

New and Interesting Species of Basidiomycetes III ¹⁾

By Rolf Singer (Tucumán, Argentina).

The following notes concern the genera *Conocybe*, *Pholiotina*, *Alnicola* and *Naucoria*. The genera *Conocybe* and *Pholiotina* were treated, under the name of *Conocybe*, in a monograph by Kühner, R., *Le Genre Galera* (Fries) Quélet, *Encyclopédie Mycologique* VII, Paul Lechevalier, Paris 1935, and one may say that the systematics of these genera was then established in a scientific sense. Kühner and Romagnési have contributed much toward the basic knowledge we now have on the genus *Alnicola*, a split group from the old genus *Naucoria*. This latter genus was twice emended, once by Singer (1936, 1937) and once by Romagnési (1942) in order to accommodate the species congeneric with *Naucoria centunculus* (Fr.) Quél. In this narrow sense, it is most closely related to *Alnicola*, but no monographic treatment has ever been attempted. Nevertheless, some of the important European species have been redescribed by various European authors, and one may say that our knowledge regarding all four genera is now rather considerable, at least as far as the species of Europe are concerned. With these basic data on hand, and the stimulation provided by the papers indicated above, the author has collected and studied a great number of species in Europe, Asia, North and South America. It seems that the additional descriptive material provided by these studies should be published in order to supplement the taxonomy of these genera and indicate some skeleton of a distributional study.

1. Notes on *Conocybe* Fay.

The genus is here understood in the narrow sense, i. e. in the sense of Fayod. This excludes the genus *Pholiotina* which differs in having a different tramal structure, also in rarely showing capitate cheilocystidia, but frequently some trace of a veil.

***Conocybe albocinerea* Sing. spec. nov.**

Pileo albocinereo vel dilute cinereo-fuscidulo, hygrophano, cinereo vel albo in statu sicco, haud striato in humidis, subsulcolato

¹⁾ The first part of this paper appeared in *Mycologia* 37: 425—439. 1945; the second part in *Papers of the Michigan Academy of Sciences, Arts and Letters* 32: 103—150, pl. 1, 1948.

in statu sicco, viscidulo, campanulato vel convexo, 5–9 mm. lato, 3–4 mm. alto. Epicute hymeniformi *Conocybum* modo. — Lamellis laete brunneis, ferruginescentibus, subdistantibus vel moderate confertis, latiusculis, adnexis. Sporis intense ferrugineis in NH_4OH et KOH , ellipsoideis, poro apicali distincto, truncato praeditis, levibus, membrana complexa instructis, $6.5-8.5 \Rightarrow 3.5-4.5 \mu$; basidiis tetrasporis, breviter clavatis, $25-28 \Rightarrow 7.5-9 \mu$; cheilocystidiis capitatis, $16-21 \Rightarrow 5.5-7.5 \mu$, capitulo $2.5-3.3 \mu$; ammoniaco ope crystallis nullis vel subnullis formatis. — Stipite albo, nitidulo, glabro vel ad apicem subpruinoso, subaequali, pseudorhiza destituto, $40 \Rightarrow 1.5$ mm. Dermatocystidiis stipitis capitatis fasciculatis apicem versus sparsis vel frequentibus, e. gr. $20.5 \Rightarrow 10.5 \mu$, capitulo 4.5μ . — Carne tenuissima, alba, inodora vel farinolente. — Ad humum silvestrem inter muscos nec non ad arenam fluvialem prope arbores; Augusto mense. Typus: Oirotia, Kurai, 14/15—VIII—1937, R. Singer & L. N. Vasiliëva A 116 (LE).

This species is distinguished by its color and lack of striation in wet condition. It is closest to *C. mesospora* Kühner and *C. striatipes* (Speg.) Sing. but differs from both in having different colors and surface characters of the pileus, in being smaller and growing on forest earth.

We also collected another specimen, very similar in its macro- and microscopical characters. It differs in being slightly more colored, having somewhat larger spores ($9-10 \Rightarrow 5.5-6 \mu$) and cheilocystidia ($20 \Rightarrow 8-10.5 \mu$, capitulum $4-4.5 \mu$) but the basidia are likewise four-spored. It seems that this form is merely a macrosporous form of the mountain steppe where the air is drier and the spores, as in the subalpine forms, have a tendency to be somewhat larger than in the forest forms, even if collected at equal altitudes.

Conocybe antipoda (Lasch) Kühner forma **floridana** (Murr.) Sing. comb. nov.

Galerula floridana Murr., Mycologia **33**: 445, 1941.

Galerula canalipes Murr., Lloydia **5**: 147, 1932.

The types of Murrill's species have typical *Conocybe* spores but with a rhomboid outline like those of *Deconica*, with broad germ pore, $7.2-8.2 \Rightarrow 6-6.5 \mu$; they are only $4.3-4.5 \mu$ broad when seen in profile; basidia $21-22 \Rightarrow 8-8.7 \mu$, 4-spored; cheilocystidia capitate, hyaline, $16-20 \Rightarrow 5-8.7 \mu$, capitulum $3.5-5 \mu$ thick, "neck" 1μ thick; epicutis of pileus consisting of vesiculose-piriform bodies forming a hymeniform layer, $14-18 \mu$ in diameter; epicutis of stipe with extremely abundant hyaline capitate dermatocystidia, $10.5-25 \Rightarrow 3.5-8 \mu$, very few with ampullaceous apex without capitulum; hyphae with clamp connections. No needle-like crystals observed in ammonia mounts.

This is obviously a form of *C. antipoda* with somewhat smaller spores.

Conocybe crispella (Murr.) Sing. comb. nov.

Galerula crispella Murr., Lloydia 5: 148. 1942.

This species is rather common in Florida as well as in Argentina. It is very close to *C. lateritia* sensu *Ricken, Kühner*, but differs in having somewhat smaller spores, darker hygrophanous pileus, transparent striae on the margin and sulcate margin when dry.

Pileus "oak, briar" or "burnt umber" M & P in center, a mixture of "larial" and "bran" on margin, becoming avellaneous on center and much paler avellaneous buff on margin when drying out (near "maple" M & P), striate on margin over one half to three quarters of the radius, the striation either disappearing in drier material and reappearing in the herbarium, or sulcate in dry fresh material, later often splitting deeply from the margin (one third to one half), distinctly hygrophanous and glittering when dry, 25—53 mm. broad²⁾ and about 15 mm. high, obtusely conical to conico-campanulate, eventually somewhat expanding and becoming umbonate-sub-applanate. — Lamellae "Pablo" M & P, ascendant, linear, adnexed to subfree, narrow (2—3 mm.), close; spore print intensely ferruginous. — Stipe pure white, strongly pubescent but slightly glabrescent in age, with slightly enlarged basal portion (1.5—5 mm. in diameter), 56—105 \Rightarrow 1—3 mm., pseudorhiza none. — Context white, unchanging, odorless, mild.

Spores 10—13.5 (13.7) \Rightarrow 7—8.8 (9.3) μ , more rarely reaching up to 16 \Rightarrow 9.4 μ , well colored, with distinct germ pore, smooth; basidia 18.3—29 \Rightarrow 11—13.5 μ , short-clavate, 4-spored with very few 2- to 3-spored ones intermixed in some caps; cheilocystidia 21—29 \Rightarrow 7—9.4 μ , capitate, capitulum 3—4.2 μ ; dermatocystidia of the stipe clavate, ventricose, fusoid, often undulate, in most specimens some of them elongated into hyphous prolongations ("hairs"), 23—30 \Rightarrow 7—9 μ (without the hair-portion); pileus with an epicutis of piriform-vesiculose bodies forming a continuous hymenium; dermatocystidia none or extremely few; ammonia not forming needle-like crystals with the hymenophore; all hyphae with clamp connections.

Among Gramineae in shaded lawns and in woods, on earth or on scattered dung; fruiting from January until June (Argentina), August (Florida).

²⁾ The measurements of the pileus are always given in a straight line from one edge of the margin to the opposite edge of the margin; they are consequently lower than those obtained by *Kühner* for the same individual.

Material studied: U. S. A. Florida. Gainesville, W. A. Murrill F 18576 (FLAS, type). — ARGENTINA. Prov. Tucumán. Anta Muerta, R. Singer T 582 (LIL); Tucumán, R. Singer T 79 (LIL).

This species may have been described before Murrill's publication. In fact, Murrill says "Closely related to *G. crispa* Longyear" which is undoubtedly true. However, I have not studied the type of that species. The description would indicate larger spores, non-striate pileus, anastomosing and less close lamellae, and it may well be that this is the true *Agaricus lateritius* Fries. *C. crispella* is certainly different from Kühner's conception of *Conocybe lateritia*, a species now redescribed by Métrod under the name of *Conocybe lactea* (Lange) Métrod. Another species which might possibly be close to or identical with *C. crispella* is *Galera argentina* Speg. However, the type is in very poor condition, and although the spores are of approximately the same size as those of *C. crispella*, one cannot be sure that this is the same as Murrill's species. Consequently, the latter is here accepted.

Conocybe intrusa (Peck) Sing. comb. nov.

Cortinarius intrusus Peck, Bull. Torr. Bot. Club **23**: 416, 1896.

Pileus all shades between "pinkish buff" and "chamois" (R.), and often whitish near the margin, non-hygrophanous to very slightly subhygrophanous, subviscid when very wet in some caps, usually very strongly sulcate-rugose to wrinkled-scröbiculate in marginal portion, otherwise smooth, convex becoming applanate, very obtuse, 30—80 mm. broad. — Lamellae pale buffish yellowish, in youth almost whitish, very deeply and intensely ferrugineous when mature, more rarely watery ferrugineous, with entire or somewhat serrulate edge which becomes almost sinuate near the margin in some caps, usually narrower than the flesh, moderately broad (about one tenth of the diameter of the pileus), 3—8 mm. broad, rounded-adnexed, close to crowded; spore print ferrugineous. — Stipe pure white, rarely assuming some yellowish or brownish shades in age, stuffed, soon becoming hollow, pruinose all over, equal with slightly thickened base, nonradicate, 32—60 \approx 6—14 mm. (above); veil none. — Context pure white everywhere except for a narrow watery zone above the lamellae, fleshy in pileus and stipe, moderately fragile, unchanging, inodorous or with very slight odor of apple cider or reminding one of *Boletus edulis*, or of radish; mild to very slightly astringent.

Spores 6.8—7.5 \approx 4—4.2 μ , very slightly lens-shaped, and in frontal view up to 5.2 μ broad, and then the thickest portion just above the middle, deep rust color with a fulvous line around the endosporium, smooth with distinct germ pore; basidia 15—20 \approx 7—8 μ , 4-spored; cheilocystidia capitate, 17—27 \approx 8.8—10.6 μ ,

capitulum $3.5-4.2\ \mu$, "neck" $2.7-3.5\ \mu$; pileus with a cellular epicutis without dermatocystidia; dermatocystidia of the stipe like those of the gill-edge, but some slenderer ($7\ \mu$) and some larger (broader and longer), in bunches, hyaline; hyphae with clamp connections.

In greenhouses among cucumbers, or among pinks in beds and in plant pots with sheep manure, also on mushroom beds, usually in large numbers, fruiting all through the year.

Material studied: U. S. A. Massachusetts. Mansfield. E. V. Seeler (FH). — Newtonville, Lizzie C. Allen, with a colored plate (FH). — Boston, R. Macadam (NYS, type). Also indicated from New Jersey.

This has never been collected in the woods and fields, and there is a possibility that it is an introduced species. It is not closely allied to *Cortinarius multiformis* as stated by Peck but belongs in *Conocybe*. It has, however, the habit of a *Cortinarius* and is quite unusual in this regard. The section *Giganteae* Sing. (Sydowia **2**: 36. 1948) has been proposed for it. The type species of the section was erroneously spelled *C. detrusa* instead of *intrusa*.

Conocybe juruensis (Henn.) Sing.

A Brazilian species of *Conocybe* with warty spores was indicated by Singer, R. New Genera of Fungi III, Mycologia **39**: 88. 1947.

Conocybe lentispora Sing. spec. nov.

Pileo fusco ("Clove Manchu" M & P), hygrophano, pallide fuscido ("oakbuff" M & P) in siccis, in duabus tertiis externis striato in humidis, sublevi in siccis, glabro, papillato, convexo, $5.5-7\ \text{mm. lato}$, $3-4\ \text{mm. alto}$. — Epicute cellulosa, acystidiata. — Lamellis ferrugineis, angustissime adnexis vel subliberis, subascendentibus, ventricosis, latis, moderate confertis. — Sporis in massa ferrugineis. Sporis intense ferrugineis, levibus, membrana complexa et poro germinativo lato appanato-truncato praeditis, a parte dorsali visis saepe subrhomboideis fortiterque lentiformibus, latioribus in parte superiore atque ellipsoideis quando a latere angusto observatae sunt, $5.5-5.8 \approx 4.3-4.8\ \mu$ ($+90^\circ$: $3-4\ \mu$ latis). Basidiis tetrasporis, hyalinis, late clavatis, $16 \approx 7.8\ \mu$. Cystidiis nullis. Cheilocystidiis capitatis, hyalinis $17-20 \approx 8.5-10\ \mu$, plerumque $8.7\ \mu$ latis, capitulo $3-4.3\ \mu$ in diametro, plerumque $3.3-3.7\ \mu$. Tramate hymenophorali typo Conocybum correspondente. — Stipite fuscido-alutaceo ("lariat" M & P), obscuriore in parte inferiore, subglabro, filamentoso, usque ad $18\ \text{mm. longo}$, $0.5-0.7\ \text{mm. crasso}$. Vestimento consistente e dermatocystidiis decapitatis cheilocystidiis haud analogis, versiformibus (ampullaceis, nonnullis hyphosis, pilosisque), sparsis; hyphis stipitis longitudinalibus, parallelis, fibulatis. — Carne tenuissima, inodora; reactione ammoniacali cum hymenophoro debilissima

tardivaque. — Habitat ad terram nudam declivem, solitarie. Typus in San Pablo provinciae Tucumanensis, Argentina, 27—III—1949 ab auctore collectus et in LIL depositus (T 316) est.

This species is very remarkable for its small lentiform spores which recall those of *Deconica* but with the characteristic intensely rust colored pigment. It is nearest *C. hexagonospora* Métrod which differs in being somewhat larger and having larger hexagonal spores and longer cheilocystidia, and also in growing on charcoal.

Conocybe macrorhina (Speg.) Sing.

This species is close to *C. juruensis* from which it differs in having normal (i. e. not marasmioid) habit and much larger spores. See Singer, R. Type Studies on Basidiomycetes IV, Lilloa adhuc ined.

Conocybe macrorhiza (Speg.) Sing.

This species is close to *C. neoantipoda* (Atk.) Sing. sensu Kühner (*C. siliginea* var. *neoantipus* (Atk.) Kühner). See Singer, l. c.

Conocybe magnispora (Murr.) Sing. comb. nov.

Galerula magnispora Murr., Mycologia 35 : 530. 1943.

This species was correctly described by Murrill (with microscopical notes by Singer) in the original account, l. c., but additional material collected in South America makes it desirable to give a complete description.

Pileus between chestnut and fuscous ("Cocoa Turtle", or with some "alamo-" mixed in), on the margin between the striae usually lighter colored (e. gr. "topaz"), margin, hygrophanous and drying very rapidly, transparently striate over one quarter to one half of the radius in wet condition, from "mummy" (in center) to "honey-suckle" (on margin), or pl. 11, J—6 to "Inca gold" (M & P) in dry condition, smooth or almost so in dry condition and distinctly micaceous, glabrous, campanulate to convex, more rarely obtusely conical or campanulate-subglobose, 9—16 mm. broad, 7—12 mm. high. — Lamellae dull ochraceous brown with pallid edge, eventually rusty from the spores, ascendant, rather broad (3.5 mm.), ventricose, adnate, or broadly adnexed, subclose to subdistant; spore print rusty, more intensely colored than "Arab-" M & P. — Stipe varying from concolorous but paler to whitish sordid, dirty ocher brown at the base, striatulate above, or smooth, slightly pubescent to pruinose, at least in the upper 10—12 mm. from the point of attachment of the lamellae, glabrescent and becoming somewhat shining, subequal or slightly tapering upwards, often with a slightly thickened and slightly paler base (2—3.5 mm. in diameter), hollow, 30—48 \pm 1—2 mm.; pseudorhiza none. — Context rather thin, whitish to subconcolorous, always somewhat colored in the base of the stipe in mature specimens, inodorous.

Spores $11.3-19.2 \Rightarrow 7.2-10.2-(11.5) \mu$, smooth, well colored (deep rusty) truncate because of a strongly developed germ pore, narrowly ellipsoid, very few in some caps slightly rhomboid in outline, with compound wall; basidia $21.5-34.8 \Rightarrow 11.5-16 \mu$, either all 4-spored, or with a variable percentage of two-spored ones mixed in, never exclusively 2-spored, occasionally some 3-spored ones observed; cystidia none; cheilocystidia $16-29 \Rightarrow 6.8-11.7 \mu$, capitulum $2.8-4.7 \mu$, mostly $3-3.8 \mu$ in diameter; hymenophore not forming needle-like crystals in ammonia; hymenophoral trama of the *Conocybe* type; epicutis of the pileus a hymeniform layer of piriform bodies (e. gr. $33 \Rightarrow 20 \mu$); dermatocystidia of the stipe non-capitate, versiform, usually short, subglobose to fusoid or cylindric, or ampullaceous, or oblong, acute or more often rounded above, in some elongated into a "hair" ($2-2.3 \mu$ in diameter), $14-40 \Rightarrow 3.8-8 \mu$, very numerous; hyphae with clamp connections.

Open places as well as woods, on dung and on dung-containing soil; fruiting from December until June.

Material studied: U.S.A. Florida, south of Gulf Hammock, Levy County, March 8, 1942, W. A. Merrill, F 19841 (FLAS, type). — Argentina. Prov. Tucumán. Quebrada de los Sosas, December 18, 1948, R. Singer & A. Digilio, (LIL). — Prov. de Buenos Aires. Chascomús June 4, 1949, R. Singer S 77 (LIL). — La Plata, May 24, 1949, R. Singer S 2 (LIL). — Punta Lara, June 9, 1949, R. Singer S 119 (LIL). — Garibaldi, May 30, 1949, R. Singer S 43 (LIL).

One of the above collections was more fuscous than ocher brown but evidently identical with the others (S 43); there is a greyish or fuscous form in most species of *Conocybe* (although not all); the latter often reminds one of *Panaeolus* rather than "*Galera*". A greyish ocher form with non-striate pileus (Punta Lara, S 69) is referred here with some doubt.

Conocybe mesospora Kühner.

This species has been abundantly collected near Leningrad, at Pargolovo, August 26, 1938, W. H. Tranzschel & R. Singer L. 53 (LE), in Tataria (Kazan, May 30, 1938, KAZ, LE), and in Oirotia, Altay (Kurai, R. Singer & L. N. Vasilieva, July 28, 1937, A 309, LE). *C. mesospora* also occurs in Spain (see Coll. Bot. 1: 264. 1947) and in the Caucasus (see Utch. Zap. Kaz. Univ. 99: 60. 1939).

Conocybe neoantipoda (Atk.) Sing.

This species occurs in Spain (see Ann. Myc. 34: 433. 1936). I am convinced that it is specifically different from *C. plumbeitincta* (Atk.) Sing. because of the constantly positive ammonia reaction.

Conocybe plumbeitincta (Atk.) Sing. comb. nov.

Galerula plumbeitincta Atk. Proc. Amer. Phil. Soc. **57**: 372. 1918.

Conocybe siliginea f. *typica* Kühner, l. c. p. 108.

The pileus is here as grey as in one of the small *Mycenas*; the spores are $8.3-11 \Rightarrow 4.2-6.5 \mu$ and the basidia $18.3-25 \Rightarrow 8-8.7 \mu$, 4-spored, with few 2-spored ones intermixed; cheilocystidia $17.5-21 \Rightarrow 7.2-10 \mu$, capitulum $3-3.7 \mu$; dermatocystidia of stipe ventricose and short, non-capitate, but frequently elongate into "hairs". This species occurs in the pre-Andine sierras of North Argentina, and coincides completely with the material collected by the author in Europe, except, perhaps for very slightly broader spores in South America.

Forma **ocracea** (Kühner) Sing. comb. nov.

C. siliginea var. *ocracea* Kühner l. c. p. 101.

We find a form exactly corresponding to this European fungus in the Altay Mountains, at Artubash, Oirotia, September 1, 1937, R. Singer & L. N. Vasilieva A 792 (LE).

The nomenclatorial question in this case seems to depend on the status of the species described by Atkinson. In one of my collections I found numerous cheilocystidia which had no capitula at all from the very beginning, and therefore coincide in this regard with Atkinson's indication who says that they are ampullaceous. In all other regards, the descriptions agree in every particular, even in the adnate lamellae, since many of our specimens (including such from Europe) have adnate or nearly adnate lamellae. The difference in the habitat is not important since we have seen specimens on dung and on dung mixed with conifer needles. Undoubtedly, *Agaricus siligineus* has the priority over *G. plumbeitincta* but it seems to me that Fries's description ("pileo laevi, haud expallente") excludes this species and fits *Conocybe siliginea* sensu Bresadola, Lange, Singer, i. e. what Kühner calls *C. Rickenii* J. Schaeffer. The fact that the identity of the latter and *A. siligineus* of Fries would leave *C. siliginea* sensu Kühner without a valid name, is not a nomenclatorial argument, and besides, it is not true if the species is understood in the broad sense adopted by Kühner. In the latter's taxonomic arrangement, the specific epithets *fragilis* Peck (1897) and *neoantipus* Atk. (1918) are available. The author prefers to consider some of Kühner's varieties as "micro-species" within a stirps (sense of Heim).

Conocybe siliginea (Fr. sensu Bres.) Kühner (non sensu J. Schaeffer).

There is no need of redescribing the two-spored form of this common species. This was collected in Tataria (U.S.S.R.) by L. N.

Vasilieva (det. R. Singer, LE). The forma *tetraspora* is evidently much rarer. It was once collected in remarkable abundance under *Casuarina* in Argentina, and the notes taken from that collection demonstrate the variability of this form. Since, without cultures, the identity of this form with the bisporous form cannot be proved, I prefer to give a full description of this collection:

Pileus white to yellowish brown or ochraceous brown, non-viscid, non-striate, except rarely in wet specimens at the extreme margin, smooth to rugulose, glabrous and naked, rarely slightly punctulate, campanulate, more rarely obtusely conical, becoming applanate in many caps, perhaps in most cases, at least tending to become semiglobose, glittering micaceous when dry, grasses on top of the epicutis tend to preserve the original lighter color, diameter 8—42 mm. — Lamellae avellaneous white, soon becoming rusty, ascendant becoming horizontal in age, subventricose, up to 6.5 mm. broad, adnate or adnexed, slightly pallid fringed, subclose; spore print intensely ferruginous. — Stipe white, slightly fuscous especially inside, from the bulbous or subbulbous base upwards, more or less longitudinally striate, pruinose all over, tubulose, 14—56 \Rightarrow 1.5—7 mm.; mycelium white; pseudorhiza none. — Context white or whitish except for the lower portion of the stipe in age, fragile, inodorous, but with a very slight melleous odor in dried condition in mass.

Spores 10—11.6 \Rightarrow 5.8—6.5 μ , smooth, with distinct germ pore, deep rusty colored, not rhomboid; basidia 23—25 \Rightarrow 9—11 μ , 4-spored, few 2- to 3-spored; cystidia none; cheilocystidia 19—21 \Rightarrow 6.5—7.3 μ , capitulum 3.2—4 μ in diameter, some brownish, most hyaline; hymenophoral trama of the *Conocybe*-type; epicutis consisting of piri-form bodies in hymeniform arrangement; hyphae of the stipe parallel; dermatocystidia of the stipe versiform but non-capitate, some of them elongate into "hairs" (2.2 μ in diameter); all hyphae with clamp connections.

On fallen leaves of *Casuarina*, very gregarious, often also on the dung with which the leaves were mixed, on shady place on a golf course. Gonnet, near La Plata, provincia de Buenos Aires, Argentina, May 26, 1949, R. Singer S 30 (LIL).

Conocybe striatipes (Speg.) Sing.

The bisporous form of this species was described by Spegazzini before Kühner published his *Conocybe leucopoda*. I am inclined to believe that the latter is a four-spored form of the former. A separate description of the forma bispora was given by Singer, R. Type Studies on Basidiomycetes IV, Lilloa, adhuc ined.

Conocybe subcrispa (Murr.) Sing. comb. nov.

Galerula subcrispa Murr., Lloydia 5: 148. 1942.

The type has a very small, now striate pileus which is pale yellowish buff, and a strongly elongate stipe. The spores are $13-18 \Rightarrow 7-11.5 \mu$, with smooth, complex wall and distinct truncate germ pore, well colored in NH_4OH ; basidia $30 \Rightarrow 5 \mu$, 1-, or 2-, or 3-, or 4-spored; cheilocystidia $23-29 \Rightarrow 3.5-6.5 \mu$, capitulum $4-4.3 \mu$; dermatocystidia of the stipe versiform, mosly ampullaceous, even bifurcate at the apex, never capitate. In some caps there are only immature spores.

This species, evidently of the *Lateritia*-group, is distinguished by its remarkably narrow cheilocystidia.

Conocybe subvelata Sing. spec. nov.

Pileo variante inter aequaliter ochraceo-brunneo et "seminole" (M & P) in disco et "oakbuff" (M & P) ad marginem, in hoc interdum approximante "Manila" (M & P), $\frac{2}{3}$ usque ad $\frac{3}{4}$ radii dense striato transparenter in humidis et sulcatulo in siccis, glabro, hygrophano, conico-umbonato dein convexo umbonatoque, demum saepe margine concavo-ascendente et centro latissime umbonato, 17—30 mm. lato, 11 mm. alto vel elevatiore; velo albo fugacissimo pendulo appendiculato. Epicute ex hymenio elementorum piriformium vesiculosorum consistente; dermatocystidiis nullis. — Lamellis ferrugineis ("Pathé" M & P), confertis vel confertissimis, angustis, ascendentibus, adnexas; sporis in massa ferrugineis ("Arab+" vel "raw sienna" M & P sed intensius). Sporis intense ferrugineis, levibus, membrana complexa, poro germinativo interrupta instructis, ovoideis vel ellipsoideis, $9-11.5 \Rightarrow 5.6-7.3 \mu$; basidiis tetrasporis, breviter clavatis, $18-21.8 \Rightarrow 8.7-11 \mu$; cheilocystidiis hyalinis vel subbrunnescentibus, ventricosis, capitulo abrupto praeditis, $16-22 \Rightarrow 5.8-8.7 \mu$, capitulo $2.2-5 \mu$, frequenter caduco; tramate typico Conocybum; hymenophoro ammoniaci ope crystalli haud formante. — Stipite albo ad apicem, albo vel albido ad basin, glabro vel subpruinato ad apicem, longitudinaliter substriato, paulum attenuato apicem versus vel subaequali, pseudorhiza destituto, $55-102 \Rightarrow 2.5-4 \text{ mm}$. Dermatocystidiis stipitis criniformibus vel inconspicuis, capitulo destitutis, $5-6 \mu$ latis, pilis $40-50 \mu$ longis et 2.2μ crassis, interdum omnibus brevissimis versiformibusque. — Carne tenui, alba, immutabili, linea hygrophano-aquosa supra lamellas praedita, inodora. Hyphis omnibus fibuligeris. — Ad fimum equinum et ad terram nudam, in silva montano-subtropicali secus vias et in silva sparsiore; fructificat Decembri usque ad Martium. Typus: R. Argentina, prov. Tucumán, Parque Aconquija, Sierra de San Javier, 12—III—1949, R. Singer

T 202 (LIL). Co-typus: Quebrada de los Sosas, 18—XII—1948, R. Singer & A. Digilio T 27 (LIL).

This belongs in the section *Candidae* Kühner but differs from *Conocybe lateritia* sensu Kühner = *C. lactea* (Lange) Métrod in smaller spores and the presence of a veil. This latter character, in the genus *Conocybe* in the narrower sense, is quite a novelty, and shows once more that the veil cannot be recommended as a distinctive character in the classification of the *Bolbitiaceae*.

Conocybe tenera (Schaeff. ex Fr.) Fayod ex aut. (em. Kühner) forma **excentrica** n. f.

Pileus chestnut, becoming deep tan-brownish, hygrophanous, convex, sulcato-striate on margin, 19 mm. broad. — Lamellae rust color, ventricose, broad, narrowly adnexed, moderately close — Stipe whitish, striate, pruinulose, equal, eccentric, 20 ± 1.5 mm. — Context paler in pileus, whitish in stipe, slightly brunnescent in age in lower portion of stipe, inodorous.

Spores $9.3-11 \pm 5.8-6.5$ μ , smooth, with broad germ pore, well colored but perhaps slightly paler than normal in NH_4OH , very intensely colored in KOH, with moderately thick, compound wall; basidia $18-22 \pm 8.7-10.2$ μ , 4-spored, with occasionally a few 2-spored ones intermixed; cheilocystidia $16-22.3 \pm 8-10$ μ , very numerous but usually not broader than 8.8 μ , capitulum $3.2-4.8$ μ , hyaline or brownish, capitulum often very little persistent. Dermatocystidia of the stipe with very numerous capitate dermatocystidia which are hyaline or brownish, with the capitulum $3-4.4$ μ in diameter; ammonia provoking a strongly positive reaction with the hymenophore, needle-like crystals forming within a few minutes; all hyphae with clamp connections.

On calcareous ground in "pampa steppe" vegetation, among herbaceous plants and grasses. May.

Type: R. Argentina, prov. Buenos Aires. Garibaldi, May 30, 1949, R. Singer S 44, (LIL).

2. Notes on *Pholiotina* Fay.

Pholiotina aberrans (Kühner) Sing.

This species, known only from the Alps (France) until now, has also been observed by me in the Altay Mountains (Oirotia, Kurai, August 31, 1937, on the ground in woods of *Larix* and *Picea*, A 429 LE). It is new for Asia.

***Pholiotina altaica* Sing. spec. nov.**

Pileo ochraceo, centro paulum obscuriore, rubido- vel ochraceo-brunneo, hygrophano, alutaceo-pallido in statu sicco, in herbario vivide ochraceo centroque ferruginascente, vix viscido, in statu udo

paulum transparenter striato, glabro, conico, dein diu convexo vel plano et semper conice umbonato, 10—19 mm. lato. Epicute e cellulis vesiculoso-piriformibus (e. gr. $30 \Rightarrow 18 \mu$) et nonnullis dermatocystidiis consistente. — Lamellis ferruginascentibus, acie albida, confertis, raro subdistantibus, angustis (± 2 mm. latis), rarius latiusculo-ventricosis, adnatis. Sporibus ferrugineis, in ammoniaco intense coloratis, poro germinativo obtusissimo conspicuo truncatis, levibus, ellipsoideis vel obovato-amygdaliformibus, membrana complexa instructis, (9)—10—14 $\Rightarrow 5.8$ —7.7 μ . Basidiis brevibus, bisporis, sterigmatibus 3.5—4 μ longis apiculatis, 18—23 $\Rightarrow 9$ —10 μ ; cystidiis nullis; cheilocystidiis incrustatione crystallina hyalina obtectis, hyalinis, tibiiformibus, 33—42 $\Rightarrow 8$ —12.5 μ , sub apice usque ad 4 μ attenuatis, apice subglobuloso capitatis (capitulo 7—11.5 μ in diametro). Tramate pholiotinoideo, subregulari, multis elementis brevissimis instructo. — Stipite ad apicem albido vel pileo concolori et infra annulum nonnihil striatum patulum apicalem caducum albidum simplicem sed crassiusculum fibrilloso et plerumque brunnescente-ferruginascente vel fusciscente, aequali, tubuloso, 30—60 $\Rightarrow 1$ —4 mm. Carne subconcolori, pallidiore; sapore miti; odore subfarinaceo. — Ad terram in Piceeto-Laricetis humidis, Augusto. Typus: In Montibus Altaicis, Kurai, 1700 m. altitudinis, leg. R. Singer et L. N. Vasilieva, A 728, LE.

This differs from *P. septentrionalis* in the shape and color of the pileus and in the size of the spores, the broader germ pore, the broader dermatocystidia and their incrustation, the habitat, etc. In spite of the capitate cheilocystidia, it seems that it is closer to *P. teneroides* (Lange) Kühner.

Pholiotina appendiculata (Lange & Kühner) Sing.

A bisporous form of this species (spores 10.8—11.5 $\Rightarrow 6.5$ —7.5 μ ; basidis 30—40 $\Rightarrow 11.5$ —12 μ ; cheilocystidia 32.5—35.5 $\Rightarrow 9$ —12 μ with cylindric or subulate apex (6—17 $\Rightarrow 2$ —6 μ); cells of epicutis 30 $\Rightarrow 17 \mu$) was found in Central Asia (Alma Ata, Kazakhstan, coll. Nevodovski, det. Singer, KAZ 9, LE).

Pholiotina coprophila (Kühner) Sing.

This species occurs in the Altay Mountains (Oirotia, Kurai, August 7, 1937, Singer & Vasilieva, LE) and in Argentina (Chascomús, prov. Buenos Aires, on dung in "pampa steppe", June 4, 1949, R. Singer S 76 LIL); also in the Alps (Kühner) and in Catalonia (R. Maire). The wide distribution of this species in countries with extensively pastured steppes and meadows is remarkable.

The South American form has slightly larger spores than the European and Asiatic form, viz. 12—16 $\Rightarrow 7$ —8.7 μ , mostly 13—13.7 $\Rightarrow 7.5$ —8 μ . The pruinosity of the stipe is due to dermatocystidia of the

same type as observed in *Conocybe siliginea*, *C. macrospora*, and *C. plumbeitincta*.

Pholiotina cyanopoda (Atk.) Sing.

This species was up until now known only from Michigan and Germany. I have a collection from Massachusetts with greyish pileus, white margin and blue base; the stipe is 50 mm long. Otherwise it is identical with the descriptions by R. Kühner and J. Schaffer apud Kühner.

Pholiotina filaris (Fr.) Sing.

This species was collected by me in the subalpine Alneta of *Alnus jorullensis* var. *Spachii* of the pre-Andine Sierras near Tafi del Valle, prov. de Tucumán, Argentina. It agrees well with the European description of the species which also occurs in North America from where it seems to follow the higher mountain ranges through South America. The specimens grew solitary on humus at about 2200 m. altitude, May 1, 1949, R. Singer T 511, LIL.

Pholiotina procera Sing. spec. nov.

Pileo aquose ferrugineo vel melleo, margine paulum striato, convexo dein applanato, subumbonato vel obtusissimo, ± 50 mm. lato; epicute cellulari. — Lamellis colore earum *Galerinae marginatae*, cui haec species est similis, gaudentibus neque vivide ferrugineis in vivis, emarginatis, moderate latis, 5.5 mm. latis, subconfertis. Sporis vivide ferrugineis, poro germinativo truncatis, levibus, ellipsoideis, $10-11.5 \rightleftharpoons 5.5-6.5 \mu$; basidiis tetrasporis, normaliter clavatis, $26-34 \rightleftharpoons 8-9.5 \mu$; cystidiis nullis; cheilocystidiis haud numerosis, aciem lamellarum subheteromorpham efficientibus, versiformibus, saepe fusoides vel subampullaceis vel centro constrictis, hyalinis $28-35 \rightleftharpoons 6.5-10 \mu$; tramate pholiotinoideo, ex hyphis usque ad $\pm 50 \mu$ longis sed saepe usque ad 12μ incrassatis et usque ad 20μ abbreviatis, fibuligeris consistente; lactiferis praesentibus, $5-6 \mu$ diametro. — Stipite sordide flavo-brunneo, gradatim obscuriore basin versus, nitidiusculo, fibrilloso-striato, annulato, subaequali, $70 \rightleftharpoons 6.5$ mm.; velo annuloso, annulo albedo, membranaceo, crasso sed simplici, patulo sed recurvato, superne striato. — Carne subconcolori pallidioresque sed in basi stipitis atrobunneo, inodora vel farinolente. — Ad latus trunci in silva. Septembri. Typus: In Montibus Altaicis, Oirotia, Artubash, ad ripam lacustrem L. Teletskoye, 17-IX-1937, R. Singer & L. N. Vasilieva, A 1148 (LE).

This species differs from *P. togularis* sensu Ricken which is closest, in having much larger carpophores, a different annulus and stouter stipe. The pileus is not rugulose and never has the shape of a "Galera"; the lamellae are not ascendant. However, the spores and

all other characters are more or less identical with those of that species.

Pholiotina rugosa (Peck) Sing.

This species was redescribed in Singer, R., New and Interesting Species of Basidiomycetes II, Pap. Mich. Acad. Sc., Arts & Lett. **32**: 148. 1948.

Pholiotina septentrionalis (A. H. Smith) Sing. apud Vasilieva ex. Sing. comb. nov.

Pholiota septentrionalis A. H. Smith, Mycologia **27**: 227. 1935.

Pholiota intermedia A. H. Smith, Ann. Mycol. **32**: 479. 1934, non Sing. (1929).

Conocybe intermedia (A. H. Smith) Kühner, Le Genre *Galera*, p. 143. 1935.

Naucoria temulenta f. typique Heim & Romagnesi, Bull. Soc. Myc. Fr. **50**: 175. 1934.

Pholiotina intermedia (A. H. Smith) Sing., Beih. Bot. Centralbl. (B) **56**: 170. 1936.

Conocybe intermedia var. *brunnea* Lange & Kühner apud Kühner, l. c.

Galera brunnea (Lange & Kühner) Lange, Flora Agar. Dan. **4**: 36. 1939.

Pileus "ochraceous tawny" or more or less "clay color" R. when moist, sometimes reaching a color almost as deep as date brown, hygrophanous, "ochraceous buff" R. when dry, transparently striate on the margin when moist, (from slightly and short striate — 1—2 mm. — to strongly and long-striate e. gr. four fifths of the radius), smooth or rarely (in the Florida form) rugose, slightly sulcate or smooth on the margin when dry, non-viscid, conico-convex and umbonate (in one Altay collection), or more frequently convex with or without umbo or papilla, eventually applanate, 10—30 mm. broad, sometimes up to 14 mm high; veil on margin usually well visible in young specimens. — Lamellae deep ferrugineous, deeper colored than the pileus in dried specimens, sordid chamois-ocher when fresh, moderately close or subclose to subdistant, rarely crowded (in the Caucasus collection), with many attenuate lamellulae, emarginate-subadnexed, or deeply emarginate-sinuate, or adnate (Altay collection), broad, sometimes venosely anastomosing, with more or less pallid edge in most specimens. — Stipe brownish or olive yellowish brown, between the very base (which is sometimes black — Florida form) and the apex often a zone colored "mahogany red", "burnt sienna", "Sanford's brown" R., the very apex often pallid and somewhat pruinose, below strongly to slightly fibrillose or appressedly withish sericeous, (forming indistinct belts), or furfuraceous, and thus appearing paler than

the ground color but becoming darker colored by rubbing, at times somewhat shining at places, subequal or equal or with thickened base, or even slightly tapering downwards, straight, or flexuose or curved, narrowly tubulose, $10-55 \Rightarrow 0.7-2.7$ mm. (at apex); basal tomentum slight, sordid white; veil either almost absent and its existence indicated merely by the fibrillosity, or the sericeous or furfuraceous covering on the stipe, or else by a squamulose zone, or, with a well developed annulus (as in the Caucasian form) which is infundibuliform, ascendant, with entire margin, striate to sulcate inside (above), smooth outside (below), about 5 mm. high, 2-3 mm. flaring, apical, persistent. — Context concolorous but paler than the surfaces, in the base of the stipe deep chestnut brown to black, rather thin; odor none, or (in the European material) raphanaceous; taste mild.

Spores $7-8 \Rightarrow 4.5-5.2 \mu$ (in the Caucasus material) to $6.5-10.8 \Rightarrow 3.3-6 \mu$ (in European material), with very indistinct germ pore but the latter undoubtedly present, with smooth compound wall, light ferrugineous, ellipsoid to ovoid; basidia $18-29 \Rightarrow 5.8-7.5 \mu$, 4-spored, very few of them 2-spored, hyaline to brown; cystidia none; cheilocystidia $32-42 \Rightarrow 5-10.5 \mu$, ventricose below and abruptly capitate above, the capitulum rarely mucronate (so in Florida form), $(3)-3.3-8 \mu$ in diameter, "neck" $2-8.5 \Rightarrow 1-3 \mu$; epicutis of pileus formed by a hymeniform layer consisting of vesiculose bodies, $11-17 \mu$ in diameter, these later often becoming somewhat thick-walled, occasionally smaller and larger than indicated above, the hymeniform layer in age often fragmentary, many of the vesiculose bodies with cystidiform excrescences, some of them capitate, and also some typical dermatocystidia present; hymenophoral trama of the *Pholiotina*-type, i. e. regular-subintermixed, with some very short elements; hymenophore not forming needle-like crystals with ammonia; covering layer of the stipe, at the apex, with some typical dermatocystidia, i. e. cystidioid bodies which recall those of the gill edge, e. gr. $30-32 \Rightarrow 5-7 \mu$, with $4.5-6.5 \mu$ thick capitulum (so in the Caucasus form); hypodermium and hyphae of the stipe with dissolved intracellular pigment and with incrusting pigment; hyphae of the stipe $2.5-7.5 \mu$ broad, with clamp connections.

On decaying plant material in the woods, or on decaying wood (trunks and logs, so in the Caucasus form, the Florida form, and one Altay collection), fruiting from July until October on or near *Fagus*, *Abies*, *Alnus*, *Salix*, or *Quercus*.

Material studied: U. S. S. R. Altay Mountains. Oirotia, Teletskoye Ozero, September 1937, R. Singer A 986+ and A 940 (LE). — Caucasus Mountains, Laba River valley, L. N. Vasilieva (LE). — Leningrad region, Georgievskaya, R. Singer 600 (LE). — Marien-

burg, R. Singer 121 (LE). — U. S. A. Florida, Alachua Co., Planera Hammock, Murrill F 18367 (FLAS). — Dade Co., Matheson Hammock, R. Singer F 1157 (FH).

Since Kühner and especially Lange insisted on certain differences between the American and the European form, it may be of interest to give a small survey of the forms collected and studied by me: Two collections from Europe, 2 collections from Asia, and two from North America, in addition to those already studied by other authors, especially A. H. Smith, Lange and Kühner. It is my conviction that the various forms are very little different from each other, and that they, under no circumstances, can be considered different species as intimated by Lange. The veil is, as was pointed out by Kühner, variable in this genus and especially in this species, and even in the type and co-type collections. The stipe is either long or short in the Florida collections, and must therefore be discarded as an important character in this particular case. The habitat was rotten wood in one case and humus in the other in two collections of otherwise identical fruiting bodies, both coming from two localities of the Altay Mountains, only about 30 km. apart from each other, and collected in the same month. One might distinguish three "varieties" each with a certain combination of characters.

(1) Michigan "variety": Short stipe, close lamellae, annuliform veil, narrow to broad cheilocystidia, habitat on wood.

(2) European (incl. Altay, not Caucasus) "variety": Longer stipe, more distant lamellae, annuliform or fragmentary veil, narrow to moderately broad cheilocystidia, habitat on the ground or on wood.

(3) Caucasus "variety": Longer stipe, closer lamellae, annuliform veil, moderately broad to broad cheilocystidia, on wood.

(4) Florida "variety": Short or long stipe, more distant lamellae, no annuliform veil, narrow cheilocystidia, on wood.

It is just barely possible that these forms have constant character correlations as outlined above, but it appears more probable that further observations will show these character combinations to be inconstant. The present evidence for something like beginning geographic races is rather weak.

3. Notes on *Naucoria* (Fr.) Quél.

Naucoria alachuana Murr.

This species was analysed in Singer, R. Type Studies on Agrarics II, Lloydia 9: 129, 1946. See there for the microscopic description of the types studied, and the synonymy. My own collections show the same microscopical characters. They enable me to

supplement my type studies with a detailed macroscopical description:

Pileus "Sudan brown" (M & P), or somewhat paler, hygrophanous, "buff" (M & P) in dry condition or somewhat paler avel-laneous, 1.5 mm. transparently striate from the margin inwards when wet, glabrous to finely continuously or fragmentarily velu-tinous or tomentose, non-viscid, almost semiglobose to convex, not applanate, 10—22 mm.; veil very slight at the marginal edge on very young and fresh material, soon disappearing. — Lamellae argillaceous ("Prairie+" M & P), very broad to rather broad, adnate or adnate-subsinuate, or broadly adnexed and subsinuate, very close or (more often) moderately close to subdistant, subventricose, often with distinctly white beaded edge; spore print brown (pl. 15, J-12, M & P), not rusty. — Stipe pallid to light fuscous, striate, and somewhat pulverulent at the apex, glabrescent, glabrous or subglabrous below, white or whitish from the mycelium at the very base, equal to slightly tapering upwards, $10-25 \rightleftharpoons 0.8-2$ mm. — Context pallid to subconcolorous or somewhat pale fumous, thin, fragile; odor none; taste mild.

On oak wood, in winter as well as in summer. Florida.

Material studied: Alachua Co., Planera Hammock, July 29, 1947, R. Singer F 3408 (FH). — January 16, 1940, W. A. Murrill F 19317 (FLAS, co-type). — Gainesville, January 15, 1940, W. A. Murrill F. 19305 (FLAS, type). — February 13, 1939, W. A. Murrill F 18137 (FLAS, type of *Psilocybe alachuana*). — Arredonda, July 29, 1938, W. A. Murrill F 17984 (FLAS, type of *Galerula semiglobata*).

Naucoria atomacea (Murr.) Sing. comb. nov.

Atylospora atomacea Murr. Lloydia 5: 152, 1942.

Pileus deep brown, with paler margin and darker transparent striae, somewhat hygrophanous, paler and more sulcate when dry, white atomate when young, glabrescent, conico-campanulate, then convex, umbonate or obtuse, 6—15 mm. broad. — Lamellae brownish to pale umber, at first white fringed or white punctate at the edge, adnexed to adnate, rather broad to broad, rather close to subdistant, the inserted ones narrower in some collections. — Stipe paler than the pileus, with pallid to white pruina, glabrescent, equal, $11-15 \rightleftharpoons 1$ mm. — Context paler than the outside, thin, inodorous, slightly bitter according to Murrill.

Spores $6.5-7 \rightleftharpoons 4-5.3$ μ , brownish, moderately deep colored, with rather (0.5μ) thin, more or less distinctly complex wall, smooth, subreniform or in a certain position subtriangular (with rounded angles), with a strong suprahilar applanation, broadly rounded

above, narrowed towards the base, in frontal view drop-shaped, with an indistinct to rather distinct callus, without germ pore; basidia $13-20 \Rightarrow 6.5-8 \mu$, 4-spored; cystidia none; cheilocystidia $23-44 \Rightarrow 6.5-10 \mu$, clavate to subulate, or with ventricose base and broadened apex (the clavate shape predominant in all Florida collections, the form with thickened base in the North), hyaline, making the gill edge heteromorphous; epicutis of the pileus consisting of the terminal members of a trichodermium palisade, with the appearance of an interrupted hymenial layer, these terminal members (dermatocystidia) hyaline or brown, erect, much like the cheilocystidia in shape but even more variable in a single section, some even so short as to become almost subisodiametric, e. gr. $20-26 \Rightarrow 10-11.5 \mu$, but the majority $29-68 \Rightarrow 6.5-11.5 \mu$; all hyphae with clamp connections.

On rotten wood of frondose trees, e. gr. *Liquidambar styraciflua*, in summer and fall in the North, in February in Florida. Eastern United States from New York to Florida.

Naucoria citrinipes Murr.

I have not been able to re-collect this species but the data obtained on the type specimens warrant its inclusion in the genus *Naucoria* sensu stricto, and its recognition as an independent species.

Spores $5.8-7.5 \Rightarrow 4-5 \mu$, subreniform to phaseoliform, in frontal view ovoid, melleous, smooth; basidia $22 \Rightarrow 7 \mu$, 4-spored; cystidia none; cheilocystidia $35-37.5 \Rightarrow 6.5-9 \mu$, hyaline, ventricose below, somewhat broader and subcapitate at the apex, rarely broadly fusoid with rounded apex, capitulum usually thinner than the ventricose portion but also as thick or thicker in some individual cheilocystidia, making the edge heteromorphous; hymenophoral trama regular, becoming rather irregular in age, subhyaline; epicutis of the pileus consisting of extremely inconstant (in shape and size) terminal members of the trichodermium or (at stretches) trichodermium palisade (in the latter case they are dermatocystidia and more or less similar to the cheilocystidia), the terminal members of those places where there is no palisade mostly brown, sometimes branched, often with thin cylindric excrescences, $3-22 \mu$ in diameter, probably representing outgrowths of the hypodermal layer; all hyphae with clamp connections.

Naucoria melleiceps (Murr.) Sing. comb. nov.

Galerula melleiceps Murr. Proc. Florida Acad. Sc. **7**: 119. 1944 (1945).

Pileus "ecru olive" to "citrine drab", or "dark olive buff", sometimes tending towards "honey yellow" (R.), often darker transparently striate, hygrophanous, subpulverulent, non-viscid, the smaller specimens with convex, then centrally appanate but wart-like

umbonate disc and declivous margin, the larger ones obtusely conical in the center and more applanate at the margin, with straight margin in youth, 4.5—11 mm. broad. — Lamellae "dark olive buff" to "citrine drab" (R.), rather broad (1 mm), broad in the smaller carpophores, i. e. about one fifth of the diameter of the pileus, distant, intermixed, planely and irregularly adnate, horizontal. — Stipe pale olivaceous and with or without a very faint pallid pruina, or nearly concolorous with the pileus, or with the lamellae, glabrescent and then tending towards melleous, usually sordid hyaline at the apex or in the entire upper half, the base more or less white mycelioid from a strigose basal mycelium, without veil, sometimes slightly innately fibrillose, equal or subequal, or very slightly attenuate towards the apex, $7-26 \Rightarrow 0.3-1.5$ mm. — Context very thin, pallid, inodorous.

Spores $6.8-8.2 \Rightarrow 4.2-4.7$ μ , yellowish brown, smooth, with indistinctly double wall which is moderately thick, and with an indistinct callus or without it, coma-shaped, i. e. ellipsoid with the apical portion (third or half) protracted towards the inner side when seen in profile, sometimes more ovoid, i. e. broader in the lower portion, with suprahilar applanation, or with a slight depression; basidia (18)—22—(25) \Rightarrow (7.5)—8.2—(8.8) μ , 4-spored; cystidia none; cheilocystidia 30—45 \Rightarrow 6—10.5 μ , most frequently 35—40 \Rightarrow 6.5—7.2 μ , more or less cylindric, but some somewhat clavate, some with a slight swelling near the base, and generally somewhat inconstant in shape, yet, the great majority always with a more or less cylindric general pattern, hyaline, very crowded, making the edge of the lamellae heteromorphous; epicutis of the pileus formed by an epicutis and a hypodermium, in trichodermial palisade in the epicutis, and the hypodermium formed by intermixed and strongly colored hyphae; terminal members (dermatocystidia) much like the cheilocystidia, but more irregular, cylindric, sometimes constricted in the middle or below, not incrustated by pigment, more or less broadly rounded at the apex, usually separated from the next-lower member by a septum which is frequently clamped, 16—36 \Rightarrow 5.8—10 μ ; hymenophoral trama subhyaline to hyaline, hyphous, regular; subhymenium subirregular-subcellular, consisting of small hyaline elements, moderately well separated from the trama; surface of the stipe with some dermatocystidia similar to those of the pileus but often longer; all hyphae with clamp connections.

In the mud of swamps in low hammocks, on decayed wood in tropical and low hammock, also often an dead fallen branchlets or débris of frondose trees fruiting from August until October. Florida.

Material studied: Alachua Co. Buzzard's Roost, September 29, 1938, W. A. Murrill F 15910 (FLAS, type). — Highlands Co.

Highlands Hammock State Park, August 21, 1942, R. Singer F 341 (FH). — August 23, F 367 (FH). — Dade Co. Simpson Park, Miami, October 23, 1942, R. Singer F 1217 (FH).

Naucoria praeandina Sing. spec. nov.

Pileo olivaceo ("biskra" supra "gold" vel "Whippet" M & P), subtiliter velutino, levissime substriato vel transparenter striatulo, convexo, 7—11 mm. lato. Epicute ex elementis palisadice dispositis dermatocystidiformibus consistente; dermatocystidiis cheilocystidiis simillimis, 30—58 \Rightarrow 6.5—11.8 μ , hyalinis vel basin versus brunneolis, paucis apice carentibus et tunc subsodiametricis, e. gr. 22 \Rightarrow 16 μ ; hypodermio subcellulari, cellulis pigmento incrustatis. — Lamellis subconcoloribus pileo (pl. 15, H—9/10 vel "gold" M & P), confertis vel subconfertis, adnatis, serrulatis vel pallide crenulatis, sublatis, subventricosus. Sporibus levibus, callo apicali instructis, brunneolomelleis, ellipsoideis, interius ad latus applanatis, nonnullis distincte reniformibus, 5.8—8.7 \Rightarrow 4—5 μ ; basidiis hyalinis, clavatis, tetrasporis, paucis bisporis intermixtis, 21.7—26.2 \Rightarrow 5—6.2 μ ; cystidiis nullis; cheilocystidiis hyalinis, cylindraceis, subventricosus basin versus, rarius haud ventricosus, rarius vel rarissime apice incrassatis vel subcapitatis, saepius gradatim attenuatis ad apicem late rotundatis, 32—58 \Rightarrow 5—11.5 μ ; acie lamellarum heteromorpha. — Stipite subconcolori ("gold" et "willow", aut colore lamellarum gaudente), pruinoso, aequali, bulbulo exiguo praedito, 8—17 \Rightarrow 0.7—1.3 mm. (bulbulo usque ad 2.5 mm. lato). — Carne subconcolori, sat tenui; odore nullo vel subnullo. — Habitat ad partes vivas et ad lignum putridum trunci arboris frondosae. Typus: R. Argentina, prov. Tucumán, Quebrada de Lules, prope flumen Rio Lules, 2—IV—1949, R. Singer T 373 (LIL). Co-typus Parque Aconquija, 24—III—1949, R. Singer T 267 (LIL).

This species is close to *Naucoria melleiceps* and also *N. citrinipes*.

Naucoria subvelutina Sing. spec. nov.

Pileo saturate rufocastaneo, hygrophano, alutaceo in statu sicco, velutino vel subvelutino-pubescente, levi, convexo, obtuso, haud repando, 5—15 mm. lato. Stratum velutino-pubescentis constat ex hyphis cystidioides (dermatocystidiis) erectis, obtusis, hyalinis, confertis, cylindraceis vel clavatis vel ampullaceis vel tibiiformibus, cheilocystidiis simillimis, epicutem hymeniiformem efformantibus. — Lamellis fusciculis, latiusculis, ad aciem alboflavidis vel luteolo-albis, confertis vel subconfertis, late planeque adnatis. Sporibus pallide melleis, intus granulosis vel subnebulosis, 0—1-guttulatis, membrana haud intense colorata, sat tenui, sed duplici resistenteque, levi instructis, phaseoliformibus, 7—9 \Rightarrow 4—5.8 μ ; basidiis brunneis vel

hyalinis, bi- vel tetrasporis, $17-30 \approx 6-7.5 \mu$; cystidiis nullis; cheilocystidiis numerosis, hyalinis, cylindraceis vel clavatis vel ampullaceis vel tibiiformibus (capitatis et at basin ventricosus), dermatocystidiis simillimis, $25-53 \approx 8-11.5 \mu$; tramate regulari. — Stipite pallido, subglabro, subtubuloso, cylindraceo, $12-20 \approx 1-2$ mm. — Carne pallida, inodora, insipida. — Habitat ad terram et fragmenta vegetabilia in pratis prope arbores (*Betula*), Septembri. Typus: In Montibus Altaicis, prope Artubash, 1—IX—1937, R. Singer A 298 (LE).

This species differs from *N. atomacea* (Murr.) Sing. in having longer spores. It differs from *N. centunculus* f. *luxurians* Romagnesi in having smaller carpophores. *Naucoria velutina* Murr. has a different color of the pileus and the stipe, and the spores are shaped somewhat differently, and the habitat is not the same. I have not studied the type, and do not even know whether this belongs to the same genus, but if it does, I do not believe that it is the same species. *N. centunculus*, in my sense, has olivaceous carpophores.

3. Notes on *Alnicola* Kühner.

Alnicola amarescens (Quél.) Sing.

This species, precisely as described by Heim, R., and H. Romagnesi, Sur quelques Agarics de la flore française, Bull. Soc. Myc. Fr. **50**: 179, pl. 9, fig. 4, 1934, was collected in the Leningrad region, near a place called Sovkhozy on charcoal, among *Polytrichum* and hepatics, May 18, 1938, R. Singer (LE).

Alnicola bohémica (Velen.) Kühner.

This species occurs in North America since it is obvious that the specimens received from A. H. Smith (see Pap. Mich. Acad. Sc. Art & Lett. **22**: 219. 1937 and Rev. d. Mycol. **5**: 11. 1940) from Michigan, are the four-spored form of *Alnicola bohémica*.

Alnicola devia Sing. spec. nov.

Pileo obscure castaneo, hygrophano, haud viscido, pallide cinnamomeo in statu sicco, breviter transparenter striatulo ad ipsum marginem in pileis vetustis in statu humido, radiatim ruguloso, campanulato, dein applanato, subumbonato, interdum umbilicato, $12-43$ mm. lato. Epicute cellulari e nonnullis stratis cellularum subisodiametricarum (paucarum subcystidiiformium vel piriformium, e. gr. $31 \approx 11.6 \mu$) consistente; hypodermio quoque subcellulari, ex elementis pigmento fortiter incrustatis, ferrugineis efformato. — Lamellis avellaneis, dein pallide ferrugineo-fuscidulis vel sporarum pulvere fuscatis, moderate confertis vel subdistantibus, sinuatis vel adnatis et tunc a stipitis apice separantibus, moderate latis vel latiusculis, interdum fortiter anastomosantibus usque ad totam lati-

itudinem lamellarum; sporis in massa ferrugineo-fuscis ("Arabian br." M & P). Sporis in juventute levibus, dein verrucosis Hebelomatum modo, raro grosse verrucosis Galerinarum modo, pallide ferrugineo-melleis, amygdaliformibus, disco levi suprahilari destitutis, $14.5-16 \rightleftharpoons 7.2-9 \mu$; basidiis bisporis; cystidiis nullis; cheilocystidiis hyalinis, filamentosis vel subventricosis deorsum, apice late clavatis vel subcapitatis, $30-61 \rightleftharpoons 6.5-12.3 \mu$. — Stipite albo vel albido, apice farinaceo, sericello, nitidiusculo, aequali vel subaequali, interdum basin versus subincrassato vel ad basin incrassato, cavo, $21-56 \rightleftharpoons 1-4.5$ mm.; velo praesente, cortinoideo, albo, demum nullo; dermatocystidiis apicis stipitis cheilocystidiis simillimis. — Carne pallidior vel albida, subbrunnescente in stipitibus vetustis, inodora, sapore incognito. Hyphis fibuligeris. — Habitat in fossa in dumeto prope *Salicem Humboldtianam* in vegetatione marginali fluminis Rio de la Plata ad terram humosam, saepius inundatam, gregatim, fructificat Junio mense. Typus: Punta Lara, prov. Buenos Aires, 9—VI—1949. R. Singer S 111 (LIL).

This species is clearly different from the other species of the group with broad-topped cheilocystidia. It is, together with *A. umbrina* and *A. diplocystis*, the only representative of this genus in South America, and furthermore interesting because it seems to be allied to *Salix* rather than to *Alnus*.

***Anicola diplocystis* Sing. spec. nov.**

Pileo in juvenilibus interdum aequaliter brunneo ("burnt umber" M & P) vel brunneo ("burnt umber") in disco solo, marginem versus dilute brunneo ("Cigarette Antique br." and "oak" M & P), hygrophano, in statu sicco inter "desert" (M & P) et pl. 11, D-5 (M & P), furfuraceo-squamuloso (squamulis intensius coloratis: "raw sienna" M & P, melius visibilibus in statu sicco), plus minusve cito siccato de zona intermedia centrum marginemque versus, interdum siccante zonis vel maculis et tunc submarmorato, levi, transparenter striatello in humidis ad marginem, striis usque ad 4 mm. longis, late campanulato, dein convexo, demum applanato subdepressoque circum discum subumbonatum, 11—27 mm. lato. Epicute epithelium fere efformante, e structura "cutis" derivatum in qua cellulae dilatatae sunt usque ad formationem strati pseudoparenchymatici, nonnullis cellulis catenulas cellularum vel hyphas individuales gerentibus quae multiformes sunt, atque erectae vel semierectae vel subappressae; omnibus elementis fortiter pigmento brunneo in crustatis; strato velari fragmentari epicuti superposito, ex hyphis filamentosis repentibus, conglutinatibus, paucis ex eis cystidiformibus vel piliformibus erectis vel clavatis consistente (stratum analogum cl. R. Maire in *A. bohemica* observavit). — Lamellis buxeis ("Antique

gold" M & P), gradatim colorem sporarum (quid est "Chipmonk" M & P) appropinquantibus, sinuatis, adnexis vel obtuse adnexis, raro sinuato-adnatis dente exiguo decurrentibus, confertis at haud confertissimis, linearibus vel ad tertiam anteriorem dilatatis, angustis vel moderate latis (usque ad 3.5 mm. latis); acie lamellarum albida, heteromorpha; sporis in massa "Chipmonk" (M & P). Sporis verrucosis, amygdaliformibus, depressione debili suprahilari instructis, obscure melleis, vel subferrugineis, $9.3-11.5-(13) \Rightarrow 5.7-5.8-(8) \mu$; basidiis bi- vel tetrasporis observatis, clavatis $30-38 \Rightarrow 8.5-10.3 \mu$; cystidiis nullis; cheilocystidiis ditopis, typo primario ad amba latera cheilocystidiorum inter ea et basidia disposito (ut in *Kuehneromycete vernali*), numerosissimo in speciminibus juvenilibus, dein transformato in cellulas inconspicuas (perpaucas cystidiiformes, permanentes, et tunc saccatas, $26-27 \Rightarrow 16 \mu$) vel rarius in cheilocystidia typi secundarii; cheilocystidiis primariis basidiomorphis, saepe transversaliter septatis, late rotundatis ad apicem, raro mucronatis, hyalinis vel brunneolis, $15-19 \Rightarrow 7.2-8.7 \mu$; cheilocystidiis typi secundarii primum hyalinis, dein hyalinis vel brunneolis, ventricosis, apice tenuiter acuminatis, eis *Alnicolae melinoides* exacte similibus, $29-47 \Rightarrow 3.5-8 \mu$, tramate subregulari, stramineo-subhyalino in strato tenui. — Stipite brunneo ("Centennial br." M & P), sed fibrillis albis, sericeis appressis oblecto ita ut stipites juniores subpallidae sint, ut minime prope apices, at dein fibrillis separantibus et ipsa superficie apparente colore obscuriore ("mummy" ad apicem et "oak" vel "clove" M & P) praedito; dermatocystidiis apicis sparsis eumque pruinatum efficientibus; stipite indistincte longitudinaliter striatello, tubuloso, aequali vel paulum apicem versus attenuato, $17-40 \Rightarrow 1.2-3$ mm.; velo cortinoideo vel tenuiter membranaceo, fugaci, sed in nonnullis speciminibus fragmentis exiguis furfuraceis de zona pruinosa apicis usque ad regionem basalem relictis, brunneolo-albo.; mycelio albo, mycorrhizam cum radicibus *Alni jorullensis* var. *Spachii* ectotrophicam ex hyphis hyalinis fibuligeris efformante. — Carne albida, demum brunneolo-pallida, in base stipitis speciminum maturorum obscurius brunnea; sapore haud farinaceo, neque amaro; odore nullo. Hyphis fibuligeris. — Habitat in Alnetis subalpinis ad terram, gregatim et communiter obvia, fructificationes Maio mense collectae sed probabiliter per partem calidiorem anni observabiles. Typus: R. Argentina, prov. Tucumán. Supra Tafi del Valle, 1—V—1949. R. S i n g e r T 503 (LIL).

This species is morphologically interesting because of the presence of the two types of cheilocystidia in every single specimen observed. Since the two types of cheilocystidia coincide with those separating the two basic sections of *Alnicola* as proposed by me, viz. section *Submelinoideae* Sing., Rev. d. Mycol. **3**: 68. 1939, and section

Melinoideae Sing., l. c., it will be necessary to characterize this latter section now in this manner: "Cheilocystidia with acuminate apex present." Thus, *A. diplocystis* enters section *Melinoideae* where, in my opinion, its closest relatives are. From a phylogenetical point of view, the co-existence of two types of cheilocystidia, one of them predominant in the young stages and one in the mature stage, indicates that the cheilocystidia of the section *Submelinoideae* are merely a stage of the histological development of the *Alnicolae* which also remains the final one in section *Submelinoideae*. Consequently one is led to assume that the section *Submelinoideae* is the more primitive one while the section *Melinoideae* in which the cheilocystidia of the type *Submelinoideae* is not formed any more, should be considered the more recent group. If this is so, *Alnicola diplocystis* must be the most primitive representative of the section *Melinoideae*.

Alnicola diplocystis differs from all other species of *Alnicola* in having both types of cheilocystidia. It differs from *A. melinoides*, aside from this, in having mild taste although the structure of the cuticle is identical.

The roots of *Alnus jorullensis* var. *Spachii* in the pre-Andine sierras of Tucumán and Catamarca are very frequently found to be enveloped in a thin layer of hyphae with clamp connections. These hyphae also enter the tissue but do not enter the cells. The aspect is that of typical ectotrophic mycorrhiza. The mycelium of the fruiting bodies can be traced to mycorrhiza-bearing rootlets in some cases, and since *Alnicola diplocystis* is by far the most common clamp-bearing basidiomycete restricted to *Alnus*, one will readily admit that this species must be considered the most important mycorrhizal fungus of the alder. There is undoubtedly ectotrophic mycorrhiza in connection with introduced trees such as *Pinus*, *Betula*, and *Quercus*, but the mycorrhiza of *Alnicola diplocystis* with *Alnus jorullensis* var. *Spachii* is the first case of ectotrophic mycorrhiza observed on any native South American tree.

Alnicola luteolofibrillosa Kühner.

This species was collected by Singer & Vasilieva, together with *Alnicola scolecina*, in the Altay Mountains, at the Telets koye Ozero, A 1014 (LE). All characters were observed to be in closest agreement with the description given by Kühner.

Alnicola scolecina (Fr. sensu Lange) Romagnesi.

This species, as described by Romagnesi, H., Quelques Espèces d'Agarics Ochrosporés, Bull. Soc. Myc. Fr. **58**: 121. 1942, occurs in the Altay Mountains where I collected it (Artubash, Teletskoye Ozero, September 1, 1937, under *Alnus*, A 818, LE). It showed exactly the characters indicated by Romagnesi. The spores were slightly

smaller, however ($9-11 \rightleftharpoons 5-6.8 \mu$, mostly about $10 \rightleftharpoons 6 \mu$). It is deposited in the herbarium under the name *Alnicola umbrina* (Maire) Sing. (det. Singer 1938). What seems to be the same species occurs in the pre-Andine Sierras, under *Alnus*, together with *Alnicola diplocystis*, but much more rarely, and differs from the European species in having slightly smaller spores:

Pileus pl. 15, J—12, or "Java" in center and "cocoa" on margin, hygrophanous, "walnut, taffy" or "bunny" when dry (M & P), at first non-striate, then one third to one half of radius transparently striate, at first subvelutinous, later slightly squamulose near the center to subglabrous but unpolished, convex and usually without umbo, 8—14 mm. broad. — Lamellae between "auburn" and pl. 14, J—11, or "bronze", or (eventually) "oak" (M & P) from the spores, subclose to subdistant, emarginate-adnexed, rather broad to rather narrowly adnexed but neither planely adnexed nor adnate or decurrent, moderately broad to broad. — Stipe "Kis kilim" at apex, but when very young "Java", base at first "cocoa" then leafmold, with paler striate from the veil, with a very fugacious cortina, fugaciously appressedly longitudinally sericeous-striate, glabrescent, sometimes eccentric, tubulose, \pm subequal or slightly tapering upwards, $20-24 \rightleftharpoons 1.5-2.5$ mm. — Context almost concolorous with the surfaces (somewhat paler in pileus); odor none or slightly raphanaceous; taste mild.

Spores $8.7-11.5 \rightleftharpoons 4.5-8 \mu$, warty, without "plage", with a slight suprahilar depression, melleous (rusty melleous in accumulations); basidia large, 4-spored, a few 2-spored ones intermixed in some caps, the sterigmata either normal, or some of them irregularly obliquely, eccentrically, or not apically attached; cheilocystidia $29-53 \rightleftharpoons 3.5-9.3 \mu$, of the melinoides-type, i. e. ventricose below, acuminate and tapering upwards or at least with a very narrow and usually elongated mucronate ampullaceous apex, hyaline, more rarely melleous, making the gill edge heteromorphous; cystidia none; hymenophoral trama hyaline-stramineous, always more or less colored when seen in more than one layer of hyphae, with incrusting rusty pigment, regular; epicutis of pileus and hypodermium exactly as shown in the drawing by Romagnesi for *A. scolecina* (l. c.), with larger, sometimes up to 45μ in diameter, spherocysts and a few clavate or ampullaceous or cylindric to filamentous hyphae of hyphal chains sticking out from the uppermost layer, all more or less melleous to stramineous because they are incrustated by a ferruginous pigment, fewer elements of the cuticle hyaline; all hyphae with clamp connections.

On the ground in pure *Alneta* (*Alnus jorullensis* var. *Spachii*) in the ravines of the subalpine zone of the pre-Andine Sierras, much rarer than *A. diplocystis*, fruiting in May (probably also in summer).

Material studied: R. Argentina, prov. Tucumán, Tafi del Valle, May 1, 1949, R. Singer T 512, T 521 (LIL).

The collection T 512 differs in having eccentric stipe and broader spores. It grew on a steep earth wall near exposed roots of *Alnus*, and I am inclined to consider it an accidental form of this species due to the particularity of the substratum. The spores were $9-11.5 \Rightarrow 6-8 \mu$ in this form, and $8.7-10.3 \Rightarrow 4.5-5 \mu$ in the ordinary centrally stipitate form.

Alnicola suavis (Bres.) Sing.

This striking species, usually known as *Naucoria suavis* Bres., was observed in the Altay Mountains, at Yaila, Teletskoye Ozero, under *Alnus* (Singer & Vasilieva, September 8, 1949, A 1013, LE). Its characters were in close agreement with the descriptions of Bresadola and the modern authors. This and the three preceding species are new for Asia.

Alnicola umbrina (R. Maire) Sing.

This species was described as *Tubaria umbrina* by Maire, and cannot be transferred to *Naucoria* because the resulting binomial would be preoccupied, but it can and must be transferred to *Alnicola* in preference to the other identical species and nomina nova which have been proposed for it.

It was found under *Alnus* in the Caucasus Mountains (see Singer, R., Pilze aus dem Kaukasus I, Beih. Botan. Centralbl. **46** (II): 98. 1929, as *Naucoria* spec., no. 170) and in Catalonia (see Collectan. Botan. **1**: 246. 1947).

Summary.

1. A small spored form of *Conocybe antipoda* from Florida is described.
2. An eccentric form of *Conocybe tenera* from Argentina is described.
3. A form with emarginate lamellae of *Alnicola umbrina* from Argentina is described.
4. A two-spored form of *Pholiotina appendiculata* from Kazakhstan is indicated.
5. *Galerula crispella* Murr., *Cortinarius intrusus* Peck, *Galerula magnispora* Murr., *Galerula subcrispa* Murr., *Galerula plumbeitincta* Atk. are all valid species of *Conocybe* and were transferred to that genus.
5. *Aiyllospora atomacea* Murr. and *Galerula melleiceps* are transferred to *Naucoria*.

6. The following species are described as new: *Conocybe lentispora* Sing. (Argentina), *C. subvelata* Sing. (Argentina), *C. albocinerea* Sing. (Altay); *Pholiotina altaica* Sing. (Altay), and *P. procera* Sing. (Altay); *Naucoria prae-andina* Sing. (Argentina) and *N. subvelutina* Sing. (Altay); *Alnicola devia* Sing. (Argentina), *A. diplocystis* Sing. (Argentina).
7. The following species were re-described: *Conocybe crispella* (Murr.) Sing., *Conocybe intrusa* (Peck) Sing., *C. magnispora* (Murr.) Sing.; *C. siliginea* (Fr. sensu Bres.) Kühner forma *tetraspora*; *Pholiotina septentrionalis* (A. H. Smith) Sing.; *Naucoria alachuana* Murr., *N. atomacea* (Murr.) Sing., *N. melleiceps* (Murr.) Sing. For several other species additional descriptive data are given.
8. The species named *C. siliginea* by Kühner should be known as *C. plumbeitincta* (Atk.) Sing., and the species indicated as *C. Rickenii* J. Schäffer should be known as *C. siliginea* (Fr. sensu Bres) Kühner (non Schäffer).
9. Notes on the distribution of various species: Species observed in Argentina: *Conocybe crispella*, *C. lentispora*, *C. macrorrhina*, *C. macrorrhiza*, *C. magnispora*, *C. plumbeitincta*, *C. siliginea*, *C. striatipes* (the bisporous form of which is possibly *C. leucopoda* Kühner), *C. subvelata*, *C. tenera*; *Pholiotina coprophila*, *P. filaris*; *Naucoria prae-andina*; *Alnicola devia*, *A. diplocystis*, *A. umbrina*.

Species observed in North America: *Conocybe antipoda* (Florida), *C. crispella* (Florida), *C. intrusa* (Massachusetts), *C. magnispora* (Florida), *C. subcrispa* (Florida); *Pholiotina rugosa* (Massachusetts), *P. cyanopoda* (Massachusetts), *P. septentrionalis* (Michigan, Florida); *Naucoria alachuana* (Florida), *N. atomacea* (Florida, New York), *N. citrinipes* (Florida), *N. melleiceps* (Florida); *Alnicola bohemica* (Michigan).

Species observed in the Altay Mountains: *Conocybe albocinerea*, *C. mesospora*, *C. plumbeitincta*, *C. siliginea*; *Pholiotina aberrans*, *P. altaica*, *P. coprophila*, *P. procera*, *P. septentrionalis*; *Naucoria subvelutina*; *Alnicola luteolofibrillosa*, *A. scolecina*, *A. suavis*.

Species observed in Northeastern Europe: *Conocybe mesospora*, *C. siliginea*; *Pholiotina septentrionalis*; *Alnicola amarescens*.

Species observed in the Caucasus: *Conocybe mesospora*; *Pholiotina septentrionalis*; *Alnicola umbrina*.

Species observed in Spain: *Conocybe mesospora*; *C. neoantipoda*; *Alnicola umbrina*.

Species observed in Brazil: *Conocybe juruensis*.

10. The existence of ectotrophic mycorrhiza on native South American trees was established for the first time in the Alneta of the pre-Andine Sierras in Tucumán and Catamarca, Argentina. There is a high degree of probability that the most common and most important mycorrhiza-forming fungus in this region is *Alnicola diplocystis*. The mycorrhiza was observed on rootlets of *Alnus jorullensis* var. *Spachii*.

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Jahr/Year: 1950

Band/Volume: [4](#)

Autor(en)/Author(s): Singer Rolf

Artikel/Article: [New and Interesting Species of Basidiomycetes III. 130-157](#)