

Fungi mexicani, Series prima — Agaricales

By Rolf Singer (Tucuman, Argentina).

During my various trips in Central and Southern Mexico in 1957 and in my type studies on *Basidiomycetes* originating in Mexico, I am in a position to give a list of species of fungi, in this first series all *Agaricales*, mostly new for Mexico or, if indicated before, placed or identified incorrectly and described insufficiently. Many of the species indicated are rare or new, or incompletely known until now, and these were described adequately in the present contribution.

The primary motive of my presence in Mexico was not collecting of fungi in general — as tempting an activity this might have been for a mycologist — but the observation and isolation in pure cultures of fungi causing cerebral mycetisms such as *Psilocybe* (sect. *Caerulescentes*), *Panaeolus*, *Cordyceps*, *Amanita* etc., and the previous type studies on Mexican agarics did not have the primary purpose of exploring the Mexican fungus flora but rather the clearing up of some taxonomical puzzles facing the mycologist ever since Murrill had collected in tropical North America and adjacent regions. Nevertheless, the specimens collected as samples of the flora of which the cultured species are an integral part, and the Murrillian types, taken together, will perhaps lend themselves to set up a first series of dependable elements for a future Mexican fungus flora. Contributions by authors previously dealing with Mexican fungi are — with the exception of those limiting themselves to a relatively well known group like the *Uredinales* — pitifully scarce and for the most part completely unreliable.

A list of species, in order to present reliable information based on modern taxonomical concepts, had to be more elaborate than previous contributions of this kind. Consequently, the number of species mentioned is relatively small, somewhat less than 100.

I wish to express my gratitude for their collaboration in some phase or other of the work mirrored in these lists to the following Mexican friends and colleagues: Dr. R. L l a m a, Director of the Instituto de Biología, Universidad Nacional Autónoma de México, and the staff members Martha Zenteno Zevada, Teófilo Herrero, furthermore our host in Huautla de Jiménez, Isauro Nava García, and my travel companions Miguel Ángel Palacios and Gastón Guzmán H.

*Hygrophoraceae.*1. *Hygrocybe singeri* (Smith & Hesler) Sing. comb. nov.*Hygrophorus singeri* Smith & Hesler, Sydowia 8: 331. 1954.

As described by the authors, and agreeing with Argentine material Huautla de Jiménez, Oaxaca, 1-VII-1957, R. Singer M 15 (MICH).

2. *Hygrocybe firma* (Corner) Sing. comb. nov. var. *firma*.*Hygrophorus firmus* Corner var. *typicus*, Trans. Brit. Myc. Soc.

20 (2): 176. 1936.

Pileus red, not viscid, fibrillose, sometimes with recurved fibrils, especially in age, hygrophanous, becoming yellow when faded, convex with narrowly depressed center, almost umbilicate, never umbonate or conical, 30–35 mm. broad. — Lamellae red, thick, distant, broad, deeply sinuate-subdecurrent. — Stipe red, hygrophanous fading to yellow, not viscid, not distinctly fibrillose-striate but becoming slightly so when dry, subequal, with the thickest portion in lower third, hollow, 35–40 \div 4–6 mm. — Context sunconcolorous, inodorous, mild. — Spores not strikingly dimorphic but extremely polymorphic as far as size is concerned, to be grouped in at least three size groups (I: up to 7.5 \div 5.5 μ ; II: 8.7–10 \div 6.5–8.7 μ ; III: 12–14 \div 9–10 μ), total range 7–14 \div 5–10 μ , smooth ellipsoid, rarely short ellipsoid (so in all size groups), and not uncommonly ovoid, inamyloid. — Hymenium: Basidia of at least three size groups (I: 31–34 \div 7–8 μ , II: 34–38 \div 8–10 μ ; III: 38–44 \div 10–14 μ), the two smaller sized rising from normal basidioles, the largest often from „empty“ (not protoplasm-filled) ones and possibly not producing viable spores in all cases, all basidial types 4-spored, much more rarely 2-spored, breadth varying as in the spores, from simple to double but length varying much less. Cystidia none. — Hyphae: Hymenophoral trama regular, its hyphae subparallel with each other (not perfectly parallel as in *H. conica*), hyaline, consisting of very long, fusoid, thin-walled elements 1.5–23.8 μ thick; all hyphae inamyloid with clamp connections.

In moderately shady places on the ground in coffee plantation at Huautla de Jiménez, Oaxaca, 13-VII-1957, R. Singer M 1550 (MICH).

This was described from Ceylon and Malaya and its area extended by Dennis to include the West Indies and Venezuela. It is new for Mexico.

*Tricholomataceae.*3. *Laccaria laccata* (Scop. ex Fr.) Berk. & Br., var.

It is easy to state that „La Laccaire“ exists in Mexico. This had been known for some time. This species, in its widest circumscription

is common apparently all over most of Mexico and south through the mountains of Central America. There is no doubt, however, but that this species is not only extremely variable but also likely to be split up into several varieties (in the sense of the writer) which might become, on closer investigation, geographic races, mycoecotypes, or even species.

Already, this author has been able to show from material preserved at MICH that *Laccaria tetraspora* Sing. apparently an Atlantic species, occurs in England (July 29, 1950, coll. R. W. G. Dennis) and *Laccaria ohiensis* (Mont.) Sing. in Sweden (September 5, 1945, G. Haglund no. 84).

When I noticed the amethyst lilac mycelium, I thought that this may be the same form as the Northern European one which I have described as *Laccaria laccata* var. *rosella* (Ann. Mycol. 41: 17. 1943), but the cheilocystidia do not agree. Consequently, I shall give a complete description of the Mexican form:

Pileus fulvous, reddish brown, fibrillose, convex, depressed in the center, about 10 mm. broad. — Lamellae flesh color, distant, decurrent or subdecurrent, thickish, not very broad. — Stipe subconcolorous with the pileus, fibrillose, solid, tapering upwards, 40 ± 2 (at apex) mm.; basal mycelium tomentose, amethyst lilac. — Context whitish to partly subcolorous with the surface, odor none; taste mild. — Spores $7-9 \pm 6.3-7.7 \mu$, globose to short-ellipsoid, echinate, spinules $0.3-0.9 \mu$ long, hyaline, inamyloid. — Hymenium: Basidia $30-31 \pm 8.5-10 \mu$, 4-spored; cheilocystidia e. gr. $14 \pm 9.3 \mu$, balloon shaped to subglobose, non-protoplasmatic, hyaline; cystidia none. — Hyphae of hymenophoral trama regularly arranged, all hyphae inamyloid, hyaline, with clamp connections.

In pine woods (*Pinus hartwegii*) in small groups, on earth and humus, just west of Paso de Cortés, 3650 m. alt., Mexico, 21-VII-1957. R. Singer M 1581.

4. *Tricholoma stans* (Fr.) Sacc.

Pileus „russet“ to „chestnut brown“ or almost „carob brown“, viscid, shining when dry, slightly finely rimulose-rivulose in the center but not guttate, smooth, margin at first appreciably paler than the center, later subconcolorous, convex then in center applanate to entirely applanate, 110–160 mm. broad. — Lamellae white, edge often serrulate brown spotted, crowded, sinuate, moderately broad. Spore print pure white. — Stipe white, equal or attenuate downwards but usually not strongly tapering, $105-115 \pm 20$ mm.; veil none. — Context white, fleshy; taste and odor farinaceous, not bitter. — Spores $(4.2)-4.5-5.7(7) \pm (2.8)-3.2-3.8-(4.2) \mu$, smooth, hyaline, ellipsoid-subcylindrical or ellipsoid, inamyloid. — Hymenium: Basidia $22.5-25.5 \pm 5.2-5.7 \mu$, typically 4-spored, but near edge some few

2-spored ones observed, the 2-spored ones longer and narrower (4.2—5.2 μ); pleurocystidia none; cheilocystidia of two types, I.: filamentous-flexuos to clavate, hyaline, not making the edge heteromorphous but mixed with type II as well as with basidia, 25—29 \Rightarrow 4—6.7 μ . II.: filamentous and strongly elongated, about 2—2.3 μ diameter, hyaline. — Hyphae: Hymenophoral trama regular, of parallel hyphae, stramineous-hyaline in KOH. Hypodermium filamentous, with occasional hyphal swellings, often with constrictions at septa, lower layer hyaline, upper incrustated with a fox red pigment, forming a cutis, not gelatinized, hyphae (2.8)—3.5—5(11) μ in diameter. Epicutis light cinnamon to onion skin color, filamentous, also basically a cutis but hyphae not parallel since they are gelatinized, loosely arranged and somewhat wavy, less pigment incrustated (pigment stramineous here), thin-walled, thin (1.8—5.8 μ). All hyphae without clamp connections, inamyloid.

In mixed coniferous, woods, under stands of *Abies religiosa* on humus. At about 3000 m. alt., between San Pedro de Nexapa and Paso de Cortés, Mexico 21-VII-1957. R. Singer, M. 1573 (MICH).

The upper part of the hypodermium may also be attributed to the epicutis which would then have a lower layer of non-gelatinized hyphae.

This species is the *Tricholoma stans* sensu Singer (1943, 1951). It differs from *T. albobrunneum* of Europe in narrower spores. The latter species also has filamentous cheilocystidia.

5. ***Gerronema subchrysophyllum*** (Murr.) Sing. comb. nov.

Omphalina subchrysophylla Murr., Fla. Acad. 7: 482. 1944 (1945).

Marasmiellus subchrysophyllus (Murr.) Sing., Sydowia 3: 32. 1948.

On dicotyledoneous wood, Huautla, Oaxaca -VII-1957. Singer M 1549 (MICH).

6. ***Lactocollybia aurantiaca*** Sing. Lilloa 25: 180. 1951 (1952).

This species occurs under the same conditions and in the same altitude as in Argentina where it was discovered. It probably follows the Andes and pre-Andine chains and occurs in the Alneta, lower fringe, sometimes descending into the subtropical or tropical-montane forest with or without the respective *Alnus* as it is not restricted to *Alnus* by mycorrhiza.

On earth under *Alnus glabrata*, San Andrés, Oaxaca, 2000 m. alt., 14-VII-1957. R. Singer, M 1555 (MICH).

The species is easily recognized by its deep orange color and the cystidia which turn green in KOH as do the hyphae of *Collybia alkali-virens* Sing. and the *Anthracophyllums*. The habit is omphalioid.

7. ***Xerula chrysopepla*** (Berk. & Curt.) Sing.

In the Abietetum between San Pedro de Nexapa and Paso de Cortés, on wood, 3000 m. alt., 21-VII-1957. R. Singer, M 1557 (MICH).

This is a widespread species, occurring over a vast area in the United States and south to the West Indies.

8. *Marasmius haematocephalus* (Mont.) Mont.

This species, originally described from Brazil has now been collected in Mexico with complete certainty. This permits to reestablish the identity of *Marasmius erythrocephalus* Fr. from Mexico.

Huautla de Jiménez, Oaxaca, on frondose wood, below village at about 1400 m. alt. July 1957. Leg. & det. R. Singer.

9. *Crinipellis phyllophila* Sing. spec. nov.

Pileo saturate ferrugineo in statu humido, piloso etiam in disco, 6—11 mm. lato. Lamellis albis, liberis, confertis, mediocriter latis. Stipite concolori, piloso, 30—48 \Rightarrow 0.3—1.2 mm. Carne inodora. — Sporis 9.3—10.5 \Rightarrow 4.2—5 μ ; cheilocystidiis apice coronatim appendiculatis, 21—30 \Rightarrow 4.5—6 μ ; cystidiis ad latera lamellarum nullis, pilis pilei acutissimis, haud vel minime septatis. — Ad folia quercina delapsa in silva.

Pileus on central ring-wall and on ribs between sulcations deep ferruginous, rich brown, but soon fading by dehydration to cinnamon tan (the banal color of most dry *Crinipellis* species), pale on margin because the depressions are pale tan to whitish (few hairs present), pilose with rather appressed hairs which reach the margin in wavy strands, with a circular ridge or wall in the center and flat or more rarely papillate inside this wall, not glabrous in any part of the center, sulcate (because of the hair-strands) over one half of the radius or sometimes two thirds from margin, convex, very soon appanate or depressed in the narrow disk-like center, later flat-convex to appanate, 6—11 mm. broad. — Lamellae pure white, free, or rather close, moderately broad or rather broad. Spore print pure white. — Stipe in upper portion concolorous with center of pileus, in lower portion with margin, pilose, equal, insititious, 30—48 \Rightarrow 0.3—1.2 mm. — Context white, thin, reviving; odor none. — Spores (8)—9.3—10.5—(11.2) \Rightarrow (3.7)—4.3—5 μ , oblong, always longer than twice the breadth, unicellular even if overmature, thin-walled, hyaline, smooth, not pseudoamyloid, thin-walled, slightly thickwalled when overmature. — Hymenium: Basidia 21—30 \Rightarrow 4.5—6 μ , 4-spored, cheilocystidia 21—30 \Rightarrow 4.5—6 μ , crowned by two to six erect appendages 2—5.5 \Rightarrow 1—1.2 μ , some cheilocystidia somewhat away from the very edge but pleurocystidia proper not differentiated. — Hyphae: Hairs of the pileus in the marginal zone brown or melleous with mostly hyaline tip, the latter often wavy, mostly needle-sharp acute, more rarely subacute, never broadly rounded, all hairs of the usual type in *Crinipellis*, smooth, thickwalled (wall 2.7 μ thick in a hair 7 μ thick, or 1 μ thick in a hair 4.2 μ thick), with very few or no septa, pseudo-

make the entire apex of the stipe whitish, membranous (not glutinous in its entirety) in consistence although often partly glutinous from muciliginous material dripping from the young pileus, white, eventually disappearing on the margin of the pileus and tending to become replaced, on the stipe, by one or several belts near or on apex. — Context concolorous with outside, fleshy in pileus, extremely fragile in the stipe; odor none. — Spores hyaline $7.3-10.5 \pm 5.8-8.5 \mu$, in some preparations mostly $9 \pm 7-7.2 \mu$, in others $7.7 \pm 5.8-6 \mu$, some with glutinous roughness, usually short ellipsoid to subglobose but very variable in both size and shape. — Hymenium: Basidia $26.5-35 \pm 7-10 \mu$, 4-spored. Cheilocystidia present, but they are merely cystidioid terminal ends of the hymenopodial and tramal hyphae at the edge, the former e. gr. 25μ long, the hyphal ends of the tramal hyphae about 15μ diam. and more, mostly cylindrical. True cystidia none on sides of lamellae. — Hyphae: Subhymenium a thin, non-gelatinized layer of irregular small elements (not filamentous) hyaline or almost so. Hymenopodium strongly gelatinized, with thin filamentous hyphal elements running in all directions but in young specimens mainly connecting the hymenophoral trama with the elements of the subhymenium and accentuating the impression of bilaterality, hyphae $2-4.5 \mu$ thick. Hymenophoral trama hyaline or almost so, consisting of hyphae running parallel and axial from the beginning of their development and about $18-20 \mu$ thick in the mediostratum; in a thin and somewhat obliterated zone between this and the hymenopodium, however, at first slightly divergent (as is then the hymenopodium) but soon becoming quite parallel with the hyphae of the mediostratum, both in mediostratum and lateral stratum less gelatinized than in the hymenopodium. Cuticle of pileus simple and dense, with a superimposed glutinous layer of which there remains hardly a trace in mature dried material, except that there are a few isolated hyphal ends which must have been floating in the gluten when fresh, about $2-3.3 \mu$ in diameter, with or without a claviculate head, rounded at tip, incolorous. All hyphae and base of basidia with very strongly visible and very numerous clamp connections.

Under bushes near a field, outside the forest, on earth, gregarious, fruiting in summer, Oaxaca 10-11-VII-1957. Singer M 1504, M 1522 (MICH).

12. *Pluteus nitens* Pat.

This species from the state Veracruz was restudied (type at FH) by me and redescribed (Trans. Brit. Mycol. Soc. **39**:178, 1956) and referred to its proper place in the sections of the genus *Pluteus*. It is a good species, rather widely distributed.

Agaricaceae.

13. *Cystoderma granulosum* (Batsch ex Fr.) Fayod ex aut.

Both the type form and f. *robustum* Sm. & Sing. of this species have been found abundantly in the Abietetum between San Pedro de Nexapa and Paso de Cortés, Mexico, in July 1957, R. Singer, M 1575—6 (MICH).

Coprinaceae.

14. *Psathyrella sepulchralis* Smith, Singer & Guzmán, Lloydia (in print).

This species was recently described from two stations in Oaxaca.

15. *Copelandia eaerulescens* (Berk. & Br.) Sing.

Copelandia westii (Murr.) Sing.

This species, common from Florida to Bolivia, and also in the Eastern tropics, has been found by G. Guzman, EA 1166 and EA 1177 (part at MICH) and determined by me, at a place near Jalapa, Santa Cruz. There is a culture of this at MICH.

16. *Panaeolus sphinctrinus* (Fr.) Quél. sensu Linder.

Panaeolus campanulatus aut. p. p.

Common in Huautla de Jiménez and nearby, Oaxaca, 10-13-VII-1957, specimens and cultures at MICH (Singer M 1505, M 1527) and at FH (Schultes).

Bolbitiaceae.

17. *Agrocybe xuchilensis* (Mur.) Sing. comb. nov.

Naucoria xuchilensis Murr., Mycologia 4:80. 1912.

Pileus ochraceous, nearly smooth, dried orange ochraceous, remarkably rivulose and cracked under binocular, almost velutinous, plane, 35 mm. broad. — Lamellae rusty brown, with pallid cream edge, broad, adnate-subdecurrent.

Stipe (color of fresh surface unknown), cylindric, $20 \approx 3$ mm.; veil none. — Context white, at least partly white when dry; odor and taste unknown.

Spores $(6) - 6.5 - 9.3 - (10) \approx (4.5) - 5 - 6 \mu$, smooth, with a non-truncate or imperfect germ pore at apex, rarely slightly truncate, rather bright rusty in ammonia, duller ochraceous brown in KOH and water, with complex wall. — Hymenium: Basidia $19.5 - 26.3 \approx (6) - 7 - 8.8 \mu$, hyaline, 4-spored. Cheilocystidia present and of two types, I: the vesiculose type, $11.3 - 25 \approx 8.5 - 14 \mu$. II: the elongate type, $20 - 50 \approx 6.5 - 10 \mu$, very numerous and making the edge heteromorphous, varying between hyaline and deep melleous, vesiculose to clavate, or ampullaceous to fusoid-ventricose, also with all kinds of outgrowths and often capitate at apex and the capitulum at times with a mucro. Cystidia at the sides of the lamellae present but of a cysti-

diolate type and more or less the size of the basidioles (abnormalities of which they seem to represent), sometimes reminiscent of the cystidia of *A. tuberigera* or with just one narrow mucro or appendage, or just like the basidioles but with firmer walls and opaque, non-protoplasmatic, rarely capitate. — *Hyphae*: Hymenophoral trama regular, consisting of very voluminous elements with somewhat thickened wall, hyaline. Epicutis of pileus not clearly separated from the hypodermium, the latter beset with cellular elements and groups of spherocysts which however do not form a continuous hymeniform layer everywhere and are not infrequently incrustated by a bright rusty pigment. Hyphae with clamp connections.

In lowlands, mostly coffee plantations, on sandy soil, along Rio Blanco, at Xuchiles near Cordoba, 1500—2000 ft., 17-I-1910, W. A. Murrill and Edna L. Murrill. 1124 (NY), type.

This is one of the most interesting species of *Agrocybe*. It shows some primitive characters which recall the corresponding gastro-mycelous species, especially the Cuban *Physoperidium aurantiacum* (Zeller) Sing. & Smith.

18. *Conocybe mazatecorum* Sing. spec. nov.

Pileo fusco-avellaneo vel fusco, haud viscido, longe denseque radiatim striato, obtuse conico, 24—30 mm. lato. Lamellis griseolo-argillaceis. Stipite castaneo-brunneo, apice pallido vel concolori, debiliter hyalino-pubescente sed apice pruinato-piloso, sursum sub-attenuato, $66 \div 3-6$ mm. — Sporis $9-10.8 \div 5.5-6$ μ , poro instructis, levibus, melleis; basidiis tetrasporis; cheilocystidiis $17.5-19.5 \div 5.5-7.5$ μ , capitulo $2-4.3$ μ diam.; dermatocystidiis stipitis vesiculosis, vix umquam capitatis, pilis hyphosis tenuissimis inter dermatocystidiis intermixtis. — Ad terram herbasque putridas in pascuis apricis solitario.

Pileus almost uniformly fuscous-avellaneous or fuscous, glabrous, sulcate-striate over half of the radius or more with long and dense striae, not viscid, conic with more or less obtuse tip, 24—30 mm. broad (in Kuhn's method of measurements $d = 40-55$ mm.). — Lamellae light sordid gray to pale fuscous gray or pale argillaceous. ascendant, adnexed, narrow, close. — Stipe chestnut brown with pallid apex, or with concolorous apex, somewhat longitudinally striate, finely and weakly pubescent to pruinose all over, but strongly pruinose-pilose at apex, more or less attenuated upward $66 \div 3-6$ (at base) mm., apex about 2.5 mm. broad. Veil none. — Context without a characteristic odor. — Spores $9-10.8 \div 5.5-6$ μ , melleous to sordid melleous in water and not much richer colored in alkalis, except in accumulations where the spore heaps appear dull ochraceous tawny, smooth, with a complex wall, with very distinct truncate germ pore, without suprahilar applanation or depression,

ellipsoid. — *Hymenium*: Basidia $14.7-18.5 \Rightarrow 8.2-9 \mu$, 4-spored. Cystidia none. Cheilocystidia with a suddenly constricted neck and globose tip, hyaline, $17.5-19.5 \Rightarrow 5.5-7.5 \mu$, capitulum $2-4.3 \mu$ in diameter. — *Hyphae*: Hymenophoral trama of the *Conocybe* type. Epicutis of pileus without dermatocystidia, cells $24-39 \Rightarrow 19-20 \mu$, hymeniformly arranged, with dark gray membrana pigment. Surface layer of stipe with numerous dermatocystidia which are not or extremely rarely capitate near the apex, balloon shaped or broadly ampullaceous, e. gr. $19 \Rightarrow 7 \mu$, interrupted by or giving rise to pilose hyphal hairs, e. gr. $280 \Rightarrow 1.5-2.2 \mu$, filamentous, smooth, hyaline or almost so. All hyphae with clamp connections.

On earth or on decayed herbs in pastures, far from trees, solitary fruiting in summer, below Huautla de Jiménez, Oaxaca 10-11-VII-1957. R. Singer, M 1503, M 1523 (MICH).

Strophariaceae.

19. *Stropharia semiglobata* (Batsch ex Fr.) Quél.

Common in the Huautla Valley, Oaxaca. One collection was typical for the form Smith determines as „var. *stercoraria*“ ss. A. H. Smith, The specimen was seen and determined by Smith. This is Singer no. M. 1552, 13-VII-1957. On the ground in a planation. The dung was not visible, the stipe had become exannulate and the pileus pallid. The spores are deep fuscous, smooth, with thick, complex wall, with broad germ pore, ellipsoid, $18-19.5 \Rightarrow 10.5-11.3 \mu$: cystidia as chrysocystidia e. gr. $45 \Rightarrow 17.5 \mu$ with thin apical mucro; hymenophoral trama not quite regular (parallel) as in *Naematoloma*.

20. *Psilocybe cubensis* (Earle) Sing.

21. *Psilocybe caerulescens* Murr.

22. *Psilocybe candidipes* Sing.

23. *Psilocybe aztecorum* Heim.

24. *Psilocybe mexicana* Heim.

25. *Psilocybe muliercula* Sing.

All these Mexican species are treated in a separate paper¹⁾.

Cortinariaceae.

26. *Inocybe jalapensis* (Murr.) Singer comb. nov.

Naucoria jalapensis Murr. *Mycologia* 4: 77, 1912.

The macroscopical description of the type should be supplemented by a new microscopical description:

Spores $7.7-9(9.8) \Rightarrow (4.2)5-5.7 \mu$, smooth, with double wall and without a germ pore, ellipsoid, brownish. Basidia $28 \Rightarrow 5 \mu$, 4-spored. Cystidia of the metuloid type $(50)55-80 \Rightarrow (9)16-20 \mu$, fusoid, ventri-

¹⁾ Singer R. & Smith A. H. A taxonomic monograph of *Psilocybe* Section *Caerulescentes*. *Mycologia* (in print).

cose in the middle or ventricose near base and gradually tapering above into a round tip which is mostly beset with crystals, wall $0.4\text{--}0.8\ \mu$, i. e. moderately thick. Epicutis a cutis, some hyphae incrustated by ochraceous brown pigment, little differentiated; stipe with dermatocystidia (?) and pileus with few dermatocystidia at places, e. gr. clavate $32 \approx 10.5\ \mu$; hyphae with clamp connections.

The surface of the stipe is not very well preserved and the type and distribution of the dermatocystidia of the stipe could not be ascertained.

This comes from Jalapa, Santa Cruz. (NY). Type.

27. *Galerina atkinsoniana* Smith Mycologia **45**: 894. 1953.

Pileus tawny, ochraceous-tawny, strongly long-transparently striate narrowly campanulate, neither viscid nor veiled, not distinctly pruinose under a lens, 8 mm. high, 7 mm. broad. — Lamellae brownish ochraceous, medium broad, ascendant, adnate, moderately close or subdistant. — Stipe brown, with brownish ochraceous apex, naked, equal, $43 \approx 1.5\ \text{mm.}$, at apex, 1 mm. thick, naked and subglabrous. — Context without noticeable odor. — Spores $13\text{--}16 \approx 7\text{--}10.5\ \mu$, in profile $7\text{--}8.8\ \mu$ broad, well pigmented but not really deeply colored distinctly verruculose rough, warts not small but very flat, somewhat deeper colored than the underlying episporium (KOH), without suprahilar depression, but with a suprahilar plage, ellipsoid to almond shaped and slightly compressed. — Hymenium: Basidia $24\text{--}32 \approx 7\text{--}9.5\ \mu$, (1)—2—(3)—4-spored. Cheilocystidia not differentiated but there are numerous cystidia at the edge which are indistinguishable from the cystidia of the sides of the lamellae, the latter $46\text{--}77 \approx 16\text{--}18.5\ \mu$ numerous on sides and edges of lamellae, longer or shorter pedicellate, hyaline, ventricose in the middle, ampullaceous with a subcapitate or cylindrical apex, the very base often brown from a membranous and mostly incrusting pigment, neck (non-capitate) $5.5\text{--}7.4\ \mu$ diam., capitulum $6\text{--}7.8\ \mu$ above a constriction of $5\text{--}7.8\ \mu$ diam. — Hyphae: Hymenophoral trama brownish, with pigment incrustations, the hyphae near gill edge more filamentous and thin ($2\text{--}5\ \mu$ diam.) but broader elements further toward the flesh.

Epicutis much paler than the hypodermium, the outermost layer almost hyaline, not gelatinized, dermatocystidia present but extremely scattered and only 1—3 per preparation, in shape and size like the cystidia of the hymenium; dermatocystidia on stipe more numerous, irregularly distributed but occurring down to the lower third, some brownish like the hymenial cystidia.

This differs somewhat from the specimens of this species studied by the author in Massachusetts and Michigan. It has a more variable number of sterigmata and spores per basidium, and the dermatocystidia are relatively scattered so that there is no distinct pruinosity

visible in the field. Nevertheless, I believe that the Mexican form described above should be considered as one of the forms of *G. atkinsoniana*. Some authors seem to be inclined to think that the European *G. vittaeformis* should be interpreted as the pilocystidia-bearing species. It is true that the latter occurs in Europe also, but since the description of the European species does not imply pruinosity of the pileus, and dermatocystidia were not indicated by Singer when redescribing this species for the first time, it seems more logical to take *G. vittaeformis* as the a (pilo) cystidiolate form. I propose the collection Stordal no. 5215 (Stordal Herbarium) from Norway as a lecto-type since to my knowledge no holotype has been discovered in the Fries Herbarium.

28. *Galerina badipes* (Fr.) Kuhner, Le Genre Galera, p. 222, 1935¹⁾.

Pileus dull ochraceous tawny, hygrophanous, fading to cinnamon pallid, moist and subopimous, dull shining when wet, transparently striate over half the radius (or somewhat less) of the pileus, broadly convex, 17 mm. broad. — Lamellae rusty ochraceous brown, moderately broad or broad, moderately close or close, adnate, often with a decurrent tooth. — Stipe dark brown below, light brown at apex, with pruinose apex, with a rudimentary annulus but eventually all vestiges of the veil disappearing, $33 \div 2-3$ mm. — Context inodorous. — Spores $10.8-16.2 \div 6-7$ μ , mostly (normally) $10.8-12 \div 6-6.5$ μ , ellipsoid and almost almond shaped, somewhat inequilateral in profile, the largest spores ovoid-shaped, veruculose-punctate, the ornamentation well colored and contrasting with the lighter colored episporium, smooth or slightly rough in circumference with a distinct suprahilar plage, with a distinct callus or a very tiny pore, and other spores without any discontinuity at the apex. — Hymenium: Basidia $21-26 \div 6-6.3$ μ , (1)—2—(3)-spored. Cystidia on the sides and edges $47-60 \div 9.2-14$ μ , apex (neck) $4.3-9.7$ μ wide, sometimes wavy with secondary superior ventricosities above the main basal ventricose swelling which is usually the widest, ampullaceous, sometimes with a slight apical swelling and almost subcapitate. — Hyphae: Hymenophoral trama yellow, without pigment incrustations; subhymenium not gelatinized; hypodermium of pileus golden ochraceous, but weakly incrustated, with relatively broad hyphal elements forming a cutis; epicutis consisting of narrower hyphae, ochraceous, never gelatinized. All hyphae with clamp connections. — Dermatocystidia: on epicutis of

¹⁾ Combination by implication as „*G. badipes* (Ricken)“ but since Ricken writes „*G. badipes* (Fr.)“, the basonym seems to be the same. *Agaricus badipes* Fr., Epicrisis p. 196. 1836 (non *A. badipus* Pers.).

pileus dermatocystidia in young caps present, $50-52 \approx 12.5-13.5 \mu$, necks or constrictions about $6-7 \mu$ in diameter, ampullaceous, at times subcapitate, brownish yellow to yellow, wall up to 0.8μ in diameter. Apex of stipe with numerous dermatocystidia.

In small group on wood of *Pinus hartwegii* in montane pine woods near Paso de Cortés (between Mexico and Puebla) at 3800 m. altitude. 21-VII-1957. R. Singer, M 1578 (MICH).

Only the smaller specimen has dermatocystidia demonstrable on the pileus. It seems to be somewhat retarded rather than younger. The veil is distinct even though not persistent. This species is new for Mexico, but generally widespread on conifer wood. We have studied material from Southern Tirol (Alto Adige) from the Höhn el Herbarium (FH) and several North American specimens. The species K u h n e r calls *Galera* or *Galerina badipes* is the same as M a i r e's *G. cedretorum*, a similar and closely related species which, however, seems to be specifically distinguishable.

28. *Galerina mexicana* Smith & Sing. (ined.).

This new species from near Paso Cortés, will be described in a forthcoming paper by Smith & Singer (Mycologia, in print), closely related to *G. latispora* Smith.

29. *Galerina dimorphocystis* Smith & Sing. var. *nexapensis* Smith & Sing. var. nov. (ined.).

This new variety from the fir woods above San Pedro de Nexapa will be described in a forthcoming paper on new Galerinas (Mycologia, in print).

30. *Gymnopilus* aff. *bellulus* (Peck).

Pileus rusty fulvous brown, minutely fibrillose-squamulose all over, not viscid and not hygrophanous, convex, up to 20 mm. broad. — Lamellae bright lemon yellow, adnate, separating, close, or subclose, broad. — Stipe yellow, olive brown near base, chestnut brown between the yellow of the apex and the olive of the base, glabrous to slightly fibrillose, $37 \approx 7$ mm. (at apex); veil none. — Context yellowish, unchanging; taste mild; odor none. — Spores $4.2-5.7 \approx 3.2-4.2 \mu$, ellipsoid, without plage, with a distinct and contrastingly rusty brown verruculose ornamentation all over, ferrugineous ochraceous. — Hymenium: Basidia $15-19 \approx 4.5-5 \mu$, ventricose but with a central constriction, 4-spored. Cheilocystidia $16-27(29) \approx (2)-3-5 \mu$, broadest in lower ventricose portion, rarely filamentous, with a long thin-filamentous neck which is usually slightly thickened to subcapitate at tip, neck $1-1.8 \mu$ in diameter, tip, if enlarged, $1.8-2.7 \mu$ in diameter. Cystidia on sides of lamellae none. — Hyphae: Cuticle of pileus consisting of a deep lower layer (a cutis of filamentous hyphae, all rust colored, intensely and deeply pigmented by an incrusting pigment), hyphae here $2-3 \mu$ thick,

fewer thickened up to 15 μ , upper layer (epicutis) not differentiated except that there are more numerous swollen hyphae and swollen hyphal ends ascending or even sometimes erect or repent on the surface of the cuticle, these swollen hyphal ends measuring 10–23 μ in diameter, all cuticular hyphae with yellow cell sap, with clamp connections; similarly bright yellow dissolved pigment found in all tissues especially on edge of lamellae and in cuticle, and all hyphae and base of basidia clamped.

On dead trunk of *Abies religiosa* in mixed coniferous woods at about 3000 m. altitude between San Pedro de Nejapa and Paso de Cortés, 21-VII-1957. R. Singer, M 1587 (MICH).

As compared with the type and some Michigan collections of this species this seems to be slightly aberrant, having broader spores and mild taste. Nevertheless, it does not fully coincide with the European and Asiatic *G. microsporus* which also grows on conifers, mainly *Abies* wood. My note on *G. bellulus* in Lilloa **22**: 1951 was incorrect as it was based on material different from the holotype (NYS).

31. *Phaeocollybia attenuata* (Smith) Sing. ssp. **mexicana** ssp. nov.

Phaeocollybia attenuata has been redescribed in A. H. Smith's recent *Phaeocollybia* monograph (Brittonia **9**: 195–217. 1957), The type grew in the United States under *Pseudotsuga*. The Mexican form seems to be a special race adapted either to the climate or the species of conifers represented in the fir woods above San Pedro de Nexapa, and generally the fir belt on Popocatepetl. It differs from the type form in heavier pigmentation of the cuticle of the pileus which causes the specimens to be more chestnut color when moist and ochraceous brown when dry. I believe it should be distinguished on the subspecific level:

Phaeocollybia attenuata (Smith) Sing. ssp. *attenuata* and *Phaeocollybia attenuata* ssp. *mexicana* ssp. nov.: Pileo castaneo, sicco ochraceo-brunneo. Sub *Abiete religiosa* pinisque inter San Pedro de Nexapa et Paso Cortes, Mexico, 3000 m. lat., 21-VII-1957. Leg. R. Singer no. M 1586 (MICH, dupl. in herbario Universitatis Mexicanae).

32. *Phaeomarasmius muricatus* (Fr.) Sing. in Sing. & Digilio, Lilloa **25**: 387. 1952.

Naucoria mexicana Murr., North Amer. Flora **10**: 183. 1917.

The species Murrill, described as new from Mexico is, according to my type studies, synonymous with the common *Phaeomarasmius muricatus*, a species which was formerly considered a *Pholiota*. There is no need to redescribe it since it has been adequately described by other authors, including Singer & Digilio, l. c.

Strangely enough, the original specimen from Xuchiles near Cordoba collected on wood in moist lowlands, mostly coffee plantations, January 17, 1910 by W. A. and E. L. Murrill no. 1140 (NY), is mixed with two other species which are quite unrelated with the type and do not conform with the description given by Murrill. Whether they were overlooked when the collections were first separated, or were later mixed together by confusing them during repacking or rearranging of the herbarium, cannot be established now. The two other elements are:

1. The largest fruiting body — already singled out by Dr. Dennis in the course of earlier type studies, is *Phylloporus rhodoxanthus* (Schwein.) Bres. (see under *Boletaceae*).

2. The small whitespored element which looks like an „*Omphalia*“ is apparently a *Gerronema*, most probably *Gerronema subchrysophyllum* (Murr.) Sing. (see *Tricholomataceae*).

Crepidotaceae.

33. *Tubaria pentstemonis* Sing. spec. nov.

Pileo aqueose cinnamomeo, hygrophano, paulum pellucide striatulo, glabro nudoque, multiformi, 6—21 mm. lato. Lamellis latiusculis, ventricosis, ochrobrunneis, late adnexis. Stipite dilute brunneo, aequali, apice pruinato, velo subnullo. — Sporis pallide ochraceo-brunneolis, 7—10 \Rightarrow 5—7 μ , ellipsoideis, interdum reniformibus; basidiis tetrasporis; cheilocystidiis numerosis, versiformibus; tramate hymenophorali brunneolo; apice stipitis cystidioso. — Ad caules pulrescentes *Pentstemonis barbati*, in subalpinis.

Pileus watery cinnamon brown, hygrophanous, in dry (fresh dehydrated) state fading to paler leather brownish or dingy buff, drying from center outwards, mature faintly striatulate by transference when moist, smooth when young and dry, glabrous and without traces of a veil when young or when mature, variable in shape, convex to obtusely conical, eventually often expanding, becoming convex-flat with slightly depressed center, often umbilicate, 6—21 mm. broad. — Lamellae yellowish brown to brown, broad but not exclusively represented on edge (mixed with basidia), 20—53 adnate to adnate-decurrent. Spore print ochraceous as often in *Tubaria*. — Stipe light brown, pale cinnamon brown, pale tan, with distinctly pruinose apex, equal, soon tubular, 8—24 \Rightarrow 1.2—2.8 mm.; veil none, or scarcely developed, even at first, no trace of it either in young or adult specimens. — Context paler than the surfaces, inodorous. — Spores 7—10 \Rightarrow 5—7 μ , ellipsoid without a trace of amygdaline shape, but in about one quarter of the spores there is a tendency to be reniform as seen in profile, pale brown to pale ochraceous (in accumulations under the microscope ochraceous

brown, KOH), smooth, without germ pore or callus, wall not extremely thin or tending to collapse in preparations, rather firm although seemingly simple, at least the episprium difficult to distinguish. — *Hymenium*: Basidia 21–25 \Rightarrow 6.7–10.3 μ , 4-spored, hyaline, clavate or almost so; cystidia none; cheilocystidia numerous but not exclusively represented on edge (mixed with basidia), 20–53 \Rightarrow 6.3–7.7 μ , versiform, most frequently with a slight swelling in the middle or below and with a long cylindrical apex (neck), or with a capitate or ventricose apex, very rarely entirely clavate or cylindrical, sometimes the apical swelling the broadest portion of the cell, but mostly broadest in middle or below, apex almost always rounded, neck or constriction 3.5–5.7 μ broad, all colorless, smooth. — *Hyphae*: Subhymenium consisting of small short irregularly shaped and arranged elements, hymenophoral trama regular, distinctly if pale brown because of an inconspicuously incrusting pigment; epicutis of mostly repent hyaline (sometimes hyaline-incrusted) hyphae, some irregularly interwoven, 2.7–7 μ broad; hypodermium a broad layer of broad and irregularly arranged hyphae which are 5.5–18 μ in diam., and with an conspicuous incrustation pattern from a ochraceous brown epicellular pigment. All hyphae with clamp connections. — *Dermatocystidia*: Apex of stipe with pilose-hirsute aspect under lens, consisting of two types of dermatocystidia, I. small, thin-walled, inconspicuous, cheilocystidia-like but versiform and often smaller, hyaline e. gr. 14 \Rightarrow 6 μ . II. large, pedicellate (pedicel 4.5–7.5 μ in diam.), ventricose in lower portion (10–13.5 μ in diam.) with a long subcapitate (reaching 6.5 μ in diam.) or cylindrical (3.5–4.2 μ broad) apex.

On dead, rotting stems of *Pentstemon barbatus* (det. T. Herrera) in open place away from trees at the Paso de Cortés 3850 m. alt. 24-VII-1957. R. Singer, no. M 1560. (MICH).

34. *Crepidotus cristulatus* Sing. spec. nov.

Pileo hyalino, glabro sed basi strigosa instructo, hygrophanus, levi, convexo, 33 mm. lato. — Lamellis pallide isabellinis, distantibus, laticulis, — Stipite laterali, minusculo, evanescente. — Carne alba, miti, inodora. — Sporis 8.3–8.8 \Rightarrow 6.3–7 μ , subglobois vel geometrice globois, eas *Bondarzewiae montanae* imitantibus sed brunneolis, ornamentatione 0.7–1.7 μ projiciente; cheilocystidiis 21–49 \Rightarrow 12–19 μ versiformibus. Cuticulari pilei strato vix vel paulum differente; hyphis fibulatis. — Ad lignum emortuum Dicotyledoneum., Oaxaca Mexico.

Pileus hyaline, hygrophanous, in dry (fresh) state becoming white, glabrous except in the rear portion where it is strigose, indistinctly transparently striatulate, smooth, drying from behind out-

ward, convex, 33 mm. broad. — Lamellae pale isabella color to pinkish avellaneous, distant, rather broad. — Stipe lateral, tiny and inconspicuous, eventually disappearing. — Context fleshy, white, unchanging, mild, inodorous. — Spores $8.3-8.8 \approx 6.3-7 \mu$ (with ornamentation; about $7.7 \approx 6.7 \mu$ without light melleous-brown, with a cristulate ornamentation which projects strongly ($0.7-1.7 \mu$, mostly about 1μ) much like that of *Bondarzewia montana* but brownish, consisting of crests occasional warts, crests short and often connected with neighboring crests or occasional warts and thus forming an incomplete network about as in *Strobilomyces confusus*. — Hymenium: Basidia $23-33 \approx 8-9/2 \mu$, (2)—4-spored. Cystidia none. Cheilocystidia $21-49 \approx 12-19 \mu$, balloon shaped or with a narrow and inconspicuous secondary ventricosity below (e. gr. 8.8μ broad) below an enormous capitulum above a constriction of about 7μ diam., usually short pedicellate (pedicel $3.5-7 \mu$ thick), hyaline, without protoplasmatic contents. — Hyphae: Cuticular layer not differentiated but there is a fragmentary epicuticular layer consisting of dense to scattered cystidiform terminal members of the tramal hyphae which are hyaline, smooth, versiform, taking at times the shape of the cheilocystidia, at times with several constrictions, at times cylindric-capitate, ampullaceous, ventricose-subcapitate, or clavate, etc. $19-53 \approx 7-10.5 \mu$. All hyphae with clamp connections.

Paxillaceae.

35. *Hygrophoropsis tapinia* Sing., Farlowia **2**: 544. 1946.

The description of this species need not be repeated here inasmuch as the Mexican specimens agree with the Floridian ones in every particular. The spores are pseudoamyloid which seems to be a generic character of this genus.

On a dicotyledoneous stump in tropical montane forest with evergreen oak. Huautla de Jiménez, at about 1500 m. alt., Oaxaca. 10-VII-1957. R. Singer, M 1515. (MICH).

Boletaceae.

36. *Gyrodon monticola* Sing. ex Sing. & Digilio, Lilloa **28**, 256, 1957 (1958).

This species which is ecologically and anatomically as well as macro-morphologically very close to *G. lividus*, but differs in the mild taste and some minor characters, is characteristic for the montane *Alnus* woods of the group *A. glabrata-jorullensis* which accompany the mountain ranges from Oaxaca south to Argentina. It is interesting that this species, known until now only from the south tip of the narrow area of *Alnus jorullensis* should now show up near its northern end.

The species was collected by Singer at San Andrés, Oaxaca under *Alnus* at 2000 m. alt. together with a species of similar distribution — but not mycorrhizal — viz. *Lactocollybia aurantiaca* Sing. Collected 14-VII-1957, no. M 1554 (MICH, with duplicates in Mexico).

Phylloporus rhodoxanthus (Schwein.) Bres.

See under *Phaeomarasmius muricatus*. Without notes on the fresh specimens and without a well preserved stipe base, it cannot be made out to which subspecies this specimen belongs.

Leccinum duriusculum (Schulz.) Sing., Amer. Midl. Natur. **37**: 122. 1947.

Pileus umber-fuscous, rugose, dry, convex, 50—60 mm. broad. — *Hymenophore* tubulose, tubes long and narrow, deeply depressed, in color like those of *L. scabrum*, pores small, concolorous or sometimes somewhat discolored. — *Stipe* white, tending to yellow below, strongly gray-scabrous, furfuraceous all over, solid, attenuate towards apex, 90—100 \Rightarrow 12—15 mm.; veil none.

Context white, turning gray when wounded and eventually deep gray where exposed a long time, turning blue in the base of the stipe on exposure, soft-fleshy; taste mild; odor none. — *Spores* 14.5—17.3 \Rightarrow 5.3—5.8 μ , long-fusiform, brownish fuscous but rather pale, smooth, without a germ pore, not truncate. — *Hymenium*: Basidia 27—29 \Rightarrow 10.8—13.5 μ , clavate, hyaline, 4-spored. Cystidia on pores and in tubes, (now) mostly brown (inside), ampullaceous. Fragments of stipe hymenium on scabrosities consisting of a variety of elements which are either hyaline or umber, hyphal ends and rare spherocysts with broadly rounded tips present, also dermatopseudoparaphyses which are vesiculose to clavate, broadly rounded above, 26—33 \Rightarrow 11.5—12.7 μ , also dermatocystidia which are ampullaceous to clavate-mucronate, 43—54 \Rightarrow 12—15.5 μ . — *Hyphae*: Epicutis (over a cutis representing the hypodermium) cellular, forming an epithelium, consisting of balloon shaped to subglobose hyaline to pale fuscous cells which are in several layers and often combined into chains but eventually many separated. All hyphae without clamp connections.

This species is also often called *Boletus carpini* (Pearson).

The Mexican specimens are not quite typical. They are slightly aberrant because they tend to be almost intermediate between this and *L. albellum*. A more fully representative collection and observation of the variations and the chemical reactions (which could not be observed this time) will certainly clear up any questions as to the identity of this collection.

The description given above refers exclusively to material collected under evergreen oaks in tropical montane forest near Huautla de Jiménez, Oaxaca, at about 1500 m. alt., 12-VII-1957, R. Singer, M 1537 (MICH).

Although a number of observations and collections have been made on representatives of the Boletaceae in the coniferous woods of the slopes of Popocatepetl and Cerro de Toluca, we have refrained from enumerating them or commenting on them pending a study of this family in the Distrito Federal by a Mexican investigator.

Strobilomycetaceae.

Strobilomyces floccopus (Fr.) Sacc.

This is not uncommon near Huautla de Jiménez, Oaxaca, 12-VII-1957, at about 1500 m. alt. under evergreen oaks. R. Singer, M 1535 (MICH).

Russulaceae.

40. *Russula pusilla* Peck.

This is the common bright red *Russula* in tropical-montane forests, on the ground under evergreen oaks, near and around Huautla de Jiménez, Oaxaca, 12-VII-1957, at about 1500 m. alt. R. Singer, M 1543 (MICH).

A redescription of this species has been given by this author in Sydowia (in print). The species is also common in Florida.

41. *Russula pectinata* (Fr.).

Together with the preceding species, Singer, M 1541 (MICH).

42. *Russula densifolia* (Sacc.) Gillet.

This has cream colored lamellae, mild taste and turns pink on exposure. Together with the two preceding species, Singer, M 1540 (MICH).

43. *Lactarius indigo* (Schwein.) Fr.

Together with the preceding three species under oak (no pines present) G. Guzmán (preserved in Mexico). This species is also common further north in the pine woods of the Distrito Federal, where it comes to the markets.

Supplement: Species determined in the field, but not brought to the laboratory.

It seems advisable that in the case of common and, as far as we know „unmistakable“ species, not thoroughly studied by me thus far, an exception should be made from the general rule, and a short mention be permitted, inasmuch as in the case of the exploration of the Mexican fungous flora, such initial identifications might be of some temporary value for the local collector.

The following species were observed, and most of them deposited in either the herbarium of the Instituto de Biología of the University or in the Instituto Politécnico, both in Mexico D. C. These species were:

1. From Huautla de Jiménez.

Hygrocybe psittacina (Schaeff. ex Fr.) Karst.
Clitocybe infundibuliformis (Schaeff. ex Fr.) Quél.
Lepista nuda (Bull. ex Fr.) W. G. Smith.
Gerronema icterinum (Sing.) Sing.
Panus rudis var. *strigellus* (B. & Br.) Sing.
Panus crinitus (L. ex Fr.) Sing.
Pleurotus ostreatus (Jacq. ex Fr.) Kummer.
Hohenbuehelia angustata (Berk. & Curt.) Sing.
Oudemansiella canarii (Jungh.) Höhnelt.
Marasmiellus ramealis (Bull. ex Fr.) Sing. On *Strychnus*.
Marasmiellus nigripes (Schwein.) Sing. On *Coffea*.
Mycena pura (Pers. ex Fr.) Quél.
Amanita caesarea (Scop. ex Fr.) Pers. ex Schwein.
Amanita rubescens (Pers. ex Fr.) Gray.
Amanita magnivelaris Peck.
Agaricus bambusigenus Berk. & Curt.
Coprinus comatus (Fl. Dan. ex Fr.) Fr.
Pseudocoprinus disseminatus (Pers. ex Fr.) Kühner.
Agrocybe retigera (Speg.) Sing.
Agrocybe fimicola (Speg.) Sing.
Stropharia coronilla (Bull. ex Fr.) Quél.
Stropharia melanosperma (Bull. ex) Quél.
Melanotus musaecola (Berk. & Curt.) Sing.
Clitopilus septicoides (Henn.) Sing.
Gyroporus castaneus (Bull. ex Fr.) Quél.
Lactarius fuliginosus Bull. ex Fr.
Lactarius indigo (Schwein.) Fr.

2. Markets of Mexico D. F., Amecameca, Tenango del Valle.

Lyophyllum decastes (Pers. ex Fr.) Sing.
Amanita caesarea (Scop. ex Fr.) Pers. ex Schwein.
Amanita rubescens (Pers. ex Fr.) Gray.
Boletus edulis ssp. *clavipes* Peck.
Tylopilus felleus (Fr.) Karst. (!)
Leccinum chromapes (Frost) Sing.
Russula delica Fr., many with *Hypomyces lactifluorum*
 Schwein.
Lactarius indigo (Schwein.) Fr.,
Lactarius deliciosus (L. ex Fr.) Gray (the pine form,
 determined *L. salmonicolor* Heim by Heim in Univ. Mex.
 Inst. Biol. Herb.).

3. *Popocatepetl* and *Cerro Toluca*.

Hygrocybe conica (Bull. ex Fr.) Karst.
Tricholomopsis rutilans (Schaeff. ex Fr.) Sing.
Omphalina fibula (Bull. ex Fr.) Quél.
Flammulina velutipes (Curt. ex Fr.) Sing.
Xeromphalina campanella (Batsch ex Fr.) Maire.
Amanita calyptratoidea Peck.
Amanita inaurata Secr.
Amanita muscaria (L. ex Fr.) Pers. ex Gray¹).
Agaricus arvensis Schaeff. ex Fr.
Anellaria semiovata (Sow. ex Fr.) Pearson & Dennis.
Stropharia semiglobata (Batsch ex Fr.) Quél.
Naematoloma capnoides (Fr.) Karst.
Hygrophoropsis aurantiaca (Wulf. ex Fr.) Maire.
Suillus piperatus (Bull. ex Fr.) Kuntze.
Lactarius scrobiculatus (Scop. ex Fr.) Fr.

¹) This is the same race or variety occurring in California and from Virginia southwards, always under 2-needle pines, here under *Pinus hartwegii* and other pines, characterized by yellowish veil (particularly where volva of pileus and stipe meet), bright red pileus. The new subspecific name *Amanita muscaria* ssp. *flavivolvata* mihi is proposed (Pileo rubro), velo partim vel integro flavido vel flavo. San Francisco, Calif., R. S i n g e r N 1506, 21—I—1958 (MICH), typus. Forms with yellow veil in Europe exist.

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