

Fungi Mexicani, Series secunda — Agaricales¹⁾

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Several of my own collections and some collections made by G. Guzmán Huerta, Mexico D. F. provide the occasion for a second series of contributions to the mycological flora of Mexico.

Hygrophoraceae.

Hygrotrama gen. nov.

Pilei epicute hymeniformi ex elementis vesiculosus efformata aut hyphis defibulatis (aut epicute hymeniformi et simul hyphis fibulis destitutis), raro epicute ex hyphis repentibus fibuligeris consistente, sed semper in tramate hymenophorali hyphae latiores (usque ad 35 μ attingentibus), praesertim in mediostrato adsunt. Sporibus inamyloideis, ceterum Neohygrophoro comparabile genus; Camarophyllis simile sed notis hic expositis distinguendum genus. Species typica: *H. dennisianum* Sing.

Hygrotrama dennisianum Sing. spec. nov.

Pileo epicute hymeniformi vel subhymeniformi manifesta obecto; sporibus 5—7 \times 3.5—5.2 μ , levibus, inamyloideis, hyalinis; basidiis tetrasporis; cystidiis nullis; tramate hymenophorali subregulari vel subirregulari, ex elementis angustis latisque composito; hyphis omnibus fibulatis. In apricis vel in plantationibus haud umbrosis. Ceterum „Hygrophoro“ .hymenocephalo (cf. inferius!) persimilis species. Typus in herbario LIL conservatus est.

Hygrotrama dennisianum Sing. gen. nov., spec. nov.

Pileus pearl gray to drab, sometimes the center and one side of the pileus fuscous, glabrous to minutely pruinose, often rivulose-cracking, not viscid, not hygrophanous, convex, then with convex to merely declivous marginal portion and flattened to depressed disc, 40—44 mm. broad. — Lamellae light gray, more or less reticulate-intervene in interspaces, horizontal or descendant, broad, subdistant to distant. — Stipe concolorous with either lamellae or stipe, dry, slightly innately longitudinally fibrillose-striped, smooth, glabrous and either in the beginning or in age slightly superficially fibrillose, glabrescent or not, solid, tapering downwards, 31—49 \times 9—10 (at

¹⁾ The first series was published in Sydowia (Ann. Mycol. ser. II) 11: 254—274. 1957. A third series is in preparation.

apex), 3—4 (at base) mm. — **C o n t e x t** almost concolorous with the surfaces, fleshy; odor none; taste agreeably farinaceous. — **S p o r e s** 5—7 × 3.5—5.2 μ , short cylindric or short ellipsoid, sometimes subglobose or ellipsoid, smooth, thin-walled, hyaline, inamyloid. — **H y m e n i u m**: Basidia 23—33 × 5.5—7 μ , 4-spored; cystidia and cheilocystidia none. — **H y p h a e**: Subhymenium of small elements, subcellular, hyaline. Hymenophoral trama subregular-subirregular, irregular near the junction with the trama of the pileus, consisting of hyaline-smoky-stramineous hyphae which are interwoven but mostly axially arranged, almost subparallel in some portions near the subhymenium and in the very central strand (mediostratum) in the half near the edge, very variable in size, all elongated, but in mediostratum some reaching 35 μ diameter (while others remain narrowly filamentous. All hyphae inamyloid, with clamp connections.

C o v e r i n g l a y e r o f p i l e u s: Epicutis a hymeniform or subhymeniform layer of medium to large hyaline to pale fuscous balloon shaped elements whose lower portions or at least pedicels show a brown colored wall just as most elements of the cutis underneath (the hypodermium). In the flesh underneath the hypodermium, the broad elements become gradually more numerous as the lamellae are approached.

In open places, pastures, meadows, sometimes under bamboo, or near plantations solitary or in groups fruiting in the rainy season.

M a t e r i a l s t u d i e d: Mexico: Oaxaca, Huautla de Jiménez, 13-VII-1957. R. Singer no. M 1553 (LIL). — Trinidad: St. Joseph, 20-X-1949. R. W. G. Dennis (K).

This species shows that the clamp-less hyphae of what is known as *Hygrophorus hymenocephalus* are not a generic character. This has already been concluded from the reexamination of „*Hygrophorus* sp. near *hymenocephalus* Smith & Hesler“ Dennis, Kew Bulletin for 1953, p. 255, see Singer, Type Studies on Basidiomycetes, Sydowia 9: 369—370, 1955. It shows likewise that neither the clamp-bearing nor the clamp-less species of the group here combined have what may be considered and has been described as typical hymenophoral trama structure in *Camarophyllus*. These are indeed species which are in a way intermediate between the typical *Camarophylli* and the typical *Hygrocybes* as far as the external and hymenophoral characters are concerned. Yet, they are separable from both genera by the characters of the epicutis and/or the hyphal septation.

This group of species includes the following „*Hygrophori*“:

Hygrotrama dennisianum Sing.

Hygrotrama hymenocephalum (Smith & Hesler) Sing. comb. nov. (*Hygrophorus hymenocephalus*) Smith & Hesler, Journ. El. Mitch. Sc. Soc. 56: 311. 1940.

Hygrotrama microsporum (Smith & Hesler) Sing. comb. nov. (*Hygrophorus microsporus* A. H. Smith & Hesler, *Lloydia* **5**: 11. 1942).

Apparently, a detailed restudy of the Hygrophori transferred by me (*Lilloa* **22**: 216—218. 1951) will show that they all belong in *Hygrotrama* as outlined above, i. e. *H. paupertinus*, *H. deceptivus*, and perhaps also *Omphalia atropuncta* (Pers ex Fr.) Sacc. will have to be transferred to the new genus. At present, we propose the formal transfers only in those cases that were restudied by the author in recent times.

On the other hand, Smith & Hesler, in a recent paper (*Sydowia* **8**: 319. 1954) give a key to the clamp-less Hygrophori which combines, in fact, all the species with thick lamellae (and mostly relatively long basidia) and without clamp connections. While this author has already admitted that it is preferable, on the basis of the new evidence provided by the case of *Hygrotrama dennisianum*, to separate the hygrophoroid clampless species from *Armillariella* and include them in the family Hygrophoraceae, it does not follow that they are congeneric with *Camarophyllus* as Smith & Hesler feel so strongly. These authors have become rather polemical on this question, and have forgotten that — even though their generic concept in *Hygrophoraceae* may be somewhat different from that of Fayod, Maire, Lange, Singer, Moser, and many other authors — a problem is not solved by synonymizing two or more genera: The same questions will haunt the specialist on the level of infrageneric taxonomy. It cannot be said that *Hygrophorus* sensu Smith & Hesler is as homogenous a genus as *Russula* or even *Cortinarius*, and we have to look for the point where the hiatus between the possible subdivisions are hidden (or apparent), whether we later decide that these hiatuses separate what we prefer to call subgenera, or genera. Leaving the genus *Hygrotrama* within *Hygrophorus* sensu lato without delimiting it even on the subgeneric level, one must come to the conclusion that *Hygrocybe* and *Camarophyllus* cannot be separated. But working out its limits, one will arrive at a much more homogeneous residual group in *Hygrocybe* as well as in *Camarophyllus*. If further taxonomic studies should show that this conclusion is wrong, we shall have to admit our error and attempt to reorganize the taxonomy of the genus on the basis of new evidence. But the present published evidence and the data in my notes forcefully suggest the solution provided by the distinction of the new genus *Hygrotrama*. As for „*Hygrophorus*“ *marginatus* which I have (1943) transferred to *Tricholoma*, subgenus *Humidicutis* (Sing. 1948), and which may likewise better be recombined with the *Hygrophoraceae*, once clampless species are admitted in that family, it does not

automatically become a *Hygrocybe* (or *Hygrophorus* subgenus *Hygrocybe*) again, as Smith and Hesler seem to believe. These authors go so far as to doubt my statement that I have observed chemical differences between *Humidicutis* and *Hygrocybe*, differences which I have demonstrated to the mycologists present in the 1953 season at Cheboygan Mich. and which consisted in the following:

KOH (10%) dissolves the pigment of „*Hygrophorus*“ *marginatus* and destroys it, bleaching it, to practically colorless. In the same solution, *Hygrocybe flavescens* and other true *Hygrocybes* available at that time did not show any such action of KOH and the pieces of carpophores left in KOH remained colored. Anilin stains the lamellae of „*Hygrophorus*“ *marginatus* sordid olive brown while on the lamellae of *Hygrocybe flavescens* a characteristic orange-salmon discoloration was observed. The conclusion that the corresponding pigment in *Hygrocybe* is not identical with that of „*Hygrophorus*“ *marginatus* does not appear to be far-fetched or unreasonable. This observation, on the contrary gives more weight to the direct observation in the field suggesting that the Ridgway and Maerz & Paul values of the colors involved are different from those obtained from the *Hygrocybes* studied by me in this regard. Already in 1942 and 1943 I noted „between flame scarlet and grenadine-red“ (Ridgway) for the pileus and „flame scarlet“ to „a tone deeper and brighter than anything in Ridgway“ for the lamellae, with some further variations in both cases. Furthermore, „water extracting the pigment becoming colored by it, KOH and NH₄OH strongly bleaching causing the pigmented surfaces first to become yellow, then pallid“. This material (N 312, F 471 A, F 471 B, F 2738, F 2875) is deposited at FH and F respectively.

It is true that I have not published my respective notes beyond the short characterization I have provided for the taxa above the species level, adopted in my „*Agaricales* in modern taxonomy“. It seemed to me then — and I cannot help thinking so now — that certain suggestions that come to the specialist of a given group should and could be taken into consideration without causing a reaffirmation of past views in tones which — had they not come from excellent mycologists whose intention was certainly not one of personal attack — might have had an effect quite different from the one this whole taxonomic controversy has actually had: a constructive re-evaluation of the material at hand.

As a consequence of the considerations about „*Hygrophorus*“ *marginatus*, I am convinced that this species, together with its relatives, as for example, „*Hygrocybe*“ *czuica* Sing. (*Tricholoma czuicum* (Sing.) Sing.), should be separated from both *Hygrocybe* and *Tricho-*

loma, but also from both *Camarophyllus* and *Hygrotrama* as a new genus of the *Hygrophoraceae* ²⁾).

Hygrocybe erinacea (Pat.) Sing. comb. nov.

Hygrophorus erinaceus Pat., Bull. Soc. Mycol. F. **25**: 10. 1909. Oaxaca: Huautla de Jiménez, 11-VII-1957, R. Singer, M. 1517 (LIL.)

This species is new for Mexico. It was discovered in the Eastern tropics, and was first reported as far as the Western Hemisphere is concerned by Dennis who describes a somewhat doubtful collection from Trinidad which does not fully agree with the original description but much more with a species or variety (of *H. conica*) which is known as *H. conicus* var. *peradenycus* Sacc. Our specimens do not show any trace (except innate black fibrils) of the originally very striking hirsute character of the surfaces which is due to numerous erect fibrils on the surface of pileus and stipe. This same species is rather frequent in the tropical parts of Bolivia. *H. erinacea* belongs in section and subsection *Conicae*.

Hygrocybe mexicana Sing. spec. nov.

Pileo laetissime coccineo, glabro, sulcato striatoque, haud viscido, 10 mm. lato, convexo, umbilicato. Lamellis flavis roseo-rubrisque, latissime adnatis, subdecurrentibus, distantibus. Stipite pileo concolori, sicco, 21×1.5 mm. Odore nullo. Sporis $7-9.5 \times 4-7 \mu$, levibus, haud manifeste dimorphis, basidiis 2-4-sporis, haud manifeste dimorphis, epicute pilei haud gelatinosa, nec stipitis superficie strato mucilaginoso praedita. Ad marginem plantationis. Specimen in LIL conservatum est. *H. firmae*, *sipariae*, *coccineae* affinis.

Pileus brightest scarlet red, glabrous, with sulcate and at the same time transparently striate margin over one half of the radius, not viscid, convex, umbilicate, about 10 mm. broad. — Lamellae yellowish mixed with pinkish red, very broadly adnate and either with a slight not very striking decurrent tooth, or subdecurrent, distant, very broad. — Stipe brightest scarlet red, not striate, not viscid, slightly tapering upwards, 21 mm. long, 1.5 mm. broad at apex, reaching 2.5 mm. in diameter at base. — Context almost concolorous with the surfaces, without noticeable odor. — Spores $7-9.5 \times 4-7 \mu$, ellipsoid, rather variable but not falling into definite categories of size or shape, smooth, hyaline. — Hymenium: basidia $25-35 \times 7.2-9.2 \mu$, 2-4-spored, clavate, not dimorphic but remark-

²⁾ **Humidicutis** (Sing.) Sing. stat. nov. (genus) (*Tricholoma*, subgenus *Humidicutis* Sing., *Sydowia* **2**: 28. 1948). Species typica generis: **H. marginata** (Peck) Sing. comb. nov. (*Hygrophorus marginatus* Peck, Ann. Rep. N. Y. State Mus. **28**: 50. 1876).

ably short as compared with the size of the spores. Cystidia and cheilocystidia none. — H y p h a e and whole preparation pale yellow in ammonia and KOH, with clamp connections, those of the surface layers of both pileus and stipe not at all gelatinized, those of the hymenophoral trama subregularly arranged (as in *H. coccinea*).

Along the margins of the plantations, gregarious, on earth and humus, fruiting during the rainy season.

Material studied: Huautla de Jiménez, Oaxaca, 12-VII-1957, R. S i n g e r no. M 1531 (LIL, typus).

This species is closely related to the European *H. coccinea* in the sense of S m i t h & H e s l e r. This latter species is rare in the United States and has not been observed with certainty in Mexico. It differs from *H. mexicana* in being larger and by a number of less conspicuous characters. The Mexican species has the appearance of and is certainly related with *H. firma* (Berk. & Br.) Sing. (see Fungi Mexicani, Series prima — *Agaricales*, Sydowia **11**: 355. 1957) but differs strictly in not having dimorphic spores or basidia. The spores of *H. mexicana* never reach the sizes observed in *H. firma*. *H. sipiaria* (Berk.) Sing. (*Hygrophorus siparius* Berk. Decad. no. 512, Sacc. Syll. **5**: 413) differs from *H. mexicana* by the same characters as *H. firma* differs from *H. mexicana*, and can be distinguished from all three species mentioned by the white lamellae.

Tricholomataceae.

Marasmiellus subfumosus (Speg.) Sing., Sydowia **9**: 387. 1955.

Collybia subfumosa Speg., Bol. Acad. Nac. Cienc. Córdoba **11**: 390. 1889.

P i l e u s isabellinous-avellaneous-cinnamomeous, with innately fibrillose but glabrous surface, dry, i. e. not viscid, strongly sulcate-furrowed radially and striate, convex, with or without an obtuse broad umbo, not umbilicate or narrowly depressed in center when old, or exceptionally truly umbilicate, 25—110 mm. broad. — L a m e l l a e whitish, soon palest avellaneous becoming concolorous with the pileus, subclose to crowded, with smooth inter-spaces but eventually becoming rugulose or interveined, narrow, behind eventually moderately narrow, subfree to narrowly adnexed. — S t i p e on light fuscous ground sordid-pallid velutinous and thus much paler than the pileus, velutinous layer generally thicker in upper portion of stipe, smooth or long and slightly furrowed longitudinally near apex, long stuffed but eventually (always in mature herbarium specimens) hollow, slightly to distinctly tapering upwards, sometimes flexuous, 30—150 × 4—10 mm.: basal mycelium coarsely cottony-woolly, varying from abundant to scarce and buried in the adhering trash. —

Context white, unchanging, with a strong HCN (*Marasmius oreades*) odor. — S p o r e s $7-9.5 \times 3.8-4.8 \mu$, mostly about $7.5-7.8 \times 4-4.2 \mu$, oblong to ellipsoid or almost subcylindric, smooth, thin-walled, inamyloid, hyaline. — H y m e n i u m: Basidia $29-37 \times 7 \mu$, 2-4-spored, clavate. Cheilocystidia when well preserved making the edge heteromorphous, slightly stramineous, $20-31 \times 10-14 \mu$ (measured from last septum), club shaped or cylindric, with cauliflower-like upper portion or with finger-like excrescencies or appendages, occasionally forked. Cystidia on sides of lamellae none. — H y p h a e with clamp connenctions, inamyloid; hymenophoral trama subregular, consisting of filamentous somewhat interwoven hyphae, stramineous to subhyaline when mature; trama not gelatinized. Subhymenial elements small and tending to form nodose ramifications especially where reaching the surface at edge or between basidioles.

Covering layer of pileus: Uppermost layer of cuticle at least at maturity distinctly differentiated with Rameales structure (hyphae irregularly nodose-ramified or cauliflower-like, diverticulate, or with cystidioid hyphous outgrowths), pale golden melleous without any incrusting pigment, in lower layers equally free of pigment incrustations, the whole structure basically — a cutis. Dermatocystidia hyaline, erect, usually simple, often cylindric, $23-24 \times 4.5-5 \mu$.

At the base of trunks, in woody humus and on rotten leafmold in the forest, not caespitose, but often gregarious.

Material studied: Mexico: Huautla de Jiménez, Oaxaca, 12-VII-1957, R. Singer no. M 1538 (LIL) — Brazil: São Paulo, holotype (hardly other authentic material), (LPS) — Rio Grande do Sul, Estação São Salvador, 9-XI-1951, R. Singer no. B 115 (LIL).

This species is characteristic for a large group of collybioid (with basal mycelial fibrils) *Marasmielli* and is perhaps the best known of all of them since it was redescribed by Dennis and myself. Nevertheless, a more detailed study of this mainly tropical and subtropical group of species showed that the delimitation of *M. subfumosus* as accepted by me and apparently by Dennis (because of descriptive data at variance with the type, and synonymy) has been too wide, including a number of species which have the same general characteristics such as more or less striped (innately radially fibrillose) pileus colored from pale fawn or avellaneous-isabellinous to cinnamon or fulvous, stipe from slightly longitudinally fibrillose or pruinose to strongly velvety-tomentose all over, habit of medium to large Collybias of the *impudica*-group, spores varying from rather small to rather large and from ellipsoid to oblong-subcylindric, epicutis of pileus with Rameales-structure over a cutis with or without pigment incrustation. This latter character as well as presence or absence of cystidia on the sides of the lamellae, width

and number of lamellae, degree of vestiment on the surface of the stipe, taste and odor, size of carpophores and habit and habitat may serve to differentiate many more species than had been anticipated a few years ago. It is even possible that some species generally taken for *Collybia* will have to be transferred to this group or vice versa, the whole of this group would have to be transferred to *Collybia*, an alternative discussed in a recent paper of mine (*Mycologia* **50**: 1-7-108. 1958).

For a better understanding of the species we consider it necessary to redescribe once more the species we identify with the holotype of *Collybia subfumosa* Speg. This was done above. Furthermore, we wish to add the description of another species of this group, rather widely distributed but apparently undescribed, and likewise occurring in Mexico:

Marasmiellus paurosporus Sing. spec. nov.

Pileo avellaneo vel cinnamomeo, frequenter umbilicato umbilicoque pallido instructo, 15—62 mm. lato, vulgo minore, radiatim innate fibrilloso. Lamellis albis vel pallide alutaceis, confertis vel confertissimis, angustis; sporis in cumulo albis. Stipite colore fundamentalis (apice excepto) ei pilei correspondente sed pallidius vellereo, fibrillis mycelialibus basalibus albis vel albidis. Sapore sat ingrato. Sporis 5.3—8.3 × 3—4.8 μ . Cystidiis ad latera lamellarum paucis cystidiolis saepe numerosissimis, basidiolis fusoideis, basidiis saepe sparsis. Epicute pilei elementis nodoso-ramulosis nec non hyphis levibus vel subdiverticulatis dermatocystidiisque erectis formata. Hyphis fibuligeris. Ad basin truncorum in humo nec non ad stipites herbaceas acervatas et ad folia putrescentia intra et extra silvam gregatim nec fasciculatim. Holotypus in herbario LIL conservatus est.

Pileus "fawn" to "marron glacé" (Maerz & Paul 14-A-7/8, i. e. fawn color to almost pecan brown), or "Verona brown" (Ridgway), soon with paler ground color and distinctly but innately radially fibrillose-striped, "russet" (Ridgway) or violet brown, when young, and becoming paler on fading, smooth otherwise when young, but eventually sometimes more or less extensively transparently striate when wet, somewhat hygrophanous, glabrous, not viscid, convex, then appanate, with a distinct umbilicus, more rarely with a broad obtuse umbo in age and the umbo sometimes umbilicate, 15—62 mm. broad, usually 18—26 mm. broad. — Lamellae white or whitish, then buffish pallid, or at least becoming so on drying, rather variable in stipe-attachment (subfree to subdecurrent, sometimes on the same cap), at times eventually separating from the enlarged apex of the stipe, narrow or very narrow, close or crowded, not intervenose. — Spore print white or just off white (within "A" of Crawshay scheme). — Stipe at first whitish at apex and pruinose there, more con-

colourous to cinnamon-chestnut colored below, entirely finely velvety all over, or with an almost scurfy tomentum in older specimens, the covering much paler to almost pallid, often with a slightly enlarged extreme apex, otherwise subequal or equal, with more or less abundant pallid or white basal mycelium, varying from longer than diameter of pileus to very slightly shorter than the latter, often canalliculate, stuffed, eventually (and in mature dried material) hollow, $23-70 \times 0.5-2.5$ mm. — Context in marginal half of pileus white and thin, flexible, somewhat tough-fleshy, unchanging; odor none or slight and disagreeable, of rotten sauerkraut or *Micromphale foetidum*; taste somewhat disagreeable. — Spores $5.3-8.3 \times 3-4.8$ μ , mostly around $7-7.8 \times 4$ μ , hyaline, droplet-shaped to oblong, sometimes almost subcylindric, mostly more or less ellipsoid, smooth, thin-walled, inamyloid, with suprahilar depression or apblanation. — Hymenium: Basidia $21-26 \times (4.3)-5-5.8$ μ , at first narrowly clavate, then clavate, 4-spored. Cheilocystidia $20-36 \times 5.5-12$ μ , characteristically club shaped, mostly simple, either entire with one or few knob-, thorn-, or sterigma-like short excrescencies, sometimes all entire, hyaline or subhyaline, making the edge heteromorphous or almost so. Cystidia on sides of lamellae sometimes limited to some cheilocystidium-like bodies near the edge, but mostly differentiated as very rare to scattered pleurocystidia; pleurocystidia $30-36 \times 8-14$ μ , slightly projecting, hyaline, club-shaped or more often mucronate, fusoid-ventricose or ampullaceous-subcapitate, entire. Cystidioles usually numerous, like basidioles but "empty", Basidia often few. — Hyphae hyaline, with clamp connections, with thin or rather thin walls, inamyloid. Hymenophoral trama regular, consisting of filamentous hyphae, subparallel, not gelatinized, without pigmentation. Subhymenium narrow, of chains of short-elongate to spheric elements arranged perpendicularly to the filaments of the hymenophoral trama. — Covering layers: Epicutis of pileus consisting of a layer of appressed hyphae forming basically a cutis but with rather numerous dermatocystidia (dermatocystidia $12-30 \times 4.2-6.5$ μ , hyaline, cylindric or irregular, sometimes diverticulate), soon showing islands of Rameales structure, i. e. accumulations of irregularly ascendant forked or diverticulate (irregularly) hyphae, some with brown incrustations, hyaline to stramineous-melleous, but intermittent and interrupted by smooth repent surface hyphae $1.5-15$ μ in diameter; underneath epicutis a hypodermium which is a cutis of repent subparallel-interwoven hyphae with distinct brown to deep chestnut colored pigment incrustations which may appear in spirals ("zébrées"), at places somewhat irregular in arrangement when old.

On humus and especially accumulations of dead vegetable matter such as herbaceous stems or rotting leaves of both mono- and

dicotyledoneous plants, either around tree trunks or, at times, far away from trees in fields or pastures or parks and lawns. Gregarious to almost subcespitate in places but generally not fasciculate. Fruiting in the rainy season, in the laboratory at any time.

Material studied: *Mexico*: Oaxaca: Huautla de Jiménez, 12-VII-1957, R. Singer no. B 1533 (LIL, typus). — *Bolivia*: La Paz: Nor-Yungas, Coroico, 18-II-1956, R. Singer no. B 1255 (LIL). — *Brazil*: Rio Grande do Sul: Caixa do Sul, 2-IV-1958, A. Tocchetto, comm. J. E. Wright, det. Singer (LIL). — Probably also the following two collections: Florida (U.S.A.): Highlands Co., Highlands Hammock State Park, on leaves of *Myrica* around a living trunk of *Myrica* in the "Botanical Garden" area, 2-IX-1942, R. Singer no. F 504 (F). — *Argentina*: Prov. Salta: Depto. Orán, 2 km. north of the City of Orán on various débris under trees along a road, 17-III-1955, R. Singer no. T 2304 (LIL).

This species varies somewhat as far as the closeness of the lamellae and their width is concerned, also as for habitat and size. Nevertheless, it is one of the narrow-crowded-gilled species of medium size as far as the most usual and typical aspect is concerned. The collection from Brazil was obtained in the laboratory and was growing out of a small trunk of *Prunus persica* which was planted in earth in the laboratory. The peach trees were taken to the laboratory for observation since they were diseased. The collector and phytopathologist of Caixa do Sul believes that the pathogen is the *Marasmiellus* described above. If this were confirmed, *Marasmiellus paurosporus* must be considered as facultatively parasitic and pathogenic as a root parasite on cultivated plants. Since *Prunus persica* is not native in Southern Brazil, it must be assumed that, in this case, the fungus is not very specialized as to host plant and might attack roots of many native plants in their natural habitats.

A remarkable condition has been observed in the Mexican, the Bolivian, the Argentine and, to a certain degree, the Brazilian collection: their sporulation, at all times during the development of the carpophores, was relatively reduced, and the majority of the hymenial elements consisted of basidioles, cystidioles, with very few sporulating basidia or cystidia observable. The species does not produce a spore print except in particularly favorable conditions and in the Florida form.

M. paurosporus differs from the other cystidiolate species of the collybioid group of *Marasmiellus* in combining a strong pigment incrustation with medium sized spores (not over 9 μ long). Among the acystidiolate species with which it can easily be confused, it comes close to the group *M. domesticus* - *M. biformis* (with smaller spores and less close lamellae) and to a much larger, stouter species which I tentatively identify with *M. luxurians* although I have not recently

analysed the type of that North American species and do not know whether it has the same type of pigmentation, and the same structure of the hymenium.

Marasmius strictipes (Peck) Sing. Lilloa **22**: 326. 1951.

Collybia strictipes Peck, Ann. Rep. N. Y. State Mus. **41**: 62. 1888.

Gymnopilus strictipes (Peck) Murr., North Amer. Flora **9**: 357. 1916.

Pileus white with stramineous center, later partly pale fulvous or with rusty-fulvous spots or areas, convex, becoming nearly flat, subumbonate or broadly and obtusely umbonate, not viscid, not distinctly hygrophanous, glabrous, smooth but partly reticulate to reticulate-rugose, with entire or lobed margin which is incurved at first, 26—51 mm. broad. — Lamellae white to whitish, crowded, rounded-free or subfree, not intervenose, narrow. — Stipe white, white fibrillose or with pruinose apex, equal or subequal (at times with slightly thickened base and/or apex), hollow, $47-88 \times 1.5-4.5$ mm., usually straight, with basal (white) tomentum, with connate bases. — Context white or whitish, unchanging; odor of crabs or crayfish, mixed with odor of *Marasmius oreades* (HCN). — Spores $7.5-8.5 \times 3.8-5$ μ , mostly $8.3 \times 4-4.8$ μ , ellipsoid to oblong, smooth, hyaline, inamyloid. — Hymenium: Basidia $23-28 \times 5.5-8$ μ , 4-spored, hyaline, clavate. Cystidia none. Cheilocystidia stramineous, irregular, filamentous to cylindrical-flexuous or cylindrical-subclavate, e. gr. $26-28 \times 2-5$ μ . — Hyphae hyaline, with clamp connections, with thin walls, except for some individualized filamentous thick-walled and strongly amyloid (pseudoamyloid) elements which have the appearance of the epicuticular hairs of *Crinipellis* (here walls $1-1.3$ μ diam. for a total diameter of $2.5-4.5$ μ), somewhat less but still extremely rapidly and very strongly mahogany-red in Melzer's reagent in hymenophoral, pileus- and stipe-trama. Hymenophoral trama regular, its hyphae filamentous to slightly thickened ($4-10$ μ diam). — Covering layer of pileus: Uppermost layer of the pileus consisting of erect hymeniformly arranged hyaline elements which vary from subglobose to clavate-vesiculose, entire, thin-walled, not intermixed with dermatocystidia.

On rotting leaves of Dicotyledones, especially dicot trees, in the original forest vegetation (with *Quercus*, *Carpinus*, etc.) growing cespitously during the rainy season, or in the summer-fall season in mixtures of decayed wood and foliage in deciduous woods.

Material studied: New York (U.S.A.), type (NYS). — Mexico: Oaxaca: Huautla de Jiménez, 1500 m. alt., 10-VII-1957, R. Singer no. M 1510 (LIL).

The description given above is based exclusively on Mexican material.

Marasmius oaxacanus Sing. spec. nov.

Pileo albo, centro obscuriore, 3—4 mm. lato. Lamellis decim vel tredecim, albis, collariatis. Stipite nigro, glabro, insititio. Sporis 10.8—11.2 × 3—4 μ; cystidiis nullis; epicute hymeniformi, cellulis hyalinis, minute divergenter hyalino-setulosis. Hyphis amyloideis. Ad folia Ingae, Oaxaca, Mexico. Typus in LIL conservatur.

Pileus white excepting the umbilicus where it is fuscous to pale fuscous when fresh and pale fuscous to pallid when dried, opaque and glabrous when fresh and seen macroscopically but when dried and under a strong lens appearing subtomentose, convex, umbilicate, smooth with sulcate margin, 3—4 mm. broad. — **Lamellae** white with white edges, broad, distant (10—13 lamellae present), equal, not intervenose, not or rarely forked, broadly adnate to a distinct collarium which is quite free from the stipe. — **Stipe** black except on the apex which is hyaline to white, glabrous, smooth, horse-hair-like, somewhat shining, insititious, 20—30 × 0.2—0.4 mm. — **Context** extremely thin, white in apex of stipe and under umbilicus, inodorous. — **Spores** 10.8—11.2 × 3—4 μ, mostly 11 × 3.5 μ, hyaline, smooth, fusiform, inamyloid. — **Hymenium**: Basidia 16—17 × 7 μ. Cystidia none. Cheilocystidia quite like the broom cells of the epicutis of the pileus. — **Hyphae** hyaline, thin-walled, strongly amyloid in all parts, with clamp connections. — **Covering layer of pileus** consisting of a hymeniform or subhymeniform layer of hyaline cells, these cells vesiculose to vesiculose-cylindric, very often globose or subglobose, beset with small hyaline setulae which are divergent and project about 1.3 μ, diameter of cells 16—22 μ.

On fallen dead leaves of *Inga* in shaded place, singly but gregarious, fruiting in the rainy season.

Material studied: Oaxaca: Huautla de Jiménez at 1500 m. 10-VII-1957, R. Singer no. M 1519 (LIL, typus).

This species reminds one of the various small species related to *Marasmius rotula*. It would key out with *M. peckii* Murr. with which it has many things in common as far as the original description is concerned. The only difference is in size and number of lamellae (*M. peckii* being still smaller with fewer lamellae). On the other hand, A. H. Smith (Contrib. Univ. Mich. Herb. 1: 27. 1939) has studied the type and come to the conclusion that this species „is corticated by clavate cells with the apices covered by coarse brown-walled echinulations. Both the pileus and gill trama become yellowish brown in iodine“. Smith does not seem to be certain about the spores which were doubtfully indicated as measuring 5—6 × 4—5 μ. Since the epicuticular broom cells cannot be called coarsely brown-echinulate (a description which would much rather indicate a species

with *Siccus*-type broom cells) in *M. oaxacanus*, we do not believe that the latter is identical with *M. peckii*. The iodine reaction of the type, if correctly observed, would indicate a much weaker positive reaction in *M. peckii* than in *M. oaxacanus*.

R. W. G. D e n n i s (Trans. Brit. Mycol. Soc. **34**: 418. 1951) has collected what he considers identical with the type of *M. peckii* and which he compared with the type specimen, giving a revised description of the species in his interpretation. His fungus has also only eight lamellae; the spores are indicated as $7-10 \times 3.5-5 \mu$. The pileus, although, according to Dennis, it may be as large as 5 mm. in diameter, is described as entirely colored clay color. The lamellae are indicated as narrow. The differences in the hymenophore, the shorter spores and the more abundant pigment make it impossible to identify the Mexican species with Dennis's interpretation of *M. peckii*.

Mycena pearsoniana Dennis in Sing. spec. nov.

A *Mycena pura* differt lamellis adnato-subdecurrentibus, statura minore, sporis inamyloideis. A *Mycena violacella*³⁾ differt lamellis minus anastomosantibus nec non odore forti raphanaceo. Ab ambobus differt sporis minoribus. Sub Abiete. Typus in LIL conservatus est.

P i l e u s in the color of *M. pura*, otherwise also like that species, but slightly smaller. — L a m e l l a e in the color of *M. pura*, not or little anastomosing, adnate-subdecurrent, subclose, broad. — S t i p e in the colors of *M. pura*, otherwise also like that of that species, but slightly smaller. — C o n t e x t slightly paler than the surfaces, unchanging, with a strong odor of radish. — S p o r e s $5.5-7.2 \times 4-4.8 \mu$, smooth, ellipsoid, hyaline, inamyloid. — H y m e n i u m: Basidia $23 \times 6.8 \mu$, clavate, hyaline, 4-spored. Cystidia none. Cheilocystidia $45-65 \times 7-13 \mu$, ventricose, broadest in lowest third, sometimes mucronate at apex, or ampullaceous and then with subcylindric or slightly thickened apex, subcylindric, etc., always with rounded-obtuse tip, very slightly (pale) colored to hyaline, inamyloid. — H y p h a e with clamp connections, distinctly amyloid. Cells of hymenophoral trama broad. — C o v e r i n g l a y e r of pileus: Epicutis consisting of filamentous hyphae which are hyaline, repent, smooth, inamyloid (at least in the outermost layer). Hypodermium, consisting of very broad, often almost subisodiametric elements which are arranged in a cutis, amyloid, not gelatinized.

On humus in *Abietetum religiosae* (coniferous woods with *Abies religiosa* predominating) and probably generally in coniferous and mixed woods in small groups, sometimes in company of *Mycena pura*, summer-fruiting.

³⁾ *Mycena violacella* (Speg.) Sing. comb. nov. (*Collybia violacella* Speg., Bol. Acad. Cienc. Cordoba **11**: 393. 1889).

Material studied: Mexico: East slopes of Popocatépetl at ± 3000 m. altitude, 21-VII-1957, R. Singer n^o. M 1606 (LIL, typus).

This species is undoubtedly different from both *M. pura* and *M. kuehneriana* A. H. Smith⁴⁾ since the spores are somewhat smaller than in the former, and inamyloid. The species with inamyloid spores described by Kühner has no valid name since Pearson (Trans. Brit. Mycol. Soc. **35**: 101—102. 1952) has shown that the type (K) of *Agaricus pseudopurus* has amyloid spores. I do not share Smith's opinion that the species with inamyloid spores and the American types of *M. kuehneriana* are probably conspecific. Consequently, a new name had to be proposed for this species whereby I have preferred to base it on my own type. Pearson was the first to suggest that Kühner's species will be in need of a new name, and Dennis, in an unpublished manuscript of which he has kindly sent me a copy, has proposed the name *M. pearsoniana* which I am using in the present paper.

Kühner (Encycl. Mycol. **10**: 451—453. 1938) indicates that the basidial walls are amyloid. We found the basidia (as in all similar species) inamyloid. The specimens from Mexico became rapidly leather colored in the herbarium and the stipe is now brown. This coincides well with the description originally given by Cooke and, as long as the iodine reaction of the spores of the type was unknown, the interpretation proposed by Kühner was not unjustified.

Forms which are, like the one described here as *M. pearsoniana*, intermediate between *Mycena* and *Poromyceia* can also be found in South America; therefore, I have already indicated (Mycologia **45**: 886. 1953) that the genus *Poromyceia* is untenable.

Strophariaceae.

Psilocybe zapotecorum Heim, Rev. de Mycol. **22**: 77. 1957.

Pileus reddish brown (café rojizo), glabrous, not viscid, conic to campanulate with a sharp acute papilla, sulcate over half the radius of the pileus 8—26 mm. broad, 10—25 mm. high. —

⁴⁾ The status of *M. kuehneriana* may be not fully clear from a purely nomenclatorial point of view. Undoubtedly because of a mistake in editing, the Latin diagnosis is a literal translation with certain omissions of the text of Kühner's description of *M. pseudopura*, with exception of the iodine reaction of the spores which are given as "amyloideae". On the other hand, the type designated by the author is a specimen from North America with amyloid spores. Did Smith intend to give a new name to *M. pseudopura* sensu Kühner, but proposed a new American type? Or did he intend to describe a new species? I have assumed that the latter is the case, and have accepted Smith's species on the strength of the type concept, taking the diagnosis as partly erroneous.

Lamellae deep coffee color to blackish, close to medium close, narrow (here about 3 mm. broad), adnate or adnexed, eventually appearing sinuate-subfree but merely separating. — **Stipe** brownish red, assuming bluish tones or white in part, equal, or in the larger specimens subbulbous below and, if not, at least tapering gradually upwards, hollow, $40-72 \times 1-4$ mm., bulb reaching 5 mm. in diameter. — **Context** with farinaceous odor. — **Spores** $6.8-7.5 \times 4.8-6 \times 4-4.8$ μ , heart shaped, rounded-rhomboid, when seen in profile appearing elliptical in outline, smooth, dusky melleous-brown, walls complex, germ pore broad. — **Hymenium**: Basidia $20.5-21 \times 6.8$ μ , clavate, subcylindric, or slightly constricted in the middle, mostly 4-spored, few 2-spored. Cystidia $29-35 \times 8-8.5$ μ , almost constantly thickened-ventricose below and above with a constriction (diameter $5-6.5$ μ) in the middle, upper thickening reaching $6-7.5$ μ in diameter, all hyaline but varying between opaque and diaphanous, smooth, at times brownish in lower portion, rounded-obtuse at tip, deeper rooting than basidia and very frequently visibly projecting beyond them, rather numerous. Cheilocystidia $23-33 \pm 4.7-6.2$ μ , ampullaceous, ventricose below, but not very broad there and very thin above, apex $1-2$ μ in diameter, acute or rounded-capitate (in the latter case capitulum $2-4$ μ diameter), or obtuse and filamentous-equal, hyaline, very crowded and making the edge broadly heteromorphic, length of apex $11-13$ μ . — **Hypphae** with clamp connections. Hymenophoral trama regular. — **Covering layers of pileus**: Epicutis consisting of two layers, both consisting of narrow ($1.5-8$ μ diameter) hyphae which form a nongelatinous cutis; uppermost layer hyaline to subhyaline, and not or very little pigmented, hyphae $1.5-4$ μ in diameter, dermatocystidia none; lower layer (which may as well be considered the upper layer of the hypodermium) strongly pigmented by a brown incrusting pigment and hyphae up to 8 μ in diameter. Hypodermium proper conspicuously subcellular in places, with very short (e. gr. 55×35 μ) large elements, strongly incrustated by brown pigment.

In swampy places in tropical-montane vegetation, rare.

Material studied: Oaxaca: San Agustín Loxicha, 23-VI-1958, Gastón Guzmán. Huerta no. SA 1501 (LIL, part in Instituto Politécnico, México D. F.).

This material which, for all practical purposes, must be considered a topotype, was kindly sent to me by Señor Guzmán with accompanying notes and drawings. This makes it possible to provide a new description of this species, completely based on Guzmán's and my own observations. It will be noted that these specimens are of smaller average size than those collected by Heim. However, there can hardly be any doubt but that it is the same species. It was used by the Zapotec population, according to G. Guzmán, as a

hallucinogenic mushroom. He reports the native names: „razón giól“, „razón viejo“, „hongo de la razón“ which are evidently translations of Zapotec names into Spanish. The collector also indicated the following observation about the fructification of this species: The carpophores grow by flashes (as the cultivated Mushrooms), many individuals appearing at once and then disappear.

We (Singer & Smith, *Mycologia* **50**: 266, 298, 1958) have included *P. zapotecorum* into our monographic treatment of the section *Caerulescentes* on the basis of Heim's published data. As can be seen by a comparison of Heim's and the present description, the anatomical part of the former is rather incomplete, and therefore we have done well not to „judge its final relationships without having had a chance to study specimens“ „It might conceivably ... represent a stirps of its own.“ It seems to me now that, indeed *P. zapotecorum* should enter a stirps of its own intermediate between stirps *Mexicana* and stirps *Caerulescens*. It is more mycenoid and acute than even *P. aggericola* and thus, by its habit, approaches stirps *Mexicana* and separates itself from stirps *Caerulescens* while on the other hand it has more compressed spores than *P. mexicana* and is larger than that species with an involute margin in the young stage.

Psilocybe caerulipes var. **gastonii** Sing. var. nov.

Pileo sordide flavido, campanulato, velo appendiculato, ceterum glabro nudoque, levi, viscido, margine primitus subinvoluta. Lamellis moderate latis, confertis, Stipite albo, vitreo, carne caerulescente. Sporis 7—8 × 5.5—6 × 4.2—4.8 μ, compressis, lentiformibus; cheilocystidiis typi eorum *P. isauri* praesentibus; pleurocystidiis nullis. Epicute pilei pelliculosa gelatinosa lata. Ad truncum putridum in silva Liquidambaris. Typus in herbario LIL conservatur.

Pileus dull yellowish, viscid, smooth, glabrous except for veil remainders, campanulate, subacutely papillate, about 15 mm. broad when dried; margin almost involute when young; veil appendiculate when fresh. — Lamellae sepia, with pallid edges, medium broad, subascendant, adnate to adnato-subdecurrent, close but not crowded. — Stipe white, fleshy, transparent-glassy when fresh, slightly tapering upwards, about 70 × 3 mm.; annulus none.

Context pallid, fleshy, bluing when injured. — Spores (6)—7—8—(9.5) × (4.2)—5.5—6 × 4.2—4.8 μ, distinctly compressed lentiform as in *P. zapotecorum* but somewhat less strongly so, with rounded convexities, with broad distinct germ pore, with complex wall, deep brown-olive in KOH, smooth, elliptical when seen in profile. — Hymenium: Basidia 15 × 6.5 μ, 4-spored. Cystidia none. Cheilocystidia as in *P. isauri*, also hyaline, ventricose, long-pedicellate in some individuals, with cylindric or subacute apex, 12—24 × 4—7 μ,

apex 1.2—2 μ thick, making edges heteromorphous; a resinous incrustation — also sometimes observed in *P. zapotecorum* — forming a small hood on the apex of some cheilocystidia which then seem to be subcapitate. — Hyphae with clamp connections; hymenophoral trama regular, very moderately thick-walled (wall 0.5 μ diameter) in places, brownish-hyaline, not pigment-incrusted, somewhat glassy but not cruly gelatinous. — Covering layer of pileus: Epicutis — a broad pellicle consisting of very thin wavy-spirally repent hyphae which are imbedded in a hyaline abundant gelatinous mass and are themselves hyaline. Hypodermium — a cutis formed by non-gelatinized hyphae which are somewhat broader than those of the epicutis, somewhat shortened and broadened in places, but not forming a subcellular layer like in old *P. zapotecorum*, hyphal walls distinctly but not strongly brown pigment-incrusted.

On rotten trunk in a sweet gum forest (*Liquidambar styraciflua*) in the tropical-montane zone.

Material studied: Oaxaca, Huautla de Jiménez, 13-VII-1958, Gastón Guzmán Huerta no. GH-1128 A (LIL, part of collection also at the Instituto Politécnico, México D. F.). The LIL portion is the holotype.

This variety differs from *P. caerulipes* var. *caerulipes* in marginal veil, presence, in some caps, of an acute papille, white glassy stipe, perhaps paler pileus. It may be a geographical race of the Eastern North American species. It grows together with *P. isauri*. Nothing definite is known about its hallucinogenic properties. It is perhaps sometimes gathered together with the following species and used the same way as *P. isauri*. It belongs in stirps *Caerulipes*.

Psilocybe isauri Sing. spec. nov.

Pileo ita ut *P. caerulescens* colorato sed nonnihil pallidiore, glabro, sulcolato, haud viscido, conico-companulato, acute papillato, 11—18 mm. lato, margino primitus subtiliter incurvato; velo nullo. Lamellis angustissimis, confertissimis. Stipite cupreo ut in Panaeolo sphinctrino (sensu Linder, Singer), haud vitreo, glabro vel subglabro, aequali vel basi incrassato. Carne caerulescente. Sporis 4—6.5 \times 3.5—5.2 \times 3—3.5 μ , rhomboideis, subangulatis. Cheilocystidiis fusoides vel ampullaceis pedicellatisque, 16—25 \times 3.7—5.2 μ ; cystidiis praesentibus sed vix conspicuis. Epicute pilei haud gelatinosa. Ad truncos putridos in silva Liquidambaris. Typus in LIL conservatus est.

Pileus with the general color of *P. caerulescens* but somewhat paler, conic to campanulate and acutely papillate, glabrous, in fresh condition over one third of radius sulculate, dried much further inwards sulculate, not viscid, 11—18 mm. broad and 10 or more mm. high; margin at first slightly incurved; veil none. — Lamellae

whitish at first, eventually sepia to deep purple brown, very narrow, very crowded, ascendant or subascendant, with pallid edges, adnate, subsinuate-adnate, or adnate-subdecurrent. — *Stipe* copper red as in *Panaeolus sphictrinus* (in the sense of Linder and the author, same as *Panaeolus campanulatus* of some authors), not transparent or glassy, glabrous or subglabrous, equal or with slightly thickened base, $25-60 \times 1.5-2.5$ mm.; no trace of a veil; basal mycelium white. — *Context* whitish in young pileus, injured bluing. — *Spores* $4-6.5 \times 3.5-5.2 \times 3-3.5$ μ , mostly $5.3-5.7 \times 4.3-4.5 \times 3.3$ μ , strongly rhombic in outline when seen frontally, often almost angular, elliptical in profile, with distinct broad flattened germ pore, brownish olive, at full maturity deep sepia brown, smooth, with very thick complex wall. — *Hymenium*: Basidia $11-12.5 \times 3.8-5$ μ , (2)-4-spored, clavate. Cystidia on sides of lamellae not very conspicuous and discovered usually by the thin resinous hyaline apical incrustation, versiform, often clavate or ampullaceous, $18-25 \times 5.5-10.5$ μ , often rather deep-rooting, often opaque at apex because of the incrustation but otherwise thin-walled and transparent. Cheilocystidia making the edge heteromorphous, crowded, $16-25 \times 3.7-5.2$ μ , fusoid to ampullaceous and pedicellate, hyaline, apex often with hyaline opalescent thin resinous incrustation, under it thin-walled, transparent, about $10-11$ μ long, more rarely shorter, tapering to a rounded but thin tip or else cylindrical and obtuse, $1.3-2$ μ thick. — *Hyphae*: melleous hyaline to light melleous, not incrustated except in covering layers, with clamp connections. Hymenophoral trama regular. Hyphae of pileus trama radially arranged. — *Covering layers of pileus*: Epicutis inconspicuous, consisting of a cutis of hyphae, these hyphae non-gelatinized, subhyaline, narrow, parallel, poorly differentiated from the hypodermium; scattered dermatocystidia present, hyaline, erect, same size and shape as the cheilocystidia. Hypodermium — a cutis formed by hyphae which are parallel or subparallel with each other, not subcellular in any place, strongly brown from an incrusting membrana-pigment.

On a rotten trunk of *Liquidambar styraciflua* in the tropical-montane zone, fruiting in summer (rainy season), cespitose-fasciculate.

Material studied: Oaxaca: Huautla de Jiménez, 13-VII-1958. Gastón Guzmán Huerta no. GH-1128 (LIL, holotypus; there is syntype material at the Instituto Politécnico, México, D. F.).

This species is the one mentioned by Isauró Nava (and now named for him) in 1957 and was recognized by him in 1958 as the „pajarito del bosque“ (birdie of the woods), hallucinogenic mushroom of the Mazateco country. The name is best explained by the notes published by me in *Mycologia* **50**: 244—245, 1958 „Isauró Nava ... said that there was, growing at a certain distant locality, and not

fruiting at the time of our visit, another hallucinogenic mushroom, as small as „pajaritos“ (*Psilocybe mexicana*) and of the same shape and also staining blue, but differing in its habitat — wood in the forest rather than soil of meadows. Just such a species (*Ps. yungensis*) had been collected by me earlier in the ecologically very similar Bolivian Yungas, also a tropical-montane forest ...“ This interpretation of the „pajaritos del bosque“ has been corroborated in every detail by Guzmán's collection described above as *P. isauri*. This species is indeed a *Psilocybe* of the section *Caerulescences*, and even belongs in the stirps *Yungensis* as anticipated by me. This is a further addition to the number of hallucinogenic Mexican mushrooms already known in 1958 and again belonging in the same section. The Mazateco name for *P. isauri* is not known to me, but the Spanish „pajarito del bosque“ (or „pajarito del monte“ as Isauro Nava called it sometimes, and which means the same thing) is evidently a literal translation of the Mazateco words. They refer to the name the Mazatecs have for *Psilocybe mexicana* (which grows in open places) and emphasizes the different habitat.

Psilocybe caerulescens Murr., Mycologia **13**: 20. 1923.

Psilocybe mazatecorum Heim, C. R. Acad. Sc. **242**: 1392. 1956, nom. subnud.

Psilocybe caerulescens var. *mazatecorum* Heim, Rev. Mycol. **22**: 78. 1957.

Psilocybe caerulescens var. *nigripes* Heim, C. R. Acad. Sc. **244**: 698. 1957, nom. subnud.; Rev. Mycol. **22**: 79. 1957.

A collection by Gastón Guzmán Huerta from Huautla de Jiménez, Oaxaca, 10-VII-1958 coincides well with what Heim has described as *Psilocybe caerulescens* var. *nigripes* Heim. Isauro Nava, whom we have to thank for so many interesting and always dependable informations, calls this form „Derrumbe negro“, in other words the black *Psilocybe caerulescens*, which immediately suggests Heim's variety.

However, the difference between this form and the type of *P. caerulescens* (called var. *mazatecorum* by Heim) is rather problematic and more apparent than real. Macroscopically, this form is somewhat more slender (at least in Guzmán's collection) than the average *P. caerulescens* in Huautla, and the blackening of the stipe progresses soon and rapidly. The stipe is also, as was noticed by both Heim and Guzmán more regularly cylindrical in var. *nigripes* than in the typical form. However, the color of the pileus as indicated by Heim is not unusual in typical *P. caerulescens* and is merely an individual lusus, perhaps based on physiological conditions of every single carpophore of a population. I have studied

carefully the microscopical characters of Guzmán's collection (GH-1107, LIL) and cannot say that I discovered any significant difference there. The „chemical“ difference of the stronger blackening of the stipe may have something to do with the individual texture and shape of the stipe and its development in each carpophore, but I do not believe that it is a genotypical character. Summing it up, I believe that var. *nigripes* might, at best, be listed as a *forma*.

Note: At about the time when A. H. Smith and I published our „Mycological investigations on teonanácatl“ cited above, two species of the section *Caerulescentes* of the genus *Psilocybe* were discovered and described by Tsuguo Hongo. One of these is *Psilocybe subcaerulipes* Hongo (Journ. Jap. Bot. **33**, no. 2: 44. 1958) which I have not studied but which is rather fully described by its author, and, according to these data, belongs in stirps *Zapotecorum*. Nothing is known about its physiological properties. The other species, *Psilocybe fasciata* Hongo (Journ. Ja. Bot. **32** no. 5: 144. 1957, redescribed in Mem. Fac. Lib. Arts & Educ. Shiga Univ. **7** (2): 43. 1957) is apparently near *P collybioides* Sing. & Smith (stirps *Cyanescens*).

The species enumerated above represent quite a substantial addition to those already treated in Singer & Smith, Mycological investigations on teonanácatl, the Mexican hallucinogenic mushroom. Part II. A taxonomic monograph of *Psilocybe*, section *Caerulescentes*, Mycologia **50**: 262—303. 1958. Consequently, I shall here add a new key to the section *Caerulescentes*. The species with an asterisk are used as hallucinogens in Mexico, or known to cause poisonings with hallucinatory symptoms:

- A. Annulus typically membranous and persistent B.
- B. Spores smaller C.
- B. Spores 11.5—17.3 μ long *P. cubensis**
- C. Growing on wood; pileus viscid *P. aerugineomaculans*
- C. Growing on dung; pileus merely moist *P. subaeruginascens**
- A. Annulus, if present, merely a zone of fibrils, or very fugacious D.
- D. Spores 4—6.5 \times 3.5—5.2 \times 3—4 μ , strongly compressed, frontally often rhomboid; pileus acute; stipe not whitish. On wood and woody humus in forests E.
- E. Mexican species with glabrous or subglabrous stipe *P. isauri**
- E. South American species with densely fibrillose-floccose stipe *P. yungensis*
- D. Spores larger, or not combining all the characters enumerated above F.
- F. Margin of pileus straight when young or almost so; habit mycenoid or nearly so G.

- G. Spores compressed (broader in face than in side view); growing in open places, meadows, fields, swamps etc. H.
H. Spores generally not more than $8\ \mu$ long; carpophores not thin and fragile; often in swampy areas or among moss and grass see „K“ below.
H. Spores generally more than $8\ \mu$ long; carpophores thin and fragile; in fields and pastured meadows.
*P. mexicana**
G. Not so; in temperate woods *P. silvatica* and *P. pelliculosa*
F. Margin of pileus distinctly incurved when young; habit typically collybioid I.
I. Spores typically less than $9\ \mu$ long J.
J. Stipe white, basal half scabrous-strigose, upper half strongly floccose from veil *P. candidipes**
J. Not combining the above characters K.
K. Spores $6-6.5 \times 3.5-4\ \mu$. Asiatic (Japan) species *P. subcaerulipes*
K. Majority of mature spores generally larger.
American species L.
L. Veil on stipe copious and flocculose in young specimens; not growing on wood or in swamps. M.
M. Spores in profile $5-6\ \mu$ broad; stipe whitish when young *P. caerulescens**
M. Spores in profile $4-5\ \mu$ broad; stipe colored when young *P. aggericola*
L. Veil thin, cortinate, fugacious; sometimes growing on wood, but also in swamps or on earth in open places N.
N. Pileus not viscid. Not on wood O.
O. Spores terete or up to $0.3\ \mu$ broader in frontal view than in profile.
*P. muliercula**
O. Spores more compressed *P. zapotecorum**
N. Pileus viscid. Often growing on wood of *Betula*, *Acer*, *Liquidambar*, and other frondose trees. *P. caerulipes*
I. Spores typically more than $9\ \mu$ long P.
P. Lamellae pallid to white, or brownish only at maturity — sterile to partly sterile collections of *P. collybioides* key out here.
P. Not as above Q.
Q Stipe whitish; pileus milk white or disc merely ochraceous *P. aztecorum**
Q Stipe or pileus or both more deeply colored . . R.

- R. Pileus chestnut color; spores slightly compressed *P. cyanescens*
 R. Not combining these characters S.
 S. Cheilocystidia 20—30—(36) × 4—6 μ, apex 1.2—1.5 μ in diameter *P. baecocystis*
 S. Cheilocystidia either longer or broader, or both T.
 T. Odor distinctive (farinaceous, raphanaceous or spermatic). American and African collections of *P. collybioides*
 T. Odor none or not distinctive. Taste mild. U.
 U. Stipe 100—130 mm. long, straight. *P. strictipes*
 U. Stipe up to 70 mm. long V.
 V. Spores 9.5—11 × 5—6 μ. Asiatic species *P. fasciata*
 V. Spores 11—13.5 × 5.5—7 μ. African species *P. cf. collybioides*
 (*Hypoholoma cyanescens*)

Rhodophyllaceae.

Rhodocybe gilvoides (Rick) Sing.⁵⁾ var. **convexa** Sing. var. nov.

A varietate typica differt pileo convexo nec infundibuliformi. Typus varietatis convexae in herbario LIL conservatur.

Pileus pale flesh brown to light ochraceous cinnamon, hygrophanous, fading to a much paler color, the extreme margin sometimes crenate, the marginal zone weakly sulcate in old specimens, otherwise smooth, not viscid, glabrous, not depressed anywhere, neither umbilicate nor umbonate, convex, not becoming appanate, 23—37 mm. broad. — Lamellae pale cinnamon, cinnamon pallid, not whitish, arcuate, decurrent, broad, distant, some forked. — Stipe paler than the pileus, solid, then stuffed, glabrous and smooth, not hollow, solid at first, later becoming stuffed, not viscid, irregular in shape, more or less subequal or somewhat ventricose, 40—55 × 4—7 (apex), 7 (base) mm. — Context pallid to (in pileus) concolorous with surfaces; odor of *Marasmius oreades*; taste mild to slightly astringent. — Spores 4.8—6.3 × 2.8—4.2 μ, short-ellipsoid to oblong, not cylindric, obscurely subangular to smooth, mostly distinctly angular when seen from one pole, not quite hyaline. — Hymenium: Basidia 6—7 μ broad, clavate, 4-spored. Cystidia,

⁵⁾ *Rhodocybe gilvoides* var. *gilvoides* is based on *Clitocybe gilvoides* Rick from Southern Brazil, This was analysed by Singer (Lilloa 26: 70. 1953) and transferred to *Rhodocybe* (l. c. p. 71).

pseudocystidia none. Cheilocystidia not making the edge heteromorphous, 1.5—3.5 μ in diameter, filamentous, more or less projecting, rather numerous but scattered, hyaline, smooth, rarely one forked. — Hyphae: without clamp connections. — Covering layer of pileus: Epicutis and hypodermium both formed by repent hyphae which are parallel and form a cutis, hyaline to stramineous, without any incrusting or otherwise striking pigment.

In coffee plantation on rotting piece of log.

Material studied: Oaxaca: Huautla de Jiménez, 10-VII-1957. R. Singer, no. B 1511 (LIL, typus varietatis).

This variety, if found constantly enough in its area might well represent a geographic race. If and when the range of variability of both type variety and var. *convexa* are more closely studied, the Mexican form may even be considered a species; on the other hand it may turn out to be distributed over the whole area from Brazil to Mexico or even further and be no more than a striking new form differing in a single character, that of the shape of the pileus which is infundibuliform in the var. *gilvoides*.

Supplement: Corrections in part I

Sydowia XI: 354—374. 1957.

The first paragraph of p. 354 should read: "During my various trips in Central and Southern Mexico and in my type studies on Basidiomycetes originating in Mexico, a number of notes on Mexican *Agaricales* has accumulated so that now I am in a position to give a list of species of fungi, in this first series all *Agaricales*, mostly new for Mexico ..." The phrase in italics was omitted.

No. 2 (p. 355) should read *Hygrocybe firma* (Berk. & Br.) Sing. var. *firma*, and the synonym *Hygrophorus firmus* Berk. & Br. var. *typicus* Corner, Trans. Brit. Mycol. Soc. **20** (2): 176. 1936. In the text to be corrected, "Berk. & Br." was reemplaced by "Corner", the word omitted after "var. *typicus*".

No. 15 (p. 361) should read *Copelandia cyanescens* instead of *Copelandia caeruleascens*.

No. 27 (p. 305): The last paragraph was omitted. It reads:

On mosses over rotten *Abies* trunk, 3000 m. alt., 21-VII-1957. Road from San Pedro de Nexapa to Paso de Cortés. R. Singer no. M 1565 (MICH).

No. 34 (p. 370): The last paragraph was likewise omitted. It reads:

On dead dicotyledoneous wood in the forest, 10-VII-1957. Huautla de Jiménez, Oaxaca. R. Singer M 1516 (MICH).

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