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November 2013

Bolbitius Notebook 1

L. R. Hesler

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Keys

Peck, C. H. 1893. New York species of Pluteolus.
N.Y. State Mus. Bot. Ann. Rept. 46: 58-61.

Ditto 46: 61-69. New York species of Galera.

Lühner + Romagnesi (p. 348)

Bolbitius Fr. (1836) emend.

A) Pileus in youth deprived of tints of
gray, violet, or rose. Species non-
lignicole ----- Bolbitius Fr.

A) Pileus at first gray, violet,
or rose. Growing on wood ----- Pluteolus Fr.

BOLBITIUS Fr.

Preliminary Key
to North American Species

L. R. Hesler

April, 1975

BOLBITIUS Fr.

Epicrisis, p. 253. 1838

Pluteolus (Fr.) Gill., Hymen. Fr., p. 549. 1876.

Agaricus subg. Pluteolus Fr., Hymen. Eur., p. 266. 1874.

Mycena (Pers.) Roussel ex. Murr. N. A. Flora 10:190. 1917.
non (ex. Fr.) S. F. Gray.

Key to Subgenera

1. Growing on dung, sawdust, in pastures, on lawns; pileus often white, yellow, pink, blue-greenish in one species, brownish in one Subg. Bolbitius
1. Growing on wood, usually darker than above (olivaceous, ochraceous, grayish-straw, brownish, fuliginous), rarely white, yellow, or pink Subg. Pluteolus

Subg. Bolbitius

Key to Stirps

1. Spores 7-10(11) μ long Stirps Microsporae
1. Spores 10-15 μ long Stirps Macrosporae

Subg. BOLBITIUS

Stirps Microsporae

Key to Species

1. Pileus white, when dry dull brownish, minutely squamulose B. bambusicola
1. Pileus colored at all times 2
 2. Pileus bluish-green, then greenish, finally bright brown B. gloiocyaneus
3. Pileus yellowish or buff, although the disc may show other colors 4
3. Pileus not colored as above 7
 4. Stipe white or whitish 5
 4. Stipe colored 6
5. Pileus uniformly cream colored; spores 8-9.5 x 5-5.5 μ ; odor mild, taste farinaceous B. cremeus
5. Pileus disc isabelline, elsewhere pale yellow; spores 9-11 x 7-8 μ ; odor farinaceous, taste mild . B. jamaicensis
 6. Stipe yellow; pileus yellow; spores 9-12 x 6-8 μ B. luteus
 6. Stipe dingy brown; pileus buff when dry, ecrus-olive when wet B. Tenn-21367
7. Pileus dull brown, umbo avellaneous, margin undulate; spores 7-8.5 x 3.5-4.5 μ B. brunneus
7. Pileus more or less wood brown, disc brownish or blackish; margin striate-plicate; spores 9-11.5 x 4.5-5.5 μ B. intermedius

Subg. BOLBITIUS

Stirps Macrospora

Key to Species

1. Pileus white or nearly so, disc may be colored; or
pileus pale pinkish cinnamon (isabelline) 2
1. Pileus variously colored, darker than above 6
 2. Pileus uniformly pure white B. albus
 2. Pileus not as above 3
3. Pleurocystidia and cheilocystidia present 4
3. Pleurocystidia and cheilocystidia absent 5
 4. Pileus nearly white to pale isabelline, margin
usually even; stipe glabrous B. broadwayi
 4. Pileus white (some individuals may be also
be pale yellowish or tawny), margin striate;
stipe apex mealy, base tomentose B. versicolor
5. Pileus white, disc cremeous; stipe glabrous B. floridanus
5. Pileus white or whitish, disc yellow or tawny;
stipe squamulose or furfuraceous, glabrescent B. glatfelteri
6. Pileus some shade of yellow 7
6. Pileus of other colors 12
7. Stipe white 8
7. Stipe yellow 9
 8. Lamellae distinctly deliquescing B. Tenn-3831
(also: 20858)
 8. Lamellae not obviously deliquescing B. flavus
9. Stipe base bulbous 10
9. Stipe equal (not bulbous) 11

10. Stipe furfuraceous; lamellae not deliquescent . . . B. citrinus
10. Stipe glabrous; gills slightly deliquescent . . . B. vitellinus
11. Pileus pale stramineous, center rugose; lamellae
dull dingy stramineous B. stramineus
11. Pileus light brownish yellow, not rugose;
lamellae pale lemon yellow B. flavellus
12. Stipe base bulbous; pileus grayish to
grayish-olive 13
12. Stipe base not bulbous; pileus of other colors 14
13. Stipe marginate-bulbous, with a black, fimbriate
margin; cheilocystidia none B. marginatipes
13. Stipe sub-bulbous, not marginate;
cheilocystidia present, lecythiform B. Tenn-21034
14. Stipe sulfur colored, becoming paler (pale
brownish in age), with numerous, small,
yellow scales; pileus fuliginous,
becoming yellowish olive B. variicolor
14. Stipe white or pallid (sometimes tinged
pinkish in one taxon) 15
15. Pileus pinkish gray; cheilocystidia none B. coprophilus
15. Pileus tawny-olive, disc darker; cheilocystidia
present, lecythiform B. Tenn-20414
(also: 20410)

Subg. PLUTEOLUS

Key to Species

1. Pileus white when young, in age becoming sordid B. sordidus
1. Pileus colored at all stages 2
 2. Spores 6.5-8 μ long; cheilocystidia lecythiform;
pileus and stipe brown B. Tenn-29284
 2. Spores longer; other characters not as above 3
3. Pileus olivaceous, greenish, or brownish, the disc
brown, becoming metallic-green when dried; lamellae
yellow, becoming brown B. callistus
3. Pileus and lamellae not as above 4
 4. Pileus gray to violaceous-gray, disc reticulate;
spores 9-12 x 4.5-5 μ ; cheilocystidia cylindrical or
bottle-shaped B. reticulatus
(Pluteolus aleuriatus var. reticulatus Lge.)
 4. Pileus and spores not as above; cheilo-
cystidia none 5
5. Pileus avellaneous, disc fuliginous; lamellae
slightly deliquescent; stipe white; spores
8-11 x 5-7 μ B. mexicanus
5. Pileus brownish ocher, sometimes tinged yellowish or
pinkish; lamellae scarcely deliquescent; stipe
yellow; spores 10.5-13.5(15) x 7-7.5 μ B. expansus

Key to Species of
BOLBITIUS
of Southeastern United States

L. R. Hesler

April, 1958

BOLBITIUS
(Pluteolus)

Pileus viscid or more or less glutinous, often more or less diffluent, fisso-sulcate or striate, flesh thin. Epicutis composed of vesiculose, pyriform or irregular cellular elements. Spores rusty-brown; cheilocystidia not abruptly capitate.

<u>Species</u>	<u>Synonyms</u>
1. bambusicola Murrill	1. Mycena bambusicola Murr.
2. callistus (Pk.) comb. nov.	2. Pluteolus callistus Pk.
3. citrinus (Murr.) comb. nov.	3. Pluteolus citrinus Murr.
4. floridanus (Murr.) comb. nov.	4. Pluteolus floridanus Murr.
5. Glatfelteri Pk.	5. -
6. intermedius (Coker) comb. nov.	6. Pluteolus intermedius Coker
7. radians Morgan	7. Pluteolus coprophilus Pk.
8. reticulatus (Fr.) Ricken	8. Pluteolus reticulatus (Fr.)
9. tener Berk.	9. -
10. varicolor Atk.	10. -
11. vitellinus Fr.	11. Bolbitius fragilis Fr. 11. Pluteolus vitellinus Qué1.
12. No. 21367	12. -

BOLBITIUS

(Pluteolus)

Key to Southeastern Species

1. Carpophores growing on wood (logs, limbs, and stumps)..... 2
1. Carpophores on soil or humus..... 3
 2. Pileus "french gray" to violaceous, disk anastomosing-reticulate, epicutis cells irregularly shaped, 15-25 x 9-17 μ , 2-3 layers deep..... 1. reticulatus (Fr.) comb. nov.
 2. Pileus tawny-olive to brown, drying metallic-green, more or less rugose, epicutis cells pyriform, 24-52 x 16-32 μ 2. callistus (Pk.) comb. nov.
3. Pileus white when fresh, disk at times yellowish..... 4
3. Pileus colored throughout..... 5
 4. Pileus white throughout, dull-brownish when dry, finely squamulose; spores ~~7-8 x 5 μ~~ ; on dead bamboo leaves..... ~~7-9 x 5-6 μ~~ 3. bambusicola Murr.
 4. Pileus white, disk cremeous, glabrous; spores 12-15.5 x 8-9.5 μ 4. floridanus (Murr.) comb. nov.
5. Spores 7-9 μ long; pileus hygrophanous, "light-buff" when dry, "ecru-olive" when wet, disk rugose; pleurocystidia and cheilocystidia similar, ventricose to bottle-shaped, often with a long neck, or irregular, 35-50 x 2-3 μ 5. No. 21367
5. Spores 9 μ or more in length..... 6
 6. Pileus pinkish-gray; lamellae free; stipe white or pinkish; spores 11-15 x 7-8 μ ; on dung... 6. radians Morgan (= Pluteolus coprophilus Pk.)
 6. Not with the above characters..... 7
7. Pileus colors in the yellow to buff series, at least so colored on the disk; spores 6-10 μ broad..... 8
7. Pileus colors in the brown-series (brownish, tawny, olive). 11
 8. Paraphyses present in the hymenium..... 9
 8. Paraphyses absent..... 10

9. Pileus pale yellow, fading; stipe tapering upward.....
 7. vitellinus Fr.
9. Pileus light-buff to pale olive-buff, atomate; stipe
 equal, more or less bulbillate..... 8. tener Berk. = *lactea*
10. Pileus 1.5-2 cm. broad, citrinous, becoming
 avellaneous; lamellae sulphureous becoming isabelline.
 9. citrinus (Murr.) comb. nov.)
10. Pileus 2-5 cm. broad, grayish-white to light buff,
 disk "honey-yellow"; lamellae pale cinnamon, becoming
 "sayaal brown"..... 10. Glatfelteri Pk.
11. Spores 10-15 x 7-9 μ ; pileus smoky-olive to fuliginous;
 flesh yellow becoming bright-olive to fuliginous; stipe
 sulfur-colored and ochraceous with yellow, floccose
 scales..... 11. varicolor Atk.
11. Spores smaller, 8-12 x 4.5-7 μ 12
12. Pileus tawny or brownish with an olive tinge, drying
 metallic-green; cheilocystidia or paraphyses none;
 epicutis cells pyriform, 24-52 x 16-32 μ
 2. callistus (Pk.) comb. nov.
12. Pileus wood-brown, disk nearly blackish; paraphyses
 cuneate, 12-15 x 6-8 μ ; epicutis cells 18-22 x
 12-17 μ , irregularly shaped.....
 12. intermedius (Coker) comb. nov.

BOLBITIUS ALBUS (Pk.) Watling (in ed.)

Galera alba Pk., Torrey Bot. Club Bull. 24:143. 1897.

Pileus 16-24 mm broad, campanulate, white, moist, margin striate.
Context submembranous, very fragile.

Gamellae, close, narrow, white, becoming brownish-ferruginous.

Stipe 4-6.5 cm long, 2-4 mm thick, white, glabrous, hollow, fragile.

Notes on Type (by Hesler)

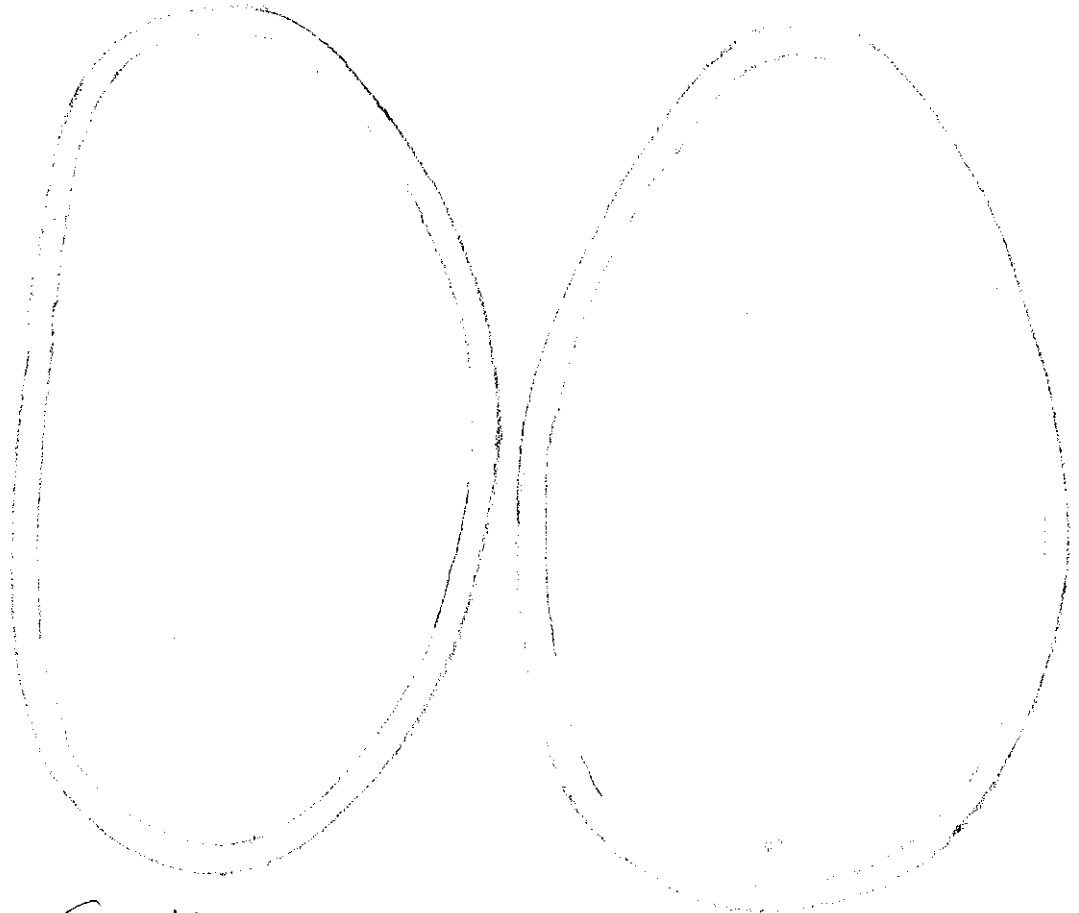
Spores 11-15 x 7-9 μ , many slightly inequilateral in profile, ellipsoid to subvoid in face view, usually more or less truncate, wall thick, smooth, clay color in 2% KOH. Pleurocystidia and cheilocystidia not found. Pileus cuticle cellular, (cell-form difficult to distinguish). Stipe cuticle of repent, dry hyphae. Caulocystidia not found.

Type on soil, among weeds, leg. T. A. Williams, Brookings, South Dakota, summer.

In a note in the specimen box, Watling says this is a true Bolbitius and should be known as Bolbitius alba (Pk.) comb. nov. (March 24, 1965).

Galera alba PK.

Type = *Bolbitius albus* (PK.) Watling (in ed.)



Profile

Face

Spores x 8000

BOLBITIUS BAMBUSICOLA Murrill

Florida Acad. Sci. Proc. 7:127. 1945

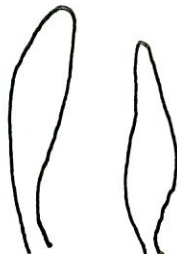
Mycena bambusicola Murrill. Florida Acad. Sci. Proc. 7:124. 1945

"Pileus conic to campanulate, gregarious, ^{up} to 1 cm.
^
broad in age; surface slightly viscid, striate, finely
squamulose, white, dull-brownish when dry, margin entire,
straight, revolute in age; context very thin, putrescent;
lamellae adnexed, crowded, narrow, entire, pallid to brownish,
partially dissolving at maturity; spores ellipsoid, smooth,
opaque, dark-fulvous, about 7-8 x 5 μ ; stipe enlarged down-
ward, hollow, pallid, slightly darker on drying, smooth,
glabrous, 4-5 x 0.2-0.3 cm."

Habitat and Distribution. - On dead bamboo leaves,
Florida, June.

Notes on Type

Spores 7-9 (10) x 5-6 μ , ellipsoid to ovoid, at times
irregularly so, brown, smooth. Pleurocystidia none; cheilo-
cystidia clavate to subventricose, not capitate, 23-30 x
6-7 μ . Gill-trama subparallel. Epicutis cellular, cells
loaf-shaped to irregularly rectangular (in section), 17-23 x
9-12 μ (Type not very satisfactory for study).



ch.

over

The Type collected by Murrill on dead
bamboo leaves, under bamboo, at Gainesville, Fla.,
June 22, 1938 (No. F 17343), at U. Florida Herb.

Mycena bambusicola Murrill. Florida Acad. Sci. Proc. 7:124. 1945

"Pileus conic to campanulate, gregarious, to 1 cm.
broad in age; surface slightly viscid, striate, finely
granulose, white, dull-brownish when dry, margin entire,
straight, revolute in age; context very thin, putrescent;
lamellae adnexed, crowded, narrow, entire, pallid to brownish,
partially dissolving at maturity; spores ellipsoid, smooth,
opaque, dark-brown, about 7-8 x 5 μ ; stipe enlarged down-
ward, hollow, pallid, slightly darker on drying, smooth,
glabrous, 1-2 x 0.2-0.3 cm."

Habitat and Distribution. - On dead bamboo leaves,

Florida, June.

Notes on Type

Spores 7-9 (10) x 5-6 μ , ellipsoid to ovoid, at times
irregularly so, brown, smooth. Pleurocystidia none; cheilo-
cystidia clavate to subventricose, not capitate, 23-30 x
6-7 μ . Gill-trama subparallel. Epicutis cellular, cells
loaf-shaped to irregularly rectangular (in section), 17-23 x
9-12 μ (Type not very satisfactory for study).



BOLBITIUS BROADWAYI (Murrill) Dennis

Bull. Soc. Myc. de France 69:193. 1953

Pholiota broadwayi Murr., Mycologia 5:32. 1913.

Description by Murrill

Pileus 1-3 cm broad, convex to expanded, nearly white to pale-isabelline, disc slightly darker, glabrous, moist or slightly viscid.

Lamellae adnate or adnexed, pale-fulvous, crowded, slightly ventricose, 2-3 mm broad.

Stipe 4-7 cm long, 2-3 mm thick, concolorous with the pileus, glabrous, hollow, terete. Veil forming a superior, membranous, evanescent annulus.

Spores 12-14 x 8-9 μ , truncate, smooth. Cystidia rare, base enlarged, apex tapering.

Type on soil, Grenada, West Indies.

Dennis (1953:193) studied material from Trinidad and the Type; and transferred it to Bolbitius. I have been unable to see the Type.

Watling (letter) states that Pholiota broadwayi Murr. is a Bolbitius.

Bolbitinus

~~AGROCYBE~~ BROADWAYI (Murr.) Dennis
Bull. Soc. Myc. de France 69: 193. 1953.

← Pholiota broadwayi Murr., Mycologia 5:32. 1913.

Pileus 1-3 cm broad, convex to expanded, nearly white to pale-isabelline, center slightly darker, glabrous, moist or slightly viscid, margin concolorous, thin and entire. Context thin.

Lamellae adnate or adnexed, pale-fulvous, crowded, slightly ventricose, 2-3 mm broad.

Stipe 4-7 cm long, 2-3 mm thick concolorous, glabrous, central, terete, equal, hollow. Veil forming a superior, membranous, evanescent annulus.

Notes by Hesler

Spores 11-14 x 7-9.5µ, ellipsoid to subovoid, truncate, smooth. Basidia 16-20 x 7-9µ, clavate, 4-spored. Pleurocystidia 20-30 x 5-8µ, ventricose, slightly flask-shaped, or cylindric, very few, inconspicuous; cheilocystidia 18-22 x 4-6µ, clavate-basidiiform, few. Gill trama of slightly interwoven hyphae, 3-7µ broad. Pileus trama interwoven. Pileus cuticle of pseudoparenchyma, with a slightly developed gelatinous zone which may be absent in some sections. Clamp connections present. Caulocystidia none.

Note: In 1912, Murrill described Hebeloma broadwayi Murr., Mycologia 4: 82. 1912. Later, he described Pholiota broadwayi Murr., Mycologia 5: 32. 1913. The former was transferred to Agrocybe by Dennis, and became Agrocybe broadwayi (Murr.) Dennis. The latter ~~was~~ ^{is now} Bolbitinus broadwayi

Did Dennis also transfer Pholiota broadwayi to Agrocybe? (Check: Bull. Soc. Myc. Fr. 69.) See Agrocybe broadwayi (Murr.) Dennis (= Hebeloma broadwayi Murr.).

BOLBITIUS BROADWAYI (Murrill) Dennis

Bull. Soc. Myc. de France 69:193. 1953

Pholiota broadwayi Murr., Mycologia 5:32. 1913.

Description by Murrill

Pileus 1-3 cm broad, convex to expanded, nearly white to pale-isabelline, disc slightly darker, glabrous, moist or slightly viscid.

Lamellae adnate or adnexed, pale-fulvous, crowded, slightly ventricose, 2-3 mm broad.

Stipe 4-7 cm long, 2-3 mm thick, concolorous with the pileus, glabrous, hollow, terete. Veil forming a superior, membranous, evanescent annulus.

Spores 12-14 x 8-9 μ , truncate, smooth. Cystidia rare, base enlarged, apex tapering.

Type on soil, Grenada, West Indies.

Dennis (1953:193) studied material from Trinidad and the Type; and transferred it to Bolbitius. I have been unable to see the Type.

~~_____~~ = Bolbitinus

PHOLIOTA BROADWAYI Murr.

Type

On soil, Grenada, West Indies

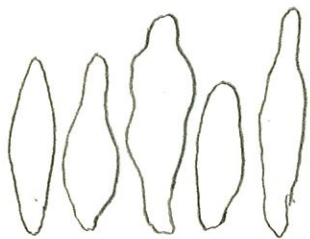
Spores 11-14 x 7-9.5 μ , ellipsoid to subovoid, truncate, germ pore present. Basidia 16-20 x 7-9 μ , clavate, 4-spored. Pleurocystidia 20-30 x 5-8 μ , ventricose, slightly flask-shaped, or cylindrical, very few, inconspicuous; cheilocystidia 18-22 x 4-6 μ , clavate-basidiiform, few. Gill trama slightly interwoven, hyphae 3-7 μ broad. Pileus trama interwoven. Cuticle with a slightly developed gelatinous zone ^{which may be} absent in some sections. Clamp connections present. Caulocystidia none.

Pileus and gill trama yellowish brown in KOH; reddish brown in Melzer's.

~~Dennis transferred Hebeloma broadwayi Murr. to Agrocybe, calling it Agrocybe broadwayi (Murr.) Dennis (Engel: Agar., 2nd ed., p. 530). Therefore we propose for Pholiota broadwayi the name Agrocybe grenadensis (Murr.) nom. nov.~~

Pholiota broadwayi Murr.

Type [= ~~Amwayi~~]
Bolbitinus



Bas. x 1000



Bas. x 1000



Spores x 4000

BOLBITIUS BRUNNEODISCA (Murr.) Sacc. & Trott.

Mycena brunneodisca Murr., N. A. Flora 10:192. 1917.

Excluded

Type

The packet contains only small fragments entirely unsatisfactory for study. *No drawings made.*

The type has been examined by Watling, who states that the small fragments of the carpophore confirm this to be a member of the Bolbitiaceae. The finding of collapsed cells on the gill-edge which are lecythiform in outline suggest---(illegible) it to be a Conocybe sp. If so, the name should be abandoned, for Conocybe is already a difficult genus without imposing on the---(illegible) who's anatomy can not be studied"--Roy Watling, April 29, 1965.

Type, Murrill-223, on soil, Jamaica, December 17, 1908.

In a letter (Mch. 14, 1975), Watling states that although the material of the type is poor, he is including it in his list, to be published later. Apparently he accepts the binomial: Bolbitius brunneodiscus (Murr.) Sacc. & Trott.

Robert W.

PLUTEOLUS BRUNNEUS Murrill

North Amer. Flora 10:188. 1917

Murrill's Description

Pileus 3-5 cm broad, caespitose or gregarious, conic to fully expanded, umbonate, hygrophanous, dull-brown, umbo avellaneous, glabrous, margin undulate and concolorous.

Lamellae adnexed, pallid to ferruginous, edges white and serrulate, crowded, narrow.

Stipe about 6 cm long and 2 mm thick, milk-white, glabrous, equal, smooth.

Notes by Hesler

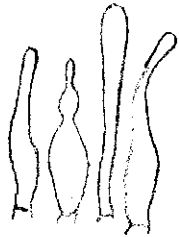
Spores 7-8.5 x 3.5-4.5 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, germ-pore present, at times obscure, occasionally more or less truncate but often obscurely so, wall medium thick-thin, brownish in 2% KOH. Pleurocystidia none; cheilocystidia 22-28 x 2-6 μ , slender, clavate or ventricose. Gill trama a narrow zone, hyphae slender and slightly interwoven. Pileus cuticle of cuneiform and subglobose cells, often pushed out of position, with a thin gelatinous zone. Pileocystidia scattered, 20-27 x 3-5 μ , clavate to ventricose (origin and exact position not determined--cuticle cells disarranged). Stipe cuticle of repent hyphae. Caulocystidia in small tufts, similar to pileocystidia.

Type, Murrill and Thompson, in sandy loam, Stockbridge, Massachusetts, Sept 3-4, 1911.

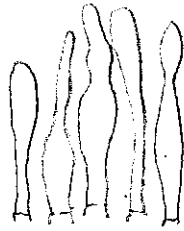
Note attached to Type packet, written by Watling, states that the structure of the spores and the epicutis suggest that this is a perfectly good Bolbitius. However, he writes, the material is not very good, the trama and epicutis have collapsed. The combination (Watling states) with Bolbitius will be made.--Roy Watling, April 29, 1965.

Pluteolus brunneus Murr.

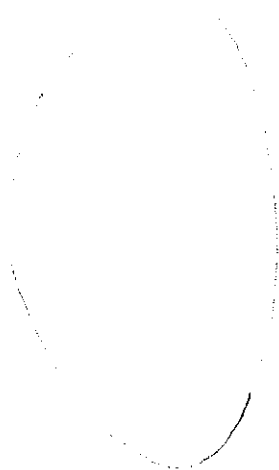
Type [= Bolbitis]



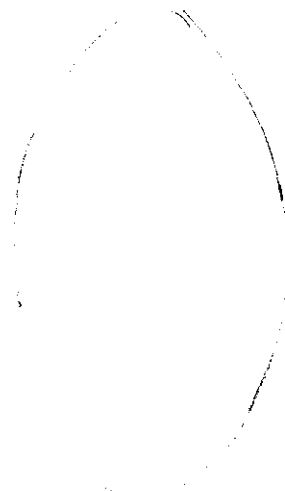
Ch x 1000



Pilei x 1000
(Caulo similar)



Profile



Face

Spores x 8000

BOLBITIUS CALLISTUS (Pk.) comb. nov.

Agaricus (Galera) callistus Pk., Buffalo Soc. Nat. Sci. Bull. 1:52. 1873.

Galera callista (Pk.) Sacc., Syll. Fung. 5:865. 1887.

Pluteolus callistus (Pk.) Pk., New York State Mus. Ann. Rept. 46:60. 1893.

Pileus 12-24 mm broad, expanded, subumbonate, olivaceous or ochraceous, disc bright chestnut, becoming dull-metallic-green on drying, viscid, margin striatulate. Context thin.

Lamellae attached but easily separating from the stipe, yellowish, becoming bright ferruginous, thin, close.

Stipe 2.5-4 cm long, 1 mm thick, yellow, pruinose, equal, hollow.

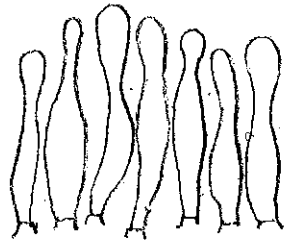
Notes on Type (by Hesler)

Spores 8-10 x 5-6 μ , obscurely inequilateral in profile, ellipsoid in face view, truncate in some, wall smooth and moderately thick, yellowish brown in 2% KOH. Pleurocystidia none; cheilocystidia 23-28 x 3-6 μ , ventricose, apices usually subcapitate. Pileus cuticle a colorless zone of cells 2-4 deep, irregularly vesiculose. Pileocystidia about 25 x 8 μ , rare, projecting slightly. Stipe cuticle of dry, repent hyphae.

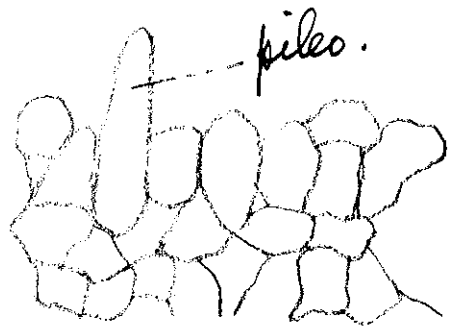
Type, from exsiccated water holes in wooded swamps, Croghan, New York, September.

I am following Watling in placing species of Pluteolus in Bolbitius.

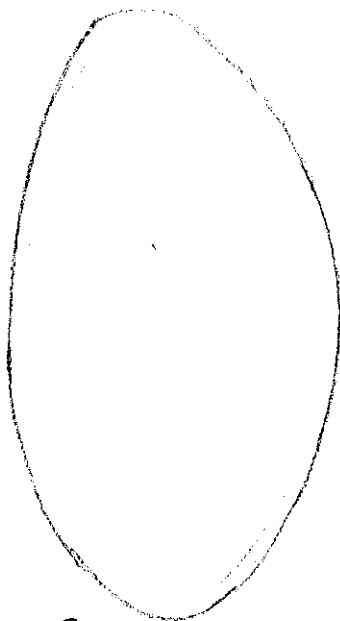
Agaricus (Galera) callistus PK.
Type = *Bolbitis*



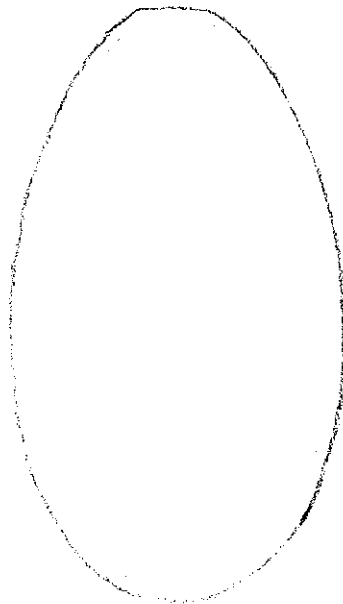
Ch x 1000



Pileus article x 1000



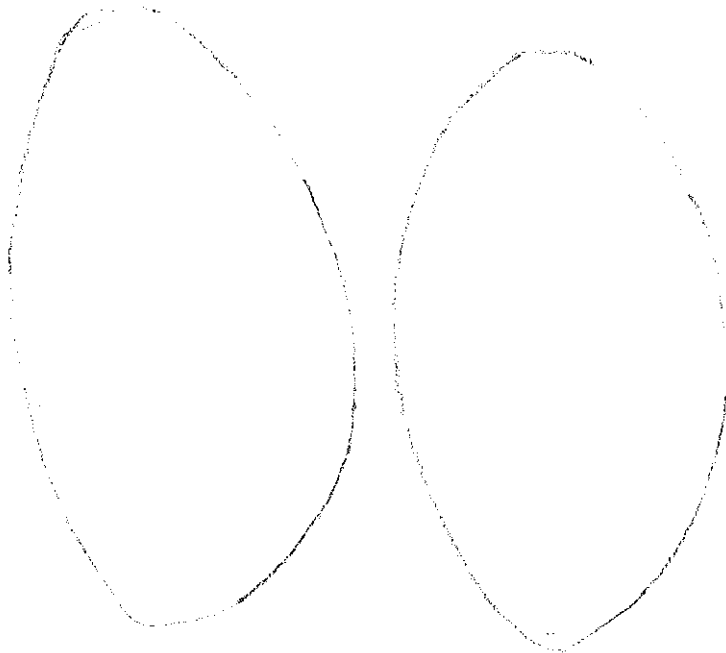
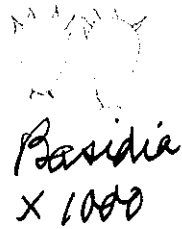
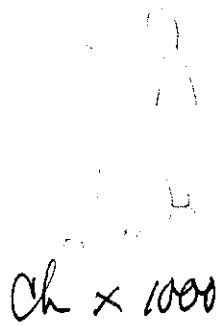
Profile



Face

Spores x 8000

Pluteolus callistus PK.
Leg. S. Davis, Stow, Mass., Sept. 18, 1907
= *Bolbitis*



Spores
x 8000

on oak log, Highlands, N. C., Sept. 3, 1939

Pileus 2 cm broad, expanded, brownish tinged olivaceous, becoming grayish violaceous when dried, disc reddish brown, glabrous, glutinous, margin striate.

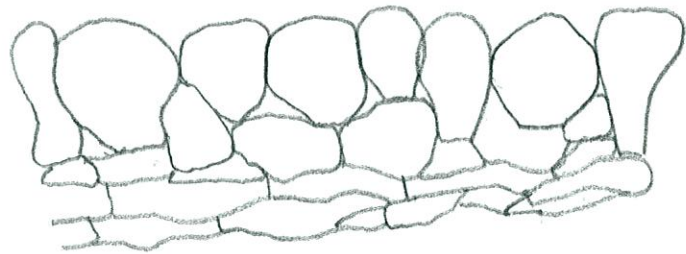
Lamellae adnate or narrowly so, seceding, brown, edges white-fimbriate, close.

Stipe 3 - 4 cm long, 1.5 - 2 mm thick, pruinose above, yellowish-green, with greenish-blue fibrils below, dry, hollow, tapering upward.

Spores 8-10.5 x 5-6 μ , ellipsoid, truncate with a germ-pore, reddish rusty brown in 2% KOH, paler in Melzer's reagent, wall double. Gill trama of slender (3-5 μ) somewhat interwoven or subparallel. Pileus trama of more or less radial hyphae. Pleurocystidia none; cheilocystidia filamentous to subclavate or slight enlarged below, 24-30 x 3-5 μ , inconspicuous. Pileus cuticle an epithelium of subglobose to subpyriform cells, 2-3 layers thick. Sections fail to reveal gelatinous cuticular elements!

Pluteolus callistus Pk.

Tem-12385



[Spores as in 27551]

on fallen chestnut bark, Indian Creek, GSMNP, N.C.,
Aug. 28, 1945.

Pileus 1-2.5 cm broad, convex then expanding nearly
plane, viscid to slightly glutinous, ~~"tawny-olive" to~~
"tawny-olive" to "buckthorn brown" with an olivaceous tinge,
drying to greenish (near "olive citrine"), surface sprinkled
with glistening golden granules, margin striate. Context
thin, fragile, whitish with a greenish tinge; odor mild.

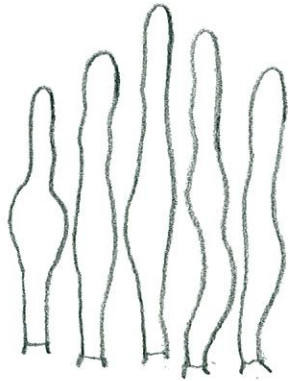
Lamellae narrowly adnexed or only attached by fibrils,
finally seceding and free, "clay color", edges white-
fimbriate, close or medium close, broad.

Stipe 2-4 cm long, 1-2 mm thick, "olive ochre",
apex paler, base livid, pruinose above, equal or tapering
upward, ~~fragile~~, dry, hollow.

Spores 8.5-10(11) x 5-6 μ , ellipsoid, smooth,
truncate, germ-pore present, red rusty brown in
2% KOH, paler in Meizer's. Basidia 20-24 x 8-10 μ ,
base contracted, 4-spored. RL none; ch
34-46 x 4-7 μ , filamentous to sub-fork-shaped or
ventricose below. Gill trama of slender, subparallel
hyphal. Pileus ^{an epithelium,} outside of about 2 layers of cells,
the outer layer of subglobose to \pm pyriform cells,
22-53 x ~~14~~ ¹⁴ - 32 μ - in ⁺ an hymeniform arrangement.

Pluteolus callistus PK.

Tem - 17121



ch x 1000

17342

PLUTEOLUS CALLISTUS Pk.

on humus, in rhododendron thicket, Highlands,
N. C., July 28, 1959

fully expanded,
Pileus 3 cm broad, glutinous, "Kronberg's green",
glabrous, margin striate.. Context thin, fragile;
odor none.

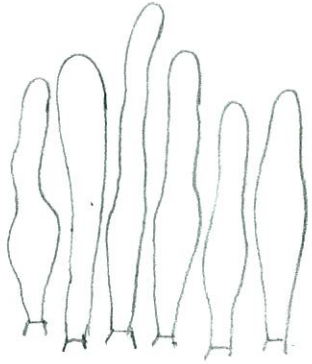
Lamellae rounded-free, pinkish brown, close,
medium broad, edges fimbriate.

Stipe 4 cm long, 2.5 mm thick, pallid, tinged
greenish, pruinose, tapering upward above the slightly
clavate base.

Spores 8-10 x 5-5.5 (6) μ , ellipsoid,
reddish rusty brown in 2% KOH, smooth,
germ pore present, truncate. H none; Ch
30-42 x 5-7 μ , subventricose-subcylindric, ~~at~~
open sub-flask-shaped. Pileus cuticle 1-2
layers of pyriform to subglobose cells — an
epithelium (\pm hymeniform).

Pluteolus callistus PK.

Tenn - 17342



Ch x 1000

22709

PLUTEOLUS CALLISTUS Pk.

on the bark of rotting, deciduous log, Cades Cove,
GSMNP, Tenn., October 9, 1957

Pileus 2.8-3.2 cm broad, convex, expanding,
glutinous, olivaceous with an orange tint (not matched),
glabrous, rugose, obscurely striate. Context whitish,
thin, fragile; odor and taste mild.

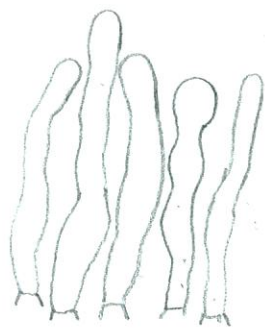
Lamellae emarginate, nearly free, greenish (not
matched), edges whitish-fimbriate, close, medium broad.

Stipe 2.5 - 3 cm long, 1 - 1.5 mm thick, olive-
yellowish, tapering upward, dry. "

in deposit: "Cinnamon brown"
Spores 8.5-10(11) x 5-6(7) μ , ellipsoid, smooth,
often truncate, with a germ-pore, "~~cinnamon brown~~" in
~~deposit~~, a distinctive yellowish-brown in water (under
'scope), red ^{rusty} ~~rusty~~ brown in 2% KOH (under 'scope). Pl
none; ch 30-42 x 3-6 μ , filamentous, often sub-ventricose
below, at times flexuous and more or less capitate. Pileus
cuticle of globose to subpyriform cells - an epithelium.

Pluteolus callistus PK.

Tem - 22709



Ch x 1000

24928

PLUTEOLUS CALLISTUS Pk.

on decayed log, Kephart Prong, GSMNP, North Carolina,
August 9, 1962.

Spores 8 - 10.5 x 5 -6 μ , smooth, truncate,
germ pore present, yellowish brown in water, red rusty
brown in KOH. Other micro characters as usual.

25814

PLUTEUOLUS CALLISTUS Pk.

on decaying log, Cades Cove, Tenn, GSMNP,
Aug. 15, 1963.

Spores 8-10 x 4.5-5.5 μ , ~~yellow~~ ellipsoid, truncate,
with a germ pore, smooth, yellowish brown in water,
red rusty brown in 2% KOH. All other micro characters
~~usually~~ usual.

on decorticated log, Flat Mt. Road, Macon County,
North Carolina, leg. Ron Petersen & C.T. Rogerson,
Aug. 20, 1961 (labelled Naucoria centunctula).

Notes by Hesler

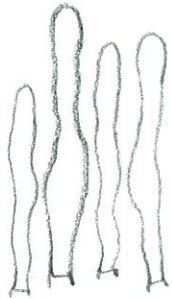
Spores 8-11 (12) x 5-~~7~~^{6.5(7)} μ , ellipsoid, wall smooth, double, with a germ-pore, many truncate, distinctly reddish brown, ^{or rusty red-brown} in 2% KOH, paler red-brown in Melzer's. PL none; ch 27-34 x 3-5 μ , filamentous to slightly flark-shaped (not capitate, or only occasionally subcapitate), not always conspicuous. Pileus cuticle, ^{a dry} ~~an~~ epithelium, the cells \pm globose or slightly irregular; pileocystidia none. Stipe cuticle of ^{dry} repent hyphae, ~~dry~~ bearing scattered tufts of caulocystidia, 45-78 (100) x 5-8 μ . ~~No~~ Clamp connections and incrusted elements not found.

Dried, the pileus is grayish-violaceous suggesting ~~P. callistus~~ Pk. Pluteolus callistus Pk. It agrees

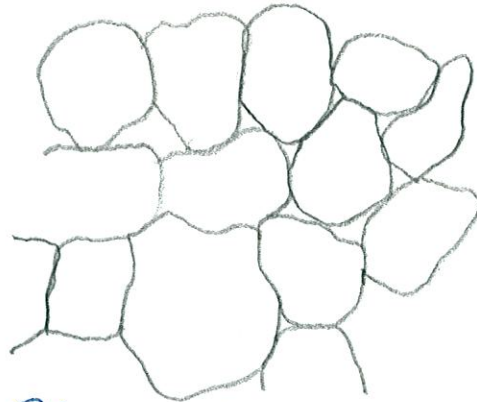
well microscopically with my No. 12385, P. callistus.

~~Kaurelia~~ *Phlebotus callistus* PK.

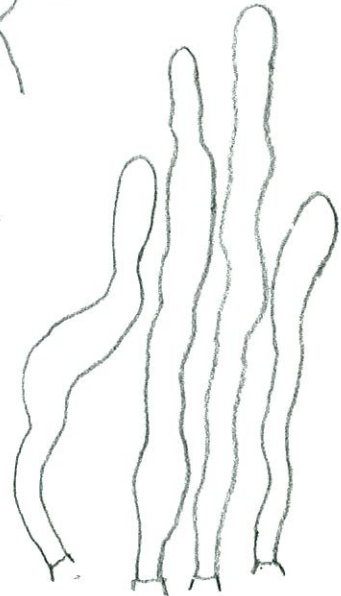
Tem - 27551



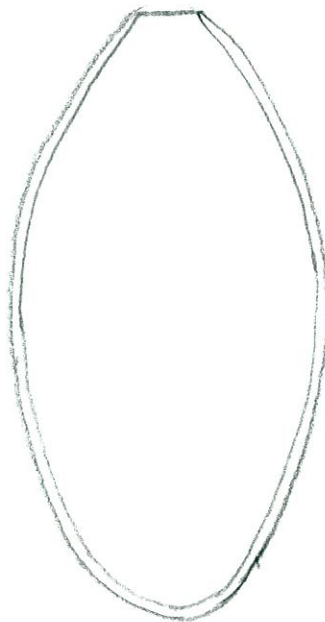
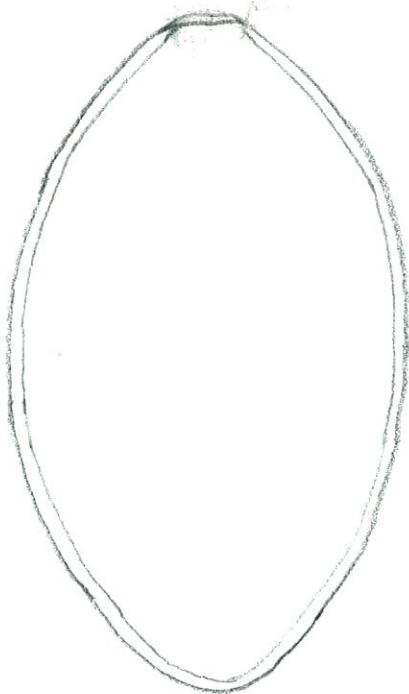
Ch x 1000



Pileus cuticle
x 1000



Caule - x 1000



Spores x 8000

Bolbitinus

PLUTEOLUS CITRINUS (Murrill) *Comb. nov.*

Mycologia 35:534. 1943

Pluteolus citrinus Murr.

"Pileus convex to deeply depressed, not umbonate, scattered, 1.5-2 cm. broad; surface slimy-viscid, conspicuously sulcate to the disk, uniformly citrinous, becoming avellaneous with age; margin straight when young, entire to ragged; context extremely thin, fleshy, fragile, pallid, mild; lamellae adnexed, rounded behind, close, very narrow, inserted, entire, sulfureous, becoming isabelline with age; spores ellipsoid, truncate, smooth, 1-guttulate, deep-ferruginous, 12-14 x 7-8 μ ; cystidia none; stipe equal above the small rounded bulb, fleshy, hollow, furfuraceous, sulfureous, smooth, not viscid, about 3-5 x 0.15-0.2 cm.; bulb about 3 mm."

Habitat and Distribution. - On shaded lawn, Florida, February.

Discussion. - "According to Singer, 'Cheilocystidia vesiculose, smooth, hyaline, 17-28 μ . Epicutis of pileus consisting of vesiculose-stipitate bodies which form an hymeniform layer. They are hyaline, 23-27 x 9-11 μ . Basidia are 4-spored.' "

next page

~~Notes on Type~~

~~Spores 11-13 x 6-8 μ , ellipsoid, truncate, smooth.
Pleurocystidia none; cheilocystidia pyriform to vesiculose, 16-20 x 13-16 μ . Epicutis of pyriform to vesiculose-stipitate hymeniform layer of cells, 19-24 x 11-15 μ .~~

PLUTEOLUS CITRINUS Murr.

Notes by Hesler (on Type)

Spores 11-13 x 6-8 μ , ellipsoid, truncate, smooth. Pleurocystidia none; cheilocystidia 16-20 x 13-16 μ , pyriform to vesiculose. Pileus cuticle an hymeniform layer of vesiculose to pyriform-stipitate cells, 19-24 x 11-15 μ .

(These notes made years ago, and to me not as full as one might like. If necessary, I could probably borrow the type again, and make a re-study.)

A Bolbitis.

PLUTEOLUS CITRINUS Murr.

Type, No. F 19335, leg-det Murrill, Gainesville, Florida, shady grassy lawn, February 18, 1939.

Notes by Hesler

Spores 10-13.5 x 7.5-8.5(9) μ , slightly inequilateral in profile in a few individuals, ellipsoid in face view, wall 0.7 μ thick, double, smooth, truncate at apical end, rather bright golden yellow-brown in 2% KOH. Pleurocystidia and cheilocystidia not found. Pileus cuticle of cuneiform cells, 10-14 x 7-10 μ , with a thin gelatinous surface. Stipe cuticle of repent hyphae, dry bearing scattered tufts of caulocystidia, 15-20 x 5-9 μ , inconspicuous.

The macro and micro characters indicate that this is a Bolbitius.

Pluteolus citrinus Murr.

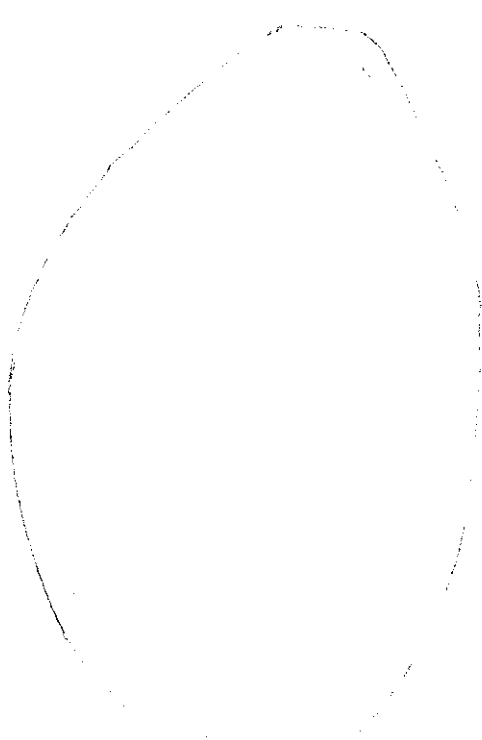
Type: 7 19335, Feb. 18, 1939



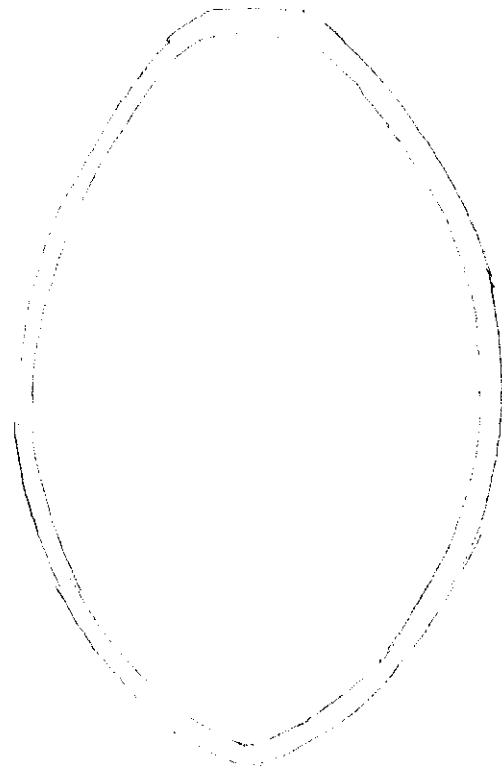
Pileus cuticular
cells - x 1000



Caulo (tuft) x 1000



Profile



Face

Spores x 8000

[Bolbitus coprophilus (PK.) comb. nov.]

Pluteolus coprophilus PK.

N. Y. State Mus. Ann. Rept. 46: 59. 1893

Said to be same as Bolbitus radians Morgan,
Cincinnati Soc. Nat. Hist. Jour. 18: 37. 1895.

(Nat. 10: 187)

BOLBITIUS COPROPHILUS (Pk.) comb. nov.

Pluteolus coprophilus Pk., New York State Mus. Ann. Rept. 46:59. 1893.

(Bolbitius radians Morgan, Jour. Cinn. Soc. Nat. Hist. 18:37. 1895.

Listed by Murrill, N. A. F. 10:187. I have not confirmed this.)

Pileus 2.5-4 cm broad, conical or campanulate, becoming nearly plane, pinkish-grey, somewhat viscid when moist, margin striatulate. Context thin, submembranous, fragile.

Lamellae free, pale cinnamon, narrow, crowded.

Stipe 5-9 cm long, 2-4 mm thick, white, sometimes tinged pink, straight or somewhat flexuous, hollow.

Notes on Type (by Hesler)

Spores 10-14.5 x 7-8(9) μ , obscurely inequilateral in profile, ellipsoid in face view, wall smooth, thick (double), truncate, ferruginous in 2% KOH. Basidia 20-26 x 9-12 μ , 4-spored, upper half globose or subvoid, with a rather slender stalk. Pleurocystidia and cheilocystidia none. Pileus cuticle of vesiculose cells, 9-15 x 7-10 μ , the surface appearing gelatinous. Stipe cuticle of dry, repent hyphae. Caulocystidia rare, scattered, cylindrical to subclavate.

Type, on dung heaps, West Albany, New York, June.

Peck comments that the striatious are similar to those of Galera lateritia, from which this species is separated by its expanded viscid pileus, different color and free lamellae.

13316

Bolbitius

PLUTEOLUS COPROPHILUS Pk.

New York State Mus. Ann. Rept. 46:59. 1893

On straw and dung pile, Auxvaase, Missouri, leg.-det.

J. B. Routien, No. 1029, June 12, 1940.

Notes by Hesler

Spores 11-16 x 7.5-9.5(10) μ , obscurely inequilateral in profile, ellipsoid in face view, wall 0.4 μ thick, smooth, more or less truncate, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia none found. Pileus cuticle a palisade of subpyriform to cuneiform cells, mostly pushed out of position, surface with a thin gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia not found.

Murrill (N.A.F. 10:187) lists Bolbitius radians Morgan as a synonym.

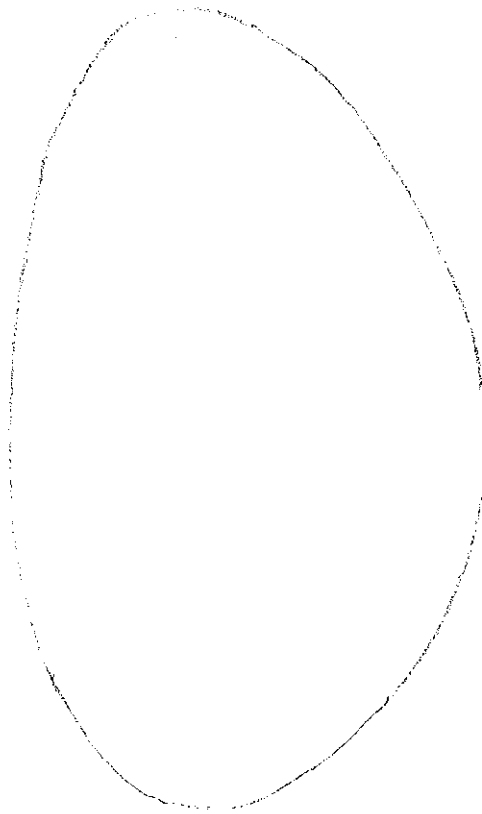
This agrees in general appearance and in micro detail with other collections labelled B. radians, and Mycena (Bolbitius) flava.

Pluteolus copriophilus OK.

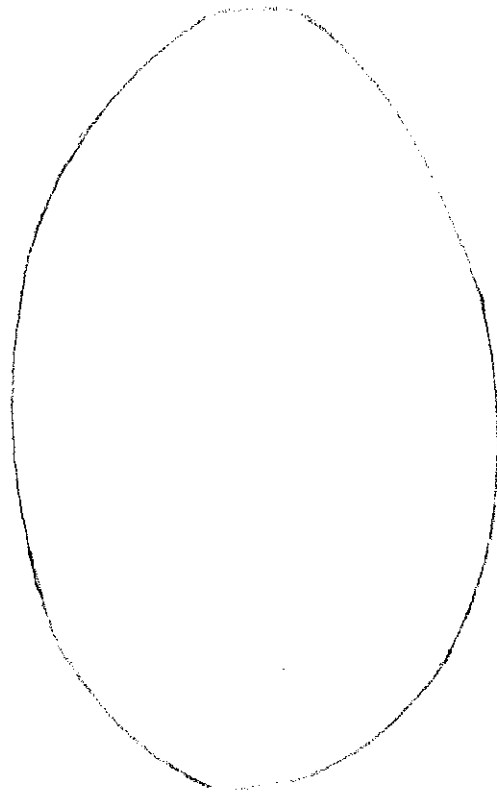
Type



Basidia x 1000



Profile



Face

Spores x 8000

13316

PLUTEOLUS COPROPHILUS Pk.

New York State Mus. Ann. Rept. 46:59. 1893

On straw and dung pile, Auxvaase, Missouri, leg.-det.

J. B. Routien, No. 1029, June 12, 1940.

Notes by Hesler

Spores 11-16 x 7.5-9.5(10) μ , obscurely inequilateral in profile, ellipsoid in face view, wall 0.4 μ thick, smooth, more or less truncate, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia none found. Pileus cuticle a palisade of subpyriform to cuneiform cells, mostly pushed out of position, surface with a thin gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia not found.

Murrill (N.A.F. 10:187) lists Bolbitius radians Morgan as a synonym.

This agrees in general appearance and in micro detail with other collections labelled B. radians, and Mycena (Bolbitius) flava.

Pluteolus coprophilus PK.
Tem - 13316 (Rautien - 1029)



Spores cuticle
x 1000



Profile

Spores x 8000

Face

Pluteolus

PLUTEOLUS CREMEUS Murrill

North Amer. Flora 10:188. 1917

Murrill's Description

Pileus 1-2.5 cm broad, conic to subexpanded, truncate, uniformly cream-colored, glabrous, margin concolorous, not striate. Context cream-colored; odor not distinctive, taste farinaceous.

Lamellae free, fulvous at maturity, crowded, rather broad, ventricose, edges whitish and finely serrulate.

Stipe 3-5 cm long, 1.5-3 mm thick, whitish, glabrous, equal, cylindric, cartilaginous, hollow.

Notes by Hesler (in *Fyfe*)

Spores (7) 8-9.5 x (4.5) 5-5.5 μ , slightly inequilateral in profile, ellipsoid in face view, germ-pore present and sometimes obscure, sometimes slightly truncate, wall 0.25 μ (or less) thick, yellowish brown in 2% KOH. Basidia 22-25 x 7-8 μ , 4-spored. Pleurocystidia none; cheilocystidia (16) 23-32 x 4-6 μ , ventricose, usually subcapitate, sometimes crooked, scattered. Gill trama of slender, subparallel hyphae, the zone medium broad. Pileus trama of loosely interwoven, medium broad hyphae. Pileus cuticle a palisade of cuneate cells. Stipe cuticle of repent hyphae. Caulocystidia in rather numerous clusters, 33-70 x 5-15 μ , clavate, constricted-ventricose, or somewhat irregularly shaped. Clamp connections not observed.

Type, James McMurphy-57, among sticks and leaves, on soil, under trees, Madera Creek, near Stanford University, California, December 21, 1902.

A note attached to Type packet, by Watling, states that this is a true Bolbitius and should be transferred to that genus (see forthcoming Monograph)--Roy Watling, April 30, 1965.

PLUTEOLUS CREMEUS Murr.

Notes on Type (by Hesler)

Spores 7-9 x 5-5.5 μ , slightly inequilateral in profile, ellipsoid in face view, smooth, truncate (slightly so, in some), yellowish brown in 2% KOH. Pleurocystidia none found; cheilocystidia 17-32 x 5-6 μ , ventricose to ampullaceous, often crooked or irregular-shaped, usually more or less capitate or subcapitate. Basidia 18-20 x 6-8 μ , 4-spored. Pileus cuticle of subpyriform to cuneiform cells in a palisade. Stipe cuticle of repent hyphae, dry. Caulocystidia in tufts, 33-70 x 6-15 μ , subcylindric and subcapitate, ventricose, often crooked and somewhat irregularly-shaped.

A Bolbitis.

Pluteolus cremens Murr.

Type (McMurphy - 57)



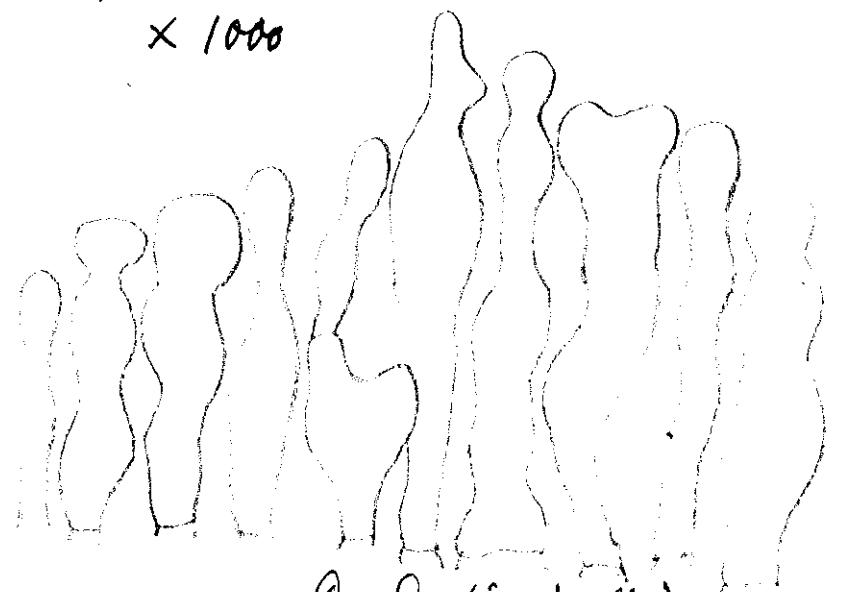
Ch x 1000



Basidia x 1000



Spores cuticle x 1000



Conia (in tufts) x 1000



Profile

Face

Spores x 8000

BOLBITIUS EXPANSUS (Pk.) comb. nov.

Agaricus (Galera) expansus Pk., Buffalo Soc. Nat. Sci. Bull. 2:52. 1873.

Galera expansa (Pk.) Sacc., Syll. Fung. 5:870. 1887.

Pluteolus expansus (Pk.) Pk., New York State Mus. Ann. Rept. 46:59. 1893.

Pileus 2.5-5 cm broad, expanded or centrally depressed, brownish-ocher, sometimes tinged yellow or pink, viscid, margin plicate-striate. Context submembranous, thin, watery-yellow.

Lamellae free or slightly attached, ferruginous, crowded.

Stipe 7.5-10 cm long, 2 mm thick, yellow, slightly pruinose, equal, faintly striate, hollow.

Notes on Type (by Hesler)

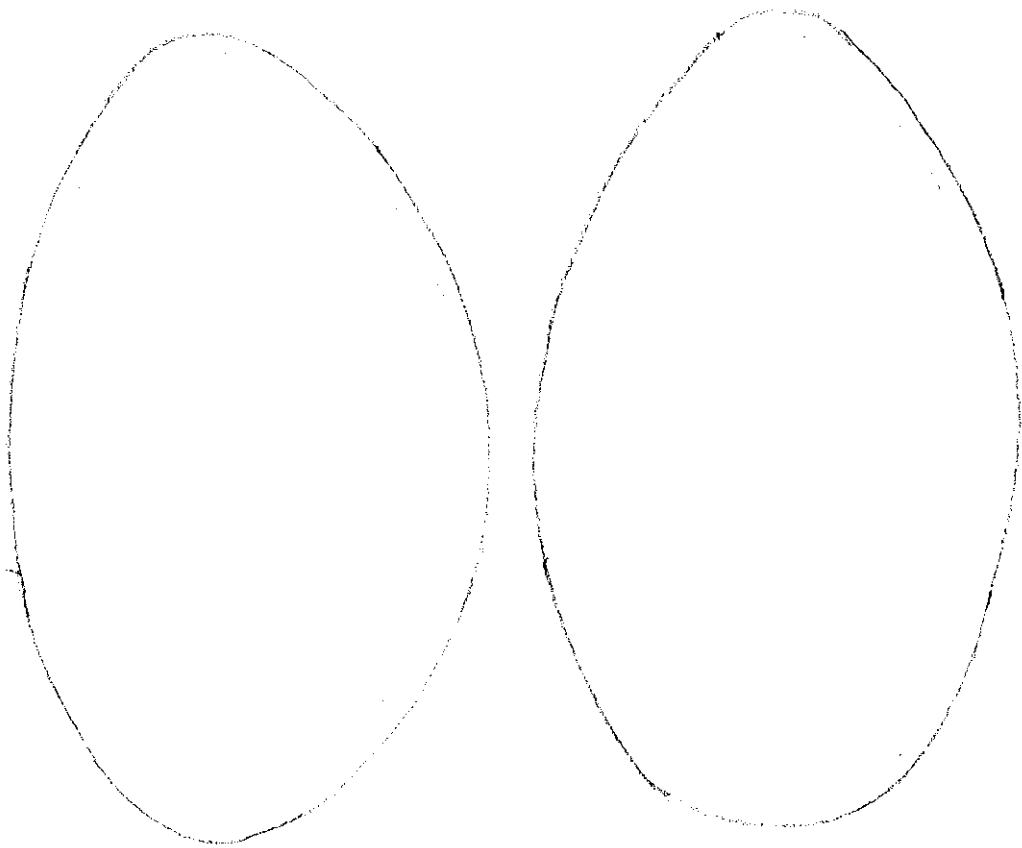
Spores 10.5-13.5(15) μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, sometimes slightly truncate, wall thick, rusty-brown in 2% KOH. Pleurocystidia and cheilocystidia none. Pileus cuticle cellular, often collapsed, surface elements faintly gelatinous. Stipe cuticle of repent, dry hyphae. Caulocystidia short, more or less cylindrical.

Type, on decaying wood, Memphis, Onondaga County, New York, August.

I follow both Singer and Watling in using Bolbitius, and place Pluteolus in synonymy.

Pluteolus expansus (PK.) PK.

Type



Profile

Face

Spores x 8000

Murrill

MYCENA FLAVA Murrill

North Amer. Flora 10:192. 1917

Murrill's Description

Pileus 4-7 cm broad, caespitose, conic to fully expanded, viscid, bright-lemon-yellow to pale-sordid-yellow, usually glabrous, margin concolorous. Context without characteristic odor or taste.

Lamelae free, pale brown or fulvous at maturity, broad, ventricose, crowded.

Stipe 6-10 cm long, 8-12 mm thick, white, glabrous above, fibrous-shaggy below, hollow, tapering upward somewhat.

Notes by Hesler

Spores 13-15.5 x 8-10 μ , obscurely inequilateral in profile, ellipsoid in face view, obscurely truncate, wall smooth, 0.3 μ thick, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia none. Pileus cuticle of disarranged cells; surface with a thin gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia as apical tufts, the individuals more or less collapsed and their form indistinct; below, the caulocystidia are about 34 x 7-8 μ , more or less clavate.

Type, Baker-161, on horse-manure in an old pasture,
Stanford University, California, November 30, 1901.

Watling, in a note attached to the packet, says that
it is a perfectly good Bolbitius, and that the new
combination will be made in the future.--Roy Watling,
March 12, 1952.

Mycena flava Murr.
[= *Bolbitis* f.] - Type



Conulo x 1000



Profile

Face

Spores x 8000

Bolbitius
PLUTEOLUS FLAVELLUS Murrill

North Amer. Flora 10:188. 1917

Murrill's Description

Pileus reaching 4 cm broad, convex to expanded, viscid when young, glabrous, light brownish yellow, margin pallid and deeply striate, splitting with age. Context thin, bright yellow; taste mild.

Lamellae adnexed, pale lemon yellow, not showing coloration by spores, narrow, crowded, edges finely serrulate.

Stipe 4-7 cm long, 2-4 mm thick, lemon yellow, with a whitish bloom, pruinose-furfuraceous, equal, hollow.

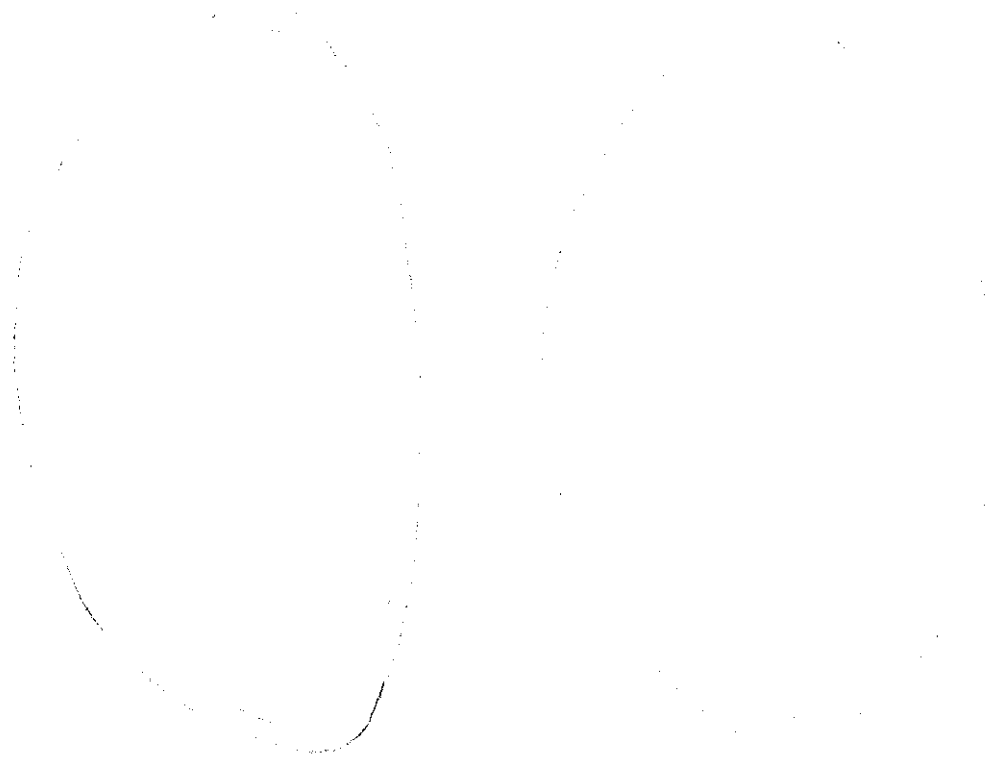
Notes by Hesler

Spores 10-14 x 7-8.5 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, truncate, wall 0.3 μ thick, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia not found. Pileus cuticle a palisade of cuneate cells. Stipe cuticle of repent hyphae. Caulocystidia in tufts, collapsed and their shapes not determined.

Type, Earl 90, N. Y. Bot. Garden, ^{on soil} June 13, 1900.

Note by Watling attached to Type packet: "This is a true member of the Bolbitiaceae. However, the material is immature (or uni-sterile). Because of this, the characteristics of the cheilocystidia and pleurocystidia and spore size cannot be relied upon. It approaches (if not identical with) Bolbitius variicolor Atk." Roy Watling, April 3, 1965.

Pluteolus flavellus Murr.
Type



Profile

Face

Spores x 8000

BOLBITIUS FLORIDANUS (Murrill) comb. nov.

Pluteolus floridanus Murr. Mycologia 30:371. 1938

"Pileus convex to plane, not umbonate, solitary, about 2.5 cm. broad; surface viscid, striate, white, smooth and cremeous on the disk, margin splitting and becoming discolored with age; context thin, white, fragile; lamellae free, narrow, crowded, entire, soon ferruginous, much wrinkled and folded on drying; spores ellipsoid, slightly smaller at one end, smooth, ferruginous, rarely guttulate, 13-15.5 x 7-8.5 μ ; stipe long, slender, hollow, tapering upward from a clavate base, smooth, glabrous, white, shining, about 8 cm. long."

Habitat and Distribution. - On rich, open soil among weeds, Florida, January.

Notes on Type

Spores 12-15.5 x 8-9.5 μ , ellipsoid to subvoid, smooth, truncate. Pleurocystidia and cheilocystidia not found. Epicutis of pyriform, more or less stipitate cells, 20-30 x 10-17 μ .

Type, coll. by Murrill, at Gainesville, Fla., Jan. 13, 1938, No. 15959 (in U. Fla. Herb.).

PLUTEOLUS FLORIDANUS Murr.

Notes on Type (by Hesler)

Spores 12-15.5 x 8-9.5 μ , ellipsoid to subovoid, smooth, truncate. Pleurocystidia and cheilocystidia not found. Pileus cuticle of pyriform, more or less stipitate cells, 20-30 x 10-17 μ . I shall examine the type again, as soon as it comes; then, will send revised notes.

PLUTEOLUS FLORIDANUS Murrill

On rich soil, among weeds, Gainesville, Florida, leg-det Murrill,
January 13, 1938. Type, No. 15939, coll. Murrill,
Gainesville, Florida, Jan. 13, 1938. (FLAS)

Notes by Hesler

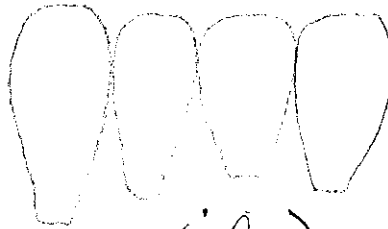
Spores 11-15.5 x 8-9.5(10) μ , slightly inequilateral in profile, ellipsoid in face view, smooth, truncate, yellowish brown in 2% KOH, wall 0.6 μ thick (double). Pleurocystidia and cheilocystidia not found. Pileus cuticle of cuneiform cells, 20-30 x 10-14 μ , surface slightly gelatinous. Stipe cuticle of repent hyphae, with a few scattered small clusters of caulocystidia, 32-40 x 7-12 μ , clavate to more or less ventricose.

The type material is very sparse, with only a few fragments of the pileus and most of one stipe. It is hardly suitable for critical study.

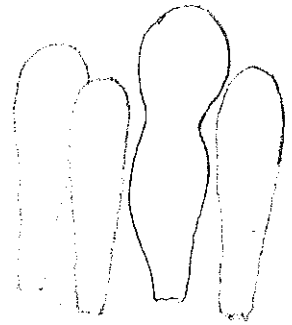
This is a Bolbitius.

Pluteolus floridanus Murr.

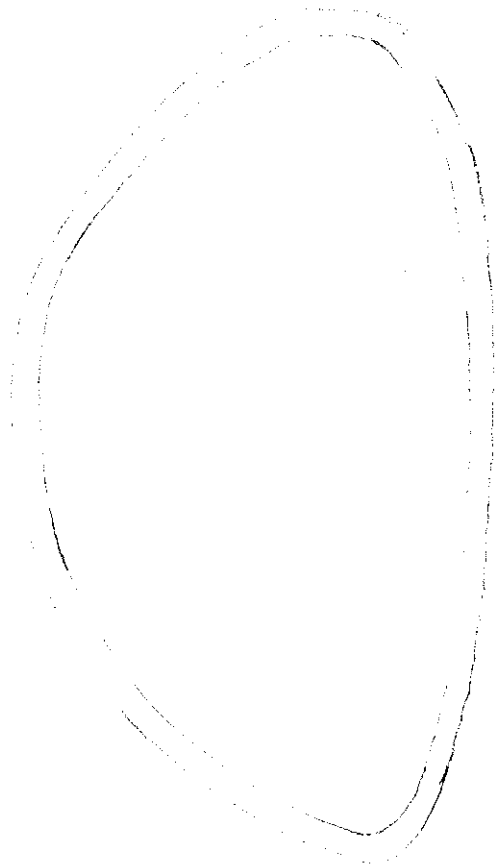
Type: 715939, leg.-det. Murrill



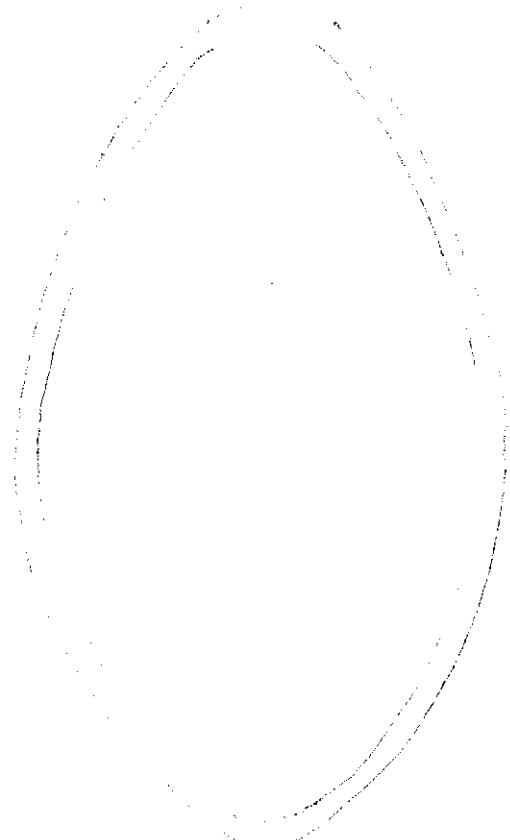
Cuticle (pileus)
cells - x 1000



Caule x 1000



Profile



Face

Spores x 8000

BOLBITIUS GLATFELTERI Pk.

Torrey Bot. Club Bull. 30:97. 1903

Mycena glatfelteri (Pk.) Murr., N. A. Flora 10:190. 1917.

Pileus gregarious or cespitose, 2-3 cm broad, conic or subcampanulate, soon expanding with the margin curving upward, sometimes umbonate, white, disc yellowish or tawny, very viscid, glabrous, margin widely striate. Context thin.

Lamellae free, pallid becoming ferruginous and pulverulent, crowded, rather narrow, subventricose.

Stipe 5-10 cm long, 4-5 mm thick, pure white, slightly aquamulose or furfuraceous when young, becoming glabrous and shining, hollow.

Notes on Type (by Hesler)

Spores 11-15.5 x 7.5-9.5 μ , obscurely inequilateral in profile, ellipsoid in face view, wall thick (double), smooth, more or less truncate, brownish in 2% KOH. Pleurocystidia and cheilocystidia none. Pileus cuticle of more or less cuneiform cells. Stipe cuticle of dry, repent hyphae.

Type, leg. N. M. Glatfelteri, May 6, 1902, St. Louis, Missouri, on rotted manure.

Peck comments that it is apparently related to B. sordidus Lloyd from which it may be separated by its larger spores and more narrow lamellae.

BOLBITIUS GLATFELTERI Peck

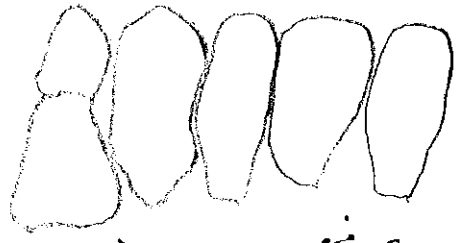
Torrey Bot. Club Bul. 30:97. 1903

Pileus ovate then conical, finally convex-expanded, 2-5 cm. broad, slightly umbonate, umbo "honey yellow," elsewhere grayish-white to "light buff," innately silky, atomate, margin becoming ocher to purplish-ocher, striate half way or entirely to umbo, viscid (~~wet~~), shining ^{when} (dry). Flesh thin, white. Lamellae narrowly adnate, crowded, pale cinnamon, becoming "sayaal brown," not separable from pileus, medium broad, ventricose, narrowed behind, several with glistening watery drops, short, edges white, serrulate or fimbriate, dissolving in wet weather, somewhat crisped (dry). Stipe 3.5-9 cm. x 1-6 mm., white, striate and pruinose-mealy at apex, whitish squamulose below, glabrescent, base white-mycelioid and sometimes subbulbous, viscid, hollow, often curved at base, cartilaginous, very fragile. Veil none.

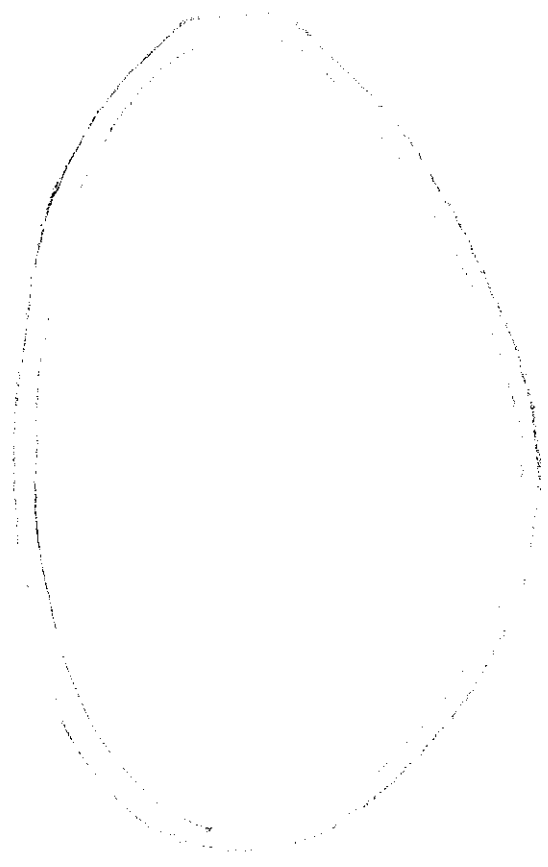
Spores brownish-ochraceous, 11-16.2 x 7.8-10 μ (mostly 14 x 8.75), ovate, ovate-elliptical, pointed at basal end or at both ends (variable). Gill-trama of parallel hyphae. Basidia mostly 4-spored, a few 3- and some 5-spored, rarely 6-spored. Pleurocystidia none; cheilocystidia clustered, 16-20 x 7-9 μ . Cuticle cells globose to ellipsoidal or pyriform, 32-40 x 18-24 μ .

Habitat and Distribution. - On compost (silage) and manure, under apple trees, Tennessee, March-June.

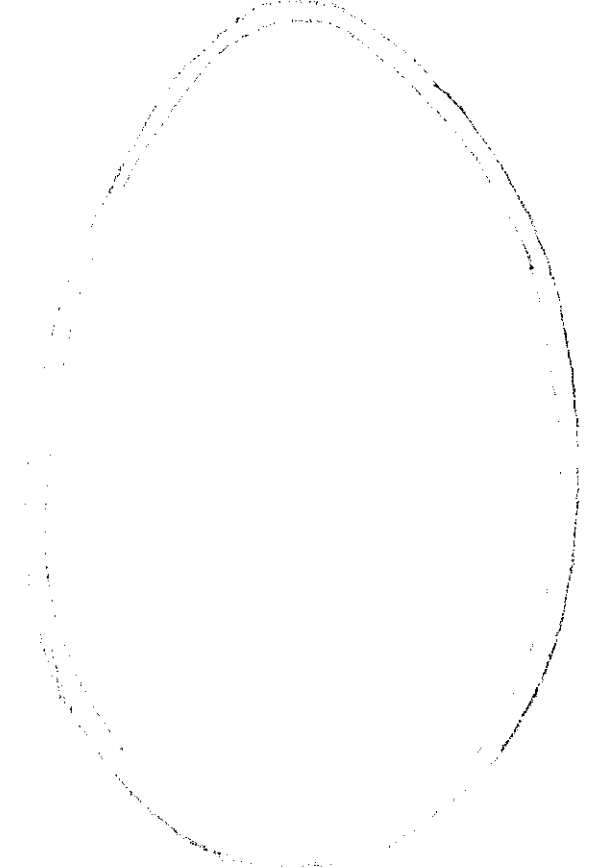
Bolbitus glatfelteri PK.
Type



Pileus cuticle



Profile



Face.

Spores x 8000

3534

BOLBITIUS GLATFELTERI Pk.

On compost (silage) under apple, University Farm, Knoxville,
leg-det LRH, det. confirmed by A. H. Smith,
April 25, 1934

Pileus 2-5 cm broad, ovoid to conic, finally convex-expanded, slightly umbonate, grayish-white, innately silky, disc often ochraceous, margin becoming ocher to purplish-ocher, viscid (wet), shining (dry), striate 1/3-1/2 way to umbo. Context thin, white.

Lamellae nearly free, crowded, pale cinnamon, becoming rusty-brown to ochraceous, not separable from pileus, broad, ventricose, narrowed behind, several with glistening watery drops, short, white on edges which are sparsely fimbriate, somewhat crisped (dry), dissolving in wet weather, thin.

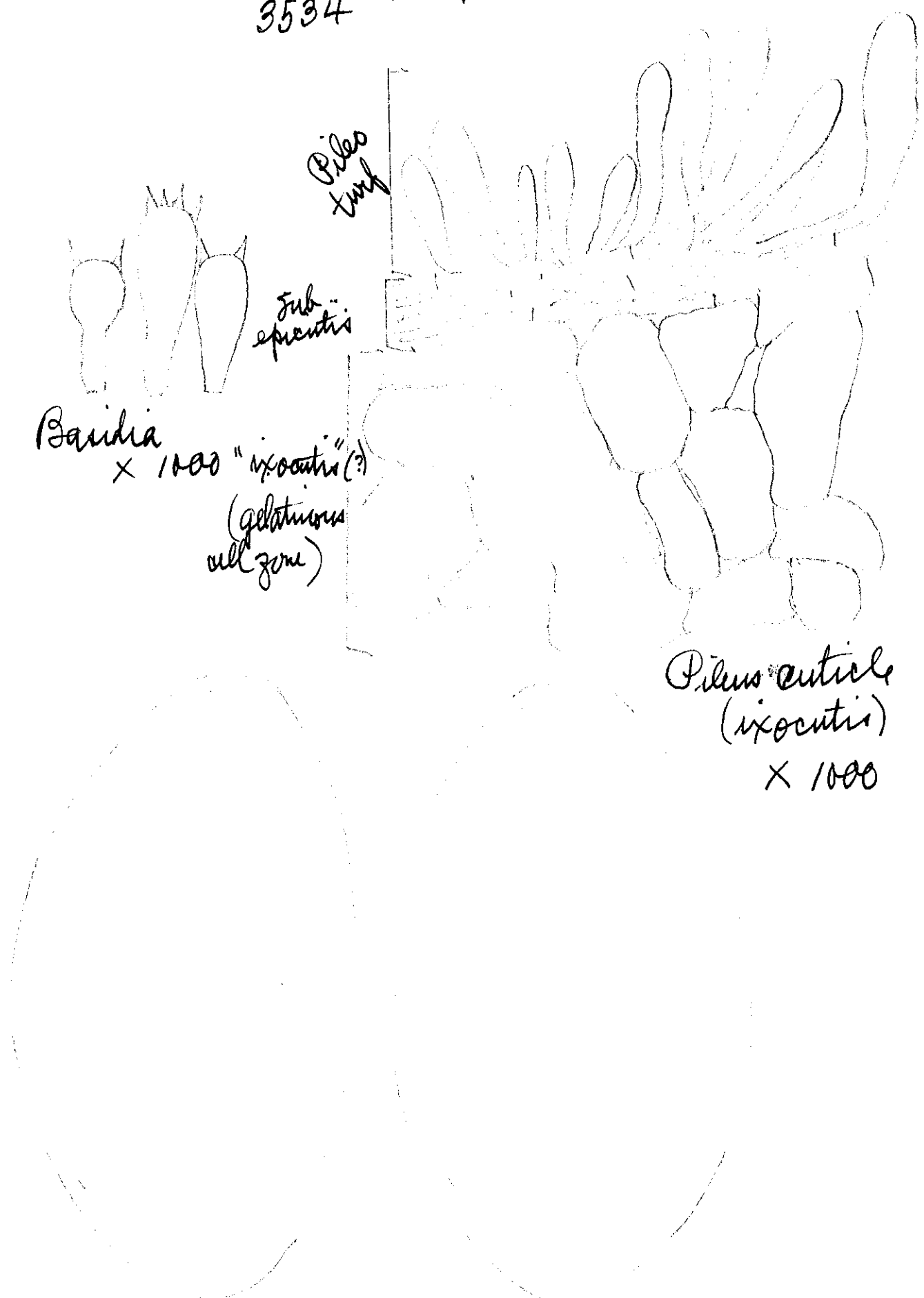
Stipe 3.5-8 cm long, 3-6 mm thick, white, striate, apex pruinose-mealy, whitish squamulose below, glabrescent, base white-mycelioid and sometimes sub-bulbous, viscid, hollow, often curved at base, cartilaginous, very fragile, stipe separable from pileus. Veil none.

Spores 11-16 x 7.5-9.5 μ , obscurely inequilateral in profile, ellipsoid in face view, wall 0.3 μ thick, truncate, smooth, reddish brown in 2% KOH. Basidia 28-40 x 10-12 μ , 2(4)-spored. Pleurocystidia and cheilocystidia none. Gill trama a broad or medium broad zone, hyphae subparallel. Pileus cuticle unique, complex: a pseudoparenchymatous zone of rather large cells the surface bearing a bed of hyphae

which become upturned, the terminal elements of pileo-
cystidia, 20-60 x 4-10 μ , clavate, often forming more or
less a palisade. Stipe cuticle of repent hyphae.

Bolbitinus glatfelteri PK.

3534



Pilus
turf

Sub-
epicutis

Baidia
x 1000 "ixocutis" (?)
(gelatinous
all zone)

Pilus cuticle
(ixocutis)
x 1000

Profile

Spores x 8000

Face

4080

BOLBITIUS GLATFELTERI Pk.

On compost, Univ. Farm, Knox County, April 23, 1934

Pileus 2-3 cm broad, ovoid-conic when young, finally expanding, at first more or less umbonate, viscid, pale yellow, fading, glabrous, margin striate. Context thin, yellowish; odor and taste not distinctive.

Lamellae narrowly adnate to nearly free, broader in front, yellowish becoming ochraceous-cinnamon, close, medium broad, thin, somewhat deliquescent.

Stipe 3-7 cm long, 3-4 mm thick, fragile, slightly tapering upward, pale yellowish, glabrous, hollow, base sub-bulbous.

Spores 11-15 x 8-9(10) μ . Other micro characters as in 3534.

4081

BOLBITI~~O~~US GLATFELTERI Pk.

On compost, Univ. Farm, Knoxville, leg-det LRH, det./
confirmed A. H. Smith, April 23, 1934

Pileus 2.5-4 cm broad.

Spores 10-16 x 7.5-10 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, truncate, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia none. Pileus cuticle as in 3524.

Agrees in all essentials with 3524.

11203

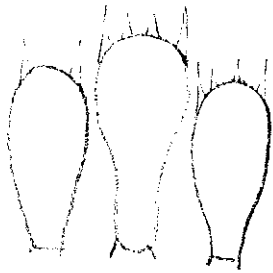
BOLBITIUS GLATFELTERI Pk.

On manure, Univ. Farm, Knoxville, March 27, 1938

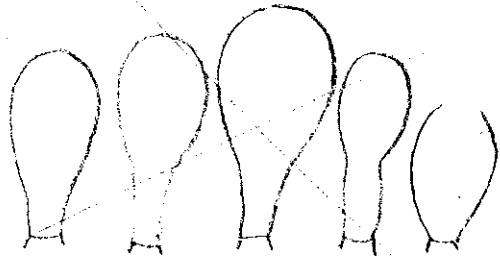
Macro- and micro- characters as in 3524. Spores 10.5-17
x 8-10 μ . Pileocystidia a bit more abundant than in 3524,
at times forming a turf, or palisade.

Polbitius glatfelteri Ph. ?

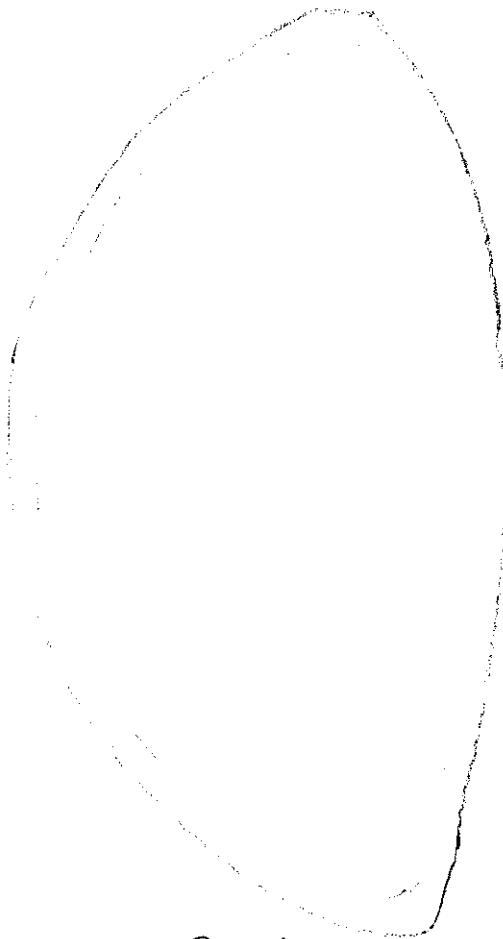
Tem - 39205



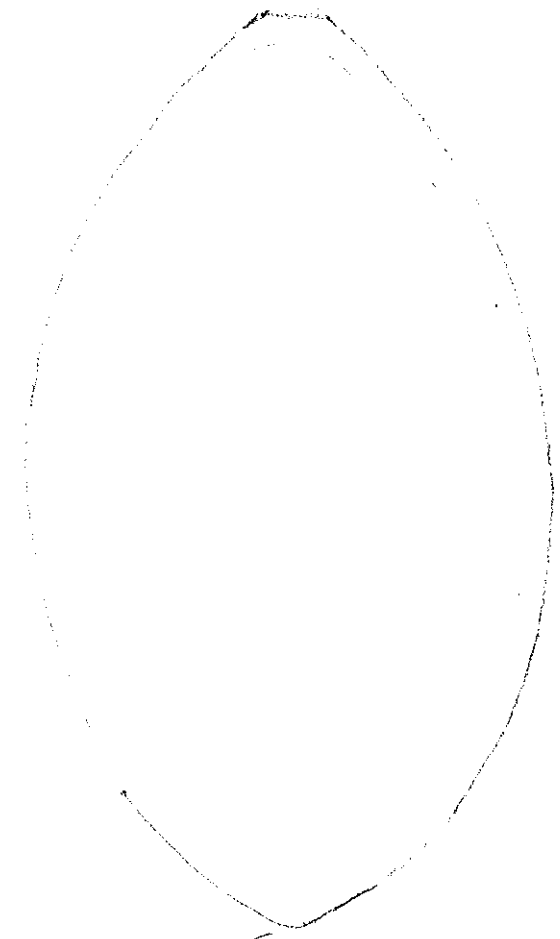
Basidia
x 1000



Ch x 1000



Profile



Face

Spores x 8000

BOLBITIUS GLOIOCYANEUS Atkinson

Ann. Myc. 6:54. 1908

Mycena gloiocyanea (Atk.) Murrill, North Amer. Flora
10:191. 1917.

Pileus 1.2-5 cm broad, conic, expanding to revolute, when young bluish-green, with a dark-brown center, in age varying in dark-green and blue-green colors but finally bright brown, wrinkled, exceedingly viscid in all stages, margin striate when young.

Lamellae medium broad, moderately close.

Stipe concolorous, viscid.

Notes by Hesler

Spores 8-10 x 5-6 μ , ellipsoid, not inequilateral in profile, smooth, many more or less truncate, brown in 2% KOH. Pleurocystidia none; cheilocystidia 18-25 x 3-6 μ , clavate, few and inconspicuous. Pileus cuticle a palisade of clavate to subcuneiform cells, the surface at times with a thin gelatinous zone. (Stipe material hardly suitable for study.)

The material in poor condition for study; it appears to have ~~dist~~ disintegrated between collection and drying.

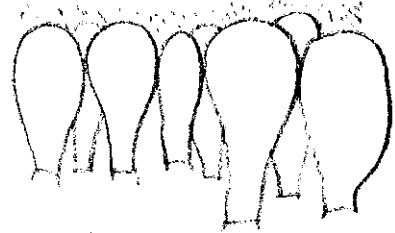
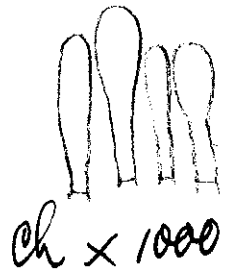
Note with specimen, by Roy Watling, April 16, 1965:
"I have taken this collection to represent the type material for *Bolbitius gloiocyaneus* Atk."

It is not labelled Type, and it would be appropriate to label it as lectotype.

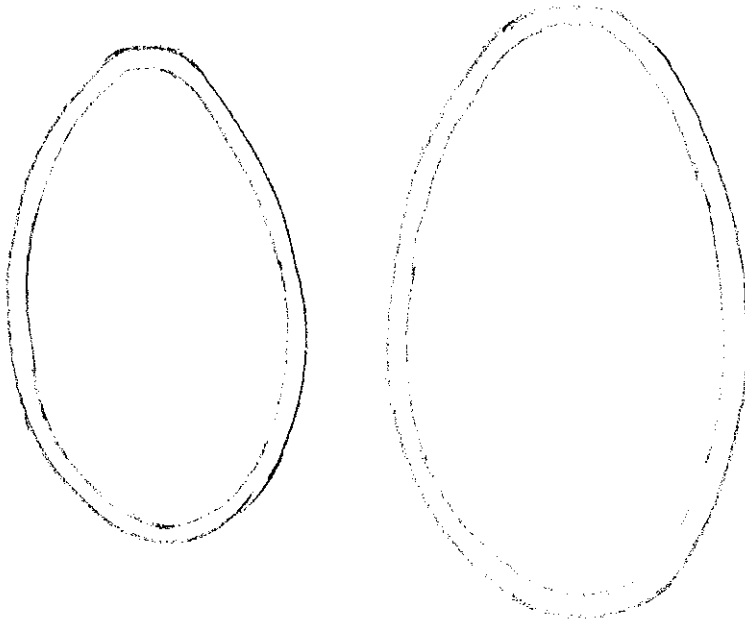
It was collected by E. A. White, at ~~S~~^torrs, Conn., on sawdust, and sent to Atkinson, Oct. 10, 1906 (OU-2011).

Murrill (1917:191) reports it from Maine, Vermont, and Connecticut.

Bolbitis glaucocyanus Atk.
"Type" (CU-2011)
(Restotype?)



Pileus cuticle
x 1000



Spores x 8000

Bolbitius

PLUTEOLUS INTERMEDIUS (Coker) Comb. nov.

Elisha Mitch. Sci. Soc. Jour. 45:175. 1929

Pluteolus intermedius Coker.

"Delicate and fragile, solitary. Cap 3-4.5 cm. broad, regular, when mature expanded or shallowly funnel-form, the very center elevated as a low rounded umbo, viscid when damp; color about wood brown, the center darker to nearly blackish; strongly striate-plicatulate, the center with rugulose radiations around the umbo. Flesh membranous, very thin and delicate.

"Gills about 2 mm. wide, close, nearly free, about cinnamon (Sayal brown, Ridgway) at maturity.

"Stem 4-6 cm. long, 2.5-4 mm. thick in center, tapering upward, delicately granular in lines, white above and below, citron yellow in middle region, lightly stuffed, then hollow; flesh color of surface.

"Spores cinnamon, ovate-elliptic, often with one side slightly flattened, 4.5-6 x 9-11.5 μ . Basidia 4-spored, separated by sterile cells, looking very much like Coprinus in surface view (see Buller's Researches in Fungi 1: pl. 3, fig. 15).

Discussion. - "This beautiful little plant combines to a peculiar degree some of the most striking characteristics of Pluteolus reticulatus and P. expansus. The blackish umbo

with glutinous reticulations is exactly as described for the former. The deeply sulcate-plicate cap and yellow stem are characters of expansus. As expansus may grow on the ground, it agrees with that species in this respect also. The colors of the cap do not agree with either species but are nearer those of expansus. The spores are exactly those of reticulatus, as given by Kauffman, and are narrower than those of expansus."

Habitat and Distribution. - On soil in woods, North Carolina, October.

Notes on Type

Spores 9-^{11.5}~~12~~ x 4.5-5.5 μ , ellipsoid to subfusoid or subovoid, more or less truncate, often inequilateral, smooth. Basidia 10-14 x 7-9 μ , 4-spored, more or less cuneate to subventricose. Paraphyses cuneate, 12-15 x 6-8 μ ; cheilocystidia clavate to cylindrical, 22-25 x 5-6 μ , or sub-cuneate, 14-18 x 5-8 μ . Epicutis of irregular loaf-shaped cells, 18-22 x 12-17 μ , at times torn away in the sectioning-process.

Difficulty was encountered in sectioning: the flesh is thin, the epicutis cells are often torn away, and myriads of spores obscure essential structures.

PLUTEOLUS INTERMEDIUS Coker

Notes on Type (by Hesler)

Spores 9-12 x 4.5-5.5 μ , ellipsoid to subovoid, at times subfusoid, more or less truncate, smooth. Cheilocystidia 22-25 x 5-6 μ , clavate to cylindrical; or, subcuneate and then 14-18 x 5-8 μ . Pileus cuticle of irregular loaf-shaped cells, 18-22 x 12-17 μ .

A Bolbitis.

BOLBITIUS JAMAICENSIS (Murr.) comb. nov.

Pluteolus jamaicensis Murr., N. A. Flora 10:189. 19171

Pileus 3-4 cm broad, convex to plane, disc isabelline, margin fading to pale yellowish, dry, glabrous. Context with a distinct farinaceous odor.

Lamellae slightl adnexed or free, pale-melleous, much crowded, narrow.

Stipe 10 cm long, 5mm thick, whitish, glabrous, equal, solid or stuffed.

Type on compost heap of vegetable remains and mud, roadside, Moore Town, Jamaica, Dec. 16, 1908. Murrill.

Pluteolus
PLUTEOLUS JAMAICENSIS Murrill

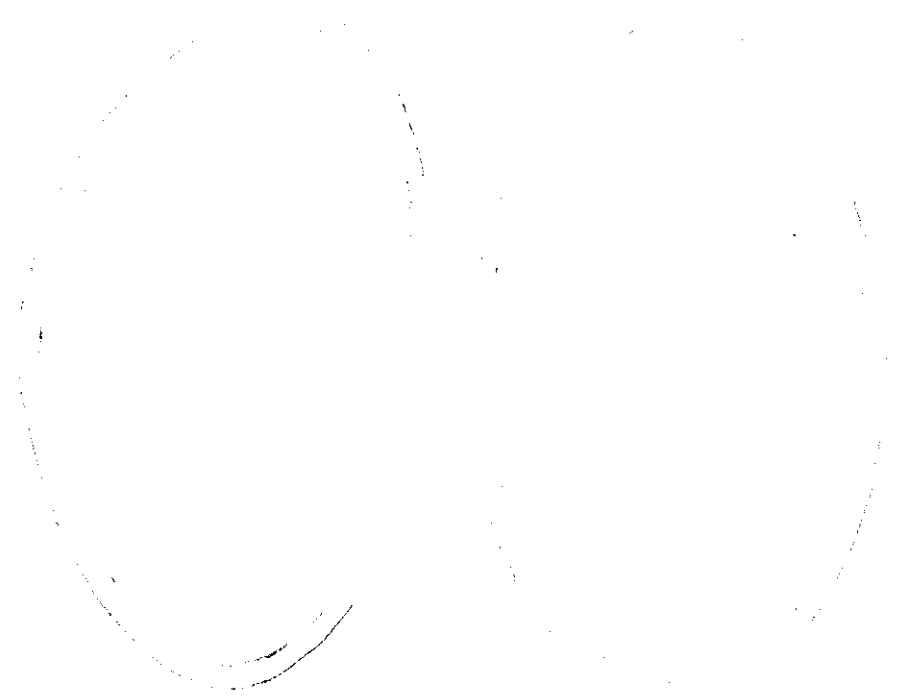
North Amer. Flora 10:189. 1917

Notes by Hesler

Spores 9-11(12) x 7-8 μ , slightly inequilateral in profile, ellipsoid in face view, smooth, germ-pore present, often more or less truncate, brown with a yellow tint in 2% KOH. Pleurocystidia and cheilocystidia not present, or poorly developed. Pileus cuticle cellular, with a thin gelatinous zone on surface.

As Watling states in a note on the packet, the material is not helpful. Although most spores appear mature, the lamellar cystidia seem poorly developed.

Pluteolus jamaicensis Murv.
Type



Profile

Face

Spores x 8000

BOLBITIUS LUTEUS (Pk.) com. nov.

Pluteolus luteus Pk., Torrey Bot. Club Bull. 22:203. 1895.

Pileus 2-3.5 cm broad, gregarious, subvoid then convex or sub-campanulate, yellow, glabrous, viscid, margin slightly striate. Context thin, very fragile.

Lamellae free or slightly adnexed, yellowish becoming ferruginous, crowded, numerous.

Stipe 3.5-7.5 cm long, 2-4 mm thick, yellowish, apex sprinkled with mealy particles, thickened slightly toward the base, hollow.

Notes on Type (by Hesler)

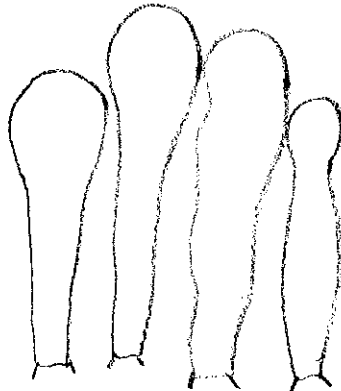
Spores (7.5)9-^{12.5}~~8~~ x (5.5)6-8 μ , slightly inequilateral in profile, ellipsoid in face view, yellowish brown in 2% KOH, truncate, wall smooth, thick. Pleurocystidia and cheilocystidia none found. Pileus cuticle of vesiculose cells, surface viscid. Pileocystidia 35-46 x 8-14 μ , scattered, clavate. Stipe cuticle of repent, dry hyphae. Caulocystidia not found.

on manure + soil,
Type under trees, leg. McClatchie No. 859, near Pasadena, California,
December.

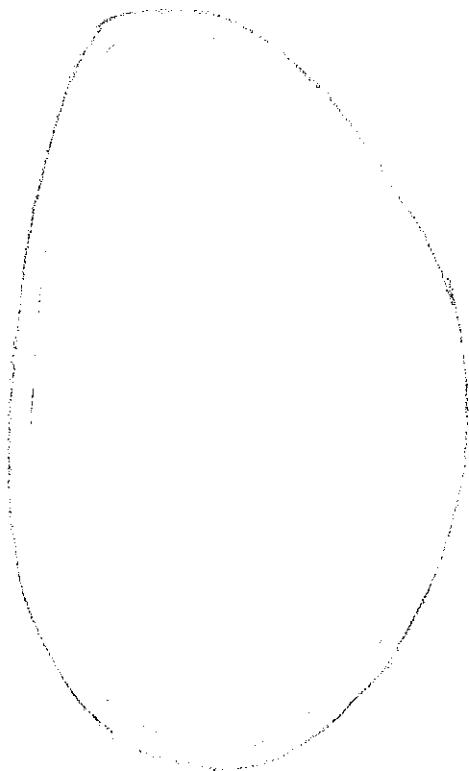
Peck comments that the prominent characters are the yellow color and viscid pileus.

Pluteolus luteus PK.

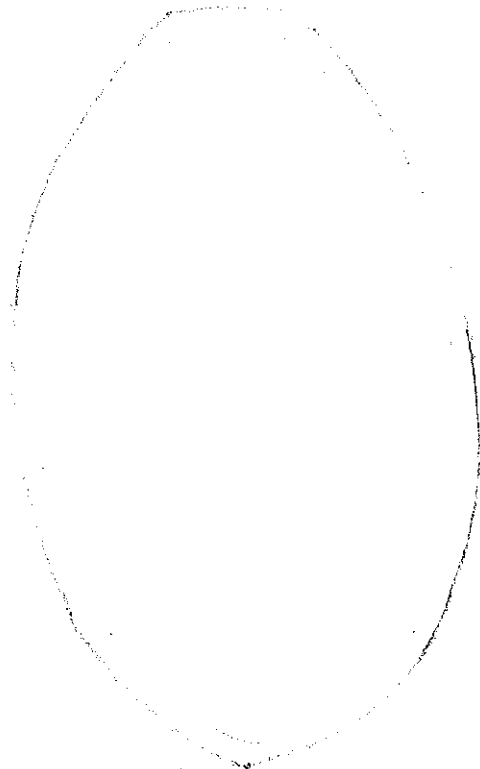
Type



Spores x 1000



Profile



Face

Spores x 8000

BOLBITIUS MARGINATIPES Zeller

Mycologia 25:378. 1933

Pileus 1-4 cm broad, conic then expanded to almost plane, isabella color on disc, young plants more gray, mature plants grayish white, somewhat viscid, smooth or innately fibrillose, somewhat radiately rugose, plicate-striate to splitting ~~in~~ half way to disc when expanded. Context white, membranous.

Lamellae adnate, grayish then ochraceous to antique brown, narrow, some very narrow, splitting, thin, margins even.

Stipe 2-8 cm long, 2-3 mm thick, ~~white~~, blackish ~~margin blackish fimbriate; white above~~ ~~fimbriate above~~, striate, base marginate-bulbous, hollow, brittle.

Spores 12-14 x 7.5-9 μ , dark ochraceous, smooth, with a hyaline apical germ-pore. Cystidia not seen.

On fertile manured soil in greenhouse, leg. Zeller, Corvallis, Oregon, (date?).

Zeller says it is very close to B. titubans(Bull.)Fr., but differs in the pileus and stem, in the striations/^{on}~~of~~ the stem, and the marginate-bulbous base. Young stages appear like Coprinus.

BOLBITIUS MEXICANUS (Murr.) Dennis

Bull. Soc. Myc. de Fr. 69:193. 1953

Mycena mexicana Murr., Mycologia 4: 73. 1912.
Murrill's Description

Pileus subcaespitose, about 2 cm broad, ~~flat~~ ^{conic} to expanded, avellaneous, umbo fuliginous, subglabrous, dry (see below!), striate.

Lamellae adnexed, becoming ferruginous and at length slightly deliquescent, rather broad, close.

Stipe 3-4 cm long, 1 mm thick, white, glabrous, equal, hollow.

Notes by Hesler

Spores 8-11 x 5-7 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, germ-pore present, more or less obscurely truncate, ~~flat~~ brownish with a tint of yellowish in 2% KOH. Pleurocystidia and cheilocystidia none. Pileus cuticle of subpyriform cells, many pushed out of position, the surface with a gelatinous zone (viscid, when wet). Stipe cuticle of repent hyphae. Caulocystidia in small mounds, their form difficult to delineate.

Type, Murrill-1127, on decayed wood, in coffee plantations, xuchiles, near Cordoba, Mexico, January 17, 1919.

Note by Watling, attached to packet, states that although the material is in poor condition, it is a perfectly good Bolbitius; judging (he says) from the structure of the spores and epicutis, I (Watling) think Dennis' interpretation (1953) agrees with my findings--
Roy Watling, April 29, 1965.

Mycena mexicana Murr.
[*Polbitius mexicanus* (Murr.) ~~Sacc.~~ ^{Murr.}]

Type



Profile

Face

SPORES X 8000

BOLBITIUS NOBILIS Pk.

New York State Mus. Ann. Rept. 24:71. 1872.

Mycena nobilis (Pk.) Murr., N. A. Flora 10:191. 1917.

Pileus 2.5 cm broad, ovate, then campanulate, pale yellow, disc tinged red, margin plicate-striate, margin at length recurved and splitting. Context thin.

Lamellae attached, pale yellow with a darker edge, alternate gills more narrow, tapering outward, *subdistant*

Stipe about 3.5-12 cm long, 2 mm thick, white, equal, striate at top hollow.

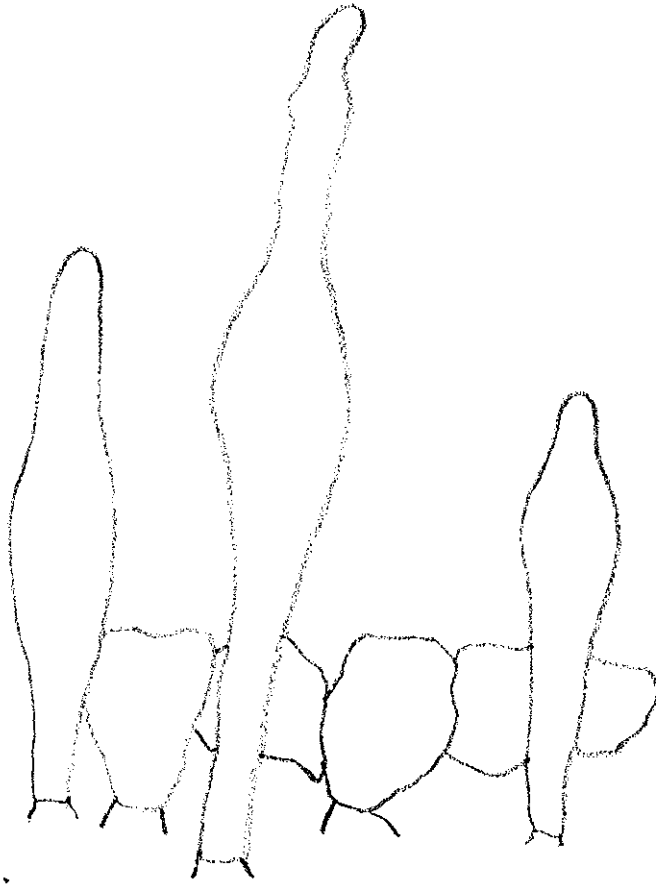
Notes on Type (by Hesler)

* Spores none found; scattered in each of many mounts were purple-brown spores, which were sublimoniform, rough (rugulose) about 15 x 7 μ , but these do not belong to Bolbitius. The basidiocarps seem to be sterile (Neither Peck nor Murrill mention spores). Pleurocystidia and cheilocystidia not found. Pileus cuticle viscid, of vesiculose to subcuneate. Pileocystidia 60-115 x 12-17 μ , ventricose, scattered, very conspicuous. Stipe cuticle of repent hyphae. Caulocystidia 50-112 x 9-26 μ , ventricose, scattered.

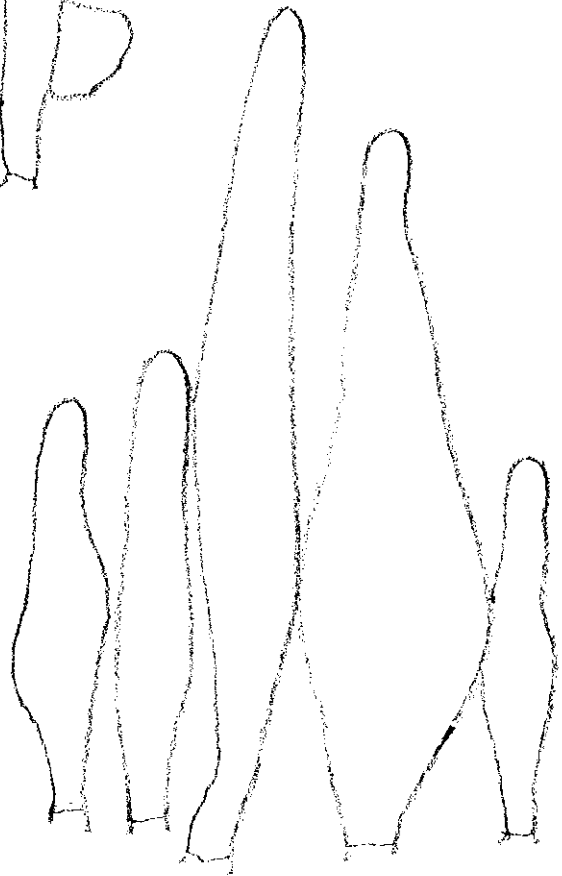
Type on soil, woods, Grieg, N. Y., Sept.

* Murrill, N. A. F. 10:191, does not mention spores; nor does Peck in his original description.

Bolbitus nobilis PK.
Type ✓



Filament cuticle and
piloaryptidia. $\times 1000$



Carloaryptidia $\times 1000$

PLUTEOLUS PARVULUS Murr.

Not the Type; collection from N. Y. Bot. Garden, by R. A. Harper, 14, Jan. 31, 1911, from California

Notes by Hesler

Spores 13-17 x 7.5-8.5 μ , slightly inequilateral and some subreniform in profile, ellipsoid in face view, smooth, germ-pore present, many show more or less a truncate apical end, wall 0.5 μ thick, reddish brown (ferruginous) in 2% KOH. Pleurocystidia none; cheilocystidia 30-38 x 5-7 μ , subclavate to subventricose. Pileus cuticle a palisade layer of cells. Pileocystidia scattered among and on pileus cuticular cells, 32-53 x 6-10 μ , subventricose; the surface slightly gelatinous. Stipe cuticle of repent hyphae. Caulocystidia cylindric, rather long, not abundant. Clamp connections not observed.

As Watling states, in his notes in the packet: There are discrepancies between the type description and the specimen. For example, the spores are described as bright-melleous under the microscope and 9-11 x 5 μ ; the specimens show the spores to be ferruginous and larger (13-17 x 7.5-8.5 μ).

Pluteolus
PLUTEOLUS PARVULUS Murr.

Not the Type; collection from N. Y. Bot. Garden, by
R. A. Harper, 14, Jan. 31, 1911, from California

Notes by Hesler

Spores 13-17 x 7.5-8.5 μ , slightly inequilateral and some subreniform in profile, ellipsoid in face view, smooth, germ-pore present, many show more or less a truncate apical end, wall 0.5 μ thick, reddish brown (ferruginous) in 2% KOH. Pleurocystidia none; cheilocystidia 30-38 x 5-7 μ , subclavate to subventricose. Pileus cuticle a palisade layer of cells. Pileocystidia scattered among and on pileus cuticular cells, 32-53 x 6-10 μ , subventricose; the surface slightly gelatinous. Stipe cuticle of repent hyphae. Caulocystidia cylindric, rather long, not abundant. Clamp connections not observed.

As Watling states, in his notes in the packet: There are discrepancies between the type description and the specimen. For example, the spores are described as bright-melleous under the microscope and 9-11 x 5 μ ; the specimens show the spores to be ferruginous and larger (13-17 x 7.5-8.5 μ).

PLUTEOLUS PARVULUS Murrill

Mycologia 4:246. 1912

Note on Type: The folder sent me from New York Botanical Garden herbarium states that the specimen of P. parvulus (type) is lost. Within the folder is an herbarium sheet, to which is glued a packet the label of which reads: "No. 1189, Pluteolus mucidolens, W. A. Murrill and L. S. Abrams, November 25, 1911." The collection was from Preston's Ravine, Palo Alto, California. This packet contains no specimen.

Another folder marked Pluteolus parvulus contains a packet, glued to a sheet, labelled Pluteolus parvulus, coll. by R. A. Harper, 14, Jan. 31, California. The specimens were studied (see notes and drawings). But, in this packet is a note, signed by ^{Roy}~~Ray~~ Watling, which reads:

"The material does not agree in many respects with the type diagnosis of Pluteolus parvulus. It is not the topotype, and I do not intend to publish this as neotype in the absence of the type material because of the many discrepancies found between (the) material and description. The material represents a Bolbitius sp., close to B. vitellinus (if not identical)." Roy Watling, April 28, 1965.

PLUTEOLUS PARVULUS Murrill

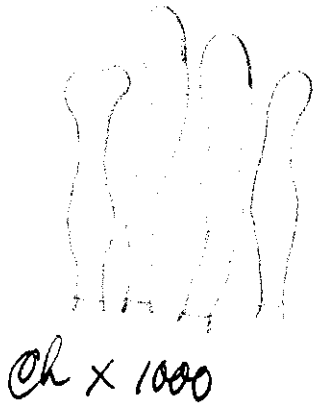
Mycologia 4:246. 1912

Note on Type: The folder sent me from New York Botanical Garden herbarium states that the specimen of P. parvulus (type) is lost. Within the folder is an herbarium sheet, to which is glued a packet the label of which reads: "No. 1189, Pluteolus mucidolens, W. A. Murrill and L. S. Abrams, November 25, 1911." The collection was from Preston's Ravine, Palo Alto, California. This packet contains no specimen.

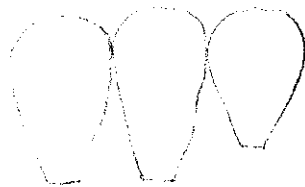
Another folder marked Pluteolus parvulus contains a packet, glued to a sheet, labelled Pluteolus parvulus, coll. by R. A. Harper, 14, Jan. 31, California. The specimens were studied (see notes and drawings). But, in this packet is a note, signed by ^{Roy}~~Ray~~ Watling, which reads:

"The material does not agree in many respects with the type diagnosis of Pluteolus parvulus. It is not the topotype, and I do not intend to publish this as neotype in the absence of the type material because of the many discrepancies found between (the) material and description. The material represents a Bolbitius sp., close to B. vitellinus (if not identical)." Roy Watling, April 28, 1965.

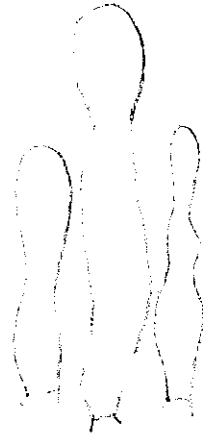
Pluteolus parvulus Murr. (?)
Harper-14, Not the Type



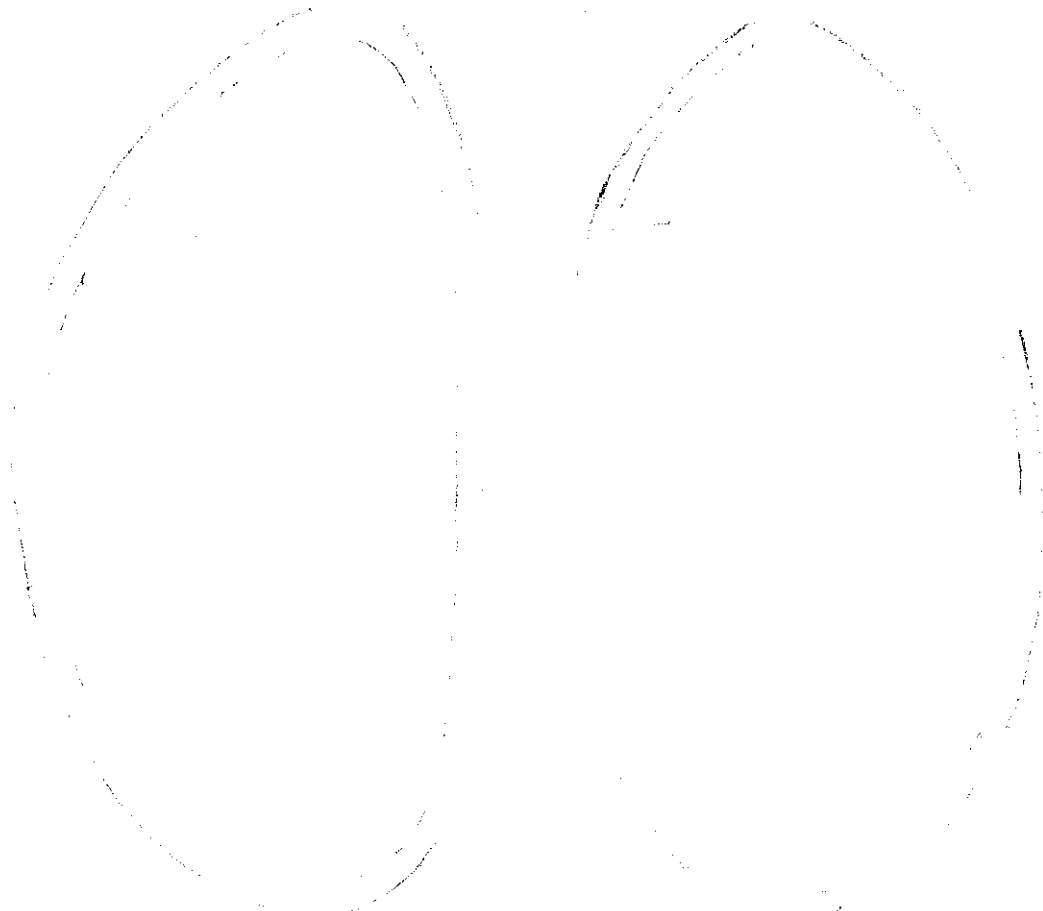
Ch x 1000



Pileus cuticle



Pileocystidia
x 1000



Profile

Spores x 8000

Face

79

BOLBITIUS RADIANS Morgan

Jour. Cinc. Soc. Nat. Hist. 18: 37. 1895

Notes by Hesler (on NYBG collection)

Spores 13-16 x 8-10 μ , slightly inequilateral in profile, ellipsoid in face view; wall 0.4 μ thick, smooth, more or less truncate, reddish-brown in 2% KOH. Pleurocystidia and cheilocystidia none found. Pileus cuticle cellular, the cells pushed out of position, surface with a thin gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia not found.

Baker, No. 161, near Stanford University, California, Nov. 30, 1901 (NY), det. by F. S. Earle. A note on the packet says the whole plant becomes watery, and the gills deliquesce.

from N.Y. Bot. Garden Herb.

This collection is mounted on the same sheet with Mycena flava Murr., and a note by Watling is attached to the packet: "This--(illegible) appears to represent further specimens of Mycena flava from the type gathering. Spore characters, etc. suggest it is a distinct Bolbitius sp. worthy of searching the Stanford Univ. area for."--Roy Watling, April 28, 1965.

Murrill (NAF 10:187) lists Bolbitius radians Morgan as a synonym of ~~Ple~~ Pluteolus coprophilus.

BOLBITIUS RADIANS Morgan

Cincinnati Soc. Nat. Hist. Jour. 18:37. 1895

Pluteolus coprophilus Pk. N. Y. State Mus. Ann. Rept.
46:59. 1893

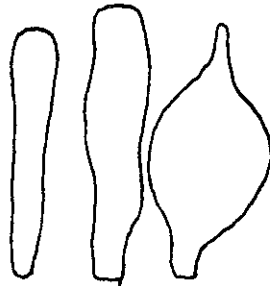
(N.A.F. 10:187)

"Pileus thin, submembranous, fragile, conic or campanulate, becoming nearly plane, sometimes cespitose, 2.5-6 cm. broad; surface somewhat viscid when moist, pinkish-gray, margin finely striate; lamellae narrow, crowded, free, pale-cinnamon-colored; spores ellipsoid, dark-ferruginous, 12.5-15 x 7.5 μ ; stipe long, straight or somewhat flexuous, hollow, flocculose, white, sometimes tinged with pink, 5-8 cm. long, 2-4 mm. thick."

Habitat and Distribution. - On dung, Florida.

Notes on U-T No. 13316
(from J. B. Routien, Missouri)

Spores 11-14.5 x 7-8 μ , ellipsoid to subovoid, more or less truncate, smooth. Pleurocystidia and cheilocystidia not found. Epicutis of cylindric to ventricose cells.



Epicutis cells

BOLBITIUS RADIANS Morgan

Jour. Cinc. Soc. Nat. Hist. 18: 37. 1895

Notes by Hesler

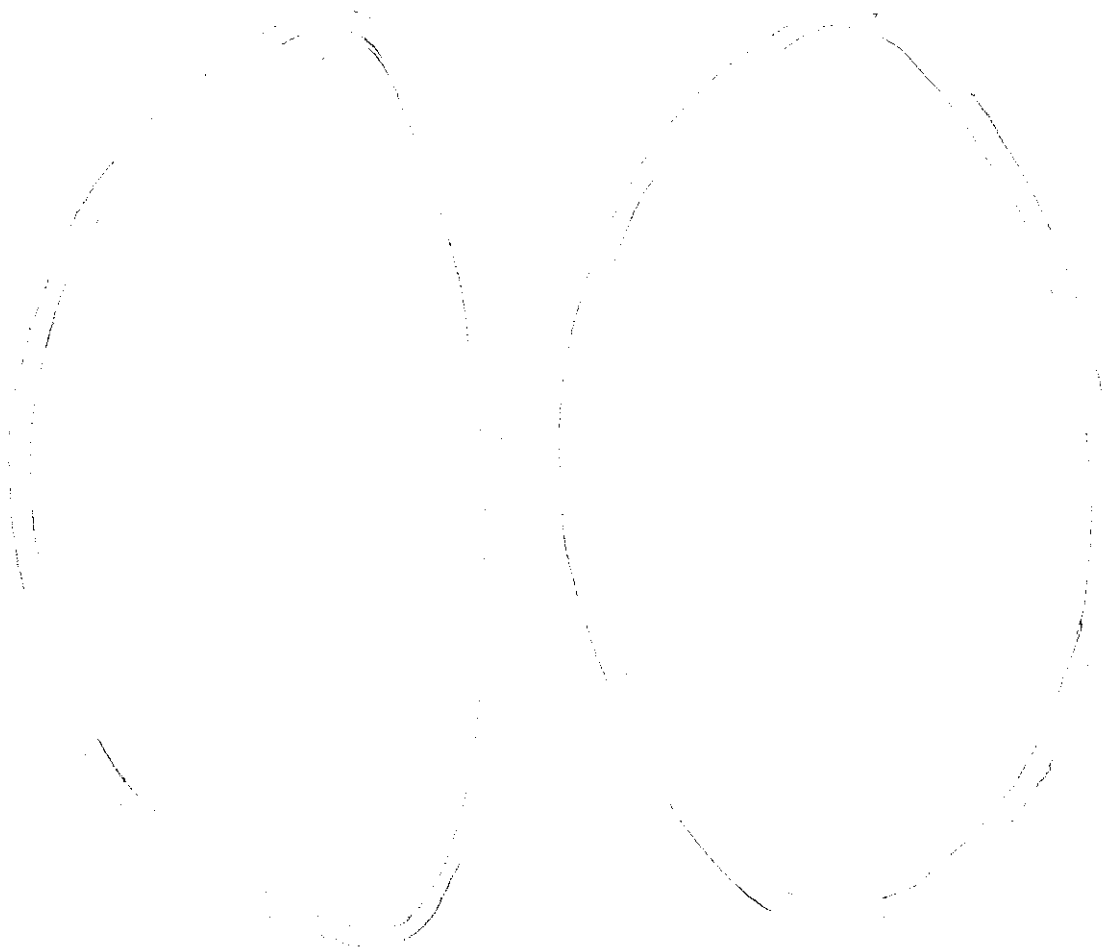
Spores 13-16 x 8-10 μ , slightly inequilateral in profile, ellipsoid in face view; wall 0.4 μ thick, smooth, more or less truncate, reddish-brown in 2% KOH. Pleurocystidia and cheilocystidia none found. Pileus cuticle cellular, the cells pushed out of position, surface with a thin gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia not found.

Baker, No. 161, near Stanford University, California, Nov. 30, 1901 (NY), det. by F. S. Earle. A note on the packet says the whole plant becomes watery, and the gills deliquesce.

This collection is mounted on the same sheet with Mycena flava Murr., and a note by Watling is attached to the packet: "This--(illegible) appears to represent further specimens of Mycena flava from the type gathering. Spore characters, etc. suggest it is a distinct Bolbitius sp. worthy of searching the Stanford Univ. area for."--Roy Watling, April 28, 1965.

Murrill (NAF 10:187) lists Bolbitius radians Morgan as a synonym of ~~Plat~~ Pluteolus coprophilus.

Bolbitus radians Morgan
C. F. Baker - 161 (NYBG)



Bolbitius reticulatus (Fr.) Ricken

PLUTEOLUS RETICULATUS (Fr.) Gill.

Champ. Fr. p. 549. 1876

Pileus 23 mm. broad, expanded, umbonate, glutinous, grayish to violaceous gray ("french gray"), marginal third becoming pinkish-gray, disk strongly anastomose-reticulate, margin striatulate. Flesh thin, pallid; odor mild. Lamellae nearly free, "pinkish buff," ventricose, medium broad, crowded, edges fimbriate. Stipe white, dry, 3 cm. x 2.5 mm., glabrous, apex white-mealy to flocculose, easily splitting, slightly enlarged downward, curved, hollow.

Spores (8) 9-12 x 4.5-5 (5.5) μ , smooth, ellipsoidal, brown. Basidia 9-12 x 7-8 μ , 4-spored, more or less vesiculose. Paraphyses similar to basidia. Cheilocystidia clustered, cylindrical to bottle-shaped, 22-35 x 4-6 μ . Epicutis of irregular cells, 15-25 x 9-17 μ , about 2-3 layers deep, colorless.

Habitat and Distribution. - On oak log, Tennessee, October.

Fänge, J. (1939: 43) places reticulatus as follows: Pluteolus alexiatus var. reticulatus Fänge, stating that it differs in having a venoso-reticulate cap, and generally a little more violaceous-livid colours.

BOLBITIUS SORDIDUS C. G. Lloyd

Mycological Notes 18. 1899

Mycena sordidus (Lloyd) Murr., N. A. Flora 10:190. 1917.

Pileus 3-4 cm broad, ovoid when young, explanate when mature, gregarious, pure snow-white when young, sordid when old, glutinous, hygrophaneous, margin even when young, plicate-sulcate and ragged when old.

Lamellae free, firm and white when young, becoming cinnamon-colored, moist and flaccid when old, ovate.

Stipe 5 cm long, 5 mm thick, pure-white, scurfy, hollow.

Spores 9 x 6 μ , ovoid.

Type, on rotten shavings used for horse bedding, Cincinnati, Ohio, leg. C. G. Lloyd.

I have not seen the Type.

Bolbitius

PLUTEOLUS STRAMINEUS Murrill

Mycologia 4:246. 1912

Murrill's Description

Pileus solitary, 3 cm broad, viscid, flavous and rugose at the center, pale-stramineous, closely and conspicuously striate to the center. Context thin.

Lamellae free or slightly adnexed, dull-dirty-stramineous, narrow, medium close, twice inserted.

Stipe 10 cm long, 5 mm thick, stramineous, pulverulent above, equal, fleshy, hollow.

Notes by Hesler

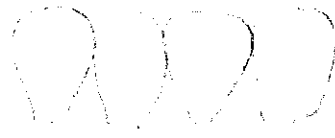
Spores 11-12(13) x 7-8 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, truncate, wall 0.4 μ thick, reddish brown in 2% KOH. Pleurocystidia and cheilocystidia none found. Pileus cuticle a palisade of cuneiform cells. Stipe cuticle of repent hyphae. Caulocystidia none found.

In a note by Watling, attached to the Type packet, he states that it is a Bolbitius, and the combination in Bolbitius will be made in the future.

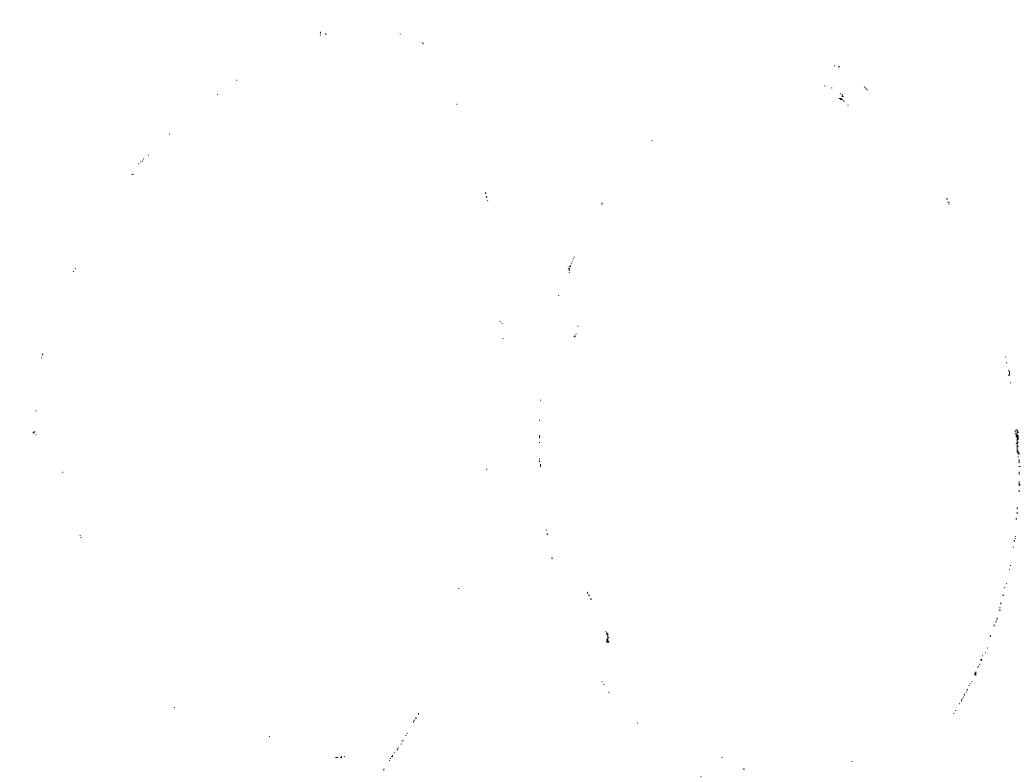
Type, Murrill 1019, in open grassy lawn, Corvallis, Oregon, Nov. 6-11, 1911.

Pluteolus stramineus Murr.

Type



Pilens cuticle
x 1000



Profile

Face

Spores x 8000

BOLBITIUS VARIICOLOR Atkinson

Studies Amer. Fungi, p. 164. 1900

Mycena variicolor (Atk.) Murrill, North Amer. Flora 10191.

1917.

Illustration:

Atkinson, Stud. Amer. Fungi, fig. 158.

Pileus 2-4 cm broad, ovate to conic when young, then convex, expanded, finally the margin elevated, with a broad umbo, margin straight, finely striate one-half to two-thirds of the way to the center, colors variable: smoky ^{olive} to fuliginous, darker when young, ^{becoming paler as the pileus expands,} ~~olive and yellow~~, very viscid when young, in dry weather the surface sometimes cracks into patches, sometimes surface fibrils are drawn into strands which form reticulations which in general radiate from center. Context yellow, ~~then bright-olive to fuliginous in age.~~

Lamellae rounded adnate to adnexed, becoming free, at first yellow then ferruginous, sometimes the edges finely fimbriate, soft, at maturity more or less mucilaginous.

Stipe 4-10 cm long, 3-8 mm thick, sulfur-colored and ochraceous, becoming light brown in age, with numerous, small, yellow, floccose scales, dry, hollow, cylindrical, tapering above.

Notes by Hesler

Spores 10-13(15) x 6.5-8(9) μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, wall 0.5 μ thick, many somewhat truncate to distinctly so, red-brown in KOH. Basidia 16-24 x 10-14 μ , 2-4-spored. Pleurocystidia and cheilocystidia none. Gill trama of slender, undulating, subparallel hyphae. Pileus cuticle of irregularly shaped cells, with scattered pileocystidia which are more or less incrustated, surface sometimes with a thin gelatinous zone. Stipe cuticle of repent, dry hyphae. Clamp connections none.

Type CU-2355, leg. Atkinson, Ithaca, New York, Buffalo Street, May 25-June 1, 1898, on freshly manured grass plots. Murrill (1917:191) reports it from New York, New Jersey, and Virginia.

The gill-edges are usually fertile, and I found no cheilocystidia.

Note attached to herbarium sheet, signed by Roy Watling, April 14, 1965: "As this collection approaches closely that figured at the time of publication I have taken the material to represent the type."

cf. closely with B. flavellus.

BOLBITIUS VARIICOLOR Atkinson

Studies Amer. Fungi, p. 164. 1900

Mycena variicolor (Atk.) Murrill, North Amer. Flora 10191.
1917.

Illustration:

Atkinson, Stud. Amer. Fungi, fig. 158.

Pileus 2-4 cm broad, ovate to conic when young, then convex, expanded, finally the margin elevated, with a broad umbo, margin straight, finely striate one-half to two-thirds of the way to the center, colors variable: smoky to fuliginous, darker when young, olive and yellow, very viscid when young, in dry weather the surface sometimes cracks into patches, sometimes surface fibrils are drawn into strands which form reticulations which in general radiate from center. Context yellow, then bright-olive to fuliginous in age.

Lamellae rounded adnate to adnexed, becoming free, at first yellow then ferruginous, sometimes the edges finely fimbriate, soft, at maturity more or less mucilaginous.

Stipe 4-10 cm long, 3-8 mm thick, sulfur-colored and ochraceous, becoming light brown in age, with numerous, small, yellow, floccose scales, dry, hollow, cylindric, tapering above.

Notes by Hesler

Spores 10-13(15) x 6.5-8(9) μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, wall 0.5 μ thick, many somewhat truncate to distinctly so, red-brown in KOH. Basidia 16-24 x 10-14 μ , 2-4-spored. Pleurocystidia and cheilocystidia none. Gill trama of slender, undulating, subparallel hyphae. Pileus cuticle of irregularly shaped cells, with scattered pileocystidia which are more or less incrustated, surface sometimes with a thin gelatinous zone. Stipe cuticle of repent, dry hyphae. Clamp connections none.

Type CU-2355, leg. Atkinson, Ithaca, New York, Buffalo Street, May 25-June 1, 1898, on freshly manured grass plots. Murrill (1917:191) reports it from New York, New Jersey, and Virginia.

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BOLBITIUS VARIICOLOR Atkinson

Studies Amer. Fungi, p. 164. 1900

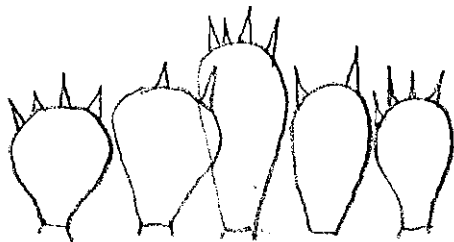
(N.A.F. 10:191)

"Pileus ovoid to conic when young, becoming convex, then expanded, and finally with a broad umbo, solitary, 2-4 cm. broad; surface very viscid when young, with the pellicle easily separable, smoky-olive to fuliginous, darker when young, becoming paler as the pileus expands, but always darker on the umbo, sometimes coarsely fibrillose-reticulate, margin finely striate; context yellow, becoming bright-olive to fuliginous with age; lamellae adnate to adnexed, becoming free, rounded behind, yellow, becoming ferruginous, sometimes finely fimbriate on the edges; spores ellipsoid, smooth, ferruginous, 10-15 x 6-8 μ ; stipe cylindric to terete, tapering above, hollow, clothed with numerous, small, yellow, floccose scales, sulfur-colored and ochraceous, becoming paler and even assuming a light-brown tint with age, 4-10 cm. long, 3-8 mm. thick."

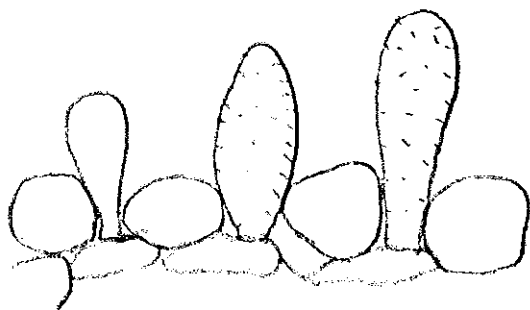
Habitat and Distribution. - On freshly manured grass plots, Virginia.

Bolbitus varicolor Atk.

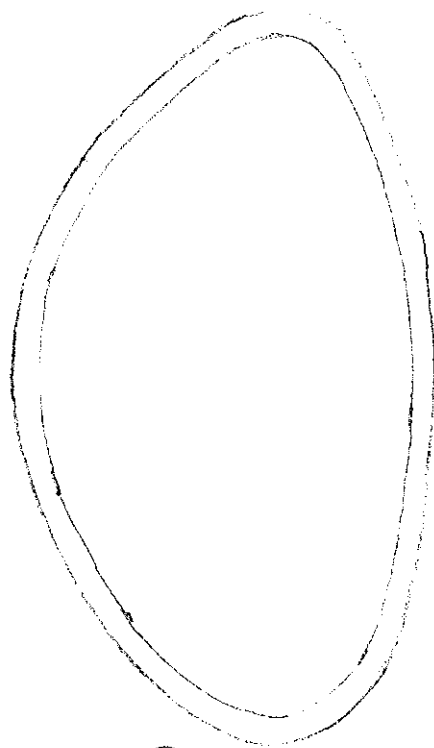
Fyfe



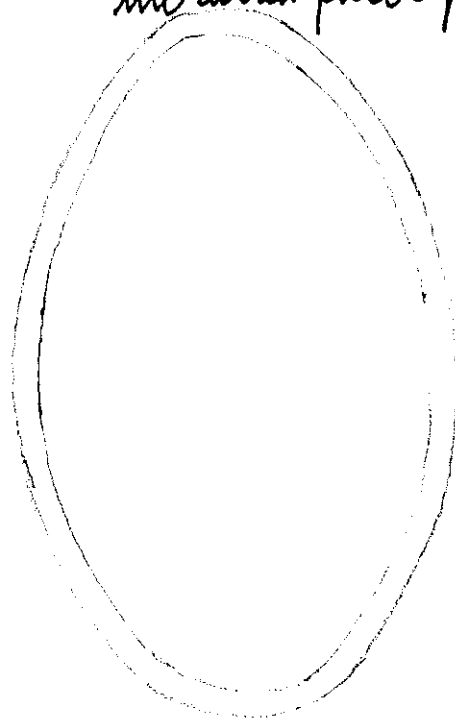
Perithecia $\times 1000$



Pileus cuticle +
incrusted pilocyptidia $\times 1000$



Profile



Face

Spores $\times 8000$

BOLBITIUS VERSICOLOR (Pk.) comb. nov.

Galera versicolor Pk., Torrey Bot. Club Bull. 24:143. 1897.

Pluteolus versicolor (Pk.) Murr., N. A. Flora 10:187. 1917.

Pileus 2.5-6.5 cm broad, convex or subcampanulate, whitish, pale-yellow or brownish tan, moist or slightly viscid, glabrous, margin striate. Context thin, fragile.

Lamellae white or pale yellow, becoming reddish-ferruginous, close.

Stipe 5-10 cm long, 2-4 mm thick, white, slightly mealy or pruinose, base often tomentose, equal, fragile, hollow.

Notes on Type (by Hesler)

Spores 10-15 x 6-10 μ , variable in size in same field, sometimes obscurely inequilateral, ellipsoid in face view, wall thick, truncate, brown in 2% KOH. Pleurocystidia 30-36 x 10-15 μ , more or less clavate, widely scattered, inconspicuous; cheilocystidia 20-27 x 8-11 μ , similar, rare. Pileus cuticle of irregularly vesiculose to sub-cuneiform cells, the surface bearing scattered pileocystidia, 25-75 x 7-18 μ , more or less clavate, many more or less capitate, conspicuous.

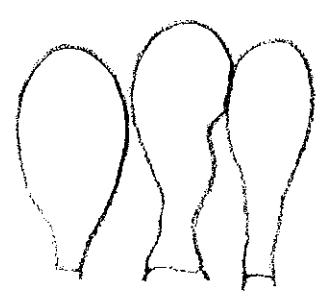
Type, leg. Williams, Brookings, South Dakota, spring and early summer, on manure and other decaying vegetable matter.

A note in the specimen box states: "Pluteolus luteus, W. A. M." Later (1917), Murrill transferred it to Pluteolus.

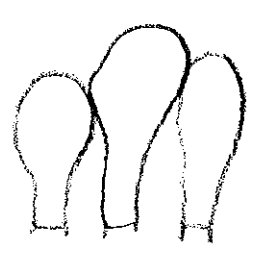
The material is difficult to section.

Galera versicolor GK.
~~Type~~ - *Bolbitius*

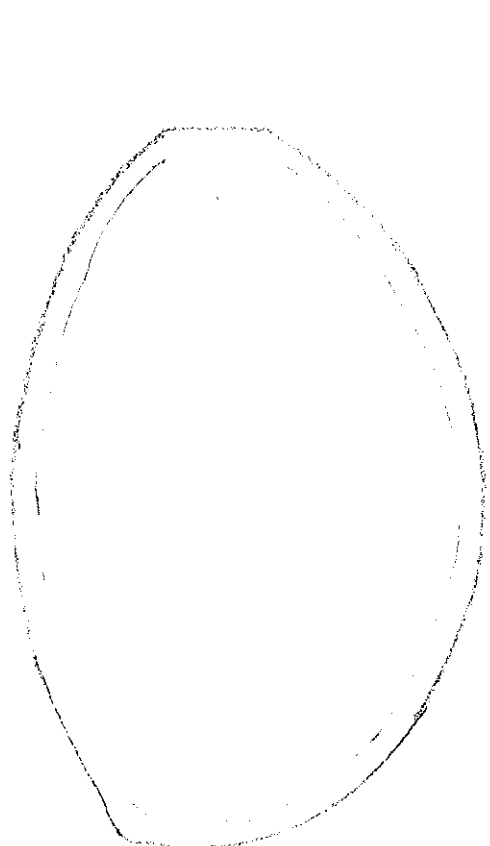
more



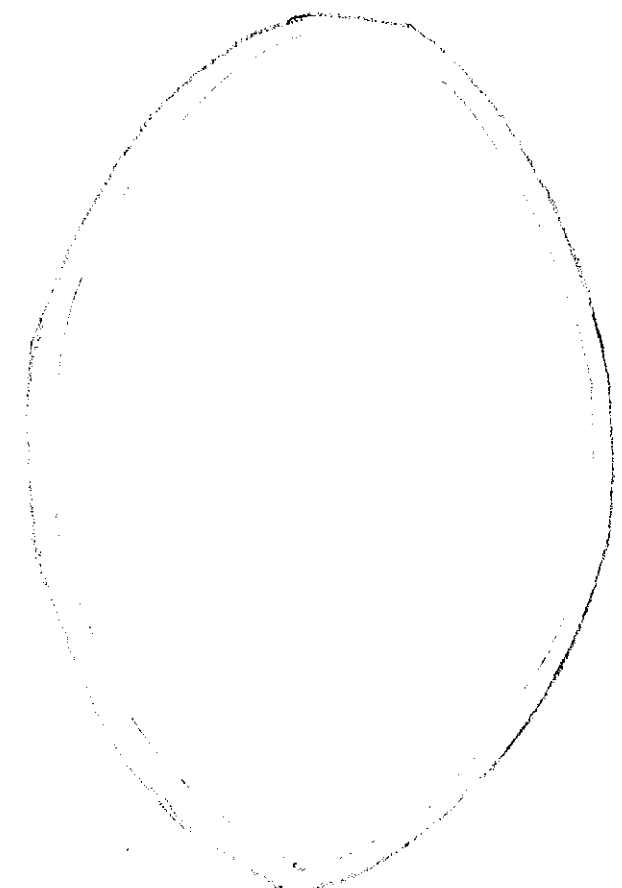
Pl x 1000



Ch x 1000



Profile

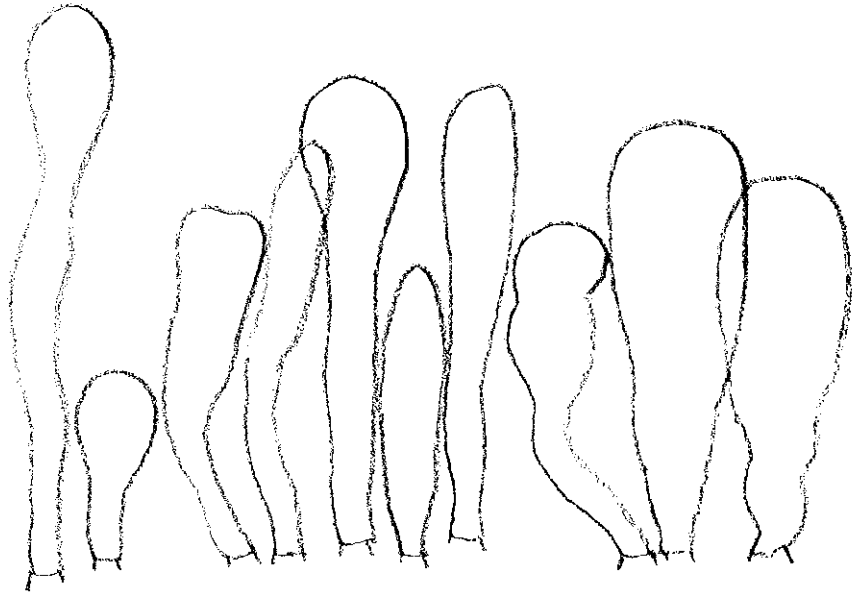


Face

Spores x 800

Galera versicolor PK.
Type

more



Pleocystidia x 1000

^{Pers. ex}
BOLBITIUS VITELLINUS (Fr.) Fr.

Epicr. Syst. Myc. p. 254. 1838

Bolbitius fragilis Fr. Epicr. Syst. Myc. p. 254. 1838

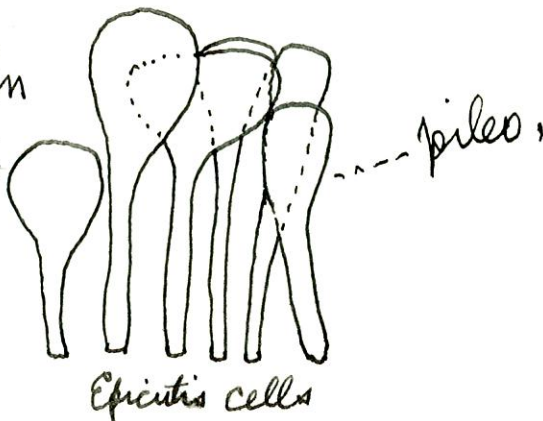
Pluteolus vitellinus Qué! Enchir. Fung. p. 104. 1886

Pileus 2-3 cm. broad, ovoid-conic when young, finally expanding, at first more or less umbonate, viscid, pale yellow, fading, glabrous, margin striate. Flesh thin, yellowish; odor and taste not distinctive. Lamellae narrowly adnate to nearly free, broader in front, yellowish becoming ochraceous-cinnamon, close, medium broad, thin, somewhat dissolving. Stipe 3-7 cm. x 3-4 mm., fragile, slightly tapering upward, pale yellowish, glabrous, hollow, base sub-bulbous.

Spores 10-15 x 7-9 μ , ellipsoid to subovoid, smooth, more or less truncate. Paraphysis 20-25 x 10-13 μ ; cheilocystidia saccate to pyriform, 17-33 x 17-30 μ . Basidia clavate to pyriform, 4-spored, 23-25 x 11-13 μ . Gill-trama of large, subparallel cells (hyphae). Epicutis of erect, clavate to pyriform cells, 25-53 x 12-20 μ .

Habitat and Distribution. - On compost, Tennessee and North Carolina, April.

See: Smith, Mushrooms in
their natural habitat,
p. 465. 1945. (Singer
says it is a good
account)



3831

BOLBITIUS

On lawn, Hesler's May 29, 1974

Pileus 1.5-2.5 cm broad, fragile, conic-campanulate, scarcely expanding, disc "light ochraceous buff," hygrophanous, viscid, elsewhere grayish-white (not matched), atomate, striate to disc. Context membranous; odor and taste mild.

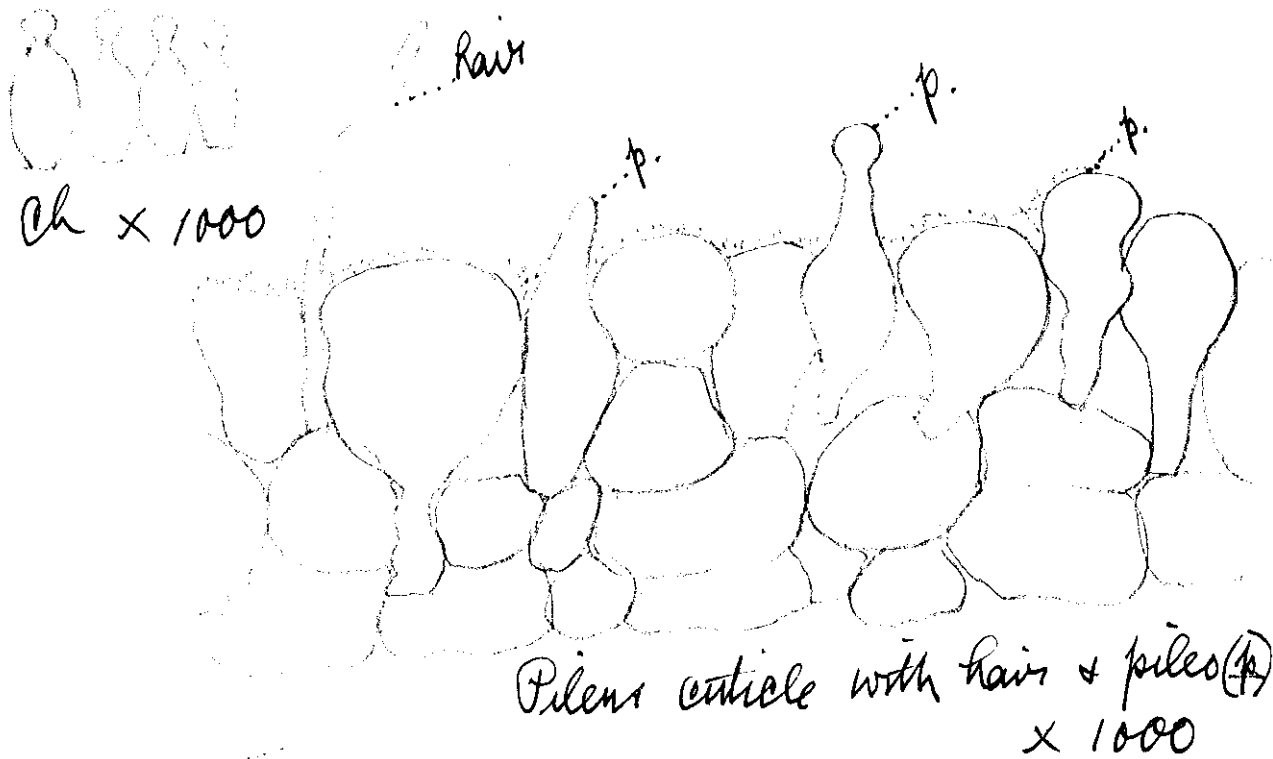
Lamellae narrowly attached or nearly free, ascending, brownish, narrow, nearly linear, close, soon flabby (deliquescent).

Stipe 5-9 cm long, 1.5-2.5 mm thick, white, dry, glabrous, equal, hollow, fragile.

Spores in deposit: "Brussels Brown" (when fresh and moist; no change when dried), 10.5-13 x 7.5-8.5 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, truncate, wall 0.3 μ thick, reddish brown in 2% KOH. Pleurocystidia none; cheilocystidia 16-20 x 5-8 μ , lecythiform, few. Pileus cuticle a zone of cuneiform to subglobose cells, 2-3 cells thick, at times with a thin gelatinous layer. Pileocystidia versiform; lecythiform, ventricose, clavate, or as hairs. Stipe cuticle of repent hyphae. Caulocystidia not found.

Polbitius

3831



Profile

Spores x 8000

Face

20410

CONOCYBE

On lawn, Timberlake Rd., Knox Co., May 30, 1952

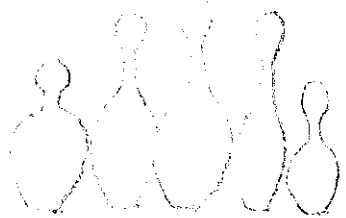
Pileus 12-16 mm broad, conic-campanulate (12-14 mm high), "tawny olive," disc darker, slightly viscid when wet, atomate, striate to disc. Context thin, fragile.

Lamellae narrowly adnate, ascending, medium narrow, "cinnamon buff," close, edges even.

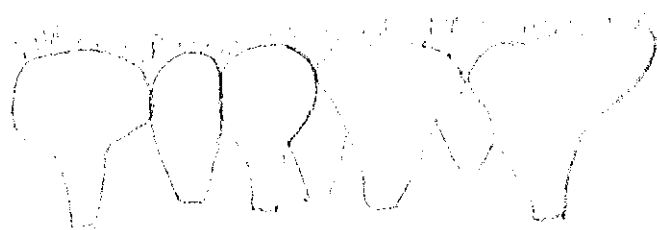
Stipe 4-6 cm long, 1.5-2 mm thick, white, fragile, apex pruinose, hollow, shining, easily splitting, equal or slightly tapering upward.

Spores color in deposit: "verona brown," 11-13(14) x 7-9(9.5) μ , slightly inequilateral in profile, ellipsoid to broadly so and often with a faint flatsidedness (scarcely ^{to sub-}rhomboid), smooth, truncate, reddish brown in 2% KOH. Basidia 22-25 x 10-13 μ , 1-2-spored. Pleurocystidia none; cheilocystidia 17-28 x 7-10 μ , head 4-5 μ broad, lecythiform. Gill trama a narrow zone, with slender, slightly interwoven hyphae. Pileus cuticle of cuneiform cells, with a thin but rather distinct gelatinous zone. Stipe cuticle of repent hyphae. Caulocystidia in frequent tufts or mounds, somewhat variable: clavate, ventricose and at times with a neck.

Conveybe *Hamulus*
20410

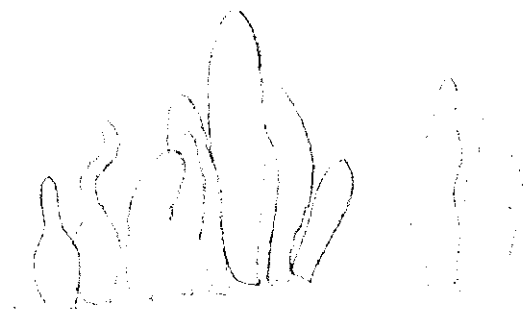


Ch x 1000

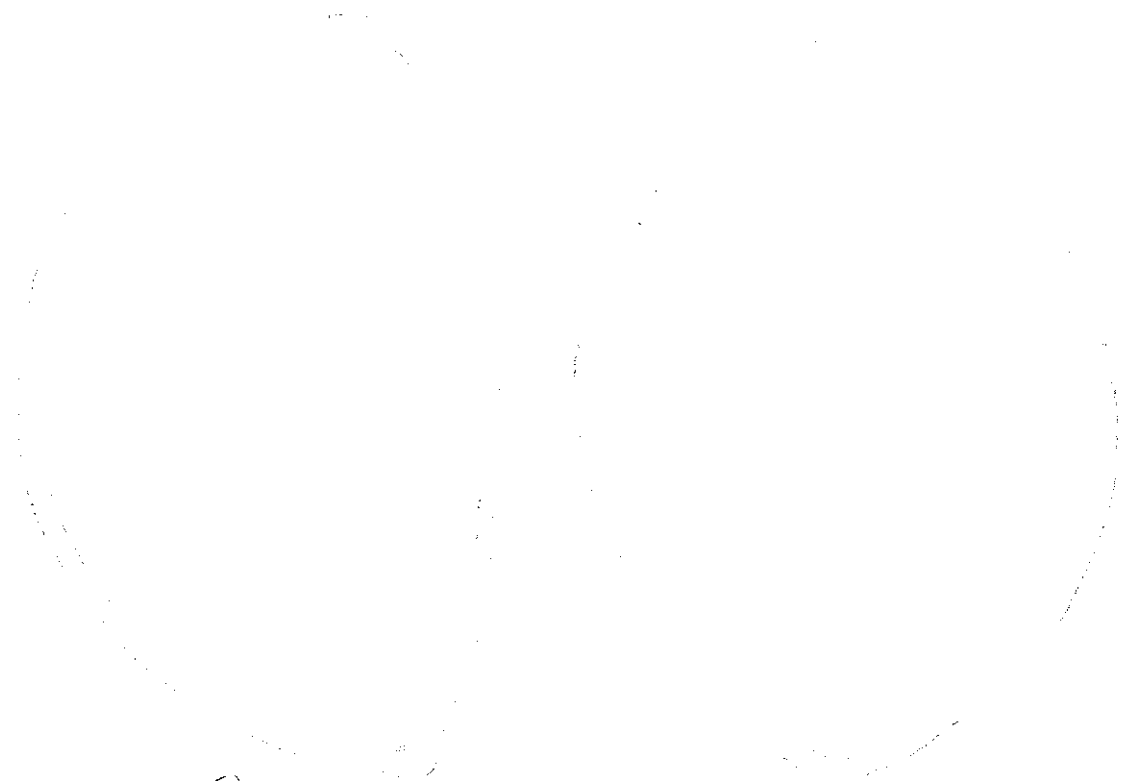


gelatinous zone

Pileus cuticle x 1000



Caulo x 1000



Profile

Spores x 8000

Face

20414

CONOCYBE

PHOTO

On lawn, Timberlake Rd., Knox Co., June 3, 1952

(same as 20410)

Pileus 10-18 mm broad, conic-campanulate, not expanding, "tawny olive," disc slightly darker, slightly viscid when wet, glabrous, striatulate to disc. Context thin.

Lamellae narrowly attached, ascending, brownish, narrow, close, occasionally slightly crisped.

Stipe 4-7 cm long, ^{1.5-2.5}~~0.4-0.6~~ mm thick, pallid to whitish, equal or tapering upward slightly.

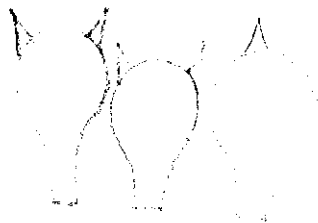
Spores 10.5-13 x 7.5-9(9.5) μ , slightly inequilateral in profile, ellipsoid to broadly so in face view, often with one or two flat-sided areas (~~scarcely~~) (scarcely rhomboid), smooth, truncate, reddish brown in 2% KOH. Basidia 20-23 x 10-13 μ , 1-2-spored. Pleurocystidia none; cheilocystidia 18-25 x 6-9 μ , lecythiform, very few found. Gill trama a narrow zone, hyphae slender, slightly interwoven. Pileus cuticle of cuneiform cells, mostly pushed out of position, with a very thin gelatinous zone. Stipe cuticle of repent hyphae, with mounds (tufts) of clavate to ventricose caulocystidia, 12-18 x 3-8 μ .

Same as 20410.

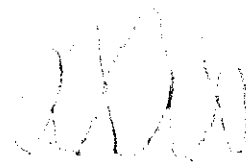
Conroybe *Bandia*
20414



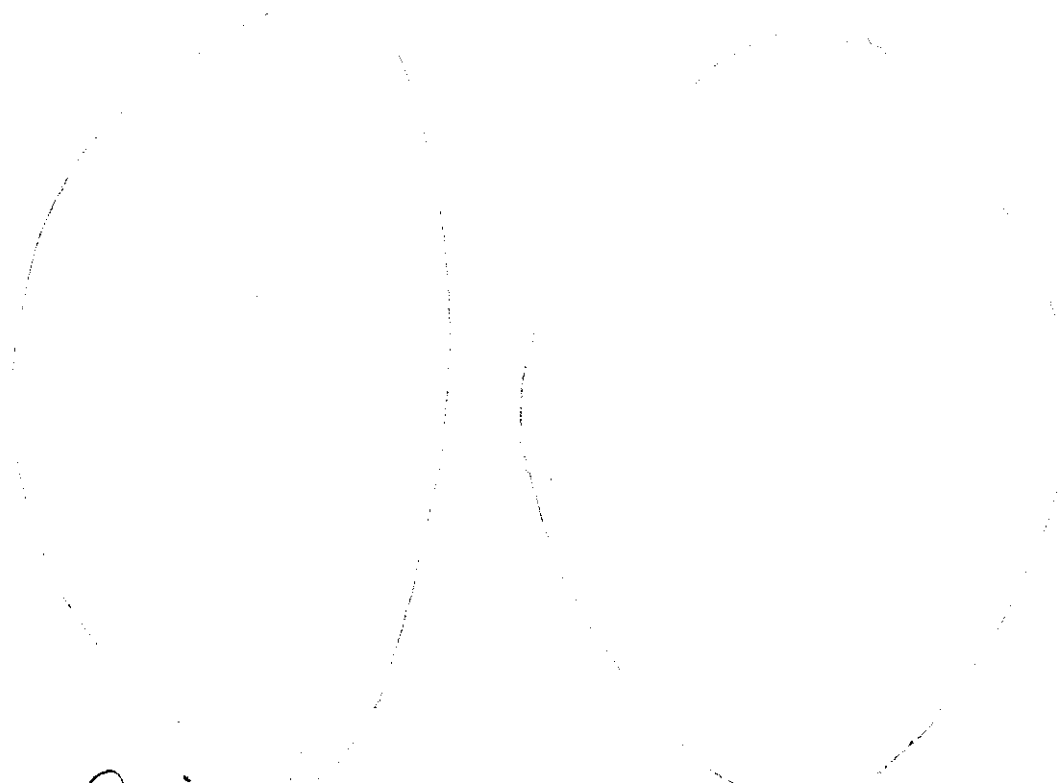
Ch x 1000



Bandia x 1000



Caulo x 1000



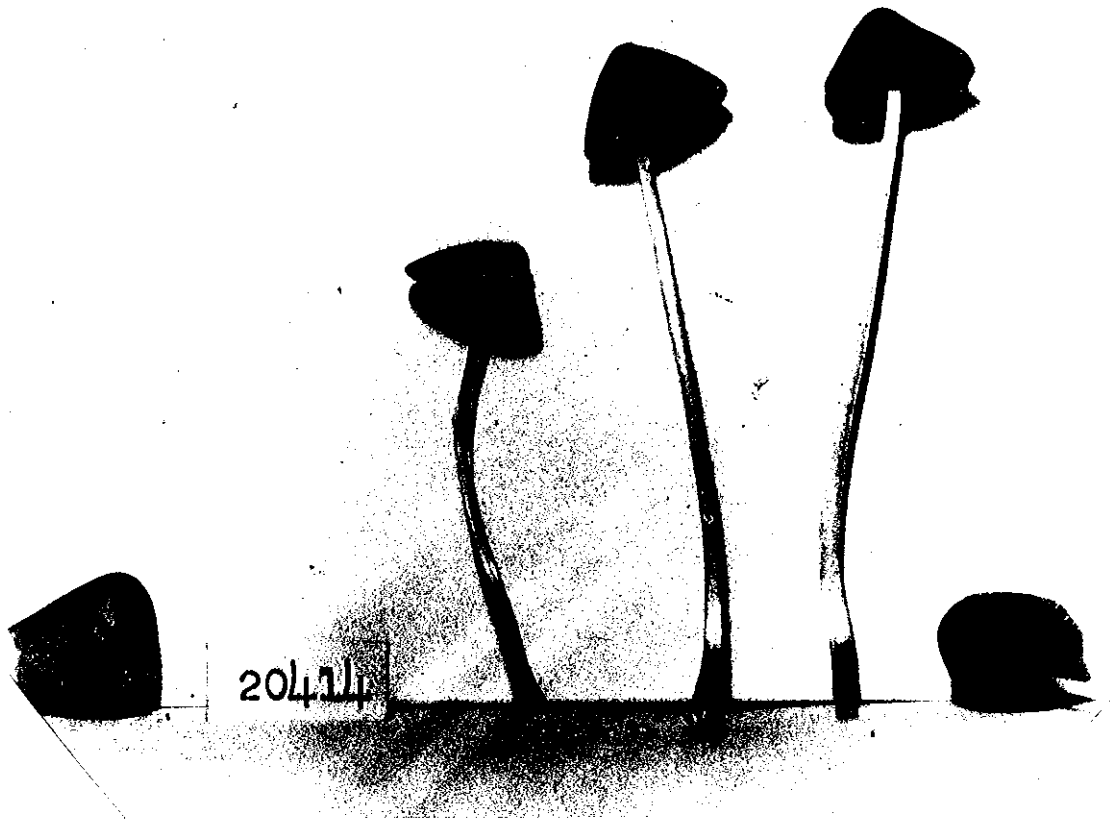
Profile

Spores x 8000

Face



~~Groenke~~ ~~Boletus~~
20414 - ~~Galera tenuis~~ Fr.



20414 — Conroy

[see a better negative, same number]

20858

CONOCYBE

PHOTO

On lawn, Timberlake Rd., Knox Co., June 14, 1953

Pileus 1-2 cm high, not expanding, 1-2.5 cm broad, "pale olive buff" to near "light buff," disc often "cream buff," glabrous, margin striatulate or, at times fissosulcate. Context very thin, delicate; odor and taste mild or none.

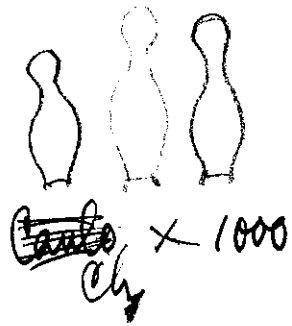
Lamellae narrowly adnate, somewhat seceding, narrow (up to 2 mm broad), linear, "buckthorn brown," edges even, soon softening and deliquescing somewhat.

Stipe 4-8 cm long, 1.5-2 mm thick, white, shining, striate, glabrous, flaccid, equal, hollow.

Spores in deposit: "buckthorn brown," 10.5-14 x (6.5) 7-9 μ , obscurely inequilateral in profile, ellipsoid to faintly rhomboid in face view, reddish brown or ferruginous in 2% KOH, smooth, with a germ-pore, sometimes more or less truncate, wall 0.3 μ thick. Basidia 25-27 x 10-12 μ , 2-4-spored. Pleurocystidia none; cheilocystidia ~~22x7~~¹⁸⁻²⁴ μ , 6-7 μ , lecythiform, rare (after a long search, only ~~one~~³ found). Gill trama a narrow zone. Pileus cuticle of cuneiform to subpyriform cells, becoming pushed out of position. Stipe cuticle of repent hyphae. Caulocystidia not found.

Conocybe

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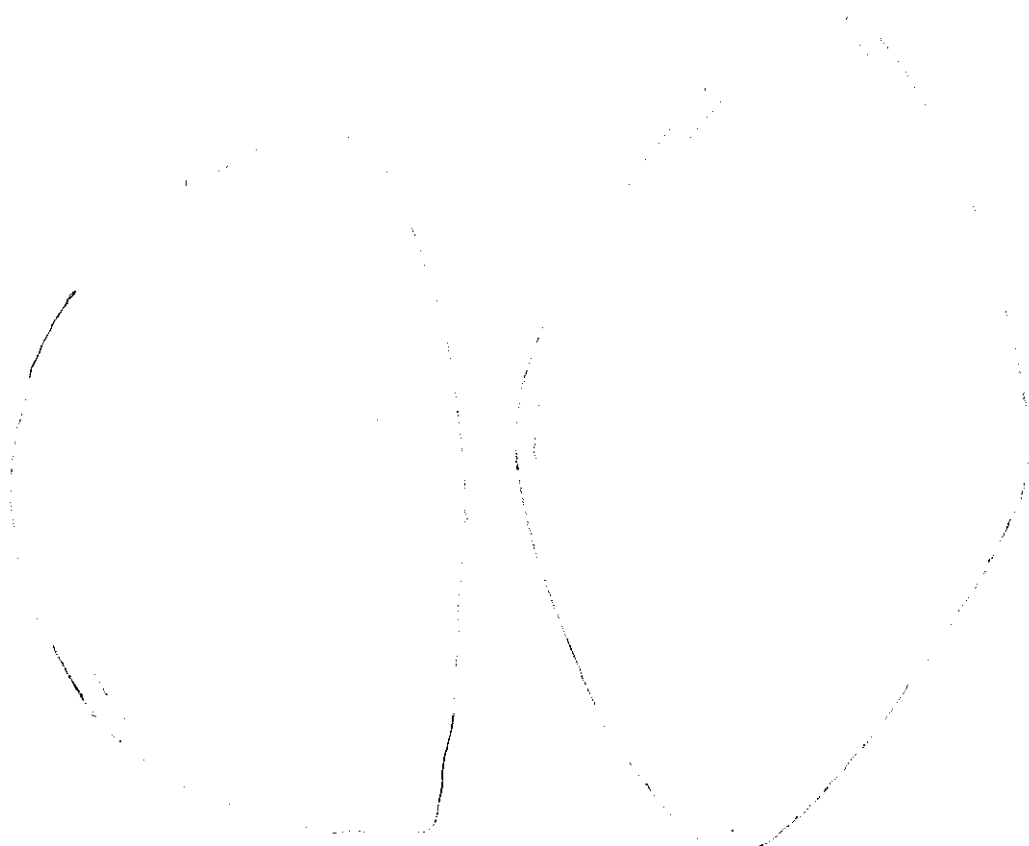
~~Spore~~ $\times 1000$
Ch



Basidia $\times 1000$



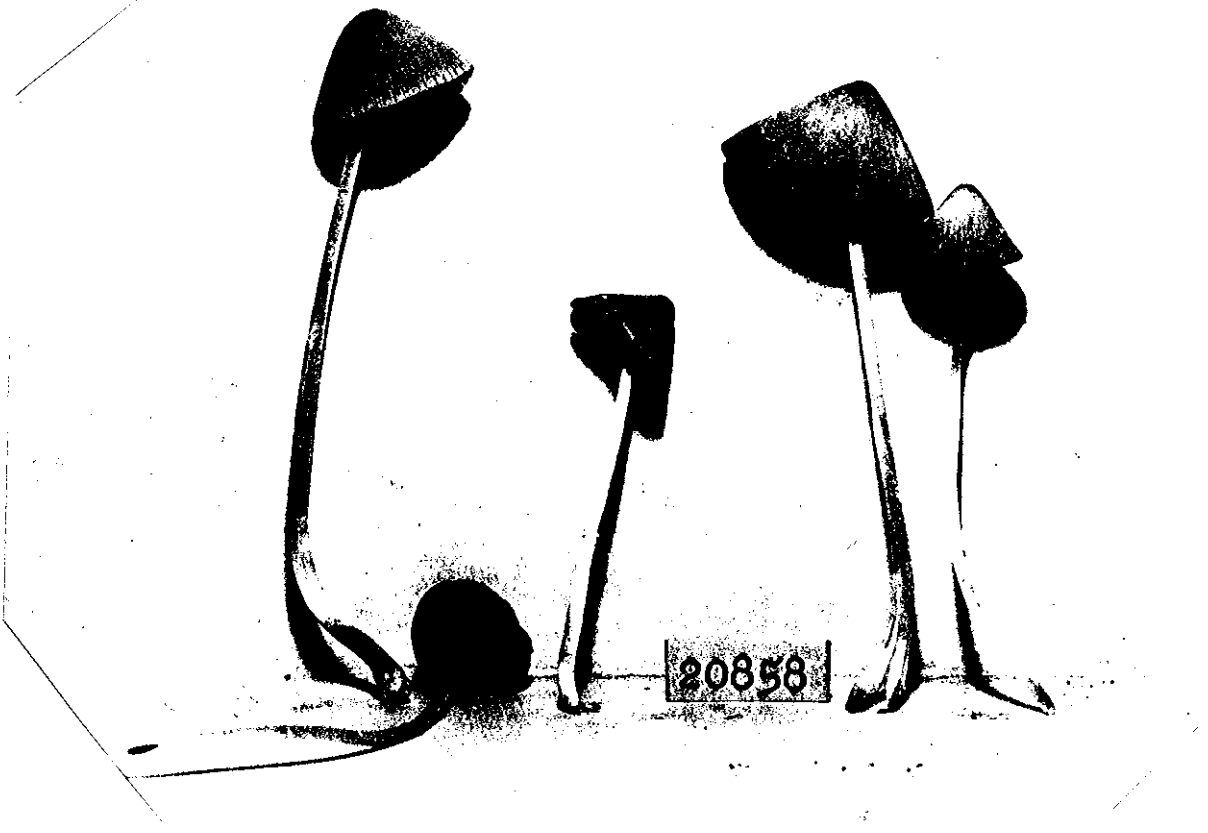
Pileus Cuticle $\times 1000$



Profile

Spore $\times 8000$

Face



20858 - *Conocybe*

21034

CONOCYBE

On lawn, Petersen's yard, Knoxville, May 23, 1974

Pileus 18-25 mm, conic-campanulate, hygrophanous, grayish-olive, disc yellowish-brown, atomate, minutely flocculose, striate to disc. Context membranous.

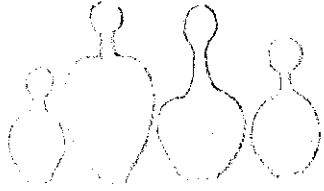
Lamellae nearly free, ascending, narrow, close, flabby, deliquescing somewhat.

Stipe 6-7 cm long, 1-2 mm thick, white, flabby, hollow, easily splitting, slightly tapering upwards, obscurely sub-bulbillate.

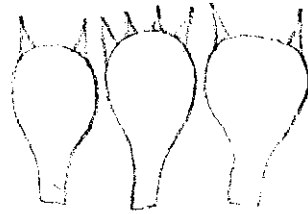
Spores 11-15 x 7.5-9 μ , slightly inequilateral in profile, ellipsoid to subovoid in face view, bright rusty-red-brown in 2% KOH, smooth, wall 0.7 μ thick, somewhat truncate. Basidia 24-28 x 10-14 μ , 2-4-spored. Pleurocystidia none; cheilocystidia 14-24 x 8-12 μ , lecythiform. Pileus cuticle of cuneiform to subovoid cells. Stipe cuticle of repent hyphae. Caulocystidia in tufts, 47-65 x 4-7 μ , subventricose, with more or less of a neck, often crooked or even coiled.

Conybe

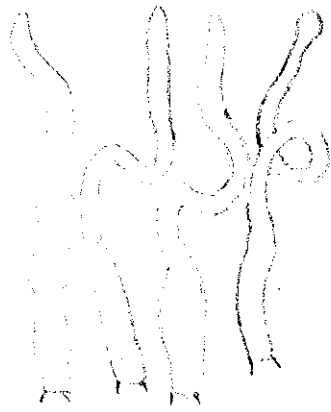
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ch x 1000



Basidia x 1000



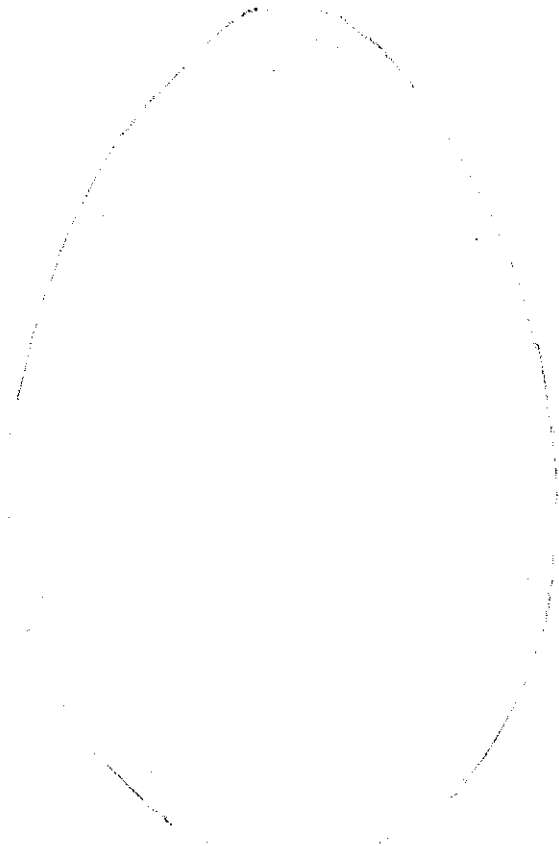
Conks (tuft) x 1000



Pileus cuticle - x 1000



Profile



Spores x 8000

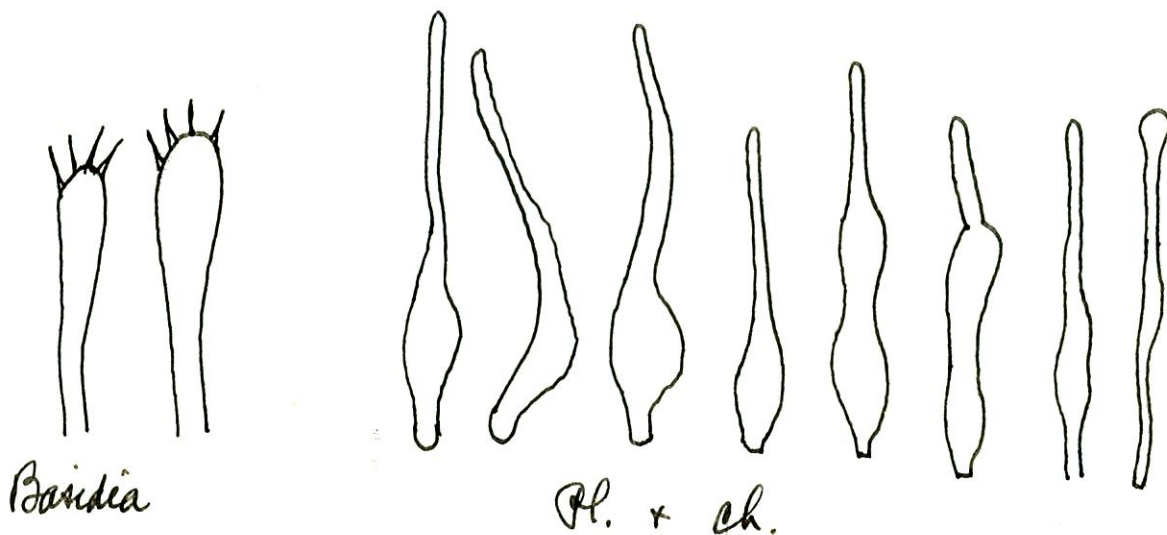
Face

BOLBITIUS No. 21367

Pileus 1.7-2.0 cm. broad, convex-expanded, hygrophanous, "light buff," disk "warm buff" (when dry), "ecru-olive" when wet, viscid (not glutinous), disk rugose, margin striate. Flesh thin, whitish, odor and taste mild. Lamellae narrowly attached, seceding, subdistant, rather broad, "sage brown," edges fimbriate. Stipe 2-3 cm. x 2-3 mm., fragile, dingy brown, silky, enlarged at apex, dry, hollow.

Spores 7-9 x 4-4.8 μ , subellipsoid to ovoid, pale brown (under 'scope), smooth. Basidia clavate, 22-26 x 4-6 μ . Epicutis of irregular cells. Pleurocystidia hair-shaped with a long slender neck or sub-ventricose, 35-50 x 2-3 μ ; cheilocystidia similar in shape and size.

Habitat and Distribution. - On soil and humus, deciduous woods, North Carolina, May.



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PLUTEOLUS

On soil and decaying wood, Pink Beds, North Carolina, leg.

Ron Petersen, Aug. 8, 1966

Pileus 13 mm broad, "buckthorn brown," umbonate, viscid, striate. Context thin.

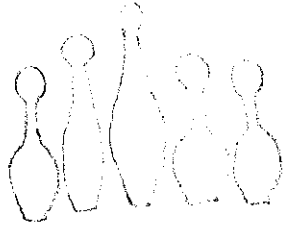
Lamellae attached, ventricose, spotted reddish-brown, lamellulae of 4-5 ranks.

Stipe 3.5 cm long, 1-1.5 mm thick, equal, pale brown.

Spores 6.5-8 x 4-4.5 μ , obscurely inequilateral in profile, ellipsoid in face view, smooth, germ-pore often visible, at times more or less truncate, yellowish brown in 2% KOH. Basidia 16-20 x 5-6 μ , 2-4-spored. Pleurocystidia none; cheilocystidia 18-26 x 5-8 μ , lecythiform, rarely the head obscurely developed. Pileus cuticle a layer of one to three colorless cells (epithelium), pyriform to irregular-shaped. Pileocystidia widely scattered, clavate, often with brown pigment.

Ruteolus

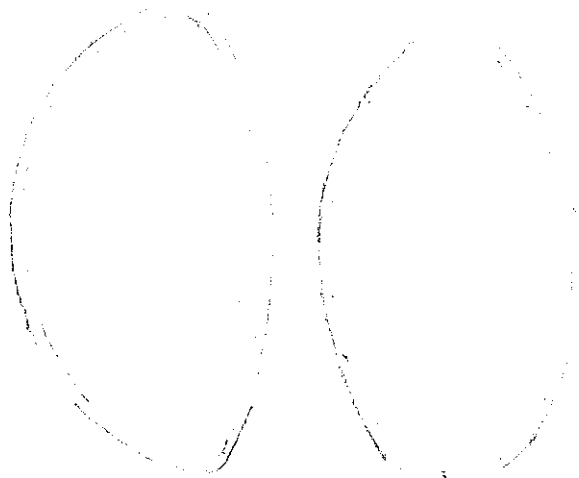
29284



Ch x 1000



Pileus Cuticle - x 1000
with pileo.



Profile

Face

Spores x 8000