

Monographs of South American Basidiomycetes, especially those of the East Slope of the Andes and Brazil. 4. *Inocybe* in the Amazone region, with a Supplement to part 1 (*Pluteus* in South America)

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With Plates XII—XVIII.

The genus *Inocybe* is predominantly a mycorrhizal genus and has therefore its main distribution in the Fagales, Tilia- and conifer woods of the northern hemisphere, and in the *Nothofagus* woods of the southern hemisphere, with occasional representatives in the montane woods (*Alnus*, *Quercus*, *Pinus*) of the tropical belt and in plantations outside its main areas. Nevertheless, there are apparently a very few species in the rain forests. Their biological characters, particularly the relation to tree species in the tropics, if any, have not been studied. These species are, however, taxonomically true *Inocybes*. We have knowledge of only one single species in the Amazonas region which shall be described below. Another species has been described by Dennis from Venezuela. In the South of Brazil, in the subtropics, a third species is known. The rest of the species known from South America are ordinary mycorrhizal fungi of the *Alnus* and *Nothofagus* zones. These were already treated in earlier papers by this author (see literature). All the species keyed out below (the tropical and subtropical ones) belong in subgenus *Clypeus*.

Key to the tropical and subtropical species of South America

- A. Spines of the spores not forked or crested; spores (including spines) not larger than 9 μ 1. *Inocybe matrisdei*
- A. Spores with forked or crested spines; spores (incl. spines) 10 μ long or longer
 - B. South Brazilian species *Inocybe hyperythra*
 - B. Venezuelan species *Inocybe lasseri*

1. *Inocybe matrisdei* Sing. spec. nov. Pl. XII, fig. 1.

Pileus reddish grayish brown to tawny, rimose and at the same time squamulose, with a fine and slight whitish overcast, convex, obtuse, about 20 mm. broad. *Lamellae* argillaceous with paler or pallid edge, medium broad, close, sinuate-adnexed. *Stipe* brownish

¹⁾ Earlier contributions of this series have appeared in *Lloydia* 21 (4): 195—299 (on *Pluteus*) and *Sydowia* (in print).

pink, entirely pruinose, with a margined bulb at base, hollow or becoming hollow in age, 27×3.5 mm. Context white in the pileus, unchanging. Odor none. Spores (incl. spines) $6.8-8.3 \times 5.5-7.2 \mu$, with 11-13 short-cylindric to obtuse-conical spines or humps which project strongly ($1.3-1.6 \mu$), $1.4-1.7 \mu$ broad at their base, wall brownish. Hymenium: Basidia $24-26.2 \times 10.3-11 \mu$, clavate, hyaline, 4-spored. Cheilocystidia $18-31 \times 8.2-9.7 \mu$, making the edge not quite heteromorphous but numerous on and near edge, vesiculose to cylindric-clavate, more often vesiculose, hyaline, smooth. Metuloids somewhat more numerous on and near the edge than away from it, $35-60 \times 12.3-16.5 \mu$, ventricose-fusoid, or ventricose-ampullaceous with relatively short neck or without neck, the neck tapering upwards, wall hyaline to more often pale stramineous, thick, especially in the upper half, and particularly at the very apex, ($2-4 \mu$ diam.), muricate with coarse abundant crystals. Hyphae: Hymenophoral trama hyaline, regular, with clamp connections. Covering layers: Epicutis of pileus formed by repent, smooth hyphae with clamp connections. Pruina of stipe formed by numerous dermatocystidia all over the stipe, these being of two types, (1) metuloids, $41-48 \times 12-20 \mu$, ventricose-fusoid, some ventricose-ampullaceous, wall hyaline to pale stramineous, thick at apex, gradually becoming thinner towards the base, some with distinct crystalline apical incrustation like the hymenial metuloid, (2) ordinary pseudoparaphysis-like dermatocystidia, $13.5-19.3 \times 8-11 \mu$, sometimes even smaller, vesiculose, hyaline, smaller than the cheilocystidia, otherwise much like the latter.

On the ground in periodically inundated rain forest, about one month after recession of the water.

Material studied: Bolivia: Pando: Madre de Dios River gallery forest near Conquista, prov. Manuripi, 27-III-1956, leg. Singer B 2285 (LIL), Typus.

Latin diagnosis: Pileo brunneo, rimoso-squamuloso, obtuso, 20 mm. lato. Lamellis argillaceis. Stipite brunneolo-roseolo, pruinoso, marginatobulboso. Carne alba, inodora. Sporis asteroidibus. $6.8-8.3 \times 5.5-7.2 \mu$, cheilocystidiis vesiculosis. Metuloidibus crassi-tunicatis, muricatis, $35-60 \times 12.3-16.5 \mu$. Dermatocystidiis stipitis et metuloidibus et cheilocystidiis similibus per totam longitudinem stipitis numerosis. Hyphis fibuligeris. In hylaea inundabili ad terram. Typus in Herbario Lilloano conservatus est.

Extralimital Species

Inocybe hyperythra Rick, *Broteria* 24: 105. 1930.

The type was analysed by this author in *Lilloa* 26: 94. 1953.

Inocybe lasseri Dennis, *Bull. Soc. Mycol. Fr.* 49: 197. 1953.

The species seems to be extremely closely related, or more probably identical with the preceding one.

Supplement to *Pluteus* (part 1)

Some additional collections from regions formerly never visited by mycologists have come to my attention. They were sent to my laboratory by Dr. Dennis to whom I am very grateful for this additional material. Furthermore, some further collecting in the sub-tropical parts of the Argentine Republic has yielded some data which prove the existence of a small number of formerly unregistered forms the most interesting of which appears to be *Pluteus nigrolineatus* Murr. A few of the species entering this supplement belong in the extremely polymorphous section *Pluteus*, the "*Cervinus*-complex" where the species concept had to be adapted to the situation as it exists in nature, i. e. the existence of numerous "microspecies", constant in their locality but very closely related to neighboring forms. This concept is, as was correctly observed by A. H. Smith, comparable with that adapted in the treatment of some sections of the genus *Galerina*.

Section *Pluteus*

Key to the species²⁾

- A. Clamp connections present
 - B. Pileus glaucous . . . 1. *P. glaucus*
 - B. Pileus gray, fuscous, or black
 - C. Edges of lamellae discolorous, dark, concolorous with the pileus; cheilocystidia at least in part with brown or fuscous cell sap . . . 2. *P. aporpus* f. *porpophorus*
 - C. Edge concolorous with the sides of the lamellae; cheilocystidia all hyaline.
 - D. Pileus black, hygrophanous; stipe entirely white; growing on the earth . . . 3. *P. nigropallescentis*
 - D. Pileus brown, striate half way to the disc when moist; stipe pale buff when mature; on wood . . . 4. *P. mesosporus*
- A. Clamp connections absent (see comments to *P. aporpus* f. *porpophorus*).

1. *Pluteus glaucus* Sing. spec. nov. Pl. XII, fig. 3.

Pileus greenish-glaucous fibrillose-squamulose on pallid ground, squamule dense in the center, less so on margin, "sage-brush" color, extreme margin sometimes more or less velutinous-tomentose-striate, convex, 18 mm. broad. Lamellae white, then pink, with the edges concolorous with the squamules of the pileus

²⁾ The species described in this supplement are keyed out in this and the following keys. In the observations on each of the species, indications will be found which place it within the keys of the original monograph (Singer 1958). It is recommended to use first the keys in Lloydia 21 (4), 1958, and then the keys given in the present supplement.

and stipe, i. e. greenish glaucous, broad, ventricose, close, remote-free. S t i p e in lower part fibrillose "sagebrush" color on pallid white ground, at apex white and glabrous, in upper portion cylindrical, in lower portion gradually broadened towards the base, 42×3 (apex), 5 (base) mm. C o n t e x t white, inodorous. S p o r e s $6.8-7.5 \times 5.5 \mu$, short-ellipsoid or subglobose, smooth. H y m e n i u m: Basidia $16-24 \times 6.8-9.7 \mu$, clavate, 4-spored. Cheilocystidia $16-27 \times 11-21 \mu$, varying from hyaline to pale fuscous (in dried condition, ammonia mount), vesiculose. Pleurocystidia of the metuloid type but relatively thin-walled (wall about $0.3-0.4 \mu$ thick), hyaline, ventricose below, above attenuate or cylindrical to subcapitate, the tip with small but usually numerous (3-7) spine-like appendages, or these small appendages (up to about 4μ long) on the tip of broad obtuse excrescences or horns, thus forming secondary prongs, $44-55 \times (11)-19-26.5 \mu$. H y p h a e with clamp connections. C o v e r i n g l a y e r s: Epicutis of pileus consisting of appressed elongated elements which are attenuate towards the tip but always rounded-obtuse, some reaching as much as 20μ in diameter, but most of them narrower, pigment intracellular, sometimes indistinctly condensed, fuscidulous in dried material studied in ammonia mount.

On dead rotten wood in the upper zone of the Valdivian forest under dicotyledonous trees, solitary.

Material studied: Chile: Llanquihué, Peulla, 20-III-1959, leg. Singer M 1892 (LIL), Typus.

This species is, among the ones known to me, unique in its color. Hennings described a similarly colored variety of *P. cervinus*, var. *griseoviridis*, from the Serra de Cantareira, Brazil, but here the spores are considerably smaller than in the Southern species described here by us, and besides, the Brazilian fungus obviously belongs to a completely different floral district so that identity between the two is extremely unlikely. The type of Hennings' variety does not exist as far as I am aware.

2. *Pluteus aporpus* Sing., Sydowia 8: 122. 1954. Forma **porpophorus** Sing. f. n. Pl. XII, fig. 2, Pl. XIII, fig. 4.

P i l e u s fuscous, not rugose, fibrillose in center, innately radi-ally fibrillose and subglabrous on margin convex with slightly depressed center, 40-65 mm. broad. L a m e l l a e pink, with strongly fuliginous edges, rather broad, almost crowded, remote-free. S t i p e fuscous or fuliginous brown on whitish ground from bulb to apex slightly and finely fibrillose, $50-82 \times 5-13$ mm. C o n t e x t white, unchanging, inodorous. S p o r e s $5.5-6 \times 3.8-4.2 \mu$, short-ellipsoid, smooth. H y m e n i u m: Basidia $23-25 \times 6-6.5 \mu$, ventricose above, hyaline, 4-spored, few 2-spored. Cheilocystidia $18-48 \times 9.5-16 \mu$, making the edge heteromorphous, but occurring also near the edge

although scattered there, and forming transitions towards the metuloid type, clavate, ventricose-vesiculose, some with short, broad, and obtuse mucro, filled with a fuscidulous, sap. Metuloids $40-75 \times 16-21 \mu$, numerous, almost crowded in places, hyaline, near the edge exceptionally filled with fuscous sap, ventricose, with broad and short mucronate apex which ends in 3-5 conspicuous prongs which may be obtuse or obtuse and minutely secondarily apiculate, or acute-curved like large sterigmata, rather thin-walled except at apex where the wall reaches up to 1μ diameter. Hyphae with clamp connections (but many hyphae with clamp-less septa). Covering layers: Epicutis of pileus of repent hyphae with fuscidulous intracellular pigment; dermatocystidia of stipe singly or fasciculate erect or ascendant, extremely versiform.

On trunk of *Nothofagus dombeyi* in woods.

Material studied: Argentina: Neuquén: Lago Nahuel Huapi, Peninsula Quetrihué, 6-III-1959, leg. Singer no. M 1676 (LIL), Type of forma.

Already in Michigan 1953 it was noticed that out-of-season specimens fruiting under extreme conditions of dryness or cold weather are inclined to form a smaller number of clamp connections than usual — as far as the section *Pluteus* is concerned. The type of *P. aporpus* was collected in after-season conditions, after snowfalls and during nightly freezing temperatures. The present form seems to represent the normal seasonal (March-April!) form. This does not mean that the presence or absence of clamp connections in the *Cervinus*-group is reduced to a phenotypic or seasonally variable character, but it does mean that clamps, like any other character, must be used with a sound criterium rather than with blind dogmatism.

In the key of my South American monograph (1958), this form would key out with *P. spagazzinianus* from which it differs in stronger pigmentation in pileus, stipe, and especially the gill edges, and in smaller spores. The metuloids are also somewhat different.

3. ***Pluteus nigropallesces*** Sing. spec. nov. Pl. XIII, fig. 6; Pl. XIV, fig. 7.

Pileus black when moist, pallescent, hygrophanous, with partly whitish margin which is closely striate, otherwise smooth, campanulate-convex, 37-38 mm. broad, quite glabrous and smooth in dried material. Lamellae white, edges also white and finely serrate, crowded, rather broad, free. Stipe white, longitudinally striate, tapering upwards, solid, $80-96 \times 11-12$ mm., at apex as thin as 5 mm. diameter. Context white. Spores $7.5-9 \times 6.2-7.5 \mu$, smooth, stramineous. Hymenium: Basidia $27-37 \times 8-9.7 \mu$, 4-spored. Cheilocystidia $24-62 \times 6-21 \mu$ (e. gr. $25 \times 8 \mu$, $27 \times 11 \mu$,

36 × 18 μ, 40 × 18 μ, 55 × 21 μ, 62 × 18 μ), clavate to long-clavate, sometimes cylindric, hyaline, broadly rounded above. Metuloids 56—82 × 12—22 μ, rather numerous, especially near the edge, hyaline, thin-walled to moderately thick-walled, not very thick-walled at apex either (there wall reaching at times 1.4 μ in diameter), with always rounded and rather broad horns which are up to 3 μ long, rarely showing a secondary small tip but never bifurcate or crested, most of the 2—4 prongs upright to somewhat oblique. H y p h a e: Hymenophoral trama typically inverse, all hyphae checked with numerous clamp connections. Covering layers: Epicutis of pileus consisting of strictly horizontal to very slightly ascendant hyphae, these strongly elongate, with broadly rounded tips, often filled with fuscous brownish sap.

On the earth in tropical-montane forest, subparamo-type.

Material studied: Venezuela: Mérida: Sierra de Santo Domingo, probably about 3600 m. alt., I—VIII—1958, leg. J. J. B u z a, comm. D e n n i s no. 1781, (LIL, K), Typus (holotypus at Lillo).

This species would key out in my monograph with *P. fibulatus* from which it differs strongly in the absence of umber fibrils on the stipe. It seems to be most closely related to extralimital species such as *P. brunneidiscus* and *P. washingtoniensis*, as well as *P. subcervinus*. It differs from *P. brunneidiscus* in broader spores, and habitat, from *P. washingtoniensis* in larger stipe, concolorous margin of pileus, and habitat, from *P. subcervinus* in the fibrillose pileus, the larger spores, and apparently from all three in the characteristic black hygrophanous pileus (although at least *P. washingtoniensis* and *P. subcervinus* may have been described in the faded condition). More data on the three extralimital species compared here, see S i n g e r (1956).

4. *Pluteus mesosporus* Sing. spec. nov. Pl. XIII, fig. 5.

Pileus brown (about "tortoise shell") smooth and glabrous, striate half way to the disc when moist, 28—29 mm. broad, sub-umbonate, convex. L a m e l l a e pinkish with pinkish edges, rather close, rather broad to broad, free, remote from stipe. Stipe pale buff, fibrillose, not punctate, hollow when mature, equal, 30 × 3 mm. C o n t e x t concolorous with surfaces or more sordid gray in pileus when fresh. S p o r e s 8—10.3 × 6.8—9 μ, smooth. H y m e n i u m: Basidia 27—33—(40) × 8—9.8 μ, 4-spored. Cheilocystidia 19—59 × 9.5—23.5 μ, short to long clavate, hyaline. Metuloids on edges and sides of lamellae rather numerous, hyaline, 68—116 × 15—23.5 μ, ventricose below or in the middle, with a neck-like thinner apex (9—13 μ broad), with slightly thickened wall in lower portion (0.5—0.8 μ diameter), and strongly thickened wall in upper portion (there 1.2—2 μ diam.), with either horizontal and obtuse to acute prongs

(up to 4.5 μ long), or, in other cells, with erect obtuse or acute prongs (in this case only up to 2.7 μ long), mostly two to three of them, sometimes (at edges) none (transition to cheilocystidia), one, or four, metuloids at edge often without a cylindrical "neck". Hyphae: Hymenophoral trama inverse. Clamp connections present. Covering layers: Epicutis of pileus consisting of appressed subparallel hyphae with rounded tips in the terminal members, with fuscous-brown intracellular pigment, pigment in some locally condensed, diameter of hyphae between 6 and 16 μ .

On a tree in a forest of *Polylepsis sericea* and *Espeletia humbertii* etc., at 3440 m. (Paramo or subparamo zone).

Material studied: Venezuela: Mérida: Sierra de Santo Domingo, Laguna Negra, 31-VII-1958, leg. Dennis no. 1756 (LIL, K), Typus.

This species is likewise similar to *P. brunneidiscus*, *P. washingtoniensis* and *P. subcervinus*. It differs from all of these in the color of the stipe and the larger spore.

In the key of my monograph (1958), it would key out with *P. fibulatus* which differs in its colors.

Section *Hispiderma* Fayod

Key to the species

- A. Clamp connections present 5. *P. nigrolineatus*
- A. Clamp connections absent
 - *B. Cystidia or cheilocystidia or both filled with a pale fuscidulous sap
 - C. Spores 8 μ or even larger 6. *P. espeletiae*
 - C. Spores much smaller 7. *P. eupigmentatus*
 - B. Cystidia and cheilocystidia quite hyaline
 - D. Epicutis of pileus a trichodermium with acute or subacute-subobtuse terminal members, these often cystidioid and typically attenuated towards the thin tip, especially so in the central region of the pileus
 - D. Pileus covering consisting exclusively, or almost exclusively, even in the center, of elements with broadly rounded tip.
 - E. Pileus light gray in center and with light gray lines on pallid or white ground around the center. 9. *P. haywardii*
 - E. Pileus more distinctly pigmented
 - F. Cystidia on sides of lamellae well developed, ventricose to ampullaceous
 - G. Pileus in the larger marginal zone distinctly radially fibrillose the fibrils dissociating soon and pileus becoming rimose; spores 5.5–6.5 μ
12. *P. riberalensis* var. *missionensis*
 - G. Pileus not becoming rimose, often hygrophanous; spores larger (if spores not larger cf. "C" above; if pileus not hygrophanous, cf. "C" above) 11. *P. atriavellaneus*
 - var. *flavidopubescens*
 - F. Cystidia on sides of lamellae none, or like pseudoparaphyses 10. *P. maculosipes*

5. *Pluteus nigrolineatus* Murr., Bull. Torr. Bot. Cl. 66: 30 1939.

Pileus watery pallid with fine grayish to blackish fibrils and long pectinate and transparently striate, dry grayish and often shining, long but not deeply sulcate, the darker lines running radially and towards center more or less reticulately, in the center often forming inconspicuous small grayish to blackish squamules, not viscid, subumbonate to umbonate, the umbo often umbilicate, convex to applanate, 20—43 mm. broad. Lamellae whitish, then sordid pink, almost cinereous pink, on edges concolorous with sides, crowded to subclose, moderately broad to very broad, free; spore print the ordinary dull pink color of the *Plutei*. Stipe white, but lower portion beset with very fine blackish or steel gray longitudinal fibrils merging with the blue base, not squamulose, often shining the blue base being "glacier blue" (M&P), very slightly tapering upwards, 40—41 × 4—5 mm. Context thin, white, unchanging, fleshy. Spores 6—8.5—(10) × 4.7—5.5—(7.4) μ, short-ellipsoid, smooth. Hymenium: Basidia 48—49 × 8.7—9.7 μ, hyaline, ventricose, 4-spored. Cheilocystidia 38—68 × 7—14.5—(17) μ, hyaline, versiform, varying from ventricose or ventricose-ampullaceous to vesiculose, and to cylindric-clavate, often acute, but also rounded at the tip, often once or twice mucronate, and in this case mucro 3—6.5 μ in diameter, without prongs. Cystidia not of the metuloid type, 48—66 × 15—24 μ, hyaline, ventricose, most frequently with a short mucro which may be somewhat subcapitulate, or else tip merely broadly rounded, non-incrusted, rather numerous. Hyphae: Subhymenium consisting of very versiform elements and sometimes the terminal member of the subhymenial cells not continued into an element of the hymenium, and in this case showing a tendency to be irregularly branched, e. gr. cross-shaped, hyaline; these and the other hyphae with clamp connections. Hymenophoral trama hyaline. Covering layers: Epicutis of pileus consisting of fascicles of terminal hyphae of the cuticle which originate in the hypodermium, terminal cells 80—110—(300) × 8—11—(15) μ, acute, subacute or attenuated into a long narrow obtuse tip, rarely forked, with brownish or light fuscous intracellular pigment which is evenly dissolved or vacuolar, often with secondary clampless septa.

On trunk of *Jacaranda* (Begoniaceae), solitary.

Material studied: U.S.A.: Florida, Alachua Co., Gainesville, 8-IX-1938, leg. Murill no. F 18103 (FLAS), Typus. — Argentina: Tucumán, Capital, Garden of the Instituto M. Lillo, 28-I-1959, leg. R. Singer, no. T 3264 (LIL).

The Argentine material differs very little from the type material, and certainly not enough to justify specific separation. It would be interesting to find out whether there is a continuous area from

Florida to Tucumán, but this will probably take many more years of collecting since the species is rare in Florida as well as in Tucumán.

This is the only South American species of this section which has clamp connections, and belongs in stirps *Nigrolineatus*. See illustration Trans. Brit. Myc. Soc. 39: 175 fig. 26. 1956.

6. ***Pluteus espeletiae*** Sing. spec. nov. Pl. XIV, fig. 8.

Pileus light brown (M&P pl. 11—C—7 to 12—B—8), dry, smooth, slightly scaly in the center, convex, obtuse, with rather obtuse margin, 31—35 mm. broad. *Lamellae* pink, with pink or pale edge which is slightly crenate, broad, close, free. *Stipe* white, fibrillose, sometimes slightly discolored in the color of the pileus (longitudinal stripes), subequal, solid, 20—25 × 4—5 mm. *Context* white. *Spores* 8—8.8 × 6.8—7.5 μ, with somewhat thickened wall but nevertheless rather brittle and collapsing under pressure, short ellipsoid, smooth. *Hymenium*: Basidia 31—41 × 8.8—9.8 μ, hyaline, ventricose, 4-spored. Cheilocystidia 33—54 × 8—18 μ, hyaline, ventricose, sometimes clavate, sometimes constricted near apex to form an indistinct broad rounded mucro, which is always very short (if present). Cystidia 40—90 × 10—24 μ, with pale fuscidulous dissolved pigment in the interior, not incrustated or very slightly so, in shape much like those of *P. sulcatus*, also often with ampullaceous apex and "neck" varying from simple to double or triple and from broadly rounded at the tip to subacute, pigmentation at times so pale it may easily be overlooked. *Hypphae* without clamp connections. *Covering layers*: Epicutis of pileus consisting of parallel hyphae with the uppermost members appressed to ascendant in bunches, even suberect in the region of the central scaliness, terminal cells all strictly elongate and consistently rounded at the tip, some more ventricose than cylindric, all thin-walled, many with intracellular dissolved pigment, occasionally with slight pigment condensations.

On rotting *Espeletia* in tropical-montane woods, at 3550 m. alt. (paramo zone).

Material studied: Venezuela: Mérida: Sierra de Santo Domingo, Lago Mucudaji, 23-VII-1958, leg. Dennis, no 1720 (LIL, K), Typus.

This keys out with *P. fernandezianus* Sing. in stirps *Plautus*, but differs from *P. fernandezianus* in still larger spores, less intensely colored pileus, larger size of the carpophores, and probably also the covering of the pileus which is not tomentose on the disc and not punctate on the margin in the Venezuelan species. However, the two species are obviously closely related and have the very diluted pigment in the cystidia in common. For that reason we have thought it

necessary to make a cross reference in the key if the pigment should have been overlooked.

7. *Pluteus eupigmentatus* Sing., *Lloydia* 21: 223. 1958. Pl. XIV, fig. 9.

Additional material of this species, described *ad interim* in my monograph, has been collected in Argentina, Tucumán, Sierra de San Javier, Ciudad Universitaria, on a recently fallen tree (Dicotyledones), gregarious in subtropical forest, 20-IX-1958, leg. Singer no. 3150 (LIL). This material coincides very well with the original description except that it is somewhat larger (pileus to 15 mm. diam., stipe 14—18 × 0.7—1.4 mm.) and apparently more mature. Here, the epicuticular elements are more elongate and often attenuate to a subobtusate tip from the thickest portion upwards thus reminding one of the covering layers of the pileus in *P. aethalus*. At the same time, the fuscidulous contents of the cystidia and cheilocystidia is even less concentrated so that these cells appear very pale and their pigmentation can easily be overlooked; a majority of the cheilocystidia and all pleurocystidia of an individual section are often quite hyaline.

This species, in spite of the variability of the concentration of the pigment in the cystidia, belongs in the stirps *Aethalus*, and may be identical with *P. tephrostictus*.

8. *Pluteus yungensis* Sing., *Lloydia* 21: 232. 1958. Pl. XV, fig. 10.

Additional material of this species, described as new from the Bolivian Yungas in my monograph (1958), was found in Argentina, Tucumán, Sierra de San Javier, Ciudad Universitaria, on black earth in subtropical forest, 19-XII-1958, leg. R. Singer no T 3138 (LIL). This additional material differs in slightly smaller spores and the pileus not showing radial fibrils, although the spinules of the disc are clearly visible under a lens even in dried material. These slight differences are probably merely a consequence of the stage at which the fruiting bodies were collected; it appears that the Argentine collection is slightly younger than the Bolivian type collection. The measurements of the spores were 5.8—7.2 × 5.4—6.3 μ, most frequently about 6.3 × 5.5 μ. The cystidia were conspicuously incrustated.

When using the key to stirps *Fuliginosus* (to which the species belongs) caution is indicated as far as the distinction between *P. argentinensis*, *P. yungensis*, and *P. pluvialis* is concerned. The additional material (T 3138) approaches, to a certain degree, *P. fuliginosus* of North America, but differs in the absence of avellaneous or gray fibrils or squamules in the lower portion of the stipe, relati-

vely broader spores, and more thickly incrustated cystidia, also in the habitat (wood in *P. fuliginosus*).

9. *Pluteus haywardii* Sing., Trans. Brit. Mycol. Soc. 39: 147. 1956. Pl. XV, fig. 41.

Additional material of this species, described from Tucumán material in our monograph (1958), was found near the type locality, Parque Aconquija, 3-II-1959, leg. S i n g e r no. T 3268 (LIL) in which the spores were in their majority subglobose while still a considerable number was globose. The preponderance of subglobose/globose spores is rather variable and that therefore the assumption that the material collected by D u s s in the West Indies and determined (erroneously) by P a t o u i l l a r d as *Pluteus alborubellus* is indeed the same species. This means a considerable extension of area. It is expected that *P. haywardii* will be discovered in Brazil and the Guyanas.

10. *Pluteus maculosipes* Sing. spec. nov. Pl. XV, fig. 42.

Pileus pinkish, dotted with very minute brown squamules, thin and translucent, convex with slightly depressed center, eventually more applanate, 15—24 mm. broad. Lamellae pink, 2.7—3 mm. broad, close, free. Stipe pallid, yellowish, minutely dotted light brown, subequal or slightly attenuated upwards, 15—18 × 2.5—3 mm. Context white, very thin in the pileus. Spores (5.5)—6.2—8—(9) × (4.5)—5.5—7.3 μ, subglobose, smooth. Hymenium: Basidia 4-spored. Cheilocystidia 26—51 × 8.2—13.5 μ, hyaline, ventricose below and evenly attenuated to a subacute tip, or ampullaceous with a narrow "neck" (up to 15 μ long), rarely broadest in upper portion. Cystidia, none, or replaced by pseudoparaphysis-like bodies which are vesiculose-clavate, hyaline, small. e. gr. 16.5 × 9.3 μ. Hyphae without clamp connections. Covering layers: Granules of pileus consisting of small tufts of almost hymeniform palisade, its elements broadly rounded above, erect, with brown, evenly dissolved pigment, cylindrical, or slightly tapering up or downwards, smooth, 30—65 × 5.5—11.5 μ. Dots of the stipe consisting of accumulations of ascending to erect cystidioid elements which are attenuated at apex but not acute, or rarely subacute, in shape much like the cheilocystidia, filled with ochraceous-melleous sap, about 40 μ, but narrower than the cheilocystidia, viz. 4.5—8 μ in diameter, occasionally with outgrowths or forking.

On rotten log.

Material studied: Venezuela: Miranda, Cortada del Guayabo (watershed between Rio Guaire y R. Tuy), 9-VII-1958, leg. D e n n i s, no. 1154 (LIL, K), Typus.

This species would key out with *P. atriavellaneus* but differs

strongly from that species because of the scanty and inconspicuous pleurocystidia and the structure of the cuticle. In some regards, *P. maculosipes* comes close to stirps *Cinereus*, but, because of the non-rugose center of the pileus, is kept in stirps *Atriavellaneus* although it may, in the end, become preferable to put it into a stirps separated from both *Cinereus* and *Atriavellaneus*.

The dotted stipe also appears to be diagnostic.

11. ***Pluteus atriavellaneus*** Murr. var. ***flavidopubescens*** Sing. var. nov. Pl. XV, fig. 13; Pl. XVI, fig. 14.

Pileus dull fuscous ("tanbark" to "oakwood"), glabrous or subglabrous, striate over about one third of the radius, hygrophanous, sulcate when dry, convex, obtuse, 26 mm. broad. Lamellae pink with pink edges, close to crowded, broad, free. Stipe white but with fine yellowish pubescence, solid, equal but with slightly enlarged base, somewhat over 60 mm. long, 3 mm. broad at apex reaching 7 mm. diameter at base; base white strigose. Context watery grayish in pileus, white in pileus. Spores (6) 7.5—8.2—(9.3) \times (5.5)—6.2—7—(9) μ , subglobose to broadly ellipsoid, very few practically isodiametric, stramineous, smooth. Hymenium: Basidia 27.5 \times 8.2 μ , ventricose, hyaline, 4-spored. Cheilocystidia 40—44 \times 11—15 μ , hyaline, ventricose in lower portion, with an ampullaceous "neck" or more frequently shaped like the pleurocystidia, only smaller. Cystidia 49—55 \times 13—18 μ , vesiculose swollen at base and gradually or in one to three steps thinned to 3—6.8 μ diam., with the extreme tip mostly obtuse, rarely subacute, with hardly any incrustation or a thin subhyaline resinous one. Hyphae without clamp connections. Covering layers: Epicutis of the pileus definitely in form of a cutis consisting of elongate elements which are smooth, 6—18 μ in diameter, repent and applicate, rarely ascendant, filled with a pale fuscous evenly dissolved pigment, with stramineous walls which may be somewhat thicker than those of the subjacent context, with broadly rounded tips. Pubescence of stipe consisting of erect cystidioid hairs which are 25—65 \times 7—12 μ , ventricose below or in the middle, attenuated to an acute or obtuse tip, some, like the epicuticular terminal cells, slightly thick-walled.

On a tree (*Espeletia humberlii*), above 3000 m. altitude.

Material studied: Venezuela: Mérida: Sierra de Santo Domingo, Laguna Negra, 1-VIII-1958, leg. Dennis no. 1756 A (LIL, K), Typus.

This variety differs in the yellowish pubescence of the stipe.

12. ***Pluteus riberaltensis*** Sing. var. ***missionensis*** Sing. var. nov. Pl. XVI, fig. 15.

Pileus very deep brown "Cordovan", in marginal zone distinctly and extensively radially rimose, the white context showing

between the fibrils, flat-convex, broadly but distinctly umbonate, 50—58 mm. broad. Lamellae pink with pink edge, close, free. Stipe white, without dark fibrils, solid, cylindric but with somewhat enlarged base, 56—59 × 4—10 mm. Context white. Spores 5.5—6.5 × 5.2—6 μ, only 0.2—0.5 μ longer than broad, and often practically geometrically globose, isodiametric in profile, stramineous, smooth. Hymenium: Basidia 24—29 × 7.5—9 μ, clavate-ventricose, hyaline, 4-spored. Cheilocystidia and pleurocystidia equal, 41—69 × 12—22 μ, most frequently with a thick (up to 7 μ in diameter), hyaline resinous incrustation which eventually falls off, with thin walls, but walls near base often thickened to up to 1.3 μ diam., always broadly rounded at the tip, ventricose to broadly clavate-vesiculose or broadly ampullaceous with very broad and obtuse “neck”, the cheilocystidia making the edge subheteromorphous, the pleurocystidia and cheilocystidia both persistently hyaline, the former less numerous than the latter but still numerous. Hyphae (and base of basidia) without clamp connections. Covering layers: Epicutis of pileus consisting of appressed hyphae which are hyaline or filled with a brownish fuscous pigment dissolved in the cell sap, the terminal members often combining to form bunches of ascending hyphae or pyramids which form the fibrils of the pileus, the elements of these fibrils always strictly elongated but variable in shape otherwise, e. gr. broadly clavate, cylindric, ampullaceous, ventricose, the apex often constricted but never attenuated to a subacute tip, rarely with a short apical mucro which is thin but with obtuse tip, with evenly dissolved or distinctly condensed pigment, with thin walls, 45—160 μ long and 13—26 μ broad.

On rotten pieces of wood in subtropical forest, among leafmold.

Material studied: Argentina: Misiones, Dpto. Iguazú, Cataratas, Punto de Canoas, 29-II-1960, leg. R. T. Guerrero no. 130 (LIL), Typus of variety.

This variety differs from the type variety (var. *riberallensis*) with which it has the white stipe in common, by the conspicuous incrustation of the cystidia, and the missing differentiation in size of cheilo- and pleurocystidia.

Section *Celluloderma* Fayod

Subsection *Mixtini* Sing.

Key to the species

- | | |
|--|--|
| A. Cheilocystidia with a conspicuous globose or ellipsoid incrustation; pileus red. | 13a. <i>P. laetus</i> var. <i>laetus</i> |
| A. Cheilocystidia without a conspicuous globose or ellipsoid incrustation; pileus orange | 13b. <i>P. laetus</i> var. <i>mixtus</i> |

13a. *Pluteus laetus* Sing. var. *laetus*. Pl. XVII, fig. 16.

Pileus bright red or orange red, center sometimes purple red,

"Brazil red", "Moroccan" to "Egyptian red", or deeper and more intensely colored than "holly berry", in center often "India red, Arabian red" or deeper, subglabrous to subvelutinous, smooth but rugose-veined or reticulose-venose in the center at least when dry, sometimes rugose-venose all over, with smooth or transparently striate to sulcate margin, in marginal region the epicuticular layer sometimes thin and red pigment mixed with yellow one (so that color on margin in this case comes close to "lacquer red"), convex, later applanate, or slightly depressed around the subumbonate center, often quite obtuse, or more distinctly umbonate, 10—21 mm. broad. Lamellae red, then yellow with red edges, then pink with "rufous" (M&P) edges but sometimes the larger portion of the edges concolorous with the sides, and only the part near the margin of the pileus discolorous, broad, ventricose, close to subdistant, rounded behind and free to narrowly adnexed, later separating and free to remote-free. Stipe yellow, "golden rod", "corn", 10—I—5 to 9—L—5 (M&P), base sometimes "rufous" (M&P), glabrous, at times slightly twisted spirally, subequal to slightly tapering upwards, 23—30 × 1.5—3 mm.; basal mycelium white. Context yellowish white, inodorous. Spores 5.5—8 × 5—7.3 μ, few, especially the small (younger?) ones, almost geometrically globose, the vast majority of the mature spores subglobose, about 0.2—0.7 μ longer than broad, smooth, stramineous-pinkish. Hymenium: Basidia 20.7—32 × 7.7—10.5 μ, ventricose, 4-spored. Cheilocystidia 24—60 × 6—16.5 μ, mostly with a ventricose main body about 40 μ long with a long needle-like apical appendage which is 1—40 × 1—3.2 μ, obtuse or acute, generally persistent, but sometimes falling off, more rarely absent in a number of cheilocystidia, with a characteristic thick-walled resinous incrustation between the main body and the appendage or on the appendage, making the cheilocystidia appear to be capitulate or with an ellipsoid thickening of the appendage, both wall and incrustation as well as contents hyaline in dried material revived in ammonia or KOH. Cystidia 24—46 × 11—19.3 μ, hyaline, at least in ammonia, when taken from dried material, ventricose to vesiculose, smooth, rarely at apex somewhat lacerated, generally with very broadly rounded tip, only in some specimens in the neighborhood of the edge with a small appendage in the manner of the cheilocystidia.

Hyphae hyaline, without clamp connections. Covering layer: Epicutis of the pileus consisting of spherocysts and cystidioid elements, the former 19—60 × 16.5—41 μ, almost all hyaline or nearly so in ammonia mounts of the dried material, the latter forming a hymeniform layer together with the spherocysts but more elongated than the latter, usually ventricose and mucronate or ampullaceous, 35—70 × 15—29 μ, also hyaline or subhyaline, furthermore a few clavate bodies in some caps present.

On dead rotting dicotyledonous wood and on forest litter in subtropical and tropical montane forest.

Material studied: Bolivia: Beni, Vaca Diez, Ivon, 3-IV-1956, leg. R. Singer no. B 2483 (LIL), Typus. — Argentina: Tucumán, Dpto. Tafi, Sierra San Javier, Ciudad Universitaria, 9-I-1960, leg. R. Singer no. T 3522 (LIL). — Below (west of) Ciudad Universitaria, at 950 m. alt., 13-I-1959, leg. R. Singer no. T 3251 (LIL).

This is a redescription of the species described by me in *Lloydia* 21: 274. 1958. The redescription has become necessary because of additional material encountered in the Argentine continuation of the east-slope mountain forest which showed a wider variability than expressed in the type diagnosis, and also because a line of the original description was erroneously omitted by the printer. In addition to this, we have also received material from Venezuela which can hardly be anything but conspecific although it differs in two points (1) in the color of the pileus which in the accompanying sketch is orange, (2) in the cheilocystidia which are described as being orange when fresh but which showed to this author hardly any difference as compared with the type of *P. laetus* except that there was, instead of the conspicuous resinous capitulum, a fine granular incrustation which is partly orange. Furthermore, in contrast to the type forms, the Venezuelan form has a yellow stipe dotted with Chinese orange. These dots are caused by fusoid hairs with rounded tips and deep orange contents. Altogether, this is probably a geographical race, but since we have no material to determine the distribution of both type form and the Venezuelan form, we describe the latter as a variety.

13b. *Pluteus laetus* Sing. var. **mixtus** Sing. var. nov. Pl. XVII, fig. 17.

Pileus orange, hygrophanous, in the center conspicuously reticulately wrinkled, with pellucidly striate margin, applanate, slightly umbonate, 19—24 mm. broad. Lamellae light yellow becoming pale pinkish, close, free. Stipe light yellow, dotted with Chinese orange, hollow, slightly tapering upwards, 25—31 × 3.5—4.5 mm. Context brownish in pileus, yellow in stipe. Spores 5.5—8.2 × 4.5—7.3 μ, subglobose, pinkish-stramineous, with rather firm wall, smooth. Hymenium: Basidia 23—33 × 8—11 μ, hyaline, varying from clavate to ventricose-ampullaceous. Cheilocystidia 23—35 × 8—15 μ, with a thin almost apicular apical appendage 1—27 × 1.5—2.7 μ without a thick resinous capitate or ellipsoid incrustation but with yellow sap when studied fresh, in dried material (ammonia mounts) becoming hyaline but with a slight partly orange granular incrustation all over the edge, main body clavate, broadly fusoid, or vesiculate, wall thin or very slightly thickened. Cystidia few, 37—44 ×

8—20 μ , hyaline in dried material (ammonia mounts), saccate-clavate, or broadly ventricose, non-appendiculate, rarely near edge with a beak-like appendage such as seen in the cheilocystidia, scattered and soon collapsing. Hyphae: Subhymenium subcellular; hymenophoral trama inverse, hyaline. All hyphae and base of basidia without clamp connections. Covering layers: Epicutis of pileus with a cellular aspect when seen in scalp preparation, but hymeniform and consisting of spherocysts and cystidiform elongated elements when seen in radial section, cystidiform elements predominating, versiform, mostly ventricose, ampullaceous, clavate-mucronate, or long-clavate, 51—89 \times (7)—49—24 μ , orange from a dissolved intracellular pigment but this soon disappearing in dried material and masses of orange yellow pigment granulations accumulating outside the cells in ammonia mounts all over the epicutis; spherocysts typical, 40—41 \times 27—32 μ ; hypodermium almost subcellular. Orange dots of stipe consisting of clusters of orange hairs (about 50—60 \times 9—14 μ) which are versiform, mostly ventricose to fusoid with rounded tip.

On bare soil in park.

Material studied: Venezuela: Dpto Federal, Caracas, Botanical Garden, 3-VII-1958, leg. Dennis at 950 m. alt., no. 1130 (LIL, K), Typus of variety. — 14-VII-1958, no. 1130A (LIL, K), a form with less beaked cheilocystidia.

Subsection *Eucellulodermini* Sing.

Key to the species

- A. Lamellae at first yellow 14. *P. globiger*
- A. Lamellae never yellow
 - B. Cystidia or cheilocystidia, or both, with fuscidulous sap; edge of lamellae dark-discolored
 - C. Stipe pallid, not dark-fibrillose 16. *P. riograndensis* var. *atromarginatus*
 - C. Stipe below strongly dark flocculose; subxerophytic species 15. *P. luctuosus*
 - B. Cystidia and cheilocystidia with hyaline contents (but optically empty); edge of lamellae concolorous with sides (pink) 17. *P. dominicanus*

14. *Pluteus globiger* Sing., Lilloa 25: 266. 1951 (publ. 1952).

Additional material was studied from Venezuela: Dpto Federal, El Avila, Sierra de la Costa, cloud forest, on logs, 4-VII-1958, leg. Dennis no. 1139 (LIL, K) — Mérida, Sierra de Santo Domingo, Lago Mucudaji, at 3550 m. 23-VII-1958, leg. Dennis no. 1706 (LIL, K), on rotting leaves of *Espeletia schultzei* in the paramo.

Dennis no 1139 from the cloud forest corresponds to our form 5 (see Singer 1958) which comes from a corresponding or comparable association and climate. Dennis no. 1706 from the paramos coincides with our form 2 which was collected in

the upper subtropical zone of the Selva Tucumano-Boliviana. Neither of them adds to the variability of the species as found in southern South America. But the two Dennis collections, accompanied by good sketches in color, obviously extend the geographic area of the species.

In addition to the Venezuelan collections, we have also a morcheloid carpophoroid of this species.

Pileus dusky olive brown "whippet" to 15—L—9 (M&P), margin more yellow, center rugose, margin less rugose, almost morcheloid-contorted, 15 mm. broad. Lamellae aborted, strongly anastomosing, with obtuse edges, sterile. Stipe lemon yellow, base orange yellow, confluent with pileus on one side, tapering upwards, short but oblique, 12×4.5 mm., substrigose below. Context yellow, inodorous. Spores none; basidioles present: typical cheilocystidia and cystidia present; epicutis with an epithelium of vesiculose round cells with light fuscous often slightly condensed pigment.

On *Alnus* wood. Argentina, Tucumán, Dpto. Tafí, Tafí del Valle, Quebradita del Mastil, 25-IV-1959, leg. R. T. Guerrero, comm. Singer T 3335 (LIL).

The configuration of the hymenophore and the connection of pileus and stipe suggest a gastroid condition; the sterility of this carpophoroid makes it comparable to the carpophoroids of *Acutis gigantea* and *Boletus rubricitrinus*.

15. *Pluteus luctuosus* Boud., Bull. Soc. Mycol. Fr. 21: 70. 1905.

Additional material of this species was found by R. T. Guerrero in Argentina, Santiago de Estero, Dpto. Río Hondo, Las Palmas, 23-I-1959 in xerophytic woods, on the base of a palm. This coincides well with our earlier material described in the monograph (Singer 1958) and confirms our opinion that *P. luctuosus*, at least the South American form with less extensive black floccons on the stipe, is a typically xerophytic-subxerophytic element in Northern Argentina. Since the habitat here means earthy material around the rootlets of the palm *Trilhrinax*, the difference in habitat indicated as a possible difference between French and Argentine materials is inconsistent. However, the limitation of the floccons of the stipe seems to be more consistent. It is quite possible that this is a geographic race but we have to wait for more collections to come to a conclusion.

16. *Pluteus riograndensis* Sing. var. **atromarginatus** Sing. var. nov. Pl. XVIII, fig. 18.

Pileus cinnamon-fuscous, radially sulcate-striate over half the radius, convex with slightly depressed center, 20—22 mm. broad. Lamellae pale pink, with the edges concolorous with the pileus,

ventricose, rather broad, close. Stipe pallid, glabrous, *not* with innate or superficial dark fibrils, tapering upwards, 27×1.5 mm.; basal mycelium white. Context pallid-white, inodorous. Spores $5.5-7 \times 5.5-7 \mu$, varying from almost geometrically globose to subglobose (but always very little longer than broad), smooth. Hymenium: Basidia $25 \times 8.2 \mu$, hyaline, clavate-ventricose, broadest in the upper, more rarely central third, 4-spored. Cheilocystidia $16-37 \times 9-25 \mu$, clavate-vesiculose to vesiculose or broadly ventricose, in the latter case sometimes with a narrow but obtuse mucro, rarely with a tip forming an angle somewhat larger than 90° , many hyaline, but also many filled with a light fuscous cell sap. Cystidia few and similar to the cheilocystidia, very rarely fuscidulous, mostly hyaline, all located near the edges of the lamellae. Hyphae without clamp connections. Covering layers: Epicutis of pileus — a single hymeniform layer of spherocysts, these e. gr. $20-30 \times 19-26 \mu$, some smaller than this, many with condensations of the intracellular fuscous pigment (vacuolar pigment!), in between these there are some spherocysts with a thin short mucro, others somewhat more elongated, almost dermatocystidioid but not projecting beyond the level of the spherocysts and very scattered, rounded-obtuse above, rarely with a small umbo-like mucro, brown, $30-35 \times 9-16.5 \mu$.

On very rotten wood in subtropical forest.

Material studied: Argentina: Tucumán, Dpto. Tafí, Sierra de San Javier, Ciudad Universitaria, 20-XII-1958, leg. Singer no. T 3141 (LIL), Typus of the variety.

This variety differs from the type variety mainly in the distinctly black bordered lamellae. In the key of my monograph (1958) it keys out with *P. luctuosus* which differs in the dark-floccose stipe and a number of other less conspicuous characters. It may be compared with other species with dark gill edges, such as *P. eugraptus* and *P. fusconigrans*, the former differing in not producing globose spores and in showing dermatocystidia of a typical and much more elongated type as found in subsection *Mixtini* (in *P. eugraptus* $38-140 \times 9-44 \mu$!). *P. fusconigrans* is a species known at present only from Ceylon, and differing from *P. riograndensis* var. *atromarginatus* in having a pink stipe, larger spores, and different cystidia.

17. *Pluteus dominicanus* Sing. spec. nov. Pl. XVIII, fig. 19.

Pileus light brown, "bran" to "yellow beige" (M&P), glabrous, not striate or sulcate at the margin, much wrinkled over most of the surface, convex, with a low obtuse umbo, about 29 mm. broad. Lamellae pink with pink edges, broad (4-4.5 mm.), close, free. Stipe white, smooth and glabrous, slightly tapering upwards, $35-40 \times 2.5-4$ mm. Context moist dirty grayish in pileus and apex of stipe, below white. Spores $6.8-9 \times 5.5-7.5 \mu$, subglobose,

smooth. H y m e n i u m : Basidia 22—36 \times 8.8—9.7 μ , 4-spored. Cheilocystidia not seen; cystidia 43—80 \times 13—25 μ , hyaline, ventricose with broadly rounded tip, some with, some without a very thin resinous incrustation which is subhyaline to pale stramineous. Hyphae without clamp connections. Covering layers: Epicutis of pileus cellular, consisting of one layer of spherocysts or scarcely elongated vesiculose bodies, these 30—50 \times 15—31 μ , with deep brownish-melleous dissolved intracellular pigment, some cells with indistinctly condensed pigment, some very few may be termed subcystidioid but merely narrower and with an occasional prong, never projecting beyond the level of the spherocysts.

In the forest of the Subparamo on rotting leaves of *Espeletia humbertii* (Compositae).

Material studied: Venezuela: Merida, Sierra de Santo Domingo. E. shore of Laguna Negra, in forest at 3440 m. alt., 1-VIII-1958, leg. D e n n i s no. 1772 (LIL, K), Typus. .

This species would key out with *P. fluminensis* and *P. jamaicensis* but differs from both in the color of the pileus, the much larger spores, and the smooth margin.

Diagnoses latinae Pluteorum novorum.

Pluteus glaucus Sing. spec. nov. Pileo glauco. Lamellis albis dein roseis aciebus glaucis. Stipite sursum glauco. Sporis 6.8—7.5 \times 5.5 μ ; cystidiis metuloideis, cornigeris. Ad lignum nothofagineum in Chile. Typus in Herb. Lilloano conservatus est.

Pluteus aporpus f. *porpophorus* Sing. f. n. Fibulis praesentibus. Typus formae in Herb. Lilloano conservatus est.

Pluteus nigropallescentis Sing. spec. nov. Pileo nigro, hygrophano, pallescente, striatulo. Lamellis aciebus albis instructis. Stipite albo. Sporis 7.5—9 \times 6.2—9.7 μ . Cheilocystidiis claviformibus vel clavato-elongatis. Cystidiis metuloideis moderate crassi-tunicatis, cornutis. Fibulis numerosis. Ad terram in silva montana (subparami). *P. washingtoniensi*, *P. brunneodisco*, *P. subcervino* peraffinis. Hab. in Venezuela. Typus in Herb. Lilloano conservatus est.

Pluteus mesosporus Sing. spec. nov. Pileo brunneo, glabro, striato, 28—29 mm. lato. Lamellis haud atomarginatis. Stipite pallide alutaceo. Carne superficiebus concolori. Sporis 8—10.3 \times 6.8—9 μ . Cystidiis metuloideis. Fibulis numerosis. Ad arborem sub Espeletii in paramo Venezuelae. Typus in Herb. Lilloano conservatus est.

Pluteus espeletiae Sing. spec. nov. E stirpe *Plauti* atque a *P. fernandeziano* differt sporis majoribus, pileo dilutiore, carpophoris majoribus. Hab. in Espeletii Venezuelae in zona parami. Typus in Herb. Lilloano conservatus est.

Pluteus maculosipes Sing. spec. nov. E stirpe *Atriavellanei* atque a *P. atriavellaneo* pleurocystidiis sparsis pseudoparaphysiformibus, dermatocystidiis fasciculatis erectis cylindraceis vel apicem versus attenuatis nec non stipite maculato differt. Ad truncum emortuum in silva nubigena Venezuelae. Typus in Herb. Lilloano conservatus est.

Pluteus atriavellaneus var. *flavidopubescentis* Sing. var. nov. A *P. atriavellaneo* var. *atriavellaneo* stipite flavidopubescente differt. Typus varietatis in Herb. Lilloano conservatus est.

Pluteus riberaltensis var. *missionensis* Sing. var. nov. A *P. riberaltensi* var. *riberaltensi* cystidiis conspicue incrustatis differt et cystidiis cheilocystidiis aequalibus. Typus varietatis in Herb. Lilloano conservatus est.

Pluteus laetus var. *mixtus* Sing. var. nov. Pileo aurantiaco et absentia incrustationis cheilocystidiorum resinacae capitulatae nec non praesentia macularum aurantiacarum in stipitis superficie aberrat. Hab. in Venezuela. Holo-Typus varietatis in Herb. Lilloano conservatus est.

Pluteus riograndensis var. *atromarginatus* Sing. var. nov. A *P. riograndensi* lamellis atromarganatis differt. Typus varietatis in Herb. Lilloano conservatus est.

Pluteus dominicanus Sing. spec. nov. Pileo dilute brunneo. Sporis $6.8-9 \times 5.5-7.5 \mu$. Ceterum characteribus suis cum *P. fluminensi* et *P. jamaicensi* congruit. Hab. in subparamo Venezuelae. Holotypus in Herb. Lilloano conservatus est.

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- The last named papers contain additional literature on the subject *Pluteus* and *Inocybe*.

Explanation of the illustrations

Plate XII.

Fig. 1. *Inocybe matrisdei*, sp = spore, $\times 2000$; p = spinose process of spore, $\times 5000$; dc = dermatocystidium of stipe, $\times 1000$; dm = metuloids of stipe, $\times 1000$; hm = metuloid of hymenium, $\times 1000$. — Fig. 2. *Pluteus aporus* f. *porpophorus*, ch = cheilocystidia, $\times 1000$; m = metuloid, $\times 1000$; a. m. = apex of another metuloid, $\times 1000$. — Fig. 3. *Pluteus glaucus*, ca = carpophore, $\times 1$; ch = cheilocystidia, $\times 1000$; hm = metuloids of hymenium, $\times 1000$; epi = hyphae of epicutis, $\times 1000$.

Plate XIII.

Fig. 4. *Pluteus aporpus* f. *porpophorus*, ca = carpophore, $\times 1$. — Fig. 5. *Pluteus mesosporus*, ca = carpophore, $\times 1$; ca. s. = section of carpophore, $\times 1$; ch = cheilocystidia, $\times 1000$; m = metuloids, $\times 1000$; epi = terminal cells of epicutis of pileus, $\times 1000$. — Fig. 6. *Pluteus nigropallescens*, ca = carpophores, one in section, $\times 1$; ch = cheilocystidia, $\times 1000$; mat = atypical metuloids, $\times 1000$.

Plate XIV.

Fig. 7. *Pluteus nigropallescens*, mt = typical metuloids, one at right: apex only, $\times 1000$. — Fig. 8. *Pluteus espeletiae*, ca = carpophores, one in section, $\times 1$; b = basidium, $\times 1000$; ch = cheilocystidia, $\times 1000$; pc = pleurocystidia (4), $\times 1000$; epi = two terminal cells of epicutis of pileus, $\times 1000$ (ca from a sketch by Dennis). — Fig. 9. *Pluteus cupigmentatus*, epi = epicutis of pileus, $\times 1000$; ca = carpophores, $\times 1$; ch = cheilocystidia, $\times 1000$.

Plate XV.

Fig. 10. *Pluteus yungensis*, collection T 3138, sp = spore, $\times 2000$; ca = carpophore, $\times 1$. — Fig. 11. *Pluteus haywardii*, collection T 3268, ca = carpophores, $\times 1$; pc = pleurocystidia, $\times 1000$; b = basidium, $\times 1000$. — Fig. 12. *Pluteus maculosipes*, pc = pseudoparaphysis-like pleurocystidium, $\times 1000$; ca = carpophores, on in section, $\times 1$; ch = cheilocystidia, $\times 1000$; epi = epicutis of pileus, $\times 1000$; sp = spore, $\times 2000$; st = covering layer of stipe, $\times 1000$ (ca from a sketch by Dennis). — Fig. 13. *Pluteus atrivellaneus* var. *flavidopubescens*, ca = carpophore, $\times 1$; sp = spore, $\times 2000$; st = cystidioid hairs of the covering layer of the stipe, $\times 1000$; epi = two terminal elements of the epicutis of the pileus, $\times 1000$ (ca, st, from a sketch by Dennis).

Plate XVI.

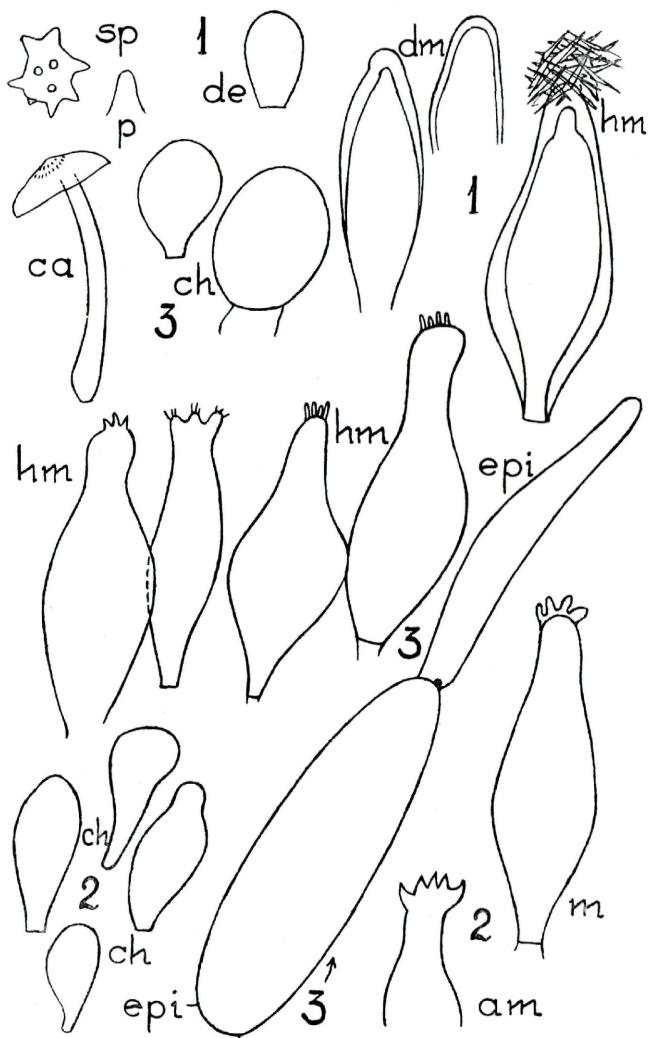
Fig. 14. *Pluteus atrivellaneus* var. *flavidopubescens*, pc = pleurocystidia, $\times 1000$; ch = cheilocystidia, $\times 1000$. — Fig. 15. *Pluteus riberaltensis* var. *missionensis*, ca = carpophores, $\times 1$; b = basidium, $\times 1000$; epi = epicutis of pileus, $\times 1000$.

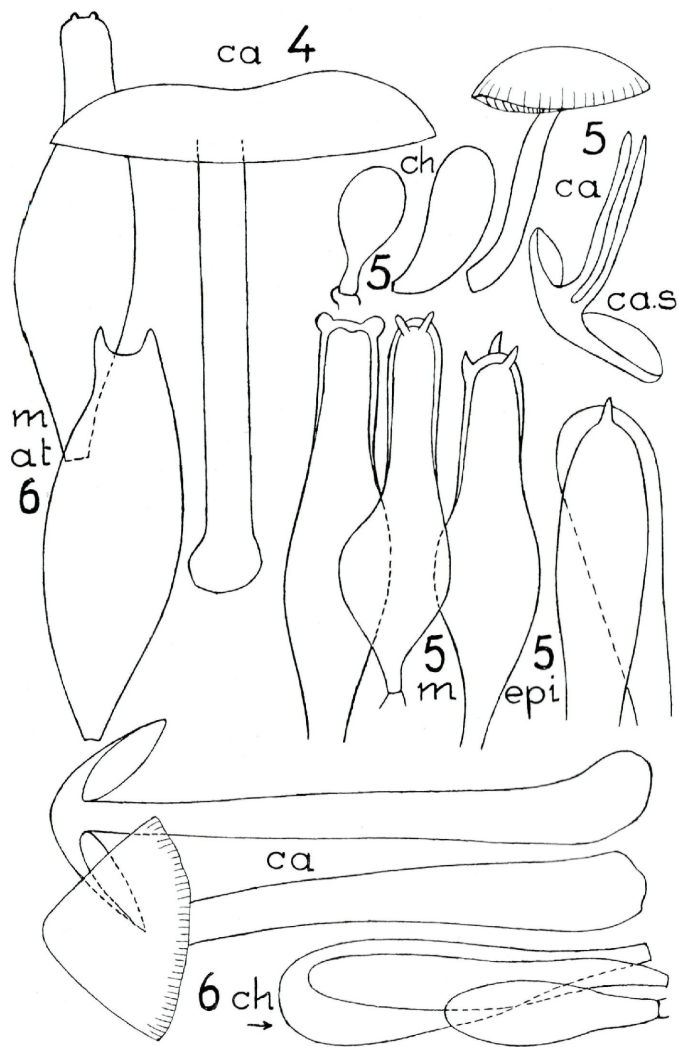
Plate XVII.

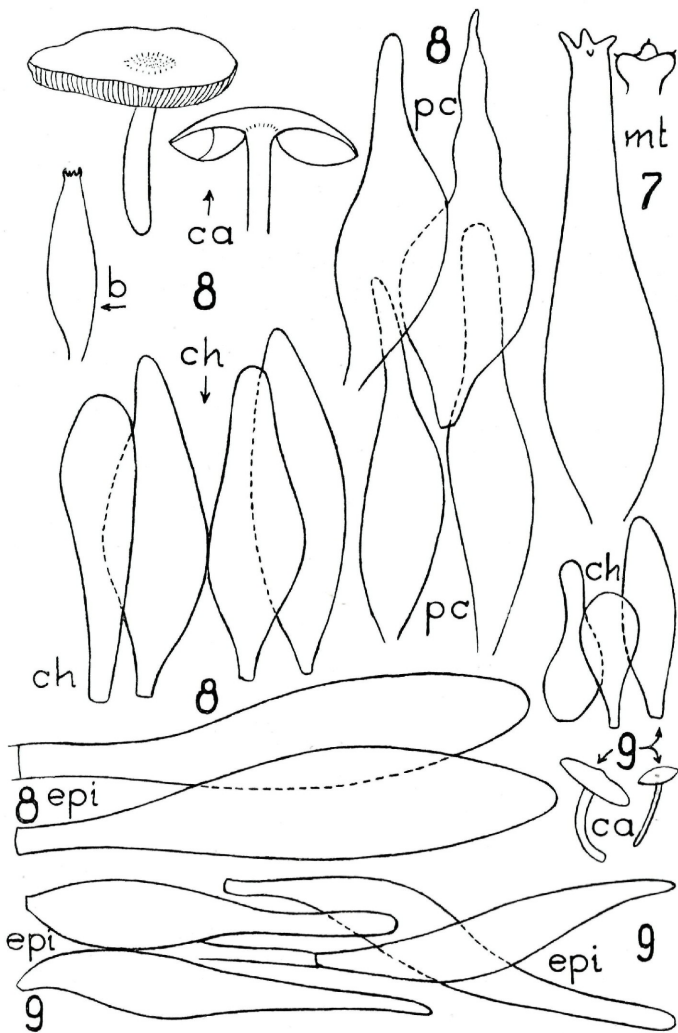
Fig. 16. *Pluteus laetus* var. *laetus*, ca = carpophores, $\times 1$; epi = epicutis of pileus, $\times 1000$; ch = cheilocystidia, $\times 1000$. — Fig. 17. *Pluteus laetus* var. *mixtus*, ca = carpophores, at right in section, below pileus seen from above, $\times 1$; pc = two pleurocystidia; ch = five cheilocystidia, $\times 1000$; st = hair from the orange dots of the stipe, $\times 1000$; epi = epicutis of pileus, $\times 1000$ (ca and st from sketches by Dennis).

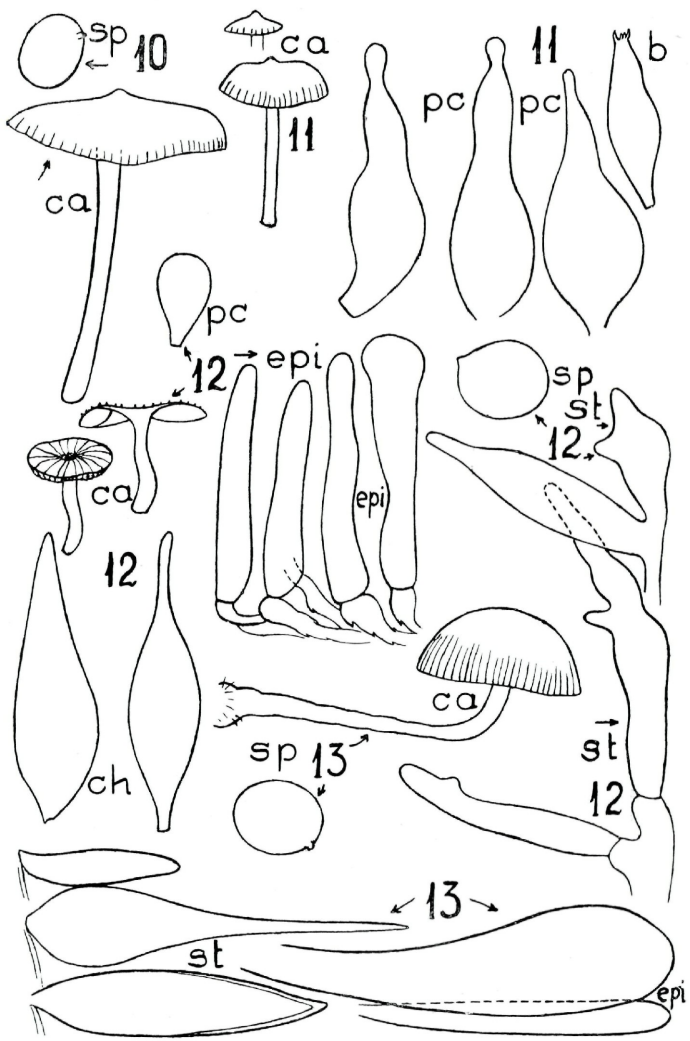
Plate XVIII.

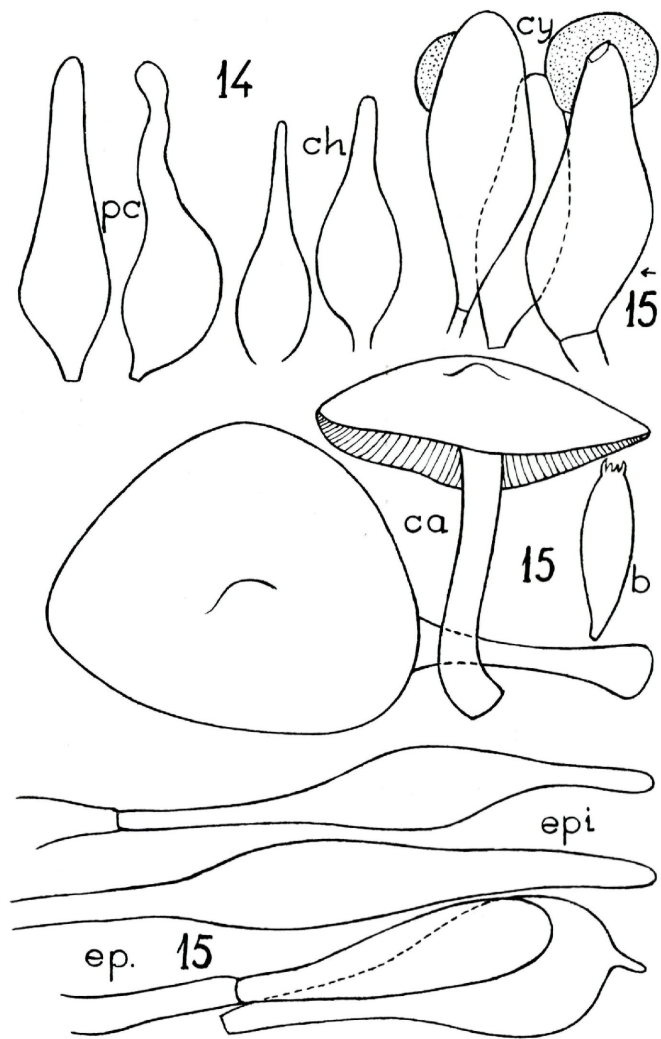
Fig. 18. *Pluteus riograndensis* var. *atromarginatus*, ca = carpophore, $\times 1$; epi = epicutis of the pileus, at the right two narrower elements, $\times 1000$; pc = pleurocystidium, $\times 1000$; ch = four cheilocystidia, $\times 1000$. — Fig. 19. *Pluteus dominicanus*, ca = carpophore, $\times 1$; ca. s. = section through a carpophore, $\times 1$; sp = spore, $\times 2000$; epi = elements of the epicutis of the pileus, $\times 1000$; b = basidium, $\times 1000$; pc = pleurocystidia, $\times 1000$.

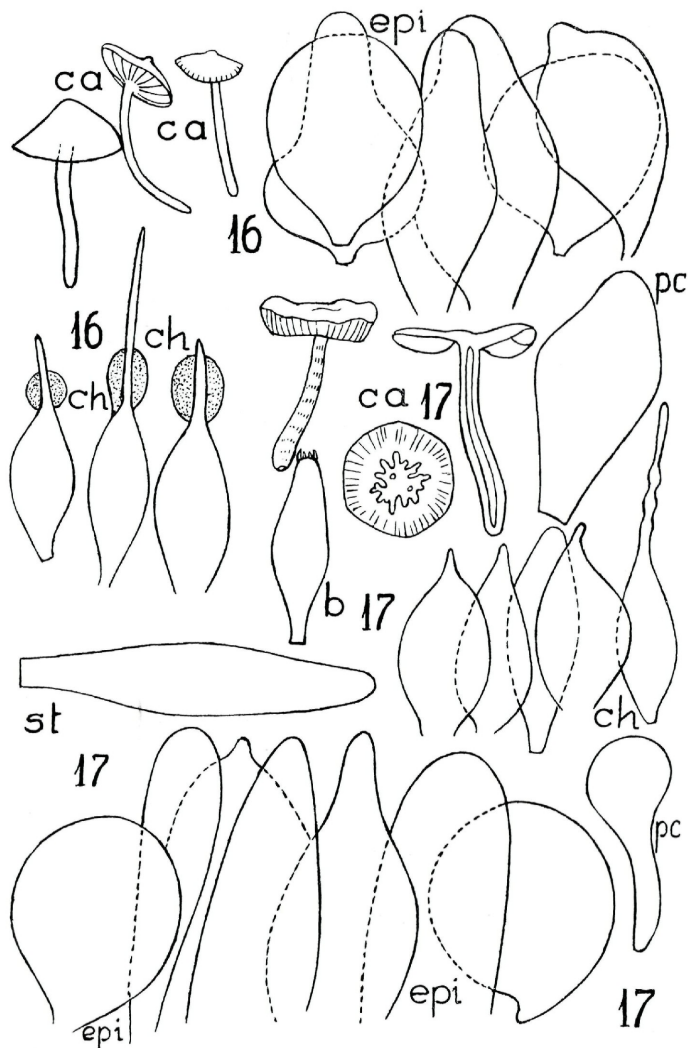


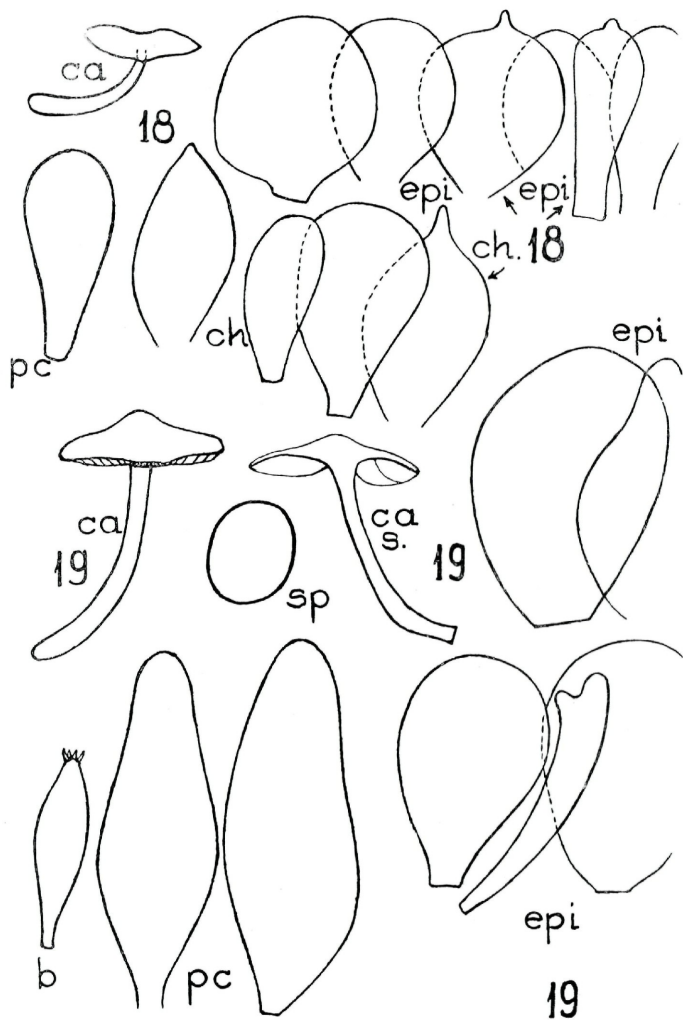












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