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FLORA AGARICINA
DANICA

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CORTINARIUS

Species of very different size and shape, chiefly characterised by the arachnoid partial veil and by the gills which generally have a fertile edge, mostly devoid of sterile, basidiiform or piliiform cells (very rarely set with vesiculose cystidia). The spore-powder is normally some shade of ferruginous or bay-brown, the individual spore in most cases not entirely smooth but either minutely punctate or more coarsely granulate.

ALTHOUGH very difficult to define in exact terms *CORTINARIUS* is a natural entity. The trained field-mycologist will very rarely mistake a *Cortinarius* for a *Flammula*, a *Pholiota* or any other brown-spored Agaric. The keen eye of ELIAS FRIES at a very early epoch clearly discerned this difference, and he therefore established *Cortinarius* as a distinct genus, while retaining almost all other brown-spored species in *Agaricus*.

It is rather difficult to explain why it is so relatively easy almost at a first glance to distinguish a *Cortinarius* as such. There are no set distinctions; but each adjoining genus will generally show some traits which demonstrate its non-Cortinarioid character. The *Inocybes* have pallid gills that turn dull brown (not rusty) with age, and generally are white-edged (from the cystidia). The terrestrial *Pholiotas* have a distinct membranous ring, thinner and less powdery gills; the *Hebelomas* more clay-brownish, not rusty, spore-powder. Only some few of the *Flammulas* may be confounded with true Cortinarii at first sight. And the boundary-line between the smaller *Hydrocybes* and *Galera* is also rather vague, when microscopic characters are not taken into account.

As indicated by the name *Cortinarius* the partial veil which connects the edge of the cap with the stem is cobweb-like. While in some of the larger species this cortina is very conspicuous, it is often rudimentary in the smaller ones and only to be seen in young specimens. In certain groups a universal veil is also present. In *Cliduchii*, the larger *Telamonias* and *Inolomas* it is peronate, primarily covering the stem more or less completely like a sheath or hose, with a terminal, generally incomplete ring above. In *Scauri* it is attached to the bulb, often forming a circumcised edging to it and leaving remnants as flocci near the edge of the cap or as adpressed scales on the disc. In *Colliniti* the peronate veil is reduced

to a slimy coating; in the smaller *Telamonias* to a ringlike zone or some few fugacious scales. In *Hydrocybe*, *Dermocybe* and the smaller *Phlegmaciums* it is entirely absent.

Microscopic characteristics. The spores of the individual species of *Cortinarius* seem to vary but little in size, shape and configuration and are therefore of great taxonomic value for the identification of any species, even if the difference be slight between the spores of the species under observation and those of the neighbouring ones. Whenever two authors give entirely different spore-dimensions for a certain species it may be taken for granted that they have been studying not one, but two distinct species.

The spores vary in size in the different groups from index (3: length $\times$ breadth in μ) about 100 down to index 25. A visible apical germ-pore seems to be lacking in all true *Cortinari*. The epispore is generally rough (varying from coarsely warty to minutely punctate); but in a number of species the spores appear to be perfectly smooth (at least when the magnification used is below 500, which is generally the case in my investigations). The colour of the individual spore (like that of the spore-powder) varies considerably. The larger and very rough spores are generally brownish amber; the smaller and smoother ones are paler yellow and more transparent. The form of the spore varies between narrow ellipsoid and almost spherical. Thus the group *Colliniti* within *Myxadium* is known for its large, coarsely warty, somewhat lemon-shaped spores. Spores of a quite extraordinary type (cylindric, almost as in *Boletus*) are met with in *C. heterosporus*; and in *Leucocortinarius bulbiger* the epispore is perfectly hyaline. — The basidia in *Cortinarius* generally are of the ordinary club-shaped type with four sterigmata; no 2-spored basidia have ever come within my field of observation.

While in almost all other brown-spored Agarics the gill-edge is set with more or less conspicuous sterile cells, "cystidia", of various shape, the gills of the *Cortinari* are generally devoid of any such, their edge being made up entirely of basidia. In dubious cases this character can make it clear whether a certain plant is a true *Cortinarius* or should be referred to *Hebeloma*, *Flammula* or any other adjoining genus. Only some few species within *Myxadium* have the gill-edge adorned with conspicuous (vesiculose) cystidia, and even sterile basidiiform cells or marginal hairs are rather rare.

Taxonomy. The genus *Cortinarius*, as established by FRIES, has been left practically intact by later authors. Also the subgenera among which he distributed the innumerable species have withstood the criticism of a century. To raise these subgenera to generic rank — as done by some authors — I consider an innovation of questionable value. Some *Phlegmaciums* really are more intimately related to species of *Myxadium* and *Dermocybe* than to the species in the neighbourhood of which they are now placed on account of their dry stem and viscid cap (e. g. *C. cristallinus* and its allies). And the line of demarcation between *Inoloma* and *Dermocybe* is rather vague as well as that between *Hydrocybe* and *Telamonias*. A truly rational taxonomy, however, can hardly be built up without a more complete

and intimate knowledge of all the innumerable species; and I therefore do not propose any far-reaching innovations. A very great number of species might reasonably be arranged in strictly confined small series or "stirpes". But to carry this principle through will also require a more thoroughgoing study of all the species described, not only macroscopically, but also with regard to the configuration of the spore and the anatomy of the cuticle, the gills, etc. As examples of such natural "stirpes" may be mentioned the bitter-tasting, almost smooth-spored, pallid or yellow species within *Phlegmacium*, *Myxadium* and *Dermocybe* which might be called *Amarescentes*, and all the *Dermocybes* in the vicinity of *Cortinarius cinnamomeus* and *C. anomalus* respectively.

Agaricus bulbiger which on account of its hyaline spores was placed in *Armillaria* by FRIES — but which has no natural relation there, while in all other respects it is Cortinarioid, intimately related to the group *Scauri* of *Phlegmacium* — I have made bold to transfer to *Cortinarius* (*Leucocortinarius*).

The taxonomic arrangement within the Friesian subgenera will be seen in the key.

KEY

TO THE SPECIES FIGURED

I. LEUCOCORTINARIUS

Spores hyaline. Spore-print white.

Cap pale brownish or clay. Stem bulbous 1. *C. bulbiger*

II. CORTINARII VERI

Spore-print some shade of rusty or brown.

A. PHLEGMACIUM. Fleshy, generally large species with a more or less viscid cap and a dry stem.

α. *Scauri*. Stem with a distinct, often somewhat marginate bulb.

a. Young gills whitish or pallid.

1. Bulb somewhat depressed, broad 2. *C. rapaceus* forma major

2. Bulb roundish.

* Cap alutaceous or pale gilvous ochre. Stem slender.

† Flesh mild. Cap pale gilvous-ochre 3. *C. multiformis*

†† Flesh bitter. Cap alutaceous-pale 4. *C. talus*

** Cap subfulvous. Stem short... .. 5. *C. allutus*

b. Gills not whitish or pallid.

1. Young gills violet or bluish.

* Gills turning purplish when bruised.

† Young gills deep violet 6. *C. purpurascens*

†† Young gills very pale bluish 7. *C. subpurpurascens*

** Gills not turning purplish.

† Cap at first bluish 8. *C. coeruleascens*

†† Cap without any trace of blue.

° Mycelium not sulphur-yellow. Cap alutaceous to leather-brownish.

^ Normal stature. Bulb roundish... .. 9. *C. cyanopus*

** Dwarfish. Bulb somewhat depressed, turbinate 10. *C. arquatus*

°° Mycelium sulphur-yellow. Cap some shade of yellow 11. *C. calochrous*

2. Young gills yellow, olive or greenish.

* Young gills some shade of yellow.

† Spores 8—10 μ long.

° Stem and young gills deep yellow, subfulvous... .. 12. *C. fulgens*

°° Stem (inside and outside) and young gills some shade of lemon-yellow.

^ Cap 7—8 cm, yellowish-olivaceous... .. 13. *C. sulphureus*

** Cap 5—6 cm, more lemon-yellow 13 a. *C. sulphureus* var. *citrinus*

†† Spores over 10 μ long.

° Cap light ochre-yellow. Stem white 14. *C. sulphurinus*

°° Cap fulvous with yellow edge. Stem yellowish... .. 15. *C. aurantio-turbinatus*

** Young gills green or olive.

† Stem light green 16. *C. prasinus*

†† Stem somewhat olive-brownish... .. 17. *C. scaurus*

β . *Cliduchii-Elastici*. Stem club-shaped or cylindrical, without marginate bulb.

a. Spores rather large (9 μ or more long).

1. Stem peronate, more or less scaly or belted.

* Very tall, almost inodorous 18. *C. triumphans*

** More short-stemmed, rather strong smelling.

† Spores 9—10 $\times$ 5 μ . Stem clavate-bulbous with yellowish scales 19. *C. olidus*

†† Spores 10—12 $\times$ 7 μ . Stem white-peronate, subannulate 20. *C. claricolor*

2. Stem almost glabrous.

* Gills pallid, whitish.

† Cap fulvous-yellow 21. *C. sp.*

†† Cap pale brownish or clay.

° Edge of cap not lilac 22. *C. crassus*

°° Edge of young cap pale lilac... .. 23. *C. balteatus*

** Gills pale bluish or violet.

† Stout and rather large. Gills not turning purplish 24. *C. nemorensis*

†† Smaller, more slender. Gills and flesh turning purplish when bruised 25. *C. porphyropus*

b. Spores smaller (less than 8 μ long).

1. Spores subspheric or broadly ovate.

* Cap clay or alutaceous ochre. Flesh not bitter (vide *C. decoratus*, no. 54).

** Cap dark olive fuscous. Flesh bitter.

° Large. Stem stout (about 2 cm) ... 26. *C. infractus*

°° Smaller. Stem slender (about 1 cm) ... 27. *C. olivascens*

2. Spores ellipsoid or amygdaliform.

* Inodorous. Cap whitish (vide *C. cristallinus* and *C. emollitus*, no. 38—39).

** Foetid. Cap subfulvous... (C. foetidus)

B. MYXACIUM. Both cap and stem more or less viscid.

α. *Colliniti*. Stem peronate, slimy. Spores pruniform, large (more than 10 μ long).

a. *Cystidios*. Gills' edge set with balloon-shaped cystidia.

1. Gills not bluish when young.

* Tall species.

† Cap strongly sulcate ... 28. *C. elatior*

†† Edge of cap striate ... 29. *C. mucifluus*

** Dwarfish species. Edge of cap almost even ... 30. *C. pumilus*

2. Edge of gills blue ... 31. *C. pseudo-salor*

b. *Nudi*. Gills' edge without cystidia.

1. Cap bright fulvous-orange... 32. *C. collinitus*

2. Cap clay-brownish ... 33. *C. trivialis*

β. *Delibuti*. Stem merely viscid. Spores smaller (less than 9 μ long).

a. Gills somewhat bluish. Spores subspheric ... 34. *C. delibutus*

b. Gills whitish or pale. Spores ovate or ellipsoid. Flesh bitter.

1. Cap flushed with light violet ... 35. *C. croceo-coeruleus*

2. No trace of violaceous.

* Cap bright fulvous-ochre ... 36. *C. vibratilis*

** Cap pale, whitish, clay or alutaceous.

† Stem viscid. Spores 8 × 5 μ... 37. *C. pluvius*

†† Stem almost dry. Spores somewhat smaller.

° Cap viscid.

^ Stem rather tall and slender ... 38. *C. cristallinus*

** Stem short, somewhat clavato-bulbose ... 39. *C. emollitus*

°° Cap dry. Stem not bulbous, often ascendent ... 40. *C. ochroleucus*

C. INOLOMA. Cap and stem dry, generally squamulose or somewhat fibrillose. Stem stout.

α. *Pallido-violacei*. Whole fruit-body whitish or flushed with lilac or bluish.

a. Cap and stem whitish (no trace of lilaceous colours).

1. Spores almond-shaped ... 41. *C. turgidus*

2. Spores subglobose. (Stem very short)... (C. opimus)

- b. Cap lilac, clay-brownish etc.
1. Stem not clad with dark fuscous flocci.
 - * No lilac tinges, except at apex of stem and edge of young cap 42. *C. suillus*
 - ** Lilac or violet tinges in all parts.
 - † Robust species.
 - ° Whole plant of a deep violaceous colour (*C. violaceus*)
 - °° Cap and stem light lilac. Flesh rhubarb-rusty in stem 43. *C. traganus*
 - †† Less robust species. Flesh not rusty or ochre.
 - ° Cap and stem lilac-fuscous.
 - ^ Spores rather large (9—11 μ long) 44. *C. malachius*
 - ** Spores smaller (7—9 μ long) 45. *C. cinereo-violaceus*
 - °° Cap silky shining, white or bluish. Stem white-peronate, light blue above 46. *C. albo-violaceus*
 - 2. Stem densely clad with dark fuscous flocci 47. *C. pholideus*
- β . *Olivaceo-aurati*. Cap and stem some tinge of olive, yellow, ochre or red.
- a. Stem devoid of red scales or fibrils.
 1. Cap olive. Spores subglobose 48. *C. cotoneus*
 2. Cap ochraceous or yellow.
 - * Cap obtuse, fibrillose or squamulose. Spores subspheric.
 - † Cap fulvo-ochraceous 49. *C. tophaceus*
 - †† Cap rich yellow; disc subfulvous 50. *C. callisteus*
 - ** Cap conical, squarrose. Spores pruniform 51. *C. humicola*
 - b. Stem with red fibrils or scales.
 1. Stem clad with minium-red fibrils from base up (*C. Bulliardii*)
 2. Cap and stem with dark red scales (vide *C. bolaris*, no. 59).
- D. DERMOCYBE. Cap dry (not hygrophanous), subfibrillose or subsquamulose. Stem slender.
- α . *Anomali*. Gills olive, bluish or pallid.
- a. Gills greenish or olive-brown.
 1. Whole plant olive-fuscous or olive-cinnamon 52. *C. raphanoides*
 2. Whole plant pale olive-greenish 53. *C. venetus*
 - b. Gills bluish or pallid.
 1. Stem smooth or slightly fibrillose.
 - * Cap whitish to clay-ochre.
 - † Rather large species. Cap sub-viscid, ochre-clay (or slightly bluish) 54. *C. decoloratus*
 - †† Smaller species. Cap pallid. Gills whitish without any trace of blue 55. *C. tabularis*
 - ** Cap fuscous violet or brownish-fulvous. Gills somewhat bluish.
 - † Rather large species. Cap becoming rufo-fulvous 56. *C. caninus*
 - †† Smaller species. Cap fulvous to lilac-hoary 57. *C. anomalus*

2. Stem squamulose with coloured scales.

* Scales yellow, granular 57 a. *C. anomalus* var. *lepidopus*

** Scales red.

† Cap smooth or somewhat scaly, not reddening when bruised.

° Edge of cap and apex of stem slightly lilaceous 58. *C. spilomeus*

°° No trace of lilac... .. 58 a. *C. spilomeus* var. *depau-*

†† Cap red-scaly all over, reddening when bruised... .. 59. *C. bolaris* *peratus*

β. *Nitidi*. Gills brilliant yellow to deep blood-red or liver-brown.

a. Gills deep scarlet to dark liver-brown blood-red.

1. Cap deep scarlet or dark liver-brown blood-red.

* Whole plant deep scarlet 60. *C. cinnabarinus*

** Whole plant dark liver-brown blood-red.

† Generally dwarfish. Spores $< 9 \mu$ long 61. *C. sanguineus*

†† More slender. Spores $> 9 \mu$ long 62. *C. anthracinus*

2. Cap deep bay liver-brown or somewhat olive.

* Cap deep liver-brown. Stem bay-brown... .. 63. *C. phoeniceus*

** Cap olive-brown. Stem somewhat yellowish... .. 64. *C. semisanguineus*

b. Gills yellow to orange.

1. Cap and stem pure scarlet orange.

* Cap acutely umbonate 65. *C. uliginosus*

** Cap convex, subumbonate 65 a. *C. uliginosus* var. *obtusius*

2. Cap not scarlet orange.

* Edge of cap brilliant chrome-yellow. Stem somewhat greenish inside... .. 66. *C. malicorius*

** Not so.

† Stem yellowish, almost glabrous.

° Cap 3—5 cm, somewhat cinnamon or olive 67. *C. cinnamomeus*

°° Cap smaller ($1\frac{1}{2}$ —3 cm), fulvous yellow 67 a. *C. cinnamomeus* var. *cro-*
cens

†† Stem brownish pink, minutely flocculose-fibrillose with red flocci 68. *C. purpureo-badius*

E. *TELAMONIA*. Expallent or hygrophanous. Stem peronate or annulate by remnants of universal veil.

α. *Carnosi*. Rather fleshy species (only sub-hygrophanous), with a somewhat bulbous stem. Spores often rather large (9μ or more long).

a. Scales and ring-like belt bright red 69. *C. armillatus*

b. Scales or belt whitish.

1. Gills somewhat violaceous or dirty flesh-colour.

* Flesh of stem somewhat coloured.

† Gills somewhat violaceous. Smell aromatic or pungent.

° Stem subbulbous, peronate by a whitish coating. Smell aromatic, sweet 70. *C. torvus*

- ^{oo} Stem cylindric with a white coating or belts. Smell strong (*C. scutulatus*)
 †† Gills dirty flesh-colour. No particular smell ... 71. *C. lucorum*
 ** Flesh of stem whitish. Gills dirt-brown with a flush of lilac 72. *C. urbicus*
 2. Gills without violaceous or flesh-coloured tints.
 * Cap dark (chestnut, umber or bistre).
 † Large species (cap 5 cm or more). Spores ovate.
 ^o Young cap fuscous bay. Stem bulbous ... 73. *C. bovinus*
 ^{oo} Young cap dark fuscous (almost sepia) ... 74. *C. brunneus*
 †† Small species. Spores cylindrical, narrow ... (*C. heterosporus*)
 ** Cap light coloured (fulvous ochre or honey).
 † Large species (cap 6—10 cm). Veil and ring persistent,
 white, membranous ... (*C. laniger*)
 †† Medium-sized species.
 ^o Stem sub-ferruginous. Gills rusty ... 75. *C. hinnuleus*
 ^{oo} Stem whitish. Gills pale ochre ... 76. *C. triformis*
 β. *Submembranacei*. Slightly fleshy, hygrophanous species with a rather
 slender stem. Spores generally rather small (less than 9 μ long).
 a. Young gills ochraceous or light rust-coloured. Cap somewhat ochry.
 1. Cap somewhat fleshy. Stem subclavate ... 77. *C. melleopallens*
 2. Cap submembranaceous (2—3 cm). Stem thin and slender.
 * Stem with yellow scales and fibrils. Gills very broad. ... 78. *C. gentilis*
 ** Not so.
 † Cap glabrous or slightly fibrillose ... 79. *C. incisus* forma
 †† Cap densely set with minute granular squamules ... 80. *C. psammocephalus*
 b. Young gills pallid or dark.
 1. Velum white or whitish. Young cap somewhat fuscous.
 * Stem with a whitish belt.
 † Stem pallid.
 ^o Stem whitish pale or silvery grayish ... 81. *C. biformis*
 ^{oo} Stem clay-brownish ... 82. *C. punctatus*
 †† Stem rather dark, subfuscous.
 ^o Young cap very dark, almost sepia-brown ... 83. *C. glandicolor* var. *curtus*
 ^{oo} Young cap fuscous date-brown ... 84. *C. rigidus* forma
 ** Stem white-flocculose all over.
 † Young gills pallid. Cap white-flocculose.
 ^o Cap rather large (3—5 cm), obtusely umbonate ... 85. *C. hemitrichus*
 ^{oo} Cap smaller (2—3 cm), acutely umbonate ... 86. *C. paleaceus*
 †† Young gills dark, violet-fuscous. Cap acutely umbonate 87. *C. flexipes*
 2. Velum and flocci on stem yellow. Young gills violaceous ... 88. *C. helvelloides*
 F. *HYDROCYBE*. Hygrophanous species with a glabrous or slightly fibril-
 lose stem.
 α. *Firmiores*. Cap generally over 4 cm broad, obtuse with incurved
 edge. Spores rarely under 9 μ long.

a. Læticolores. Cap fulvous rubiginose to pale honey-colour.

1. Stem bulbous or somewhat clavate.

* Cap and stem becoming fulvous or rubiginose.

† Base of stem rubiginose, rounded. Spores broadly ovate 89. *C. balaustinus*

†† Base of stem whitish, acuminate. Spores spheric... 90. *C. saturatus*

** Cap clear ochre or dingy honey-colour. Stem whitish.

† Rather large species. Cap ochre-apricot. Stem white, base acuminate... 91. *C. armeniacus*

†† Rather small species. Cap about 4 cm, dingy honey-colour. Stem with a flush of the same colour, slightly clavate ... 92. *C. dilutus*

2. Stem cylindric, acuminate or rooting.

* Stem whitish or pallid, not flushed with violaceous.

† Stem firm and stout (1½ cm). Cap dingy ochre ... 93. *C. duracinus*

†† Stem more slender, rooting.

° Cap gilvous honey-colour... 94. *C. candelaris*

∞ Cap fulvous date-brown or horn-brownish.

^ Subfasciculate. Cap somewhat fulvous ... 95. *C. damascenus*

^^ Solitary. Cap horn-brownish ... 96. *C. rigens*

** Stem whitish, flushed with light violaceous ... 97. *C. bicolor*

b. Fuscescentes. Cap somewhat fuscous or dark brown.

1. Stem not white.

* Stem not flushed with lilac or violaceous tints.

† Stem from base upward flushed with brown. Cap umbonate ... 98. *C. rubricosus*

†† Stem more or less fuscous.

° Stem pale fuscous, base whitish. Cap without umbo ... 99. *C. holophæus*
(Vide also *C. castaneus*, no. 103).

∞ Stem dark fuscous, almost sepia-brown ... 100. *C. uraceus*

** Stem more or less flushed with violaceous or lilac tints above.

† Subfasciculate. Stem violaceous above. Spores 7—8 μ long... 101. *C. saturninus*

†† Solitary. Stem but slightly flushed with lilac or violaceous tints.

° Gills very dark. Spores 8—10 μ long.

^ Stem and edge of cap with fuscous-violaceous tints 102. *C. sciophyllus*

^^ Cap dark maroon. Stem pallid fuscous, slightly tinged with lilaceous ... 103. *C. castaneus* (?)

∞ Gills somewhat cinnamon. Spores 7—8 μ long... 104. *C. erythrinus*

2. Stem whitish.

* Stem pure white ... 105. *C. Bresadola*

** Stem silvery white, streaked with watery lines... 106. *C. tortuosus*

- β . *Tenuiores*. Cap small (rarely over 4 cm broad), often acute, straight-edged. Spores rather small ($< 9 \mu$).
- a. Cap dark, subfuscous or violaceous.
1. Medium-sized species. Cap somewhat fuscous. Stem with a flush of silvery lilac ... 107. *C. decipiens*
 2. Very small species. Cap dark violet. Stem deep violet ... 108. *C. pulchellus*
- b. Cap light, whitish to ochre brown or gilvous.
1. Cap pallid. Stem white. Spores spheric ... 109. *C. Hoefftii*
 2. Not so.
 - * Stem flushed with cinnabar from base upward... 110. *C. miniatopus*
 - ** Not so.
 - † Stem with yellow fibrils ... 111. *C. saniosus*
 - †† Not so.
 - ° Cap obtusely umbonate.
 - ^ Cap 2—4 cm. Stem somewhat ventricose or subfusiform ... 112. *C. obtusus*
 - ** Cap 1—2 cm. Stem slender and thin ... 113. *C. scandens*
 - °° Umbo acute.
 - ^ Gill-edge with clavate, sterile cells. Edge of cap with white fibrils ... 114. *C. Junghuhnii*
 - ** No sterile edging. Cap naked.
 - ° Stem slightly fibrillose with gilvous fibrils ... 115. *C. fasciatus*
 - ** Stem glabrous, whitish ... 116. *C. acutus*

SPECIFIC DESCRIPTIONS AND NOTES

I. LEUCOCORTINARIUS

1. *C. bulbiger* (Alb. & Schw.) Lange (*Armillaria bulbiger* (Alb. & Schw.) Fr.). (Plate 81. fig. A.)

Cap 5—8 cm, convex or somewhat gibbous, pale brownish or clay. Gills almost pure white*), rather crowded, truncate-emarginate. Stem whitish, with a distinct, 2—3 cm broad, somewhat flattened bulb. Veil arachnoid. Spore-powder white.

Spores ovate-ellipsoid, $7\frac{1}{2} \times 4\frac{1}{2} \mu$, hyaline. Cystidia absent.

Not uncommon in woods of *Picea*.

In every respect, except the spore-colour, *C. bulbiger* is so close to the *Scauri* of *Phlegmacium*, that its transference to *Cortinarius* appears to me to be very well justified. (Some authors use the name *Cortinellus* for it, but this name is better reserved for the cortinate *Tricholomas*, as done by SHROETER (loc. cit. p. 666)).

*) When not expressly stated otherwise "colour of gills" always refers to the gills of the young, partly expanded cap.

II. CORTINARII VERI

A. *Phlegmacium* α . Scauri2. *C. rapaceus* Fr. forma *major* sensu Fr. (Plate 84. fig. A.)

Cap 7—8 cm, convex, pallid clay, edge minutely fibrillose. Gills pallid, with a slight flush of grayish lilac; edge entire. Stem whitish with a light ochraceous tinge from base upward. Bulb flattened above, with a free margin. Flesh rather firm, almost pure white.

Spores ovate lemon-shaped, $9 \times 5\frac{1}{2} \mu$, minutely warty-punctate (varying in other finds $9-10\frac{1}{2} \times 5-6 \mu$).

Rather rare. Met with in woods of *Fagus*, in deep beds of foliage.

The somewhat flattened bulb and the entire-edged gills distinguish this species from the typical *C. multiformis*. It is very close to *C. aleuriosmus* Maire, but without any characteristic smell and with somewhat smaller spores. KONRAD & MAUBLANC (Icones sel., tab. 114) depict it sub nom. *C. multiformis*; but they do not distinguish between the two species. The figure in FRIES' Icones selectæ (tab. 143¹) is very good. — BRESADOLA'S figure (Iconographia, tab. 612) does not belong here.

3. *C. multiformis* Fr. (Plate 81. fig. D.)

Cap 5—8 cm, slightly gibbous, pale ochre with a tinge of gilvous. Gills whitish isabelline, serrulate. Stem rather slender, whitish with a flush of the cap-colour; basal bulb roundish, indistinctly marginate, white, rather soft.

Spores ellipsoid, comparatively small, $7\frac{1}{2}-8 \times 4\frac{1}{2} \mu$ (exceptionally $9-10 \times 4\frac{3}{4}-5 \mu$), smooth.

Not rare, chiefly in woods of *Fagus*, in deep foliage-beds.

The stem is sometimes almost bulbless, and such specimens may be sought under *Cliduchii*.

4. *C. talus* Fr. (Plate 82. fig. B.)

Cap 4—7 cm, convex flat, alutaceous, edge whitish pallid, viscous. Gills pallid. Stem white, slightly flushed with isabelline, with a small, roundish bulb. Flesh whitish, except for a pale livid zone over the gills. Taste bitterish.

Spores somewhat obliquely ovate ellipsoid, $8-9\frac{1}{2} \times 4\frac{1}{2} \mu$, smooth.

Rare. Met with in a plantation of *Abies* (with old stumps of *Fagus*).

Very close to *C. multiformis*, but paler, more viscid and somewhat bitter. FRIES' figure (Icones sel.) is excellent.

5. *C. allutus* (Secr.) Fr. (Plate 81. fig. B.)

Cap 4— $5\frac{1}{2}$ cm, convex, rufo-fulvous, expallent. Gills whitish pallid, edge somewhat eroded. Stem whitish with a slight flush of fulvous, white pruinose. Bulb rather large, marginate, obovate, white. Flesh with a tinge of rufo-fulvous in cap and stem, not bitter.

Spores ovate ellipsoid, $8\frac{1}{2}-9\frac{1}{2} \times 5-5\frac{1}{2} \mu$, minutely punctate.

Rather rare. Growing in dense plantations of *Picea* on the ground among needles.

The darker, more saturate colour distinguishes this species from *C. multiformis*. COOKE (Illustrations, pl. 725) depicts small and dwarfish specimens, smaller than I have ever seen. FRIES himself did not know this species.

6. *C. purpurascens* Fr. (Plate 82. fig. A.)

Cap 5—9 cm, convex or slightly gibbous, fuscous olive with darker tiger-spots and lines. Gills dark violaceous, becoming purplish when bruised. Stem violet with darker and more dingy striæ; basal bulb roundish, indistinctly marginate, of the same colour, disappearing with age. Flesh dark and dingy violet, expallent.

Spores ovate, sub-limoniform, $7\frac{1}{2}$ —9 $\times$ 5 μ , punctate.

Not uncommon, chiefly and most typical in woods of *Picea*, in mossy places.

My figures depict the typical, deep-coloured form; BRESADOLA'S (Iconographia, tab. 619) and RICKENS' (Die Blätterpilze, pl. 36³) represent much more pallid forms, transitions to *C. subpurpurascens*.

7. *C. subpurpurascens* (Batsch) Fr. (Plate 82. fig. C.)

Cap about 7 cm, convex, pallid date-brown with darker tiger-spots. Gills pallid, slightly lilac, becoming somewhat purplish when bruised. Stem whitish with a slight bluish tinge; basal bulb indistinctly marginate, roundish. Flesh and stem turn purplish, like the gills, when rubbed.

Spores ovate, somewhat lemon-shaped or amygdaliform, $8\frac{1}{2}$ —9 $\times$ 5—5 $\frac{1}{4}$ μ , warty-punctate.

Rather rare, in woods of *Fagus*.

This species may be regarded as a frondose wood form of *C. purpurascens*. Intermediate forms (vide sub no. 6) are more common than the type here depicted.

8. *C. coerulescens* Fr. (Plate 82. fig. D.)

Cap 6—8 cm, convex, fleshy, of a beautiful light blue colour, but soon discolouring, from centre outward, to a dingy date-brownish hue. Gills of the same blue colour, edge often somewhat eroded. Stem short, firm and stout, of the same colour, with a very broad, flat, distinctly marginate, whitish bulb. Flesh in cap whitish, in stem blue, expallent.

Spores amygdaliform ellipsoid, $8\frac{1}{2}$ —10 $\times$ 5 μ , punctate.

Rather rare. Met with in woods of *Fagus*, in deep beds of foliage, often partly hidden by the dead leaves.

COOKE'S figures (Illustrations, pl. 721) evidently depict this species, although the colour is too red-dish lilac. REA refers this species to *C. casio-cyaneus* Britz. and gives somewhat larger spore-dimensions. But *C. casio-cyaneus* according to KONRAD & MAUBLANC (loc. cit.) has pallid, not originally blue gills.

9. *C. cyanopus* (Secr.) Fr. sensu Rick. (*C. glaucopus* (Schaeff.) Fr. sensu Rea, nec Fr.). (Plate 84. fig. D.)

Cap 7—11 cm, convex, lion-yellow, viscous. Gills pallid lilac-grayish, edge somewhat

eroded. Stem bluish white, slightly yellowish towards the base, with a roundish, $2\frac{1}{2}$ —3 cm broad, whitish-isabelline bulb (with a free, somewhat volvaceous edge), attached to the substrate by white strands of mycelium. Flesh under the cuticle slightly fulvous ochre, for the rest whitish, except at the top of the stem where it is somewhat bluish.

Spores obliquely lemon-shaped, $10\frac{1}{2}$ — $12 \times 6\frac{1}{2}$ — 7μ , coarsely granulate.

Rare. Met with in woods of *Fagus*, growing gregariously in the foliage-bed.

The synonymy of this species is rather entangled. FRIES describes it fairly well, but places it in *Cli-duchii*. It is the *C. glaucopus* of REA and COOKE (while *C. cyanopus* in COOKE'S Illustrations (pl. 699) probably depicts *C. nemorensis*). *C. glaucopus* (Schaeff.) Fr. is a pinophilous species.

10. *C. arquatus* (Alb. & Schw.) Fr. (Plate 83. fig. B.)

Cap 5—6 cm, convex, light date-brown fulvous, paler, somewhat ochraceous, towards the edge. Gills pallid lilaceous. Stem short, somewhat conical, with an obconic, distinctly marginate bulb. Flesh almost white, slightly flushed with bluish at apex of stem.

Spores subovate, $8\frac{1}{2}$ — $9 \times 5\frac{1}{2} \mu$, punctate.

Rare. Met with in a wood of *Fagus*.

Very close to *C. cyanopus*, only more brownish and dwarfish, with somewhat smaller spores. RICKEN'S *C. arquatus* does not belong here. *C. arquatus* is little known; my plant might be referred to *C. Boudieri* Henry, to judge from the description in Bull. Soc. Mycol. Fr., vol. 52, p. 153.

11. *C. calochrous* (Pers.) Fr. (Plate 81. fig. C.)

Cap 4—7 cm, convex, clear yellow, somewhat deeper lion-yellow in the middle. Gills pure lilac. Stem whitish, springing from a depressed, marginate bulb which on the outside is flushed with sulphur-yellow. Flesh whitish.

Spores obliquely amygdaliform-ellipsoid, $10 \times 5\frac{1}{2} \mu$, punctate.

Not uncommon, in woods of *Fagus*, nestling in rather deep foliage-beds.

A very distinct species. The fulvous form described by FRIES I have never met.

12. *C. fulgens* (Alb. & Schw.) Fr. (sensu Cooke) (*C. fulmineus* Fr. sensu Rick.). (Plate 83. fig. D.)

Cap 6—10 cm, convex, orange fulvous, orange-yellow towards the margin. Gills deep yellow. Stem rather stout, yellowish ochre above, somewhat fulvous towards the base, with a depressed, broad, marginate bulb. Flesh pale ochre in the cap, becoming almost rhubarb-yellow in the stem and bulb.

Spores somewhat lemon-shaped, 9 — 10×5 , granulate warty.

Not uncommon and often gregarious in frondose woods (various trees).

FRIES describes *C. fulgens* as a pinophilous species, but for the rest his diagnosis covers my plant fairly well, while his *C. fulmineus* has a "rooting" bulb, whitish to yellow flesh etc. and possibly is identic with *C. aurantio-turbinatus* Secr. (no. 15). COOKE'S figures (and spores) of *C. fulgens* are very good (Illustrations, pl. 716). RICKEN'S figure of *C. fulmineus* (Blätterpilze, pl. 38³) leaves no doubt of its identity.

13. *C. sulphureus* (Kauffm.) n. comb. (*C. fulmineus* Fr. var. *sulphureus* Kauffm.). (Plate 85. fig. B.)

Cap 7—8 cm, convex flat. The basic colour is pale sulphur, but is only visible towards the edge, being covered, especially in the middle, by an olive-brownish coating (which in wet weather is glutinous, the gluten in drying often shrinking to drop-like scales on the disc). Gills pale lemon-yellow, soon becoming curry- or olive-greenish. Gills rather short and stout, pale lemon-yellowish, somewhat striate with a depressed, very broad (over 3 cm) and distinctly marginate bulb, springing from a sulphur-coloured mycelium. Flesh pale lemon-yellow all over, never with ochry or fulvous tones. Almost inodorous.

Spores plum-shaped, $9-10 \times 5\frac{1}{2} \mu$, warty punctate.

Rather rare. Woods of *Fagus* on foliage-covered ground.

None of the descriptions which the classical authors give of yellow-gilled *Scauri* cover the present species with sufficient exactness. In "Studies" X (1935) I referred it to *C. elegantior* Fr., but modern authors, e. g. KONRAD & MAUBLANC (loc. cit.), ascribe larger spores to this species. My plant also has much in common with *C. fulmineus* — especially as depicted by KONRAD & MAUBLANC (Icones sel., tab. 120), — while RICKEN'S figure is totally different (Blätterpilze, pl. 38^a). Probably the earliest fairly good figure is that of COOKE (Illustrations, pl. 709) (with the misleading name *C. multiformis* var. *flavescens*), and the first satisfactory description that of KAUFFMAN (The Agaricaceæ of Michigan, p. 354), who calls it *C. fulmineus* Fr. var. *sulphureus*. I therefore adopt his name. But as the plant evidently is a distinct species, I propose to raise it from varietal rank, there being nothing to be gained by attaching it to the ambiguous species *C. fulmineus*.

13a. *C. sulphureus* var. *citrinus* Lange n. comb. (*C. splendens* Henry). (Plate 84. fig. E.)

Somewhat smaller than the main form and less robust (cap about 5 cm, stem about 1 cm, bulb 2—2 $\frac{1}{4}$ cm), the cap more yellow, the stem more cylindric, the bulb not quite so flat. The flesh is of a slightly deeper lemon-colour all over.

Spores $8\frac{1}{2}-9 \times 4\frac{1}{2}-5 \mu$.

Rather rare, in woods of *Fagus*, gregarious.

I described this variety under the name *C. elegantior* var. *citrinus* in "Studies" X (1935). It is rather distinct, but as intermediate forms are not rarely met with, I do not think it deserves specific rank. Recently R. HENRY has given a good figure and a very elaborate description of it in Bull. Soc. Mycol. Fr., vol. 52, pl. 2, under the name *C. splendens*.

14. *C. sulphurinus* Quél. (nec Rick.). (Plate 83. fig. A.)

Cap about 7 cm, convex or slightly gibbous, yellow, pale towards the edge, disc covered with small, rhomboid scales (from the universal veil) which are paler yellowish than the cap itself. Gills pale ochraceous. Stem whitish, somewhat flushed with ochre or light gilvous from base upward, springing from a broad, depressed, marginate bulb which is sulphur-yellowish outside. Flesh whitish, firm.

Spores obliquely lemon-shaped, $11-12\frac{1}{2} \times 6\frac{1}{2}-7 \mu$, warty.

Rare. Only met once, in a wood of *Fagus*, in deep foliage.

The *C. sulphurinus* of RICKEN has gigantic spores and fulvous-orange cap and should be referred to *C. aurantio-turbinatus*.

15. *C. aurantio-turbinatus* Secr. (*C. sulphurinus* Quél. sensu Rick., nec Quél.). (Plate 84. fig. C.)

Cap 7—9 cm, fleshy, convex, disc orange fulvous, lemon-yellow towards the edge which is pale sulphur. Gills lemon-yellowish with a flush of olive-green. Stem stout, lemon-yellowish (whitish above) with a somewhat marginate, brownish, turbinate or obovate bulb. Flesh white, sulphur in the bulb and under the cuticle of stem and cap.

Spores lemon-shaped, $12-14 \times 7-8 \mu$, coarsely granulate-warty (in another find $12-15\frac{1}{2} \times 7-8 \mu$).

Rare. Met with in woods of *Fagus* by POUL LARSEN (Århus, 1933) and F. H. MØLLER (Falster, 1934).

RICKEN'S description is very good but differs far too much from the Quéletian diagnosis of *C. sulphurinus*. I have restored the name of SECRETAN (*Mycographie suisse*, 1833).

16. *C. prasinus* (Schaeff.) Fr. (Plate 83. fig. C.)

Cap 4—5 cm, convex, pallid or dingy horn-brownish with a greenish tinge towards the edge. Gills pale dingy greenish. Stem whitish, flushed with light bluish green from the top downwards. Bulb somewhat flat, marginate at first, but almost disappearing with age. Flesh light bluish green (white in the bulb, pallid in the cap).

Spores almond-shaped, $8\frac{1}{2}-10 \times 4\frac{1}{2}-5 \mu$, minutely punctate.

Rare. Met with in woods of *Fagus* (with some *Picea*) in grass, gregarious.

17. *C. scaurus* Fr. (Plate 84. fig. B.)

Cap 4—5 cm, flat, almost date-brown with darker, more saturated tiger-spots. Gills olivaceous brownish. Stem slender ($5-6 \text{ cm} \times 5-6 \text{ mm}$), attenuated upward from a small, roundish, indistinctly marginate, whitish bulb, pallid with a tinge of olivaceous.

Spores ovate, $9-10 \times 5\frac{1}{2}-6 \mu$, granulate.

Rare. Met with under *Alnus* in plantations of *Picea*.

β. *Cliduchii-Elastici*

18. *C. triumphans* Fr. (Plate 85. fig. C.)

Cap 9—10 cm, convex, light yellow ochre, subfulvous in the middle and somewhat innato-squamulose. Gills pallid with a slight flush of lilaceous. Stem tall (10—15 cm), clavate, peronate up to the cortina with numerous belts of adpressed scales which are yellowish at

first, then somewhat fulvescent. Flesh of stem inside and outside whitish, becoming somewhat ochre with age, without any notable smell.

Spores ellipsoid, $10-12 \times 5\frac{3}{4}-6 \mu$.

Not uncommon in woods of *Betula*, on peaty ground, often gregarious.

The luxuriant form which FRIES describes as having a squamose stem almost like *Amanita Vittadinii* I have never seen. But according to F. H. MØLLER it has been found in Låland. My plant is more like FRIES' forma *minor*, and is also very well represented by the figures of KONRAD & MAUBLANC and of COOKE (loc. cit.).

19. *C. olidus* Lange. (Plate 86. fig. E.)

Cap 6—10 cm, somewhat gibbous, glutinous, light crust-brown, towards the edge almost alutaceous; cuticle on disc more or less disrupted into small, adpressed scales of a slightly deeper colour. Gills pallid alutaceous, then pale ochre, edge eroded. Stem clavate-bulbous, often somewhat irregular; apex white, below the cortina whitish with more or less distinct, broad, adpressed, somewhat zonate, ochraceous scales. Bulb up to 2½ cm broad, stem about 7 cm high. Smell rather strong, somewhat after the manner of *C. hinnuleus*.

Spores almond-shaped, $9-10 \times 5 \mu$, with a big drop and granular contents, smooth. Cystidia absent.

Rather rare, but gregarious or even subfasciculate, in woods of *Fagus*.

This species is excellently described by RICKEN (loc. cit.) sub nom. *C. cliduchus*, but cannot be this Friesian species which has ferruginous cinnamon gills, a yellow cap etc. Neither is it permissible to refer it to *C. cephalixus* (Secr.) Fr., as done by HENRY (Bull. Soc. Mycol. Fr., vol. 52, p. 279), which, according to SECRETAN himself, has a white stem set with minute olive-brown squamules. COOKE'S figure (Illustrations, pl. 718) of *C. papulosus* may represent a slender form of the same species (as suggested by HENRY); but *C. papulosus* as described by the English authors is a totally different, pinophilous species.

20. *C. claricolor* Fr. (Plate 85. fig. A.)

Cap 5—7 cm, slightly gibbous, of a light, later on more saturated ochre-ferruginous colour, at first — from edge in — covered by fibrillose, white flocci and scales (from the universal veil), soon dry. Gills pallid alutaceous at first, then ochry ferruginous, not eroded. Stem peronate up to the spurious ring, white-floccose, somewhat clavate, firm, about 1.5 cm thick, somewhat flushed with ferruginous towards the base. Flesh white. Smell rather strong, rankish (only very faint in young specimens).

Spores obliquely lemon-shaped, $10-12\frac{1}{2} \times 7 \mu$, granulate-warty. Cystidia absent.

Not uncommon, gregarious and sometimes subfasciculate in open spaces on naked ground in woods of *Fagus*.

This species has a somewhat Pholiotoid appearance on account of the spurious ring. REA'S description comes very close to mine, while the *C. claricolor* of KONRAD & MAUBLANC is a pinophilous plant, and BRESADOLA'S has smaller spores.

21. *C. sp.* (Plate 86. fig. C.)

Cap 4—7 cm, rather flat, of a rich fulvous-yellow colour. Gills pallid, edge eroded. Stem almost cylindrical, about 7×1.2 cm, base slightly thickened, but not bulbous, smooth, white. The veil which connects the edge of the cap with the stem is pure white, rather conspicuous.

Spores ovate-ellipsoid, $10 \times 5-5\frac{1}{2} \mu$, smooth.

Rare. Met with in a dense plantation of *Picea*, gregarious, but not fasciculate.

In "Studies" X (1935) I described this *Cortinarius* with considerable doubt as a solitary form of *C. turmalis*, with which it has many traits in common. However, the solitary growth and the pinophilous habit remove it too far from this species. It is very close, if not identical, to *C. claricolor* in the sense of BRESADOLA (nec al.) and COOKE'S figure of *C. mucosus* probably represents the same species. But in my specimens the stem was not viscid. The bulbless stem and the bright colour distinguish it from *C. multiformis*.

It will require further study to place this species and find out if it deserves a specific name.

22. *C. crassus* Fr. (Plate 88. fig. A.)

Cap 8—10 cm, fleshy, convex, almost clay-brownish (edge pallid, viscid), somewhat fibrillose towards the edge. Gills whitish, then light cinnamon, broad, emarginate, edge somewhat eroded. Stem cylindrical, stout and firm, about 2 cm thick, white, somewhat flushed with dingy ochre towards the base, apex very slightly pruinose, fibrillose downward. Taste almost none. Smell rather rankish. Spore-powder pale cinnamon.

Spores somewhat obliquely ovate-ellipsoid, $10 \times 5\frac{1}{2} \mu$, granulate-rough. Cystidia absent.

Rather rare, in grass in woods of *Quercus* and *Fagus*.

C. crassus is a much disputed species. My plant comes very close to the Friesian description. But RICKEN'S *Hebeloma crassum* is something quite different. REA follows RICKEN; while BRESADOLA'S description of *C. crassus* is quite satisfactory. The absence of cystidia distinguishes my plant clearly from *Hebeloma*.

23. *C. balteatus* Fr. (Plate 87. fig. D.)

Cap 5—9 cm, very fleshy and firm, strongly convex with a very pale lilac, pruinose edge when young, for the rest dark clay-brown (or almost date-brown at the disc), soon dry. Gills whitish. Stem short, stout, subbulbous or almost ovate ($2\frac{1}{2}$ —3 cm thick), whitish, toward the base with inconspicuous, large, adpressed, filmy, pale lilac scales. Flesh white, very firm.

Spores amygdaliform ellipsoid, $10 \times 5 \mu$, punctate.

Rather rare. Met with in grassy places in woods of *Fagus*, gregarious.

BATAILLE — who regards it as a variety of *C. variicolor* — ascribes somewhat larger spores to it. FRIES' description and figures are very good. KONRAD & MAUBLANC describe *C. balteatus* as pinophilous, while mine is a decided phyllophilous species.

24. *C. nemorensis* Lange n. comb. (*C. variicolor* (Pers.) Fr. var. *nemorensis* Fr.). (Plate 88. fig. C.)

Cap 5—9 cm, firm and fleshy, convex, date-brown at the disc, very light bluish lilac towards the edge, rather dry. Gills very light bluish lilac. Stem firm, almost cylindric or

slightly widened above and swollen below, whitish with a flush of pale blue, pruinose above. Flesh white with a bluish tinge all over, rather hard.

Spores ellipsoid, $10-10\frac{1}{2} \times 5\frac{1}{2} \mu$, punctate.

Rather common, but nearly always solitary, in woods of *Fagus*.

FRIES treated it as a variety of *C. variicolor*, but I think it deserves specific rank. The true *C. variicolor*, which is a pinophilous species, I have never met with in Denmark. *C. largus* in the sense of RICKEN is synonymous.

25. *C. porphyropus* Fr. (Plate 87. fig. B.)

Cap 3—5 cm, convex, at first pale date-brownish with a tinge of violaceous, but soon becoming pallid dirt-gray. Gills deep violet-purple. Stem whitish, bluish above, rather slender ($5-6 \text{ cm} \times 0.6-1.2 \text{ cm}$), slightly clavate, inside as well as outside turning pale purple when bruised or cut. Smell somewhat fragrant.

Spores ellipsoid amygdaliform, $8\frac{1}{2}-9\frac{1}{2} \times 5-5\frac{1}{2} \mu$, punctate-rough.

Not uncommon, especially in mixed frondose woods (*Betula*, *Quercus* etc.).

This rather small species has many traits in common with the robust, subbulbous *C. purpurascens*.

26. *C. infractus* (Pers.) Fr. (Plate 87. fig. C.)

Cap 4—8 cm, somewhat gibbous, date-brown with a tinge of olive. Gills dark, bistre-olivaceous. Stem clavate, rather stout, whitish, more or less flushed (from apex downwards) with bluish olive. Flesh whitish in the cap, pallid in the stem, with a tinge of bluish olive above. Taste somewhat bitter.

Spores ovate-globose, $7\frac{1}{4} \times 5\frac{1}{2} \mu$, warty.

Not uncommon in frondose woods, often gregarious, in grassy localities.

C. infractus varies considerably in colour of cap and stem, and several mycological authors segregate a series of more or less distinct species from it. Thus RICKEN describes — besides *C. infractus* proper — *C. obsкуро-cyaneus* (Secr.) and *C. subsimilis* (Pers.). But my finds have traits in common with all of them. Also *C. anfractus* Fr. is probably not specifically distinct. The whole stirpe is well characterised by the bitter taste, the subglobose spores and the dark gills.

27. *C. olivascens* Fr. (Plate 86. fig. A.)

Cap $3\frac{1}{2}-5 \text{ cm}$, convex, date-brown olive, subfuscous. Gills dark dirt-brown olivaceous. Stem slender ($6 \text{ cm} \times 0.8-1.0 \text{ cm}$), whitish with slightly darker, watery-grayish striæ, pale glaucous above (inside as well as outside). Flesh bitter.

Spores broadly ovate, slightly acuminate at the base, $7\frac{1}{2} \times 5-5\frac{1}{2} \mu$, minutely granulate.

Rare. Met with in a mixed frondose copse, on boggy ground amongst moss.

Very close to the preceding species, but smaller and more slender.

C. foetidus Karst.

Cap 3 cm, convex flat, fulvous with a flush of ochre, edge pallid, almost white (tan

when dry), viscid. Gills narrow, crowded, white, then yellowish. Stem cylindric, white, soft and spongy, 6—7 × 0,7—0,9 cm. Flesh yellowish, foetid.

Spores ellipsoid, 5—6 × 3,5 μ , almost smooth.

Plantation of *Picea*, central Jylland, 1926, POUL LARSEN leg. et det.

The uncommonly small spores and the disagreeable smell distinguish this little species.

B. Myxacium

α . *Collinitus*

28. *C. elatior* Fr. (Plate 89. fig. B.)

Cap 5—8 cm, campanulate or obtusely conical, clay-brown with a tinge of fulvous or livid, coarsely grooved-wrinkled half way up, at last expanded or even somewhat reflexed. Gills broad, rather thick, transversely venose, clay-brownish. Stem in fully developed specimens rather tall, somewhat rooting and slightly fusiform, towards the base more or less disrupted into zonate scales, whitish, often with a tinge of bluish.

Spores limoniform ellipsoid, base somewhat acuminate, 12 × 7 μ , granulate-warty. Cystidia on edge of gills balloon-shaped, 18—26 μ broad.

Common, in rather dry and open woods of *Fagus*, till late in the season.

When fully developed this is a very conspicuous and distinct species. But more frequently it is shorter, smaller and altogether of a more commonplace appearance. The mycological authors differ somewhat with regard to the spore-dimensions: BATAILLE'S and RICKEN'S are broader, REA'S narrower than mine.

29. *C. mucifluus* Fr. (Plate 90. fig. D.)

Cap about 6 cm, somewhat gibbous, then expanded umbonate, livid dirt-brown (umbo darker and edge somewhat paler), becoming somewhat striate-sulcate. Gills watery clay-brownish, not venose, edge white. Stem white, rather tall (10 cm × 1,2 cm), attenuated downward and somewhat rooting, lower part somewhat disrupted into zonate scales (white on a whitish ground).

Spores broadly amygdaliform, 12—14 × 7½—8 μ , coarsely verrucose. Cystidia balloon-shaped, 14—22 μ broad (some few almost bottle-shaped, about 12 μ).

Rare. The figured specimen is from a plantation of *Picea*, but it has also been met in woods of *Fagus*.

This species is very close to *C. elatior*, but rather like *C. collinitus* in habit. It is a somewhat disputed species. BATAILLE regards it as a subspecies of *C. collinitus*, from which it is clearly distinguished by the cystidia. FRIES' description is very good; but his figure (*Icones sel.*, tab. 148¹) does not at all correspond to it and probably depicts *C. trivialis*. COOKE'S figure probably also should be referred to *C. trivialis*.

30. *C. pumilus* Lange n. comb. (*C. collinitus* d. *pumilus* Fr.). (Plate 89. fig. D.)

Cap 3—5 cm, convex or somewhat gibbous, dirty brownish-livid, edge almost even. Gills

pallid at first, somewhat venose. Stem short (4—5 cm), somewhat fusiform and rooting, whitish or with a flush of blue, even or slightly disrupted.

Spores obliquely amygdaliform, $12 \times 7 \mu$, verrucose. Cystidia balloon-shaped, about 20μ broad.

Rather common, on somewhat dry ground in woods of *Fagus*.

As figured here it is very distinct, but transitional forms connect it with *C. elatior*.

31. *C. pseudo-salor* Lange. (Plate 89. fig. A.)

Cap 6 cm, somewhat conical, edge at last reflexed and minutely rugoso-striate; umbo pale ochre or alutaceous, shading off towards the edge into a somewhat livid violaceous. Gills crowded and narrow, alutaceous with a distinct, light bluish violet edge, transversely venose on the face. Stem slightly fusiform, somewhat rooting (8 cm $\times$ 1.5 cm), striate above, silky below, white with a flush of light violaceous-blue.

Spores broadly limoniform-ovate, $12-13 \times 8\frac{1}{2} \mu$, coarsely verrucose. Cystidia balloon-shaped, $15-20 \mu$ broad.

Only met once, in a wood of *Corylus* and *Quercus*, growing solitary.

The true *C. salor* I have never met. According to most mycological authors its spores are almost spheric and considerably shorter. (However, ROB. FRIES (loc. cit.) gives spore-dimensions for *C. salor*: $12-14 \times 6 \mu$, almost like mine, so his find may belong here). *C. stillatitius* Quél., which BATAILLE regards as a form of *C. elatior*, is probably synonymous. The species will require further study. — Nos. 29—31 are all so intimately related to *C. elatior* that they might very well be regarded as varieties of this species. But their habit is so different that I deem it more practical to treat them as distinct species.

32. *C. collinitus* (Pers.) Fr. (Plate 88. fig. B.)

Cap 5—9 cm, soon expanded and somewhat gibbous, bright orange-fulvous, edge even. Gills pallid at first, not venose. Stem tall, often rather slender (9—12 cm $\times$ 1—2 cm), disrupted into broad zonate scales, whitish or more often pale bluish, on a somewhat fulvescent ground.

Spores pruniform or sub-limoniform, $12-15 \times 7-8 \mu$ (or $13-15 \times 7\frac{1}{2}-8\frac{1}{2} \mu$), somewhat granulate-rough. Edge of gills devoid of cystidia.

Common in coniferous woods on deep mossy ground, often gregarious.

FRIES' description is excellent (barring the varieties), and so is REA'S (spores rather small). This species is very widely distributed (I have collected it in Manitoba (Canada)).

33. *C. trivialis* Lange (Plate 89. fig. C.)

Cap 6—9 cm, gibbous, clay-brownish, colour somewhat deepening with age, edge even. Gills pallid, livid grayish at first. Stem tall, rooting (total length 10—12 cm), up to the cortina cracking transversely into zonate scales (scales pallid, interspaces becoming dirt-brown or almost dingy cinnamon like the flesh).

Spores amygdaliform, $11\frac{1}{2}-13 \times 6\frac{1}{4} \mu$, granulate. Cystidia absent.

Not uncommon, on grassy ditch-banks etc. under Salices and other shrubs.

This species is casually confounded with *C. mucifluus* (of the *elator*-stirpe). Even FRIES' own figure of *C. mucifluus* probably depicts *C. trivialis*. The lack of balloon-shaped cystidia connects it with *C. collinitus*, but it is quite distinct in every way. To avoid confusion with the real *C. mucifluus* I proposed the new name (in "Studies" X), which refers to its more commonplace appearance and less gaudy colours than those of its near relative *C. collinitus*.

β. Delibuti

34. *C. delibutus* Fr. (Plate 90. fig. E.)

Cap 4—7 cm, convex or slightly gibbous, pallid yellowish, becoming darker (subfulvous-alutaceous) with age. Gills light bluish lilac. Stem clavate, smooth, white with a flush of yellow, often rather tall, 5—8 cm × 0,7—1,2 cm (above) and 1,2—2 cm (below).

Spores subspheric, $7-8 \times 6\frac{1}{4}-6\frac{1}{2} \mu$, minutely punctate.

Rather common, especially in copses of *Betula* and *Populus tremula*, on somewhat boggy ground, amongst moss and grass; more rarely met with in open spaces in woods of *Fagus*.

35. *C. croceo-coeruleus* (Pers.) Fr. (*C. viola* Lange). (Plate 90. fig. C.)

Cap $2\frac{1}{2}-4\frac{1}{2}$ cm, strongly convex, at first light bluish-violaceous all over, but soon discolouring, from disc out, into pallid or livid tones. Gills crowded, thin, whitish, with a tinge of dirty isabelline (no trace of bluish). Stem rather short (4—5 × 0,9—1,3 cm), more or less fusiform, acuminate rooting, slightly viscid below the cortina, pure white or at first with a flush of bluish. Flesh bitterish.

Spores ovate, $7\frac{1}{2} \times 4\frac{1}{2} \mu$, smooth (or indistinctly punctate).

Not uncommon, gregarious, in woods of *Fagus*.

The current descriptions of *C. croceo-coeruleus* accord to it lilaceous gills, watery flesh and a dry stem. I therefore did not deem it right to identify it with my finds. But as the original diagnosis of PERSOON does not say anything about lilac or violaceous gills, and for the rest fits very well, the new name (proposed in "Studies" X) had better be cancelled. (The bluish colour on the cap, in tab. 90, is too dull).

36. *C. vibratilis* Fr. (Plate 90. fig. F.)

Cap 3—5 cm, bright orange-yellow (edge paler), slightly gibbous. Gills alutaceous, pale. Stem somewhat clavate, base often acuminate, white, 5—6 cm × 0,8—1,2 cm. Flesh white, slightly flushed with ochre in the stem, bitter.

Spores ovate, $6\frac{1}{2}-7\frac{1}{2} \times 4\frac{1}{2} \mu$, smooth.

Not uncommon, chiefly in coniferous woods, but also met with in mixed frondose woods, generally solitary.

37. *C. pluvius* Fr. (Plate 91. fig. A.)

Cap $2\frac{1}{2}-4$ cm (rarely more), somewhat umbonate, pallid alutaceous or somewhat ochry, hygrophanous. Gills pallid, broadly adnate or subdecurrent. Stem slender (6—8 cm), slightly

clavate (rarely somewhat shorter and stouter), white. Flesh rather soft, tinged slightly ochre. Taste bitter.

Spores ovate, $7\frac{1}{2}$ — 9×5 — $5\frac{3}{4}$ μ .

I have only met typical specimens of this species once, growing gregariously in deep moss in a dense plantation of *Picea*. RICKEN'S spore-dimensions agree fairly well with mine, while REA has $9-10 \times 7-8$ μ (an extraordinary large size in this group). Probably his *C. causticus* is identical with my *C. pluvius*, but it differs considerably from the *C. causticus* of FRIES.

38. *C. cristallinus* Fr. (*C. emollitus* Fr. var.?). (Plate 87. fig. A.)

Cap $5-6\frac{1}{2}$ cm, convex flat, slightly umbonate, with a detachable, mucous cuticle; disc ochry alutaceous, whitish towards the edge. Gills crowded, emarginate, of a pale cinnamon-ochraceous colour. Stem dry, cylindric, rather tall and slender ($7-8$ cm $\times$ $1-1.2$ cm), minutely silky-striate, base acuminate. Flesh in cap thin, whitish, in stem somewhat yellowish, bitter (as well as the cuticle).

Spores oval-ovate, 7×4 μ , smooth.

Rather rare, in woods of *Fagus*.

39. *C. emollitus* Fr. (Plate 86. fig. B.)

Cap $4-6$ cm, strongly convex and rather firm, ivory-yellowish, viscid. Gills pallid ochre (with a slight flush of flesh-colour), rounded adnate, rather crowded. Stem short, swollen below the middle (base acuminate), white, smooth, not viscid, 5 cm $\times$ 1.5 cm. Flesh pallid ochry, white towards the base, bitter and with a characteristic odour.

Spores ovate, $7-7\frac{1}{2} \times 4\frac{1}{2}$ μ , smooth.

Rare. Met with in woods of *Fagus*, on rather dry and hard bottom.

Nos. 38 and 39 are very intimately related, possibly only phenotypically different. (BRESADOLA figures a pale form of *C. emollitus* sub nom. *C. cristallinus*). The stem is dry in ordinary weather, and for this reason they are generally placed in *Phlegmacium*, but they are so close to the bitter *Myxaciums*, that I deem it preferable to remove them to this subgenus together with no. 40, the driest of the whole stirpe.

40. *C. ochroleucus* (Schaeff.) Fr. (Plate 93. fig. D.)

Cap $3-4$ cm, campanulate-convex, then expanded, of a dull whitish colour, edge often abruptly inflexed. Gills broadest behind, pallid, then ochraceous. Stem $4-5$ cm $\times$ $0.5-0.7$ cm, often ascending (base acuminate), whitish as well inside as outside. Whole plant dry in ordinary weather, slightly viscid after prolonged rain. Flesh bitter.

Spores ovate, 7×5 μ .

Not very rare. Mostly met with in woods and copses of *Corylus* and *Quercus*.

This species is generally placed in *Dermocybe*, but has no natural allies there and is therefore here removed to *Myxacium* for the same reasons as nos. 38—39.

No. 35—40 make up a very natural series or stirpe, which might be called *Amarescentes* on account of their bitter taste. The last four with their indifferent whitish or alutaceous colours are very difficult to distinguish from each other.

C. Inoloma
α. Pallido-violacei

41. *C. turgidus* Fr. (Plate 92. fig. C.)

Cap 4—7 cm, convex, whitish, slightly alutaceous, dry, almost smooth. Gills emarginate, whitish, then clay, and finally somewhat ferruginous. Stem rather short, ventricose or somewhat bulbous (1.5—2.5 cm), acuminate and somewhat rooting, white. Flesh white, not bitter and almost inodorous.

Spores almond-shaped, $9\frac{1}{2}$ — $10 \times 6\frac{1}{4}$ μ .

Not uncommon, generally gregarious, in woods of *Fagus*.

The opinion of the leading authors differs somewhat with regard to *C. turgidus*. My plant answers fairly well to the descriptions of FRIES, except for the almost inodorous flesh. FRIES does not mention that the base of the stem is more or less acuminate as in the neighbouring species *C. argutus*, which differs in being ochraceous.

***C. opimus* Fr.**

Cap 8—10 cm, convex, very fleshy, alutaceous, somewhat tan when old, somewhat felty, subviscid in wet weather, often cracked. Gills whitish. Stem very short and stout, 3—4 cm long and broad, subturinate, whitish. Flesh very firm and compact.

Spores ovate-globular, 8 — $8\frac{1}{2} \times 6\frac{1}{2}$ — 7 μ , coarsely granulate.

Rare. Collected in Sjælland 1934 by M. P. CHRISTIANSEN.

It may have its right place in *Phlegmacium*.

42. *C. suillus* Fr. (Plate 90. fig. A.)

Cap 6—9 cm, strongly convex with incurved edge, then expanded and somewhat gibbous, at first pale date-brownish with a slight flush of lavender, then clay-brownish with a fulvous tinge at the disc. Veil white, silky fibrillose at the edge of the cap. Gills at first clay, with a flush of flesh-colour lilac, rather distant, broad, deeply emarginate. Stem ventricose-bulbous, base somewhat acuminate, rather short and stout (6—7 cm $\times$ 2.5—3.5 cm), apex at first flesh-colour lilac, for the rest almost white. Flesh very firm, whitish, except at apex of stem, where it has a dingy lilac tone. Smell and taste almost absent.

Spores broadly ovate, 9×6 μ . Cystidia absent.

Rather rare. Met with in mixed frondose woods (chiefly *Fagus*), growing on rather dry ground. Gregarious or subfasciculate.

***C. violaceus* (L.) Fr.**

Cap 5—12 cm, convex-gibbous, dark violet, villososquamulose. Gills rather distant, violet (soon discoloured). Stem robust (about 10×2 — 3 cm), somewhat bulbous, villososquamulose, somewhat paler than the cap. Flesh of cap lilac, in stem with darker violaceous spots or stripes.

Spores subovate, $11-13 \times 7\frac{1}{2} \mu$. Sterile cells on edge of gills subfusiform, obtuse, $50-85 \times 15-20 \mu$, somewhat coloured.

Rare. Met with by F. H. MØLLER in Falster (boggy ground under *Betula*, *Alnus* and *Pinus*) 1920 and later years, and in Jylland by POUL LARSEN in similar localities.

43. *C. traganus* Fr. (Plate 92. fig. D.)

Cap 5—9 cm, strongly convex, then gibbous, pale lilac with a silky lustre, soon discolouring into whitish clay from centre out. Gills dull brown. Stem stout, clavate-bulbous, base rounded, obtuse, $8-9 \text{ cm} \times 1,5-2 \text{ cm}$ (base up to 3,5 cm), at first peronate by the pale lilac veil. Flesh pallid in the cap, rhubarb or almost ferruginous towards the base. Odour strong, goatly.

Spores ovate-ellipsoid or amygdaliform, $7\frac{1}{2}-10 \times 5-5\frac{1}{2} \mu$ (mostly $8\frac{1}{2}-9\frac{1}{2} \times 5 \mu$), smooth or indistinctly punctate.

Not uncommon, in mossy plantations of *Picea*.

44. *C. malachius* Fr. (Plate 91. fig. E.)

Cap 4—6 cm, convex or slightly gibbous, hoary fibrillose, at first pale lilac grayish, then clay-brownish, disc paler. Gills pallid, dingy lilac. Stem clavate or subbulbous, pale dingy lilac, whitish below. Flesh tinged with the same colours, rather spongy in the bulb. Almost inodorous.

Spores almond-shaped, $9\frac{1}{2}-11 \times 5\frac{1}{2}-6 \mu$, very minutely punctate. Edge of gills with hair-shaped, obtuse cystidia.

Rare. Only seen once, in wood of *Picea*, gregarious.

45. *C. cinereo-violaceus* Fr. (*C. violaceo-cinereus* (Pers.)). (Plate 91. fig. B & C.)

Cap $4\frac{1}{2}-6\frac{1}{2} \text{ cm}$, convex, fuscous with a tinge of violaceous (sometimes paler and more brownish), pale lilac towards the edge and silky fibrillose. Gills dark, violaceo-fuscous, edge entire. Stem either stoutish, slightly clavate (up to 2 cm), dingy violet at the top, dirty whitish towards the base, or more slender and paler ($6 \times 1 \text{ cm}$, (base 1,4 cm)). Flesh in cap pallid brownish, at apex of stem dingy violaceous, paler and slightly brownish at the base.

Spores (in slender form) broadly ovate, $7 \times 5 \mu$, punctate, in stoutish form ovate, $7\frac{1}{2}-9 \times 5\frac{1}{2}-5\frac{3}{4} \mu$, minutely punctate.

Rare. Met with in woods of *Fagus*.

RICKEN and BATAILLE ascribe somewhat larger spores ($10-12 \times 6-7 \mu$) to this rare species. — Plate 91. fig. B represents the somewhat slender, fig. C the more robust form.

46. *C. albo-violaceus* (Pers.) Fr. (Plate 92. fig. A.)

Cap 3—7 cm, expanded, umbonate, silky, pale lilac-blue when young, soon becoming silvery whitish. Gills light blue at first. Stem somewhat clavate, bluish above, peronate up

to the cortina by a smooth, white coating. Flesh whitish, more or less flushed with light lilac-blue, especially at the top of the stem when young.

Spores ovate, $8-9 \times 5\frac{1}{2} \mu$.

Not uncommon, often gregarious, chiefly under *Fagus*, but also met with in mixed coniferous-frondose woods.

BRESADOLA'S *C. albo-violaceus* does not belong here. — *C. albo-violaceus* also belongs to the American flora. I have gathered it in Manitoba (Canada), and KAUFFMAN records it from Michigan.

47. *C. pholideus* Fr. (*C. lepidomyces* (Schw.)). (Plate 93. fig. F.)

Cap mostly 3—4 cm (rarely more), campanulate convex, somewhat umbonate, date-brown, everywhere minutely flocculose (flocci somewhat darker than the cap). Gills pale, with a flush of lilac. Stem generally tall and slender ($9-10 \times 0.8-0.9$ cm), pallid brownish, everywhere up to the cortina set with somewhat zonate, brownish fuscous flocci, apex slightly flushed with lavender.

Spores very broadly ovate, $7\frac{1}{2} \times 5\frac{1}{2} \mu$.

Not uncommon, on mossy ground, especially under *Betula* in plantations of *Picea*.

COOKE'S figure depicts an unusually robust form (Illustrations, pl. 761). Plate 93, fig. F is a portrait of the more common, slender form, which has the stature of a *Dermocybe*.

3. Olivaceo-aurati

48. *C. cotoneus* Fr. (*C. sublanatus* (Sow.) Fr. sensu Konrad & Maublanc). (Plate 93. fig. E.)

Cap about 7 cm, convex, slightly gibbous, yellowish olive-brown, centre somewhat fuscous, everywhere with a plush-like coat of innate, erect, minute flocci and fibrils. Gills brownish yellow, rather distant. Stem cylindric, slightly clavate, $6-7 \times 1.5$ cm, silky fibrillose, pallid yellowish olive-brown. Flesh at first yellow-brownish, then subfulvous. Smell slight, reminding of that of *Hebeloma crustuliniforme*.

Spores almost spheric, $7-8 \times 6\frac{1}{2} \mu$, coarsely verrucose.

Rare. Only met once, in a wood of *Fagus*, solitary.

The synonymy of the group to which this species belongs, is very bewildering. *C. arenatus*, *C. sublanatus* and *C. cotoneus* — to judge from the descriptions — are so intimately related, that they might probably just as well be regarded as varieties only. My plant is figured very well by COOKE sub nom. *C. cotoneus* (Illustrations, pl. 749). KONRAD & MAUBLANC'S *C. sublanatus* (loc. cit., tab. 143) is identical. (Their description is better than the figure, which gives the colour too fuscous, the flesh almost white). But COOKE'S figures of *C. sublanatus* and *C. arenatus* (which probably only depict a stout and a more slender form of one species) are somewhat different (whitish, fusco-squamulose stem and white flesh, after the manner of *C. pholideus*). And *C. sublanatus* according to COOKE has gigantic spores $14-16 \times 8-9 \mu$ (?). It will require a comparative study of several finds of these rare forms to settle their relationship.

49. *C. tophaceus* Fr. (Plate 91. fig. D.)

Cap about 4 cm, bullate convex, lion-yellow, innately squamulose with slightly darker scales. Gills light yellow ochre. Stem bulbous (bulb about 2 cm, apex of stem about 1 cm

broad), fibrillose-scaly, peronate up to the cortina, of the same colour as the cap (pale above). Flesh firm, whitish in the cap, somewhat ochraceous towards the base.

Spores subglobose, $6\frac{1}{2}$ — $7\frac{1}{2} \times 5\frac{1}{2}$ — 6μ , indistinctly punctate.

Rare. I have only met this species once, growing subfasciculate, in wood of *Fagus*.

My specimens were rather small but quite distinct, not at all to be referred to *C. callisteus*, as done by HENRY (Bull. Soc. Myc. Fr., vol. 53¹). COOKE'S *C. tophaceus* (Illustrations, pl. 772) with almond-shaped spores must be another species.

50. *C. callisteus* Fr. (Plate 92. fig. B.)

Cap 4—6 cm, convex flat, of a deep and bright yellow colour, disc subferruginous, innate-fibrillose. Gills yellow with a tinge of ferruginous, adnate. Stem rather slender, clavate, yellow, ferruginous towards the base. Flesh yellowish-pale in the cap, deeper yellow in the stem (ferruginous towards the base).

Spores ovate-spheric, $7\frac{1}{2} \times 6 \mu$, minutely warty spinulose.

Not uncommon on low, mossy ground, in woods of *Picea*.

51. *C. humicola* (Quél.) Maire. (Plate 90. fig. B.)

Cap 4—5 (7) cm, conical, subsquarrose, lion-yellow. Gills ochraceous. Stem slender (about 7×1 cm), of the same colour as the cap, squarrose up to the cortina, base fibrillose, apex pale. Flesh white, slightly ochry towards the base.

Spores ovate, 8 — $9\frac{1}{2} \times 5\frac{1}{2}$ — $5\frac{3}{4} \mu$, punctate. Cystidia absent.

Rather rare, in woods of *Fagus*, often solitary.

This agaric was at first placed in the genus *Pholiota*. Hence the rather meaningless name *C. humicola*.

***C. Bulliardii* (Pers.) Fr. (nec Rick.).**

Cap 5—6 cm, convex, pallid rufous, expallent, almost glabrous. Gills brick-red, somewhat purplish, with a whitish edge, then brown, broad. Stem 6—7 $\times$ 1—1.5 cm, clavate, pallid above, from base up tinged bright minium-red, fibrillose, arising from a cinnabar-red mycelium.

Spores oval, 8.5 — 10×5 — 6μ , warty rough. Marginal cystidia vesiculose.

Rare. Wood of *Fagus*, Århus 1927. POUL LARSEN leg. & det.

RICKEN describes and figures this species sub nom. *C. colus* Fr. But *C. colus* is a pinophilous plant, according to FRIES. (Vide also *C. miniatopus*, no. 110).

D. *Dermocybe*

α . *Anomali*

52. *C. raphanoides* (Pers.) Fr. (Plate 96. fig. A.)

Cap $3\frac{1}{2}$ — $5\frac{1}{2}$ cm, slightly umbonate, olive-bistre, later more brown with a tinge of fulvous, minutely innato-fibrillose. Gills at first olivaceous ochre. Stem slightly clavate, paler

than the cap, minutely silky-fibrillose, base more loosely fibrilloso-tomentose. Flesh olive-brownish, at the top of the stem at first slightly flushed with dingy violaceous. Smell somewhat of radish, but faint.

Spores broadly ovate, $7-8 \times 5-5\frac{1}{2} \mu$, verrucose.

Not uncommon, in woods of *Fagus*, often in small flocks.

53. **C. venetus** Fr. (Plate 95. fig. B.)

Cap about $2\frac{1}{2}$ cm, convex, minutely punctate-squamulose, almost velvety, yellowish olive-green. Gills olivaceous. Stem $4-5 \times 0.7$ cm, light greenish yellow, minutely fibrillose, base pale yellowish. Flesh of the same colour, slightly bitterish-rank.

Spores almost globose, $6-6\frac{1}{2} \times 5\frac{1}{2} \mu$, punctate-verrucose.

Only met with once, growing in wood of *Fagus*, on sloping ground.

54. **C. decoloratus** (Trog) Fr. (Plate 86. fig. D.)

Cap about 6 cm, convex, clay-coloured, with a tinge of dingy fulvous at the disc and a pallid edge, viscid, but soon dry. Gills pallid clay-whitish, edge eroded. Stem tall (10—11 cm), slightly clavate, silky and minutely fibrillose; whitish, flushed with yellowish towards the base. Flesh whitish, almost without smell and taste.

Spores subglobose ovate, $7-8 \times 5-6 \mu$, minutely punctate.

Not uncommon, often rather numerous, but dispersed, in woods of *Fagus*.

In wet weather the cap is viscid, and FRIES therefore placed *C. decoloratus* in *Phlegmacium*. But it is so intimately related to *Dermocybe tabularis* and its allies, that I prefer to remove it to *Dermocybe*. COOKE'S figures depict unusually small specimens. But REA'S description is excellent, his spore-dimensions almost like mine: subglobose, punctate, $7-8 \times 7 \mu$ (CARLETON REA in lit.).

55. **C. tabularis** (Bull.) Fr. (Plate 94. fig. B.)

Cap $3\frac{1}{2}-5\frac{1}{2}$ cm, convex flat, whitish clay. Gills with no trace of bluish, almost white at first. Stem rather tall, slightly clavate (about 1 cm thick), whitish. Flesh white.

Spores ovate, $7\frac{1}{2}-10 \times 6 \mu$.

Not uncommon, but transitional forms to *C. anomalus* are more common than the type. It grows in woods of *Fagus*.

56. **C. caninus** Fr. (Plate 93. fig. C.)

Cap 5—8 cm, convex or slightly gibbous, clay-brownish at first, becoming almost fulvous with age. Gills very pale lilac-bluish. Stem clavate, comparatively stout, whitish (apex flushed with pallid lilaceous), becoming tinged with light fulvous both inside and outside. It often has a narrow, median ring-like zone.

Spores subspheric ovate, $8-8\frac{1}{2} \times 6\frac{1}{2} \mu$, verrucose.

Rather common (often with *Lactarius deliciosus*) in outskirts of young plantations of *Picea*.

While this species in Denmark is exclusively pinophilous, REA gives its habitat as "deciduous woods and heaths".

57. *C. anomalus* Fr. (Plate 94. fig. C.)

Cap $3\frac{1}{2}$ —5 cm, somewhat gibbous, at first subfuscous with a tinge of violaceous and hoary grayish, then clay-brown with an almost ochre-pallid edge. Gills rather deep violaceous, but soon discolouring; edge entire. Stem rather slender, somewhat clavate, apex 0.6—0.7, base 1—1.3 cm, faintly violet above, pallid whitish below, almost smooth or more often with dispersed, minute, yellow squamules up to the cortina.

Spores subspheric ovate, $7\frac{1}{2}$ —9 $\times$ 6— $6\frac{1}{2}$ μ .

Rather common, in frondose woods (chiefly *Fagus*).

Similar forms with more or less yellow-squamulose stem are recorded from U. S. A. by KAUFFMAN. A more robust and brighter blue variety, a transition to *C. azureus* Fr., is occasionally met with.

57a. *C. anomalus* var. *lepidopus* (Cooke) n. comb. (*C. lepidopus* Cooke). (Pl. 94. fig. C¹.)

This variety only differs from the type by having the stem up to the cortina rather densely clad with granular, orange squamules which form numerous ring-like zones.

Rarer than the type. In similar localities.

It hardly deserves specific rank, being connected with the typical *C. anomalus* by a series of intermediate forms.

58. *C. spilomeus* Fr. (Plate 96. fig. D.)

Cap about 3 cm, convex, disc brownish, somewhat lilaceous-fuscous towards the edge and sparingly set with adpressed, dark blood-red rufous squamules. Gills pallid lilac-grayish. Stem rather slender, whitish, flushed with dingy lilac above and adorned, more than half way up, with zones of cherry-red fulvous, adpressed squamules. Flesh pallid, flushed with dingy violaceous tints at apex. Subfasciculate.

Spores subspheric ovate, $6\frac{2}{3}$ —7 $\times$ $5\frac{2}{3}$ —6 μ , minutely punctate.

Met with in Jylland by POUL LARSEN and in Møen by F. H. MØLLER. The figured specimens are from a heath-plantation (*Calluna* and young *Picea*) in Skåne (Sweden).

C. Lebretonii Quél. is probably synonymous. FRIES (Icones sel., tab. 154) depicts a very luxuriant form as well as a less showy, pallid one. Mine comes nearest to this latter. But the gills are not so bright blue as shown in this illustration.

58a. *C. spilomeus* var. *depauperatus* Lange. (Plate 96. fig. B.)

Cap 3— $4\frac{1}{2}$ cm, somewhat umbonate, clay-brownish with a tinge of livid fuscous. Gills pale ochre. Stem slender (7—8 $\times$ 0.5—0.9 cm), attenuated upward, whitish, tinged light pinkish below and clad with cherry-red brownish, adpressed squamules, forming numerous zones more than half way up. Flesh pallid brownish.

Spores subspheric ovate or broadly ovate, $7\frac{1}{2}$ —9 $\times$ 6 μ , indistinctly punctate.

Rare. Only met with once in outskirts of young plantation of *Picea*, amongst moss.

The paler colours and the slightly longer spores characterise this variety. I formerly referred it to *C. (Telamonia) paragaudis* var. *præstigosus* Fr. But as RICKEN uses the name *C. paragaudis* for an

entirely different plant, and mine, in spite of its non-violaceous gills, is very close to *C. spilomeus*, I have attached it to this species. A similar form (but with shorter spores like the type) has been collected by F. H. MØLLER in several localities.

59. *C. bolaris* (Pers.) Fr. (Plate 93. fig. A.)

Cap 3—4 cm, strongly convex, edge incurved, fundamental colour whitish, but covered — completely on the disc, more sparingly towards the edge — by adpressed, cinnabar-fulvous or pinkish fulvous squamules. Gills pallid cinnamon. Stem subbulbous, whitish, densely fibrillose-scaly with fulvous-pink squamules. All parts redden when touched or cut, even the originally white flesh.

Spores obovate, $7-7\frac{1}{2} \times 5 \mu$.

Not uncommon, in woods of *Fagus*.

This species is generally referred to *Inoloma*, but small and rather slender it has much in common with the preceding species. It is widely distributed. I have gathered it in the Adirondacks (New York State, U. S. A.).

β. Nitidi

60. *C. cinnabarinus* Fr. (Plate 94. fig. E.)

Cap 2—5 cm, convex, deep cinnabar. Gills concolorous, as well as the rather short (3—5 cm) stem.

Spores ovate, $7\frac{1}{2} \times 5 \mu$ (or somewhat pip-shaped, $7\frac{1}{2}-8 \times 4\frac{1}{2} \mu$).

Rather common, in woods of *Fagus*.

61. *C. sanguineus* (Wulf.) Fr. (Plate 94. fig. F & F¹.)

Cap 2—4 (rarely up to 6) cm, often somewhat umbonate, dark blood-red with a flush of crimson. Gills of the same colour, as well as the stem, inside and outside, except towards the base where it is more pale, whitish pink. The stem, when pressed, exsudes a vinaceous juice.

Spores ovate, somewhat ellipsoid, $7\frac{1}{2} \times 4\frac{1}{2} \mu$, smooth.

Rather rare. Chiefly, but not exclusively, to be met with in coniferous woods, particularly under *Abies*.

62. *C. anthracinus* Fr. (Plate 94. fig. A.)

Cap $2\frac{1}{2}$ —4 cm, with a prominent umbo, dark blood-red with a tinge of rufous. Gills dark rufous-ferruginous. Stem rather slender ($5-7 \times 0.4-0.7$ cm), often somewhat wavy, slightly lighter than the cap, hollow.

Spores almond-shaped, averaging $9\frac{1}{2} \times 5\frac{1}{2}$ ($8-11 \times 5-6$) μ , smooth.

Met with in a plantation of *Picea*, on rather low ground.

This species is very close to *C. sanguineus*. RICKEN regards *C. semisanguineus* as synonymous. And his figure of *C. anthracinus* certainly is very like this species. But my *C. anthracinus* — which I think is the true one — is closer to *C. sanguineus*.

63. *C. phoeniceus* (Bull.) Maire (*C. miltinus* Fries sensu Quél.). Plate 93. fig. B.)

Cap 4—5 cm, somewhat umbonate, dark liver-brown. Gills nearly of the same colour, with a tinge of ferruginous. Stem often rather slender, paler than the cap, fibrillose with brownish — towards the pallid base somewhat crimson — fibrils. Flesh brown.

Spores ovate, $6\frac{1}{2}$ — $7 \times 4\frac{1}{2}$ μ , smooth.

Not uncommon in plantations of *Picea*, growing somewhat gregarious on mossy ground.

Intermediate between *C. sanguineus* and *C. semisanguineus*. I formerly used the name *C. miltinus* (in the sense of Quélet); but the name *C. phoeniceus* is now adopted by most modern authors, as the name *C. miltinus* may lead to confusion. FRIES' own description of *C. miltinus* leaves some doubt as to its identity, and BRESADOLA'S is altogether different.

64. *C. semisanguineus* Fr. (sub *C. cinnamomeus*). (Plate 95. fig. E.)

Cap $3\frac{1}{2}$ —5 cm, somewhat umbonate, silky, brown with a tinge of yellowish olive. Gills deep blood-red. Stem rather slender, yellowish with somewhat olive-fuscos fibrils.

Spores ellipsoid or almond-shaped, 8×4 μ .

Not rare in mossy coniferous woods. Also met with in swamps among sphagnum.

The sphagnophile form here depicted is very slender, like other Agarics in similar localities.

65. *C. uliginosus* Berk. (Plate 95. fig. A.)

Cap 2—3 cm, conical at first, then expanded and rather acutely umbonate, fulvous orange. Gills ochry yellow with a flush of olive. Stem slender (6 — 7×0.4 cm), flexuose, paler than the cap. Flesh light olive.

Spores almond-shaped, 9 — 10×5 μ , indistinctly punctate.

Rare. Met with in a Sphagnum-bog, under Salices, rather numerous (1904).

65 a. *C. uliginosus* var. *obtusus* Lange (*C. concinnus* Karst. sensu Henry). (Plate 95. fig. C.)

Cap 3—4 cm, at first campanulate, then obtusely umbonate. Stem attenuated upward. Flesh under the cuticle subfulvous. For the rest like the main form.

Spores almond-shaped, 9 — $9\frac{1}{2} \times 5$ — $5\frac{1}{4}$ μ , minutely punctate. The tissue of the gills is sparingly interwoven with lemon-yellow hyphæ.

Rare. Met with in a bog under *Salix cinerea* near the water's edge, gregarious (1915 and later years).

This beautiful Agaric seems to be known under several names. *C. concinnus*, as described by KARSTEN, has somewhat longer spores; but R. HENRY (Bull. Soc. Mycol. Fr., vol. 52, p. 89) ascribes spores to it rather smaller than mine. *C. Quéletii* Bat. evidently is identical. The plant is, however, altogether so close to *C. uliginosus*, that I think it better to treat it as a variety of this species.

66. *C. malicorius* Fr. (Plate 95. fig. D & D¹.)

Cap 3—5 cm, slightly umbonate, central part ferruginous-fulvous, shading off towards the margin into bright and vivid yellow. Gills bright fulvous-yellow. Stem yellow with golden-fulvous fibrils, often rather stout. Flesh somewhat olive with a flush of yellow.

Spores ovate, $6 \times 4 \mu$.

Not uncommon in woods of *Picea*, on mossy ground.

C. malicorius is widely distributed, being excellently described from Michigan, U. S. A., by KAUFFMAN.

67. *C. cinnamomeus* (L.) Fr. (Plate 95. fig. F.)

Cap 3—5 cm, convex, of somewhat varying colour, mostly olive-brown, or with a flush of wood-yellow. Gills some shade of bright yellow or orange (or with a faint flush of olivaceous yellow). Stem yellow, more or less fulvous-fibrillose, rather thin ($5-6 \times 0,4-0,7$ cm). Flesh yellowish.

Spores obovate, $7\frac{1}{2}-8 \times 4\frac{1}{2}-5 \mu$. The tissue of the gills is sparsely interwoven with yellow hyphæ.

Very common (and very variable) as well in frondose as in coniferous woods (mostly the latter) and even in Sphagnum-bogs.

67 a. *C. cinnamomeus* var. *croceus* Fr. (Plate 95. fig. G.)

Cap only $1\frac{1}{2}-3$ cm, fulvous brown, edge yellowish. Gills bright yellow. Stem thin ($2-4$ mm), yellow, subfulvous below. Flesh yellow, paler in the cap.

Spores almond-shaped, $7\frac{1}{2} \times 4 \mu$.

Not uncommon, especially on and about rotten stumps of *Alnus* in coniferous plantations on low ground.

Typical specimens are rather distinct, but intermediate forms, which are of rather frequent occurrence, connect it with the main form.

68. *C. purpureo-badius* Karst. (Plate 94. fig. D.)

Cap 2—4 cm, rather acutely umbonate, dark brownish purple, minutely fibrillose, edge paler. Gills saffron-cinnamon, flushed with purplish at the base (becoming crimson brownish when bruised), rather distant. Stem slender ($6 \times 0,25-0,5$ cm), soon hollow, pinkish brown (at the top more purplish, at the base paler pink and saffron-tomentose), fibrillose or slightly squamulose with minute scarlet-saffron fibrils and flocci. The flesh is somewhat purplish, expallent in the cap.

Spores almond-shaped, $8-9 \times 5 \mu$, smooth.

Rather rare. Met with in coniferous woods (*Picea*), always on mossy ground.

This species is quite distinct from the species in the *cinnamomeus*-stirpe. It seems to be overlooked by most mycologists (BRESADOLA'S *C. anthracinus* (Iconographia, tab. 644) may belong here). It might be placed in *Telamonia*.

*E. Telamonia**α. Carnosi***69. *C. armillatus* Fr.** (Plate 97. fig. E.)

Cap 5—10 cm, convex, dull brown (paler cinnamon with a tinge of brick-red when young). Gills pallid, somewhat cinnamon. Stem rather tall (9—13 × 1—1,5 cm), with a 2 mm broad, scarlet zone about midway (and often 1—3 additional narrower and paler zones below).

Spores almond-shaped, 10—12 × 5½—6 μ.

Rather common, but exclusively in woods of *Betula*, especially with an undergrowth of *Juniperus*, *Calluna* etc.

C. haematocelis (Bull.) Fr. is hardly specifically distinct.

70. *C. torvus* Fr. (Plate 96. fig. C.)

Cap 4—8 cm, convex, rather fleshy, date-brown, fibrillose-hoary. Gills rather dark and dull violet, soon becoming somewhat umber. Stem short, ventricose or subbulbous, then elongated, peronate up to the rather substantial, whitish ring by a dingy white, squamulose coating; apex somewhat violaceous. Flesh pallid, dingy lilac in the upper part of the stem. Smell aromatic, but not very strong.

Spores ovate, 8—10 × 6 μ, indistinctly punctate.

Not uncommon, in woods of *Fagus*.

This species varies very much in size and stature. It is often more slender than the figured specimens. Large specimens like those figured by FRIES (*Icones sel.*, tab. 157) I have never seen.

***C. scutulatus* Fr.**

Cap 5—8 cm, convex, then plane or slightly depressed round the obtuse umbo, date-brown, expallent (grayish clay when dry), fibrilloso-squamulose (edge somewhat shaggy-squamulose). Gills purplish-blue, broad, distant. Stem about 7 × 1,5 cm, cylindric or slightly attenuated upward, lower half white peronate, above the white, spurious ring minutely striolate, purplish blue inside and outside. Strong sweetish, somewhat radish-like smell.

Spores ellipsoid, 8—9 × 5—6 μ, minutely punctate.

Rare. Mixed frondose woods (Jylland). POUL LARSEN leg. & det.

71. *C. lucorum* Lange n. comb. (*C. impennis* Fr. var. *lucorum* Fr.). (Plate 96. fig. E.)

Cap 7—8 cm, convex, dingy cinnamon, slightly flushed with flesh-colour, somewhat streaked with watery, darker spots. Gills rather distant, pallid cinnamon with a tinge of flesh-colour. Stem stout, clavate-cylindric, 8 × 1,5—2,25 cm, at first whitish, streaked with pallid, dingy flesh-coloured lines, gradually becoming darker, more fuscous brownish, indistinctly zoned by a whitish belt below the middle (or with detached, broad, whitish,

adpressed scales which soon disappear). Flesh pallid chocolate flesh-colour with watery, darker lines.

Spores broadly almond-shaped, base acuminate, $10-11 \times 6\frac{1}{2} \mu$, warty-granulate.

Not uncommon, often somewhat clustered, in woods of *Fagus*.

I think this Agaric is better treated as a distinct species, than as a variety of *C. impennis*, which I have never met with in Denmark. To judge from his figure and description this is the *C. subferrugineus* of RICKEN (but certainly not of FRIES). KARSTEN'S *C. lucorum*, with subglobose spores, must be something different.

72. *C. urbicus* Fr. (Plate 97. fig. B.)

Cap 4—5 cm, convex, whitish clay, towards the edge at first silky-arachnoid and with a flush of dingy lilac. Gills watery ferruginous with a tinge of purplish. Stem about 4—5 × 1 cm, apex with a flush of pallid, watery grayish, peronate half way up by a smooth, white coating which terminates in a spurious, ragged ring. Flesh white, with a slight tone of lilac-grayish at the apex of the stem.

Spores narrow ovate, $7\frac{1}{2}-8 \times 4\frac{1}{2} \mu$.

Rare. Met with in copses of *Salices* and *Corylus*, growing somewhat clustered.

BATAILLE'S *C. urbicus* is an ochre-yellow species which hardly belongs here.

73. *C. bovinus* (Secr.) Fr. (Plate 98. fig. C & D.)

Cap 5—8 cm, convex, edge incurved, with rather thick and firm flesh, dark date-brown (when old more rufo-fulvous), edge at first white-fibrillose. Gills broad, rather thick, not crowded, deeply emarginate, rather pale when young, but soon becoming darker flesh-colour cinnamon, at last ferruginous-bay. Stem clavate, more or less bulbous (bulb somewhat spongy, often oblique, up to 3 cm broad), dirt-brown, more or less silky-fibrillose from whitish filaments and with a whitish median zone which soon disappears. Flesh of the same colour, but somewhat paler, fibrillose.

Spores almond-shaped or ovate-ellipsoid, $9\frac{1}{2}-11 \times 6-6\frac{1}{2} \mu$ (or $9-9\frac{1}{2} \times 5\frac{1}{2}-6 \mu$), minutely punctate.

Rather rare. In young plantations of *Picea* (with *Lactarius deliciosus*) and also in frondose woods (chiefly *Fagus*).

This species seems to be little known. FRIES has collected it "in silvis", KARSTEN in coniferous woods. My specimens (Plate 98, fig. D) from coniferous plantation are not quite typical, having more of the colours of *C. brunneus*. Plate 98, fig. C depicts a rather superannuated specimen from frondose wood. As far as I can see both RICKEN'S and KONRAD & MAUBLANC'S *C. brunneus* are identical with my *C. bovinus*.

74. *C. brunneus* (Pers.) Fr. (Plate 99. fig. E.)

Cap 5—6 cm, umbonate, dark bistre to almost sepia when fresh, fuscous date-brown when dry. Gills very broad, rather distant, of the same colour with a flush of dark purple. Stem attenuated upward, 7—8 × 0.9—1.3 cm (base up to 1.6 cm), pallid fuscous with darker (more

saturated) lines and fibrils; base whitish-tomentose. Ring whitish, evanescent. Flesh fuscous, becoming pale dirty brown in drying.

Spores ovate, $8-9 \times 6-6\frac{1}{2} \mu$.

Rare, but generally gregarious, on mossy ground, in dense plantations of *Picea*.

This species is rather differently conceived. RICKEN'S *C. brunneus* is probably identical with my *C. bovinus*, while his *C. glandicolor* might be a small form of my *C. brunneus* (while FRIES' *C. glandicolor* is a much more slender plant). FRIES describes *C. brunneus* as having a tall, upward attenuated, but not clavato-bulbose stem, exactly like mine.

C. heterosporus Bres.

Cap $1\frac{3}{4}-3$ cm, at first convex, then depressed around the obtuse umbo, chestnut-brown, somewhat expallent, edge incurved, somewhat tomentose and (sub lente) radiato-fibrose. Gills brownish yellow, rotundato-adnate with a small denticle; edge somewhat serrulate, spotted brown when bruised. Stem short and relatively stout, cylindric, paler than the cap, silky fibrillose, with a central, whitish, woolly-floccose, ring-like zone. Flesh pallid with a dark line over the gills, ochry towards the base. Smell and taste almost absent. Spore-print fulvous rusty.

Spores cylindric, Boletoid, $8-9 \times 2\frac{1}{2}-3 \mu$, base obliquely acuminate. Cystidia absent.

Rare. Found by F. H. MØLLER in coast-plantation (sand-dunes) amongst lichens and moss under *Pinus*, Falster 1926.

C. laniger Fr.

Cap 6-10 cm, convex (edge somewhat wavy), bright fulvous yellow; marginal veil membranous, white. Gills broad and thick, yellow, then reddish fulvous-cinnamon. Stem 10 cm or more, 1-2 cm broad above, base strongly swelled, but not marginate bulbose, everywhere white-fibrillose and with a persistent, white ring, ochre-brownish inside.

Spores ovate, $8-11 \times 6-7 \mu$, indistinctly punctate.

Rare. Recorded from mixed *Betula-Picea* wood on low ground in Jylland (Ry, 1909) by POUL LARSEN.

75. *C. hinnuleus* (Sow.) Fr. (Plate 98. fig. A.)

Cap 3-6 cm, umbonate, fulvous ochre, edge paler, almost gilvous. Gills broad, rather distant, ferruginous ochre. Stem cylindric ($5-7 \times 0.5-1.2$ cm), paler than the cap, with a distinct, white, subperonate or ring-like zone above the middle. Flesh tinged with the same colour. Smell characteristic (somewhat like that of *Tricholoma sulphureum*, but much fainter).

Spores ovate, about $8 \times 5 \mu$, verrucose.

Rather common, often gregarious, in open spaces amongst grass in mixed frondose woods (chiefly *Quercus*).

76. *C. triformis* Fr. (Plate 97. fig. C.)

Cap about 5 cm, somewhat gibbous, alutaceous, with watery, slightly darker streaks, disc pale honey-ochre. Gills broad, pale gilvous ochraceous. Stem rather short (5—6 cm), somewhat bulbous (base acuminate), white-peronate half way up, pallid alutaceous above. Flesh with a tinge of watery gilvous, whitish towards the base.

Spores ovate, $9\frac{1}{2} \times 6 \mu$, smooth.

Rare. Met with in small troops in a wood of *Fagus*.

My plant almost equals the form (var. *Schaefferi* Fries) figured and described by COOKE (Illustrations, tab. 790), except the larger specimen. I have also gathered a larger form, a transition to *C. bivelus*. FRIES placed *C. triformis* in *Leptophylli*, but it has more of the stature of *Carnosii*.

 β . Submembranacei**77. *C. melleo-pallens* Lange n. comb.** (*C. triformis* Fr. var. *melleo-pallens* Fr.). (Plate 97. fig. F.)

Cap $4\frac{1}{2}$ —5 cm, convex, light honey-yellow with a faint, white bloom, more saturated and dingy-coloured towards the edge. Gills pale honey, rather crowded. Stem tall, clavate (apex 0.7, base 1.6 cm, total length 8—9 cm), whitish alutaceous above, white-peronate, up to the ring-like zone, by a very thin, evanescent coating.

Spores ovate, 7×4 — $4\frac{1}{2} \mu$, smooth or slightly punctate.

Rather rare in woods of *Abies* and *Picea*.

C. melleo-pallens is evidently not very well known. BATAILLE says the spores are subglobose, 6—8 μ diam. FRIES himself regarded it as a subspecies under *C. triformis*, but it seems to me to be quite distinct.

78. *C. gentilis* Fr. (Plate 100. fig. D.)

Cap 3—4 cm, convex, with a small, acute umbo, ferruginous yellow, cuticle at last often somewhat rimoso-fibrillose. Gills very broad, broadly adnate, distant, deep yellow. Stem slender, 6 — 7×0.4 cm, somewhat ferruginous with lighter yellow fibrillose scales.

Spores subspheric ovate, $7 \times 5\frac{1}{2} \mu$, verrucose.

Not rare, but often solitary, in woods of *Picea* on mossy ground.

A very characteristic species, somewhat Dermocyboid in character. BRESADOLA'S figure (Iconographia, tab. 664) does not belong here. It depicts a dwarfish species with long and narrow spores, more like *C. saniosus*.

79. *C. incisus* (Pers.) Fr. forma. (Plate 99. fig. C.)

Cap 1—2 cm, convex, with a small, rather acute umbo, ochre-fulvous, fibrillose. Gills gilvous ochre. Stem 4 — 5×0.15 — 0.25 cm, slender, very pale gilvous with dispersed, white, fibrillose squamules and an incomplete ring.

Spores almond-shaped, 7 — $7\frac{1}{2} \times 4$ — $4\frac{1}{2} \mu$, smooth.

Not common. Met with in rather large numbers on low ground in *Alnus*-copse, with dispersed *Picea*-trees.

C. incisus is probably a collective species. The author has found several very similar forms, differing chiefly in the size of the spores (up to $9-10 \times 5\frac{1}{2} \mu$). BRESADOLA figures a somewhat olivaceous form; RICKEN depicts a large and tall species with verrucose, ovate spores, and finally COOKE a subfasciculate, dwarfish species which reminds one of an *Inocybe*.

80. *C. psammocephalus* (Bull.) Fr. (Plate 99. fig. F.)

Cap 2—3 cm, convex, rather acutely umbonate, cinnamon-ochre or with a tinge of fulvous, densely clad with minute, almost granular squamules of the same colour. Gills cinnamon with a flush of fulvous. Stem 3—5 $\times$ 0,3 cm, almost concolorous, fibrillose-squamulose up to the cortina.

Spores ovate ellipsoid, $8\frac{1}{2}-9 \times 5-5\frac{1}{2} \mu$, indistinctly punctate.

Not uncommon, in frondose woods and copses.

I have never met this species in coniferous woods, as FRIES has it.

81. *C. biformis* Fr. (Plate 99. fig. D.)

Cap 4—5 cm, somewhat umbonate, of a saturated, rufous-bay colour (somewhat fulvous when dry), edge white-fibrillose. Gills somewhat venose-rugulose, rather dark ferruginous-fulvous. Stem rather tall (7—8 $\times$ 0,7—1 cm), cylindrical or slightly incrassated below, whitish pallid, white-fibrillose silky, especially downwards, with a spurious, white ring about midway. Flesh in cap somewhat fulvous, in stem pallid, subfuscous.

Spores almond-shaped, $8-8\frac{1}{2} \times 4\frac{3}{4} \mu$, almost glabrous.

Not rare, in mossy plantations of *Picea*.

82. *C. punctatus* (Pers.) Fr. (Plate 98. fig. E.)

Cap 3—5 cm, with a rather prominent conical umbo when expanded, at first watery dark dirty brown, fibrillose hoary, then more pallid clay, rugulose towards the edge and somewhat venose. Gills broad and distant, at first bistre-olive, then coffee-brown ferruginous. Stem tall (8 $\times$ 0,6 cm), slightly clavate, pale clay-brownish with a whitish, somewhat squamose belt about midway. Flesh pallid clay.

Spores almond-shaped, about $10 \times 5\frac{1}{2} \mu$, indistinctly punctate.

Rare. Met with in a mixed frondose wood.

RICKEN'S *C. punctatus*, with very large spores, cannot be identical; but his description and figure makes it not unlikely that his *C. incisus* belongs here.

83. *C. glandicolor* Fr. var. *curtus* Fr. sensu Rea. (Plate 97. fig. D.)

Cap $2\frac{1}{2}-4$ cm, strongly convex, with a very prominent, conical umbo, at first fuliginous bay, then slightly paler (dark bay-brown, umbo subfuliginous), edge at first rather densely clad with white fibrils. Gills somewhat distant, rather broad, at first almost concolorous.

lous, then more bay-brown ferruginous. Stem about 5—0.3 cm, concolorous, somewhat flexuose, base slightly thicker and whitish tomentose, with an evanescent, whitish, ring-like belt about midway.

Spores almond-shaped, $8-9\frac{1}{2} \times 4\frac{1}{2} \mu$, indistinctly punctate.

Not uncommon on boggy ground growing gregariously under *Betula*, *Fraxinus*, *Abies* etc.

84. *C. rigidus* (Scop.) Fr. forma. (Plate 100. fig. A.)

Cap $1\frac{1}{2}-3\frac{1}{2}$ cm, more or less umbonate, umbo generally rather acute, fuscous date-brown, for the rest of a paler fulvous date-brown colour; edge at first silky fibrillose. Gills dusky cinnamon-olive, rather distant, plano-adnate or slightly emarginate. Stem about 4×0.3 cm, flexuose, dark dirty brown, somewhat fibrillose and minutely flocculose, with an indistinct, whitish, annular zone. Smell somewhat like that of *C. hinnuleus*, but fainter.

Spores ellipsoid or narrow amygdaliform, $8\frac{1}{2}-9 \times 4\frac{1}{2} \mu$, smooth, pale yellow.

Not common, but often numerous in its proper places (on boggy ground amongst ferns in woods of *Betula*).

My plant is not shining ("nitidus"), as FRIES has it, and is altogether not quite typical. RICKEN gives still smaller spore-dimensions for this species ($6-7 \times 3 \mu$), but REA'S and BRESADOLA'S accord well with mine.

85. *C. hemitrichus* (Pers.) Fr. (Plate 99. fig. B.)

Cap 2—5 cm, convex, with a small, more or less prominent umbo, watery date-brownish, densely clad with small, white, down-like flocci, which are easily washed away. Gills at first pallid clay. Stem rather tall, pale dirty grayish, whitish above, with a coating of whitish, fibrillose squamules. Flesh pallid.

Spores ovate-ellipsoid, $7\frac{1}{2}-8 \times 4-4\frac{1}{2} \mu$.

Not uncommon in woods of *Betula*.

86. *C. paleaceus* Fr. (Plate 99. fig. A.)

Cap $1\frac{1}{2}-3\frac{1}{2}$ cm, with a prominent, acute umbo, watery dirt-brown with a flush of lilac, at first tomentose-downy or almost squamulose from the white velum, soon becoming naked and pallid alutaceous clay. Gills light cinnamon. Stem long and slender (about 8×0.3 cm), somewhat flexuose, minutely whitish-squamulose up to the cortina.

Spores ovate, $7\frac{1}{2} \times 4\frac{3}{4}$ (or $7\frac{1}{2}-8 \times 4\frac{1}{2}$) μ , minutely punctate.

The typical slender form is met with in Sphagnum-bogs, under trees (*Betula*, *Pinus*, *Quercus*). But intermediate forms, transitions to *C. hemitrichus* and *C. flexipes*, are more common than the typical one.

87. *C. flexipes* Fr. (Plate 98. fig. B.)

Cap $1\frac{1}{2}-3$ cm, with a small, more or less prominent umbo, dingy date-brown, hoary from a whitish, fibrillose coating. Gills dark umber with a flush of violaceous. Stem 5—7 $\times$ 0.2—0.4 cm, somewhat flexuose, of the same colour as the cap, white-flocculose up to the cortina. Flesh rather dark dirt-gray.

Spores almond-shaped, $10 \times 5\frac{1}{2} \mu$ (in the figured specimens) or ovate, $8 \times 5 \mu$.

Not uncommon in moist copse-woods (chiefly frondose ones), gregarious.

The last three species are very intimately related, especially nos. 85—86, while *C. flexipes* is fairly well distinguished by the dark gills.

88. *C. helvelloides* Fr. (Plate 97. fig. A.)

Cap $1\frac{1}{4}$ —2 cm, with a small, obtuse umbo. While in bud the cap is completely covered by deep yellow, silky fibrils which overreach the edge; later on this coating is broken up into minute, fibrillose squamules, leaving the cap partly naked, brownish, somewhat fulvous at the disc; when dry the cap is yellowish brown. Gills distant, rather thick, at first umber-violaceous, edge whitish, then dark brown with a flush of purple. Stem slender, $4-5 \times 0.2$ cm, ferruginous brownish, yellow-fibrillose and slightly tinged with lilac at the apex when young.

Spores broadly almond-shaped, about $9 \times 5\frac{1}{2} \mu$, slightly punctate.

Rare. Met with on boggy ground in a wood, under *Salices* and *Alnus*.

This very characteristic and rare Agaric has also been met with in U. S. A. (described sub nom. *C. lacorum* by ALEX. H. SMITH in ANN. MYC., vol 32, 1934). In Icones sel. FRIES, besides small specimens like mine, also depicts considerably larger ones.

F. *Hydrocybe*

α. Firmiores

89. *C. balaustinus* Fr. (Plate 101. fig. E.)

Cap 4—8 cm, somewhat gibbous, rufo-fulvous, very hygrophanous. Gills at first pale cinnamon, then ferruginous cinnamon, edge entire. Stem rather tall (7×1.5 cm, base up to 2 cm), base rounded and sub-bulbous, pale at first, but soon becoming somewhat ferruginous fulvous, from base upward, silky fibrillose above. Flesh concolorous.

Spores broadly ovate, $8 \times 5 \mu$, rough.

Rather rare. Met with on grassy road-borders (through wood of *Fagus*), under *Betula*.

This Agaric is not unlike bright coloured old specimens of *C. caninus*. RICKEN'S *C. balaustinus* has globose spores and does not belong here. COOKE'S figure (Illustrations, pl. 794) is very good.

90. *C. saturatus* Lange (*C. dilutus* (Pers.) Fr. (sensu Rick. nec Fr.)). (Plate 101. fig. A.)

Cap 5—9 cm, slightly gibbous, when young fulvous ochre, rather shining; when old (in wet weather) becoming a deep chestnut-rufous. Gills very broad and broadly emarginate, rather distant, at first ochraceous with a tinge of ferruginous, then dark ferruginous-bay with a flush of blood-red. Stem clavate, subbulbous ($5-7 \times 1-1.3$ cm, base up to 2 cm), often somewhat acuminate, white below, pale above with alutaceous-ochry striation, becoming darker rufo-ferruginous with age. Flesh concolorous (pale at first, darker, rufo-ferruginous when old).

Spores almost globose, $5\frac{1}{2} \times 5 \mu$, minutely punctate-verrucose.

Rather rare, but gregarious, occasionally subfasciculate, in woods of *Fagus* with scattered old *Pinus*-trees.

A very characteristic species. RICKEN describes it sub nom. *C. dilutus*; but it cannot be the *C. dilutus* of FRIES which is a smaller and paler species. When old it almost answers to RICKEN'S description of *C. rubricosus*. Although well characterised by the globose spores it seems to be overlooked by most mycologists.

91. *C. armeniacus* (Schaeff.) Fr. (Plate 103. fig. G.)

Cap about 6 cm, somewhat campanulate, then expanded gibbous, gilvous to almost apricot, umbo pale ochre, edge silky white-fibrillose. Gills pale ochre, then subferruginous, rather broad. Stem clavate (0,8 cm above, 1,4—1,7 cm below), base often somewhat acuminate, white, with a flush of the cap-colour above. Veil sometimes rather evident, subperonate, white.

Spores ovate, $8\frac{1}{2}$ — 10×5 — $5\frac{1}{2}$ μ , indistinctly punctate.

Rare, met with in woods of *Picea*.

REA'S description covers my plant exactly. RICKEN'S is somewhat ambiguous.

92. *C. dilutus* (Pers.) Fr. (nec Rick.). (Plate 100. fig. B.)

Cap about 3 cm, convex, slightly umbonate (umbo rather acute), at first dull clay-brown, then paler (honey-colour), alutaceous when dry. Gills pallid, somewhat ochry. Stem rather slender (about 5 cm long, apex 0,4, base 0,6 cm), whitish with a flush of honey-colour. Flesh rather soft, somewhat darker honey.

Spores almond-shaped, $10\frac{1}{2}$ — $12 \times 5\frac{3}{4}$ — $6\frac{1}{4}$ μ , smooth.

Rare. Met with in a copse of *Alnus* and *Corylus*.

93. *C. duracinus* Fr. (Plate 102. fig. D.)

Cap about 6—7 cm, convex, slightly gibbous, hygrophanous, pale date-brown clay with a slight flush of pale flesh-colour, whitish clay when dry, edge incurved, white-silky. When expanded the cap often shows a somewhat raised marginal zone. Flesh thin, except at the disc. Gills broad, rather distant, date-brown cinnamon, edge whitish. Stem rather tall and stout (about $9 \times 1,5$ cm), hard, cylindric or slightly incrassated above, with a rather short "tap-root", whitish, with a flush of dingy bluish above.

Spores almond-shaped, 9 — $9\frac{1}{2} \times 6$ μ , slightly punctate. Edge of gills set with basidiiform, sterile cells.

Rare. Woods of *Fagus*, generally solitary.

C. duracinus seems to be rather differently conceived by the mycological authors. BRESADOLA depicts an almost white form with larger spores. BATAILLE describes the gills as milk-white. RICKEN'S description is more like mine.

94. *C. candelaris* Fr. (?) (Plate 101. fig. D.)

Cap 4—5 cm, somewhat conical-expanded, clay-brownish fulvous, edge somewhat striate

and abruptly incurved, alutaceous ochre when dry. Gills broad and broadly adnate, somewhat venose at the base, ochre-cinnamon or somewhat gilvous. Stem tall (8—9 × 0,8—1 cm) cylindric, with a “tap-root”, white, more or less striate from apex downward with minute lines of a pale alutaceous. Flesh flushed with the same colour.

Spores ovate, $7-8\frac{1}{2} \times 5-5\frac{1}{4} \mu$, minutely punctate.

Met with in a wood of various frondose trees, gregarious.

My plant differs from the *C. candelaris* of FRIES by the habitat and by not being particularly bright or shining. But I find no other species to which it can be referred. *C. illuminus* has certain traits in common but a somewhat clavate, rootless stem. *C. candelaris* is, however, very differently conceived. RICKEN depicts a gigantic form (cap about 10 cm), while BATAILLE gives the dimension of the cap as 3 cm and FRIES even less (2—3 cm). Mine is intermediate.

95. *C. damascenus* Fr. (Plate 100. fig. E.)

Cap 6—7 cm, somewhat gibbous, very hygrophanous, at first light fulvous, then (from edge in) darker, saturated fulvous bay-brown (tan-colour when dry). Edge at first white-silky, often abruptly incurved and somewhat venose and fissile. Gills rather broad, at first watery cinnamon, then somewhat darker (fulvous bay). Stem firm and rather stiff, cartilaginous, about $7 \times 1,2$ cm, cylindric or slightly bulbous, generally with a short “tap-root”, whitish with a flush of pallid ochre. Flesh white. Taste slightly rankish. — Subfasciculate.

Spores ellipsoid, $7\frac{1}{2} \times 4\frac{1}{2}-4\frac{3}{4} \mu$.

Rare. Met with in a wood of *Fagus*, growing in rather thick clusters about stumps.

Remarkable for its somewhat fasciculate growth.

96. *C. rigens* (Pers.) Fr. (Plate 100. fig. C.)

Cap 2—5 cm, convex or slightly gibbous, clay- or horn-brownish, expallent. Gills broad and broadly adnate, pallid cinnamon. Stem firm and cartilaginous, with an often rather long “tap-root”, 5—6 cm high (exclusive the “root”), 0,4—0,8 cm thick, cylindric, whitish. Flesh concolorous.

Spores ovate or almond-shaped, $7-8 \times 4-4\frac{3}{4} \mu$.

Not uncommon in woods of *Fagus*, often in somewhat open spaces.

FRIES places this species in *Tenuiores*, but it seems to have no natural affinities there.

97. *C. bicolor* Cooke. (Plate 101. fig. F.)

Cap 2—4½ cm, somewhat conic campanulate at first, then expanded, subumbonate with an incurved, fissile edge. Colour of young cap almost doe-brown with a flush of flesh-colour, but soon decolorating, becoming pallid lilaceous-white and silky. Gills rather broad, watery cinnamon with a tinge of lilac flesh-colour. Stem cylindrical, 5—7 × 0,4—0,7 cm, more or less rooting, smooth, whitish with a flush of bluish lilac inside and outside, especially towards the base.

Spores ovate-ellipsoid or almond-shaped, averaging $8-9 \times 5 \mu$ (exceptionally up to $9\frac{1}{2} \mu$ long), punctate rough.

Not uncommon on rather hard and dry ground in woods of *Fagus*, often somewhat gregarious.

COOKE depicts this species very well, a larger form (Illustrations, pl. 871) and a smaller one (Illustrations, pl. 820, sub nom. *C. quadricolor*). The specimens found in Denmark are intermediate.

C. bicolor evidently belongs to the *scutulatus*-stirpe and may be regarded as a reduced, dwarfish form of *C. evernius* (as suggested by R. MAIRE), like *C. pumilus* or *C. elatior*.

98. *C. rubricosus* Fr. (Plate 100. fig. F.)

Cap about 6 cm, with a prominent umbo, shining, date-brown bay, subhygrophanous, edge at last somewhat fibrillose or slightly rimose. Gills very broad (up to 1.2 cm), becoming dark bay-ferruginous. Stem cylindric, $8-9 \times 0.8-0.9$ cm, smooth, clay date-brown, darkest below.

Spores roundish ovate, $8-8\frac{1}{2} \times 5\frac{1}{2}-6 \mu$, coarsely warty.

Rare. Met with in a wood of *Pinus* and *Picea*, growing solitary in deep moss.

99. *C. holophæus* Lange. (Plate 102. fig. C.)

Cap $5-5\frac{1}{2}$ cm, convex flat, smooth, but silky-glossy, date-brown with a slight flush of purplish flesh-colour; when dry date-brown with a tinge of fulvous; edge very slightly white-silky. Gills broad, broadly emarginate, distant, edge entire, of the same colour as the cap. Stem somewhat cartilaginous, 6×1 cm, flushed with the colour of the cap; base clavate and somewhat oblique ($1\frac{1}{2}$ cm broad), white, somewhat silky-fibrillose.

Spores almond-shaped, $8-8\frac{1}{2} \times 4\frac{1}{2}$, slightly punctate. (In other finds slightly larger or smaller).

Rather rare, on moist ground in woods of *Fagus*, often solitary.

This evidently is *C. milvinus* in the sense of RICKEN, but not *C. milvinus* Fr. In colour and habit this *Cortinarius* recalls dark, luxuriant specimens of *Collybia butyracea*.

100. *C. uraceus* Fr. (Plate 102. fig. B.)

Cap about 3 cm, with a small, somewhat acute umbo, fuliginous bistre, slightly expallent. Gills rather distant, broad, almost concolorous or somewhat bay-brown. Stem concolorous, straight and rather tall ($6-7 \times 0.4-0.5$ cm); base whitish, slightly rooting. Flesh dusky bistre. Smell somewhat rank.

Spores ovate, $8 \times 5 \mu$, punctate-rough.

Not uncommon, chiefly on somewhat boggy ground in mixed frondose woods (also in *Betula-Picea* wood).

RICKEN'S *C. uraceus*, with gigantic spores and beautiful olive-red gills, must be something different. BATAILLE'S spore-dimensions accord with mine.

101. *C. saturninus* Fr. (Plate 102. fig. E.)

Cap $5-7$ cm, obtusely umbonate, date-brown, becoming somewhat fulvous, edge at first

white-silky. Gills rather dark, at first somewhat purplish, rather broad. Stem 6—8 × 1 cm (base 1,5 cm), somewhat clavate, whitish, upper part tinged light violaceous inside and outside, discolouring with age to a dingy clay-brownish. — Subfasciculate.

Spores ellipsoid, $7\frac{1}{2} \times 4\frac{1}{2} \mu$.

Rather rare, chiefly outside of woods in open spaces, behind hedges etc.

Distinguished from most other *Cortinarii* by the habitat. BRESADOLA describes this species very well sub nom. *C. castaneus*. RICKEN'S spore dimensions are considerably larger than mine.

102. *C. sciophyllus* Fr. (Plate 103. fig. F.)

Cap 5—7 cm, obtuse, expanded, of a dark, almost soot-brown colour; but with a bloom of white silkyness that gives it a tinge of plum-blue; when dry it becomes dirty clay-brown. Gills broad, dark umber. Stem 5—6 × 1—1,3 cm, dusky violaceous above, pallid or somewhat brownish towards the base. Flesh concolorous.

Spores obliquely ovate, 8—10 × 5—5 $\frac{1}{4}$ μ , rather coarsely verrucose.

Rather rare, in frondose woods, always early in the season (mostly in June).

Seems to be overlooked by most mycologists, probably on account of its precocity.

103. *C. castaneus* (Bull.) Fr. (?) (Plate 102. fig. A.)

Cap 3—5 cm, obtuse, rather shining, bistre, when dry more chestnut- or date-brown. Gills dark, bistre with a flush of purplish. Stem firm, rather short (4—5 × 0,6—1,1 cm), pallid dirt-brown, striate above and flushed with dirt-gray violaceous (inside as well as outside).

Spores ovate-ellipsoid, 8—10 × 4 $\frac{1}{2}$ —5 μ , indistinctly punctate.

Rare. Mixed frondose woods (chiefly *Fagus*), in June.

Although my specimens answer fairly well to the description of FRIES they are probably too close to *C. sciophyllus* to be specifically distinct and might possibly be regarded as a somewhat sun-scorched form of this species. *C. castaneus* is a somewhat ambiguous species which perhaps has better be discarded. BRESADOLA'S *C. castaneus* evidently is *C. saturninus*. BATAILLE'S is a small species with "rose-purpurascés" gills. REA, like the author, has met with it early in the season.

104. *C. erythrinus* Fr. (sensu Rea). (Plate 103. fig. E.)

Cap 2 $\frac{1}{2}$ —3 $\frac{1}{2}$ cm, campanulate convex, then somewhat umbonate, at first dark and shining purplish bay, edge slightly white-silky, then chestnut-fulvous; hygrophalous. Gills at first pallid clay-cinnamon (edge whitish), then cocoa-cinnamon, edge slightly eroded. Stem rather thin (3 $\frac{1}{2}$ —6 × 0,3—0,5 cm), silky shining, apex pale lilac, for the rest more silvery and slightly brownish below.

Spores ovate, 6 $\frac{1}{2}$ × 4—4 $\frac{1}{2}$ μ , smooth and pale. Edge of gills set with clavate, sterile, about 6 μ broad cells.

Not uncommon, on moist ground in woods of *Picea*, amongst needles, gregarious.

FRIES places this species in *Tenuiores*, but it is intimately related to the preceding species, and the edge of the cap is distinctly incurved. RICKEN describes it as having somewhat larger, roundish and warty spores.

105. *C. Bresadolæ* Schulz. (Plate 102. fig. F.)

Cap 3—5 cm, campanulate-convex, then somewhat gibbous, edge incurved, glabrous, dark chestnut (dark date-brown and shining when dry). Gills dark ochre with a flush of ferruginous, rather distant. Stem rather short ($5-6 \times 0.5-1$ cm), whitish, minutely fibrillose.

Spores almond-shaped, $8-8\frac{1}{2} \times 4\frac{1}{4}-5$ μ , indistinctly punctate or almost smooth.

Rare. Met with in a wood of *Picea*, a number of specimens.

This species is not recorded from Great Britain, but the upper figures on pl. 842 in COOKE'S Illustrations probably depict *C. Bresadolæ*, not *C. castaneus*.

106. *C. tortuosus* Fr. (Plate 101. fig. C.)

Cap about 5 cm, convex, slightly umbonate, purplish bay-brown, drying fulvous tan, edge somewhat fissile. Gills purplish cinnamon, dark red when bruised. Stem cylindrical, silvery white, fibrillose-striate from apex downward by somewhat twisting lines of a hyaline lilac-grayish colour.

Spores almond-shaped, $7-9 \times 4\frac{1}{2}-5$ μ .

Rare. Met with in a wood of *Picea* amongst *Calluna* in deep bed of moss.

FRIES (in Hym. Eur.) in his diagnosis says about the gills: "tactis purpurascentibus", but in the description: "tritae sanguineæ". In my specimens the colour was a dull rufous with a flush of blood-red. The species is very close to *C. (Telamonia) biformis*; old specimens of this latter species, having lost their subperonate, white scalyness, can hardly be distinguished from it.

 β . *Tenuiores***107. *C. decipiens* (Pers.) Fr.** (Plate 103. fig. D.)

Cap $1\frac{1}{2}-4$ cm, somewhat conical and — when expanded — with a depression round the broad umbo, fuscous bistre with a purplish sheen and a white-silky bloom towards the edge, drying almost date-brown. Gills cinnamon ochre. Stem rather slender, $5-7 \times 0.3-0.5$ cm, silvery shining, with a flush of flesh-colour lilac. Flesh — especially that of the stem — dull lilac flesh-colour.

Spores ovate, $8-9 \times 5$ μ , verrucose-rough.

Not uncommon, in various localities. Met with on humous ground under *Pinus*, *Betula*, *Sambucus* etc.

This species has some traits in common with *C. (Telamonia) hemitrichus* and its allies, but lacks the white, plumulose coating. RICKEN'S *C. decipiens* does not belong here; his figure (loc. cit., tab. 53⁸) probably depicts *C. fasciatus*.

108. *C. pulchellus* Lange. (Plate 101. fig. B.)

Cap 0.7—0.9 cm, conical, expanding, dark violet-fuscous, slightly fibrillose, especially towards the edge which therefore is somewhat paler. Gills of a beautiful bluish-violaceous

colour, subdistant, emarginate. Stem rather slender, $2\frac{1}{2}$ —3 $\times$ 0,1—0,25 cm, violet, towards the base more pallid, purplish flesh-colour, slightly fibrillose-striate, base somewhat swollen. Flesh concolourous, without any taste or smell.

Spores almond- or plum-shaped, $9 \times 5 \mu$, transparent, smooth (in another find $8 \times 4\frac{1}{2} \mu$).

Rare. Met with on boggy ground under *Betula* and *Fraxinus* or under *Alnus*.

This beautiful little *Cortinarius* (first described by me in "Meddelelser", vol. IV, 1926) has recently been recorded from U. S. A. and described sub nom. *C. (Telamonia) americanus* by ALEX. H. SMITH (Ann. Myc., vol. 32 (1934)). When the cortina is more developed (as in the American specimens) it would find its place in the vicinity of *C. (Telamonia) flexipes*. *C. fusco-violaceus* Peck (from U. S. A.) is very close, but has smaller spores.

109. *C. Hoefftii* Fr. (Plate 103. fig. A.)

Cap $2\frac{1}{2}$ —3 cm, expanding, subumbonate, edge deflexed and somewhat striate, light clay-brownish with a flush of flesh-colour, drying almost alutaceous white, especially towards the edge. Gills gilvous. Stem cylindric, 4—5 $\times$ 0,4—0,6 cm, pure white, silky-striate. Flesh whitish, except at the umbo, where it is concolorous with the cap.

Spores almost globose, $6\frac{1}{2} \times 5\frac{1}{2} \mu$, slightly punctate.

Rare. Met with in a wood of *Pinus* and *Fagus*.

FRIES places this species in *Firmiores*. My specimens were intermediate between the two groups.

110. *C. miniatopus* Lange. (Plate 103. fig. B.)

Cap about 2 cm, conic-convex, at last slightly umbonate, smooth, cinnamon coloured with a flush of fulvous from umbo out; edge indistinctly fibrillose (fibrils cinnabar). When dry the cap is paler cinnamon ochre. Gills somewhat distant, cinnamon, adnate and slightly emarginate. Stem 4—5 $\times$ 0,3—0,5 cm, apex pallid, downward tinged pinkish cinnabar or minium-red from a coating of minute, silky fibrils. Flesh pallid brownish, somewhat reddish in the stem, except at the very base, where it is whitish.

Spores ovate, $6\frac{1}{4}$ —7 $\times$ $4\frac{1}{4}$ — $4\frac{1}{2} \mu$, minutely punctate.

Rare. Met with in a dense plantation of *Picea*.

This characteristic species which forms a transition to *Dermocybe* (e. g. *D. uliginosus*) has been described under various names. RICKEN (loc. cit.) depicts it very well under the name *C. fasciatus* Fr., from which it is entirely different. KONRAD & MAUBLANC attach the name *C. colus* Fr. to it; but FRIES' (very brief) diagnosis of this species does not affirm this opinion, and neither REA'S nor COOKE'S descriptions bear it out. By giving it a new name the Gordian knot will be cut.

111. *C. saniosus* Fr. (Plate 103. fig. C & C¹.)

Cap $1\frac{1}{2}$ — $2\frac{1}{2}$ cm, at first conic convex, then expanding with a small, rather acute umbo, somewhat fulvous with a subfuscous umbo and a yellowish-fibrillose edge. Gills ochry cinnamon. Stem 3—6 $\times$ 0,2—0,3 cm, somewhat flexuose, subfuscous, yellow-fibrillose or subfloccose up to the cortina, apex paler. Flesh concolourous.

Spores almond-shaped or almost ovate, 8 — $9\frac{1}{2} \times 5$ — $5\frac{1}{4} \mu$, punctate.

Rather rare. Growing in open spaces, outskirts of woods, behind hedges, chiefly under *Populus*, in small troops.

RICKEN'S *C. saniosus* (Blätterpilze, pl. 53) is a larger and taller plant. BRESADOLA'S figure of *C. gentilis* probably should be referred to *C. saniosus*. (Vide Iconographia, tab. 664²).

112. *C. obtusus* Fr. (Plate 104. fig. A.)

Cap $1\frac{1}{2}$ — $3\frac{1}{2}$ cm, at first somewhat campanulate, then expanded, gibbous or obtusely umbonate, gilvous — or almost fulvous, edge striate, when dry somewhat ochry tan. Gills ochraceous fulvous. Stem short or somewhat elongated (3—6 cm), generally more or less ventricose or subfusiform (0.5—0.7 cm), but often more slender and almost equal (base acuminate), flushed with the colour of the cap above, almost white below. Flesh concolorous.

Spores amygdaliform, 7 — $8\frac{1}{2} \times 4\frac{1}{2}$ — 5μ .

Common in woods of *Picea*, under very different conditions, but most profuse and well developed on mossy ground.

113. *C. scandens* Fr. (*C. obtusus* Fr. var. *scandens* Quélet.). (Plate 104. fig. C.)

Cap $1\frac{1}{2}$ — $1\frac{3}{4}$ cm, convex, subumbonate, fulvous tan, tan-whitish when dry. Gills fulvous ochre. Stem tall, slender and somewhat flexuose, about 7×0.3 cm, white, slightly flushed with the cap-colour at apex, fibrillose silky.

Spores ovate-amygdaliform, 7 — $8 \times 4\frac{1}{2} \mu$, smooth.

Rare. On the ground amongst needles in woods of *Picea*.

QUÉLET, not without reason, treats it as a slender form of *C. obtusus*. *C. fulvescens* — which he also regards as a variety — is almost intermediate. (Vide BRESADOLA'S Iconographia, tab. 669).

114. *C. Junghuhnii* Fr. (Plate 104. fig. E.)

Cap 2—3 cm, conic-convex (umbo acute), fulvous cinnamon, at first (especially about the edge) minutely arachnoid-fibrillose, hardly hygrophalous. Gills vivid ochre-cinnamon, deeply emarginate, edge white-fimbriate or somewhat eroded. Stem 4 — 5×0.3 — 0.4 cm, somewhat flexuose, paler than the cap, minutely silky-fibrillose or almost glabrous, amber-cinnamon or subferruginous inside.

Spores broadly ovate, $7 \times 4\frac{3}{4} \mu$, punctate-rough. The edge of the gills set with somewhat fasciculate cystidia, varying in shape from clavate (45×7 — 9μ) to balloon-shaped (15 — 20×9 — 10μ).

Rather rare, on boggy ground, growing gregariously amongst grass under *Quercus*, *Betula* and *Pinus*.

RICKEN gives a very good description of this little species. The cystidia on the gill-edge characterise it very well. It is not unlike *C. (Telamonia) rigidus*, which is met with in similar localities.

115. *C. fasciatus* Fr. (Plate 104. fig. D.)

Cap $1\frac{1}{2}$ — $2\frac{1}{2}$ cm, conic convex, umbo acute, somewhat fuscous, the rest of the cap bay-brown fulvous (drying fulvous tan). Gills gilvous ochre. Stem rather slender, $6-7 \times 0.3$ cm, pale with a slight flush of fulvous, whitish below, minutely fibrillose with gilvous fibrils. Flesh somewhat fulvous, without any smell or taste.

Spores ovate sub-limoniform, $8-8\frac{1}{2} \times 5\frac{1}{4} \mu$, indistinctly rough.

Not rare, on mossy ground in woods of *Picea*.

RICKEN'S *C. fasciatus* is *C. miniatopus*. His *C. decipiens* seems to belong here. QUÉLET looks upon *C. fasciatus* as a mere form of *C. acutus*, which seems to me not unlikely.

116. *C. acutus* (Pers.) Fr. (Plate 104. fig. B.)

Cap $1-2\frac{1}{2}$ cm, convex, acutely umbonate; umbo darker, almost bay-brown, for the rest cinnamon fulvous; edge pellucido-striate. Gills cinnamon ochre. Stem $4-5 \times 0.15-0.3$ cm, glabrous, whitish, pale gilvous inside.

Spores almond-shaped, $8-9 \times 4 \mu$, smooth.

Rare. Met with in open space on sandy hill in a plantation of *Picea*.

Very close to the preceding species (if not identical); differing chiefly in the form of the spores and the striate cap. — As I have only gathered what I consider typical specimens of *C. acutus* once, many years ago, I am not in a position to decide, whether or not it should be accorded specific rank.

PHOLIOTA

Somewhat fleshy, often rather large species with a distinctly annulate stem. Spore-print ferruginous to cigar-brown. No crested cystidia, but the gill-edge generally set with sterile cells of various shape (bottle-shaped, hair-shaped etc.).

The genus *PHOLIOTA* is fairly well distinguished from the adjoining genera by the distinctly annulate stem. Only some few *Cortinari* are peronate subannulate, and in a few *Hebelomas* (particularly *H. versipelle*), the veil sometimes forms a spurious, fibrillose ring. Some of the smaller species show a marked affinity to the velate *Galeras*; but while the *Pholiotas* have an entire, distinct ring, the *Galeras* in question have the aperture of the young cap closed by a white, membranous veil which, when the cap expands, splits up in a number of marginal, dentiform squamules. In some of the larger species the stem is peronate by a universal veil which sheaths the stem with a granulose or squamulose coating, generally extending over the cap (while in bud) as a scaly or floccose layer. Finally *P. (Rozites) caperata* is unique in having a rudimentary volva at the base of the stem.

Microscopical characteristics. The spores vary considerably in size but not much in shape in this genus. The smallest spores are those of *P. flammans* (index 12), the

largest those of *P. caperata* (index 100). In most cases the epispore is smooth; but rough or warty spores also occur. The basidia are generally 4-spored. The only exceptions known to me are *P. erebia* and a little Galeroid species which I call *P. teneroides*, both of which have constantly 2-spored basidia. Some kind of sterile cells are to be found on the gills of all the species. Facial cystidia are rare, and those on the edge are generally of a rather trivial type, hair-shaped or slightly clavate. A rather characteristic type of cystidium is that of *Pholiota squarrosa*: obovate-clavate, generally with a short, hair-shaped appendix. The cuticle of the cap in the genuine, xylophilous *Pholiotas* is of a fibrous texture, being made up of minute, more or less interwoven fibrils. But in *P. togularis* and its allies it is cellular, consisting altogether of roundish, isodiametric cells. The same is true of *P. præcox* (and probably of the adjacent species). *P. Vahlîi*'s velutinous-powdery epiderm is made up of ovate, roundish or sub-fusiform cells.

Taxonomy. *Pholiota* as here conceived (in the Friesian sense) is not a natural entity but rather a collective, comprising species and series of species of a very different nature, which, however, can all be characterised as annulate *Dermini*. — The ingenious French mycologist QUÉLET was the first to attempt a more natural classification. In fact he completely split up the old genus *Pholiota*, distributing its members amongst other — already existing or new — genera. Many of his innovations evidently were improvements. Like other modern mycologists I follow him to a certain extent. But for practical reasons I refrain from disbanding the genus. Such revolutionary proceedings should be postponed till a more complete and precise knowledge of all the species be acquired, particularly with regard to their anatomical characteristics. But while maintaining the genus in the Friesian sense I do not think it possible to uphold his internal taxonomic arrangement. First of all *P. Vahlîi* (= *P. aurea*) and *P. caperata* must needs be reserved a special position (even if they be not excluded from the genus altogether). *P. ægerita*, which FRIES places together with *P. radicata*, finds a more natural position in the vicinity of *P. præcox*, in spite of its xylophilous habit, and *P. erebia* has spore-powder so dark that its right position must be in *Phæotæ*. Some authors remove *P. radicata* to *Hebeloma*, but although it certainly has many Hebelomoid characters I hesitate to follow them in this. The details of the taxonomic arrangement will be seen in the key.

KEY

TO THE SPECIES FIGURED

I. PHÆOLEPIOTA

Cap velutinous-powdery. Stem and outside of ring granulate.

Very large, lion-yellow species... 1. *P. Vahlia*

II. ROZITES

Stem sub-volvate. Cap more or less covered by evanescent, filmy or arachnoid, white scales.

Large species with a rivulose, alutaceous ochry cap ... 2. *P. caperata*

III. EU-PHOLIOTA

Species without any of the characters of I and II.

A. TRUNCIGENÆ. Xylophilous species (except no. 17).

α. Carnosæ. Non-hygrophanous, often large and fleshy species.

a. Eu-Dermiæ. Spores rusty to bay-brown.

1. VISCIDÆ. Cap more or less viscid or smeary.

* Stem with glutinous, bay-brown scales. Spores very small 3. *P. adiposa*

** Stem devoid of glutinous scales.

† Spores 6—7½ μ long.

° Stem fibrillose squamulose ... 4. *P. lucifera*

∞ Stem squarrose with recurved scales ... 5. *P. intermedia*

†† Spores 8—9 μ long.

° Cap ferruginous-yellow. Scales on stem not recurved 6. *P. aurivella*

∞ Cap pale yellow. Scales on stem recurved... 6 a. *P. aurivella* var. *cerifera*

2. SICCÆ. Cap dry.

* Stem and cap squarrose with recurved scales.

† Scales brown ... 7. *P. squarrosa*

†† Scales chrome-yellow... 8. *P. flammans*

** Stem fibrillose or somewhat squamulose.

† Large species. Spores granulate... 9. *P. spectabilis*

†† Rather small species. Spores smooth ... 10. *P. tuberculosa*

b. Phæotæ. Spores dull cigar-brown. Gills at first whitish, never rusty or yellowish.

1. Stem without a long "tap-root".

* Cap and stem clad with coarse, cottony, white scales... 11. *P. destruens*

** Cap and stem almost glabrous or fibrillose-squamulose ... 12. *P. heteroclita*

(Vide also no. 22, *P. ægerita* (with inflated cystidia)).

2. Stem with a long "tap-root" ... 13. *P. radicata*

β. *Hygrophanæ*. Cap hygrophanous, smooth. Flesh rather thin.

a. Cap minutely white-felty. Gills rufous trout-red ... (P. *confragosa*)

b. Not so.

1. Stem densely clad with umber-brown squamules ... 14. P. *mutabilis*

2. Stem fibrillose or glabrous.

* Growing on wood (twigs, needles).

† Cap 2—3 cm. Gills rather narrow... 15. P. *marginata*

†† Cap 1½—2 cm. Gills rather broad... 16. P. *unicolor*

** Growing on the ground amongst grass and moss ... 17. P. *pumila* var. *subferruginea*

B. HUMIGENÆ. Species growing on the ground, rarely (no. 22) on or about stumps.

α. *Phæotæ*. Spores dull brown (lighter or darker cigar-brown).

a. Cap bistre.

1. Basidia 2-spored ... 18. P. *erebia*

2. Basidia 4-spored ... 19. P. *brunneola*

b. Cap whitish or light horn-brown.

1. Species growing on the ground.

* Cap fleshy, white to yellowish. Spores 12—13 μ long.

† Cuticle entire ... 20. P. *dura*

†† Cuticle cracked ... 20 a. P. *dura* forma *cutifracta*

** Cap less fleshy, sub-hygrophanous, pale horn-brownish. Spores 9—10 μ long.

† Cap 3—6 cm. Stem medium or short.

° Stem medium. Cuticle of cap not cracked ... 21. P. *præcox*

°° Stem short. Cuticle somewhat cracked ... 21 a. P. *præcox* forma *cutifracta*

†† Cap 2—3 cm. Stem slender ... 21 b. P. *præcox* var. *paludosa*

(Vide also no. 13, P. *radicosa* with long tap-root).

2. Species growing on or about stumps ... 22. P. *ægerita*

β. *Eu-Derminæ*. Spores rusty or ochry. Cuticle of subglobose cells.

(Vide also no. 17, P. *pumila* var. (with fibrous cuticle)).

a. Basidia 4-spored. Ring radiato-sulcate.

1. Cap 2—4 cm ... 23. P. *togularis*

2. Cap 1—1½ cm ... 24. P. *filaris*

b. Basidia 2-spored. Ring slightly striate ... 25. P. *teneroides*

SPECIFIC DESCRIPTIONS AND NOTES

I. PHÆOLEPIOTA

1. P. **VahlII** (Schum.) Sev. Pet. (P. *aurea* (Matt.) Fr.). (Plate 105. fig. C.)

Very large, often tall. Cap 8—14 cm, convex or slightly umbonate, bright lion-yellow, somewhat velutinous-powdery. Gills rusty yellow, free. Stem 9—18 × 2—3½ cm, clavate,

firm, peronate up to the large, spreading ring which on the lower side is adorned with darker, brownish ochre granules, arranged in radiating veins which run down the stem, gradually disappearing about half way down. Above the ring the stem is paler yellow and slightly farinose.

Spores fusiform ellipsoid, $12 \times 5 \mu$. Basidia 4-spored. Cystidia absent. Cells on surface of cap inflated (ovate, subspheric or almost fusiform), up to 30μ long, light yellow.

Not common. Especially met with in open woods, parks etc., where the soil is rich and loamy.

QUÉLET named this species *Lepiota pyrenæa*, and it certainly has the look of a gigantic *Lepiota amethystina*. Its stature and lively colour make it one of the most imposing species among the Hymenomycetes. *Agaricus aureus* Matt. is such a dubious name and has been so much misinterpreted that I prefer with SEV. PETERSEN ("Meddelelser", vol. II) to use the name given by SCHUMACHER (1803).

II. ROZITES

2. *P. caperata* (Pers.) Fr. (*Rozites caperata* (Pers.) Karst. (Plate 104. fig. F.)

Large. Cap 5—9 cm, at first oviform, then convex, wrinkled and somewhat grooved towards the edge, pale ochre or alutaceous, sparingly clad with adpressed, evanescent, whitish, filmy scales. Gills adnate, rather narrow, pale to alutaceous-ochre. Stem rather tall, whitish, base somewhat swollen, with a rudimentary, submarginate volva; ring white.

Spores broadly ovate, sublimoniform, $11\frac{1}{2}—14 \times 7—8\frac{1}{2} \mu$, minutely granulate.

Rather uncommon, chiefly growing in woods of *Fagus* (in rather dry places), but also met with in mixed frondose-coniferous woods.

On account of the rudimentary universal veil KARSTEN placed this species in a distinct genus, *Rozites*, intended to form a parallel to *Amanita*. FRIES in his earlier works referred it to *Cortinarius* (*Phlegmacium*); but RICKEN has observed marginal, clavate cystidia on the gills, which would indicate that it should not be referred to *Cortinarius*, although the spores approach it to this genus. It is also a native of America: Michigan (KAUFFMAN), Adirondacks (LANGE).

III. EU-PHOLIOTA

A. *Truncigenæ*

α. *Carnosæ*

a. *Eu-Dermineæ*

1. VISCIDÆ

3. *P. adiposa* Fr. (Plate 107. fig. A.)

Large or rather large. Cap 6—9 cm, convex, viscous, dark yellow, everywhere set with fulvous bay-brown, cherry gum-like scales. Gills at first straw-yellow. Stem rather long, yellow above, becoming ferruginous brown downwards, squarrose up to the apical, incom-

plete ring, with numerous tiers of bay-brown, glutinous scales. Flesh of stem yellow, paler in the cap. — Fasciculate, often in big clusters.

Spores oval, $5\frac{1}{2}$ — $6\frac{3}{4} \times 3\frac{1}{2}$ — $3\frac{3}{4} \mu$, smooth, pale brownish yellow.

Not uncommon. Always clustering at the base of trunks and stumps of Fagus.

Although *P. adiposa* is one of the most characteristic and well defined species, it has been misinterpreted a good deal in mycological literature, f. inst. by QUÉLET (who probably mistook it for *P. aurivella*). The smallness of the spores is the most outstanding character, besides the glutinous-scaly stem.

4. *P. lucifera* (Lasch) Fr. (Plate 107. fig. B.)

Rather small or medium. Cap $3\frac{1}{2}$ — $6\frac{1}{2}$ cm, convex, slightly gibbous, dark yellow, the disc somewhat ferruginous, viscid, with small, ferruginous-fulvous, adpressed, drop-like scales; edge fringed by the veil. Gills crowded, yellow, becoming ferruginous (edge paler), rather narrow. Stem 4 — $6 \times 0,4$ — $0,8$ cm, fibrillose-squamulose below the fugacious ring, apex yellowish white, rusty towards the base. Flesh somewhat bitter, yellowish white in the cap, rhubarb-rusty towards the base.

Spores oval-phaseoliform, 7 — $7\frac{1}{2} \times 4$ — $4\frac{1}{2} \mu$, smooth, amber-yellow. Cystidia clavate basidiiform, about 8μ broad (slightly larger than the basidia).

Rare. Found by M. P. CHRISTIANSEN on buried sticks (of Fraxinus?) Also recorded from other localities in Sjælland by N. F. BUCHWALD and others.

5. *P. intermedia* n. sp. (Plate 109. fig. D.)

Rather large. Cap 5 — 8 cm, strongly convex, viscid, pale yellow, but towards the middle almost completely covered by fulvo-ferruginous, broad, triangular scales, which become more scattered towards the paler, almost straw-coloured edge. Gills pale yellowish, then cinnamon chestnut, emarginato-adnate. Stem $0,7$ — $0,9$ cm thick, squarrose — from base more than half way up — with recurved, ferruginous cinnamon scales on a slightly paler, brownish yellow ground; apex straw-yellow. Ring incomplete. Almost inodorous. — Fasciculate.

Spores oval, 6 — $6\frac{3}{4} \times 4$ — $4\frac{1}{2} \mu$. Cystidia on edge of gills cylindric bottle-shaped, about $30 \times 7 \mu$.

Rare. Only found at Krabbesholm, Jylland, 1918—32, growing in a knot-hole in a trunk of Juglans.

This species is intermediate between *P. aurivella* and *P. squarrosa*. The stem reminds one of *P. squarrosa*, while the cap is more aurivelloid. The dry stem distinguishes it from *P. adiposa*, the smaller spores from *P. aurivella*.

6. *P. aurivella* (Batsch) Fr. (Plate 108. fig. D.)

Large. Cap 8 — 12 cm, expanded gibbous, deep yellow (ferruginous in the middle), with rather large, adpressed, bay-brown fulvous scales. Cuticle gelatinous. Gills pale straw-

yellowish, becoming ferruginous brown, emarginate. Stem ascendent, fibrillose, with a fugacious, incomplete ring, at first almost whitish above, but soon becoming brownish yellow, from base up.

Spores oval ovate, $8-9 \times 5 \mu$.

Rather rare. Growing on trunks of frondose trees (often high up) in small clusters or almost solitary.

The figures on plate 108 D depict the plant at a rather advanced age. FRIES describes this species as "subviscido", but I have always found the cuticle gelatinous slimy. In contradistinction to *P. adiposa* it never grows at the foot of trees or around stumps.

6 a. *P. aurivella* var. *cerifera* (Karst.) n. comb. (*P. cerifera* Karst.). (Plate 108. fig. E.)

Differing from the type by the pale yellow (in the central part somewhat ferruginous) cap and by having the stem up to the ring-like zone densely clad with recurved, squarrose scales which at first are whitish (like the stem) but soon turn brownish-rusty from base upward. The spore-print is dark cinnamon.

Spores oval ovate, $9 \times 5-5\frac{1}{2} \mu$. Cystidia hair-shaped, short.

Rare, found only on *Fagus*, growing some meters up, in knot-holes and fissures, almost solitary.

This form is transitional to *P. intermedia* by the squarrose stem, but has the spores of *P. aurivella*. *P. cerifera* Karst., as described in „Mycologia Fennica” III, p. 169, seems to me to be identical with my plant, but it is hardly specifically distinct. KARSTEN probably was induced to believe so, because FRIES describes *P. aurivella* as only subviscid.

2. SICCÆ

7. *P. squarrosa* (O. F. Müll.) Fr. (Plate 110. fig. D & D¹.)

Rather large. Cap 3—8 cm, convex, fundamental colour pale straw-yellow, but almost entirely obscured by the squarrose, recurved, cinnamon scales. Gills straw-yellowish when young. Stem often rather tall, attenuated downward, whitish above the apical, split ring, peronate with numerous tiers of recurved scales like those on the cap. Inside straw-yellowish. Densely fasciculate.

Spores somewhat variable in size. In the figured specimens ellipsoid oval, $7-8 \times 4 \mu$; in several other finds smaller, $6\frac{1}{2} \times 3\frac{1}{4}-3\frac{3}{4} \mu$. Cystidia obovate club-shaped (with or without a short, hair-like appendix), about $8-10 \mu$ broad.

Rather common, chiefly on frondose trees (*Fraxinus*, *Malus*, *Quercus*, *Robinia* etc.), but also on *Picea* (fig. D¹). It always clusters at the foot of the trunk.

8. *P. flammans* Fr. (Plate 109. fig. C.)

Medium to rather small. Cap 2—5 cm, strongly convex, fulvous yellow, everywhere set with triangular, sulphur-yellow scales. Gills crowded, yellow. Stem generally rather short,

below the narrow, apical ring squarrose with chrome-yellow scales. Flesh of cap and stem yellow.

Spores ellipsoid, $4-5 \times 2\frac{1}{2} \mu$. Cystidia crowded, rather obtuse, cylindric bottle-shaped, about 30μ long.

Rather rare, subsolitary, on stumps of *Picea*.

9. *P. spectabilis* Fr. (Plate 108. fig. B.)

Large or very large. Cap 6—12 (20) cm, convex, of a rich golden yellow, innately fibrillose or somewhat fibrillose squamulose. Gills yellow, soon becoming ferruginous. Stem somewhat fusiform and tapering into a short „root”, paler than the cap, slightly fibrillose. Ring horizontal, apical. Flesh light yellow. — Solitary or in small fascicles on stumps.

Spores ovate ellipsoid, $8-10 \times 5-5\frac{1}{2} \mu$, minutely granulate. Cystidia crowded, obtuse hair-shaped, apex slightly swelled. Basidia 4-spored.

Not uncommon, on stumps and at the base of old trees (*Ulmus*, *Fagus*, *Quercus*, *Crataegus* etc.).

10. *P. tuberculosa* (Schaeff.) Fr. (Plate 108. fig. A.)

Rather small. Cap $2\frac{1}{2}-3$ cm, convex, yellow, centre rusty-yellow, smooth, at length disrupting towards the edge into small, adpressed squamules; edge incurved. Gills broadly adnate, rather crowded, yellow. Stem short, cinnamon-ferruginous, with small, adpressed scales and a horizontal ring. Apex whitish-yellow, base slightly swelled, napiform. Taste somewhat bitter.

Spores ovate phaseoliform, $6\frac{3}{4}-7\frac{3}{4} \times 4\frac{1}{2}-5 \mu$, smooth, yellow. Cystidia balloon-shaped or inflated club-shaped, $20 \times 8-14 \mu$.

Rare. Met with on sticks in wood of *Fagus* (and also on branches of *Tilia*) by M. P. CHRISTIANSEN (Sjælland 1934).

b. *Phæotæ*.

11. *P. destruens* (Brond.) Fr. (Plate 107. fig. C.)

Large and robust. Cap 6—10 cm, convex or somewhat gibbous, of a pale cinnamon or wood-brown colour, but a first almost entirely covered by a thick, cottony, white universal veil which soon breaks up into broad scales, leaving the disc almost naked. Gills at first pallid, then cigar-brown or Vandyke. Stem very short, mostly 2—3 cm thick, scaly like the cap; discolouring, from base up, to a dingy brown. Spore-print cigar-brown. Smell rather strong, somewhat aromatic.

Spores oval, $7\frac{1}{2}-8\frac{1}{2} \times 5 \mu$, pale brown. Cystidia hair-shaped, obtuse, about 5μ broad.

Not common, exclusively on *Populus*-stumps. The fruit-bodies always spring from the central part (the pith-region) of the wood, while in most other xylophilous fungi they are chiefly to be found in the peripheral region.

FRIES did not know this species from personal observation. It seems to be a southern species. In Denmark I have most frequently met with it after hot summers.

12. *P. heteroclita* Fr. (Plate 108. fig. C.)

Rather large. Cap about 7 cm, convex, dry, light yellow, paler towards the edge, somewhat scaly in the middle by adpressed, brown scales, towards the edge less distinctly scaly by dispersed, fibrillose squamules. Gills at first pallid, then watery-pallid grayish brown. Stem short, curved, base inflated, apex whitish, plumulose, below the rudimentary ring yellowish, fibrillose, rhubarb-rusty towards the base (inside as well as outside). Flesh very thick. Smell strong, reminding of that of *Inocybe pyriodora* and *Armoracia*. Spore-print light cigar-brown.

Spores oval ovate or sub-phaseoliform, $7-8 \times 4\frac{3}{4} \mu$, smooth, brownish-yellow.

Rare. Collected by F. H. MØLLER in Falster (1933), growing solitary on trunk of *Alnus*.

13. *P. radicata* (Bull.) Fr. (Plate 109. fig. E.)

Large. Cap 7—9 cm, convex or subgibbous, alutaceous pale or deal-brownish, towards the edge more or less fibrillose-squamulose, slightly viscid or dry. Gills pallid, then dull brownish. Stem firm, whitish, fibrilloso-squarrose with a long, tapering "tap-root" and a double ring with a lacinate edge.

Spores ovate ellipsoid, $7\frac{1}{2}-9\frac{1}{2} \times 5-5\frac{1}{2} \mu$, very minutely asperulate. Cystidia hair-shaped clavate, up to 40μ long and 8μ broad (or even 12μ).

Rather common, generally solitary, in woods of *Fagus* and *Quercus*.

A subfasciculate, small form (cap only 3—4 cm, stem almost rootless) is occasionally met. Some authors call this species *Hebeloma radicosum*. Although apparently growing on the ground it is probably xylophilous like *Collybia radicata*.

β . Hygrophanæ

***P. confragosa* Fr.**

Rather small. Cap $2\frac{1}{2}-4$ cm, strongly convex, then somewhat flat or with upturned edge, umbilicate, hygrophanous, rufous, clad with a white, minute tomentum, especially towards the edge. Gills almost of the same colour, but more vivid, with a flush of trout-red or salmon, rotundato-adnate, narrow and crowded. Stem rather short, fistulose (base incrassated), somewhat lighter than the cap and more ochry, whitish above, densely piloso-tomentose by a white tomentum below. Ring large, whitish, entire, cup-shaped, then pendulous. Smell pleasant. Taste faint. Spore-print fulvous rusty.

Spores sub-phaseoliform, $6-7\frac{1}{2} \times 3\frac{3}{4}-5 \mu$. Cystidia fasciculate, cylindric or slightly fusoid, wavy, $25-45 \times 6-7\frac{1}{2} \mu$.

Rare. Recorded from Lolland 1926 by F. H. MØLLER, growing somewhat fasciculate on sawdust.

A very characteristic species, which seems to have a northern distribution.

14. *P. mutabilis* (Schaeff.) Fr. (Plate 110. fig. A.)

Medium. Cap $3\frac{1}{2}-5$ cm, somewhat gibbous, varying in colour from almost chestnut or date-brown to pale tan (umbo generally darker); very hygrophanous. Gills at first pallid. Stem slender, whitish above, below the apical, membranous ring densely squarrose-squamulose, dark chestnut or umber. — Densely fasciculate.

Spores ovate ellipsoid, $6-7 \times 4-5 \mu$. Cystidia crowded, short hair-shaped, apex slightly swelled.

Very common, from spring to early winter, exclusively on frondose stumps.

15. *P. marginata* (Batsch) Fr. (Plate 109. fig. B.)

Rather small. Cap $2\frac{1}{2}-3$ cm, convex flat, very hygrophanous, gilvo-ferruginous or subfulvous, edge minutely striate. Gills rather narrow, becoming cinnamon rusty. Stem slender, $5-7 \times 0.4$ cm, dusky brownish, darkening from base up (darker inside), in vigorous specimens with silvery white fibrils. — Somewhat fasciculate.

Spores ovate ellipsoid, about $8-8\frac{1}{2} \times 5\frac{1}{4}-5\frac{1}{2} \mu$. Cystidia hair-shaped, obtuse, base somewhat inflated.

Not uncommon, almost exclusively on coniferous stumps. But I have exceptionally met with it (a form with very narrow gills) on a stump of a frondose tree (*Fagus*?).

16. *P. unicolor* (Vahl) Fr. (Plate 109. fig. A & A¹.)

Small or very small. Cap $1-1\frac{1}{2}$ cm, convex, somewhat umbonate, of a very pale ferruginous colour, somewhat hygrophanous. Gills rather broad. Stem short, at first almost white, becoming dingy ferruginous from base up, inside as well as outside. — Subsolitary.

Spores varying somewhat in size, $7\frac{1}{2}-9 \times 4\frac{1}{2}-5$ (fig. A), $9-10 \times 5-5\frac{1}{2} \mu$ (fig. A¹). Cystidia obtuse, hair-shaped with a somewhat inflated, $6-9 \mu$ broad basal part.

Rather rare, but met with on frondose as well as coniferous stumps and sticks. (Plate 109, fig. A from *Salix*, fig. A¹ from *Picea*).

The specific value of *P. unicolor* is rather dubious, especially as transitional forms to *P. marginata* occur (on fallen sticks of *Picea* (fig. A¹)). But the types are of very different stature.

17. *P. pumila* Fr. var. *subferruginea* Møller & Lange n. var. (Plate 109. fig. F.)

Small. Cap $1\frac{1}{2}-2$ cm, convex, edge indistinctly striate, honey-ferruginous (ochry when dry), very fragile. Gills very broad, broadly adnate (or slightly decurrent), of a vivid

ochre-ferruginous colour. Stem about 4—5 cm, slightly paler than the cap, glabrous, with an apical, small, membranous, slightly striate ring.

Spores ovate, $10 \times 6 \mu$. Basidia 4-spored. Cystidia about 60μ long, hair-shaped, obtuse, base slightly swelled ($6-7 \mu$ broad).

Rare. Met with on meadow-land, wet ground amongst grass (not attached to moss), in Jutland (1921). (Also recorded by F. H. MØLLER from similar localities in Falster).

The plant here described differs from *P. pumila* in the sense of FRIES by the more lively coloured, ochre-ferruginous gills, and the ring which — though small — is distinctly membranous. But the stature and habitat is identical. Microscopically it is very close to *P. unicolor* and *P. marginata*.

B. *Humigenæ*

α . Phæotæ

18. *P. erebia* Fr. (Plate 105. fig. B.)

Medium. Cap 3—6 cm, convex, somewhat umbonate (edge in old specimens somewhat reflexed), slightly viscid, bistre-brown (paler, dirty brown when dry), edge somewhat grooved. Gills pallid when young, soon turning almost Vandyke-brown. Stem whitish at first, becoming dirty bistre-brownish from base upward; apex with decurrent lines. Ring radiately striate, white. Spore-print Vandyke-brown.

Spores ellipsoid, $10-13 \times 5-6 \mu$. Basidia 2-spored. Cystidia cylindric club-shaped, $10-12 \mu$ broad. Cuticle of cap formed of globular, balloon-shaped or pyriform cells, $9-15 \mu$ diam.

Not uncommon in small troops on moist ground in shady, frondose woods.

FRIES figured this species in *Icones. sel.* (tab. 20) under the erroneous name *Armillaria denigrata*. His description of *P. erebia* is not very good (he placed it in "*Eudermiini*" in spite of its dark spore-print). This probably explains a good deal of the confusion still extant. Both RICKEN and BRESADOLA (besides *P. erebia*) describe *P. ombrophila* Fr., but characterise the two macroscopically in very similar terms and microscopically as almost identical. The American author PECK described it under various names (*P. aggericola*, *P. indecens*); but already KAUFFMAN showed their identity. The large spores and 2-spored basidia distinguish this species, which has much in common with *Hebeloma*.

18 a. *P. erebia* forma *gracillima* (Plate 104. fig. G.)

A small and gracile type (cap 3 cm, stem 5×0.3 cm), but in every other respect macro- and microscopically like the main form.

Met with in a moist, frondose wood.

19. *P. brunneola* (Fr.) Lange n. comb. (*P. ombrophila* Fr. var. *brunneola* Fr.). Pl. 105. fig. A.)

Medium. Cap $4\frac{1}{4}$ cm, expanded, somewhat umbonate, coarsely wrinkled when old, dingy date-brown or grayish bistre (when dry paler date-brown). Gills rather narrow (4—5 mm), moderately crowded, with a paler, somewhat eroded edge, at first pallid greyish

brown, then darker date-brown fuscous. Stem slightly clavate, $5-6 \times 0.8$ (base 1.0) cm, dingy whitish above, subfuscous below, hollow, somewhat rooting, with coarse, white strands of mycelium like no. 18. Ring pendulous, thin. Spore-print cigar-brown.

Spores ovate to sub-limoniform, $7-8 \times 4\frac{1}{2}-4\frac{3}{4} \mu$, date-brownish, diaphanous. Basidia 4-spored. Cystidia very scarce, inflated, with or without a short, obtuse "bottle-neck", $45 \times 18 \mu$.

Rare. Only met with once, on sandy ground in a plantation, near Flensburg, Oct. 1936.

The 4-spored basidia and the smaller spores characterise this species, but it may be nothing but a 4-spored form of *P. erebia*. FRIES' *P. ombrophila* evidently is a collective. His figure and description of var. *brunneola* (Icones sel., tab. 103²) fit my plant so well, that I deem it justifiable to apply the name to this form.

20. *P. dura* (Bolt.) Fr. (sensu Quélet). (Plate 105. fig. D.)

Medium. Cap 3—7 cm, convex, alutaceous white or cream, firm and fleshy. Gills at first pallid, then smoky gray to dull brown, adnate. Stem cylindric, firm, often tall, whitish, with an apical, narrow, cottony ring. Spore-print light cigar-brown.

Spores ovate-ellipsoid, $12-13 \times 7\frac{1}{2} \mu$. Edge of gills rather sparsely set with cylindric sack-shaped or slightly bottle-shaped, $14-16 \mu$ broad cystidia.

Rather common, chiefly at road-borders and in cultivated fields, rarely in woods, mostly early in the season.

SCHROETER (loc. cit.) describes this species sub nom. *P. candicans* (Schaeff.). FRIES' description is fairly good, except with regard to the colour of the cap, which he erroneously calls "fulvous, alutaceo-fuscescent". The larger spores distinguish this species clearly from whitish forms of *P. præcox*.

20a. *P. dura* forma *cutifracta* (*P. vermiflua* Peck). (Plate 106. fig. F.)

A large, cream-yellow and strongly areolate-rimose form, very much like the one figured by BRESADOLA as var. *xanthophylla*, but the gills are not yellow (vide Iconographia, tab. 689).

Spores and cystidia do not differ materially from those of the main form.

In cultivated, open fields. Rarer than the type.

21. *P. præcox* (Pers.) Fr. (Plate 106. fig. G.)

Medium to rather small. Cap 3—5 cm, convex, pale horn-brownish or alutaceous, expal-lent (whitish when dry). Gills at first pallid, then dull brown. Stem rather thin, whitish with a membranous, drooping ring. Spore-print light cigar-brown.

Spores ovate ellipsoid, $9-10 \times 5-5\frac{1}{2} \mu$. Cystidia (on edge and face of gills) rather sparse, inflated bottle-shaped, obtuse, about 20μ broad. Cuticle of cap made up of sub-spheric, about $10-18 \mu$ broad cells.

Very common, from June to harvest-time, chiefly in shady places, under trees, in copses etc.

The sub-hygrophanous, horn-brownish pallid cap and the smaller spores distinguish this species from the preceding one.

21 a. *P. præcox* forma *cutifracta*. (Plate 106. fig. D.)

More compact, short-stemmed, the cap at last areolate-rimose, but for the rest not materially differing from the main form.

Road-borders etc.; rather rare.

Evidently an open-air form.

21 b. *P. præcox* var. *paludosa* Lange. (Plate 106. fig. E and E¹.)

Small. Cap 1½—3 cm, horn-brown to pale tan or alutaceous. Stem very slender, 5—7 cm × 0.2—0.3 cm, fistulose, somewhat wavy, flushed with the colour of the cap. Ring apical, horizontal, rather broad, inferior.

Spores etc. as in the main form.

Not uncommon in marshy meadows. June.

Evidently a palustrine form, but more like a *Naucoria* (*N. arvalis*) than an ordinary *P. præcox*. BRESADOLA describes and figures it sub nom. *P. sphaleromorpha* (Bull.) Fr. ("Iconographia", tab. 692). But it cannot be the true *P. sphaleromorpha* which according to FRIES has whitish yellow gills, a deep yellow ("luteus") cap and a somewhat bulbous stem, and which grows in gardens, at road-sides etc.

22. *P. ægerita* (Brig.) Fr. (Plate 107. fig. D.)

Rather small or medium. Cap 3½ cm, convex, pallid tan, edge incurved, even, paler than the disc. Gills whitish, then gray-brownish, adnate with a decurrent denticle. Stem short, hollow, whitish, flushed with the cap-colour, somewhat attenuated. Ring horizontal, radiato-striate by the brown spore-powder. Flesh whitish, with a somewhat farinaceous smell.

Spores ovate, 8—5 µ, translucent, pale brownish, smooth. Cystidia (on edge and face of gills) dispersed, balloon-shaped, about 15 µ broad.

Rare. Growing at the base of a Robinia in a garden, Odense 1927.

This species has many traits in common with *P. præcox*. The main difference is its sub-xylophilous habit. — Besides the form here depicted I have seen a specimen (found growing on an old board) which was considerably larger, with slightly longer spores (9 × 5 µ). This is the only representative of this southern tribe which I have on record from Denmark.

β. Eu-Derminæ

23. *P. togularis* (Bull.) Fr. (sensu Quélet). (Plate 106. fig. A and A¹.)

Rather small. Cap 2—3½ cm, convex or slightly gibbous, hygrophanous, when fresh some tint of tan-colour, alutaceous when dry. Gills rather broad, almost free, ochre to somewhat ferruginous. Stem rather short (3—4 cm), whitish, becoming dirty ferruginous from base up (especially inside). Ring white, somewhat spreading, radiato-sulcate, often split into fragments. Spore-powder light ferruginous ochre.

Spores oval, $7\frac{1}{2}$ — $9 \times 4\frac{1}{2}$ — $5\ \mu$. Cystidia coarsely hair-shaped, apex slightly swelled (up to $7\ \mu$ broad), obtuse.

Not uncommon, in gardens etc., early in the season (April—May).

Fig. A on plate 106 represents the pale form, fig. A¹ the somewhat darker, ferruginous brownish one. RICKEN calls this species *P. blattaria* Fr., and KÜHNER (Le genre *Galera*) adopts the same nomenclature which, however, cannot be upheld, as it is anti-Friesian. (FRIES in "Monographia" expressly states that *P. blattaria* has an entire, smooth ring). The synonymy is made still more confused by the alterations made by FRIES himself, who in "Monographia" (while calling *P. togularis* *P. Arrhenii*) used the name *P. togularis* for the species which in "Hymenomycetes" he calls *P. ombrophila*.

24. *P. filaris* Lange n. comb. (*P. togularis* (Bull.) Fr. var. *filaris* Fr.). (Plate 106. fig. C and C¹.)

Very small. Cap 1 — $1\frac{1}{2}$ cm, campanulate, expanding, pale tan, edge paler, alutaceous, somewhat striate when fresh. Gills almost free, light ochry tan. Stem slender (3 — $4 \times 0,15$ cm), white at first, then dirty ferruginous-pale with a small, spreading, radiately striate, white ring.

Spores ellipsoid, $7\frac{1}{2}$ — $4\frac{1}{4}\ \mu$. Cystidia hair-shaped.

Not uncommon, growing on the ground amongst sticks and other rubbish, mostly solitary, generally later in the season (Sept.—Oct.) than *P. togularis*.

It may be regarded as an autumnal, slender and dwarfish variety of *P. togularis*. But I deem it better to treat it as a distinct species. It is very well figured by FRIES (Icones sel., tab. 104⁴).

25. *P. teneroides* Lange. (Plate 106. fig. B.)

Small. Cap $1\frac{1}{2}$ — 2 cm, campanulate or broadly parabolic, ferruginous ochre when fresh, pale ochry yellowish and somewhat wrinkled when dry. Gills rather broad, almost free, ochre-ferruginous. Stem comparatively tall, slender (6 — $7 \times 0,2$ cm), pale straw-yellowish, becoming dirty brown from base upward, with a narrow, horizontal, slightly striate ring.

Spores ellipsoid, 11 — 12×5 — $5\frac{1}{2}\ \mu$, with a distinct apical pore. Basidia 2-spored. Cystidia cylindric flash-shaped, obtuse, about $12\ \mu$ broad.

Rather rare, on moist ground amongst sticks etc. in copses and woods.

RICKEN calls this species *P. togularis* (Bull.) Fr. and identifies it (erroneously) with *Galera ovalis*. KÜHNER (Le genre *Galera*, p. 162) follows Ricken, but also describes a 4-spored form. But as this one — to judge from his figure — has a radiato-sulcate, splitting ring, more like that of *P. filaris*, I prefer to keep the two apart. *P. blattaria* as described by FRIES in "Monographia" may be identical, although he says the cap is convex, then flat. His description in "Hymenomycetes" is, however, rather different. So the nomenclature is hopelessly confused, and I deem it preferable to use a new name. But for the distinctly annulate stem it might be mistaken for a *Galera tener*; hence the name. (Vide "Studies" IX, 1921).

INOCYBE

Medium-sized to rather small species. Cap convex or umbonate; its cuticle made up of fibrils (either adpressed-agglutinate or more or less squamulose); the edge provided with an arachnoid or rudimentary veil. Gills never truly decurrent; their edge adorned with cystidia or paracystidia. Spore-powder dull brown (not ferruginous).

INOCYBE is one of the most homogeneous and natural genera in Agaricaceæ. Although the number of species is great, only very few show any aberrant characters and the boundary-lines towards the neighbouring genera are clear and well defined. Some few authors include the indusiate *Hebelomas* in *Inocybe*. FRIES placed some of the smaller species in *Naucoria* (*A. sublimbatus* and *A. pannosus*) and in *Hebeloma* (*A. petiginosus*). And *I. dulcamara* and its allies have some traits in common with the geophilous *Flammulas*. The most aberrant species of *Inocybe* in the Friesian sense, *I. tricholoma*, is now generally transferred to *Paxillus* or to a special genus, *Ripartites*.

The number of species here described is about 50. This figure exceeds the total number of species mentioned by FRIES in *Hymenomyces Europæi*, while in most other genera the number of Danish species falls considerably below. But since the time of FRIES microscopic investigation has made it much more easy to distinguish closely related species of *Inocybe* — which show much more marked microscopical variations than f. inst. *Tricholoma* or *Amanita* — the consequence being a considerable numerical increase. On the other hand more exact investigations may also result in a reduction in the number of species by showing that what has been taken as specific characters are only phænotypical or “atmosphæric” variations of no real importance. While BATAILLE in 1910 (*Flore analytique des Inocybes d'Europe*) enumerates about 100 species, HEIM (1931) in his monography (*Le genre Inocybe*) only admits about 80, reducing the rest to varieties or synonyms.

Microscopical characteristics. The shape of the spore is the most conspicuous and easily ascertained difference between the several species. First of all we have the smooth spore and the spore with some kind of configuration. But of this latter two distinct types are met with: In *I. calospora* and its allies the spore is oval-globose, set with a number of minute, cylindric bristles. In all the rest of the subgenus *Clypeus* the spore is nodulose or almost stellate in outline. But considerable variations exist: In some species the processes are large and conical, giving to the spore an almost star-like shape, in others they are obtuse, semiglobate, in others again the outline is simply somewhat wavy-angular, thus forming a transition to the smooth spore of the elongated, almost rectilinear type. But also the smooth-spored species show considerable, if not conspicuous, differences in the shape of the spore. A number of species, particularly *I. fastigiata* and its numerous allies, have distinctly phaeoliform spores, practically without a pedicel. In a far greater number the spore is more

or less one-sided ovate or sub-limoniform with a fairly distinct, oblique pedicel. Finally *I. lacera* and some related species have subcylindric, elongated spores (breadth half the length or less).

The edge of the gills is always provided with some form of cystidia. But of these two fairly distinct types may be distinguished: the thick-walled, crested cystidium and the more thin-walled, naked one. The former type (which may also be met with on the faces of the gill) is generally more or less ventricose (fusiform, bottle-shaped or inflated limoniform) and is often crested by a scurf of crystals (oxalate of lime). The latter is clavate, obtuse or even round-headed or obovate, naked, and is strictly confined to the gill-edge. Some authors reserve the name cystidium for the crested, thick-walled type and consequently describe some species as "devoid of cystidia". However, as intermediate types exist (f. inst. in the group *flocculosa*) and as the term cystidium is in other genera used — in a far wider sense — for any sterile, marginal cells, I prefer to designate both types as cystidia, using the term paracystidia for the thin-walled type whenever it is necessary to stress the difference. In a number of species the crested cystidia are also met with on the upper part (more rarely all over) the stem, giving it a powdery-pruinose aspect, while in most cases the surface of the stem is minutely fibrillose. (This difference is sometimes a very good mark of distinction between two species of similar habit (e. g. *I. asterospora* — *I. napipes*).

Taxonomy. Since the introduction of microscopic investigation — shortly after the time of FRIES — the description of the individual species has gained much in exactness. The microscopical characters also are of great value for the taxonomy of the genus, and some progress has certainly been made in later years. Still a really natural, indisputable taxonomy seems yet to be a good way off.

Under the overwhelming impression of the difference in spore-shape revealed by the microscope some authors proposed to divide *Inocybe* in two distinct genera, *Clypeus* (KARSTEN) or *Astrosporina* (SCHROETER) being the name adopted for the rough-spored series. However, this can hardly be deemed an improvement. To disband such a natural entity as the genus *Inocybe*, rending the tie between such intimately related species as f. inst. *I. Cookei* — *I. prætervisa*, *I. obscura* — *I. lanuginosa* etc., seems to me a step in the wrong direction.

On the other hand to reduce the main types of spores (and cystidia) to characters of secondary importance (as done by HEIM in his elaborate monography) seems to me equally out of place. If this be done, one must needs rely mainly upon other, generally more vague, characters, thus rendering the whole taxonomy more indefinite. Although HEIM's proposal: to divide the genus into a number of divisions and subdivisions ("stirpes") is excellent, the actual results are not so convincing and self-evident as could be desired. Thus he places *I. umbratica* (a species with almost stellate spores and a pruinose, marginato-bulbose stem) in the immediate vicinity of *I. geophylla* (which is smooth-spored, with a bulbless, fibrillose stem); and *I. jurana* (a species showing strong affinity to the *fastigiata*-stirpe) he places

close to *I. pyriodora* and its allies (which have crested cystidia and almond-shaped spores, while *I. jurana* has phaseoliform spores and only paracystidia at the gill-edge). *I. calospora*, the quite unique little *Naucoria*-like species with subglobose, spinulose spores, he places in the vicinity of his stirpe *astrosporina*, the type of which is a large species with nodulose spores.

However, it is evident that the taxonomic arrangement of FRIES cannot be upheld. The small section *Viscidi* lost all coherence when its main type, *I. tricholoma*, was removed to another genus. The other 4 sections are more distinct, but too artificial, being established almost exclusively on the nature of the coating of the cap (and stem).

When in 1917, as a result of 24 years' investigations, I published a paper on *Inocybe* (Studies in the Agarics of Denmark, III) I divided the genus into two subgenera: *Eu-Inocybe* (with smooth spores) and *Clypeus* (comprising all the rough-spored species). *Eu-Inocybe* I subdivided in two sections: *Muriculatæ* and *Depauperatæ* (with crested cystidia and paracystidia respectively); and *Clypeus* was similarly divided into two: *Astrosporina*, with nodulose-stellate spores, and *Calosporæ* with spinulose spores. These main divisions in my opinion deserve to be maintained. But as a result of recent finds and further investigations during the last 20 years (by myself and other mycologists) I have now rearranged the minor subdivisions and tried to establish an altogether more natural taxonomy (comprising a number of larger and smaller "stirpes") and constructed a key accordingly, to facilitate the identifications of the species.

KEY

TO THE SPECIES FIGURED

I. EU-INOCYBE

Spores smooth.

A. MURICULATÆ. Edge of gills set with thick-walled, often crested cystidia.

α. *Ovisporæ*. Spores obliquely ovate or phaseoliform.

a. *Pyriodoræ*. Large species with a rather strong, sweetish-aromatic smell.

1. Cap whitish or somewhat ochraceous.

* Cap rather obtuse, somewhat ochre or flushed with flesh-colour.

† Large and stout. The stem (and occasionally also the cap) flushed with pinkish flesh-colour 1. *I. incarnata*

†† Somewhat smaller. Only the flesh of the stem slightly flushed with flesh-colour... .. (*I. pyriodora*)

** Cap somewhat conical, whitish, then pallid 2. *I. corydalina* var. *albido-pallens*

2. Cap obtuse, with bistre or dark brownish, adpressed scales and fibrils ... 3. *I. scabra*
- b. Ingratæ. Smell slight, disagreeable (earthy, spermatic or obsolete).
 1. Stem becoming tinged with green. Flesh flushed with red ... 4. *I. hæmacta*
 2. Stem not becoming green.
 - * Stem with recurved scales ... 5. *I. hystrix*
 - ** Stem squamulose or smooth.
 - † Cap bistre to pale mouse-gray (ochre in no. 13).
 - ° Cap bistre, squamulose or squarrose. Cystidia brownish.
 - ^ Cap squarrose, very small ... 6. *I. cincinnata*
 - ** Cap squamulose-felty, larger ... 7. *I. obscura*
 - °° Cap mouse-gray or brown (ochre in no. 13), felty-fibrillose to almost smooth.
 - ^ Cap not distinctly rimose.
 - Stem pale lilac above ... 8. *I. griseo-lilacina*
 - ** No trace of lilac.
 - ° Spores medium (8 μ long or more).
 -) Cap very small, when young clad with whitish fibrils and squamules ... 9. *I. abjecta*
 -) Cap larger (2—2½ cm) (vide also no. 20, *I. deglubens*).
 - ” Cap mouse-brown, fibrillose-tomentose and subsquamulose ... 10. *I. flocculosa*
 - ”” Cap mouse-gray, when young covered with hoary-white fibrillosity ... 11. *I. pallidipes*
 - °° Spores small (about 7 μ long). Cap almost smooth, small ... 12. *I. microspora*
 - ** Cap becoming distinctly rimose; fibrils date-brown or ochre.
 - Stem whitish above.
 - ° Cap somewhat ochry ... 13. *I. auricoma*
 - °° Cap date-brown ... 14. *I. descissa* var. *brunneo-atra*
 - ** Stem bluish above ... 15. *I. pusio*
 - †† Cap lilac, whitish, pallid or ochraceous.
 - ° Cap not ochraceous.
 - ^ Cap about 2 cm, acuminate.
 - Cap white to whitish ... 16. *I. geophylla*
 - ** Cap lilac or flushed with light red.
 - ° Cap lilac ... 16 a. *I. geophylla* var. *lilacina*
 - °° Cap becoming flushed with tile-red or light red ... 16 b. *I. geophylla* var. *lateritia*
 - ** Cap 3—5 cm, rather obtuse.
 - Cap becoming flesh-coloured or pink.

- Stem without marginate bulb 17. *I. rubescens*
 - Stem marginato-bulbose... .. 18. *I. Rickenii*
 - Cap not staining pinkish.
 - Cap white to whitish, silky-smooth 19. *I. sindonia*
 - Cap pallid to brownish. Cuticle disrupting... .. 20. *I. deglubens*
 - Cap ochraceous.
 - ^ Stem tall, somewhat club-shaped... .. 21. *I. posterula*
 - ^^ Stem rather short, cylindric.
 - Cap 2—4 cm. Cuticle at last breaking up into scales 22. *I. Langei*
 - Cap 1—2 cm.
 - Stem minutely velutinous-pruinose and striato-sulcate 23. *I. hirtella*
 - Stem minutely fibrillose-plumose (vide *I. auricoma*, no. 13).
- β. *Longisporæ*. Spores long (averaging 12 μ or more, oblong (at least twice as long as broad)).
 - a. Cap 2—3½ cm, fibrilloso-squamulose all over, dull brown... .. 24. *I. lacera*
 - b. Cap larger (almost glabrous, disc whitish) 25. *I. serotina*
- B. DEPAUPERATÆ. Edge of gills with subclavate, thin-walled paracystidia.
 - α. *Pyriodoræ*. Smell sweetish-aromatic. Rather large species.
 - a. Large species. Cap light cinnamon, tinged with flesh-colour... .. 26. *I. Bongardii*
 - b. Medium sized species. Cap darker, cigar-brown (*I. Bongardii* var. *cervicolor*)
 - β. *Ingratæ*. Smell spermatic, earthy or very faint.
 - a. Cap squarrose, dark brown or bistre.
 - 1. Stem fibrilloso-striate 27. *I. hirsuta*
 - 2. Stem with squarrose, recurved scales... .. 28. *I. calamistrata*
 - b. Cap not squarrose.
 - 1. Flesh some shade of red or pink. Rather large species.
 - * Cap originally whitish, becoming tinged with light red or pink. Robust species... .. 29. *I. Patouillardii*
 - *•• Cap with dark or somewhat cinnamon fibrils. Flesh flushed with vinaceous-pink.
 - † Cap with dark fibrils. Rather robust species 30. *I. jurana*
 - †† Cap with light brownish fibrils. More slender species 31. *I. rhodiola*
 - 2. Flesh not flushed with red.
 - * Cap more or less rimose, somewhat conical when young. Rather large species.
 - † Cap bay-brown or chestnut, often with adpressed, whitish scales when young 32. *I. maculata*
 - †† Cap some other colour.
 - ° Stem not marginato-bulbose.

- ^ Umbo of cap cigar-brown, edge whitish. Very large species ... 33. *I. perlata*
- ** Cap some other colour.
 - * Cap alutaceous-ochre or cinnamon-ochre, rimose... 34. *I. fastigiata*
 - ** Cap deep yellow-ochre (umbo darker), somewhat diffracto-squamose... 35. *I. squamata*
- °° Stem marginato-bulbose. Cap pale ochre... 36. *I. Cookei*
- ** Cap convex-flat, velvety-tomentose to plushy-squamulose, ochry ... 37. *I. dulcamara*

II. CLYPEUS

Spores not smooth.

A. ASTROSPORINA. Spores stellate or nodulose-angular.

α. Cap without erect hair-scales on the disc.

a. Spores almost stellate with conical projections or prominent, blunt nodules.

1. Stem with a distinctly marginate bulb, pruinose and minutely striate.

* Cap rimose with dark umber or bay-brown fibrils... 38. *I. asterospora*

** Cap subrimose, ochry.

† Cap medium, conic-convex... 39. *I. prætervisa*†† Cap small (1½–2 cm), conical ... 40. *I. xanthomelas*

2. Basic bulb without distinct margin (or stem almost equal). Stem not pruinose.

* Rather large and tall, cap somewhat conical. Bulb depressed 41. *I. napipes*** Rather small and short. Bulb not depressed... 42. *I. umboninota*

b. Spores irregular, obtusely nodulose or wavy-angular.

1. Stem bulbous.

* Rather small. Cap about 2 cm, brown, subrimose... 43. *I. umbrina*** Larger. Cap 2½–4 cm, dingy, with silky whitish fibrils 44. *I. grammata*

2. Stem not distinctly bulbous.

* Large. Cap campanulate, whitish to pale clay. Stem white 45. *I. fibrosa*

** Not so.

† Cap rather large, dark brown or rufous-umber... 46. *I. Boltonii*

†† Cap smaller (1–3 cm).

° Cap dull brown to mouse-gray. Spores 8–9 μ long.

^ Cap 1½–3 cm, conic-convex, tomentoso-fibrillose 47. *I. lanuginella*** Cap 1½ cm, conical, fibrilloso-rimose 48. *I. putilla*

°° Cap brownish or whitish. Spores 6–8 μ.

^ Cap whitish to somewhat yellowish... 49. *I. trechispora*

** Cap brownish, somewhat hoary.

- Subfasciculate. Cap brownish to umber, originally clad with whitish, pilose tomentum... 50. *I. rufo-alba*
- Solitary. Cap brownish, clad with agglutinate, whitish, minute squamules when young ... 51. *I. petiginosa*
- β. Cap clad with erect hair-scales in the middle, umber to bistre... 52. *I. lanuginosa*
(Cystidia thin-walled, inflated, smooth or slightly crested).
- B. CALOSPORA. Spores ovate-globose, minutely spinulose. Cap small (about 2 cm), brown ... 53. *I. calospora*

SPECIFIC DESCRIPTIONS AND NOTES

I. EU-INOCYBE

A. *Muriculatæ*

α. *Ovisporæ*

Stirpe 1: *pyriodora*.

1. ***I. incarnata*** Bres. (*I. pyriodora* var. *incarnata* (Bres.) Maire). (Plate 110. fig. C.)

Large and robust. Cap 5—7 cm, slightly gibbous, at first very pale clay-yellowish, smooth, later on of a deeper clay-yellow, more or less tinged with pinkish flesh-colour and becoming shaggy-fibrillose towards the edge. Gills at first pallid, becoming flushed with cinnamon. Stem rather tall (6—9 cm × 10 mm or more), solid, whitish, then tinged pinkish flesh-colour (especially at apex and base) inside and outside. Smell fruity-aromatic (Calycanthus-flowers).

Spores broadly ovate, $8\frac{1}{2}$ —10 × $5\frac{1}{2}$ —6 μ. Cystidia inflated bottle-shaped, about 12—18 μ broad, crested.

Rather rare, in woods of *Fagus*.

I. pyriodora (Pers.) Fr.

Rather large. Cap 4—5 cm, fleshy at the disc, fibrillose scaly, pallid ochre, scales slightly darker. Stem paler than the cap, somewhat fibrillose, slightly tinged with pinkish tones with age, inside and outside.

I. pyriodora probably originally was a collective species, comprising nos. 1—3 and other forms. The type here described is intermediate. It is met with occasionally in frondose woods.

2. ***I. corydalina*** Quél. var. *albido-pallens* Lange n. n. (*I. albidula* Britz. sensu Sacc.). (Plate 110. fig. B.)

Rather large or large. Cap 4—6 cm, at first bluntly conical, then convex and strongly umbonate, whitish when young, becoming pallid clay with age, except at the umbo, smooth,

slightly viscid; cuticle almost glabrous, then innato-fibrillose towards the edge (but not rimose). Gills whitish when young. Stem solid, stout, 4—5 cm × 8—10 mm, white, tinged with the colour of the cap from base up. Flesh white (or slightly pink at the base). Smell sweetish aromatic (exactly like *Corydalis cava albiflora*).

Spores obliquely ovate or slightly lemon-shaped, $9 \times 5\frac{1}{2} \mu$. Cystidia inflated fusoid, crested, 13—16 μ broad, immixed with inflated club-shaped paracystidia (30—40 × 10—15 μ).

Not rare, in frondose woods.

Specimens are occasionally met with in which the umbo (rarely the whole disc) is as stained with pale ink-spots of a glaucous gray colour. This evidently is the typical *I. corydalina* of QUÉLET. — In "Studies" III (1917) I described var. *albido-pallens* sub nom. *I. albidula* Britz. sensu Saccardo. But BRITZELMAYR'S original description of *I. albidula* (in German) shows it to be an entirely different plant.

3. *I. scabra*. (O. F. Müll.) Fr. (sensu Rick.). (Plate III. fig. G.)

Rather large. Cap 4—5 cm, convex, umbonate, almost cigar-brown; umbo rather dark, shading off to a paler, dull brownish towards the edge; outer half shaggy fibrillose, edge fringed by a cottony veil. Gills at first white. Stem rather tall (6—7 cm × 5—9 mm), minutely striolate (apex slightly flocculose), whitish, flushed with dirty brown. No pinkish tints in any parts. Smell sweetish-aromatic.

Spores ovate, somewhat oblique, $9 \times 5 \mu$. Cystidia cylindric bottle-shaped, slightly crested, about $50 \times 10 \mu$. Paracystidia cylindric club-shaped, about 7 μ .

Rare. Met with in a frondose wood.

The synonymy of this species is rather bewildering. What *Agaricus scaber* in Fl. Dan. really is, nobody is likely ever to find out. Neither FRIES nor QUÉLET mentions the "fruity" smell. Probably the plant described by MASSEE (Monograph., p. 489) and figured by COOKE (Illustrations, pl. 381) sub nom. *I. Bongardii* is identical. — F. H. MØLLER records a form of this species (from Falster) with dispersed, dark scales on a pallid ground. The author has met with a similar type (in Fyn) in a wood of *Fagus*. This variety is represented fairly well by BRESADOLA'S fig. 726² in Iconographia.

Stirpe 2: *hæmacta*.

4. *I. hæmacta* B. & C. (Plate II. fig. B.)

Medium. Cap $2\frac{1}{2}$ — $4\frac{3}{4}$ cm, convex flat, with a low umbo, at first grayish brown, tomentose squamulose with adpressed scales (edge somewhat fibrillose), then shaggy-fibrillose by cigar-brown fibrils on a whitish ground which at last becomes red. Gills pallid, with a whitish edge, becoming grayish brown or (with age) flushed with red tones. Stem rather thin (4 — $5\frac{1}{2}$ cm × 3—4 mm), slightly incrassated towards the base, pallid, soon becoming flushed (from base up) with a greenish-gray colour, while the very minute fibrils and flocci are tinted a darker gray. The base remains white, slightly tomentose. The colour of the flesh of the stem is greenish like the outside, that of the cap becomes a deep and bright pink or almost cherry-red. Smell and taste almost wanting.

Spores obliquely ovate or sub-limoniform, $9\frac{1}{2} \times 6 \mu$ (or 8 — $10 \times 5\frac{1}{2}$ —6). Cystidia nar-

rowly bottle-shaped, $65-95 \times 12-18 \mu$. Paracystidia inflated clavate or almost ovate, $14-20 \mu$ broad.

Rare. Met with at Tiselholt (Oct. 1935), growing gregariously in wood of *Fagus*, in a deep bed of dead foliage on humous ground. (Also recorded from Jylland (POUL LARSEN)).

A very characteristic species, microscopically very close to the preceding one, but easily recognised by the greenish tinge on the stem, the deep pink tones, the smaller size and its lack of fruity smell. The figures of COOKE depict as well specimens very much like mine as a more stoutish form, more like *I. corydalina* in stature. HEIM (loc. cit. p. 288) regards it as a mere form of *I. corydalina*. But the lack of smell as well as the other distinctive characters make me reluctant to follow him in this.

Stirpe 3: *hystrix*.

5. ***I. hystrix*** Fr. forma *minor* Fr. (Plate III. fig. E.)

Medium to rather small. Cap about 3 cm, convex, hazel-ochre, densely squarrose by upright or recurved scales, formed of agglutinate fibrils. Gills pallid at first. Stem about $5 \text{ cm} \times 5 \text{ mm}$, squarrose by recurved, ochre-brown scales (like the cap) and concolorous. Flesh whitish (except immediately under the cuticle). Smell absent.

Spores narrowly ovate, somewhat lemon-shaped, $10 \times 6 \mu$. Edge of gills sparingly set with fusoid bottle-shaped, about 14μ broad cystidia, which are slightly muriculate at the apex. Paracystidia numerous, inflated, almost ovate, about 12μ broad.

Rare. Met with in a wood of *Fagus*, solitary.

My plants were considerably lighter, more cinnamon, than those depicted by FRIES (*Icones sel.*, tab. 106¹).

Stirpe 4: *cinninnata*.

6. ***I. cinninnata*** Fr. (Plate III. fig. H.)

Small or very small. Cap about $1\frac{1}{2}$ cm, obtusely umbonate, bistre-brown, everywhere densely set with minute, erect, acuminate squamules. Gills first pallid, edge brown. Stem $3 \text{ cm} \times 1\frac{1}{2}-2 \text{ mm}$, tinged with a violaceous colour from apex downward, pallid below, thinly covered by fibrillose, brownish flocci. Flesh in young cap flushed with violet, especially in the upper part of the stem.

Spores obliquely ovate, $9 \times 5 \mu$. Cystidia on edge elongated fusiform or almost cylindric, slightly crested, $65-70 \times 10-12 \mu$. Paracystidia almost obovate, $11-13 \mu$ broad.

Not uncommon, in moist frondose woods and copses.

Figured very satisfactorily by BRESADOLA (*Iconographia*, tab. 732²). COOKE'S *I. cinninnata* (*Illustrations*, pl. 425) does not belong here, as the spores are nodulose. HEIM'S figures (*Inocybe*, pl. 22⁶) do not show the pointed scales.

7. ***I. obscura*** (Pers.) Fr. (Plate III. fig. A & A¹.)

Rather small. Cap $1\frac{1}{2}-3 \text{ cm}$, convex, slightly umbonate, dark bistre, plushy-squamulose. Gills at first pallid (edge somewhat brown), becoming dark brown all over. Stem about

3 cm × 3 mm, paler than the cap, fibrillose-flocculose by brown flocci, white inside (or with a very faint bluish tinge (when young) in the upper part).

Spores obliquely lemon-shaped, $7\frac{1}{2}$ — $9 \times 4\frac{1}{2}$ — 5μ . Cystidia brownish, cylindric bottle-shaped, 10 — 12μ broad. Paracystidia inflated, of various shape, 9 — 18μ broad.

Not uncommon in open spaces in woods of *Picea*.

This species differs from the preceding one in being altogether larger and stouter and in lacking the pointed, erect scales. — *I. obscura* is very variously conceived. FRIES (Icones sel.) besides a small form (stature like mine) also mentions a large one. HEIM ("Inocybe") describes a number of very divergent forms, all lacking the brownish cystidia.

Stirpe 5: *flocculosa*.

8. *I. griseo-lilacina* Lange. (Plate III. fig. F.)

Rather small. Cap $1\frac{1}{2}$ — $2\frac{1}{2}$ cm, strongly convex or slightly umbonate, tomentose, then somewhat shaggy-fibrillose to subsquamulose, pale grayish-brown, centre a little darker, edge pallid, with a flush of grayishlilac. Gills at first pallid with a slight lilaceous tinge, edge remaining white. Stem rather slender (4 — 7 cm × 3 mm), inside and outside of a pale lilac colour (base whitish), covered by whitish flocci and fibrils.

Spores obliquely ovate-ellipsoid, $9 \times 5 \mu$. Cystidia hyaline, somewhat inflated bottle-shaped, with or without scurf, 40 — 55×14 — 17μ . Paracystidia obovate or almost balloon-shaped, 14 — 20μ broad.

Not uncommon in frondose woods, amongst dead foliage on humous ground.

I. obscura in the sense of BRESADOLA (Iconographia, tab. 730) evidently is identical; *I. obscura* var. *violascens* (Quél.) Heim is very close.

9. *I. abjecta* Karst. (Plate III. fig. B.)

Small. Cap 1 — 2 cm, slightly umbonate. Colour of cuticle at first almost entirely hidden by a whitish fibrillose-subfloccose tomentum, which soon disappears (from umbo outward), thus revealing the cigar-brown ground. Gills pallid when young. Stem somewhat wavy, thin (3 — 4 cm × 2 — 3 mm), inside and outside pale brownish with a tinge of flesh-colour, at first everywhere minutely fibrillose plumulose. — Solitary to subfasciculate.

Spores ovate, rather narrow, $8\frac{1}{2}$ — $9\frac{1}{2} \times 4\frac{1}{2} \mu$. Cystidia fusoid bottle shaped, 45×12 — 13μ , apex muriculate.

Not very common, in frondose woods (*Fagus*, *Tilia* etc.) on moist humus.

Smaller than the preceding species and without any lilaceous colours.

10. *I. flocculosa* Berk. (sensu Masee). (Plate III. fig. C.)

Medium. Cap 2 — $3\frac{1}{2}$ cm, campanulate convex, then expanded gibbous, of a dull mouse-brown colour, at last somewhat purer brown, everywhere fibrillose tomentose, becoming subsquamulose in the middle and subrimose towards the edge with whitish fibrils. Veil

distinct, cobwebby. Stem 3—5 cm × 4—5 mm, slightly thickened towards the base, whitish-pale (base white), everywhere white-fibrillose.

Spores obliquely ovate, rather narrow, $9-9\frac{1}{2} \times 5 \mu$. Cystidia narrowly fusoid, crested, about 12μ broad.

Rather rare, in frondose, mixed woods (*Fagus* and *Quercus*).

More robust and somewhat darker than no. 9. HEIM regards them as varieties, and they are certainly very close.

11. *I. pallidipes* Ell. & Ev. (Plate 113. fig. D.)

Medium to rather small. Cap 2—3 cm, convex, broadly umbonate, when young pale mouse-brown, covered by a hoary white fibrillosity, with age becoming almost glabrous (edge rimose) and pale cigar-brown. Veil fibrillose. Gills pallid at first, then brownish. Stem 4 cm × 4 mm, cylindric, whitish, almost glabrous. Smell faint, spermatic.

Spores somewhat obliquely ellipsoid, $10-11 \times 5-5\frac{1}{2} \mu$. Cystidia very long and narrow, about $70-75 \times 10-12 \mu$, crested.

Rather uncommon, often growing on almost naked soil along roadsides in woods.

Very close to the preceding species, probably only to be regarded as a variety. It answers very well to the original description. HEIM uses the name *I. pallidipes* for a variety of *I. entheles* which I do not know, but which, to judge from his figures, is a small species with an ochraceous, somewhat conical cap, a transition to the *I. auricoma*-type. KONRAD & MAUBLANC use the name *I. entheles* B. & Br. for my *I. pallidipes* ("Icones", tab. 101). And the American species *I. entheloides* Ell. & Ev. probably also is identical.

Stirpe 6: *descissa*.

12. *I. microspora* Lange. (Plate 113. fig. C.)

Very small. Cap 0.8—1.8 cm, somewhat conic, becoming convex, with a small, rather acute umbo, light cigar-brown (umbo somewhat darker), almost smooth, becoming minutely tomentose-fibrillose and at last very slightly rimose at the edge. Gills pallid, then dingy cinnamon. Stem 3—4 cm × $1\frac{1}{2}$ —2 mm, pallid, then flushed with the colour of the cap, base not swelled, becoming slightly hollow with age.

Spores obliquely ovate, $6\frac{1}{2}-7 \times 4-4\frac{1}{4} \mu$. Cystidia obtusely fusoid bottle-shaped, about $44 \times 14 \mu$.

Not uncommon in dense copses (*Corylus*, *Fagus* etc.) on humous ground.

The small spores and the almost even cuticle distinguish this species from *I. descissa*.

13. *I. auricoma* (Batsch) Fr. (Plate 113. fig. B.)

Very small. Cap $1\frac{1}{2}$ cm, conic, then expanded, smooth, becoming rimoso-fibrillose, pallid ochre, the fibrils gradually taking on a somewhat deeper yellowish ochraceous colour. Gills yellowish cinnamon. Stem rather slender ($3\frac{1}{2}$ —5 cm × 2 mm), almost pure white, minutely fibrilloso-plumulose (apex slightly pruinose), not distinctly hollow.

Spores obliquely ovate, $9-9\frac{1}{2} \times 5 \mu$, pale brownish-yellow. Cystidia obtusely bottle-

shaped, somewhat crested, about $55 \times 12 \mu$. Paracystidia inflated club-shaped, $10-13 \mu$ broad.

Not very common, chiefly met with in hazel-copses (*Corylus*, *Quercus* etc.).

The figure in BATSCH: *Elenchus fungorum* (pl. 5, fig. 21) does not show the fibrilloso-rimose nature of the cuticle. — Specimens with a more brownish ochre colour, which form a transition to *I. descissa*, are occasionally met. Some authors treat it as a mere variety of this species, and the two are certainly very close.

14. *I. descissa* Fr. var. *brunneo-atra* Heim. (Plate 113. fig. A & A¹.)

Small. Cap 1—2 cm, more or less conical, distinctly umbonate when expanding, dark date-brown, becoming minutely rimose about half way in. Gills pallid, slightly affixed. Stem rather slender ($3-5 \text{ cm} \times 1\frac{1}{2}-3 \text{ mm}$), white or whitish, not distinctly hollow.

Spores obliquely ovate, $8\frac{1}{2}-10 \times 5 \mu$. Cystidia fusoid bottle-shaped, about $50 \times 14 \mu$, somewhat crested.

Not uncommon in copses and shady woods (*Corylus*, *Quercus* etc.).

The form here depicted only differs from *I. descissa* var. *brunneo-atra* HEIM, as depicted in his "Inocybe" (pl. XX¹), by slightly paler cap-colour. The *I. descissa* of FRIES, which he describes: "pileo albo-fuscescente, stipite subcavo", neither HEIM nor I myself have ever observed.

15. *I. pusio* Karst. (Plate 112. fig. A.)

Small. Cap $1\frac{3}{4}-2 \text{ cm}$, rather acutely umbonate (somewhat conic at first), cigar-brown, distinctly rimose (whitish between the fibrils towards the edge). Gills pallid. Stem rather short ($3-3\frac{1}{2} \text{ cm} \times 3 \text{ mm}$), pale lilac above and slightly white flocculose, pallid brownish below. Flesh whitish, with a faint flush of lilac in the upper part of the stem.

Spores obliquely ovate-ellipsoid, $9\frac{1}{2}-10 \times 4\frac{1}{2}-5 \mu$. Cystidia fusoid bottle-shaped, about $60 \times 14 \mu$, crested.

Rather rare, on moist ground in woods (*Quercus*, *Corylus* etc.).

My plant is exactly as described by KARSTEN ("Öfversigt", p. 465). HEIM regards it as a variety of *I. obscura*.

Stirpe 7: *geophylla*.

16. *I. geophylla* (Sow.) Fr. forma *typica*. (*I. geophylla* var. *alba* auct.). (Plate 112. fig. E pro parte).

Small or rather small. Cap $1\frac{1}{4}-3\frac{1}{2} \text{ cm}$, conic, then expanded and umbonate, silky, becoming somewhat innato-fibrillose, but not rimose, white, discolouring to whitish. Gills whitish, then dirty gray or brownish. Stem $3-6 \text{ cm} \times 2-5 \text{ mm}$, smooth. Smell spermatic.

Spores obliquely ovate-ellipsoid or ovate, $8-9 \times 5-6 \mu$. Cystidia fusoid bottle-shaped, $60-70 \times 14-15 \mu$, crested.

Met with everywhere in coniferous as well as in frondose woods, often in great numbers.

The white specimens in fig. E on plate 112 may represent the type as well as var. *lateritia*.

16 a. *I. geophylla* var. *lilacina* Fr. (Plate 112. fig. G.)

Cap more or less deep lilac or almost violet (umbo generally pallid or pale tan), expal-
lent and discolouring.

Common, but almost exclusively met with in frondose woods and copses.

16 b. *I. geophylla* var. *lateritia* (Weinm.). (Plate 112. fig. E.)

Exactly like the type when young, but becoming flushed, from umbo downward, with
a bright and clear tile-red colour.

Spores obliquely ovate, about $8 \times 5 \mu$. Cystidia inflated bottle-shaped, $16-20 \mu$ broad.

Rare. Gregarious in the deep needle-bed of an old wood of *Picea* (Glamsbjerg, 1900).

Differs from the common forms by the slightly smaller spores and more inflated cystidia.

Stirpe 8: *rubescens*.

17. *I. rubescens* Gill. (Plate 112. fig. H.)

Medium to rather large. Cap $2\frac{1}{2}-5$ cm, convex, obtusely umbonate or gibbous, at first
white and silky, soon taking on a pinkish tinge (deepening to a rich pink in places or all
over) and becoming subfibrillose. Gills pallid, becoming cinnamon or flushed with pink.
Stem comparatively stout, slightly thickened downward, whitish, tinged like the cap with
age. Smell slight, spermatic.

Spores obliquely ovate or sub-phaseoliform, $9-9\frac{1}{2} \times 5 \mu$. Cystidia obtuse, inflated bottle-
shaped, about $50 \times 20 \mu$, muriculate.

Not uncommon. To be met with both in coniferous plantations and — more rarely —
in copses and shrubberies.

All modern authors seem to agree that *I. Godeyi* Gill. is identical. BRESADOLA refers it to *I. Trinii*
Weinm., but this, as MASSEE has proved, is erroneous.

18. *I. Rickenii* Kbch. (nec Heim). (Plate 112. fig. C.)

Rather small to medium. Cap $2\frac{1}{2}-3$ cm, expanded, slightly umbonate, alutaceous tan,
umbo flushed with tile-red, smooth and silky. Gills pale grayish-cinnamon, edge pallid.
Stem comparatively tall ($4\frac{1}{2}$ cm $\times$ 3—5 mm), white, slightly powdery above, with a broad mar-
ginate bulb. All parts of the fruit-body become a tile-red pink when cut or bruised. Smell
slight, rankish.

Spores almost ellipsoid, $9\frac{1}{2}-10\frac{1}{2} \times 5\frac{1}{2}-5\frac{3}{4} \mu$. Cystidia on edge and faces of gills infla-
ted bottle-shaped, $55-60 \times 14-19 \mu$, crested.

Rare. Met with at borders of drive in frondose woods.

The above description covers the figured specimen; but a somewhat more stoutish, short-stemmed form
also occurs (KOLDERUP ROSENVINGE, in a locality near Furesøen, 1923). BRESADOLA uses the name *I. Trinii*
Weinm. forma *campestris* for this species. *I. Rickenii* HEIM is a totally different plant = *I. Boltonii*
HEIM. — Although the difference between the two rubescent species here depicted is not always so out-
standing, I regard them as distinct.

Stirpe 9: *posterula*.

19. **I. sindonia** Fr. (Plate 112. fig. F.)

Medium. Cap 3—4½ cm, campanulate convex, then obtusely umbonate, whitish and silky-smooth when young, dingy alutaceous or very pale clay and minutely fibrillose with age. Gills whitish, becoming pale grayish brown with age, edge whitish. Stem rather tall, minutely powdery above, whitish, slightly attenuated from the pure white base.

Spores obliquely ovate-ellipsoid, 8—10½ × 4½—5 μ. Cystidia fusoid, slightly ventricose, about 70 × 10—12 μ. Paracystidia small, ovate club-shaped, 25 × 10 μ.

Not very common, always under conifers.

Larger and blunter than *I. geophylla*, with which it has very much in common.

20. **I. deglubens** Fr. forma. (Plate 112. fig. D.)

Medium. Cap 3—4½ cm, convex, soon expanded and obtusely umbonate, cuticle at first almost smooth, innato-fibrillose, but becoming disrupted into more or less distinct scales. The colour is a paler or deeper shade of clay-brownish. Gills at first whitish. Stem equal or slightly attenuated upward, rather tall, straight, 3—5 cm × 3—5 mm, whitish, with a flush of the colour of the cap, apex powdery, the rest of the stem minutely fibrillose and slightly striolate.

Spores obliquely ovate-ellipsoid, 9 × 5 μ. Cystidia fusoid, muriculate, 65—70 × 13—15 μ, immixed with almost obovate, 10—14 μ broad paracystidia.

Not uncommon, often gregarious, in coniferous woods (*Picea*, *Abies*).

My plant is never "obscure furfurata" at the top of the stem (as described by FRIES). (HEIM ("Inocybe", pl. XIII²) reproduces my figure but by mistake names it *I. lucifuga*). *I. lucifuga* as depicted by BRESADOLA (Iconographia, tab. 751) is probably identical, and so also is COOKE'S, to judge from the figure.

21. **I. posterula** Britz. (sensu Saccardo). (Plate 113. fig. E.)

Medium to rather large. Cap 3—5½ cm, conic-campanulate, then expanded and rather prominently umbonate, almost smooth, then fibrillose and subrimose, pale ochraceous (the umbo somewhat deeper ochre). Gills at first whitish, becoming pale yellowish cinnamon. Stem rather tall, attenuated upward from the subclavate base, white, flushed with the colour of the cap. Apex minutely white-plumulose, 5—7 cm × 5—7 mm (base 7—11 mm).

Spores ovate, slightly oblique, 7—8 × 4½—5 μ. Cystidia slightly inflated fusiform, 55 × 10—12 μ, somewhat crested.

Rather rare. Met with in coniferous woods (*Pinus*, *Picea*).

The form of this species depicted by HEIM is very much like mine, only differing by a somewhat darker and deeper colour and a tendency to scalyness ("Inocybe", pl. XVIII³). *I. eutheles* Berk. & Br., as described and figured by him (ibid. pl. IX¹), is also very close, but deviating in the opposite direction (very light ochry, absolutely smooth). *I. geophylla* var. *lutescens*, as depicted by BRESADOLA (Iconographia, tab. 753), is smaller but for the rest very much like my plant.

Stirpe 10: *hirtella*.

22. **I. Langei** Heim forma *major*. (Plate 113. fig. F.)

Medium to rather small. Cap 2—4 cm, convex, obtusely umbonate, at first innato-fibrillose, then breaking up, more or less, especially towards the edge, into small scales, at first very pale ochre, becoming somewhat deeper ochry with age, especially at the umbo. Gills whitish-pale at first, becoming cinnamon with a straw-yellowish or slightly olivaceous tinge. Stem rather short ($2\frac{1}{2}$ —3 cm $\times$ 4—6 mm), cylindric or slightly incrassated above, not distinctly bulbous, white or whitish inside and outside, very minutely striolate and pruinose, especially above.

Spores ovate-ellipsoid, $7-8 \times 4\frac{1}{2}-5 \mu$. Cystidia rather short ($50-55 \times 13-16 \mu$), obtuse, slightly ventricose, crested or not.

Not uncommon, generally gregarious, in moist places (around stagnant pools etc.) on black humous-clayey ground in copses and woods (*Corylus*, *Rubus cæsius*, *Quercus*).

In "Studies" III (1917) I described this species — for want of a better name — as *I. cæsariata* Fr. var. — *I. cæsariata* is, however, now generally regarded as a relative of *I. dulcamara* (belonging to the section *depauperata*). But recently HEIM ("Inocybe") has described what evidently is a small form of the same species sub nom. *I. Langei*, and I therefore have cancelled my former nomenclature. My specimens are generally somewhat larger than those of HEIM, the cuticle more distinctly disrupted with age (after the manner of *I. deglubens*) and the stem is not visibly bulbous. But for the rest the two square exactly, macroscopically as well as microscopically (small spores, short cystidia).

23. **I. hirtella** Bres. (Plate 113. fig. G.)

Small. Cap 1—2 cm, slightly conical, soon expanding, not distinctly umbonate, slightly squamulose at the disc, fibrilloso-rimose towards the edge, deep ochre in the middle, paler yellowish in the outer half. Gills pallid with a flush of straw-yellow, then yellowish cinnamon. Stem 2—3 cm $\times$ 2—2 $\frac{1}{2}$ mm, base slightly swelled, minutely velutino-pruinose and (sub lente) striolate, flushed with the colour of the cap. Smell very faint ("of bitter almonds").

Spores ovale-ellipsoid, $9\frac{1}{2} \times 5 \mu$. Cystidia on edge of gills ventricose bottle-shaped, with a comparatively long neck ($70 \times 15 \mu$); paracystidia obovate clavate, $35 \times 13-16 \mu$.

Not very common, chiefly met with in open, grassy spaces in frondose copses (*Corylus*, *Quercus* etc.).

This species is very intimately related to *I. Langei*, especially as described by HEIM. The best marks of distinction are the microscopical ones. It also resembles *I. auricoma* a good deal, thus forming a connecting link between the two stirpes. It is very well figured in Fungi Tridentini (tab. 58¹), while the copy in "Iconographia" is too pale.

β. Longisporæ

Stirpe 11: *lacera*.

24. **I. lacera** Fr. (Plate 111. fig D.)

Rather small. Cap 2—3 $\frac{1}{2}$ cm, convex with a small umbo, everywhere fibrilloso-squamulose, of a dull cigar-brown colour. Gills at first pallid. Stem rather short, equal or slightly

attenuated downward, fibrillose, of the same colour as the cap (paler above), rufous brown inside.

Spores long, almost cylindric, $11-15$ ($10-18$) $\times$ $4\frac{1}{2}-5\frac{1}{2}$ μ . Cystidia inflated, obtuse or somewhat acuminate, crested or not, about 18μ broad.

Rather common, especially in sandy open spaces, f. inst. along paths in plantations of *Picea*.

24 a. *I. lacera* forma *gracilis*. (Plate 111. fig. D¹.)

Slender, more distinctly umbonate. Cap about 2 cm. Colour inside and outside somewhat paler brownish, with a tinge of flesh-colour.

Spores and cystidia as in the type.

Found in a grassy footpath in a copse (*Fagus*, *Corylus*).

In the open sand-hills along the coast of the North Sea I have met (Aug. 1907) a very closely related species, with the same type of spore. It grew with the stem partly immersed in the sand. This probably is the *I. halophila*, described from coastal sand-dunes in France by HEIM ("Inocybe", p. 242).

Stirpe 12: *serotina*.

25. *I. serotina* Peck (*I. ammophila* Atk.). (Plate 111. fig. I.)

Large. Cap $2\frac{1}{2}-5$ cm, convex, subumbonate, becoming somewhat gibbous, alutaceous whitish in the middle, somewhat ochry clay-colour at the circumference, almost glabrous, except towards the edge where it is subfibrillose (and generally densely sprinkled with adhering grains of sand). Gills pale grayish brown, then darker cigar-brown, edge paler. Stem stout, $4-6$ cm $\times$ $5-12$ mm, cylindric (base slightly incrassated), almost glabrous, whitish, generally more than half way immersed in the sand. Flesh rather thick, whitish, almost inodorous.

Spores large, generally long, obliquely cylindric-ellipsoid, $(12) 13\frac{1}{2}-15$ (17) $\times$ $5\frac{1}{2}-7 \mu$. Cystidia inflated, obovate or vesiculose pyriform, obtuse, large, $45-55 \times 18-24$ (30) μ , sometimes crested, but more often without any cristals.

In sand, outer sand-dunes at Blåvand, North Sea coast, Oct. 1936 (leg. MORTEN LANGE).

This large and characteristic N. American species has recently been recorded from Holland and figured by HEIM ("Inocybe", pl. X and XXXV). Its stoutness, its white, firm stem and almost smooth cap reminds one of *I. Patouillardii* or *I. fibrosa* var. *trivialis*. The long spores and inflated cystidia attach it to the *I. lacera*-group of arenicolous species.

B. *Depauperatae*.

Stirpe 13: *Bongardii*.

26. *I. Bongardii* (Weinm.) Fr. (Plate 114. fig. E.)

Large and tall. Cap 4—6 cm, campanulate-convex, subumbonate, fibrilloso-squamose, edge fibrillose, pale cinnamon with a slight tinge of flesh-colour. Gills pallid, then cinnamon.

Stem tall (7—8 cm × 7—8 mm), fibrillose, pallid above, flushed with pinkish flesh-colour, darker and more dull brown towards the base. Flesh turning more or less deep pink, when cut, especially below. Strong sweetish aromatic odour like that of *I. pyriodora*.

Spores ovate-ellipsoid, $13 \times 6\frac{1}{2} \mu$. Cystidia on edge of gills cylindric club-shaped, about $55-60 \times 10 \mu$.

Not common, but generally in small flocks, in frondose woods (Fagus).

The larger spores and club-shaped cystidia distinguish this species from *I. pyriodora* and its allies.

I. Bongardii var. *cervicolor* (Pers.) Lange n. comb. (*I. cervicolor* (Pers.) Fr.).

Somewhat smaller and more slender, darker brown and with a more densely fibrillose stem. The smell a little more rank. — Microscopical characters identical.

Met with at Hindsgaul, in park, Aug. 1934.

Very well figured by KONRAD & MAUBLANC (Icones sel., tab. 88).

Stirpe 14: *calamistrata*.

27. *I. hirsuta* (Lasch) Fr. (Plate 114. fig. F.)

Medium, tall. Cap 2—4½ cm, broadly campanulate, slightly umbonate, Vandyke-brown to bistre, squarrose with fibrillose, more or less recurved scales. Gills broad, free, originally whitish. Stem rather dark brown. Stem rather tall and slender (6—10 cm × 4—5 mm), cylindrical, minutely fibrilloso-striate (apex white-plumulose, base slightly white-tomentose), paler than the cap. Flesh concolorous, becoming pink everywhere, when touched. Taste somewhat bitter; smell rather pungent.

Spores ovate-ellipsoid to sub-phaseoliform, $11 \times 6\frac{1}{4} \mu$. Cystidia cylindric-clavate, $50-60 \times 9-11 \mu$ (another find: spores $10\frac{1}{2}-13 \times 6\frac{1}{2}-7\frac{1}{2} \mu$).

Rare. Met with in woods (of Picea or various trees).

The lack of fruity smell distinguishes it from *I. Bongardii* var. *cervicolor*, which runs it very close. *I. relicina* Fr. in the sense of RICKEN is identic; but the true *I. relicina*, according to FRIES, has yellow gills (Monographia I, p. 335).

28. *I. calamistrata* Fr. forma *gracilis*. (Plate 114. fig. D.)

Rather small. Cap 1½—2½ cm, broadly campanulate convex, umbonate, bistre brown, set with acute, erect, fibrillose scales; edge fibrillose. Gills whitish, then cigar-brown, edge whitish. Stem rather slender (4—5 cm × 2—3 mm), incrassated below, somewhat paler than the cap, with recurved scales, especially below the middle, base covered with a white tomentum (often with a bluish-green tinge). Flesh almost concolorous. No fruity smell.

Spores oblong phaseoliform, $10\frac{1}{2}-12 \times 5\frac{1}{2} \mu$. Cystidia inflated club-shaped or almost balloon-shaped, $12-18 \mu$ broad.

Rare. Met with in a frondose copse (Alnus, Fagus) on naked, clayey ground.

This is the slender form figured by FRIES (Icones sel., tab. 106²).

Stirpe 15: *Patouillardii*.

29. *I. Patouillardii* Bres. (*I. lateraria* Rick.). (Plate 115. fig. E.)

Large. Cap 5—6½ cm, campanulate, then convex and somewhat umbonate, often somewhat split with age. Surface minutely silky-fibrillose (disc glabrous), whitish when young, becoming flushed with brownish ochre and turning bright pinkish flesh-colour when bruised. Gills whitish, then clay-grayish, at last with a flush of olive-yellowish. Stem rather stout (about 7 cm × 11 mm), slightly incrassated towards the base, almost glabrous, whitish, slightly flushed with the cap-colour and turning pink in the same manner. Smell rather strong, rankish.

Spores ovate-ellipsoid, 9½—11 × 5½—6¼ μ. Cystidia clavate, occasionally subcapitate, 60—70 × 7—15 μ.

Only met with in the eastern provinces, on chalk in frondose woods (chiefly *Fagus*) (leg. F. H. MØLLER).

First recorded from Denmark by SEV. PETERSEN (Danske Agaricaceer) sub nom. *I. sambucina* var. *æstivalis* (F. H. MØLLER in lit.).

Stirpe 16: *jurana*.

30. *I. jurana* Pat. (Plate 117. fig. E.)

Large. Cap about 5 cm, obtusely conic, expanding and umbonate, everywhere covered by dark vinaceous-fuscos (or dark fuscous) fibrils which at the disc form adpressed scales, while towards the margin the pale ground is visible between the fibrils. Gills at first whitish gray, becoming grayish brown with a whitish edge. Stem 6—7 cm × 7—9 mm, rather stout, with a slightly bulbous base, whitish and indistinctly flocculose above, flushed with a dingy vinaceous colour from base up. Flesh especially in umbo and lower part of stem pinkish-vinaceous. Smell faint.

Spores broadly ovate-phaseoliform, 9½—10½ × 6½ μ. Cystidia on edge of gills club-shaped, about 45 × 10 μ.

Rather rare. Met with in frondose woods and copses, especially under *Corylus* and *Quercus*, but also under *Fagus*.

BRESADOLA identifies it with *A. frumentaceus* Bull. But BULLIARD'S figure (Hist. Champ. de France, 571¹) is very dubious (other authors think it represents a *Hygrophorus*). I have never noticed the "frumentaceous" smell which it is said to possess.

31. *I. rhodiola* Bres. (Plate 117. fig. F.)

Large to rather large. Cap 4—5 cm, expanded conical, rather acutely umbonate, everywhere covered with brownish ochre, minute fibrils, edge pallid, at last subrimose, umbo with a flush of flesh-colour. Gills at first grayish. Stem rather slender, about 7 cm × 5—6 mm, fibrilloso-striate, whitish, becoming tinged (inside and outside) with pale vinaceous pink.

Spores obliquely oval, sub-phaseoliform, $9-10 \times 6 \mu$. Cystidia club-shaped, about $40 \times 11-13 \mu$.

Rather rare. Often in small flocks in frondose woods, especially on grassy borders of drives and sentries.

Very close to *I. jurana*. BRESADOLA himself united them in "Fungi Tridentini". But it is more slender and of a paler, more ochry colour.

Stirpe 17: *fastigiata*.

32. *I. maculata* Boud. (Plate 116. fig. E.)

Rather large or large. Cap 4—6 cm, somewhat conical, becoming distinctly rimose almost all over when expanding, bay-brown or chestnut, when young often partly covered in the middle by white fibrils or filmy, adpressed scales. Gills pallid at first, then cigar-brown. Stem 6—8 cm $\times$ 6—9 mm, cylindrical, fibrilloso-striate, pallid, becoming tinged with the colour of the cap.

Spores phaseoliform, $9-11 \times 5-5\frac{1}{2} \mu$. Cystidia inflated, club-shaped, $55-60 \times 12-15 \mu$.

Not uncommon, in frondose woods, behind hedges etc.

I. brunnea Quél., to which I formerly referred the scaleless forms of this species, is — according to HEIM — a species with muriculate cystidia.

33. *I. perlata* Cooke. (Plate 115. fig. F.)

Large. Cap $5\frac{1}{2}-6\frac{1}{2}$ cm, expanded conical, sub-umbonate, slightly viscid and almost even at first, then minutely fibrillose and subrimose, somewhat shaggy towards the edge. Umbo cigar-brown, the colour shading off to whitish pale at the margin. Gills whitish at first, becoming brownish cinnamon with a whitish edge. Stem cylindric, rather stout (6—8 cm $\times$ 10—12 mm), originally white, then flushed with brownish, subfibrillose.

Spores obliquely ovate sub-phaseoliform, $9\frac{1}{2}-10\frac{1}{2} \times 6\frac{1}{2} \mu$. Cystidia club-shaped cylindric, about $50 \times 10 \mu$.

Rather rare. Met with in moist, clayey grassland, overshadowed by trees and hedges.

My plant never attains the dimensions of COOKE'S figures (Illustrations, pl. 961). Smaller forms, more like the ordinary *fastigiata*-type, are also met. *I. fastigiata* var. *superba* Fries (Icones sel., tab. 108¹) is very close.

34. *I. fastigiata* (Schaeff.) Fr. (sensu restr.). (Plate 114. fig. B.)

Medium to rather small. Cap 3—4 $\frac{1}{2}$ cm, conical, expanding, with an often rather acute and prominent umbo, pale ochre, vivid ochre or brownish ochre, distinctly rimose about $\frac{2}{3}$ in. Gills narrow, pallid, more or less tinged straw-yellowish and later on attaining an olivaceous tint. Stem almost equal, often rather slender (5—7 cm $\times$ 4—7 mm), almost white, fibrilloso-flocculose.

Spores oval sub-phaseoliform, $10-11 \times 5\frac{1}{2} \mu$. Cystidia almost cylindric, slightly club-shaped or sub-ventricose, $50-60 \times 12 \mu$.

Common, in frondose woods, often solitary.

I take the species in a somewhat restricted sense: the slender, ochraceous, acuminate type of moderate dimensions, as represented f. inst. by the figures of BRESADOLA (Fungi Tridentini, tab. 57), COOKE (Illustrations, pl. 384 (sub nom. *I. rimosa*)) etc.

35. *I. squamata* Lange. (Plate 115. fig. D.)

Large to medium. Cap 3—7 cm, campanulate-conical, somewhat umbonate when expanding, fibrillose and at last somewhat rimose, fulvous ochre or subferruginous, the cuticle of the central part of a deeper colour than the rest and breaking up into adpressed scales. Gills at first dingy yellowish-pale, then Vandyke-brown with a flush of yellow, edge white. Stem cylindric, 3—7 cm $\times$ 5—10 mm, fibrilloso-striate, pale, gradually becoming flushed with yellowish brown.

Spores obliquely ovate sub-phaseoliform, $9-10 \times 5-6\frac{1}{4} \mu$. Cystidia somewhat inflated club-shaped, about $45 \times 11-15 \mu$.

Rather rare. Growing gregariously on clayey ground behind hedges (of *Populus* etc.).

I. Curreyi Berk., to judge from the figures in COOKE'S Illustrations (pl. 398), is intermediate between *I. squamata* and the ordinary *I. fastigiata*. My plant also approaches *I. mimica* MASSEE (which has gigantic spores, 14—16 μ long).

36. *I. Cookei* Bres. (Plate 114. fig. A.)

Medium. Cap 3—4 cm, somewhat conical, expanded umbonate, pale ochre, becoming minutely rimose about half way in. Gills pallid. Stem cylindric, with a marginate, roundish bulb, whitish, slightly flushed with the colour of the cap, not pruinose (only slightly flocculose-fibrillose at the top).

Spores oval sub-phaseoliform, $7-8 \times 4\frac{1}{4} \mu$. Cystidia inflated, obovate to almost balloon-shaped, $16-22 \mu$ broad.

Rather common, often gregarious, in frondose woods and copses.

I. rimosa in the sense of RICKEN is almost identical.

Stirpe 18: *dulcamara*.

37. *I. dulcamara* (Pers.) Fr. (*I. delecta* Karst.). (Plate 114. fig. C.)

Medium to rather small. Cap 2—4 cm, convex flat, at first velvety tomentose, then plushy squamulose, when young pallid brownish ochre, becoming more vivid ochraceous with a flush of fulvous at the disc and ochry honey-coloured towards the edge. Veil evident, arachnoid. Gills at first yellowish white, then yellowish brown or cinnamon (edge white), slightly emarginate, with a decurrent denticle. Stem somewhat hollow, rather short (3—4 cm $\times$ 3—6 mm), floccoso-fibrillose, pale at first, then flushed with ochry cinnamon. Flesh with a tinge of the same colour or dirty yellow. Spore-powder ochraceous cinnamon.

Spores oval phaseoliform, $7-9\frac{1}{2} \times 5 \mu$. Cystidia cylindric club-shaped, short ($30 \times 7-11 \mu$).

Not very common, but generally gregarious on grassy drives etc. in coniferous plantations, on light soil.

This species forms a transition from *Inocybe* to *Flammula*, especially *F. Agardhii* and other species of the *Velutini*-group. *I. flocculosa* Berk., as understood by SEV. PETERSEN (Danske Agaricaceer), is undoubtedly identical. My plant is almost tasteless, and the Karstenian name *I. delecta* so far is a better one. HEIM (loc. cit.) mentions *I. delecta* as a species with genuine cystidia; but KARSTEN himself only says about it: "Cystidia cylindrical, $6-10 \mu$ (?)", that is to say what HEIM calls "poils cystidiformes" = paracystidia. (Vide KARSTEN: "Kritisk Öfversigt").

II. CLYPEUS

A. *Astrosporina*

Stirpe 19: *asterospora*.

38. *I. asterospora* Quél. (Plate 117. fig. G.)

Rather large or medium. Cap $3\frac{1}{2}-5$ cm, expanded, obtusely umbonate, bay-brown or chestnut, distinctly rimose $\frac{2}{3}$ in (subcuticular tissue white). Gills pallid when young. Stem $5-6$ cm $\times$ $5-7$ mm, with a distinctly marginate basal bulb, minutely striate and velvety-pruinose, whitish, becoming more or less tinged with the colour of the cap, from base up.

Spores stellate, $9-12 \times 7\frac{1}{2}-9 \mu$, outline with $5-8$ strongly prominent, obtusely conical projections. Cystidia bottle-shaped, ventricose, crested, $40-60 \times 12-18 \mu$. Similar cystidia on the stem.

Rather common, but generally solitary, in frondose woods, parks etc.

One of the most outstanding and characteristic species.

39. *I. prætervisa* Quél. (Plate 115. fig. A.)

Medium. Cap $2\frac{1}{2}-3$ cm, conic-convex, minutely rimose about half way in, ochraceous (central part a little deeper, paler towards the margin). Gills pallid at first. Stem $5-6$ cm $\times$ $3-5$ mm, slightly attenuated from the marginate, roundish bulb, minutely pulverulent, striolate, white.

Spores nodulose substellate, $10-12 \times 7-9 \mu$, outline with $5-8$ coarse, obtuse warts. Cystidia fusiform, rather narrow, about $60 \times 12-14 \mu$, crested.

Not uncommon, chiefly in frondose woods, but also met with in a plantation of *Pinus*.

Distinguished from *I. asterospora* by the ochraceous, less strongly rimose cap and the white stem.

40. *I. xanthomelas* Bours. & Kühner (*I. prætervisa* var. *pusilla* Lange). (Plate 115. fig. B.)

Small. Cap $1\frac{1}{2}-2$ cm, expanding, with a small, rather acute umbo, yellow-brownish, becoming subrimose and slightly darker brown. Gills at first pale, then date-brownish,

rather distant, free. Stem $4\text{ cm} \times 1\frac{1}{2}\text{--}2\text{ mm}$, pale above, flushed with yellow-brownish from the white, marginate bulb, minutely striate and velvety pruinose.

Spores nodulose stellate, about $10\frac{1}{2} \times 7\frac{1}{4}\text{ }\mu$, outline with 7—8 prominent but rather blunt warts. Cystidia cylindric fusoid or somewhat bottle-shaped, about $60 \times 15\text{ }\mu$ (apex about $9\text{ }\mu$), crested.

Rather rare. Met with on boggy ground, especially under *Salix cinerea*.

This little *Inocybe* does not differ very materially from *I. prætervisa*, except in stature, and I therefore in "Studies" III (1917) described it as var. *pusilla* of this species. BOURSIER & KÜHNER may be right in giving it specific rank. In fact I have never seen any intermediate forms. The darkening of the cap, which they mention as characteristic for the species, is very slight in my finds. (Vide Bull. Soc. Mycol. de France, vol. 49, pag. 84). *I. trechispora* Berk. in BRESADOLA'S Iconographia (tab. 766¹) seems to represent the same species.

Stirpe 20: *napipes*.

41. *I. napipes* Lange. (Plate 116. fig. A.)

Medium to rather large. Cap 3—5 cm, conico-campanulate, then expanded and acutely umbonate, umber-brown or chestnut, almost smooth (minutely fibrillose), then fibroso-rimose. Gills whitish when young. Stem 5—6 cm $\times$ 5—8 mm, rather tall, attenuated upward from the somewhat depressed, but not marginate, basal bulb, pale above, more or less flushed with the colour of the cap from base up, minutely fibrillose (not velvety-pruinose).

Spores prominently nodulose, $9\text{--}10 \times 6\text{ }\mu$, outline with 5—6 coarse, blunt warts. Cystidia more or less inflated, obtuse, $50\text{--}60 \times 12\text{--}18\text{ }\mu$, glabrous or somewhat crested.

Not uncommon, especially in somewhat moist or boggy places in woods (particularly under *Betula*), in small flocks.

It has the colour of *I. asterospora*, but differs in the character of the stem and bulb. And the cap is not distinctly rimose. — I have also collected this species in America (Vermont).

42. *I. umboninota* Peck var. (Plate 117. fig. D.)

Rather small. Cap $1\frac{1}{2}\text{--}2\frac{1}{2}$, mammiform, with a strongly prominent, conical papilla, dark umber, minutely fibrillose and at last slightly rimose. Gills broad, ventricose, almost free, Vandyke-brown. Stem ascendent, $2\frac{1}{2}\text{--}3\text{ cm} \times 1\frac{1}{2}\text{--}2\frac{1}{2}\text{ mm}$, base incrassated, somewhat bulbous, flushed with the colour of the cap (except at the base). Flesh of cap white, brownish in the stem, especially below.

Spores rather prominently nodulose, $9\frac{1}{2}\text{--}11 \times 6\text{ }\mu$, outline often conic-ovate, with 5—7 obtuse warts. Cystidia obtuse, cylindric ventricose, about $60 \times 15\text{ }\mu$, crested or not.

Rare. Met with at Skørping, edges of road, through mixed wood, on sandy ground, gregarious.

My plant is smaller than given by PECK, and has somewhat larger spores. It is very close to *I. napipes*. *I. acuta* Boud. is regarded as synonymous.

Stirpe 21: *umbrina*.43. *I. umbrina* Bres. (Plate 118. fig. G.)

Rather small. Cap 1,8—2,5 cm, convex, sub-umbonate, dark date-brown or Vandyke-brown, subviscid, minutely innato-fibrillose and at last subrimose. Gills pallid clay-brownish when young (not yellowish). Stem rather short (3½ cm × 3 mm), immarginate-bulbose, flushed with the colour of the cap, minutely fibroso-striate, pruinose above. When young the whole plant is more pallid, becoming darker with age.

Spores nodulose angulate, 8—9 × 5—6 μ, with more or less prominent, obtuse warts. Cystidia about 55 × 14 μ, obtuse, cylindric subventricose, somewhat muriculate at apex.

Not uncommon, chiefly met with in plantations of *Picea*, often gregarious, but also recorded from frondose woods (*Fagus*).

The plant, as I know it, is somewhat smaller than shown in BRESADOLA'S figure (*Iconographia*, tab. 758), and the gills are not yellowish when young.

44. *I. granimata* Quél. (*I. hiulca* Fr. sensu Bres., nec al.). (Plate 116. fig. D.)

Medium. Cap 2½—4 cm, convex with a small, rather acute umbo. Umbo whitish, the rest of the surface covered by innate, silky, whitish fibrils on a ground of clay-brownish with a slight flush of flesh-colour. Gills whitish, then pale brownish gray. Stem rather tall (5—7½ cm), marginato-bulbose, white with a flush of the cap-colour, minutely pruinose.

Spores nodulose, 7½—9 × 5—6 μ, outline with about 6, rather flat nodules. Cystidia somewhat bottle-shaped, obtuse, about 60 × 15—18 μ, crested.

Not common. In frondose copses.

BRESADOLA figured this species excellently in *Fungi Tridentini* (tab. 112²). But the name *I. hiulca* is a very disputed one, which has been construed to mean almost everything and had better be discarded.

Stirpe 22: *fibrosa*.45. *I. fibrosa* Sow. var. *trivialis* Lange. (Plate 116. fig. B.)

Rather large. Cap 3—4½ cm, campanulate, obtuse, somewhat viscid, innately fibrillose with pallid clay-brownish fibrils all over, except at the top, which is bone-white and glabrous. Gills white, slowly becoming clay-brownish. Stem 5—7 cm × 4—11 mm, almost smooth, white, cylindric with a sub-bulbous base, often rooting rather deep in the ground.

Spores very irregular with prominent base, 9—13 μ long, outline with 5—7 obtuse but rather prominent nodules. Cystidia inflated, 50—60 × 18 μ, obtuse, somewhat crested. Basidia occasionally with only 2 or 3 sterigmata.

Not uncommon, on clayey ground, outside of woods, behind hedges etc.

The considerably larger and almost pure white main form of this species (BRESADOLA: *Fungi Tridentini*, tab. 56) seems to be very rare. HEIM has not seen it, and I have only met it once (Langå, Jylland, 1914).

Stirpe 23: *Boltonii*.**46. I. Boltonii** Heim (*I. plumosa* (Bolt.) Fr. sensu Quél.). (Plate 116. fig. C.)

Rather large. Cap about 5 cm, expanding (edge at last upturned), broadly gibbous, disc even, for the rest fibrillose subsquamulose, rufous umber (paler towards the edge). Gills dingy white when young. Stem cylindric, rather short (5 cm × 8 mm), flushed with the cap-colour, inside and outside, slightly fibrillose.

Spores irregularly oblong or sub-trapezoid ($9\frac{1}{2}$ — $12\ \mu$ long), nodulose, somewhat oblique, outline with about 5 slightly prominent nodules. Cystidia rather large (60 — 80×15 — $20\ \mu$), inflated, rather obtuse or with a long bottle-neck, crested.

Rare. I have only met this species twice, in sandy soil on coast-common under trees (*Populus*).

I have adopted the name *I. Boltonii* (HEIM, "Inocybe", p. 345 bis), created by HEIM to take the place of a multitude of dubious synonyms: *I. plumosa* (Bolt.) Fr. sensu Quél., *I. carpta* Scop. (Fr.) sensu Bres., probably also *Astrosporina relicina* (Fr.) sensu Schroet. (nec al.), if this be not a gigantic form of the *lanuginosa*-stirpe. (HEIM first called it *I. Rickenii*, but cancelled this name for priority-reasons, *I. Rickenii* Kallenbach being older).

Stirpe 24: *lanuginella*.**47. I. lanuginella** (Schroet.) Lange (*Astrosporina lanuginella* Schroet.). (Plate 117. fig. A.)

Rather small. Cap $1\frac{1}{2}$ —3 cm, conic-convex, then plano-convex with a small umbo, grayish brown, at last dingy ochraceous brown or almost doe-brown, tomentoso-fibrillose, slightly squamulose. Veil evident, arachnoid. Gills pallid when young. Stem rather short (3—4 cm × 2—3 mm), whitish-pale, becoming dingy brownish from base up (inside and outside), minutely silky fibrillose, without basal bulb.

Spores oblong, often oblique or truncate, 8 — $9\frac{1}{2}\ \mu$ long, outline with 5—6 obtuse nodules. Cystidia inflated fusoid, 40 — 50×15 — $16\ \mu$, smooth or somewhat crested. Fibrils on cap septate, about $7\ \mu$ broad.

Not uncommon, on moist ground under *Salices*, in shrubberies etc. amongst *Juncus bufonius* and such like.

SCHROETER'S description (Die Pilze Schlesiens, vol. I) is very good, but refers to rather small specimens. HEIM ("Inocybe") uses the name *I. cicatricata* Ell. & Ev. for it. But SCHROETER'S name is older than the American one, and more appropriate.

48. I. putilla Bres. (Plate 117. fig. B.)

Very small. Cap about $1\frac{1}{4}$ cm, acutely conical, then acuminate, minutely fibrillose and at last slightly rimose, light doe-brown or brownish clay. Gills pallid, edge minutely crenulate. Stem equal, 3 cm × $1\frac{1}{2}$ mm, white, becoming flushed with dingy flesh-colour from base up.

Spores obtusely nodulose, $8\frac{1}{2}$ — $9\frac{1}{2} \times 6$ — $6\frac{1}{2}\ \mu$, outline with about 6 blunt, low warts. Cystidia somewhat bottle-shaped, about $65 \times 15\ \mu$, obtuse, crested.

Rare. Only met once, in a copse, under *Corylus* (Fyen, 1915).

Very close to *I. lanuginella*, especially as depicted by BRESADOLA himself (Iconographia, tab. 764). But the extreme, pygmean, strongly acuminate form found by me is fairly distinct.

Stirpe 25: *trechispora*.

49. *I. trechispora* Berk. (Plate 118. fig. B.)

Small. Cap 1,3—2,5 cm, conic convex, then expanded and umbonate, slightly viscid, ivory-white, becoming straw-yellowish or very pale ochre (umbo concolorous), silky, then fibrillose and subrimose. Gills rather narrow, pale when young. Stem thin, often somewhat wavy, 3—4 cm × 2 mm, white, at last slightly yellowish, minutely powdered, base slightly incrassated, with radiating mycelioid hairs. Smell slight.

Spores small, wavy nodulose, $7\frac{1}{2}$ —8 × $4\frac{1}{2}$ — $4\frac{3}{4}$ μ , outline with 5—6 somewhat prominent, obtuse nodules. Cystidia fusoid, 45—60 × 9—13 μ , crested.

Rare. Met with on boggy ground in woods (especially under *Betula* and *Salix cinerea*).

BRESADOLA'S *I. trechispora* does not belong here, and RICKEN'S is a species with gigantic spores. According to KÜHNER *I. paludinella* Peck is synonymous. — It is a very pretty little species, more slender than *I. geophylla alba* and well characterised by the small spores.

Stirpe 26: *petiginosa*.

50. *I. rufo-alba* Pat. & Doass. (Plate 117. fig. C.)

Small. Cap 1—2 cm, at first campanulate convex, then expanded, more or less umbonate or gibbous, when young brownish, everywhere clad with a whitish, pilose tomentum, later becoming ferruginous umber, tomentoso-squamulose all over. Veil absent. Gills rather distant, argillaceous brownish when young. Stem short (2—3 cm × $1\frac{1}{2}$ —3 mm), often wavy, subferruginous inside and outside. — Subfasciculate.

Spores rather small, irregularly ovate, 7—8 μ long, outline with about 6 obtuse and slightly prominent nodules. Cystidia 45—50 × 9—11 μ , narrow fusoid bottle-shaped, paracystidia small, obovate 20—25 × 9—10 μ .

Rare. Only met with once, but in great numbers, on a sandy drive through an open plantation of *Picea* (Fyen, 1910).

A very distinct little species, well characterised by the white, pilose tomentum on the ferruginous-umber ground. It is a small-spored species like *I. petiginosa*, but quite distinct by habit and habitat.

51. *I. petiginosa* Fr. (Plate 118. fig. A.)

Very small. Cap 0,7—1,2 cm, campanulate convex, sub-umbonate, pale brownish with agglutinate, minute, whitish squamules which soon disappear. Gills at first straw-yellowish. Stem short (1—2 cm × 1— $1\frac{1}{2}$ mm), date-brown or slightly rufous, pruinat.

Spores very small, $6\frac{1}{2}$ —7 × $4\frac{1}{2}$ μ , irregularly wavy-nodulose. Cystidia crowded on the gill-edge, fusoid, about 45 × 10 μ , crested. The stem is densely set with similar cystidia.

Common, especially in the vicinity of old stumps of *Fagus*.

SCHROETER (loc. cit.) describes this tiny little species very well sub nom. *Astrosporina scabella* (Fr.). FRIES himself, in later years, transferred it to *Hebeloma*, where it has no natural relatives. The pruinose, brown stem, the yellowish gills and the agglutinate squamules characterise this species egregiously.

Stirpe 27: *lanuginosa*.

52. *I. lanuginosa* (Bull.) Fr. (sensu lato). (Plate 118. fig. C.)

Rather small or small. Cap 1,3—2,5 cm, convex, dark umber or bistre, velutino-squamulose, subsquarrose at the disc by minute, erect squamules. Gills pallid when young. Stem short to medium, pallid above, flushed with the colour of the cap downward and clad with darker, bistre-brown, floccose squamules about $\frac{2}{3}$ up.

Spores obovate, $8-10\frac{1}{2} \times 5\frac{1}{2}-7 \mu$, outline with about 7—8 very prominent but obtuse, coarse warts. Cystidia inflated, of somewhat variable form, naked or slightly crested.

On sandy ground and on and around stumps.

Of this species several forms or varieties exist, some of which even have been accorded specific rank. Two of these are on record from Denmark.

a) *I. lanuginosa* forma *typica* Heim. (*I. sabuletorum* B. & Curt.) (not figured).

Small. Cap 1—3 cm, slightly umbonate. Gills broad. Stem short ($1\frac{1}{2}-3 \text{ cm} \times 2-3 \text{ mm}$).

Spores $8-10\frac{1}{2} \times 5\frac{1}{2}-6\frac{1}{2} \mu$, outline with 6—7 prominent nodules. Cystidia at the gill-edge strongly inflated, obtuse or slightly bottle-necked, $40-45 \times 12-18 \mu$, sometimes crested.

Met with on sandy soil in several localities in Jylland (1926 and later years) by POUL LARSEN.

b) *I. lanuginosa* var. *Casimiri* Vel. (*I. lanuginosa* sensu Bres.).

Rather small. Cap $1\frac{3}{4}-2\frac{1}{2} \text{ cm}$, convex, dark umber. Gills medium. Stem taller than in form a), $4-5 \text{ cm} \times 3 \text{ mm}$. Flesh white in the cap, brownish in the stem.

Spores $10 \times 7 \mu$, outline with about 7 prominent nodules. Cystidia inflated, obtuse, generally broadest below the middle and slightly contracted above, about $45 \times 16-20 \mu$, not crested.

Rare. Met with chiefly in frondose woods, the figured specimens (plate 118, fig. C) on moist ground among ferns in wood of *Fagus*, but other finds on boggy ground under *Salices* and *Picea* and on an old, decaying stump of *Fagus*.

B. *Calospora*

Stirpe 28: *calospora*.

53. *I. calospora* Quél. (Plate 115. fig. C & C¹.)

Small. Cap 1,2—1,8 cm, conic convex, more or less acutely umbonate, minutely plushy squamulose, subsquarrose on disc, fibrillose towards the edge, light cigar-brown or somewhat

umber. Gills rather broad, pallid at first. Stem 3—4 cm $\times$ 1½—2 mm, paler or darker brown, minutely white-plumulose.

Spores broadly oval to subglobular, 8½—10 $\times$ 7—8 μ , set with numerous, 1½—3 μ long (hardly 1 μ broad), cylindric aculei. Cystidia on gill-edge cylindric bottle-shaped, short, 35—40 $\times$ 10—11 μ , naked or somewhat crested.

Rare (or possibly overlooked on account of its inconspicuous, *Naucoria*-like habit) in moist, frondose woods (amongst *Juncus bufonius*, *Agrostis alba* etc.).

The figures on plate 115 (fig. C and C¹) depict two forms of this species, fig. C a more *Naucorioid* form, C¹ a somewhat larger and darker one, more *Inocyboid* in habit. — *I. echinospora* Egeland (Nyt Magazin f. Naturvidenskaberne, vol. 51, 1912) is identical and so probably is *Astrosporina lanuginosa* in the sense of SCHROETER (Die Pilze Schlesiens, p. 577). MASSEE (Monograph, tab. 32, fig. 12) gives an exaggerated figure of the spore (about 20 μ long, with coarse, about 3 μ broad aculei). *I. Gaillardii* Gill. is hardly specifically distinct.

HEBELOMA

Cap convex, fleshy, viscid, almost smooth. Veil fibrillose or absent. Gills emarginate, pallid, becoming chocolate-brown. Spores obliquely ovate or sub-limoniform. No crested cystidia.

The genus *HEBELOMA* is a very natural one, the species of which are very intimately related. In fact the real difficulty confronting the mycologist is not the delimitation of the genus, but of the individual species which often run completely into each other.

The majority of the *Hebelomas* are of medium stature; but the genus also comprises a number of very small species as well as some few very large ones. The former may be mistaken for *Naucorias*, but can be distinguished, macroscopically, by their more fleshy stem and pallid whitish colours; the latter may have a somewhat *Cortinarioid* habit. Some affinity also exists between *Hebeloma* and certain *Pholiotas*, particularly *P. radicata* and *P. erebia*.

Microscopical characteristics. While the microscope is of paramount importance for the identification of the *Inocybes*, it is not nearly so useful in the case of the *Hebelomas*. The form of the spores only varies within a comparatively narrow limit — from ellipsoid-ovate to obliquely limoniform — neither is their size very variable (the average length rarely falls below 8 or exceeds 12 μ). It is not unlikely that careful investigation by means of strong lenses will show characteristic variations in the configuration of the spores of all the species; but when observed by moderate power — as is the case here — they simply seem to be either glabrous or warty-punctate. The gill-edge is always set with sterile cells. These cystidia, however, are never very conspicuous. They are generally obtuse, often somewhat club-shaped, straight or slightly wavy, hair-like bodies. In some cases they exude drops of

water, visible to the naked eye or under a pocket-lens. But this characteristic depends too much on the state of the weather to be of outstanding importance for identification-purposes.

Taxonomy. FRIES divided the genus in three sections: the velate, the naked and the pygmean group. But the latter hardly deserves to be upheld. Even in the Friesian sense it is a very small group; and by shifting over *A. petiginosus* to *Inocybe*, where it undoubtedly belongs, and cancelling *A. sterilis*, which probably is a *Cortinarius* (*C. pulchellus* Lange) it is reduced to next to nothing. I therefore divide the genus into two main sections only, *Indusiata* and *Denudata*. It is true that the veil in some of the indusiate species is very fugacious and rudimentary; but by careful examination of the unopened cap it is nevertheless fairly visible, at least by means of a pocket-lens. — The minor groups are even more difficult to characterise. The key will show how I have tried to overcome the difficulties.

The number of species here described is rather limited. Some of the species are very polymorphous and have been split up into a number of minor species, but their characters appear to me to be too vague, depending too much on age and weather, to give them any claim to specific rank.

KEY

TO THE SPECIES FIGURED

- A. *INDUSIATA*. Veil present, minutely fibrillose or somewhat shaggy-woolly.
- α . Rather large and stout (stem about 1 cm broad) ... 1. *H. fastibile*
 - β . Medium or small.
 - 1. Stem woolly-fibrillose up to the spurious ring ... 2. *H. strophosum*
 - 2. Stem merely fibrillose; no ring.
 - * Cap paler or darker date-brown on the disc; towards the pallid edge more or less fibrillose or shaggy ... 3. *H. mesophæum*
 - ** Not so.
 - † Medium. Stem tall; base obtuse ... 4. *H. testaceum*
 - †† Very small (cap 1—2½ cm). Stem slightly rooting ... 5. *H. pumilum*
- B. *DENUDATA*. No trace of a veil.
- α . *Ingrata*. Smell of radish (or faint).
 - 1. Rather stout. Cap fulvous ... 6. *H. truncatum*
 - 2. Cap some other colour (alutaceous, café au lait or dull brown).
 - a. No long, tapering "tap-root".
 - * Very large. Cap 5—12 cm, alutaceous-tan or pale café au lait ... 7. *H. sinapizans*
 - ** Medium to small.
 - † Medium (cap 3—6 cm).

- ° Stem rather short (about diameter of cap)... .. 8. *H. crustuliniforme*
 °° Stem tall (twice diameter of cap or more).
 ^ Cap alutaceous. Stem almost white 9. *H. longicaudum*
 ^^ Cap and stem pale ochre. Stem very slender 10. *H. elatum*(?)
 †† Very small (cap 1—2½ cm) 11. *H. pusillum*
 b. Stem elongated into a very long, tapering "root" 12. *H. spoliatum*
 β. *Sacchariolentia*. Smell strong, sweetish aromatic... .. 13. *H. sacchariolens*

SPECIFIC DESCRIPTIONS AND NOTES

A. *Indusiata*

1. *H. fastibile* Fr. (Plate 118. fig. F.)

Large to rather large. Cap 4—6 cm, convex, alutaceous to pallid clay-colour, viscid, rather thick-fleshed. Gills pallid, then slightly flesh-coloured, becoming clay cinnamon. Veil evident, membranous fibrillose. Stem rather stout, about 1 cm thick, of the same colour as the cap, inside and outside, fibrilloso-striate, slightly pruinose at apex. — Sub-fasciculate.

Spores ovate, $8-9\frac{1}{2} \times 5-5\frac{1}{2}$ ($7-10 \times 4-6\frac{1}{2}$ μ), smooth, almost hyaline. Cystidia obtuse, hair-shaped, total length about 60 μ , base slightly inflated (5 μ).

Rather rare. Only met with by me in coniferous woods (*Picea*, *Pinus*), growing gregariously or in arcs.

I have never observed any drops on the gill-edge in this species. KONRAD & MAUBLANC also have it from coniferous woods, while FRIES gives "silvis campestribus" as its habitat.

2. *H. strophosum* Fr. (Plate 118. fig. D.)

Medium. Cap 3—4 cm, convex to subumbonate, almost smooth (sub lente minutely innato-squamulose), viscid (but soon dry), brownish clay. Gills broadly emarginate, pallid, becoming tinged with pale flesh-colour and then clay brownish. Stem slender (5—6 cm $\times$ 5—6 mm), peronate up to the fibrillose, spurious ring by a dense, woolly-fibrillose coating, white above, dingy ochry clay-brown below; flesh concolorous. Smell slight, of radish. Tastesomewhat bitter.

Spores ellipsoid-oval, $7\frac{1}{2}-9 \times 4\frac{1}{2}-4$ μ , smooth, very pale, almost hyaline. Cystidia clavate hair-shaped, obtuse, rather short (40 μ), base slightly inflated (5 μ).

Rare. Met with in grass amongst young *Picea* in plantation, gregarious.

Less typical forms, transitions to *H. mesophæum*, are occasionally met.

3. *H. mesophæum* Fr. (Plate 119. fig. C.)

Medium to rather small. Cap 2½—4½ cm, convex, subumbonate when expanding, clay-brown, disc often almost date-brown, edge pallid, whitish, fibrillose when in bud, somewhat

viscid. Gills pallid, becoming flushed with pale flesh-colour, dingy brown with age. Stem medium or short, whitish at first, but soon flushed with dirty brown from base up (darker earth-brown inside), more or less fibrillose, with a distinct, fibrillose velum.

Spores ovate, $9\frac{1}{2}$ — 10×5 — $5\frac{1}{2} \mu$, contents minutely granular. Cystidia short, obtuse, about $40 \times 6 \mu$.

Very common till late in the season, often in great numbers, chiefly in open plantations, but also on naked soil in shrubberies etc.

As here conceived *H. mesophæum* is a rather polymorphous species, varying in stature and colour. A more strongly umbonate form with a dark dirt-brown or almost bistre umbo, which is occasionally met with in more sunny places, almost equals *H. holophæum* Fr.

4. *H. testaceum* (Batsch) Fr. (Plate 118. fig. E.)

Medium. Cap $2\frac{1}{2}$ —5 cm, convex-flat or slightly umbonate, not fibrillose towards the edge, disc fulvous tan, edge whitish. Gills whitish, becoming flushed with flesh-colour and then light brownish, beaded with very minute drops. Stem rather tall, whitish, slowly becoming slightly flushed with dingy brownish from base up, almost glabrous with minute fibrils of an apical veil. Flesh pale brownish flesh-colour. Taste somewhat bitter.

Spores obliquely ellipsoid, $10\frac{1}{2}$ — 11×5 — 6μ , glabrous or indistinctly punctate. Cystidia obtuse, base inflated, 45 — 50×3 — 4μ (base about 7μ).

Rather rare. It is generally met with in moist places (Betula—Fraxinus-bogs etc.), often gregarious.

The purer and lighter colours, the almost glabrous stem and the very fugacious veil distinguish this species from *H. mesophæum*.

5. *H. pumilum* Lange n. sp. (Plate 119. fig. B.)

Small. Cap 1 — $2\frac{1}{2}$ cm, convex (at first almost semiglobate-campanulate), pale clay-brownish (edge whitish, disc tan-brownish), smooth, viscous. Gills broad, broadly emarginate, crowded, edge (sub lente) minutely fimbriate and somewhat beaded with drops, becoming watery light cinnamon (edge whitish). Stem 3 — 4 cm $\times$ 2 — 4 mm, cylindrical, base often protacted into a short "tap-root", whitish, minutely pruinose above, with a fugacious, fibrillose veil; below the veil minutely fibrillose. — Smell almost none. Taste slightly bitter.

Spores obliquely ovate to sub-limoniform, minutely punctate. Cystidia short, 25×4 — 5μ , subclavate. Basidia 4-spored.

Rather rare. Met with in woods of Fagus, under old tress, growing gregariously on the ground. (First find Sept. 1912).

A very characteristic pygmean species.

*B. Denudata**α. Ingrata*6. *H. truncatum* (Schaeff.) Fr. (Plate 120. fig. D.)

Large and stout. Cap 4—6½ cm, campanulate-convex, fleshy and firm, bright fulvous to rufo-fulvous, viscid, edge slightly turned upward. Gills broadest behind, somewhat adnate, whitish, then pale cinnamon, not beaded with drops. Stem cylindric, stout and short, whitish, slightly fibrilloso-striolate and somewhat powdered. Smell obsolete. Flesh white, tasting somewhat rank-bitterish. Spore-powder light ochry cinnamon.

Spores ellipsoid, smooth, 8½—10 × 4½ μ, light yellow. Cystidia hair-shaped clavate, apex about 6 μ.

Not uncommon, in open plantations of young *Picea*.

Some modern authors regard *Ag. truncatus* (Schaeff.) Fr. as a *Rhodopaxillus* or *Tricholoma*. But the Friesian species has ferruginascent gills (vide vol. I, p. 62).

7. *H. sinapizans* (Paul.) Fr. (Plate 119. fig. D.)

Very large. Cap 5—12 cm, convex, obtuse or slightly gibbous, alutaceous-tan with a flush of flesh-colour. No trace of a veil at the pruinose edge. Gills pallid at first, not visibly beaded. Stem solid, 5—8 × 1,3—1,5 cm, often rather tall, incrassated below (and occasionally also above), base more or less rooting, upper part coarsely white-squamulose (about half way down), whitish, becoming flushed with pallid clay-brownish from base up. Smell faint, taste bitter.

Spores obliquely ovate-ellipsoid, sub-limoniform, 10—11½ × 5½—6 μ. Cystidia rather short, cylindric-clavate, 5—6½ μ broad above.

Not uncommon, often gregarious in moist woods, especially on boggy ground under *Picea*, but also in frondose woods.

H. sinuosum Fr., especially as depicted by KONRAD & MAUBLANC (loc. cit., tab. 80), seems to me identical. And my specimens lack the strong radish-smell said to characterise *H. sinapizans*. But according to FRIES *H. sinuosum* belongs to *Indusiata* (although the veil is nowhere expressly mentioned), and I have therefore made use of the Pauletian name.

8. *H. crustuliniforme* (Bull.) Fr. (Plate 119. fig. A.)

Medium to rather large. Cap 4—6 cm, convex or somewhat gibbous, alutaceous-pallid, more or less tinged dirt-brownish or dingy tan. Gills pallid, densely beaded with drops. Stem solid, 4—5 × 0,5—1,3 cm, often sub-bulbous, whitish, flocculoso-granulose from apex downward, sometimes even to the base. Smell of radish.

Spores ovate-ellipsoid, slightly limoniform, 11½—12 × 6½ μ, indistinctly punctate. Cystidia clavate-cylindric, apex 5—7 μ.

Very common, especially in moist woods, amongst debris in gardens etc.

A very variable species, varying in colour (from almost white to dirty tan), size, stoutness and scalyness.

9. *H. longicaudum* (Pers.) Fr. (Plate 119. fig. E.)

Medium to rather large. Cap 3—5½ cm, campanulate convex, alutaceous white, umbo slightly darker, viscid. Gills whitish, becoming flushed with flesh-colour and then café au lait, very minutely beaded with drops or almost dry. Stem slender (7—8 cm × 7 mm), apex slightly farinose, base indistinctly bulbous, whitish, somewhat hollow. Almost without smell. Taste slightly bitter.

Spores sub-limoniform, 10—12 × 6½ μ, minutely punctate. The cuticle is mainly made up of thin (1—4 μ broad) fibrils. Cystidia clavate hair-shaped.

Rather rare. Met with in moist woods of *Fagus*, in small flocks.

The almost naked, slender stem and the sub-inodorous flesh distinguish this species fairly well from whitish forms of *H. crustuliniforme*. — COOKE'S figure (Illustrations, pl. 415) is uncommonly large.

10. *H. elatum* (Batsch) Fr. var. (?) (Plate 120. fig. B.)

Medium, very tall. Cap about 4½ cm, plano-convex, rather fleshy, viscid, alutaceous ochre, edge minutely reticulate-lacunose. Gills crowded, narrow (about 3 mm), somewhat café au lait. Stem very tall and slender (11 cm × 3—5 mm), fistulose, minutely fibrillose, pale tan, whitish at apex and base, glabrous (apex slightly pruinose). Taste somewhat bitter. Smell slightly rank (not of radish). Spore-powder light cigar-brown.

Spores almost lemon-shaped, somewhat compressed, 8—5½ × 4 μ, transparent, light dingy ochre. No marginal cystidia, on the gill-faces a very few, vesiculose ones, about 18 μ broad.

Solitary in grass, outskirts of wood (*Picea* etc.), Glamsbjerg 1926.

This peculiar species is more like a giant *Naucoria*. On boggy ground at Gerup I have met with a very similar type, but with cylindric marginal cystidia (35 × 7 μ). COOKE'S figure (Illustrations, pl. 962) is a more robust plant, with broader gills.

11. *H. pusillum* Lange n. sp. (Plate 120. fig. C.)

Very small. Cap 0.8—2 cm, conic-convex, then expanded, with a small but rather prominent umbo of date-brown rufous colour; the rest of the cap pallid tan (edge whitish), slightly viscid. Veil absent. Gills rather broad, beaded with drops on the edge, rather distant, pallid, then flesh-colour clay-brown. Stem 2—4 cm × 1—2½ mm, white, powdered, not hollow. Flesh slightly bitter. Smell faint, of radish.

Spores ellipsoid lemon-shaped, generally about 12—13 × 6 μ (10—14½ × 5½—7). Cystidia clavate, 45—60 × 6—11 μ. Cuticle formed of rather coarse, 4—12 μ broad, sausage-shaped cells.

Not uncommon in *Salix cinerea*-bogs and the like, often gregarious, Aug.—Oct.

This tiny species is the smallest within the genus. *H. hiemale* Bres. is somewhat larger, indistinctly umbonate, and forms a transition to the smaller forms of *H. crustuliniforme*.

12. *H. spoliatum* Fr. (Plate 120. fig. A.)

Medium, tall. Cap 2—5 cm, somewhat campanulate, then convex or slightly umbonate,

clay-brown, becoming darker, almost date-brown on the disc (edge pallid), viscous. Gills whitish, then clay-brown cinnamon. Stem slender, 5—6 cm × 4—6 mm, with a long, tapering "tap-root", whitish at first, flushed inside and outside with the colour of the cap when growing old, narrowly fistulose.

Spores oval-ellipsoid, $8\frac{1}{2}$ —10 × 5 μ , brownish yellow. Cystidia hair-shaped.

Rare. Only met once, a number of specimens growing in a wood of *Fagus*, mixed with *Picea*, Oct. 1901 (Hesbjerg). Also recorded by POUL LARSEN (Jylland, 1914, under *Picea*).

FRIES' figures (Icones sel., tab. 113) are very good, but do not show the characteristic "tap-root" which, however, is mentioned in the text.

β . *Sacchariolentia*

13. *H. sacchariolens* Quél. (Plate 120. fig. E.)

Medium to rather small. Cap $2\frac{1}{2}$ —4 cm, convex or slightly gibbous, alutaceous, more or less flushed with pale clay-brownish. Gills broad, pale flesh-colour to dingy cinnamon. Stem 4—5 cm × 4—6 mm, whitish, flushed with clay-brown from base up, fibrillose. Smell strong, sweetish aromatic.

Spores ovate-limoniform, 11—12 × 6 μ (or $10\frac{1}{2}$ —12 × $6\frac{1}{2}$ —7 μ), minutely punctate. Cystidia obtuse, hair-shaped, about 6 μ broad. The fibrils of the cuticle rather thin (about 3 μ).

Not uncommon, in moist frondose woods and copses.

H. Quéletii Schulz. evidently is synonymous. The peculiar sweetish odour (reminiscent of burnt sugar, cinnamon and *Inocybe Bongardii*) distinguishes this species from all the rest.

JAKOB E. LANGE

FLORA AGARICINA DANICA

Vol III.

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A. CORTINARIUS BULBIGER

B. CORTINARIUS ALLUTUS

C. CORTINARIUS CALOCHROUS

D. CORTINARIUS MULTIFORMIS



A. CORTINARIUS PURPURASCENS B. CORTINARIUS TALUS C. CORTINARIUS SUBPURPURASCENS D. CORTINARIUS COERULESCENS



A. CORTINARIUS SULPHURINUS

B. CORTINARIUS ARQUATUS

C. CORTINARIUS PRASINUS

D. CORTINARIUS FULGENS



A. CORTINARIUS RAPACEUS forma MAJOR B. CORTINARIUS SCAURUS C. CORTINARIUS AURANTIO-TURBINATUS
D. CORTINARIUS CYANOPUS E. CORTINARIUS SULPHUREUS var. CITRINUS



A. CORTINARIUS CLARICOLOR

B. CORTINARIUS SULPHUREUS

C. CORTINARIUS TRIUMPHANS



A. CORTINARIUS OLIVASCENS

B. CORTINARIUS EMOLLITUS

C. CORTINARIUS SP.

D. CORTINARIUS DECOLORATUS

E. CORTINARIUS OLIDUS



A. CORTINARIUS CRISTALLINUS B. CORTINARIUS PORPHYROPUS C. CORTINARIUS INFRACTUS D. CORTINARIUS BALTEATUS



A. *CORTINARIUS CRASSUS*

B. *CORTINARIUS COLLINITUS*

C. *CORTINARIUS NEMORENSIS*



A. CORTINARIUS PSEUDO-SALOR

B. CORTINARIUS ELATIOR

C. CORTINARIUS TRIVIALIS

D. CORTINARIUS PUMILUS



A. CORTINARIUS SUILLUS B. CORTINARIUS HUMICOLA C. CORTINARIUS CROCEO-COERULEUS
D. CORTINARIUS MUCIFLUUS E. CORTINARIUS DELIBUTUS F. CORTINARIUS VIBRATILIS



A. CORTINARIUS PLUVIUS B. CORTINARIUS CINEREO-VIOLACEUS C. CORTINARIUS CINEREO-VIOLACEUS forma ROBUSTUS
D. CORTINARIUS TOPHACEUS E. CORTINARIUS MALACHIUS



A. CORTINARIUS ALBO-VIOLACEUS

B. CORTINARIUS CALLISTEUS

C. CORTINARIUS TURGIDUS

D. CORTINARIUS TRAGANUS



A. CORTINARIUS BOLARIS

B. CORTINARIUS PHOENICEUS

C. CORTINARIUS CANINUS

D. CORTINARIUS OCHROLEUCUS

E. CORTINARIUS COTONEUS

F. CORTINARIUS PHOLIDEUS



A. CORTINARIUS ANTHRACINUS B. CORTINARIUS TABULARIS C. CORTINARIUS ANOMALUS
 C'. CORTINARIUS ANOMALUS var. LEPIDOPUS D. CORTINARIUS PURPUREO-BADIUS E. CORTINARIUS CINNABARINUS
 F. & F'. CORTINARIUS SANGUINEUS



A. CORTINARIUS ULIGINOSUS B. CORTINARIUS VENETUS C. CORTINARIUS ULIGINOSUS var. OBTUSUS
D. & D¹. CORTINARIUS MALICORIUS E. CORTINARIUS SEMISANGUINEUS F. CORTINARIUS CINNAMOMEUS
G. CORTINARIUS CINNAMOMEUS var. CROCEUS



A. CORTINARIUS RAPHAÑOIDES

B. CORTINARIUS SPILOMEUS var. DEPAUPERATUS

C. CORTINARIUS TORVUS

D. CORTINARIUS SPILOMEUS

E. CORTINARIUS LUCORUM



A. CORTINARIUS HELVELLOIDES B. CORTINARIUS URBICUS C. CORTINARIUS TRIFORMIS D. CORTINARIUS GLANDICOLOR var. CURTUS
E. CORTINARIUS ARMILLATUS F. CORTINARIUS MELLEO-PALLENS



A. CORTINARIUS HINNULEUS B. CORTINARIUS FLEXIPES C. CORTINARIUS BOVINUS (old)
D. CORTINARIUS BOVINUS E. CORTINARIUS PUNCTATUS



A. CORTINARIUS PALEACEUS

B. CORTINARIUS HEMITRICHUS

C. CORTINARIUS INCISUS forma

D. CORTINARIUS BIFORMIS

E. CORTINARIUS BRUNNEUS

F. CORTINARIUS PSAMMOCEPHALUS



A. CORTINARIUS RIGIDUS forma

B. CORTINARIUS DILUTUS

C. CORTINARIUS RIGENS

D. CORTINARIUS GENTILIS

E. CORTINARIUS DAMASCENUS

F. CORTINARIUS RUBRICOSUS



A. CORTINARIUS SATURATUS

B. CORTINARIUS PULCHELLUS

C. CORTINARIUS TORTUOSUS

D. CORTINARIUS CANDELARIS

E. CORTINARIUS BALAUSTINUS

F. CORTINARIUS BICOLOR



A. *CORTINARIUS CASTANEUS*

B. *CORTINARIUS URACEUS*

C. *CORTINARIUS HOLOPHÆUS*

D. *CORTINARIUS DURACINUS*

E. *CORTINARIUS SATURNINUS*

F. *CORTINARIUS BRESADOLÆ*



A. CORTINARIUS HOEFTII B. CORTINARIUS MINIATOPUS C & C¹. CORTINARIUS SANIOSUS D. CORTINARIUS DECIPIENS
E. CORTINARIUS ERYTHRINUS F. CORTINARIUS SCIOPHYLLUS G. CORTINARIUS ARMENIACUS



A. CORTINARIUS OBTUSUS B. CORTINARIUS ACUTUS C. CORTINARIUS SCANDENS D. CORTINARIUS FASCIATUS
 E. CORTINARIUS JUNGHUHNII F. PHOLIOTA CAPERATA G. PHOLIOTA EREBIA forma GRACILLIMA



A. *PHOLIOTA BRUNNEOLA*

B. *PHOLIOTA EREBIA*

C. *PHOLIOTA VAHLII*

D. *PHOLIOTA DURA*



A & A¹. *PHOLIOTA TOGULARIS* B. *PHOLIOTA TENEROIDES* C & C¹. *PHOLIOTA FILARIS* D. *PHOLIOTA PRÆCOX* forma *CUTIFRACTA*
 E & E¹. *PHOLIOTA PRÆCOX* var. *PALUDOSA* F. *PHOLIOTA DURA* forma *CUTIFRACTA* G. *PHOLIOTA PRÆCOX*



A. PHOLIOTA ADIPOSA B. PHOLIOTA LUCIFERA C. PHOLIOTA DESTRUENS D. PHOLIOTA ÆGERITA



A. *PHOLIOTA TUBERCULOSA*

B. *PHOLIOTA SPECTABILIS*

C. *PHOLIOTA HETEROCLITA*

D. *PHOLIOTA AURIVELLA*

E. *PHOLIOTA AURIVELLA* var. *CERIFERA*



A & A'. PHOLIOTA UNICOLOR B. PHOLIOTA MARGINATA C. PHOLIOTA FLAMMANS D. PHOLIOTA INTERMEDIA
 E. PHOLIOTA RADICOSA F. PHOLIOTA PUMILA var. SUBFERRUGINEA



A. *PHOLIOTA MUTABILIS* B. *INOCYBE CORYDALINA* var. *ALBIDO-PALLENS* C. *INOCYBE INCARNATA* D & D¹. *PHOLIOTA SQUARROSA*



A & A¹. INOCYBE OBSCURA B. INOCYBE ABJECTA C. INOCYBE FLOCCULOSA D. INOCYBE LACERA
D¹. INOCYBE LACERA forma GRACILIS E. INOCYBE HYSTRIX forma MINOR F. INOCYBE GRISEO-LILACINA G. INOCYBE SCABRA
H. INOCYBE CINNAMMATA I. INOCYBE SEROTINA



A. INOCYBE PUSIO B. INOCYBE HÆMACTA C. INOCYBE RICKENII D. INOCYBE DEGLUBENS forma
 E. INOCYBE GEOPHYLLA var. LATERITIA F. INOCYBE SINDONIA G. INOCYBE GEOPHYLLA var. LILACINA H. INOCYBE RUBESCENS



A & A'. INOCYBE DESCISSA var. BRUNNEO-ATRA

B. INOCYBE AURICOMA

C. INOCYBE MICROSPORA

D. INOCYBE PALLIDIPES

E. INOCYBE POSTERULA

F. INOCYBE LANGEI

G. INOCYBE HIRTELLA



A. INOCYBE COOKEI B. INOCYBE FASTIGIATA C. INOCYBE DULCAMARA D. INOCYBE CALAMISTRATA forma GRACILIS
E. INOCYBE BONGARDII F. INOCYBE HIRSUTA



A. INOCYBE PRÆTERVISA B. INOCYBE XANTHOMELAS C & C'. INOCYBE CALOSPORA D. INOCYBE SQUAMATA
E. INOCYBE PATOUILLARDII F. INOCYBE PERLATA



A. *INOCYBE NAPIQUES*

B. *INOCYBE FIBROSA* var. *TRIVIALIS*

C. *INOCYBE BOLTONII*

D. *INOCYBE GRAMMATA*

E. *INOCYBE MACULATA*



A. *INOCYBE LANUGINELLA* B. *INOCYBE PUTILLA* C. *INOCYBE RUFO-ALBA* D. *INOCYBE UMBONINOTA*
 E. *INOCYBE JURANA* F. *INOCYBE RHODIOLA* G. *INOCYBE ASTEROSPORA*



A. INOCYBE PETIGINOSA B. INOCYBE TRECHISPORA C. INOCYBE LANUGINOSA D. HEBELOMA STROPHOSUM
 E. HEBELOMA TESTACEUM F. HEBELOMA FASTIBILE G. INOCYBE UMBRINA



A. *HEBELOMA CRUSTULINIFORME*

B. *HEBELOMA PUMILUM*

C. *HEBELOMA MESOPHÆUM*

D. *HEBELOMA SINAPIZANS*

E. *HEBELOMA LONGICAUDUM*



A. *HEBELOMA SPOLIATUM*

B. *HEBELOMA ELATUM* var. (?)

C. *HEBELOMA PUSILLUM*

D. *HEBELOMA TRUNCATUM*

E. *HEBELOMA SACCHARIOLENS*