



November 2013

## Lactarius Notebook 19

L. R. Hesler

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LACTARIUS HYSGINUS (Fr.) Fr. var. hysginus

Burlingham - 39, Aug. 6, 1908, in spruce woods, Vermont.

Spores 7-8 (8.5) x 5.5-6 (6.5)  $\mu$ , ellipsoid, warts 0.3-0.6  $\mu$  high, with a reticulum of broad bands and a few narrow bands and lines. Basidia 40-46 x 7-9  $\mu$ , 4-spored. Pleurocystidia 32-64 x 6-9  $\mu$ , ventricose, apices tapering or rather acute, often mucronate, granular, scattered; cheilocystidia 30-46 x 5-8  $\mu$ , similar, granular, scattered. Gill trama cellular. Pileus trama vesiculose. Cuticle a gelatinous zone, 100-180  $\mu$  thick. Caulocystidia 42-53 x 3-5  $\mu$ , filamentous, apices usually tapering, granular, scattered. Clamp connections none. Trama of gills and pileus pallid - yellowish in KOH, reddish brown in Melzer's reagent.

*Factorius hyginus*

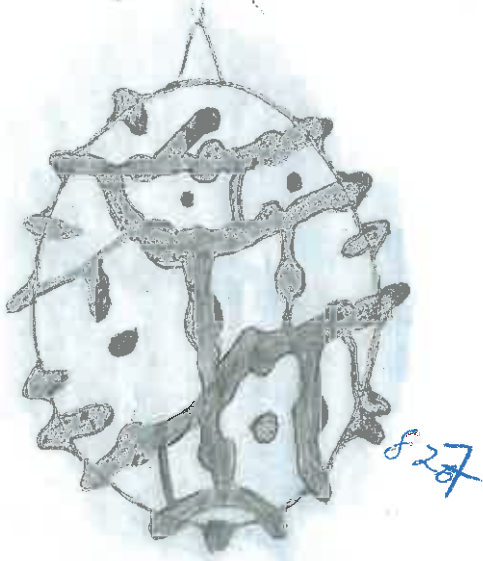
no. 39,  
Burlingham coll. N.Y. Bot. Gard., in spruce woods,  
Aug 6, 1908, Vermont (?)



Pl. - x 1000



Ch. - x 1000



Spore - x 8000



Caulo - x 1000

V. Waveren      LACTARIUS HYSGINUS (Fr. ex Fr.) Fr. (?)

On sandy soil, in mixed deciduous woods with scattered Pinus,  
Gelderland, Netherlands, August 6, 1960

Notes by V. Waveren (Transl. by Donk)

Cap 5 cm, irregularly funnel-shaped, pale flesh colour pinkish brown (Seguy 202 at center to S. 204 at margin), viscid, rugulose, not fibrillose, cuticle separable a long distance. Flesh whitish, somewhat elastic. Smell after sometime in box very typical, a mixture of a fruity smell and the smell of Hygrophorus cossus (aromatic). Latex white, very sharp.

Gills cream, crowded, narrow and thin, becoming slightly greenish-spotted.

Stalk 3.5 x 14 mm, more or less ventricose, hollow, pinkish cream, apex paler, somewhat viscid, smooth and glabrous.

Not agreeing well: the color of the gills and the smell. If the taste were not so incredibly sharp this could be pallidus.

Notes by Hesler

Spores 5.5-7.5 x 5-6  $\mu$ , warts 0.2-0.4  $\mu$ , rather coarse, bands and branches rather heavy, forming a partial reticulum. Pleurocystidia 44-57 x 4-6  $\mu$ , subventricose, widely scattered and inconspicuous; cheilocystidia 30-35 x 4-5  $\mu$ , subventricose, rare. Pileus cuticle an ixocutis; hypodermium scarcely distinct. Stipe cuticle a clear zone of subgelatinous hyphae (stipe "somewhat viscid"); rosettes present.

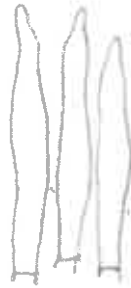
I also find it does not agree too well with L. hysginus: in this collection the pileus cuticle is only slightly gelatinous and it has very few and small pleurocystidia. The spores of the two agree rather well.

*Lactarius hypoginus?*

v. Waneren (Gelderland, Aug. 6, 1960)



Sp. x 1000



Ch. x 1000

Shaffer - 3574

LACTARIUS ~~XANTHOPHYLLIUS~~ *hysginus* sp. nov.

In spruce swamp, Newfane, Vermont, September 5, 1961

Notes by Shaffer

Pileus "chocolate," lighter and zonate on the glabrous margin, viscid.

Lamellae arcuate-adnate, stained "pecan brown."

Stipe spotted. Latex white, unchanging, acrid.

Notes by Hesler

Spores 6-8 x 5-6  $\mu$ , bands forming only a partial reticulum. Pleurocystidia 56-75 x 6-10  $\mu$ , fusoid-acuminate, numerous; cheilocystidia similar, smaller. Pileus cuticle an ixolattice to tangled ixocutis; hypodermium distinct. Stipe cuticle an ixocutis to ixolattice.

9221

LACTARIUS HYSGINUS

On soil, wet woods, Highlands, N. C., August 16, 1936

Spores 6.5-8 x 5.5-6.5  $\mu$ . Pileus cuticle a tangled ixocutis; hypodermium indistinct. Stipe cuticle a thin ixocutis. Clamp connections none.



12336

LACTARIUS HYSGINUS (Fr.) Fr. *var. hysginus*

Highlands, N. C., Coll. & det. - LRH; cf. A. H. Smith, Sept. 4, 1939

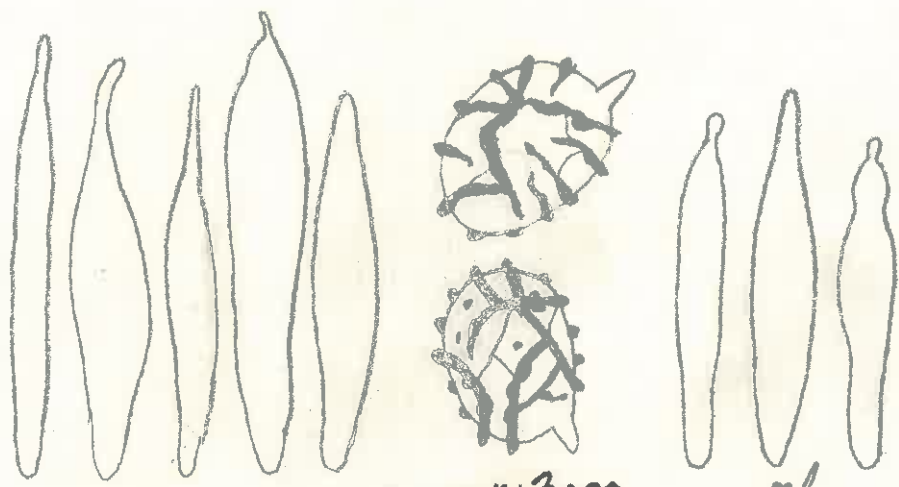
Pileus 2-8 cm broad, convex-umbilicate, finally upturned and deeply depressed, "Van Dyke brown" to "carob brown," disc darker, margin paler, glabrous, very viscid, faintly or not at all zonate, margin even, involute. Context whitish, reddish next to cuticle. Latex white, unchanging, acrid.

Lamellae adnate-subdecurrent, white, finally creamy-white, some forking behind (in some, extensive forking), close, rather narrow.

Stipe 2-5 cm long x 4-9 mm thick, (paler than pileus), at times reddish-brown spotted, glabrous, equal, viscid, brownish, finally hollow.

Spores whitish, 6.5-7.5(8) x 5.5-6.5(7)  $\mu$ , ellipsoid or subglobose, warts 0.2-0.3  $\mu$  high (some 0.4-0.6  $\mu$  high), bands and a few lines forming a partial reticulum. Basidia 38-52 x 7-10  $\mu$ , 4-spored. Pleurocystidia 50-62 x 5-11  $\mu$ , fusoid to clavate, apices more or less tapering, at times of pileus appendiculate; cheilocystidia similar, 42-50 x 6-8  $\mu$ . Pileus cuticle an ixocutis, 220-350  $\mu$  thick, the hyphae tangled or often mostly erect and forming a turf, at times branched, the apices usually slightly clavate-subcapitate, sparsely septate. Stipe cuticle a thin ixocutis, at times sloughed away before or during sectioning. Lactifers few. Clamp connections none.

*Saccarium hyosginus* Fr.  
No. 12336



Pl - x 1000

x 3000

Ch - x 1000



Pilus : *Syotrichodermium* - x 1000

12843

LACTARIUS HYSGINUS

On soil, Mt. LeConte, August 25, 1940

Spores 6.5-8 x 5.5-7  $\mu$ . Pleurocystidia 48-65 x 7-10  $\mu$ . Pileus cuticle an ixocutis, hyphae often tangled.

14676

LACTARIUS HYSGINUS

Highlands, N. C., Aug. 30, 1942

Spores 6-8 x 5.5-7  $\mu$ . Pleurocystidia 50-74 x 6-11  $\mu$ ;  
cheilocystidia 38-50 x 4-6  $\mu$ . Otherwise as in Tenn-12336.

16442

LACTARIUS HYSGINUS

Highlands, N. C., September 2, 1944.

Spores 6-8 x 5.5-6.5  $\mu$ . Pileus cuticle gelatinous, an ixocutis, 120-200  $\mu$  thick. Stipe cuticle a thin ixocutis, at times sloughs away when sectioning (if not before).

22035

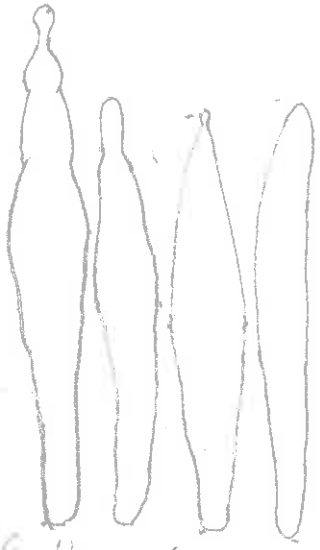
LACTARIUS HYSGINUS

On soil, in pine planting, Mt. Mitchell, N. C., July 26, 1955.

Spores 6-7.5 x 5.5-6.5  $\mu$ . Pleurocystidia 54-68 x 6-11  $\mu$ ; cheilocystidia 30-45 x 4-7  $\mu$  (see drawings). Pileus cuticle an ixocutis, hyphae more or less interwoven. Stipe cuticle a thin ixocutis, often sloughing away in sectioning (or before).

*Act. hypogina*

Term - 27035



68-11  
56-8  
55-10  
50-10

Pl - x 1000



Ch - x 1000

Sm - 32944

*Hyginius v. hyginius*  
LACTARIUS ~~BRUNNEODISCUS~~ sp. nov.

Gregarious in mixed woods, Mackinaw City, Michigan, August 7, 1949

Notes by Smith

Pileus 3-7 cm broad, depressed with an arched margin, becoming shallowly vase-shaped, "pinkish buff" on margin, disc near "Verona brown," elsewhere various shades of pinkish cinnamon, glabrous, viscid, subzonate. Context pallid, rather soft, lax, very quickly and sharply acrid. Latex scanty, white, unchanging, not staining, taste sharply acrid.

Lamellae short-decurrent, "light buff" to "cartridge buff," crowded, narrow, edges slightly eroded, not spotted.

Stipe 3-4 cm long, 10-15 mm thick, "pale pinkish cinnamon," equal, glabrous, lubricous to slightly viscid at first, with pale, obscure spots.

Spores "cartridge buff" in deposit, 6-7.5  $\mu$ , globose varying to subglobose, reticulate or reticulum broken, lines heavy. Basidia four-spored. Pleurocystidia 40-60 x 8-13  $\mu$ , fusoid to fusoid-ventricose, pointed, many with granular content; cheilocystidia similar to pleurocystidia but smaller. Cuticle of pileus a thick gelatinous pellicle formed by a turf of narrow (2-3  $\mu$ ), hyaline, branched hyphal filaments.

OBSERVATIONS: The colors, viscid pileus with its turf-like type of cuticle, yellow gills and globose spores are distinctive.

Notes by Hesler

Spores in deposit "cartridge buff," (5.5)6-7.5 x (4.5)5.5-7  $\mu$ ,

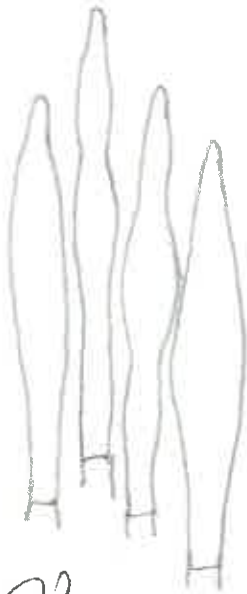


Sm-32944

*hysginus* var. *hysginus*  
L. ~~brunneodiscus~~ - page 2

globose, subglobose, or broadly ellipsoid, warts 0.2-0.4  $\mu$  high, bands forming a partial or no reticulum. Basidia 43-48 x 7-8  $\mu$ , 4-spored. Pleurocystidia 52-60 x 5-10  $\mu$ , ventricose, scattered; cheilocystidia 30-34 x 4-6  $\mu$ , similar rare. Gill trama of undulating, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle an ixocutis, hyphae interwoven; hypodermium brown. Stipe cuticle an ixocutis; hypodermium brown; rosettes none. Clamp connections none.

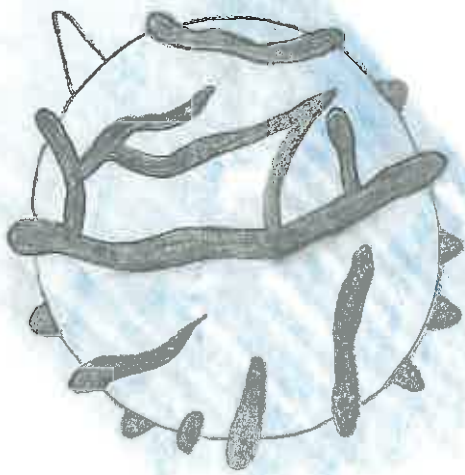
*Raetarium brunneodiscus* sp. nov.  
*hygginus* var. *hygginus*  
Sm-32944



Pl. x 1000



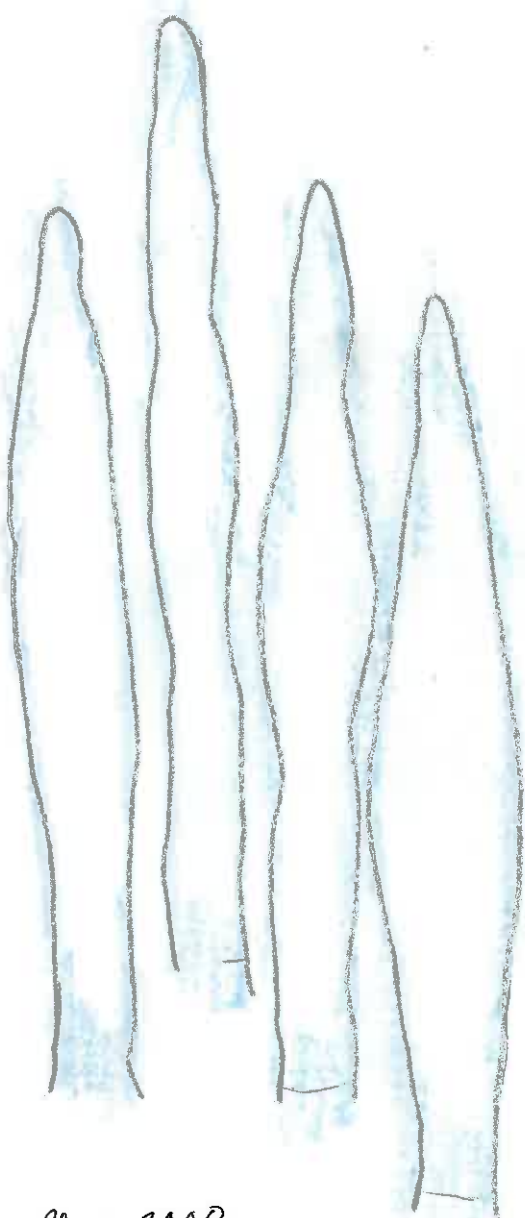
Ch. x 1000



Spore - x 8000

Lactarius

~~hymenodiscus~~ sp. nov.  
hysginus var. hysginus  
Sm - 32944



Pl-x 2000

830



830

Ch - x 2000

(Tenn - 35314)  
Bigelow - 7487

*Lactarius hypoginus* var. *hypoginus*  
LACTARIUS AURANTIOPITELLUS sp. nov.

Leverett, Franklin Co., Massachusetts, August 14, 1958

Notes by Bigelow

Pileus 3.5-5 cm broad, plano-convex, depressed, "vinaceous brown," viscid, zonate, glabrous, margin even. Context pallid, soapy-acrid. Latex white, unchanging, not staining, acrid.

Lamellae adnate, yellowish-orange, close, narrow.

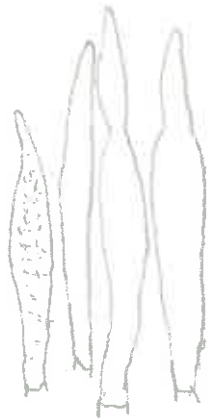
Stipe 2-3 cm long, 9-12 mm thick, concolorous with pileus but paler, viscid, glabrous, solid, spotted.

Notes by Hesler

Spores 6.5-8 x 5-6  $\mu$ , warts 0.2-0.4  $\mu$  high, bands and branches forming a partial or no reticulum. Basidia 40-44 x 7-8  $\mu$ , 4-spored. Pleurocystidia 37-52 x 4-7  $\mu$ , fusoid or subfusoid, at times constricted; cheilocystidia 27-37 x 3-5  $\mu$ , similar. Gill trama of narrow, subparallel hyphae. Pileus trama more or less vesiculose. Pileus cuticle an ixocutis of interwoven to subparallel, gelatinous hyphae. Stipe cuticle a thin ixocutis; rosettes present, inconspicuous. Clamp connections none.

*Paetarius aurantophyllus* sp. nov.

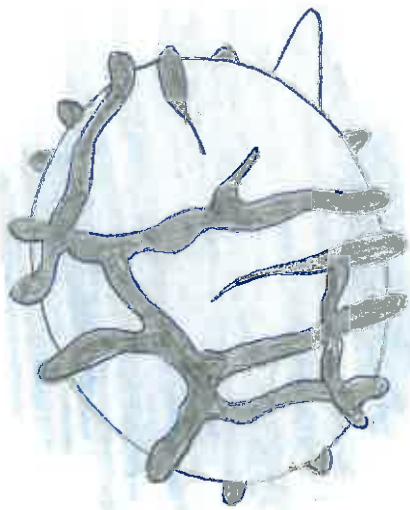
Bigelow - 7487 *hygginus*



Pl. - x 1000



ch. - x 1000



954

Spore - x 3000

Tenn - 35349  
Bigelow - 14166

*Hyoginrus var. hyoginrus*  
LACTARIUS ~~ATROBRUNNEUS~~ sp. nov.

PHOTO

Gregarious in mixed woods, Washington Co., Vermont, September 21, 1964

Notes by Bigelow

Pileus 2-5 cm broad, convex, at first with incurved and narrowly inrolled margin, becoming broadly convex, finally plane with margin narrowly decurved, disc shallowly depressed, dark reddish brown, "burnt umber" young, paler in age then "cane brown" to "walnut brown," margin edge whitish when young; outline irregular at times, not striate, radiate fibrillose beneath viscid surface. Context thin, firm, "pale orange yellow;" odor none, taste acrid. Latex white, not staining, but dregs drying creamy.

Lamellae adnate to subdecurrent, "pale orange yellow," close, narrow, frequently forked near base, edges even.

Stipe 1.3-3.4 cm long, apex 6-14 mm thick, "light pinkish cinnamon," base tapered strongly into soil, more or less equal above, viscid, hollow, surface rather hoary and often with a few small spots.

Notes by Hesler

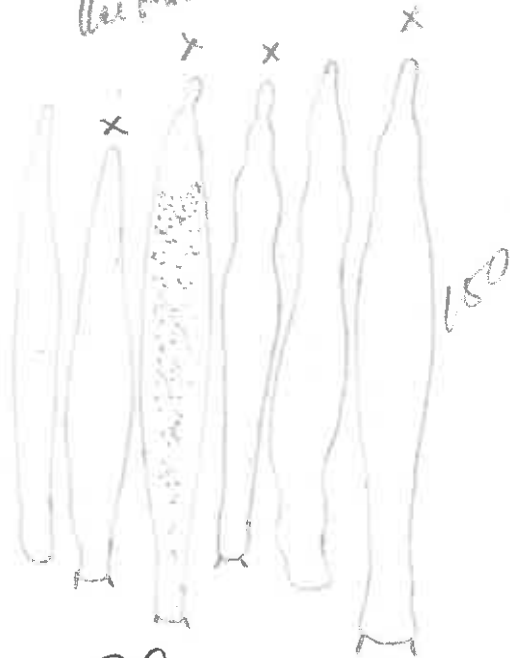
Sporoes 7-8.5 x (5)5.5-7  $\mu$ , ellipsoid to subglobose, with bands and free branches, forming a partial or no reticulum. Basidia 43-52 x 9-11  $\mu$ , 4-spored. Pleurocystidia 57-76 x 7-10  $\mu$ , ventricose; cheilocystidia 42-50 x 5-8  $\mu$ , similar. Gill trama of undulating, subparallel, short-celled hyphae. Pileus trama vesiculose; rosettes below. Pileus cuticle an ixotrichodermium; hypodermium obscure. Stipe cuticle a thin ixocutis; rosettes present. Clamp connections none.

The dark red brown pileus, the short stipe, and the ixotrichodermium of the pileus are distinctive characters.

*Factarium atrovirens* sp. nov.

Bigelow - 14166 *hyginus* var. *hyginus*  
(Tenn - 35349)

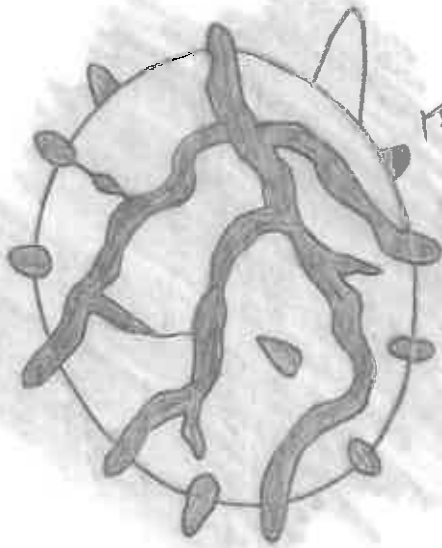
Use these marked



Pl. - x 1000



Ch. - x 1000



Spore - x 8000

Tenn-35693

Bas-2775

LACTARIUS HYSGINUS (Fr. ex Fr.) Fr.

Near Augsburg, Bavaria, Germany, October 2, 1963

Notes by Bas (Transl. by Donk)

Cap up to 7 cm, irregularly convex with incurved irregular margin and depressed center, viscid, strongly shining, strongly but minutely radially rugulose, faded red brown in center, foxy-isabelle at margin. Context white but tinted yellow-brown; odor faint, slightly fruity; taste soon very sharp.

Gills cream with a slight pink tinge, crowded, edges strongly dentate.

Stipe 50 x 10 mm, faded isabella-brown at the top, pale isabella at base, hollow.

Notes by Hesler

Spores 6-8.5 x 6-7(7.5)  $\mu$ , warts 0.2-0.5  $\mu$ , bands somewhat fragments, at times forming a complete but usually a partial reticulum. Pleurocystidia 50-63 x 5-8  $\mu$ , subventricose, rare and more or less buried; cheilocystidia 18-33 x 3-5  $\mu$ , subventricose-acuminate. Gill trama of irregularly-shaped cells. Pileus cuticle an ixocutis, hyphae loosely interwoven; hypodermium obscure. Stipe cuticle of repent hyphae, the outermost usually gelatinous--an ixocutis; rosettes present. Clamps none.



Sm-38733

LACTARIUS *hysginus* ~~SUBHYSGINUS~~ sp. nov. - ~~TYPE~~ PHOTO

Scattered under alder, Tahquamenon, Michigan, September 13, 1951

Notes by Smith

(Smith says: near mutabilis, but not that. cf. hysginus.)

Pileus 4-12 cm broad, convex-depressed with a spreading margin, disc between "walnut brown" and "verona brown," margin "fawn color" to "vinaceous buff," gradually duller, glabrous, viscid, surface smooth to rugulose, zonate, zones alternating light and dark near margin, becoming obscure. Context pallid, not changing color; odor faintly fragrant, taste acrid. Latex white (milky) unchanging, not staining gills, acrid.

Gills subdecurrent, more or less "cinnamon buff" to "pinkish cinnamon," close, narrow to broad, not staining the gills, forked near base.

Stipe 3-8 cm long, 1-2 cm thick, more or less concolorous with cap or base more tawny-cinnamon, viscid at first, soon dry.

Spores "pinkish buff" in deposit.

Notes by Hesler

Spores in deposit "pinkish buff," (5.5)6-9 x 5.5-7.5  $\mu$ , ellipsoid to subglobose, warts 0.3-0.6  $\mu$  high, bands forming a partial reticulum. Pleurocystidia 44-60 x 5-8  $\mu$ , sub-cylindric, at times mucronate; cheilocystidia 28-35 x 3-5  $\mu$ , similar. Pileus cuticle an ixocutis; hypodermium brown.

Sm-38733

L. ~~sub~~hysginus ~~sp. nov.~~ 2

Stipe cuticle an ixocutis.

This is subhysginus, despite its zones (which fade), rather than hysginus because of its gill color, and spore color (in deposit) and ornamentation.

Sm-41778

LACTARIUS HYGIEIUS

Tahquamenon, August 3, 1953.

Notes by Smith

Pileus disc purplish fuscous, margin pinkish buff, viscid.  
Context acrid; latex white, unchanging, acrid.

Lamellae vinaceous buff.

Stipe viscid, more or less vinaceous buff.

Spores white in mass.

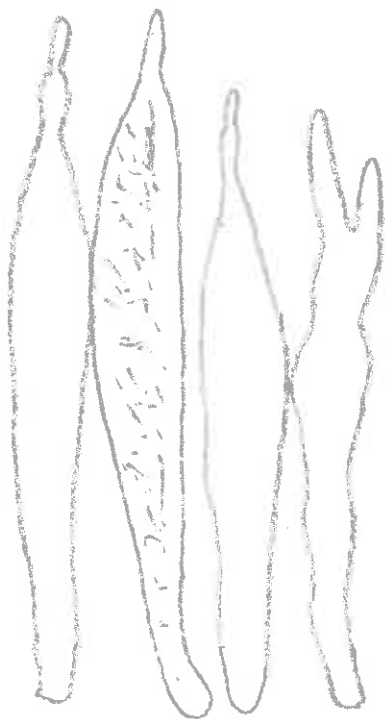
Notes by Hesler

Spores 7-8.5 x 6-7.5(8)  $\mu$ , warts 0.2-0.4  $\mu$  high, bands forming a partial reticulum. Pleurocystidia 70-92 x 10-12  $\mu$ , clavate acuminate, granular-spangled, rarely forked; cheilocystidia 32-46 x 6-7  $\mu$ , ventricose-acuminate. Gill trama of narrow slightly interwoven hyphae. Pileus trama vesiculose. Pileus cuticle an ixotrichodermium, with a distinct brownish hypodermium; no rosettes. Stipe cuticle an ixocutis; hypodermium none; cortex with scattered rosettes, and vesiculose cells. Clamp connections none.

My 16442 also has a margin paler than in most other collections.

*Factarium lysginus*

Sm-41778



Pl - x 1000



Ch - x 1000

Sm-57646

LACTARIUS ~~HYSGINUS~~ sp. nov.

Tahquamenon, Michigan, August 27, 1956

Notes by Smith

Pileus 2.5 cm broad, depressed, bay-red shining, disc darker, viscid, even. Latex white, unchanging, mild then slowly acrid, not staining.  
4 <sup>Panellae</sup> ~~Gills~~ pinkish cinnamon, not staining, close, narrow. 4 Stipe 3 cm long, 4 mm thick, reddish brown, scrobiculate, hollow.

"  
Spores pale pinkish buff <sup>in deposit</sup>.

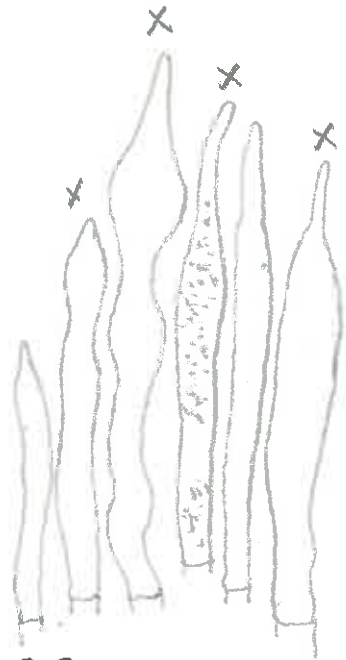
Notes by Hesler

Spores 6-9 ~~μ~~ x 5.5-7 μ, warts 0.2-0.5 μ high, bands with free-ending branches, not forming a reticulum. Basidia 38-44 x 7-8 μ, 4-spored. Pleurocystidia 38-73 x 4-10 μ, subcylindric, often constricted, granular; cheilocystidia 25-32 x 3-4 μ, similar. Gill trama subparallel. Pileus <sup>rosette ixocutis with some ± erect hyphae;</sup> cuticle an ~~ixocutis~~ hypoderm brown. Stipe cuticle an ixocutis, with scattered small tufts of caulocystidia; hypoderm brown; rosettes present ~~in gills~~. Clamps none.

Near L. hysginus, in which the gills become yellowish, and the spore-ornamentation is more of a reticulum.

*Actinurus rhyssinus* sp. nov.

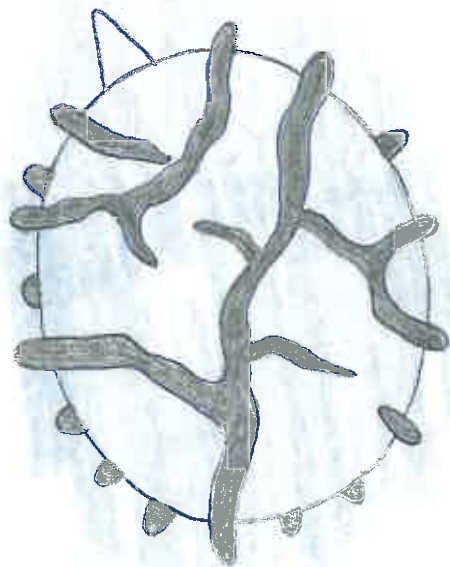
SM-57646



Pl. x 1000



Ch. x 1000



862

Spore - x 8000

*Lycoginus* (Fr.) Fr.

Sm-62038

LACTARIUS ~~POLITUS~~ sp. nov.

Porcupine Mts. Park, October 8, 1958 (~~near mutabilis~~)

Notes by Smith (supplemented)

Pileus 3-6 cm broad, brownish, marginal area pallid, viscid, azonate, shining-polished when dry, glabrous, margin thin, taste slowly acrid. Latex white, unchanging, taste slowly acrid.

Lamellae adnate-subdecurrent, pale cream, close, medium broad, lamellulae present.

Stipe 3-4.5 cm long, 6-8 mm thick, grayish brown, viscid, hollow, equal.

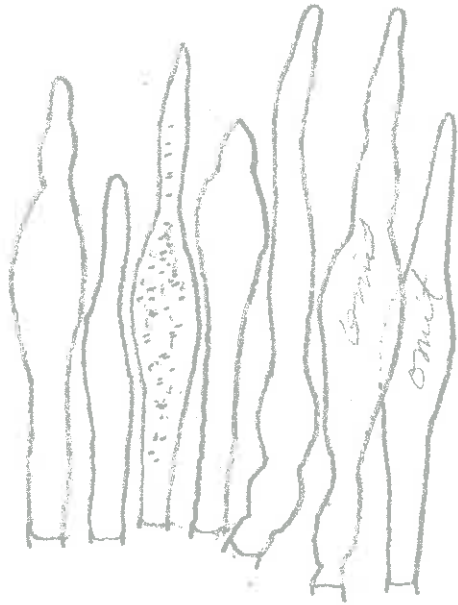
Spore deposit: "pinkish buff."

Notes by Hesler

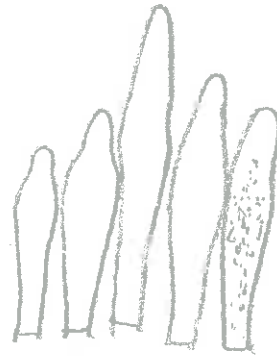
Spores "pinkish buff" in deposit, 6.5-8.5 x 5.5-6  $\mu$ , warts 0.2-0.4  $\mu$  high, bands and branches forming a partial reticulum. Basidia 36-40 x 7-8  $\mu$ , 4-spored. Pleurocystidia 48-76 x 6-12  $\mu$ , ventricose, apices more or less tapering, at times constricted near base or apex; cheilocystidia 24-42 x 5-7  $\mu$ , subventricose. Gill trama of irregular cells. Pileus trama vesiculose. Pileus cuticle an ixocutis; hypodermium brown. Stipe cuticle a narrow ixocutis, at times obscure; rosettes present. Clamp connections none.

This is characterized by its highly polished pileus (when dried), the central portion dull reddish brown, the marginal portion grayish, the rather distinctive ventricose pleurocystidia.

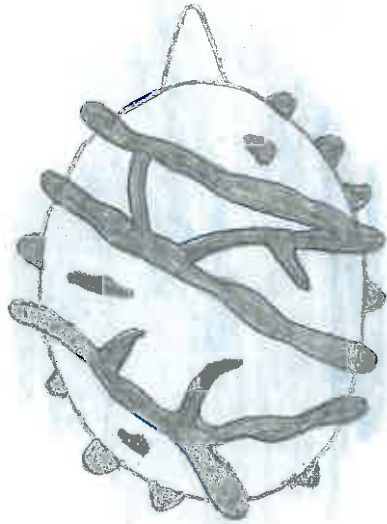
*Pantanus politus* sp. nov. *hyginus*  
Sm - 62038



Pl - x 1000



Ch - x 1000



800  
290

Spore -  
x 8000



Sm-66187

*hysginus* var *hysginus*  
LACTARIUS ~~ATRONUBESUS~~ sp. nov.

Solitary under conifers, Upper Payette Lakes, Idaho, leg. N. J. Smith,  
August 25, 1962 (near hysginus)

Notes by Smith

Pileus 7 cm broad, plano-depressed, surface viscid, shining when dry, disc "dark livid brown," toward the margin "light brownish vinaceous," and at the margin "light greyish vinaceous," the surface appearing more or less streaked and spotted beneath the viscid layer. Context pallid buff, hard but brittle; odor none, taste quickly and very acrid,  $\text{FeSO}_4$  - pinkish buff. Latex creamy white, unchanging, not staining.

Lamellae adnate pale yellow, very narrow, close to crowded, not spotted, very intervenose.

Stipe 8 cm long, 15 mm at apex, surface paler than pileus and with conspicuous darker watery spots, subfusoid, apex slightly hoary, viscid, shiny when dry, hollow, pale buff within.

Notes by Hesler

Spores (6)7-9 x (5.5)6-7(7.5)  $\mu$ , ellipsoid, more rarely subglobose, warts 0.2-0.3  $\mu$  bands and branches forming a partial reticulum. Basidia 52-57 x 7-9  $\mu$ , 4-spored. Pleurocystidia 58-80 x 7-11  $\mu$ , subventricose-acuminate, at times constricted; cheilocystidia 30-44 x 5-7  $\mu$ , ventricose, apices tapering and often constricted, or subcapitate. Gill trama of narrow, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a loosely interwoven ixotrichodermium. Stipe cuticle a thin ixocutis, 20-25  $\mu$  thick, at times so thin as to escape notice, bearing some irregularly cylindrical caulocystidia; rosettes present. Clamp connections none.

Sm-66187

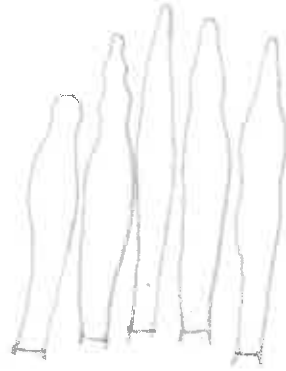
*lyngium*  
~~*thorabear*~~  
L. ~~lividobrunneus~~ - page 2

The distinguishing characters include the colors, the creamy white, acrid, unchanging latex. It is distinguished from L. cremeolactis in which the latex is white but dries yellow, gills pallid vinaceous fawn, and the flesh white.

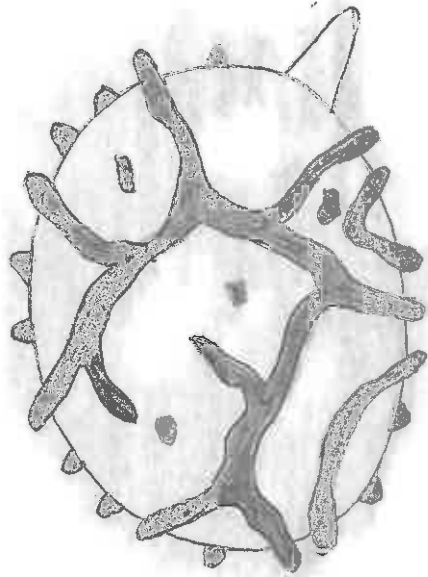
*Saccarium lindobumense* sp. nov.  
~~atro-rubens~~ hyginus  
Sm - 66/87



Sp - x 1000



Ch - x 1000



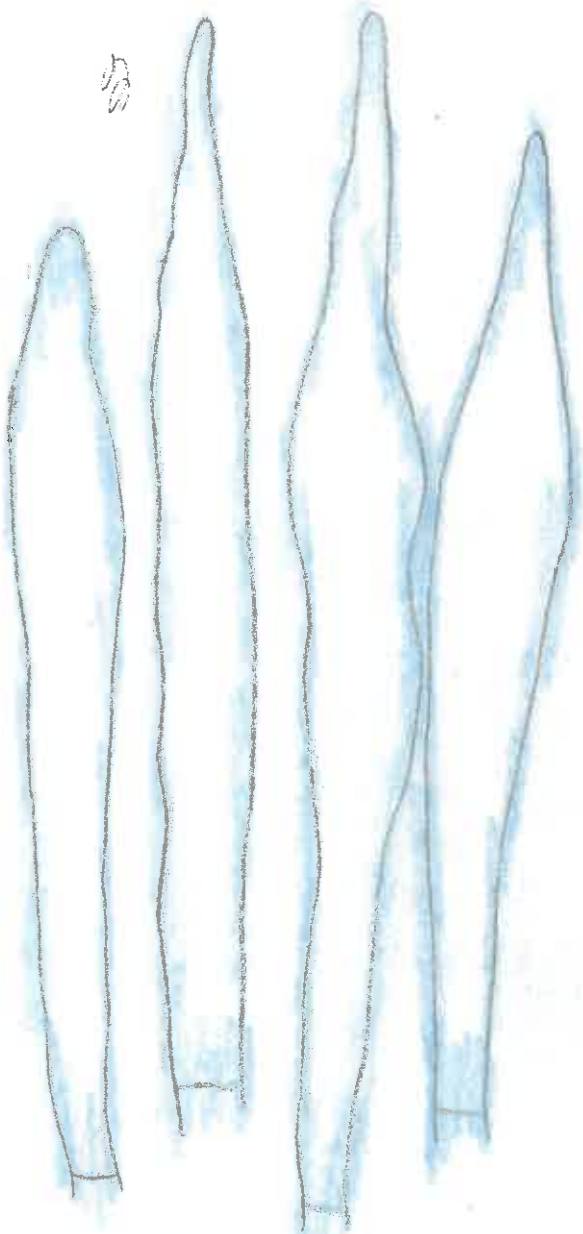
Spore - x 8000

L. ~~atrovirens~~ *hypoginns*

advent

Sm - 66187

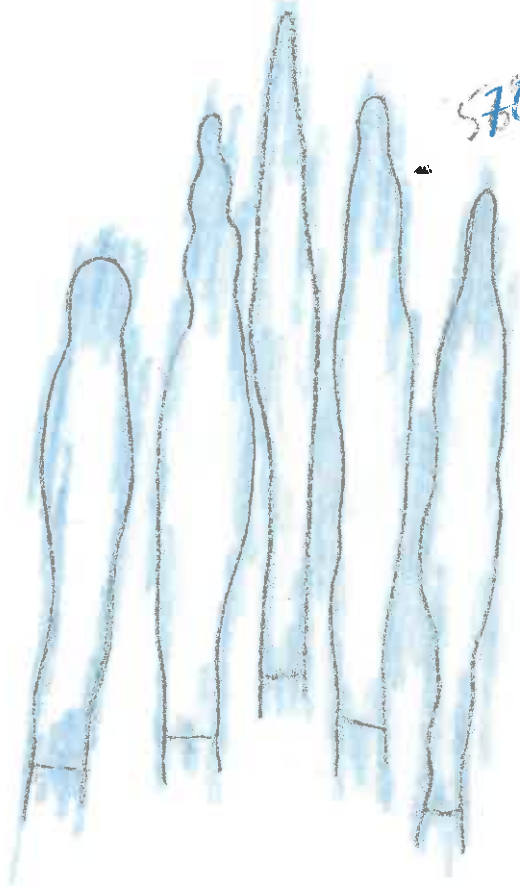
perkins W 803



579

579

fl - x 2000



570

fl - x 2000

Sm-73408

*hygginus* (Fr.) Fr.  
LACTARIUS ~~RUFORUNNEUS~~ sp. nov.

Binarch Creek, Priest Lake, Idaho, September 14, 1966

Notes by Smith

Pileus 2.5-3.5 cm broad, Van Dyke brown to walnut, glutinous, glabrous, azonate to slightly zonate. Latex white, unchanging, slowly staining gills rusty-brown, strongly burning acrid.

Lamellae adnate, rich cream color, slowly staining rusty where injured, close to subdistant, narrow.

Stipe 2-2.5 cm long, 5-8 mm thick, cream color above, brown below, discoloring slightly from handling, scrobiculate, naked, dry.

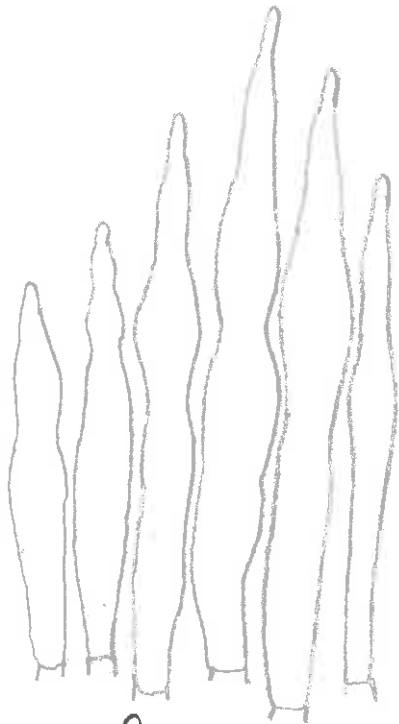
Notes by Hesler

Spores 7-8.5 x 5.5-7  $\mu$ , ellipsoid, or broadly so, at times subglobose, warts 0.2-0.3  $\mu$ , a few isolated, bands and branches forming a partial reticulum. Basidia 42-50 x 8-10  $\mu$ , 4-spored. Pleurocystidia 50-88 x 6-10  $\mu$ , subventricose, acuminate, often more or less constricted; pseudocystidia filamentous; cheilocystidia 24-42 x 3-5  $\mu$ , similar. Gill trama of small-celled, interwoven hyphae. Pileus trama with a few rosettes below. Pileus cuticle an ixotrichodermium; hypodermium brown. Stipe cuticle of repent, dry hyphae; rosettes present. Clamps none.

It is near L. galactus, but is distinguished by its milk-like, acrid latex, its shorter spore-warts, broader pleurocystidia, its ixotrichodermium on the pileus, and scrobiculate stipe. Likewise it is near L. dissimilis, although with different spore-ornamentation and different pileus-coloring.

*Hypogynus*  
*Factarium* ~~fulvobrunneus~~ sp. nov.

Sm-73408 - ~~XXXXXX~~



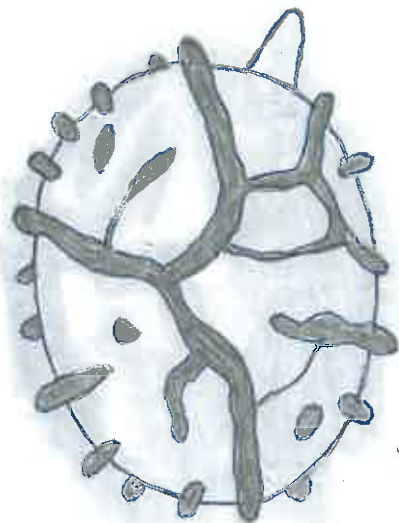
Pl. x 1000



Ch. x 1000



Pseudo -  
x 1000



Spore - x 8000

~~1327~~  
1327

*hyginius*

Sm-74179

LACTARIUS ~~XANTHOPYLLUS~~ sp. nov.

Upper Priest River, Idaho, October 13, 1966 (near hyginius)

Notes by Smith

Cap 3-5 cm, glabrous, slimy-viscid, dark to pale bay brown, subzonate, margin pallid and minutely pubescent.  $\text{FeSO}_4$  - pallid tan. Latex white, unchanging, instantly very acrid, staining slightly brownish.

Gills ochraceous buff, becoming more or less pinkish cinnamon, adnate, close, narrow.

Stipe slimy, pallid or tinged color of cap, spotted in some.

Notes by Hesler

Spores 6-8 x 5.5-6.5  $\mu$ , broadly ellipsoid, warts 0.2-0.3  $\mu$ , bands and branches forming a partial reticulum. Basidia 46-52 x 7-8  $\mu$ , 4-spored. Pleurocystidia 53-75 x 6-11  $\mu$ , subventricose-acuminate; cheilocystidia 38-60 x 5-7  $\mu$ , more or less similar. Pileus cuticle an ixotrichodermium. Stipe cuticle an ixolattice or ixocutis.

Sm-76733

*Hygginus*  
LACTARIUS ~~XANTHOPHYLLUS~~ sp. nov.

PHOTO

Gregarious, Priest Lake, Idaho, September 29, 1968 (try hygginus).

TYPE

Notes by Smith

Pileus 4-8 cm broad, convex with an inrolled margin, becoming expanded but with a shallowly depressed disc, "Carob brown" on disc, margin slightly paler, surface glabrous, slimy-viscid, azonate to zonate, unpolished. Context pallid, unchanging. Latex milk-white, unchanging, staining the gills slightly brownish.

Lamellae decurrent, cream color to buff young, more ochraceous tan in age, staining slightly brownish, close, narrow, many of them forked.

Stipe 3-5 cm long, 10-20 mm thick, paler than pileus and with darker watery spots (scrobiculate), soon hollow, more or less equal, surface glabrous-viscid, but soon dry.

Notes by Hesler

Spores 6-7.5(8) x 5-6(6.5)  $\mu$ , warts 0.2-0.3  $\mu$ , bands and branches forming a partial reticulum. Basidia 44-50 x 7-9  $\mu$ , 4-spored. Pleurocystidia 58-76 x 6-9  $\mu$ , ventricose-acuminate, often more or less constricted, scattered, somewhat more abundant on the lower portion of the gill; cheilocystidia 36-50 x 5-6  $\mu$ , similar. Pileus cuticle a tangled ixotrichoderm; hypodermium none or indistinct;



rosettes in lower trama. Caulocystidia 24-42 x 4-5  $\mu$ , resembling the cheilocystidia. Stipe cuticle an ixocutis to ixolattice; rosettes present. Clamp connections none.

Distinctive features: pileus carob brown, zonate to azonate; gills cream to buff when young, more ochraceous in age; latex white, unchanging, staining gills brownish; spores rather small. Resembles L. hysginus in which the gills are white then yellowish, not staining.

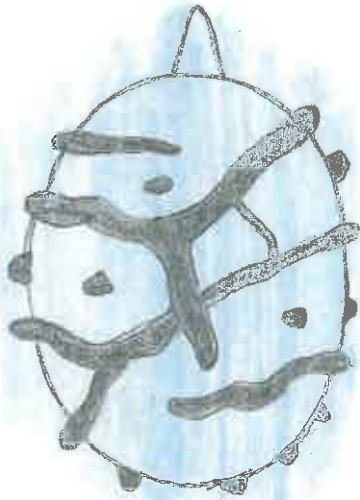
*Factarium pseudohyginus* sp. nov.  
Sm - 76733 ~~*Xanthophyllum* sp. nov.~~  
hyginus



Pl x 1000



Ch x 1000



681

Spore x 8000

Sm - 77242

LACTARIUS HYSGINUS

Northeast corner of Sugar Island, Michigan, July 20, 1968 (near hysginus)

Notes by Smith

Cap 6 cm, depressed, brown, viscid, zonate. Latex white, unchanging, quickly very hot on tongue.

Gills yellowish, crowded, not spotted.

Stipe violaceous-brown, spotted.

Spores buff color.

Notes by Hesler

Spores 6-8 x 5.5-7  $\mu$ , warts 0.2-0.3  $\mu$ , bands and branches forming a partial to nearly complete reticulum. Basidia 37-45 x 8-10  $\mu$ , 4-spored. Pleurocystidia 45-66 x 5-10  $\mu$ , ventricose acuminate; cheilocystidia 37-50 x 5-8  $\mu$ , similar. Pileus cuticle more or less an ixotrichodermium; hypodermium brownish. Stipe cuticle an ixotrichodermium; hypodermium brown; rosettes present.

Bigelow - 3430

~~Ascetiastrus~~ LACTARIUS ROSEUS sp. nov. (see PHOTO 10488) - Type

Lysiginus v. subroseus var. nov.

Sinclair, Maine, July 22, 1956, gregarious under fir-cedar

Notes by Bigelow

(Colors from Villolobos Color Standards)

Pileus 5-7 cms broad, at first plane and depressed with the margin narrowly decurved, becoming broadly infundibuliform, margin at times undulate and with an occasional sinus, near "Rood's brown" at center to shades of vinaceous buff on the margin; not striate, surface viscid, zonate when mature (occasionally with spots and depressions near the margin), color SO 7 and 8-3<sup>o</sup>, 4<sup>o</sup> inc. at center, OOS 15 and 16-6<sup>o</sup> 7<sup>o</sup> inc. near margin. Context thin, pallid; taste acrid-soapy, odor rather fragrant but not distinct. Latex white, staining or becoming yellowish.

Lamellae decurrent, crowded, narrow (2-4 mms) creamy, (nearest OOV 18-10<sup>o</sup>), edges even to eroded, undulate.

Stipe 2-4 cm long, 15-20 mm thick, dark vinaceous spotted over a pale gray-vinaceous, solid at first, then hollow by grub action, at times eccentric, base attenuated.

Notes by Hesler

Spores "cream color," 6-7.5(8) x 5-6.5  $\mu$ , ellipsoid, warts 0.3  $\mu$  high or less, blunt, bands forming a partial to complete reticulum. Basidia 38-45 x 7-9  $\mu$ , 4-spored. Pleurocystidia 46-54 x 4-7  $\mu$ , sub-ventricose, apices tapering; cheilocystidia 30-38 x 4-6  $\mu$ , subventricose, apices torulose. Pileus cuticle a gelatinous zone, hyphae more or less erect and arranged in a lattice; hypodermium none. Stipe cuticle an

Bigelow - 3430

*L. hyginus* v. *ambrosens* - 2  
~~*rosettae*~~  
~~*L. roseus* page 2~~

ixotrichodermium or in a lattice; hypodermium brownish, distinct; rosettes rare. Clamp connections none.

HABIT, HABITAT, AND DISTRIBUTION - On soil, in coniferous or mixed woods, Maine, New Hampshire, Vermont, Massachusetts, July-September.

MATERIAL STUDIED - MAINE: Bigelow 3430, 3492, 3500; 3809 type (MICH), south of Sinclair, August 5, 1956; 4196, 10488, 10680, 10802, 11412; MASSACHUSETTS: Bigelow 6231; NEW HAMPSHIRE: Bigelow 12470; VERMONT: Bigelow 13474, 13798, 13862.

OBSERVATIONS - This resembles *L. hyginus* in its general macroscopic characters, but in <sup>this variety ~~*rosettae*~~</sup> ~~*L. roseus*~~ the latex either stains yellow <sup>or</sup> itself becomes yellow, the pileus is zonate, odor fragrant, gills decurrent, and spores cream-color. It is near *L. carolinensis* but has smaller spores, a fragrant odor, and "Rood's brown" pileus.

~~roseotinctus~~ hyginus v. subroseus

Bigelow - 3492

LACTARIUS ROSEUS sp. nov.

Near Madawaska Lake, Maine, July 24, 1956 (label says: see card 3430,  
which is ~~roseotinctus~~ roseus sp. nov.)

Spores 6-7.5(8) x 5-6.5  $\mu$ . Pleurocystidia and cheilocystidia usual.  
Pileus cuticle a more or less ixotrichodermium (at least a lattice-type);  
hypodermium indistinct. Stipe cuticle a distinct ixotrichodermium with  
a well-defined brown hypodermium.

Cf. Bigelow - 3430.

*hygicus* var. *subroseus* var. nov.  
~~*procutinatus*~~

Bigelow - 3500

LACTARIUS ROSEUS sp. nov.

South of Sinclair, Maine, July 25, 1956 (label says see Card 3430)

Agrees with other collections.

*hyssginus* var. *subroseus* var. n. s.

~~*roseitinctus*~~

Type

Bigelow - 3809

LACTARIUS ROSEUS sp. nov.

South of Sinclair, Maine, August 5, 1956 (see card 3430, L. ~~*roseus*~~ <sup>*roseitinctus*</sup> sp. nov.)

Micro characters as in Big.-3430.



*hyssiginus* var. *subroseus* var. nov.  
~~*rosetinctus*~~

Bigelow - 4196

LACTARIUS ~~ROSEUS~~ sp. nov.

South of Sinclair, Maine, August 21, 1956 (Label says: see Card-3430,  
~~*rosetinctus*~~  
which is *roseus*).

Micro characters usual, except: pileus cuticle an ixocutis; stipe  
cuticle an ixocutis; rosettes present.

~~Assetonatus~~ *hygginus* var. *subroseus* <sup>var. nov.</sup>

Bigelow - 6231

LACTARIUS ~~ROSEUS~~ sp. nov.

Near Hawley, Massachusetts, September 8, 1957

Notes by Bigelow

Pileus 5-7 cms broad, plane and depressed at first with the margin narrowly decurved, becoming broadly infundibuliform, margin broadly undulate at times and with an occasional sinus, not striate, surface viscid, zonate when mature, (one carpophore with spots and depressions near the margin), color SO 7+8-3°, 4° inc. at center, OOS 15+16-6°7° inc. near margin, near "Rood's brown" at center to shades of vinaceous buff; flesh thin, pallid, taste acrid-soapy, odor rather fragrant but not distinct. Latex white, staining or becoming yellowish.

Lamellae: decurrent, crowded, narrow (2-4 ms) creamy (nearest ocy 18-10°), edges even to eroded, undulate.

Stipe short, 2 cms x 1.5-2 cms apex enlarged, solid at first, then hollow by grub action, surface dark vinaceous spotted over a pale-gray vinaceous, eccentric at times, base attenuated, no tomentum, viscid.

Spores cream color.

<sup>which he says is</sup>  
Notes by Hesler (on Bigelow - 6231, same as 3430)

Spores (5.5)6-7.5(8) x 5-6  $\mu$ , ellipsoid, warts blunt, short (0.2  $\mu$  or less), bands forming a partial or at times a complete reticulum, occasionally with free-ending branches. Basidia 37-42 x (7)8-10  $\mu$ , 4-spored. Pleurocystidia 47-56 x 3-7  $\mu$ , subventricose or nearly filamentous, apices tapering, granular; cheilocystidia 27-40 x 2.5-5  $\mu$ , ventricose to cylindrical, apices often constricted and capitate. Gill trama of short celled, interwoven hyphae. Pileus trama vesiculose.

*lygginus* var. *subroseus*  
~~*procutinatus*~~

Bigelow - 6231

*L. roseus* - page 2

Pileus cuticle an ixocutis; hypodermium none. Stipe cuticle an ixotrichodermium (as in *L. carolinensis*); rosettes rare. Clamp connections none.

This is near *L. carolinensis* in which the spores are white, slightly larger, and of different ornamentation; the pileus colors differ in that they are brownish in *carolinensis* and pinkish or vinaceous-buff in Bigelow-3430.

Same as Bigelow-11412.

~~Peridermium~~ *hyoginicus* var. *subroseus*  
*Peridermium* ~~roseus~~ sp. nov.

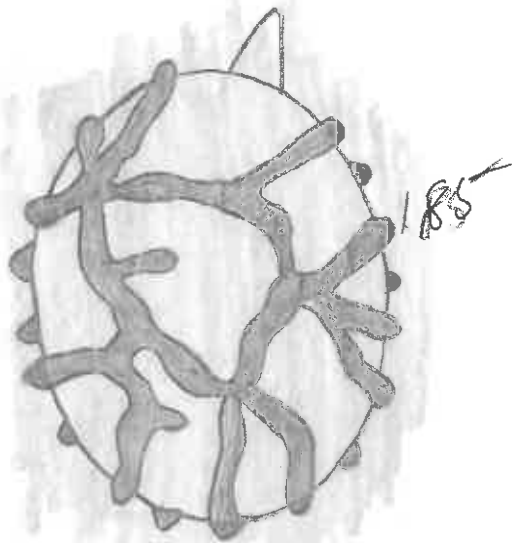
Bigelow - 6231



Sp. - x 1000



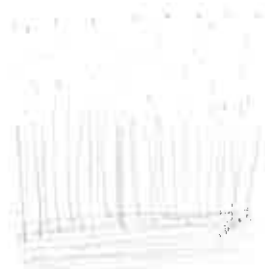
Ch. - x 1000



Spore - x 8000



*ixocetis*  
(pileus)



*ixotrichodermium*  
(stipe)

*hirsutus* var. *subroseus* var. nov.  
~~*hirsutus*~~

Bigelow 10488

LACTARIUS ~~recess~~ sp. nov.

PHOTO

(Same as Bigelow 3430) Sinclair, Maine, July 22, 1956, gregarious under  
fir-cedar

Notes by Bigelow (on 3430)

(Colors from Villolobos Color Standards)

Pileus 5-7 cms broad, plane and depressed at first with the margin narrowly decurved, becoming broadly infundibuliform, margin broadly undulate at times and with an occasional sinus, not striate, surface viscid, zonate when mature (one carpophore with spats and depressions near the margin), color SO 7 and 8-3°, 4° inc. at center, OOS15 and 16-6° 7° inc. near margin, near "Rood's brown" at center to shades of vinaceous buff; flesh thin, pallid, taste acrid-soapy, odor rather fragrant but not distinct. Latex white, staining or becoming yellowish.

Lamellae decurrent, crowded, narrow (2-4 mm) creamy (nearest O0Y18-10°), edges even to eroded, undulate.

Stipe short, 2 cms x 1.5-2 cms, apex enlarged, solid at first, then hollow by grub action, surface dark vinaceous spotted over a pale gray-vinaceous, excentric at times, base attenuated, no tomentose.

Spores cream color.

Notes by Hesler

Spores 6-7.5(8) x 5.5-6.5(7)  $\mu$ , ellipsoid, warts  $\neq$  0.2-0.4  $\mu$  high, bands forming a partial or no reticulum. Fleurocystidia 56-75 x 7-10  $\mu$ , ventricose; cheilocystidia 36-52 x 6-8  $\mu$ , ventricose or subfusoid. Pileus cuticle a gelatinous, tangled or tangled-lattice; hypodermium brown. Stipe cuticle an ixotrichodermium; hypoderm brown; rosettes present.

The flesh is thin, & distinctly pliant when dried.

*lynginus* var. *subroseus* var. nov.  
~~*Agrostinatus*~~

Higelow - 10680

LACTARIUS ROSEUS sp. nov.

Under conifers, near Katahdin Stream Campground, Baxter State Park,  
Maine, July 31, 1962

Spores "cream buff" (Higelow). Higelow says it is same as his 3430.

Spores (5.5)6-7.5(8) x 5-6(6.5)  $\mu$ , warts 0.2-0.4  $\mu$  high, bands forming no or a partial reticulum. Basidia 44-52 x 8-10  $\mu$ , 4-spored. Pleurocystidia 45-66 x 4-8( $\mu$ ), subcylindric or subfusoid, apices tapering, often constricted; pseudocystidia cylindric-clavate; cheilocystidia 28-44(53) x 4-5(9)  $\mu$ , subfusoid, subacicular, or subcylindric, often constricted. Gill trama of subparallel, narrow hyphae. Pileus trama vesiculose. Pileus cuticle an interwoven to lattice-like ixocutis. Stipe cuticle similar to pileus; rosettes rare.

~~1000~~ *Ascaris* *hyginus* var. *subrosus*  
*Ascaris* ~~Ascaris~~ sp. nov.

Bigelow - 10680



Pl. x 1000



Ch. x 1000

*lyngium* var. *subroseus* var. nov.  
~~*Assectinotus*~~

Eigelow - 10802

LACTARIUS ~~ROSEUS~~ sp. nov.

Baxter State Park, Maine, August 6, 1962

Eigelow says: see Card 3430. It is also the same as Eigelow - 10488 and 10680.

Spores 6-7.5(8) x 5.5-6.5(7)  $\mu$ , warts .02-.04  $\mu$ , bands forming a partial reticulum or none. Pleurocystidia 52-70 x 7-10  $\mu$ ; cheilocystidia 35-48 x 5-8  $\mu$ . Pileus cuticle a tangled gelatinous zone; stipe cuticle similar but more of a lattice-type.

The dried pilei are very pliable because of the thin flesh.



*hygginus* var. *subroseus* var. nov.  
~~*roseus*~~

Bigelow 11412

LACTARIUS ROSEUS sp. nov.

Baxter State Park, Maine, August 30, 1962 (same as 3430  
and 6231).

Spores 6-7.5(8) x 5-6.5(7)  $\mu$ , ellipsoid, more rarely  
subglobose, warts 0.2-0.3  $\mu$  high, bands forming a partial  
or at times complete reticulum. Pleurocystidia and cheilo-  
cystidia as in 6231. Pileus cuticle an ixocutis, hyphae  
interwoven. Stipe cuticle an ixocutis, hyphae tangled,  
some more or less erect but no palisade; rosettes rare.

*hygginus* var. *subroseus* var. nov.  
~~*roseotinctus*~~

Bigelow 12470 LACTARIUS ~~ROSEUS~~ sp. nov.

In mixed woods, Redstone, Carroll County, N.H.,  
September 5, 1963.

Spores 5.5-7.5(8) x 5-6(6.5)  $\mu$ . Other micro  
characters as in Bigelow 10488 et al.

Bigelow says the cap is reddish brown (hygginus?)  
and the stipe spotted. Cf. hygginus, which it, at  
times, resembles superficially.

*hysginus* var. *subroseus* var. nov.  
~~rosettostratus~~

Bigelow - 13474

LACTARIUS ROSEUS sp. nov.

(Card: 3430)

Mt. Elmore State Forest, Vermont (Lamoille Co.), August 17, 1964

(labelled doubtfully hysginus which it resembles).

Spores 6.5-7.5(8) x 5-6.5(7)  $\mu$ , warts 0.2-0.4  $\mu$  high, bands forming a partial or complete reticulum. Pileus cuticle a tangled ixocutis.

Stipe cuticle an ixotrichodermium; rosettes present. Other micro

~~characters~~ characters as in 3430.

*higginsii* var. *subroseus* var. n. sp.  
~~*Asciotricha*~~

Bigelow - 13798

LACTARIUS RESEUS

(Card: 3430)

Ranch Brook, Lamoille Co., Vermont, September 1, 1964

Spores and other micro characters as in 3430.

*hyginus* var. *subroseus* var. nov.  
~~resurrectus~~

Bigelow - 13862

LACTARIUS ~~ROSEUS~~ sp. nov.

Card: 3430

Stowe, Vermont, September 3, 1964

Micro characters as in 3430, 6231, 10488.

We exclude it  
from our manuscript!

LACTARIUS ICHORATUS Fr.

Epicr. Myc., p. 345. 1838

(Translation from Neuhoff, p. 203-204)

Pileus 3-7 cm broad, only exceptionally larger (up to 11 cm), at first plano-convex, rarely with a broad, low umbo, very soon irregularly depressed to deeply so, sometimes the margin ribbed. Surface dull, doubtless always dry, margin slightly wrinkled (ribbed) (under lens), with dingy-cinnamon to olive-dark-brown watery spots, near the margin with 1-3 small (0.5-1 mm broad), distinct zones, center orange-brown, foxy-brown or ventian- to English-red, margin ocher-orange, the outer marginal zones often apricot-yellow, on drying becoming dingy and paler, the center somewhat foxy-yellow, margin orange-ocher to orange-rusty-yellow, rarely with a flesh-reddish-gray tone, sometimes colored like L. aurantiacus or L. mitissimus, but usually bright (on) margin.

Stipe 3-7 cm long, often of characteristic form, cylindric above, the lower half somewhat broadened and then pointed (at base), (with) pale-ocher to purplish-brown mycelium, apex at first pale orange-brown with a flesh-red appearance, then darker foxy and darkening beneath to a purplish to wine-red.

Lamellae almost crowded, with lamellulae, slightly sickel-shaped, somewhat rounded at the stipe, at first pale-ocher then bright ocher-foxy, with an orange-foxy appearance, slightly foxy to olive-rusty spotted.

Latex white, soon watery-white, soon sparse or almost absent, mild,

after a time somewhat bitter, at most only a trace of sharpness (acridity). Flesh whitish, tinged somewhat foxy; in the stipe-base distinctly foxy, without mild latex, somewhat stinging the tongue, slightly scratchy in the throat but not sharp (acid); odor as in L. quietus; GUAIAIC colors flesh immediately ocher-foxy, after about 20 min. foxy-yellow with a slight olive-tone, GUAIACOL after 5 min ocher-gold-yellow (lamellae wine-red), KOH immediately pale olive-gray,  $\text{HNO}_3$  bright-foxy,  $\text{FeSO}_4=0$ .

Spores in deposit bright-ocher creamy-yellow (C-D), ellipsoid,  $7.5-8.5 \times 6.5-7 \mu$ , with rather stout warts, some isolated, some connected by bands, scarcely (a) reticulum. Basidia  $40-45 \times 9-11 \mu$ , 4-spored. Cystidia spindle-shaped, long-pointed,  $50-60 \times 6-8.5 \mu$ , projecting  $25 \mu$ , sparse on the sides (of gills). Pileus cuticle of almost only elongate cells, with only  $\frac{1}{2}$  isolated hyphal-threads.

ILLUSTRATIONS - Bresadola, T.376 (as L. quietus good). (But, Bresadola describes pileus as subviscid-L.R.H.); Konrad and Maubl., T.337 (as L. subdulcis, good); Lange, T.175A (as L. cremor, good); Romagnesi, BSM Fr. 57; 1941, Atlas T.84 (as L. mitissimus); K. & R., p. 479, Fig. 671 (spore, as L. fulvissimus).

LACTARIUS ICHORATUS Fr.

Lundell and Nannfeldt No. 2345, Fungi Exsicc. Suecici, Praesertim  
Upsalienses, leg. September 21, 1938

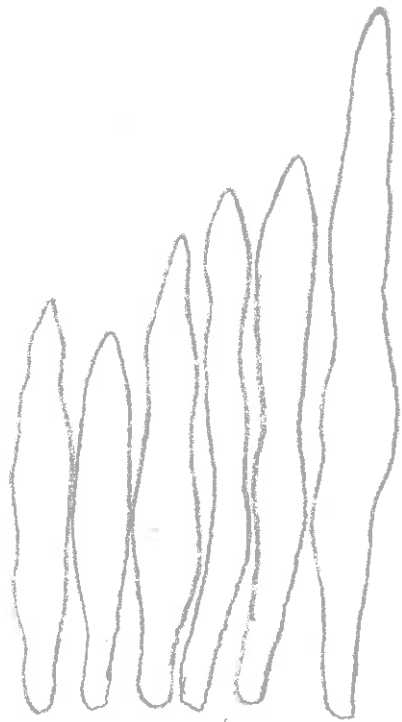
Spores 8-9(10) x (6)7-8  $\mu$ , ellipsoid, warts 0.4-0.8  $\mu$  high,  
usually slender, with broad bands and a few fine lines and occasional  
isolated warts. Basidia 40-47 x 9-11  $\mu$ , 4-spored. Pleurocystidia 50-  
94 x 6-10  $\mu$ , subventricose to cylindrical, apices conic-acute;  
cheilocystidia 22-30 x 3-5  $\mu$ , scattered, few, ventricose. Gill trama  
cellular. Pileus trama vesiculose. Cuticle scarcely differentiated,  
with scattered, erect pileocystidia, 25-30 x 3-4  $\mu$ , ventricose, similar  
to cheilocystidia. Caulocystidia 10-36 x 2-4  $\mu$ , in small tufts or  
often scattered. Clamp connections none.

The printed label on the above collection is the statement  
written by Lundell, that: "It seems to be impossible to find out the  
original meaning of Agaricus subdulcis Fr., Syst. Myc. 1:70; the  
description suggests a collective species. We had better drop this  
name, as it has been interpreted variously and there is no Swedish  
tradition about it. In his later years, Roswell used the name L.  
subdulcis for L. theiogalus (Fr.) Fr." Lundell thinks it probable  
that L. rubro-cinctus Fr. (Monogr. II, p. 176, 1863), at least to judge  
from Icon. sel. II. tab. 171:2, is a mere form of L. ichoratus.

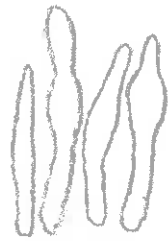


*Sactarius ichoratus*

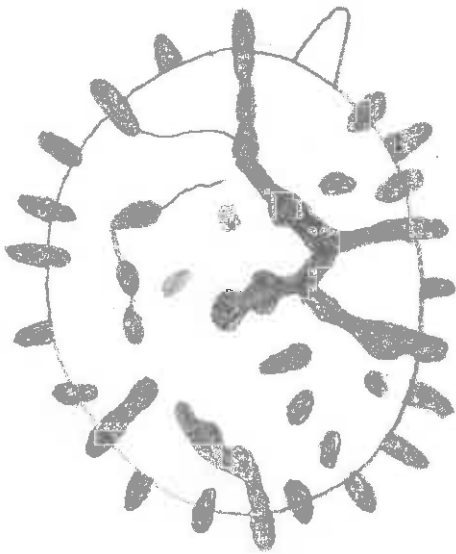
Fundell & Nannfeldt  
Fungi Exsicc. Suecici - No. 2345



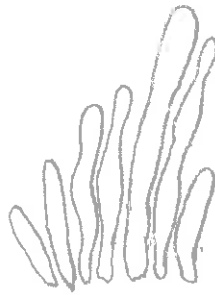
Pl - x 1000



Ch - x 1000



Pileo - x 1000



Caulo - x 1000

Tem-35817

Bas-1993

LACTARIUS ICHORATUS sensu Neuhoff

(=L. fulvissimus Romagn.)

On wet clay, with Tilia, Utrecht, Holland, August 3, 1960

Notes by Bas

Cap 45-80 mm, plano-convex with depressed center, smaller fruit bodies with small pointed umbo, then shallow funnel-shaped, margin incurved when young, brown with bright (ocher) orange, narrow margin, when young very dark vinaceous red-brown, when older a faded ocher orange, main color dark orange-red, rarely faintly zonate, glabrous or pruinose under a lens, then rugulose, older fruit bodies somewhat ribbed on margin (as in Clitocybe infundibuliformis). Context tinted faded flesh-colour, becoming stained yellow (from milk) after more or less 2 hours; odor fruity (as quietus). Latex white, copious, drops on flesh becoming somewhat yellow, soon bitter then sharp in the throat.

Gills usually decurrent by a tooth, faded flesh-color - ocher-beige-cream, then more flesh, pale brown-spotted, crowded, narrow, thin.

Stipe 40-60 x 9-23 mm, slender and cylindric to ventricose or clavate, pale flesh ocher, soon darker brownish salmon, later brownish flesh, glabrous.

Spore deposit: dingy dark-cream.

Pellicle of cap not cellular, without encrusted hyphae.

Plate 22, Neuhoff, does not agree: too pale, too little red. However, Knauth-Neuhoff 12 (No. 9, 14, 18, 19) is good. Bres. 376 and K.6M, 337 have better colour. Spore ornamentation agrees better with ichoratus sensu Romagn. = rubrocinctus sensu Neuhoff (= sensu Lange).

Notes by Hesler

Spores 7-9 x 6-8  $\mu$ , subglobose to globose, warts 0.4-1.3  $\mu$ , usually slender and numerous, many isolated, bands broken, often short, or no bands. Pleurocystidia 60-73 x 5-7  $\mu$ , widely scattered, rare, absent in many gill sections, ventricose-acuminate; pseudocystidia filamentous, often capitate, 3-5  $\mu$  broad; cheilocystidia 20-32 x 3-5  $\mu$ , slender, cylindric or subventricose, at times subcapitate, rare. Pileus cuticle of subgelatinous surface hyphae, underlying elements of inflated cells. Stipe cuticle of subgelatinous, ixocutis, hyphae; rosettes present.

The spores and cystidia are different from those of Bas-2001.

Bas-2001      LACTARIUS ICHORATUS sensu Neuhoff

(=L. fulvissimus Romagn.)

Among grass, on clay, under Quercus and Fagus, August 3, 1960

Notes by Bas (Transl. by Donk)

Cap dark fox-red-brown when moist, rather pale orange brown at margin, faintly shining, smooth except for slightly ribbed margin, finely granular under lens, on drying becoming paler with small dark spots. Latex white, somewhat sharp.

Gills pale flesh-color isabella-cream.

Stalk more or less concolor with slight purple tinge at base.

Notes by Hesler

Spores 7-9(9.5) x 7-8.5  $\mu$ , globose to subglobose, warts 0.2-0.5  $\mu$ , bands and branches forming a partial reticulum. Basidia 38-43 x 9-11  $\mu$ , 4-spored. Pleurocystidia rare, 48-60 x 5-7  $\mu$ , ~~sub~~ subventricose-acuminate; pseudocystidia filamentous, scarce, 2-4  $\mu$  broad; cheilocystidia 23-32 x 3-5  $\mu$ , subventricose-acuminate. Pileus cuticle of colorless, dry, repent hyphae, which however at times appear subgelatinous. Stipe cuticle of dry, repent hyphae, the surface bearing a thin turf of cylindric caulocystidia; rosettes present.

The structure of the pileus does not seem to agree with Neuhoff's description which says it is of long roundish cells of intermixed hyphae.

Differs from Bas-1993 in spore-warts and cystidia.

Watling - 100c

LACTARIUS ICHORATUS

Inverness-shire, Scotland, August 19, 1957

Spores 7.5-8.5(9.5) x 6-7.5  $\mu$ , ellipsoid, warts 0.4-0.7  $\mu$  high, bands at times branching, with a few lines, no reticulum, with occasional isolated warts. Basidia 40-45 x 7-8  $\mu$ , 4-spored. Pleurocystidia 48-63 x 5-7  $\mu$ , awl-shaped, aciculate, to slender ventricose, granular; cheilocystidia 32-38 x 3-5  $\mu$ , flask-shaped, with a neck. Gill trama of undulating subparallel hyphae. Pileus trama slightly vesiculose. Pileus cuticle an ixocutis, hyphae interwoven and at times lattice-like; hypodermium a distinct brownish zone. Stipe cuticle of repent, interwoven hyphae, dry, with caulocystidia in small tufts or scattered; rosettes present. Clamp connections none.

Neuhoff says the pileus epicutis is of long-roundish cells with intermixed hyphae. Watling's collection seems not to agree with Neuhoff, and neither agrees with Lundell-Nannfeldt-2345.

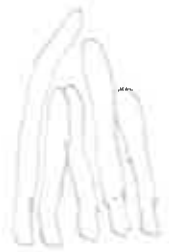
*Sactarius ichoratus*  
Walling 100c



Sp. - x 1000



Ch. - x 1000



Caulo -  
x 1000

Bas (Leiden)

LACTARIUS ICHORATUS, Fr. sensu Romagn.

Gelderland, the Netherlands, near Utrecht, leg. Kortrelius,

October 7, 1968.

Notes by Bas

Cap up to 70 mm, young with conic umbo, center red-brown, elsewhere orange ochraceous, margin pinkish ochraceous and with conspicuous ridges, surface frosty, glabrous. Taste mild (flesh, gills, and milk). Latex white, after 1/2 hour on white filter paper pale yellow.

Gills subdecurrent, at first pale pinkish ochraceous, later more ochraceous flesh pink.

Stem 40-53 x 6-13 mm, ochraceous flesh red with hoary surface, more purple at base.

Spores 6.5-8 x 5.7-7.2 u, with long warts connected here and there by fine spines (lines? L.R.H.).

Notes by Hesler

Micro characters as in Bas-1993 (= *Tam. 35817*).

LACTARIUS ICHORATUS var. MITIS

Leg. C. G. Lloyd, No. 1080, sent to Peck, collected in Ohio; labelled as L. ichoratus var. mitis apparently in Peck's handwriting.

Notes by Hesler

There are two basidiocarps, 2-3 cm broad, brownish, zones apparent, and the surface seems to be glabrous (under lens).

Spores 6-8(8.5) x 5.5-6(7)  $\mu$ , ellipsoid to subglobose, warts 0.2-0.6  $\mu$  high, bands and a few branches forming a partial reticulum. Pleurocystidia 40-53 x 3-5  $\mu$ , slender-ventricose, apparently somewhat collapsed, scattered, inconspicuous; cheilocystidia 26-30 x 4-5  $\mu$ , ventricose, inconspicuous. Pileus cuticle of irregularly ellipsoid to elongate and often partially flattened-collapsed cells, with scattered hyphal fragments. Stipe cuticle of repent hyphae; rosettes few, inconspicuous. Clamp connections none.

Mr. Stanley J. Smith (letter to Hesler, Nov. 12, 1971) states that he found the Lloyd collection of Lactarius ichoratus, and that he assumes that this is the material cited by Miss Burlingham (in Torrey Club Mem. 14: 93-94. 1908). In her account, Burlingham gives the spores 8-10 x 6-7  $\mu$ , and states that it resembles L. volemus but is zonate and more slender. The collection from Albany is labelled L. ichoratus Fr. v. mitis; within the packet this trinomial also appears, in Peck's handwriting. It is not clear where Peck got this name. Nor, is it clear where Burlingham got her description. The var. name mitis suggests that it is mild and Burlingham describes the latex as mild or astringent. However, in Burlingham (1908:94) quotes Lloyd's notes as stating that the latex is acrid.

This collection (Lloyd-1080) seems to agree somewhat macroscopically with European material. Our study of it microscopically also shows that it agrees acceptably with Neuhoff's description in its spores and in the structure of the pileus cuticle.



*Factarium ichoratus* [var. *mitis* (?)]

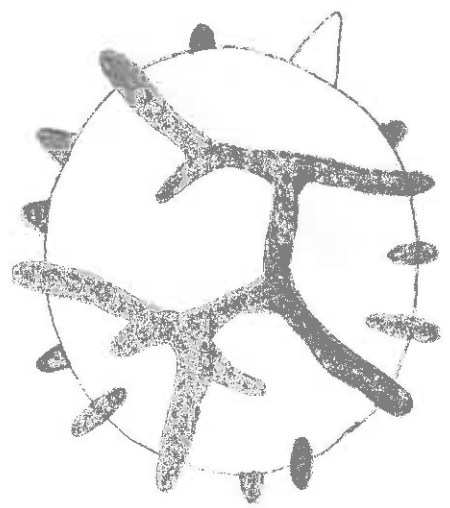
C. G. Floyd - 1080 (from Ohio)  
(ex - Peck Herb.)



As x 1000  
(apparently somewhat collapsed)



Ch x 1000



Spore x 8000

Excluded

LACTARIUS ILLACHRYMANS Berk. & Rav.

Ann. Mag. Nat. Hist. II:12:425. 1853

Type

On deposit at Kew. Borrowed, and examined March 13, 1968. Collected by Ravenel, in swamps of South Carolina, sent to Berkeley in Sept. 1950. Notes accompanying the type:

"Pileus compact, plano convex, umbilicate, light tawny, with 2-3 concentric zones of darker shade, 1-1 1/2 inches--substance thin--Gills dingy white, numerous, narrow, subdecurrent, not discharging any milk on fracture, but of a slightly aromatic pungent taste. Stipe 1-2 inches long, solid, white. - H.W.N".

There are six basidiocarps affixed with glue to a card, so that a section of the pileus was not feasible. A few gill fragments were mounted in Melzer's reagent, and numerous, small, colorless, smooth spores were found. No LACTARIUS spores were found.

LACTARIUS IMPERCEPTUS Beardslee & Burlingham

Mycologia 32:581. 1940

Illustrations:

Beardslee and Burlingham, Mycologia, 32, figs. 1C, 4F.

Pileus 5.5-cm broad, broadly convex and spreading, slightly umbonate, dark fawn to snuff brown tone 2, azonate, viscid when wet, glabrous, margin becoming striate when mature. Context staining sulphur yellow when cut; odor none. Latex white, slowly becoming sulphur yellow, taste bitter then peppery.

Lamellae slightly decurrent, pallid, tinted rosy-white tone 4 singly, broad and rounded in front, narrowed behind, close, unequal, sometimes forked at the base.

Stipe 3.5-cm long, 10 mm thick at the apex, 8 mm at the white-tomentose base, solid .

Spores 8-10 x 7-8 $\mu$ , fleshy-white tone 1, ellipsoid, at times broadly so, warts 0.4-0.8 $\mu$  high, reticulum of both broad bands and fine lines. Basidia 36-44 x 8-10 $\mu$ , 4-spored. Pleurocystidia 35-68 x 5-8 $\mu$ , slender-ventricose, at times slightly constricted above, apices tapering, often terminating in a capitellum, granular; cheilocystidia 30-45 x 3-7 $\mu$ , similar. Gill trama cellular. Pileus trama vesiculose. Cuticle a gelatinous zone, 70-120 $\mu$ , broad, of colorless, narrow hyphae, the terminal elements cystidioid. Caulocystidia none, Clamp connections none

Stipe cuticle dry & inconstant

HABIT, HABITAT, AND DISTRIBUTION - In a hammock of sweet gum, maple, and oaks, Florida, January.

MATERIAL STUDIED - FLORIDA: Beardslee and Burlingham (No. 2),

type (NY), near Oviedo, January 8, 1938.

OBSERVATIONS - Beardslee and Burlingham state that it is related to L. cognocibilis and L. theiogalus. It differs from the former in being azonate, and in the changing color of the latex and cut flesh, and in the larger, more reticulate spores; and from the latter in the more slender form, azonate pileus, less crowded lamellae, more slowly changing latex, and in the absence of odor.

LACTARIUS IMPERCEPTUS Beards. & Burl.

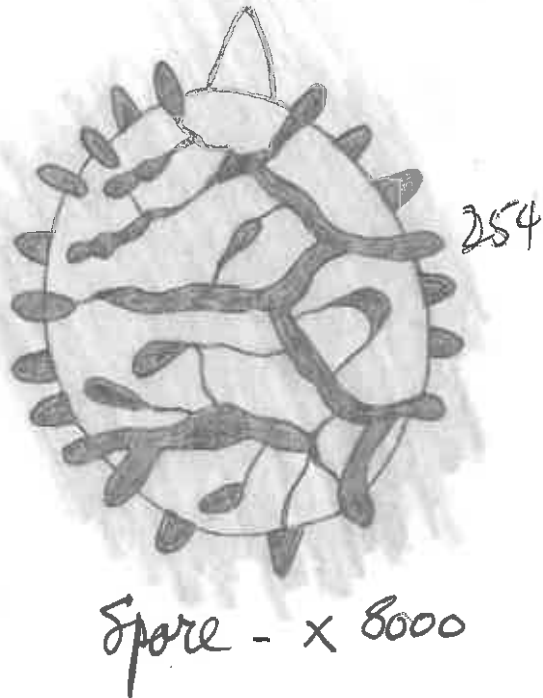
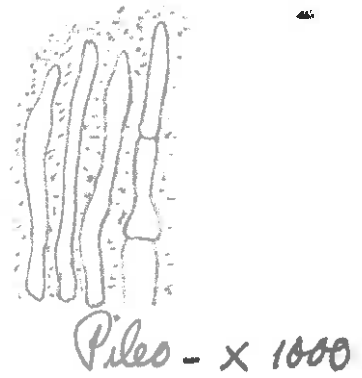
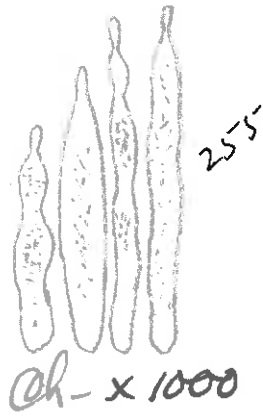
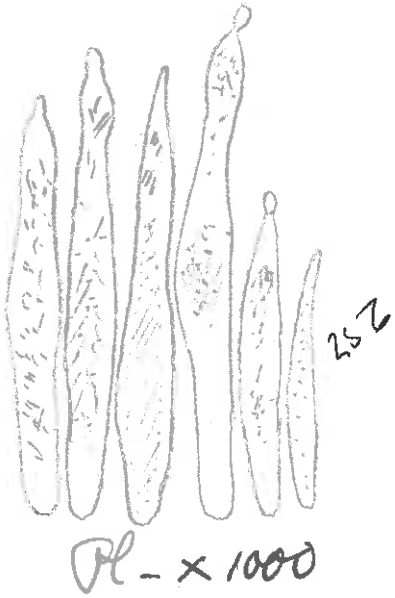
In a hammock of sweet-gum, maple, and oaks, near Oviedo, Florida,  
January 8, 1938 (Burlingham-2)

Type

Spores 8-10 x 7-8  $\mu$ , fleshy-white tone 1, ellipsoid, at times broadly so, warts 0.4-0.8  $\mu$  high, reticulum of both broad bands and fine lines. Basidia 36-44 x 8-10  $\mu$ , 4-spored. Pleurocystidia 35-68 x 5-8  $\mu$ , slender-ventricose, at times slightly constricted above, apices tapering, often terminating in a capitellum granular; cheilocystidia 30-45 x 3-7  $\mu$ , similar. Gill trama cellular. Pileus trama vesiculose. Pileus cuticle a gelatinous zone, an ixocutis, 70-120  $\mu$  broad, of colorless, narrow hyphae, the terminal elements cystidioid. Stipe cuticle of dry, repent hyphae; rosettes present. Caulocystidia none. Clamp connections none.

*Saccarius imperceptus* Beards. + Bwrl.

Type



Ammirati - 2446

*imperfectus* Beardsl. & Burt.  
LACTARIUS ~~INFUSCATUS~~ sp. nov.

Under hardwoods, Jackson Co., Michigan, September 6, 1968

Notes by Ammirati

Pileus 3-5 cm broad, depressed, "avellaneous" to "wood brown," or tinted "buffy brown," disc tinged cinnamon, viscid, azonate, glabrous, odor slight. Latex watery-white, unchanging, not staining, but the stipe-flesh at the apex becoming dull yellow; taste mild.

Lamellae adnate, whitish then "light pinkish cinnamon" finally "pinkish cinnamon," close, narrow, lamellulae numerous.

Stipe 2-4 cm long, 6-10 mm thick, ground color "light vinaceous cinnamon" or "pinkish cinnamon," with a whitish subpruinose bloom, dry, hollow.

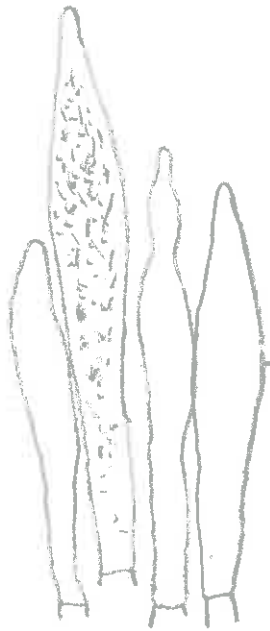
Spore deposit white.

Notes by Hesler

Spores white in deposit,  $7.5-9.5 \times 6-8 \mu$ , ellipsoid, warts  $0.4-1.0 \mu$  high, bands with free-ending branches forming a partial reticulum. Basidia  $38-48 \times 8-10 \mu$ , 4-spored. Pleurocystidia  $48-76 \times 7-11 \mu$ , ventricose-acuminate, cheilocystidia  $25-34 \times 3-5 \mu$ , subfusoid. Gill trama of small cells. Pileus trama vesiculose. Pileus cuticle of interwoven, gelatinous hyphae--an ixocutis; hypodermium not differentiated. Stipe cuticle of repent, dry hyphae, bearing more or less a turf of caulocystidia,  $12-20 \times 2-3.5 \mu$ , cylindrical; rosettes present. Clamp connections none.

*Plecterium infuscatum* sp. nov.

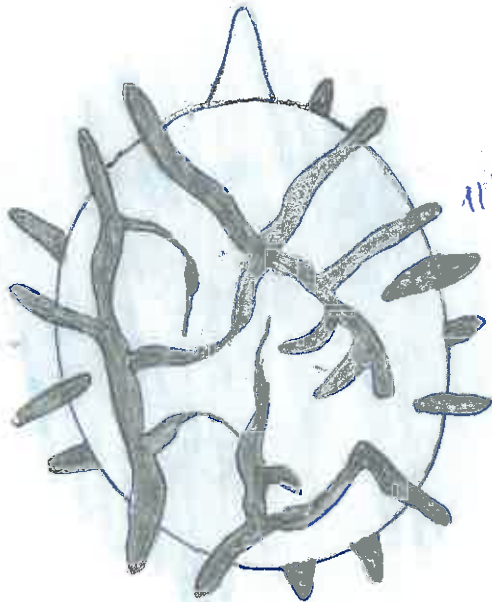
*Ammirati* - 2446 - ~~type~~



Pl. x 1000



Ch. x 1000



1153

Spore - x 8000



Ammirati - 2632

LACTARIUS IMPERCEPTUS *Beards. + Burl.*

Scattered or more or less gregarious on moist soil along pond edge in hardwoods, Waterloo, Bush Road, Washtenaw Co., Michigan, October 5, 1968.

Notes by Ammirati

Pileus 3-8 cm broad, convex to plano-convex then plane to uplifted, depressed on disc slightly or with a slight umbo at first, more or less smooth and moist to slightly viscid (check cuticle), more or less brownish cinnamon to buffy brown to pinkish cinnamon buff, or light apricot buff when faded. Context light pinkish-whitish to pale ochraceous buff, more or less watery, solid, brittle, odor slight, taste slight. Latex creamy to whitish cream, ~~with~~ <sup>staining</sup> some reddish (dull) to pinkish spots.

Lamellae adnexed to subdecurrent, close, pale pinkish to whitish pink, or pinkish light flesh color.

Stipe 2.5-4.0 cm long, apex .7-1.5 cm equal to more or less clavate, often hollow in age, brittle, more or less color as pileus context, surface pinkish - flesh color beneath whitish bloom, sometimes darker near dull light apricot buff, whitish-pink in some.

Spore deposit: light cream color.

Notes by Hesler

Spores 8-10 x 6.5-8  $\mu$ , warts 0.5-1.0  $\mu$ , bands branched, broken, or more or less catenulate. Micro characters as in Type (pileus cuticle an ixocutis; stipe cuticle dry).

*Taste of latex + flesh seems to vary from mild to slight to bitter becoming peppery; and at times may stain the gills.*

Sm-5022

LACTARIUS IMPERCEPTUS

On old logs and under Vaccinium in oak woods, Muskegon, Michigan,  
October 11, 1936 (see also Sm-9632).

Pileus 3-11 cm broad, slightly umbonate or convex at first, becoming broadly depressed with a plane or elevated margin, margin inrolled at first and remaining decurved for a long time, color "walnut brown" to "fawn color" or "wood brown," sometimes grayish brown, viscid at first, dry at maturity, glabrous, azonate. Context at first pale, vinaceous brown, whitish when faded, hygrophanous. Latex white unchanging, wounds on gills sometimes changing to yellowish incarnate-brown or dark avellaneous, slowly acrid.

Lamellae subdecurrent, close to subdistant, narrow to moderately broad, (5-8 mm), some forking at base, "pale pinkish buff" at first - becoming darker and more vinaceous brown in age (usually near "avellaneous"), in some young specimens evenly "pale purple drab" after standing over night.

Stipe 4-8 cm long, 10-20 mm thick, equal to enlarged downward, solid, pallid vinaceous brown fresh, hoary-pruinose, in age often tinged purplish or vinaceous drab near the apex.

Spores 7.5-10 x 6.5-8  $\mu$ , warts 0.3-0.8  $\mu$  high, bands not forming a reticulum. Basidia 38-42 x 8-10  $\mu$ , 4-spored. Pleurocystidia 56-78 x 6-9(10)  $\mu$ , ventricose, acuminate; cheilocystidia 33-42 x 4-7  $\mu$ , similar, often closely appressed against the edge. Gill trama subparallel, short-celled. Pileus trama vesiculose. Pileus cuticle an ixocutis. Stipe cuticle <sup>of dry, repent</sup> ~~thin, at~~  
~~hyphae~~ ~~is inconspicuous, ixocutis~~; rosettes present.

Same as Sm-9632.

(Tera-353)   
Bigelow - 7798

LACTARIUS IMPERCEPTUS

Gregarious under white pine, Mt. Taby, Sunderland, Massachusetts,

September 20, 1958

Notes by Bigelow

Pileus 3-8 cms broad, convex at first with an incurved margin, even, expanding to plane, at times with the margin somewhat elevated, azonate, moist but not viscid, glabrous, "apricot buff" young, darkening to "vinaceous cinnamon" when expanded; flesh whitish except near cuticle where tinted the cap color, moderately thick on disc to thin at margin, firm, taste peppery slowly, no odor. Latex white but soon changing to yellow.

Lamellae short decurrent (evenly in forming a collar), close, narrow (2-4 mm), forked "light buff" to "pale ochraceous buff" when young, darkening in age to "pinkish buff" or "light ochraceous buff," at times with vinaceous brown stains "liver brown," edges crenate under lens.

Stipe 3.5-5.5 ~~cm~~ cms x 1-2 cms more or less equal above, base abruptly tapered in needles, solid, compressed at times, glabrous above, tomentose to strigose where base embedded in needles, concolor with gills and stained likewise.

Spores "light buff" to "pale ochraceous buff".

Notes by Hesler

Spores 7-9 x 6-7  $\mu$ , warts 0.4-0.8  $\mu$  high, bands rarely branched, not forming a reticulum. Basidia 37-44 x 7-9  $\mu$ , 4-spored. Pleurocystidia 42-74 x 7-10  $\mu$  ventricose, more rarely spathulate, granular-spangled; cheilocystidia 30-42 x 5-7  $\mu$ , more or less similar. Gill trama of undulating hyphae. Pileus trama vesiculose. Pileus cuticle a rather

over

thin ixocutis; hypodermium brown and distinct. Stipe  
cuticle of repent. dry hyphae; rosettes present.

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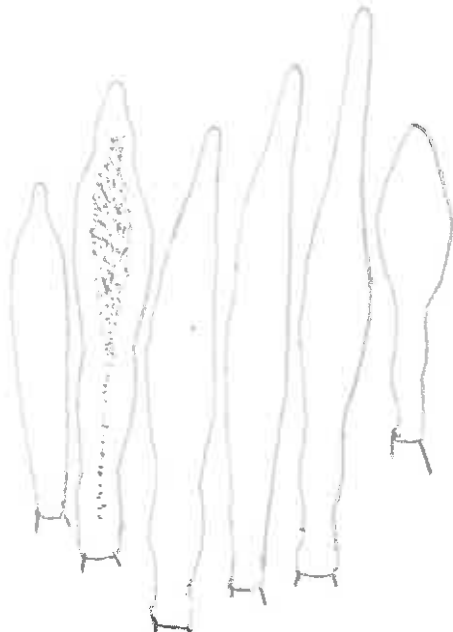
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*Pistacium imperceptus* Beards. & Burd.

Bigelow - 7798



Pl. x 1000



Ch. x 1000

Sm-9632

LACTARIUS IMPERCEPTUS

In oak woods, Chelsea, Michigan, July 20, 1938.

Pileus 3-6 cm broad, convex becoming plane or the margin arched and decurved, disc shallowly depressed in age, surface glabrous and slightly viscid, pellicle subseparable and thin, color near "avellaneous" to "wood brown" or with a vinaceous fawn tinge at first, sometimes pale putty color in age, usually azonate but some faintly zoned; flesh "pale vinaceous fawn" in pileus and stipe, odor none at first but when dried faintly aromatic as in L. camphoratus; latex white, unchanging, not staining the gills, slowly but distinctly acrid.

Lamellae broadly adnate, "pale vinaceous fawn" or slightly darker, close, narrow, not discolored in old caps.

Stipe 4-5 cm long, 10-15 mm thick, equal, concolorous with gills or tinged more vinaceous, faintly hoary at first but soon dull and glabrous, unspotted.

Spores 8.5-10.5 x 7.5-8.5  $\mu$ , ellipsoid, warts 0.5-1.2  $\mu$  high, bands (broad and narrow) forming a partial reticulum. Basidia 38-48 x 9-10  $\mu$ , 4-spored. Pleurocystidia 48-72 x 3-8  $\mu$ , aciculate(~~aciculate?~~) to subfusoid, apices acuminate, granular-spangled, often rare and inconspicuous; pseudocystidia filamentous, rare; cheilocystidia 21-32 x 3-5  $\mu$ , ventricose, apices tapering, granular. Gill trama of cells, 12-35 x 10-30  $\mu$ , with some hyphae. Pileus trama loosely interwoven, with some vesiculose cells.

Pileus cuticle ~~and~~ thin ixocutis (40-50  $\mu$  thick); hypodermium present.

Stipe cuticle ~~a thin ixocutis~~; rosettes present. <sup>dry, repent;</sup> <sup>Caules cylindric, singly or in tufts.</sup> <sup>Clamp connections none.</sup>

Same as Sm-5022; the latex sometimes is slow to become yellow (and might be overlooked), and slow to stain the gills yellowish.

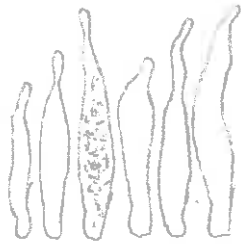
Resembles L. flocculosiceps (dried) but the latter has isolated warts or only a few lines.

*Actinaria imperceptus*

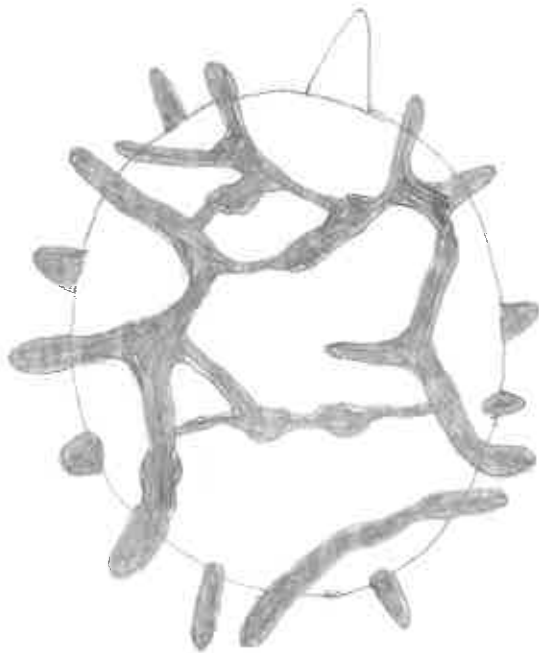
Sm 9632



Pl - x 1000



Ch - x 1000



Spore - x 8000

9651

LACTARIUS IMPERCEPTUS

Walland, Tenn., October 30, 1936

Pileus 3.5-7 cm, snuff brown, viscid; odor mild. Latex white then yellow, bitter to acrid. Lamellae broader behind, narrowed in front. Stipe 3-5.5 cm long, 4-10 mm thick.

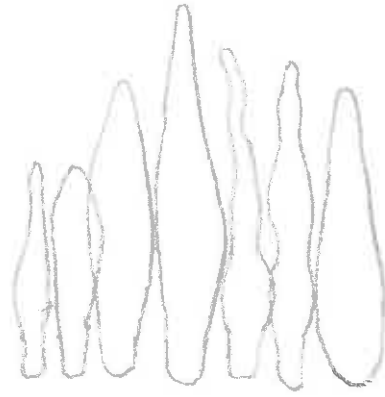
Spores 8-10 x 7-8.5 $\mu$ , warts 0.5-1.0 $\mu$ , bands and lines forming a reticulum (as in type). Basidia 36-40 x 6-8 $\mu$ , 4-spored. Pleurocystidia 48-72 x 5-7 $\mu$ , cylindric, obclavate, ventricose, granular, scattered, not conspicuous; cheilocystidia 26-50 x 5-10 $\mu$ , ventricose, bottle-shaped, fusoid, granular, not present in every section. Gill trama cellular. Pileus trama vesiculose. <sup>Pileus</sup> cuticle a gelatinous zone, 70-100 $\mu$  thick. *Stipe cuticle dry;*  
*rosettes present.*



*Factarius imperceptus*  
Term - 9651



Pl - x 1000



Ch - x 1000

[Spores as  
in type]

Potter - 10862

LACTARIUS IMPERCEPTUS

Ithaca, Michigan, under white pine, July 21, 1956

Notes by Potter

Pileus azonate; odor none. Context turning yellow where cut.  
Latex creamy white, unchanging, old wounds tawny, tardily and weakly  
acid. Spores creamy white.

Notes by Hesler

Micro characters as in Potter-12144.

Potter - 12144

LACTARIUS IMPERCEPTUS

On soil, woods, Edgewood, Michigan, October 2, 1958

Notes by Potter

Pileus "Toltec," 11-B-7 (Mærz and Paul) (near "light pinkish cinnamon"). Odor mild. Latex sparse, white, somewhat watery, unchanging, but cut flesh becoming yellow and cut gills pinkish, tardily slightly acrid. Spores white in deposit.

Notes by Hesler

Spores 7.5-10 x 7-8.5  $\mu$ , warts 0.5-0.8(1.0)  $\mu$ , coarse, bands and a few lines, rather widely spaced, forming no reticulum. Basidia 42-48 x 8-10  $\mu$ , 4-spored. Pleurocystidia 62-74 x 7-12  $\mu$ , ventricose, apices tapering; cheilocystidia 34-46 x 5-10  $\mu$ , similar. Pileus cuticle a thin ixocutis; hypoderm brown. Stipe cuticle dry, repent, bearing more or less turf of cylindric or subclavate caulocystidia, 18-43 x 3-4  $\mu$ ; rosettes present.

Potter - 13359

LACTARIUS IMPERCEPTUS

On soil, Ithaca, Michigan, September 30, 1961

Notes by Potter

Pileus disc 7-E-11 (M + P, "tritteur tan," or "mummy brown," or near "snuff brown" Ridgway), margin paler ("India spice" or "toasted almond," M + P, 13-B-8; near "clay color," Ridgway), azonate. Context slightly acrid, odor not distinctive. Latex white, watery, unchanging, staining flesh slightly yellow.

Lamellae near "honey yellow" (Ridgway), "Dorado" (11-C-6, M + P).

Spores white in deposit.

Notes by Hesler

Micro characters as in Potter-12144.

Sm - 20944

LACTARIUS IMPERCEPTUS

Edge of bog, George Reserve, Michigan, October 3, 1945

Notes by Smith

Pileus vinaceous brown, viscid; latex acrid, azonate or very faintly ~~se~~ *zoned*.

Notes by Hesler

This resembles imperceptus, but without notes on latex-color, I can only guess: The micro characters agree with imperceptus. The box-lid says: see 9632 which also is imperceptus.

22972

*n.c.*

LACTARIUS IMPERCEPTUS

Clingman's Dome, September 14, 1958

Spores 7.5-9.5(10) x (6.5)7-8  $\mu$ , warts 0.5-1.0  $\mu$  high. Pleurocystidia,  
cheilocystidia, and gelatinous <sup>*pileus*</sup> cuticle usual.

23136

*Beards +*  
LACTARIUS IMPERCEPTUS, Burl.

On soil, in pine woods, Horse Cove, Highlands, N.C.  
Aug. 18, 1958

Pileus 3-6 cm broad, convex, finally expanded plane, at times slightly depressed with or without a small umbo, viscid, buttons "buffy brown", or dull livid (not matched) then "light vinaceous cinnamon" to "light pinkish cinnamon", at times "pinkish cinnamon", glabrous, azonate, margin even. Context thin, very thin on margin, white, unchanging; odor and taste mild or slight. Latex white, turning slowly yellow, staining gills slightly brownish or not at all, slowly acrid leaving a burning in throat.

Lamellae adnate, few forking behind, many short, close or crowded, medium broad, narrowed behind, white then "light pinkish cinnamon", edges even.

Stipe 3-8 cm long, 6-12 mm thick, "pale pinkish cinnamon", finally "pinkish cinnamon", rivulose, glabrous, base more or less white-strigose, dry, ~~solid~~ <sup>solid</sup> then hollow, equal.

Spores 8-10 x (6.5) 7-8  $\mu$ , ellipsoid to nearly subglobose, warts 0.4-0.8  $\mu$  high, reticulum of broad bands and fine lines (as in L. imperceptus, type). Basidia 38-47 x 8-10  $\mu$ , 4-spor. Pleurocystidia 42-72 x 5-7  $\mu$ , ventricose, apices tapering, rarely with capitellum, granular; cheilocystidia 27-43 x 3-5  $\mu$ , similar. Gill trama cellular. Pileus trama vesiculose. Pileus cuticle a gelatinous

over

zone (an ixocutis), 40-70 $\mu$  thick, of colorless slender hyphae,  
the terminal elements ~~of~~ more or less ~~slender hyphae~~ cystidioid.  
Stipe cuticle of dry repent hyphae; rosettes present.



*Sactarius imperceptus*

Teun - 23136



Pl - x 1000



Ch - x 1000

[Spores as in  
type of *S. imperceptus*]



Fileo -  
x 1000

28149

LACTARIUS IMPERCEPTUS

Cades Cove, Tenn., Aug. 27, 1965

Pileus 2.5-6 cm broad, convex, expanding, more or less depressed, occasionally with a conic umbo, viscid, fulvous, near "Hazel," azonate, glabrous, margin even. Context thin, acrid. Latex white, very slowly changing to yellow, acrid.

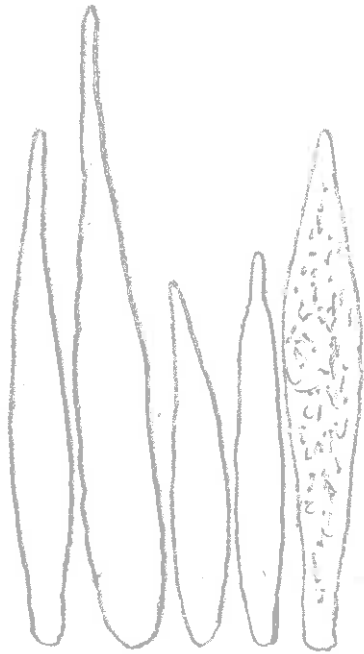
Lamellae adnate to subdecurrent or decurrent, white, close, rather narrow, not staining.

Stipe 3-6 cm long, 5-9 cm thick, concolorous or paler, slightly fibrillose, equal.

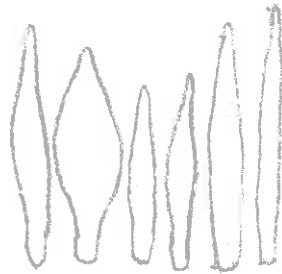
Spores (7.5)8-9.5(10) x 7-8  $\mu$ , ellipsoid, warts 0.7-1.3  $\mu$  high, bands and fine lines forming an incomplete (rarely complete) reticulum. Spore deposit failed. Basidia 38-44 x 8-10,  $\mu$ , 4-spored. Pleurocystidia 48-84 x 6-11  $\mu$ , ventricose to subulate; cheilocystidia 23-35 x 3-9  $\mu$ , subfusoid. Gill trama of short cells, slightly interwoven. Pileus trama vesiculose. <sup>Pileus</sup> cuticle of gelatinous hyphae, <sup>(insects)</sup> resting on a zone of brown hypodermial hyphae not greatly differentiated. Stipe repent, <sup>dry;</sup> ~~a thin cuticle of gelatinous hyphae~~; rosettes present.

*Sactarius imperceptus*

No. 28149



Sp. - x 1000



ch. - x 1000



29918

*imperceptus*  
LACTARIUS ~~MINUSCULUS~~ sp. nov.

On soil, oak-pine woods, Cades Cove, July 28, 1967.

Pileus 2.5-5 cm broad, with a low umbo, more or less depressed around the disc, "light vinaceous cinnamon" or "avellaneous," disc "wood brown" to "buffy brown," glabrous, viscid, azonate, margin even. Context pallid, unchanging; odor slight, taste mild to faintly subacid, becoming slightly unpleasent. Latex white, unchanging, mild.

Lamellae adnate, white, finally pinkish cinnamon, close, narrow, lamellulae, numerous.

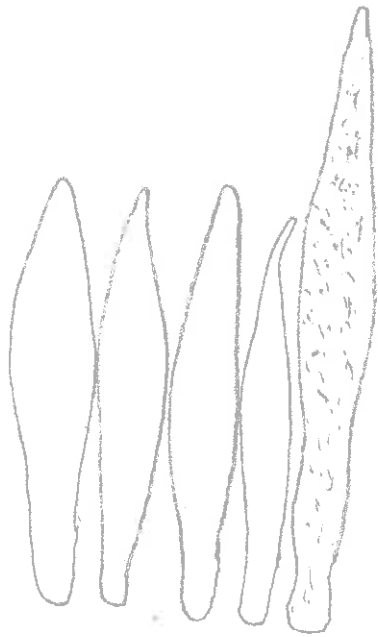
Stipe 2.5-4 cm long, 6-10 mm thick, concolorous with the pileus or paler, with a whitish bloom, more or less enlarged below, spongy, dry.

Spores white in deposit, 7.5-9.5 x 6.5-8  $\mu$ , ellipsoid to subglobose, warts 0.6-1.0  $\mu$  high, bands and lines forming a partial reticulum. Basidia 36-42 x 8-10  $\mu$ , 4-spored. Pleurocystidia 53-82 x 7-12  $\mu$ , ventricose or fusoid, granular-spangled; cheilocystidia 22-30 x 3-6  $\mu$ , similar. Gill trama of short-celled, subparallel hyphae. Pileus trama vesiculose. Pileus cuticle an ixocutis (at times a semi-ixotrichodermium); hypodermium brownish. Stipe cuticle of dry, repent hyphae; rosettes present. Clamp connections none.

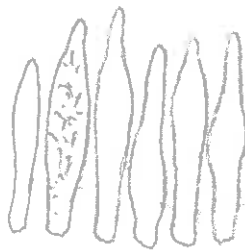
The spore deposit became pale cream after 4 years in the Herbarium. Near cognoscibilis but is smaller and azonate; also near appalachianensis but with smaller pileus and smaller spores. L. minusculus has a fulvous cap with a crenate or sulcate margin, broad lamellae, somewhat smaller spores which are somewhat reticulate; and a viscid stipe.

Same as Ammirati - 2446.

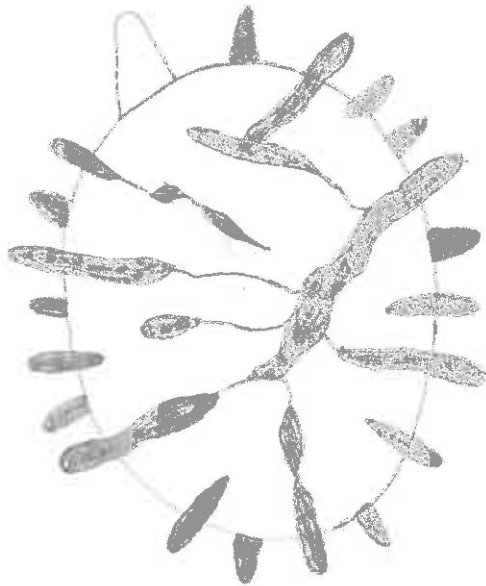
*Ractarius* ~~*puberulus*~~ <sup>*imperceptus*</sup> sp. nov.  
29918 *imperceptus*



Pl - x 1000



Ch - x 1000



Spore - x 8000

35135

LACTARIUS IMPERCEPTUS

~~W1019~~

Under rhododendron-pine, Horse Cove, Highlands, N.C., August 23, 1969

Pileus 3-5 cm broad, convex then expanded, pale brown, becoming avellaneous or more pinkish, azonate, viscid. Latex white then yellow, acrid or slightly peppery, not staining.

Lamellae close, white then creamy-pink, few or none forking, lamellulae not abundant.

Stipe 3-5 cm long, 4-7 mm thick, concolorous to pileus, equal or tapering upward, hollow, not spotted.

Spores <sup>pale cream</sup> ~~white~~ in deposit, 7-10 x 6-8.5  $\mu$ , warts 0.4-0.8 (1.0)  $\mu$ , bands nodulose, some lines, partial or no reticulum. Pleurocystidia 48-77 x 5-8  $\mu$ , fusoid-acuminate; cheilocystidia ~~34-40~~ 40 x 4-6  $\mu$ , similar. Pileus cuticle a thin ixocutis; hypodermium brownish. Stipe cuticle repent, dry; rosettes present.

37565 LACTARIUS IMPERCEPTUS Beards. & Burl.

In woods, under oak, Cades Cove, October 27, 1972

Pileus 3.5-6.5 cm broad, plano-convex, margin becoming upturned and center slightly depressed, olive-gray-brown, then finally avellaneous to pallid-tawny (not matched), viscid, with a bloom to glabrous, even. Context pale pinkish buff; odor alkaline, taste acrid. Latex white, becoming very pale yellow, staining the flesh of the stipe and cap yellow, acrid.

Lamellae white, then pale pinkish buff, close, medium broad, occasionally forking behind, lamellulae abundant.

Stipe 2-4 cm long, 6-12 mm thick, pale pinkish buff, with a bloom to glabrous, dry, equal, hollow.

Spores in deposit: "cartridge buff," 7.5-9 x 6.5-8  $\mu$ , short-ellipsoid, warts 0.4-0.7  $\mu$  high, bands and lines more or less catenulate, forming a partial reticulum. Pleurocystidia 35-68 x 4-9  $\mu$ , ventricose-acuminate; cheilocystidia 28-46 x 4-6  $\mu$ , similar. Pileus cuticle an ixocutis. Stipe cuticle dry.



Sm - 38376

LACTARIUS IMPERCEPTUS

Tapinabee pine barrens, Michigan, September 1, 1951.

Smith says: see 9632 (L. imperceptus). Spores white.

Micro characters as in type (pileus cuticle a narrow ixocutis;  
stipe cuticle a dry cutis).

Cooke - 41450

LACTARIUS IMPERCEPTUS Beards. & Burl.

On soil, under hardwoods, Highland County, Ohio, September 20, 1969

Notes by Cooke

Pileus 4-8 cm, brown to reddish brown, margin striate; odor none. Latex cream color, mild, not staining. Gills adnate, cream to pale brownish, close, yellowish where bruised. Stipe 3.5-5 cm x 9-13 mm, brown with a purplish cast.

Notes by Hesler

Spores 7-9 x <sup>small</sup> 5.5-7  $\mu$ , warts 0.3-0.5  $\mu$ , bands and lines, with branches, forming a partial reticulum. Basidia 38-44 x 8-10  $\mu$ , 4-spored. Pleurocystidia 40-66 x 6-8  $\mu$ , slender-ventricose; cheilocystidia 30-37 x 4-5  $\mu$ , similar. Pileus cuticle an ixocutis. Stipe cuticle dry; rosettes present.

Cooke - 41491

LACTARIUS IMPERCEPTUS

Under hardwoods, Hamilton County, Ohio, September 24, 1969

Notes by Cooke

Fileus brown with a reddish tinge, 4-8 cm, azonate or weakly zonate.  
Latex cream, mild, unchanging, staining yellow brown where bruised.  
Gills flesh brown. Stipe 4-6 cm x 10-18 mm.

Notes by Hesler

Micro characters as in Type.

Sm-64487

IMPERCEPTUS Beards. & Burl.  
LACTARIUS ~~SPITUS~~ PHOTO (not found)

Scattered under aspen, Rifle River Area, Michigan, September 29, 1961

~~XXXXX XXXXXXXXXX XXXXX XXXXXXXXXX XXXXX~~

Notes by Smith

Pileus 4-11 cm broad, convex-depressed with the disc shallowly depressed, in age shallowly depressed with a spreading to decurved margin, surface dry (see below) and hoary at first, "benzo brown" to "cinnamon drab" fading as if hygrophanous to "vinaceous buff" or "pale vinaceous fawn," spotted dingy grayish brown where injured, azonate, or along margin subzonate, Context thin, brittle at first flabby in age, pallid to pale vinaceous fawn,  $FeSO_4$  - dingy yellowish, KOH - 0 (but KOH yellow on epicutis) taste slowly peppery, odor none. Latex creamy-white, unchanging but staining dingy brown on bruised areas.

Lamellae close, narrow, decurrent, "pale pinkish buff" to "pinkish buff" and stained dingy-gray-brown where injured, edges even and concolor.

Stipe 4-9 cm long, 8-15 mm at apex, equal, solid, fragile, surface pallid, not viscid, naked, base slightly white tomentose and wounds gray-brown.

Spore deposit - pale cartridge buff to pale cream color ("B") may appear white in a thin deposit.

Notes by Hesler

Spores 8-10 x 6-7.5  $\mu$ , warts 0.2-0.5  $\mu$ , bands and branches forming a partial or rarely a complete reticulum. Basidia 37-42 x 7-8  $\mu$ , 4-spored. Pleurocystidia 62-76 x 8-11  $\mu$ , ventricose-acuminate; cheilocystidia 38-62 x 5-7  $\mu$ , similar. Gill trama of undulating-subparallel hyphae. Pileus trama vesiculose. Pileus cuticle a narrow gelatinous to subgelatinous zone--an ixocutis. Stipe cuticle dry, repent; rosettes present.

~~This is a puzzling collection: it seems to agree best with collections of L. vistus from Bas (Netherlands); the pileus stains grayish brown where injured. One problem: the latex is described as creamy-white at first.~~

Sm-64128

LACTARIUS INCANUS sp. nov.

→ Type

On Nelson's lawn, Glenwood Road, Ann Arbor, Michigan,

September 7, 1961

Notes by Smith

Pileus 4-8 cm broad, convex-depressed, expanding to shallowly vase-shaped, rarely with a slight papilla in depression, color evenly "Hayes brown" to "russet vinaceous" paler in age and when faded (subhygrophanous), at maturity the margin faintly striate when wet, zonate to azonate, typically azonate when faded, hoary overall at first, never viscid. Context vinaceous buff; odor none, taste slowly slightly acrid,  $\text{FeSO}_4$  - grayish; KOH brown. Latex white, scanty, unchanging, rarely staining darker brownish.

Lamellae adnate to short-decurrent, "pale vinaceous pink," becoming darker ("vinaceous fawn"), rarely stained darker brownish, crowded, narrow, edges even.

Stipe 2-6 cm long, 10-18 mm thick, equal, hollow, fragile, concolor with cap or paler and hoary at first, naked after handling, not changing color much from youth to age.

Spore deposit "pinkish buff" or a little paler ("pale pinkish cinnamon.")

Notes by Hesler

Spores "pale pinkish cinnamon" in deposit, 6.5-8.5 x 5.5-7  $\mu$ , ellipsoid, warts 0.2-0.5  $\mu$  high, often rather obtuse, a few isolated bands and branches forming a partial reticulum,

sterigmal appendage inconspicuous. Basidia 35-42 x 7-10(11)  $\mu$ , (2)4-spored. Pleurocystidia 47-64 x 3-6(7)  $\mu$ , slender-fusoid to sub-aciculate or subventricose, acuminate, granular, inconspicuous; pseudocystidia filamentous, 2.5-3.5  $\mu$  broad; cheilocystidia 24-33 x 3-6  $\mu$ , ventricose, apices at times subcapitate, granular. Gill trama distinctly cellular, the cells 15-54 x ~~10/1~~ 10-22  $\mu$ , parallel or subparallel; subhymenium a narrow zone of flattened hyphal cells. Pileus trama vesiculose. Pileus cuticle <sup>a cutis, bearing</sup> floccose-tangled <sup>hyphae,</sup> the terminal elements at times as pileocystidia, 23-60 x 5-15  $\mu$ , cylindrical or subclavate, erect to decumbent (no turf). Stipe cuticle of repent hyphae bearing scattered or numerous more or less cylindrical caulocystidia, 20-45 x 3-5  $\mu$ ; rosettes present. Clamp connections none.

This is distinguished by its striate pileus and its color and hoariness; scanty, acrid, unchanging latex; and slender, tapering, inconspicuous pleurocystidia. It is near L. boughtoni in which the pileus is walnut brown, azonate, even; and different pleurocystidia. After being dried and stored, it has the odor of fenugreek--as in L. camphoratus.

Sm-64369 is the same.

*Pectaricus incanus* sp. nov.

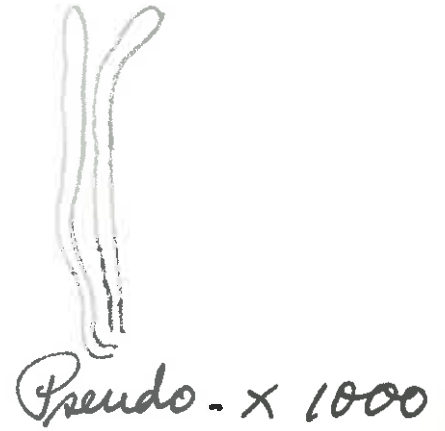
Sm-64128 - Type



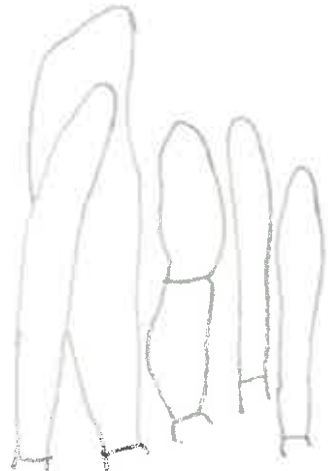
Pl - x 1000



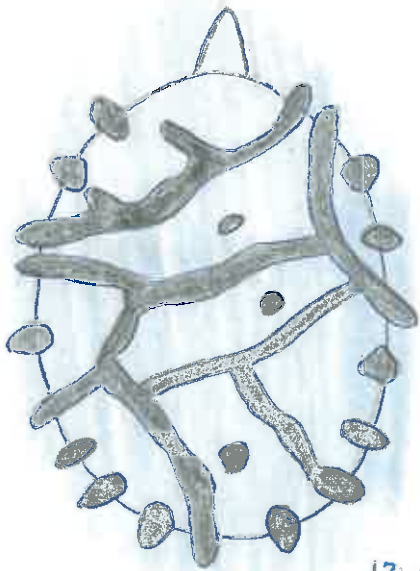
Ch - x 1000



Pseudo - x 1000



Pileo - x 1000



Spore -  
x 8000

136D



*Haetarium incanum* sp. nov.

Sm-64128 - Type



1602 -

(Pileus entire x 1000  
bearing  $\pm$  repent to  
erect hyphae + files.)

*incanus*

Sm-57337      LACTARIUS ~~QUIETUS~~ var. ~~AMERICANUS~~ var. nov.  
Tapinobee Barren, July 14, 1957

Spores 7-9 x 6-7.5  $\mu$ , similar to Bas (TENN 23913).  
Pleurocystidia 46-63 x 5-7  $\mu$ , ventricose-acuminate; cheilocystidia 28-40 x 4-5  $\mu$ , similar. Pileus cuticle an ixocutis; hypodermium brown. Stipe cuticle of repent, dry hyphae, vertically disposed; rosettes present.

The pileus ixocutis shows greater gelatinization in mature caps than in European collection (Bas, Tenn 23913).

*incanus*

Sm-57338 LACTARIUS ~~QUIETUS~~ var. AMERICANUS

Tapinabee, July 14, 1957

Spores 7.5-9 x 6-7.5  $\mu$ ; all micro characters as in Tenn. 23913 (from Netherlands), except Smith's collection slightly paler. Pleurocystidia and cheilocystidia as in Sm-57337. Pileus cuticle a colorless zone, of more or less repent, interwoven hyphae, at times subgelatinous. Stipe cuticle of dry, repent hyphae; rosettes present.

Sm-64369

LACTARIUS INCANUS sp. nov.

Dieterli's woods, Ann Arbor, Michigan, September 18, 1961. (Smith

~~says: see CARD 64128. But he says Sm-64369 has a mild taste, latex watery, and spores "pale pinkish buff").~~

Notes by Hesler

6.5-8.5

Spores ~~6.5-8.5~~<sub>λ</sub> x 5.5-7 μ, ellipsoid, warts 0.2-0.5 μ, bands and branches forming a partial reticulum. Basidia 36-42 x 7-10 μ, 4-spored. Pleurocystidia 46-63 x 4-6 μ, slender-ventricose, apices tapering, scattered, inconspicuous; cheilocystidia 27-34 x ~~φ~~ 3-5 μ, similar. Pileus cuticle a hyphal tangle - the terminal elements cystidioid.

Otherwise as in Sm-64128.

*incanus*

Sm-72089    LACTARIUS ~~QUIETUS~~ var. ~~AMERICANUS~~ var. nov.

Sugar Island, Michigan, August 14, 1965

Notes by Smith

Cap dark mahogany, zoned paler, testaceous when faded.  
Latex watery-whey-like, mild.

Gills close, narrow, decurrent, pale vinaceous tawny.

Stipe concolor with cap, dry.

Spore deposit: "pale pinkish buff."

Notes by Hesler

Spores (6.5)7-9 x 5.5-7  $\mu$ , warts 0.3-0.8  $\mu$  high, bands forming a partial reticulum. Pleurocystidia 46-70 x 6-9  $\mu$ , ventricose-acuminate; pseudocystidia filamentous, 3-4  $\mu$  broad; cheilocystidia 30-42 x 4-6  $\mu$ , somewhat similar. Gill trama of narrow, subparallel hyphae. Pileus cuticle an ixocutis, in some sections gelatinization distinct in others sub-gelatinous. Stipe of repent, dry hyphae, bearing scattered caulocystidia, 30-60 x 4-5  $\mu$ , subcylindric, at times slightly constricted; rosettes present. Clamps none.

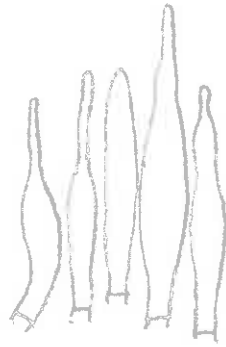
The whey-like milk is a deviation (cap perhaps old); otherwise it seems to be same as other collections from Michigan.

*Saxtarinus quatuor* (Fr.) ~~var. americanus var. nov.~~

Sm - 72089 incanus



Sp. - x 1000



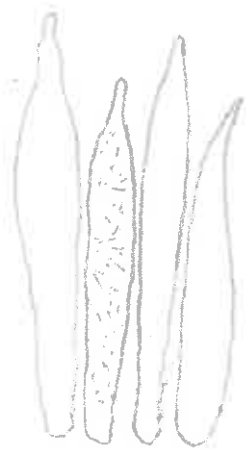
Ch. - x 1000



Caulo.

x 1000

*Sactrinus quietus* var. ~~americanus~~ var. ~~sur.~~  
Sim-73170 *incanus*



Pl - x 1000



Ch - x 1000

*incanus*

Sm-72564 LACTARIUS ~~QUESTUS~~ var. ~~AMERICANUS~~ var. nov.

Gregarious on golf course, Ypsilanti, Michigan, September 11, 1965

(cf. Sm-72089)

TYPE

Notes by Smith

Pileus 4-10 cm broad, convex-depressed becoming shallow funnel-shaped, glabrous, viscid when wet, hygrophanous, when moist zonate, azonate when faded, "Cameo brown" to "burnt umber," about "fawn color" when faded, margin oftentimes wavy in age. Context fragile, odor slight, taste disagreeable (not acrid). Latex scanty, milk-like, watery in old basidiocarps, not staining, taste mild.

Lamellae decurrent, pallid then fawn color, spotted in intermediate stages, close, narrow, lamellulae present.

Stipe 3-6 cm long, 10-20 mm thick, concolorous with pileus or at first hoary, more or less equal, fragile, stuffed, dry.

Spore deposit pale pinkish buff.

Notes by Hesler

Spores "pale pinkish buff," 7-9 x 5.5-7  $\mu$ , warts 0.3-0.7(0.8)  $\mu$ , at times isolated, bands and branches forming a partial reticulum. Pleurocystidia 50-64 x 5-8  $\mu$ , ventricose-acuminate; cheilocystidia 22-38 x 4-6  $\mu$ , similar. Pileus cuticle a well-defined ixocutis, the zone, 160-200  $\mu$  thick, hyphae interwoven; hypodermium none. Stipe cuticle of dry, repent hyphae, bearing scattered or pyramidal tufts of caulocystidia, 32-66 x 4-6  $\mu$ , cylindrical; rosettes present. Clamp connections none.



*incanus*

Sm-73170 LACTARIUS ~~QUIETUS var. AMERICANUS var. nov.~~

Barry Co., Michigan, Sam Mazzer, August 24, 1966

Spores 7-9.5 x 6-7.5  $\mu$ , warts 0.3-0.8  $\mu$ , bands and branches forming a partial reticulum. Pleurocystidia 43-56 x 5-10  $\mu$ , ventricose to subulate, acuminate; cheilocystidia 30-35 x 4-5  $\mu$ , similar. Pileus cuticle an ixocutis, hyphae repent and interwoven. Stipe cuticle of repent, dry hyphae; cortex with rosettes.

*incanus*  
Sm - 81014 LACTARIUS ~~DRYOPHILUS~~ sp. nov. ~~Sm~~

Scattered under oak, Oak Grove, Michigan, October 18, 1971  
(near subdulcis of English Foray)

Notes by Smith

Pileus 4-9 cm broad, convex-depressed, becoming vase-shaped, soon rimulose-areolate near the margin, short sulcate at times in age, more or less "vinaceous fawn," with "army brown" watery zones, azonate when faded and then evenly colored or disc more vinaceous. Context vinaceous buff, dry, brittle; odor none (and none when-dried), taste slowly peppery; KOH on cuticle olivaceous, FeSO<sub>4</sub> none. Latex white or whey-like to watery, staining gills darker.

Lamellae decurrent, pallid vinaceous becoming nearly "fawn color" (vinaceous over all), staining darker in age (near "army brown"), close, moderately broad.

Stipe 6-9 cm long, 10-17 mm thick, brittle, surface finally "sorghum brown" over all (darker than cap), context vinaceous buff, equal, solid, dry, unpolished.

Spore deposit: "pinkish buff."

Notes by Hesler

Spores 5.5-7.5(8) x  $\beta\phi$  5-6.5(7)  $\mu$ , warts 0.3-0.6(0.8)  $\mu$  high, bands forming a partial reticulum. Pleurocystidia 56-78 x 6-8  $\mu$ , ventricose-acuminate; cheilocystidia 32-38 x 4-6  $\mu$ , slender ventricose-acuminate, absent in some sections.

Pileus cuticle a dry trichodermium, many terminal elements as clavate pileocystidia, more or less in large tufts or group, cuticular hyphae repent between tufts; hypodermium none. Stipe cuticle similar to pileus, caulocystidia often in tufts; rosettes present.

Near L. marquetteensis which differs in size, is darker, azonate, has fungoid-pungent odor, disagreeable taste, latex not staining, the gills, spore-deposit "cream color."

~~It is~~ <sup>It is</sup> a sp. nov. - in Sect. Rimoselli.

*Sactarius <sup>incanus</sup> dryophilus* sp. nov.

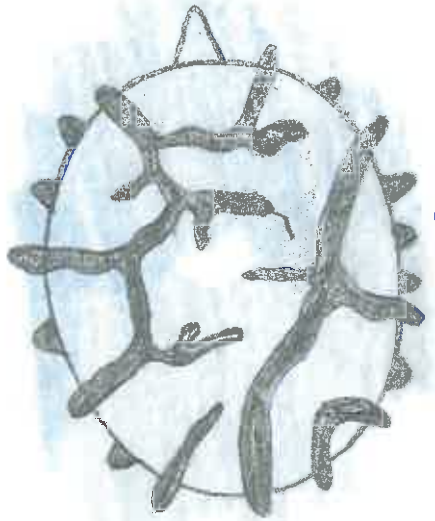
Sm. 81014 - Type



Pl x 1000



Ch x 1000



Spore x 8000

Sm-81024

*McCann*  
LACTARIUS ~~BRYOPHILLUS~~ sp. nov.

Under oak, Cedar Lake, Washtenaw Co., Michigan,

October 20, 1971

Notes by Smith

Pileus 4-10 cm broad, convex-depressed, expanding shallowly funnel-shaped, appearing glabrous but under lens rimulose-areolate, when moist "pecan brown," darker watery spots, streaks, and zones, margin "avellaneous" to "vinaceous buff," margin short-sulcate at times in age, when faded near "vinaceous fawn." Context thin, pallid to pale dull vinaceous buff, unchanging when cut; odor slight, taste mild then weakly peppery. Latex scanty, whey-like (almost watery), slowly peppery.

Lamellae adnate, pale vinaceous fawn, becoming dull "light vinaceous cinnamon," close, medium broad.

Stipe 3-5 cm long, 8-15 mm thick, vinaceous tawny, base strigose, concolor or darker, dull, dry, equal.

Spore deposit "pinkish buff."

Notes by Hesler

Spores (5.5)6-8 x 5-6.5(7)  $\mu$ , warts  $\emptyset/\text{width}$  0.3-0.6(0.8)  $\mu$ , bands forming a partial reticulum. Pleurocystidia 52-76 x 6-8  $\mu$ , slender-ventricose-acuminate; cheilocystidia 30-36 x 4-6  $\mu$ , similar. Pileus cuticle dry, trichodermial, terminal elements clavate (pileocystidia), in large tufts. Stipe cuticle similar to pileus cuticle; rosettes present.

Sm-81024

*AMCR11111*  
L. ~~dryophilus~~ - page 2

This is the same as Sm-81014, except that the rimose-areolate condition is less accentuated than in 81014.

Hillhouse - 130

LACTARIUS INDIGO

Near willow oak, Liverpool, Texas, May 27, 1970

Notes by Ervin Hillhouse

Cap light blue with a silvery sheen, concentric zoning, 4.0 to 9.0 cm at maturity, margin acutely enrolled when immature, slightly enrolled when mature, depressed at center, short trumpet-shape to funnel-shape, cuticle overlapping gills, flesh dark blue or indigo-blue, fairly thick, (0.5 to 0.8 cm near stem). Latex blue and unchanging. Odor fairly strong, a little musky and perhaps "rain-water aromatic." Raw taste slightly musky, first mild then slightly acrid.

Gills dark blue, decurrent, of many lengths, some forked, fairly close but ~~not~~ not crowded, shallow.

Stem same color as cap, 3.0 to 5.0 cm long, 1.0 to 2.0 cm thick, firm, brittle, hollow; when cut or bruised the stem exudes a blackish latex, equal, generally curved at bottom.

Spores creamy white, (butter yellow on white paper) shape irregular, some spherical and some broadly elliptic, echinate, a few apiculate.

Notes by Hesler

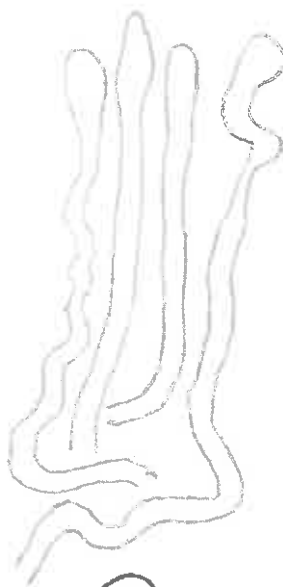
Spores (6)7-9 x 5.5-7  $\mu$ , ellipsoid, warts short (0.3 or less), bands and branches close set forming a partial reticulum. Pleurocystidia none found; pseudocystidia filamentous, 4-6  $\mu$  broad, brown in KOH; cheilocystidia 23-30 x 4-6  $\mu$ , subventricose to subclavate. Pileus and stipe cuticle an ixocutis.

*Factarins indigo*

Hillhome 130  
(Texas)



oh x 1000



Pseudo  
x 1000



In pine woods, Brazoria Co., Texas, December 26, 1970

Notes by Hillhouse

Cap dark blue when young and fresh, gray-blue with a silvery sheen when dry, becomes gray-green to olive-green when old, viscid or slimy when wet and during damp weather; dry, slightly rough and almost velvety when dry. Sometimes flat, sometimes flat and with the center depressed, sometimes broadly convex or rounded across the top, sometimes slightly funnel-shaped; rarely an immature specimen will be found that is convex and with the margin inrolled. About 3.0 to 5.0 cm across when mature, zoning visible in mature specimens only, obscurely striate to distinctly striate at the margin. Flesh white but quickly changing to dark blue from the latex which is copious, about 0.3 to 0.5 cm thick near stem tapering to thin at margin. Latex deep indigo-blue, stains blue on white paper and is unchanging. Flesh turns green where cut or bruised after about thirty minutes to an hour; odor and taste none.

Gills about same color as cap, become green with age, decurrent, to long decurrent, 0.3 to 0.7 cm deep halfway between margin and stem tapering to shallow at margin, about 16 to 19 per cm at margin, of several lengths with many of intermediate or short length at margin, short ones ventricose or bow-shaped, quickly turn dark indigo-blue where cut or bruised and then slowly to gray-green or olive.

Stem about same color as cap, 1.5 to 2.3 cm long, 0.5 to 0.8 cm thick, sometimes solid, sometimes hollow, tapers downward.

Spores white, subglobose to spherical, some apiculate, rough to verrucose, 6.3 to 8.2 microns. Basidia 4-spored, almost equal to tapering upwards, projecting from the hymenium about 20-25  $\mu$ , about 7.0 to 10  $\mu$  thick. Sterigma about 7.0  $\mu$  long by 0.5  $\mu$  thick. Pleurocystidia not apparent. The face or edge of the gills are heavily adorned with long slender, sometimes segmented appearing cystidia - these are found on the bottom edge and not the lateral sides.

Notes by Hesler

Spores 6-8.5 x 5.5-7  $\mu$ , warts 0.2-0.4  $\mu$ , bands and branches forming a partial to almost complete reticulum. Pleurocystidia none to extremely rare (then 52-60 x 6-8  $\mu$ , more or less clavate-appendiculate to ventricose); pseudocystidia dark brown, more or less filamentous, 3-5  $\mu$  broad; cheilocystidia 28-37 x ~~36~~ 3-6  $\mu$ , ventricose, scattered. Pileus cuticle a distinct ixocutis; hypodermium none. Stipe cuticle a thin ixocutis; hypodermium none; rosettes present. Clamp connections none.

The spore-size varies slightly from one collection to another; but in this collection the dimensions given above are rather constant in the several fields examined. The basidiocarps in this collection are smaller than usual.

Bartelli - 2251

LACTARIUS INDIGO

August 24, 1964, Michigan.

Spores 7.5-8.5 (9-10) x 5.5-7  $\mu$ , warts 0.2-0.5  $\mu$  high, more or less reticulate. Basidia 38-43 x 8-10  $\mu$ , 4-spored. Pleurocystidia 45-53 x 3-6  $\mu$ , aciculate, granular, inconspicuous, mostly near edges; pseudocystidia present; cheilocystidia 26-43 x 5-6  $\mu$ , flask-shaped or ventricose. Pileus cuticle gelatinous; trama vesiculose (no rosettes). Stipe cuticle of brown, repent hyphae; cortex with rosettes, and vesiculose cell-groups.

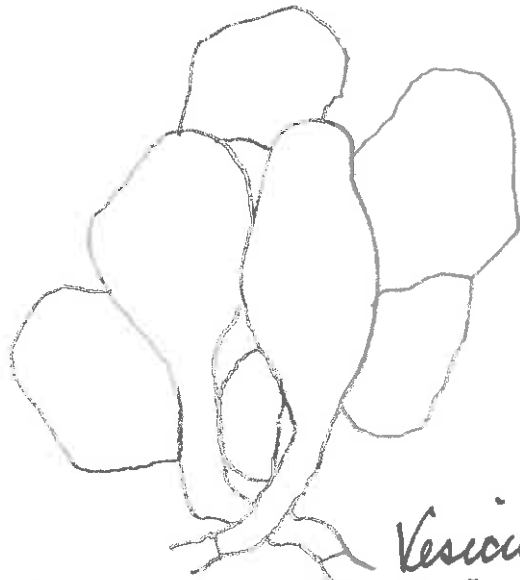
*Factarium indigo*  
Bartelli - 2751



Ph - x 1000



Ch - x 1000



Vesiculate cell-  
groups in pileus  
trama (two shown as  
swollen hyphal ends)

- x 1000

Isaacs - 2313

LACTARIUS INDIGO

Under willow oak and crataegus, Gainesville, Florida, July 12, 1965

(Labelled L. indigo; no notes)

Notes by Hesler

Spores usual. Pleurocystidia none found; pseudocystidia filamentous, yellow-brown; cheilocystidia rare. Pileus cuticle an ixocutis. Stipe cuticle repent, dry, at times bearing cylindric caulocystidia; rosettes present. Yellow-brown lactifers abundant in gill- and pileus-tramæ.

Isaacs - 2372

LACTARIUS INDIGO

Under live-oak, Gainesville, Fla., July 19, 1965

Notes by Isaacs

Pileus 8.5-9.3 cm, depressed, zonate, greenish-blue. Stipe 2.4-3  
cm x 15-17 mm, bluish, scrobiculate. Lamellae decurrent, close.

Apparently okay.

3275

LACTARIUS INDIGO

Huntington Co., Pa., Overholts, October 4, 1933.

Spores, etc., as usual.

5419

LACTARIUS INDIGO

Under pine, Rich Mt., August 14, 1934.

Spores 6.5-8.5(9) x 5.5-6.5  $\mu$ . Otherwise typical.



5420

LACTARIUS INDIGO

Cades Cove, leg. Sharp, August 12, 1934.

Spores 6.5-8.5 x 5.5-6.5  $\mu$ . Otherwise usual.

5421

LACTARIUS INDIGO

Knox Co., Tenn., August 19, 1934.

Spores 7-8.5(9) x 5.5-7  $\mu$ . Otherwise usual.

6288

LACTARIUS INDIGO

Montvale Springs, Tenn., August 23, 1934.

Spores 6.5-8.5 x 5.5-7  $\mu$ . Otherwise usual.

6576

LACTARIUS INDIGO

Knox Co., October 6, 1934.

Spores 7-9(10) x 5.5-7  $\mu$ . Otherwise usual.

6577

LACTARIUS INDIGO (Schw.) Fr.

Knox Co., December 17, 1934.

Spores 7-9.5 x 5.5-7.5  $\mu$ . Pleurocystidia rare;  
cheilocystidia 25-33 x 4-6  $\mu$ , ventricose, fusoid,  
scattered. Otherwise typical.

*Factarium indigo*

6577



Pl - x 1000



Ch - x 1000

6578

LACTARIUS INDIGO

Soil, under pine, Clinton, Tenn., October 20, 1934.

Spores 7-9 x 5.5-6.5  $\mu$ . Otherwise usual.

7060        LACTARIUS INDIGO

Cades Cove, August 30, 1934.

Spores 6.5-8.5 x 5-6.5  $\mu$ . Otherwise usual.



7061

LACTARIUS INDIGO

Cades Cove, August 27, 1934.

Spores 7-9 x 5.5-7  $\mu$ . Otherwise usual.

7062

LACTARIUS INDIGO

Forrester Ridge, N.C., GSMNP, Sharp, August 6, 1934.

Spores 7-9 x 5.5-7  $\mu$ . Otherwise typical.

7206

LACTARIUS INDIGO

Under red cedar, New Hopewell, August 27, 1934.

Spores 6.5-8 x 5.5-6.5  $\mu$ . Otherwise usual.

Pileus (dried) a grayish-tawny (not matched) -  
a color rather usual for dried pilei.

9580

LACTARIUS INDIGO

New Hopewell, Knox Co., October 17, 1936.

Spores 7-9 x 5.5-6.5  $\mu$ . Otherwise usual.

11734                    LACTARIUS INDIGO

Indian Creek, N.C., August 14, 1938.

Spores 6.5-8.5 x 5.5-7  $\mu$ . Otherwise usual.

11757

LACTARIUS INDIGO (Schw.) Fr.

New Hopewell, September 16, 1938.

Spores 6.5-8.5 x 5.5-7  $\mu$ . Stipe cuticle a zone of perpendicular, colorless hyphae which appear to show gelatinization--an ixocutis.

11765

LACTARIUS INDIGO

Rich Mt., Blount Co., September 15, 1938.

Spores 7-8.5 x 5.5-7  $\mu$ . Otherwise usual.

17098            LACTARIUS INDIGO (Schw.) Fr.

Cades Cove, L.R.H., August 8, 1945.

Pileus 3-5 cm broad, "burn blue" to "light  
neropalin blue". Context (and milk) "clear windsor  
blue," to "dull violaceous blue."

Spores 6.5-8.5 x 5.5-7  $\mu$ . Otherwise usual.



17398

LACTARIUS INDIGO (Schw.) Fr.

Purchased on market, Pueblo, Mexico, by Mrs. A. J.

Sharp, August 4, 1945.

Spores 7-8.5 x 5.5-7  $\mu$ . Otherwise usual.

19319

LACTARIUS INDIGO (Schw.) Fr.

Pileus (3)5-15 cm broad, convex-umbilicate, becoming plane to depressed or infundibuliform, "burn blue" to "light neropaline blue," fading, more or less zonate, viscid, margin even. Context firm, "clear windsor blue" to "dull violaceous blue;" odor mild, taste soon bitter, then slightly acrid. Latex blue, concolorous with flesh.

Lamellae short-decurrent, broad, close, concolor to pileus, finally yellowish to greenish.

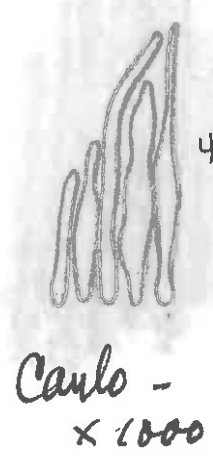
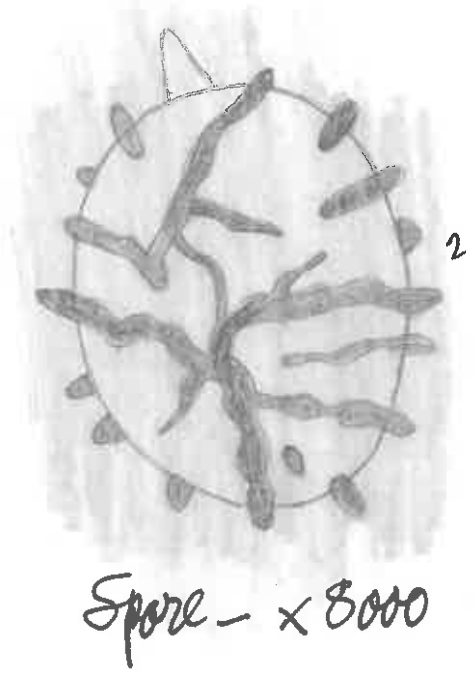
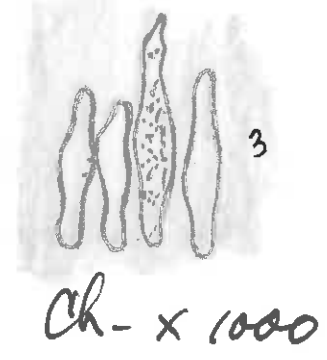
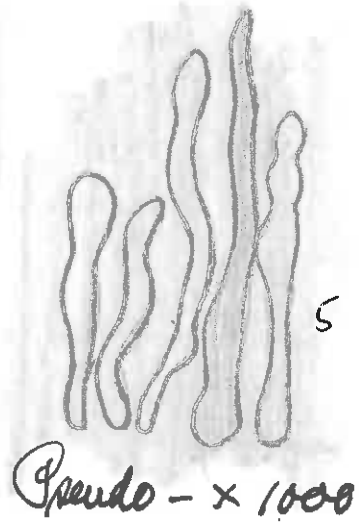
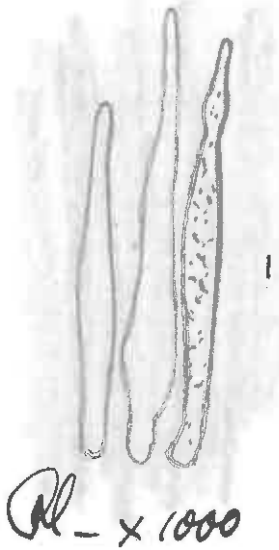
Stipe 3-5 cm long, 10-20 mm thick, concolorous to pileus or paler, at times spotted, glabrous, finally hollow, tapering downward slightly.

Spores "cream color" in mass, 7.5-8.5 x 5.5-7  $\mu$ , ellipsoid, warts 0.3-0.6  $\mu$  high, bands at times forming a slight reticulum. Pleurocystidia 46-60 x 5-8  $\mu$ , rather inconspicuous, projecting slightly, subfusoid, apices tapering, granular; pseudocystidia 33-54 x 3-6  $\mu$ , often flexuous, at times collapsed; cheilocystidia 20-32 x 4-5  $\mu$ , fusoid, granular. Gill trama irregularly cellular, with prominent, brownish lactifers; subhymenium of small, compact, colorless cells. Pileus cuticle a prominent, gelatinous zone, 150-350  $\mu$  thick. Stipe cuticle a distinct, colorless zone, the hyphae gelatinized; rosettes present. Caulocystidia 18-37 x 2-4  $\mu$ , cylindric, ventricose, scattered, or in small fascicles. Clamp connections none.

Singer (1957) found it under oak in Mexico; also in pine woods of the Distrito Federal, where it comes on the markets.

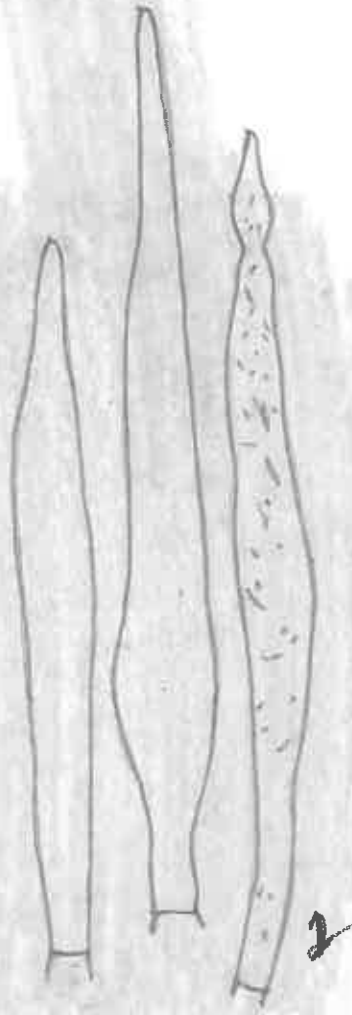
*Factarium indigo*

19319

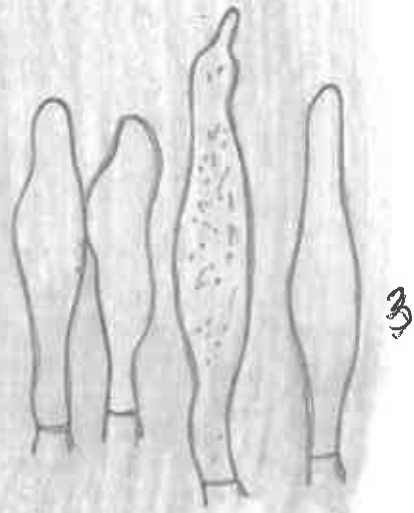


*Bacterium indigo*

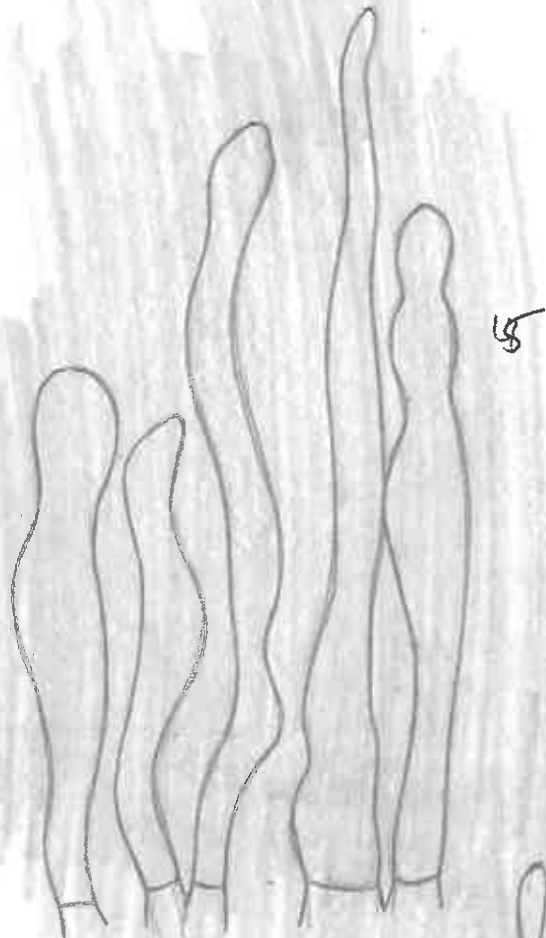
19319



Pl - x 2000



Ch - x 2000

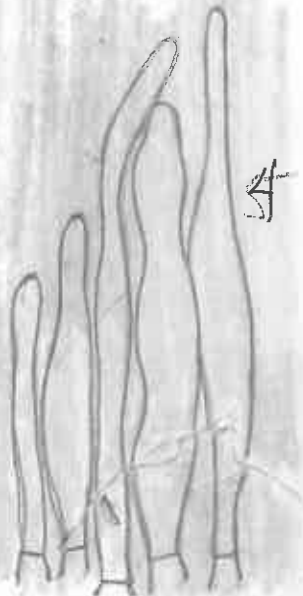


Caules x 2000



Spore - x 8000

Pseudo x 2000





19319 - *Lactarius indego* (Schw.) Fr.

19738

LACTARIUS INDIGO (Schw.) Fr.

Natural Arch Nat'l. Forest, McCreary Co., Ky.,

September 17, 1950.

Spores 7-8.5 x 6-7  $\mu$ . Otherwise typical.

19808

LACTARIUS INDIGO

Tamaulipas, Mexico, Sharp, August, 1950.

Spores 6.5-8.5 x 5.5-7  $\mu$ . Otherwise typical.

21936

LACTARIUS INDIGO

In deciduous woods, Cades Cove, August 6, 1955.

Spores 7-8.5 x 5.5-6.5  $\mu$ . Stipe cuticle a distinct gelatinous to subgelatinous zone of repent hyphae - an ixocutis.



21974

LACTARIUS INDIGO

Ida Cason Gardens, Chipley, Ga., August 3, 1955.

Spores in deposit yellowish ("Naples yellow"),  
6-8 x 5.5-6.5  $\mu$ . Otherwise usual.

23247

LACTARIUS INDIGO

Under oaks, Ocala, Fla., Thiers, August 1, 1958.

Spores 6-8 x 5.5-6.5  $\mu$ . Otherwise usual.

23744

LACTARIUS INDIGO

PHOTO

In pine woods, Oak Ridge, Tenn., October 21, 1960.

Spore 7-8.5 x 5.5-7  $\mu$ . Otherwise usual.



23744 - *Lactarius indigo* (Schw.) Fr.

23787

LACTARIUS INDIGO

DeSoto State Park, Ala., October 8, 1960, *leg. Sharp*

Pileus (dried) is grayish olive-buff.

Spores 6-8.5 x 5.5-6.5  $\mu$ . Otherwise typical.

24965

LACTARIUS INDIGO

Herndon's, Maloney Road, Knox Co., October 12, 1962.

Spores "Naples yellow" in deposit, 6.5-8.5 x  
5.5-7  $\mu$ . Otherwise typical.

25648      LACTARIUS INDIGO (Schw.) Fr.      PHOTO  
Under oak, Cades Cove, July 9, 1963.

Spores 6-8(8.5) x 5.5-6.5  $\mu$ . Otherwise usual.

26320

LACTARIUS INDIGO

PHOTO

Metcalf Bottoms, GSMNP, August 31, 1965.

Pileus (dried) grayish to grayish buff or grayish tawny.

Spores 6-8.5(9) x 5.5-7  $\mu$ . Otherwise typical.





26320 - *Lactarius indigo*



26320 - *Faetarius indigo*

26531

LACTARIUS INDIGO

On soil, pine woods, near Walland, Tenn., September 1, 1964.

Spores 6-8.5 x 5.5-7  $\mu$ . Otherwise typical.

26625

LACTARIUS INDIGO

In rich humus, Transylvania Co., N.C., leg. Petersen,  
July 11, 1963.

Notes by Petersen

Macrochemical tests - KOH: pileus cuticle, stipe  
flesh, and stipe cuticle pale watery orange; hymenium  
dingy orange.

Notes by Hesler

Spores 7-8.5 x 5.5-6.5  $\mu$ . Otherwise typical.

26828

LACTARIUS INDIGO

In oak-pine woods, Cades Cove, Tenn., August, 1964.

Spores 6-8.5 x 5.5-6.5  $\mu$ . Otherwise typical.

26912

LACTARIUS INDIGO

Macon Co., N.C., August, 1964.

Pileus subzonate.

Spores 6-8.5 x 5.5-6.5  $\mu$ . Otherwise typical.

28213

LACTARIUS INDIGO

Cades Cove, September 3, 1965.

Spores 7-9 x 5.5-7  $\mu$ . Otherwise usual.

29231

LACTARIUS INDIGO

PHOTO

On soil, pine woods, Cades Cove, August 25, 1966.

Dried pileus grayish olive.

Spores 6-8.5 x 5.5-7  $\mu$ . Otherwise usual.





29231. *Lactarius indigo*

29426

LACTARIUS INDIGO

In pine woods, near Walland, October 21, 1966.

Spores 7-9 x 6-7.5  $\mu$ . Otherwise usual.

35137

LACTARIUS INDIGO

PHOTO

On lawn, under pine, Dunford's, Knox County, October 13, 1969

Pileus 8-11 cm, convex then depressed, zonate (more or less distinctly so on the margin), "lilac gray" to "light Varley's gray," central portion tinged ochraceous.

Context whitish, promptly staining blue on cutting. Latex indigo blue, drying and staining greenish, taste slightly bitter-astringent.

Lamellae adnate, close, medium broad, blue, staining greenish, few forking behind, few lamellulae.

Stipe 3-6 cm x 12-27 mm, bluish, staining greenish, solid, equal.

Spore deposit: "warm buff."



35137 - *Lactarius indigo* - x<sup>2</sup>/<sub>3</sub>

35235

LACTARIUS INDIGO (Schw.)Fr.

~~XXXXX~~  
PHOTO

on soil, in Pinus taeda planting of about 35 years old,  
Flat Hollow, Campbell Co., Tenn., Sept. 8, 1970

Pileus 7-10 cm., one zonate. All parts blue then greenish.



35

35235 - *Lactarius indigo* (Schw.) Fr.

35592

LACTARIUS INDIGO

Cades Cove, GSMNP, Sept. 14, 1970, leg Jenkins

Spores in deposit: "cream color"