow universal veil; pileus at first tawny-yellow.  
*C. annulatus* Pk.
- (ee) Entire plant saffron-yellow.  
*C. croceocolor* sp. nov.
- (eee) Pileus bluish to purple when young; buff to tan when old.
- (f) Stem stout, 10-20 mm. thick; pileus punctate.  
*C. unidicola* sp. nov.
- (ff) Stem more slender, 5-10 mm. thick; pileus not punctate. *C. deceptivus* sp. nov.
- (dd) Plants small, subannulate; pileus less than 3-4 cm. broad.
- (e) Pileus watery-cinnamon, smooth.  
*C. lignarius* Pk.
- (ee) Pileus fuscous, when young covered with white, villose fibrils.  
*C. paleaceus* (Weinm.) Fr.
- (cc) Stem with no annulus, or annulus evanescent.
- (d) Stem bulbous or clavate.
- (e) Bulb depressed-marginate; gills heliotrope-purple when young.  
*C. obliquus* Pk.
- (ee) Bulb clavate.
- (f) Color of plant lilac to whitish.
- (g) Plants usually larger than in the next; lilac color persistent.  
*C. lilacinus* Pk.
- (gg) Plants of medium size; violet tinge evanescent.  
*C. alboviolaceus* (Pers.) Fr.
- (ff) Color of pileus some shade of buff.  
*C. caespitosus* Pk.
- (fff) Color of entire plant deep-chrome, unchanging.  
*C. callisteus* Fr.
- (dd) Stem subequal or tapering downward.
- (e) Pileus not hygrophanous.
- (f) Pileus cinnamon-colored; stem yellow; no olivaceous tinge.
- (g) Gills at first yellow.  
*C. cinnamomeus* (L.) Fr.
- (gg) Gills at first flame-scarlet.  
*C. semisanguineus flamineus* var. nov.
- (ggg) Gills at first dark blood-red.  
*C. semisanguineus* Fr.
- (ff) Pileus tawny olive; stem yellow, olive-tinged.  
*C. croceus* Fr.
- (fff) Pileus and stem scarlet or blood-red.

- (*g*) Pileus broad as compared with the rather short stem; spores  $8 \times 5 \mu$ .  
*C. cinnabarinus* Fr.
- (*gg*) Pileus narrower, stem longer; spores  $6 \times 4 \mu$ .  
*C. sanguineus* (Wulf.) Fr.
- (*ee*) Pileus distinctly hygrophanous.
- (*f*) Plant small; pileus 2 cm. broad or less.
- (*g*) Pileus conical at first; stem slender  
*C. subflexipes* Pk.
- (*gg*) Pileus convex at first.
- (*h*) Stem stout, smooth; pileus chestnut-colored.  
*C. castaneus* (Bull.) Fr.
- (*hh*) Stem slender, fibrillose; pileus fuscous.  
*C. fuscoviolaceus* Pk.
- (*ff*) Pileus broader than 2 cm.
- (*g*) Pileus tawny-orange to cinnamon; stem pale.  
*C. armeniacus* (Schaeff.) Fr.
- (*gg*) Pileus watery-cinnamon; gills very distant.  
*C. distans* Pk..

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