DANSK BOTANISK ARKIV
UDGIVET AF
DANSK BOTANISK FORENING
BIND 1. Nr. 5.

STUDIES IN THE AGARICS OF DENMARK

BY

JAKOB E. LANGE

PART I

GENERAL INTRODUCTION
THE GENUS MYCENA

WITH TWO PLATES

KØBENHAVN
H. HAGERUP'S BOGHANDEL
Trykt hos J. Jørgensen & Co. (Ivar Jantzen)
1914

Pris: 3 Kr.

DANSK BOTANISK ARKIV
UDGIVET AF
DANSK BOTANISK FORENING
BIND 1. Nr. 5.

Studies in the Agarics of Denmark.

I. General Introduction. The Genus Mycena.

By

Jakob E. Lange.

With two plates.

GENERAL INTRODUCTION.

My object in publishing the papers on the Agarics of Denmark, here commenced, is to make up a series of critical surveys of the several genera, based on the personal observations of the author. At the same time these papers when completed are intended to serve as letterpress to my »Afbildninger af Danmarks Agaricaceer« (»Illustrations of the Agarics of Denmark«), a collection of water-colour drawings, of which are now complete vol. I—V (622 plates), painted by me during the years 1893—1910. (Supplementary vol. in preparation.)

The aim of this work is to form a kind of Standard-collection (made up of water-colour portraits, as far as possible absolutely true to nature in every detail) which may serve as a documentary fundament to the systematic and floristic study of our agarics, thus contributing to make this study more rational.

It has always been readily acknowledged, that figures are of great value to the investigator of any province of the vegetable kingdom. From the very infancy of botany no effort has been spared to produce good pictures of the different species. (With us Flora Danica 1763—1883 is the most eminent example.)

As the exact distinction of closely allied species has come to turn more and more upon a close examination of even

the most minute details, portraits of plants have however become somewhat less important to systematic study in most branches of botany. Dried or otherwise preserved specimens are now of superlative importance. When you want to ascertain if a specimen is rightly named, you turn to the »type«-specimens of the author, and, likewise, investigations in old herbaria can serve to correct and revise the floristic notes of older books.

With regard to mushrooms, unfortunately, there is not much to be done in that line. Herbaria are of very little use, and even preserved specimens of these soft and loose-textured plants are very often so thoroughly altered as to be of comparatively small value.

While therefore in all other provinces of the vegetable kingdom portraits of the plants have become less indispensable to the exact investigation, they are still of the greatest importance for the study of the agarics. This is the more so as these plants often show colour-tints and variations of outline which are important characters but next to impossible to describe exactly. Hence the saying: a good figure is better than a full page of letterpress.

Unfortunately the existing material in this line is sorely insufficient and many of the prints almost valueless. To produce figures really true to nature, clearly bringing out all important details, is an exceedingly difficult task, for which the ordinary colour-printing and other mechanical methods of reproduction are insufficient. Even expensive works as f. inst. E. Fries: »Icones selectæ« and Cooke's »Illustrations of Brit. Fungi« show this to be the case. As for the larger and rather showy species the best of such prints may answer the purpose fairly well (vide f. inst. the splendid »Atlas« of Rolland); but as for the smaller species and all those which are distinguished by minute details and shades of colour the prints generally are of very little use, if not actually making bad worse by giving a misleading impression of the plant in question.

The only mechanical reproduction which in some cases shows satisfactory results is photography. F. inst C. G. Lloyd has succeeded in producing something valuable in that line (especially Phalloids and Gasteromycetes). But with regard to the Agarics, in which the different colour-tints and shades are of such eminent importance, photography is less satisfactory

and water colour-drawing therefore still the most adequate means for portraying these plants. [1])

To be of any real use for the exact study such drawings must not however fall too short of a certain standard of perfection. The most important features of this standard are:

1) The figures should not be mere sketches, barely giving a general impression of the outward appearance and habit of the fungus. All shades and tints, all details of shape and surface, the attachment of the gills, the nature of the veil etc. the figure should bring out as distinctly as possible. Where brush and pencil fall short, a needle has to be used (thus f. inst. for characterizing the edge of the gills, their crowdedness etc.). To ensure exactness in tints and shades etc. colouring after models should never be resorted to, nor will figures, drawn by direction be of any real use. The mycologist must always do the entire work himself.

2) Often it will be found necessary to figure a species in different stages of growth, and the smaller fungi should be figured not only natural size but also somewhat magnified. Outlines of the spores and cystidia should never be omitted, and also other microscopic details may be of great use.

3) In selecting the plants to be figured, making use of any abnormal specimens, called forth by extraordinary conditions (heavy rain, frost etc.) should be carefully avoided. Only fullgrown, normal specimens should be used. But at the same time it should never be forgotten that a figure always must be a portrait, representing an individual, not a type; so that in no case it will be allowable to deviate from the actual material (as f. inst. by emphasizing lineaments, colours or other features, which in the specimens found are less prominent than usual

[1]) Unfortunately, as far as I know, what exists in the way of original water-colour-drawings is as yet very insufficient. In the Museum of Stockholm some of the drawings from the time of E. FRIES are still preserved, mostly such ones as have been reproduced in his »Icones sel.«. But a great number have been lost. The collection in the Kew Herbarium comprises some watercolours, but — at least when I inspected it in 1905 — comparatively little and rather heterogenous matter. Some of the best figures existing are SCHUMACHERS, now more than one hundred years old water-colour-sketches »Flora Hafniensis, Fungi delineati« in the library of the Botanic Garden, Copenhagen, a collection still worth consulting, although it belongs to the time before Fries.

for the species in question. If this rule be not strictly adhered to, the figures will lose the character of reliable documents.

4) Finally of course the naming of the plants should be as correct and careful as possible. And if the specimens figured in any way differ from the diagnosis of the species, a description should be added.

In short: The figures should be so carefully executed, that it will be possible to give from them a correct and detailed description of the species in question.

In »Afbildninger af Danm. Agar.« I have tried to fulfil these requirements. All the figures have been executed and the plants collected by the author himself[1]). To avoid mistakes the microscopic details always (with a few expressly stated exceptions) represent spores etc. taken from the specimens figured. But it must be noted, that although the spores, for practical reasons, are shown magnified 1000 times, the magnifying power employed is generally only about 400 (Seibert obj. IV, oc. III) and consequently the figures do not bring out any details not to be seen by such moderate power.

As the value of such a collection of portraits very much depends on its completeness I have used my best effort — during the last 20 years — to portray all the species I have met. Owing to the extreme rareness of many species I have not succeeded in figuring all the species of our flora; but as the 5 volumes now completed number 622 plates (species) and the supplementary volume in preparation already carries this figure up above 700, it will be quite an exception, if a fairly common species should be found missing in the collection. (For comparison it may be mentioned that Rostrup's »Flora« II only describes a little over 200 species and that Severin Petersen's »Danske Agaricaceer« (all those species included which are dubious citizens) comprizes about 800 species.)

Even if a number of my figures should turn out to be erroneously named — and such mistakes I dare not hope entirely to have avoided — it will not render them worthless, if only the figures be really correct in all details. Coming

[1]) All the figures have been executed in duplo, thus forming two absolutely similar collections, one in the library of the Botanic Garden of Copenhagen, the other in my own. Copies of any species can be obtained from the author.

mycologists will then be able, in spite of the erroneous naming, to see what species has been portrayed, and the naming can thus be corrected and revised as is now the case with specimens in herbaria.

It seems to me not unlikely that my portrait-collection, supplemented by the series of critical surveys of the genera which is here begun by a review of the genus *Mycena* (and which I hope to complete in a future not too distant) may be found useful to promote the study of this interesting but bewildering part of botany, and more especially to add to the exactness of our knowledge.

THE GENUS MYCENA.

The study of the agarics presents difficulties of rather extraordinary character. Not only are most of these plants comparatively rare or at any rate sporadic; but more especially they are very difficult to refind, as their »flowering« is generally of short duration, and even if the plant does not die off entirely after having developed reproductive bodies, it probably often happens that it disappears for years, one or more »flowerless« seasons separating the fertile ones, thus disappointing the botanist exploring the locality where the plant has formerly been met with. Indeed quite a considerable portion of the species belonging to our flora have been recorded only once in this country; in not a few cases only a single specimen has been found.

Moreover the study is rendered difficult by the fact that these plants often show considerable alterations during their lifetime. The veil may disappear; the shape of the cap, the attachment of the gills and other important characters may become entirely altered. Besides, the specimens are as a rule very difficult or almost impossible to preserve in a satisfactory way, and consequently any revision or further investigation of the specimens found, their comparison to new finds etc. are out of the question. The result of this is that it is almost impossible to entirely avoid that different finds of a mushroom, in reality belonging to the same species, are differently named, or, reversely, that by a slip of memory specimens found are erroneously referred to a species formerly observed, from which they could have been readily distinguished, if a direct comparison had been possible.

The whole case is further aggravated by the fact that the characteristic features of these plants are often extremely difficult to describe with sufficient exactness. This is especially the case with smell and colour, characteristics for which the

different languages generally have but vague and ambiguous terms: »smell of fish«, »earthy« smell, plum-colour, clay-yellow, livid etc.

It is therefore not to be wondered at that — in spite of the work of eminent mycologists — there still obtains in this province of mycology a confusion rather more marked than in any other branch of botany. Very often the name-giving will either be almost mere guesswork or rest chiefly on tradition, and the systematic and floristic notes of different authors consequently are apt to become incongruous or even contradictory.

Naturally this confusion is particularly marked in the genera made up of minute species in which the habit of the plants generally presents but few salient features that can be used as leading characters (even if their specific features be just as fixed and distinct as in most of the larger species). In such cases the introduction of microscopic characters into the diagnosis will of course be found particularly useful; but unfortunately the microscopic data given by the different authors are often contradictory (owing probably in most cases to their having used the same name for different plants). With regard to old species microscopic data are consequently of comparatively small value if they be not accompanied by illustrations, showing to what plant they really do apply.

It appears to me to be of great importance to proceed further in the direction of microscopic investigation. Not only that the naming of the agarics might become more exact, but probably we should by this means attain to a deeper insight in the real relationship of the different species and genera.

To what extent microscopic characters may be used as a basis for the classification of the agarics I cannot say; but already they have been successfully used for such purposes in several instances. Thus the very heterogenous genus *Clitopilus* has been split up in: 1) a rough-spored lot, which undoubtedly should be placed in *Hyporhodius* (sensu Schroeter), more particularly in the subdivision *Eccilia*, and 2) a smoothspored lot, which possibly could be referred partly to *Paxillus* (C. prunulus, C. mundulus etc.) partly to *Pleurotus* (C. cretatus), in which case the genus Clitopilus would entirely disappear. Likewise several authors have split up the genus *Inocybe* by setting apart the rough-spored species as a new genus (*Clypeus* Britz., *Astrosporina* Schroet.) or parallel series. — Also the different structure

of the hymenium has been used for such purposes of classifi cation, f. inst. to regulate the boundary-line between such genera as *Coprinus* and *Psathyrella*, *Bolbitius* and *Galera*.

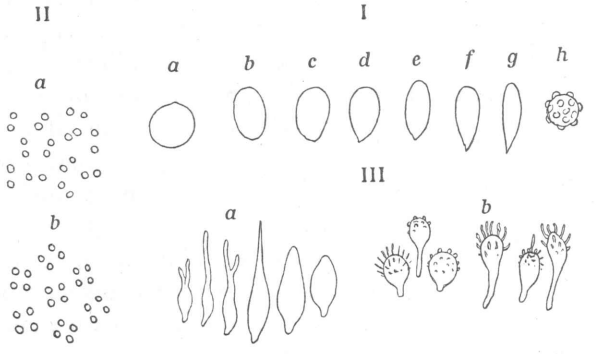
The genus *Mycena* which is to be the subject of this dissertation presents a great variety of such microscopic characters which I shall here try to make use of as an expedient to a more precise and systematic handling of the species.

It will hardly be right to split up the genus. Its species, although very numerous, are comparatively closely allied, making up a very solid whole, easily distinguished from the adjoining genera by outward appearance. Only that little group of the neighbouring genus *Omphalia*, which FRIES very adequately named *Mycenarii*, runs into Mycena without any marked boundary-line. For the rest only in a few instances a minute *Marasmius* or *Collybia* may be mistaken for a Mycena.

But although the genus *Mycena* thus constitutes a well defined whole it goes without saying that within a genus so large (already E. FRIES describes 100 European species) there will exist different tribes. As everybody knows FRIES arranged all the species in 9 lots; and this classification partly rests on characters so marked and unchanging that undoubtedly it will be of lasting value. But being limited to the use of macroscopic characters he was obliged for practical reasons to make use also of distinctions far less valuable for purposes of classification. Thus one of his tribes »*Adonideæ*« is characterized mainly by »bright colours« (and colour is in this genus a character even less reliable than usual); and other tribes are chiefly characterized by size (a very variable character) or toughness (which can only be roughly estimated).

If, on the contrary, the microscopic characters are made use of for purposes of classification our position becomes far more favourable. For within this genus the species present microscopically a number of unusually distinct and varied characters. In the first place this is the case with the spores. The shape of the spores is exceedingly variable: not only that their outline varies from spheric to fusiform, their surface is also different, as besides the usual smooth type there exists a type in which the spores are set with coarse warts (fig. I h). Moreover the size of the spores varies considerably, from hardly 5 μ to about 12 μ in average length.

A fact also worth mentioning is that quite a number of the species in the genus M. have 2-spored basidia, a rather rare case within the province of the agarics.[1] This character (and the other microscopic characters mentioned above) are of particular value because they can easily be delt with in a wholesale way, thus eliminating any chance deviation from the type. F. inst. the number of spores on each basidium can easily be ascertained by examining a young and quite fresh gill (dry and without cover-glass) under a microscope of small power (about 200). The spores will then be seen all over the surface of the gill, arranged in pairs or fours (fig. II a—b).



(I Types af Mycena-spores. II Arrangement of spores on surface of gill. III Types of cystidia.)

But besides the characters presented by the basidia and spores the genus Mycena possesses another prominent microscopic character: the form and nature of the *cystidia*, which make up the edge of the gills or are imbedded among the basidia of the edge (occasionally also on the sides of the gill). Cystidia are indeed also met with in other genera, but hardly in any other genus in shapes so various.

What is here designated as cystidia, are possibly in reality cells of rather heterogenous nature. Sometimes they probably

---

[1]) Probably a more thorough investigation will show, that basidia with only 2 sterigmata are to be met within numerous genera. I myself have noted that (besides in some of the *Omphalia* most closely allied to Mycena) two-spored basidia are found in *Clitocybe* (*Russuliopsis*) *tortilis*, in a few species of *Nolanea* and *Leptonia*, some *Galera* (especially of the *tener*-tribe) *Naucoria erinacea*, *Pholiota erebia*, a form of *Psalliota campestris* and in a little dark-spored fungus, probably a *Stropharia* of the *Merdarii*-tribe.

should be regarded as a kind of sterile basidia, sometimes rather as the terminal joint of the hyphæ of the trama. But at all events as they show very marked differences of outline and shape and are comparatively easily observable they are very useful for systematic purposes.

Two leading types of cystidia can be distinguished: 1) The cystidia are smooth, their free portion hairshaped, cylindric or conical (rarely somewhat branched or forked), the inserted part often more or less ventricose (fig. III a). 2) The free portion of the cystidia is set with warts or setiform hairs, its outline obtuse or almost hemispherical, the entire cell broadest at the top (club-shaped pyriform or obovate) (fig. III b). (This latter very characteristic kind of cystidia I have (outside the genus Mycena) only seen in a very limited number of agarics (some of the neighbouring Omphalia and some few small Marasmius). The cystidia of this type often form a comparatively broad sterile brim at the edge of the gill; in this case they are generally almost spherical or bludgeon-shaped. In other species they are less numerous and less prominent, only to be met with at the very edge of the gill and easily overlooked, (in which case the plant will be described as devoid of cystidia). (The easiest way to detect them is by examining a quite fresh gill, dry, without a cover-glass, by comparatively small power (about 300).)

The two types of cystidia are in general well defined. Only some few species possess cystidia of intermediate forms (f. inst. conical, but warted cystidia); and still fewer present cystidia so variable in shape, that on a gill set with cystidia of the first kind may at the same time be seen a number of cystidia more or less approaching type 2.

If the microscopic characters here mentioned be used as the basis for the systematic arrangement of the species, the least valuable of the macroscopic characters can be dispensed with or at least pushed back to a secondary or third class position, the handling of the whole genus thus becoming more exact. — To which of the above-mentioned microscopic characters the most prominent place should be assigned is a matter of opinion; and possibly future investigations will show that the order of precedence should be altered. But I have here tried to make up an arrangement, mainly based on the most prominent characters.

The smoothness or roughness of the spores I consider the clearest distinction. In the »Key« the genus is accordingly first divided into two subgenera: *Eu-Mycena* (with smooth spores) and *Mycenella* (with warted spores). Of the latter subgenus, which is by far the smaller one, hitherto only some few species have been met with in Denmark; but to judge from the observations of other authors quite a number of species belong to this group (f. inst. *M. rœborhiza* Lasch, *M. lutea* Bres., *M. bryophila* Vogl., *M. montana* Quél).

The subgenus *Eu-Mycena* is further subdivided according to the type of cystidia. Only a very limited number of species have no cystidia at all on the edge of the gills. Of the species known by me it is only true of two: *M. epipterygia* and *M. vulgaris*[1]). In these two the edge of the gill is formed by an elastic thread, devoid of basidia and almost structureless, which runs into the slimy cuticle of the cap. I have therefore termed this section *Gummosæ*. All the rest I arrange in two large sections, according to the type of cystidia: 1) *Ciliatæ* in which the gills are minutely fringed by cystidia of the 1st type (smooth, hairshaped etc.) and 2) *Granulatæ*, the cystidia of which are of the 2d type (warted or setulous, obtuse).

As well the section Ciliatæ as Granulatæ are then further subdivided partly by means of their most prominent and well-defined macroscopic characters, partly by other microscopic ones, such as f. inst. the number of spores on each basidium and the shape and size of the spores.

A key made up in the way here indicated will, as far as I can see, be well adapted for singling out — with comparative ease and exactness — any species met with.

Unfortunately when trying to name the plants one often encounters another obstacle blocking the way. Even if you are able clearly and perfectly to distinguish the different species met, it is in many cases exceedingly difficult to select the proper name for each species, as it is often almost impossible to make out what kind of plant the giver of a certain name really had be-

[1]) Karsten (Symb. ad Myc. Fenn. XXIX 1889) proposed a new genus *Mycenula*, distinguished from Mycena proper by having cystidia on the gills. The fact is, however, that nearly all the species observed have cystidia of some kind or other.

fore him. For not rarely the descriptions are very insufficient and the figures more misleading than helpful.

The selection of names is consequently often a matter of opinion or tradition. Still I dare hope in most cases to have made the right choice. Not infrequently by far the easiest way would be to cut the Gordian knot by totally ignoring the old, inadequate descriptions and give the species in question a new name. But when it has been in any way possible to apply an old Friesian name I have always done so, in order not wantonly to add to the legion of names. In the more intricate cases I have however added a new and more explicit description.

Besides the key given below (based on the leading microscopic characters and the best of the macroscopic ones) which comprises all the species figured of the genus Mycena, I shall in a following chapter give a series of notes on each species. But these notes I deem it expedient to limit as much as possible; and I shall therefore leave out everything already mentioned by Fries (or the post-Friesian authors of later species). I adopt this limitation the more unhesitatingly as everything pertaining to the outward habit of the species can be readily seen in the figures of »Danmarks Agaricaceer«, in which particular stress has been laid upon the exact rendering of all details, in order to avoid mistakes and confusion.

But while the key only comprises the species found and figured by me, in the notes I shall occasionally give my opinion of other species, in order to throw a searchlight upon dubious and ambiguous species, double-namers and other mycological ghosts and nightwalkers.

KEY

TO THE SPECIES OF THE GENUS *MYCENA* FIGURED IN »DANMARKS AGARICACEER«.

I. EU-MYCENA

spores smooth, of various shape.

A. **Ciliatæ.** Edge of gills set with cystidia of type I (entirely smooth, their free portion conical, cylindric, hair- or awlshaped).

α. marginatæ. Content of cystidia coloured and edge of gills consequently showing a more or less distinct coloured line.

a. *exsuccæ.* Stem devoid of coloured juice.

1. Spores 6—7 μ long.
   Cap rather fleshy, edge of gills blackish purple . *M. pelianthina.* (1)
2. Spores 8—12 μ long.
   * Edge of gills dark purple or purplish-brown.
     † Cap membranous; edge of gills distinctly dark purple . . . . . *M. rubro-marginata.* (2)
     †† Cap somewhat fleshy; edge of gills faintly purplish-brown . . . . . *M. plicosa var. marginata.* (3)
   ** Edge of gills brown or yellow.
     † Edge of gills brown . . . . . *M. avenacea.* (4)
     †† Edge of gills lemon-yellow . . . . . *M. citrino-marginata.* (5)

b. *lactipedes.* Stem contains coloured (red) juice.

1. Cap membranous; stem smooth . . . . . *M. sanguinolenta.* (6)
2. Cap somewhat fleshy; stem with a powdery bloom *M. hæmatopoda var. marginata.* (7a)

β. concolores. Content of cystidia devoid of colour.

a. *lactipedes.* Stem with coloured juice or milk.

1. juice red . . . . . *M. hæmatopoda (typ.)* (7b)
2. — milky white.
   * Cap striate, grayish (rarely white) . . . . . *M. galopoda.* (8a)
   ** Cap grooved, sooty dark brown . *M. (galopoda var.) leucogala.* (8b)

b. *exsuccæ.* Stem without couloured juice.

1. Stem dry, devoid of slimy coating.
   * Stem without basal disc.
     † Stem everywhere densely clad with erect setulæ . . *M. Iris.* (9)
     †† Stem devoid of such coating.
       ○ Basidia 4-spored.
         § Spores broad (breadth half the length or more).
           › Spores large (8—12 μ long.)

× Cystidia rather large, 7—15 μ broad.
□ Cystidia (free part) awlshaped or conical.
(Smell »nitrous«.
˘ Stoutish, cap rather fleshy. *M. alcalina.* (10a)
˘˘ Delicate, cap absolutely membranous . . . . *M. alc. var. chlorinella.* (10b)
((Smell none or faint.
˘ Cap not pellucido-striate (but somewhat grooved). . . . . *M. leptocephala.* (11)
˘˘ Cap pellucido-striate.
= Cap dark gray (grows on the ground amongst grass) *M. ammoniaca.* (12)
≡ Cap pallid (grows on stumps) *M. pseudo-galericulata.* (13)
□□ Cystidia cylindric . . . . . *M. excisa.* (14)
×× Cystidia (free part) hairshaped, 2—5 μ broad.
□ Stem with elevated parallel lines *M. polygramma.* (15a)
(Lines indistinct, whole plant milkwhite *M. p. var. candida.* (15b)
((» » dwarfy form growing on the trunk of living trees *M. p. var. pumila.* (15c)
□□ Stem without raised lines . . . . . *M. vitilis.* (16)
» Spores small (6—8 μ long).
× Cap fleshy, bright coloured 2—5 cm (smell of radish) . . . . . *M. pura.* (17)
×× Cap membranous ebony-white, 1—2 cm (no smell) . . . . . *M. flavo-alba.* (18)
§§ Spores narrow (breadth less than half the length).
› Cap red . . . . . *M. acicula.* (19)
» Cap white . . . . . *M. echinipes.* (20)
§ Basidia 2-spored.
§ Spores narrow (breadth less than half the length).
› Cap conic-campanulate . . . . . *M. lactea.* (21a)
» Cap expanded . . . . . *M. lactea var. pithya.* (21b)
§§ Spores broad (breadth half the length or more).
› Cap red.
× Cap about 1 cm across, stem white. *M. Adonis.* (22)
×× Cap about 0,3 cm, stem pale pink. *M. rubella.* (23)
» Cap gray or white.
× Taste bitter (like quinine) . . . . . *M. fellea.* (24)
×× Taste not bitter.
□ Gills nearly free.
(Plant nearly of medium size (cap about 1 cm) . . . . . *M. gypsea.* (25)
((Plant very delicate; stem filiform *M. epiphloea.* (26)
□□ Gills adnate . . . . . *M. hiemalis.* (27)
‡ Stem springing from a small disc.

† Cap white . . . . . *M. stylobates.* (28)
†† Cap gray . . . . . *M. clavularis.* (29)
2. Stem with a slimy coating . . . . . *M. rorida.* (30)

B. **Granulatæ.** Edge of gills with cystidia of type II (free portion obtuse, set with warts or setulæ).
α. marginatæ. Content of cystidia coloured and edge of gills consequently showing a coloured line.
a. Edge of gills yellow or orange . . . . . *M. elegans.* (31)
b. Edge of gills red.
1. Stem stiff upright; cap about 1 cm . . . . . *M. rosella.* (32)
2. Stem filiform, slack and slender; cap very small . . *M. pterigena.* (33)
β. concolores. Cystidia hyaline.
a. Stem with coloured juice . . . . . *M. crocata.* (34)
b. Stem without coloured juice.
1. Cap not »sugar-sprinkled« (ɔ: devoid of a coating of loose glistening particles).
* Basidia 4-spored.
† Spores ellipsoid or ovate.
○ Clustered growth.
§ Spores large (8—10 μ) . . . . . *M. inclinata.* (35)
§§ Spores small (c. 5 μ) . . . . . *M. Tintinnabulum.* (36)
♀ Solitary growth.
§ Gills plano-adnate or arcuato-decurrent (almost as in Omphalia).
› Odour mealy; gills arcuato-decurrent . *M. cinerella.* (37)
» No smell; gills broadly plano-adnate *M. pinetorum.* (38)
§§ Gills ascending, slightly adnate or almost free.
› Cap at last expanded; Gills rather distant, connected by veins . . . . . *M. fagetorum.* (39)
» Cap campanulate; gills rather crowded.
× Medium-sized fungi (cap 0,5 cm or more); spores broad (breadth half the length or more).
▫ Cap with olivaceous tint . . . . . *M. lineata.* (40)
▫▫ Cap with pinkish tint . . . . . *M. metata.* (41)
(Cap small, c. 0,5 cm, vide M. filipes).
×× Minute fungi (cap 0,1—0,3 cm); spores narrow (breadth less than half the length).
▫ Stem without a basal disc. . . *M. capillaris.* (42)
▫▫ Stem springing from minute disc. . *M. Mucor.* (43)
†† Spores spherical.
○ Cap somewhat conical, striate . . . . . *M. supina.* (44)
♀ Cap truncate-campanulate, grooved . . . . . *M. corticola.* (45)
** Basidia 2-spored.
† Cap somewhat fleshy, 2—4 cm across. . . . *M. galericulata.* (46)
†† Cap membranaceous, smaller.
○ Gills narrow, attenuate-adnate.
§ Cap $1^1/_2$—2 cm across. . . . . *M. parabolica.* (47)

§§ Cap smaller . . . . . *M. filipes.* (48)
(vide also M. metata and M. fellea).
§ Gills broad, rather broadly adnate . . . . . *M. debilis.* (49)
2. Cap »sugar-sprinkled«.
* Stem springing from minute disc. . . . . *M. tenerrima.* (50)
** Stem without basal disc. . . . . *M. osmundicola.* (51)

C. **Gummosæ.** Edge of gills formed by an elastic, almost amorphous filament. (Stem viscid or slimy. Basidia 4-spored).
α. Cap 1—2 cm; gills rather narrow, somewhat ascending. (Stem generally with a yellow tint.). . . . . *M. epipterygia.* (52)
β. Cap about 1 cm; gills very broad, subdecurrent. (Stem not yellowish) . . . . . *M. vulgaris.* (53)

II. MYCENELLA.

Spores spherical, set with coarse warts. (In the species here mentioned the basidia are 2-spored, the cystidia of the Ciliatæ-type.)

α. Cap without pellucid striæ, 1—2 cm. . . . . *M. lasiosperma.* (54)
β. Cap pellucido-striate, less than 1 cm across. (Stem filiform.) *M. margaritispora.* (55)

SYSTEMATIC AND FLORISTIC NOTES ON THE DIFFERENT SPECIES.

The purpose of the following notes is to give, in a concise manner, the microscopic data of all the species examined and figured, and such macroscopic data as cannot with sufficient clearness be derived from the ordinary sources (more especially the descriptions of Fries himself and of the authors of post-Friesian species).

Further I have added my notes on the habitat and distribution of the species. — As far as I can see the flora of the different provinces show no essential differences. Attempts — like that of Blytt regarding the flora of Norway — to point out characteristic differences in the geographical distribution of the agarics within a country (western and eastern species etc.) will hardly bring any positive results. But while the geographical distribution of the species generally is very wide (some are almost cosmopolitan), they very often are rather particular with regard to the topographic and geologic (or chemical) character of their habitat. Although there are mushrooms which — like certain flowering plants — will thrive under the most widely different conditions, it seems to me a fact that most species are confined to natural conditions of particular character.

I have therefore — as carefully as I could — made notes of the characteristics of the habitat, which I consider far more important than the precise indication of the very spot, where the specimens have been encountered.

Besides giving the facts regarding the species found by myself I shall occasionally offer some critical remarks on other species, especially such ones the description or synonymy of which present particular difficulties.

Spores of all the species are figured on plate II.

I. EU-MYCENA.

A. CILIATÆ.

α. MARGINATÆ.

1. **Mycena pelianthina** Fr.

Spores cylindric-ellipsoid, 6—7 × 3 μ. Cystidia cylindric-fusiform 50—90 × 10—12 μ, containing a red juice. Basidia 4-spored.

Figured from specimens found at Hjallese (Fyn) Oct. 4. 1895. — Not uncommon in beech-woods, on the ground.

Widely separated from the other species in this section. M. pura appears to be its nearest relation.

(*M. balanina* Berk. Judging from the description and the figure of Cooke this fungus probably is identical with a form of Marasmius erythropus Pers. (sensu Schroet.) having the edge of the gills profusely set with the dark brown awlshaped setæ characteristic of this species. (Vide also: *(Mycena) Marasmius cohærens).*

2. **M. rubro-marginata** Fr.

Spores oblong-ovate or broadly oval, $10^1/_2$ — 12 × 6 μ. Basidia 4-spored. Cystidia rather small, pointed, slenderly fusiform, length about 32—40 μ.

Figured from specimens found at Ry, near Birk Sø, Aug. 10. 1902, growing on mossy twigs of heather in a moist bog, in small troops. Rather rare.

This species has a superficial likeness to pale-coloured forms of M. sanguinolenta.

(The whitish form figured by Fries (Icones sel. tab. 78.) is unknown to me).

3. **M. plicosa** Fr. var **marginata** n. v. (Plate I, fig. a.)

Spores ovate-oblong, 9—10 × $4^3/_4$—5 μ. Basidia 4-spored. Cystidia (sub lente) faintly pale brown, of somewhat variable shape (occasionally sparingly branched) as a rule obtusely fusiform 60—80 × 10—15 μ.

Fig. from specim. found at Kirkeby (Sydfyn), Oct. 25. 1904, growing in flocks on the ground amongst dead needles in a wood of Abies pectinata.

Cap (when dry) opaque; gills soon with a whitish bloom (as already noted by Fries in his monograph). The plant has an

extremely faint »nitrous« smell. — Only the (not very marked) purplish-brown edging of the gills distinguishes this variety from the type (which I have not met). (Vide M. alcalina).

4. **M. avenacea** Fr. (sensu Schroet.).

Spores ovate-ellipsoid, 9—12 × 5—5½ μ. Basidia 4-spored. Cystidia (free portion) hairshaped, about 14 μ long, occasionally somewhat branched and wavy, base slightly inflated.

Fig. specim.: Hjallese Oct. 17. 1897, on grassy bank. — Not uncommon on old lawns, and along roadsides, growing in small troops, easily recognised by its yellowish-olivebrown colour.

The description given by Schroeter (Pilze Schles.) fits very closely, but differs considerably from the description of Fries, which possibly refers to another species (he describes it as »fuscus, demum cæsio-lividus« and a native of the beech-woods) — *M. olivaceo-marginata* Massee might be considered identical but for the exceptionally small spores (6 × 4—5 μ). According to Schroeter *M. fusco-marginata* Godey also agrees pretty closely to this species. —

The dark edging of the gills is occasionally almost obliterate and in such cases the fungus is apt to be misplaced. The plant described by Sev. Petersen (l. c. p. 127) as *M. prolifera* Fr. might be such an one.

5. **M. citrino-marginata** Gill.

Spores ovato-ellipsoid, almost apple-pip-shaped, 8—10 × 4½—5 μ. Basidia 4-spored. Cystidia generally fusiformly bottle-shaped with a long slender neck (rarely shortnecked), 30—50 × 9—15 μ. Content pale yellow.

Fig. specim.: A) Vormark, outskirts of a fir-plantation Oct. 27. 1900, and B) Hjallese, Oct. 1898. — Not uncommon in coniferous and deciduous woods and copses, on the ground, often solitary.

In pale whitish-yellow specimens the citrine edging of the gills is often almost obliterate. Such specimens come close to the description of *M. lineata* (see below). The Mycena described by Schroeter as *Ag. luteo-albus* Bolt. is probably a form of the present species.

6. **M. sanguinolenta** Alb. et Schw.

Spores ovato-ellipsoid, almost pipshaped, 8—11 × 4—6 μ. Basidia 4-spored. Cystidia (free portion) awlshaped, base up to 10 μ broad.

Fig. specim. from »Fruens Bøge« near Odense, Nov. 1895 (on rotten stump of beech) and from Odense, Aug. 1902 (on the ground amongst dead needles, fir-wood. — Common in woods, especially coniferous ones.

The edging of the gills as well as the colour of the juice of the stem is sometimes very pale, especially in small pallid specimens, but *M. cruenta* Fr., with no edging at all, I have never ob-

served. To judge from the figure of Fries it appears, like no. 7 a, to be a form running into the typical M. hæmatopoda.

7 a. **M. hæmatopoda** Pers. var. **marginata** n. v.

Spores oval-ovate 8—10 × 5—5½ μ. Basidia 4-spored. Cystidia drawn out to a sharp point, below the middle fusiformely inflated, 10—17 μ broad, their free portion 45 μ long, content pale brownish-red.

Fig. specim.: Rudme (in the head of a pollarded willow) Oct. 20. 90 and Trolleborg (stump of beech) Sept. 27. 1901. — (Also in other localities).

Only the dark edging of the gills separates this variety from cherry-brown forms of the typical M. hæmatopoda.

β. CONCOLORES.

7 b. **M. hæmatopoda** Pers. (forma typica).

Spores oval-ovate 7—10 × 5½—6 μ. Basidia 4-spored. Cystidia like those of 7 a but colourless (or nearly so).

Fig. specim.: Hesselager, on a barkbared log (of oak?) Oct. 1896, and Sorø, on fallen beech-branch, Sept. 30. 1906. — Rather rare, generally in small bunches on dead branches of beech.

Mature specimens often have the cap somewhat pellucido-striate.

8 a. **M. galopoda** Pers.

Spores oblong-ovate, 10—13 × 5—6½ μ. Basidia 4-spored. Cystidia awlshaped, (occasionally forked) somewhat fusiform 45—65 × 10—14 μ.

Fig. specim.: Hjallese, mixed deciduous wood, scattered, Nov. 3. 1895. Common in deciduous and coniferous woods on the ground. Very variable in shape and colour (ranging from almost black to pure white):

var. **candida**.

Spores 8—10 μ long. Cystidia as in the type.

Fig. specim.: Hjallese, solitary amongst beech-leaves, Oct. 1896. — Rather rare.

8 b. **M.** (**galopoda** var.) **leucogala** Cooke (as a distinct sp.)

Spores ovate-oval, 10—11 × 5—5½ μ. Basidia 4-spored. Cystidia almost as in 8 a, about 75 × 12 μ.

Fig. specim. (Supplem.): Kirkeby, Sydfyn, Nov. 2. 1911, on and around stump of fir.

Hardly to be considered an independent species, more likely only a big, somewhat tufted variety, with blackish-brown, deeply grooved cap.

9. **M. Iris** Berk.

Spores oval or ovate, about 6—7½ × 3¾—4 μ. Basidia 4-spored. Cystidia crowded, obtusely setiform, 35—40 × 4—5 μ.

Fig. specim.: Hjallese Oct. 1897, Ravnholt 1902, Fruens Bøge 1903. —

Not uncommon, solitary or in small troops, on fir-stumps.

Cap (when only half-grown) of a beautiful light blue colour, later on becoming gray, the edge retaining the blue tint for a considerable time. Base of stem also occasionally with a blue tinge. The whole stem is densely clad with minute erect setæ, very much like the cystidia.

M. marginella Pers. = *M. mirabilis* Cooke and Quél. appears — judging from the descriptions — to be only a form of this species. The same may be true of *M. coerulescens* Schroeter, *M. limbata* Lasch, and *M. calorhiza* Bres. (l. c. tab. 5).

10 a. **M. alcalina** Fr.

Spores ovato-oblong. Basidia 4-spored. Cystidia pointed, awl-shaped, somewhat fusiformely inflated (7—9 μ) below the middle. Hyphæ of the trama up to 60 μ broad.

Fig. specim.: Hjallese, in bunches on rotten log (foliaceous tree) in a wood-yard, June 1902. — Not uncommon, especially on and around stumps of fir, somewhat clustered.

(The ordinary type is of a more pure and dark gray colour than the one here figured. Old and stout specimens have much in common with no: 3). —

10 b. **M. alcalina** var **chlorinella** n. v. (Plate I, fig. b.)

Spores ovato-oval. Basidia 4-spored. Cystidia pointed or obtuse broadly fusiform (10—15 μ broad).

Fig. specim.: Fjellerup near Ringe, growing gregariously in deep moss in the outskirts of a fir-plantation, Oct. 24. 1904.

Besides by having smaller spores it is distinguished by its small quite membranous cap (0,9—1,2 cm) and sub-pellucid pale, somewhat powdery, very slender (1 mm) stem. I regard it as only a moss-form of M.alcalina.

10 c. **M. alcalina** (?) var **nivea** n. v (Plate I, fig. c.)

Spores ovate 7½—9 × 4½ μ. Basidia 4-spored. Cystidia obtuse or subobtuse, broadly fusiform (10—14 μ).

Fig. specim. (Supplem.): Gerup near Holstenshus, a small cluster on a fir-stump in coniferous wood, Sept. 9. 1909.

Cap 1¼—1½ cm, obtusely campanulate, later on somewhat expanded, membranaceous, snowy white, minutely pellucido-striate (when dry quite even). Gills ascending, rather distant, somewhat adnate with a very small decurrent tooth (not emarginate). Stem somewhat hollow, glabrous, even, base somewhat thicker (devoid of basal setæ or »root«) 4½ cm long, 1½ (base 2½) mm thick. Smell almost wanting.

M. lævigata Lasch, which is said to grow abundantly in the coniferous woods on the Scandinavian peninsula, seems to be very close to this fungus. Possibly my plant should be regarded as a variety of M. lævigata. — But M. lævigata seems to be very variously conceived. According to Saccardo its spores are »ellips., 5—6 × 3«, while Quélet tells us they are »spheric, punctuate, c. 6 μ diam.«).

11. **M. leptocephala** Pers.

Spores cylindric-oval, 10½—12 × 5½ μ. Basidia 4-spored. Cystidia acute awlshaped, somewhat fusiform 60—70 × 10—14 μ. —

Fig. specim.: Hjallese in a wood-yard (in copse-wood) on ground formed of rotten sticks, mould etc. solitary, June 1902. (Also observed on similar soil in fir-wood, Lørup, Oct. 1906).

This plant differs from big specimens of M. alcalina — to which it is closely allied by its ashy gray, grooved (not pellucido-striate) cap and very faint »nitrous« odour. It has a superficial likeness to M. polygramma.

12. **M. ammoniaca** Fr. (?).

Spores ovate, 9½—10 × 5—5¾ μ. Basidia 4-spored. Cystidia ventricose below the middle, upper portion somewhat bottlenecked.

Fig. specim.: Ravnholt, grassy pathway in outskirts of wood, in groups, Oct. 28. 1902. — Common everywhere on grassy banks, old lawns etc. It has a very faint, slightly acid smell. The stem is comparatively stiff.

This very common fungus has caused a good deal of confusion. SCHROETER (l. c.) describes it exceedingly well but names it *Ag. lævigatus* Pers. = *M. Metata* Fr. which hardly can be this species (vide M. metata). Cooke's *M. consimilis* (l. c. plate 1186) seems to me almost identical. Although the smell of this fungus is but faint I am inclined to think it the M. ammoniaca of Fries. This view is confirmed by the express statement made by him that M. amm. grows in green fields and on banks, in contradistinction to M. alcalina. Possibly *M. cætites* Fr. and other field-species also belong here.

13. **M. pseudo-galericulata** n. sp. (Plate I, fig. d.)

Spores oblong-ovate, 10½—12½ × 5½—6¼ μ. Basidia 4-spored. Cystidia large, very protruding, fusiform 75—95 × 12—18 μ.

Fig. specim.: Fruens Bøge, on a stump in alder-bog, Nov. 4. 1903. (Also observed Hjallese Sept. 1905 on hazelstump.)

Cap 2½—3 cm, plane-convex, pellucido-striate, with a somewhat silky lustre, whitish, striæ and central part livid-gray (when dry whitish, even). Gills rather distant, rather narrow arcuato-adnate with a decurrent tooth, without connecting veins, whitish (not turning pinkish). Stem rather short (3½ cm) briefly rooting, hollow, rather brittle, even and somewhat shining, 4 mm thick. Nearly odourless.

This Mycena is not unlike a little pale specimen of M. galericulata, but its microscopic characters show it to be closely related to the preceding species (10—12).

14. **M. excisa** Lash. (?) forma **solitaria** Fr.

Spores broadly ovato-oval 9—10 × 5½—7 μ. Basidia generally 4-spored (in a few finds 2-spored). Cystidia scattered, large, obtuse, nearly cylindrical, free portion 50—60 μ long. The hyphæ of the trama broad (12—16 μ).

Fig. specim: (Supplem.) Hjallese, solitary on foot of beech, Nov. 1898. —

(Observed here and there in similar places, always late in the autumn).

Cap plane-convex (about 2 cm) somewhat wrinkled and grooved, of a sooty brown colour, slightly pellucid, but hardly hygrophanous Gills rather distant, white, with a grayish tinge on the sides, narrow behind, without connecting veins. Stem straight, soon hollow, 2 mm, apparently smooth, but — when seen under a glass — at first everywhere sparsely set with minute, dark, adpressed, floccose squamules, apex somewhat powdery.

Very like the figure and description of Fries (Icones sel. plate 81) (The plant figured by Cooke as M. excisa is a big coarse fungus of the *galericulata*-type.)

15 a. **M. polygramma** Bull.

Spores broadly and obtusely ovate 9—11 × 6—7 μ. Basidia 4-spored. Cystidia (free portion) in the form of short (occasionally somewhat branched) wavy hairs (3 μ), which are crowded, their immersed portion somewhat inflated.

Fig. specim: Hjallese, foliaceous wood, on the ground around stump, Oct. 1895. — Very common, generally solitary (or a few specimens clustered) on the ground or at the base of stumps, even in winter.

15 b. **M. polygramma** forma **candida**.

Spores etc. like the type. Stem almost devoid of raised lines; whole plant pure white.

Fig. specim: Hjallese, solitary on hazel-stump, Oct. 26. 1903.

15 c. **M. polygramma** forma **pumila**. (Plate I, fig. e.)

Spores subspherical-ovate 9—10½ × 6—7½ μ. Basidia 4-spored. Cystidia almost like the type.

Fig. specim: Hjallese, scattered on the bark of living oaks, Nov. 1899—Jan. 1900.

This not uncommon form, which always grows on the lower portion of the trunk of living oaks, is characterized by short stature, want of raised lines on stem etc. But intermediate forms show clearly that in spite of its different habit it is only a dwarfy form produced by the conditions under which it grows.

16. **M. vitilis** Fr.

Spores oval-ovate, 9—12 × 5¾—7 μ. Basidia 4-spored. Cystidia very much like those of M. polygramma (crowded, their free portion hairshaped, c. 10 μ long, 2 μ broad, basal part slightly thickened.)

Fig. specim: Hjallese on the ground in foliaceous wood, Nov. 1897.

Very common in woods as well of beech as of oak, even in winter. Solitary, generally springing from buried twigs etc. —

This Mycena is not very sharply separated from M. polygramma but always much smaller and more slender. From *M. filipes* (confused with it by some authors) this species is most easily distinguished by its microscopic characters, but also by its rather cartilagineous, smooth stem and the little callous umbo on the finally somewhat expanded pileus.

17. **M. pura** Pers.

Spores oval, 6—8 × 3½—4¼ μ. Basidia 4-spored. Cystidia large, their free portion generally obtuse, inflated conical about 25 μ broad apex occasionally narrowed into a short neck. (In an ivory-white form they were cylindric-conical, 65 × 14 μ).

Fig. specim: Hjallese, beech-wood, Oct. 1895. Very common on the ground as well in coniferous as foliaceous woods.

The colour-varieties most commonly met are 1) Cap light pink, 2) lilac-incarnate, 3) lilac-glaucous, 4) whitish. The pink variety is often rather large (*Agaricus roseus* Fl. D.).

18. **M. flavo-alba** Fr.

Spores ovate, ellipsoid, almost pip-shaped, 6—8 × 3½—4 μ. Basidia 4-spored. Cystidia awlshaped or inflated conical, 25—36 × 9—16 μ.

Fig. specim: Fruens Bøge, mossy lawn in outskirts of park, Oct. 1899.

Common, especially in open spaces in or just outside of woods, gregarious. It generally grows on the dead stubble and roots of grass.

When quite fresh its cap is somewhat striate (contrary to the ordinary description). If this character be unusually prominent you have M. *lineata* Bull. (sensu Schroeter).

I have met a form of this species having the gills adnate-decurrent, with a long decurrent tooth, reminding one of *Omphalia gracillima* but for the rest showing all the characters of the typical M. flavo-alba, amongst which it grew.

19. **M. acicula** Schaeff.

Spores fusiform, base often somewhat obliquely pointed, 9—11 × 3—3½ μ. Basidia 4-spored. Cystidia small, free portion conical.

Fig. specim.: Hjallese, on the ground under beeches, July 24. 1898.

Not very uncommon (but solitary and sporadic) amongst twigs, dead leaves etc.

20. **M. echinipes** Lasch.

Spores lanceolate-ellipsoid, 6—8½ × 2½—3½ μ. Basidia 4-spored. Cystidia short, hairshaped. (3½—4 μ thick).

Fig. specim: Hjallese, on fallen leaves of beech, Oct. 1897 and Oct. 1903. — Rather rare, always solitary, on beech-leaves.

It is distinguished from *M. lactea* var. *pithya* by its relatively stout stem, (besides by its 4-spored basidia).

21 a. **M. lactea** Pers.

Spores ellipsoid-lanceolate, base drawn out to a point 9—10 × 3—4 μ. Basidia 2-spored. Cystidia few, hairshaped, insignificant.

Fig. specim.: Slotsbjærgby, in troops in a dense fir-plantation, amongst moss and dead needles, Oct. 1. 1896. — Common in similar localities, always gregarious.

According to KARSTEN (Krit. öfvers. p. 84) the spores should only be 4—7 × 3—4 μ).

21 b. **M. lactea** var. **pithya** Alb. et Schw.

Spores fusiform, base drawn out to a point, c. 10 × 2½ μ. Basidia 2-spored.

Fig. specim: Pederstrup on dead fir-leaves in a bog-dish, in groups, Oct. 22. 1899.

Base of stem not visibly swollen, and altogether this variety differs but very slightly from the type and is hardly to be considered distinct.

22. **M. Adonis** Bull.

Spores sub-ovate, almost pipshaped 9 × 5 μ (or 9½ × 5½ μ). Basidia 2-spored. Cystidia awlshaped-conical, long, pointed, up to 60 μ.

Fig. specim.: Ravnholt, beech-wood amongst Hypna, Oct. 27. 1896, and Hjallese, on the ground in wood, Aug. 1902. — Solitary and sporadic, rather rare. — The stem is whitish, sub-pellucid, rather short; the cap bright and deep pink. (The other colour-varieties described in literature are unknown to me).

(*M. coccinea* Sow. — On the ground in dense fir-woods small flocks of a very closely allied Mycena are occasionally to be found. It is smaller, cap often somewhat conical and rather deformed, stem pale pink, but for the rest, macroscopically as well as microscopically like no. 22, forming a connecting link between nos. 22 and 23. — To judge from the figures of Cooke this fungus is identical with *M. coccinea* Sow. which is generally referred to the dubious species *M. strobilina* Fr. said to have the gills edged with dark red. — *Ag. roseus* (SCHUMACHER'S water-colours) (of which Fl. D. tab. 2025 I. is a copy) is also very much like the plant here mentioned and seems to be without colouring on edge of gills and consequently not to be referred to M. strobilina (as done by Fries). Vide *M. rosella.*

23. **M. rubella** Quél. (?)

Spores oblong-ovate, 9—10 × 5—5½ μ; Basidia 2-spored; Cystidia scattered, awlshaped.

Fig. specim.: Hjallese, on twigs among dead leaves, Nov. 13. 1897. (Also found on foot of living elm, Oct. 1904).

This plant is an extreme form of the *Adonis*-group, distinguished from M. Adonis by smaller cap (0,3 cm), stem of the colour of the cap, its base with radiant hyphæ or hairs. Possibly this Mycena is identical with *M. (Collybia) floridula* Fr. — Rob. Fries (Anteckn. om svenska hymenomyceter) considers M. rubella a synonym of *Collybia Clavus,* Cooke's figure of which is not unlike my plant.

24. **M. fellea** n. sp. (Plate I, fig. f.)

Spores subrotund-oval, 9—11 × 7—8 μ. Basidia 2-spored (3-spored basidia occasionally observed). Cystidia variable, sometimes fusiform, pointed, sometimes obtuse, apex set with a number of setiform branchlets.

Fig. specimens: Hunderup, on the lower portion of the trunk of living beeches, scattered, Oct. 30. 1902. — Not rare, late in the autumn, on the somewhat moss-clad trunks of beeches (rarely oaks).

Cap conic-campanulate, 7—11 mm across, slightly striate and with a faint bloom, dull gray. Gills rather narrow, neither crowded nor distant, narrowed behind and somewhat adnate. Stem 3—4 cm long, 1 mm thick, smooth, colour of the cap. The whole plant has a very pronounced acrid taste (like gall or quinine).

This plant is not unlike *M. polygramma* f. *pumila,* but is only half its size. By the form of its cystidia it runs into the section *granulatæ.*

25. **M. gypsea** Fr. var.

Spores subrotund-ovate, 7—8 × 5—5¼ μ. Basidia 2-spored. Cystidia (free portion) obtusely awlshaped 30—40 × 7—9 μ (entire length 48—60 μ).

Fig. specim.: Hjallese, on the cracked and cancerous bark of old beeches, in small flocks, Oct. 16. 1903; (also Fruens Bøge etc. Sept. 1910—Oct. 1912).

Differs from the description of Fries by being rather short-stemmed and not densely clustered.

26. **M. epiphloea** Fr.

Spores broadly ovate, 8—10 × 5—6 μ; Basidia 2-spored; Cystidia obtusely hairshaped-cylindric, entire lenght about 30 μ, often somewhat thickened downward.

Fig. specim.: Hjallese, mossy trunk of living poplar, Nov. 3. 1898 (and 1905).

It differs from no. 24 by being altogether more delicate and small, by the watery-grayish striæ on the cap (reminding one very

strongly of M. hiemalis, from which species it probably ought not to be separated.

SCHROETER (l. c. p. 634) says that M. epiphloea has hemispherical cystidia, set with minute setulæ. His plant is consequently another species, probably the one described by me as *M. lineata* f. *pumila).*

27. **M. hiemalis** Osb.

Spores broadly ovate, 7½—9 × 5½—6 μ. Basidia 2-spored. Cystidia obtuse, cylindric-hairshaped, 7—10 μ thick.

Fig. specimens: Fruens Bøge, in troops on mossy oak, Oct. 20. 1903. — Common on trunks of oak, elm etc.

Chiefly distinguished from no. 26 by its somewhat broadly adnate gills and less conical cap. — SACCARDO erroneously gives the dimensions of the spores as 6—7 × 2—3 μ.

28. **M. stylobates** Pers.

Spores oblong-ellipsoid, 7—10 × 3½ or 8½—10 × 4—4½ μ. Basidia 4-spored. Cystidia short, hairshaped.

Fig. specim.: Hjallese, copsewood, on alder-twig, solitary, June 20. 1896. Not uncommon, but solitary and sporadic.

KARSTEN (l. c.) erroneously gives the dimensions of the spores 3 × 1½ μ.

29. **M. clavularis** Fr.

Spores oblong-ovate-ellipsoid, 8—9½ × 4—4½ μ. Basidia 4-spored; Cystidia (free portion) hairshaped, wavy, occasionally slightly branched, 40—55 μ long.

Fig. specimen: Hjallese, solitary on twig, footpath in copsewood Aug. 1903. — Not clearly distinguished from grayish forms of the preceding species.

30. **M. rorida** Fr.

Sp. lanceolate-ellipsoid, 11 × 3½ μ. Basidia 4-spored. Cystidia obtuse, more or less ventricose or nearly cylindric (total length c. 25 μ, 5—9 μ across at most). — (Another find: spores 8—12 × 4 μ ovato-cylindric, 2-spored. (Dubious observation, a single specimen, Tommerup, on dead branch of fir, June 1898)).

Fig. specimen: Munkebjærg, a few specimens growing on a twig of Vaccinium Myrtillus in a tuft of Sphagnum in wood, July 7. 1909.

From small specimens of M. vulgaris it is best distinguished by the cystidia on the edge of the gills. —

B. GRANULATÆ.

α. MARGINATÆ.

31. **M. elegans** Pers.

Spores oblong-ovate, 8—9 × 4½ μ. Basidia 4-spored. Cystidia obovate or bludgeon-shaped, prickly, warted, about 9—11 μ broad; content dark yellow.

Fig. specim.: Lammehave near Pederstrup, on the ground amongst fir-leaves, Oct. 25. 1898.

Here and there in fir-woods, usually gregarious.

(*M. aurantio-marginata* Fr. To judge from the sketch of SCHUMACHER, this plant has a very characteristic habit. I have nowhere met with typical specimens; but occasionally big and fleshy forms of M. elegans are encountered, which are of a transitional character).

32. **M. rosella** Fr.

Spores oblong-ellipsoid or ovato-ellipsoid, 8—10 × 4½—5 μ. Basidia 4-spored. Cystidia obovate or bludgeon-shaped 7—15 μ across, occasionally the apex drawn out, somewhat bottleneck-like, the free portion more or less warted. Content pinkish.

Fig. specimens: 1) Kirkeby (Sydfyn) in troops on the ground amongst fir-leaves, Oct. 18. 1905. — 2) Grib Skov, large crowds, on the ground in fir-wood, Sept. 6. 1896.

Rather rare. The pinkish colour of the cap more or less pure and deep. Bright and deep-coloured specimens might be named *M. strobilina*; but this is one of the few Friesian species which hardly deserve a specific name. (Vide pag. 25: Agaricus coccineus).

33. **M. pterigena** Fr.

Spores ellipsoid, 9—10 × 4½—5 μ. Basidia 4-spored. Cystidia ovate or subglobular with numerous minute erect setæ, content pinkish.

Fig. specim.: »Egeskov« near Kværndrup, on dead fronds of Athyrium Filix foemina, Oct. 1900. —

Rather rare. Grows in small troops on fern-fronds, as well of Ath. Filix foemina as Dryopteris Filix mas. — Curiously enough Fries placed this species in his section *Basipedes*.

β. CONCOLORES.

34. **M. crocata** Schrad.

Spores broadly oval, 6½—8 × 5—5½ μ (more often 7½—10 × 5½—6 μ). Basidia 4-spored. Cystidia clubshaped or somewhat pyriform, set with minute wart-like setæ, apex occasionally with a hairshaped appendice).

Fig. specim.: Brahetrolleborg, in beech-woods on the ground on dead leaves and buried twigs, Sept. 29. 1897. — Sporadic in beech-woods.

(*M. chelidonia* Fr. is hardly to be considered a distinct species. It rests on the find of Sowerby; but Cooke's copy of Sowerby's sketch (l. c. tab. 207 a) shows a striking likeness to rather old specimens of *M. crocata* (the gills of which often turn saffron with age)).

35. **M. inclinata** Fr.

Spores subglobate-oval 8½—9½ × 6—6½ μ. Basidia 4-spored. Cystidia broadly club-shaped, their apex (which does not protrude very much) is rounded or at least somewhat obtuse, set with comparatively few, wavy, 4—8 μ long hairs.

Fig. specim.: Hjallese, on stump of oak, Sept. 23. 1904.

This rather common species, which is always densely clustered and grows exclusively on stumps of oak, seems to have caused a lot of trouble to the mycologists. It is easily recognised by is densely tufted habit and — when young — also by the cuticle at the edge of the cap reaching out a little over the gills, thus forming a somewhat denticulate edging. The stem which at first is pallid, whitish, soon turns bright rusty-bay (from base upwards). It has a faint but characteristic smell. —

(*M. galericulata* var. *calopus* Fr. (Icon. select. tab. 80) undoubtedly represents M. inclinata in a mature stage. The same is the case with Cooke's fig. (pl. 255, upper figure) of *M. alcalina.* Does *M. prolifera* Fries also belong here? . —

36. **M. Tintinnabulum** Fr. (sensu Schroet.)

Spores ovate, 4½—5 × 2½—3 μ. Basidia 4-spored. Cystidia obovate or subglobose, set with wartlike setæ, 9—12 μ across.

Fig. specimen: Hesbjærg near Odense on stump of beech (Nov. 1898) and Hjallese (on alder-stump) Dec. 1898.

The s o l i t a r y form which Fries figures and describes (Icon. sel. tab. 80) I have never come across. It must undoubtedly be conceived as a different plant, totally apart from the very densely clustered species found commonly here in Denmark in Oct.—Dec. on stumps of beech etc. Our species is the one mentioned by Lasch (»*M. galericulata v. hiemalis*«) and described very well by Schroeter (l. c.).

37. **M. cinerella** Karst.

Spores ovato-ellipsoid or pipshaped, 7 × 5 or 7½—8 × 4—5 μ. Basidia 4-spored. Cystidia small and inconsiderable, their free portion (which protrudes but a little) is obtuse, about 10 μ across, with minute wartlike setæ.

Fig. specim.: Ravnholt, on the ground amongst moss, outskirt of wood, in small flocks, Oct. 1897. — Not uncommon, as well in foliaceous as coniferous woods, in grassy and mossy places. — This plant is most easily recognised by its »mealy« odour. To judge from the shape of the gills it might be considered an Omphalia (of the section *Mycenarii*). Cooke's figure of *O. grisea* (which is totally at variance with the figure given by Fries himself) probably could be referred to M. cinerella.

38. **M. pinetorum** n. sp. (Plate I, fig. g.)

Spores ovato-ellipsoid, 7½—9 × 4—4½ μ. Basidia 4-spored. Cystidia (on edge and sides of gills) large, somewhat variable, in most cases obovate or pyriform (apex occasionally narrowed into a kind of neck) more or less set with warts, up to 18 μ broad.

Fig. specim.: Haare Bjerge near Gelsted, in troops in a dense plantation of Pinus montana, rooting in the deep bed of pine-leaves, Oct. 23. 1906.

Cap membranaceous, campanulate-convex, later on plane-convex, subumbonate, coarsely striate, 1—1½ cm across, of a darker or paler fuscous-gray colour, occasionally almost white. Gills very broad, rather distant, broadly adnate, with a small decurrent tooth, finally almost horizontal, white or whitish, faintly connected by veins. Stem rather tough, 5—6 cm × 1—1¼ mm, apex smooth and even, downward densely clad with erect fibrillous hairs (especially on the truncate »root«).

This by the form of its gills somewhat omphaloid species seems nearly allied to *M. collariata* Fr., but the gills are not attached to a collar round the stem.

39. **M. fagetorum** Fr.

Spores oblong-ellipsoid, generally 9½—11 × 4—4½ μ. Basidia 4-spored Cystidia few, small and insignificant, club- or pear-shaped, their not much protruding free portion set with short setæ.

Fig. specim.: »Høgsholt« near Tommerup, very numerous on the ground in beech-wood, attached each to a dead leaf, Oct. 23. 1906 (also 1907).

This characteristic species can be easily recognised by its habitat and its »root«, which creeps on the surface of the leaf, thus forming a right angle with the stem. The gills which are narrow, emarginate with a decurrent tooth, are generally joined around the stem, and consequently j o i n t l y severed from the apex of the stem when the cap is expanded or turned inside out.

40. **M. lineata** Bull. (?). (Plate I, fig. i.)

Spores broadly obovate, 7—8 × 5—6½ μ (in the form *pumila* 9 × 5½ μ). Basidia 4-spored. Cystidia crowded, spherical or somewhat pyriform, 12—14 μ across, set with minute wartlike setæ.

Fig. specimens: A) (uncommonly dark specimens) Vormark on needles and twigs in fir-wood Oct. 27. 1900. B) forma *pumila,* Hjallese, on the bark of living foliaceous trees, Nov. 1. 1905.

This rather widely distributed species grows as well on rotten twigs and needles (hardly rooting in the soil itself) in firwoods as on fagots and the bark of living trees in foliaceous copsewoods (forma *pumila).* — It is very closely related to the following species, but seems not to run into it. — The following are its main characters: Cap campanulate or obtusely conical, 1½ cm across (forma *pumila* often only 0,7), when quite fresh strongly striate

(striæ and central part olive), when dry whitish, even; (small forms are generally paler, when dry almost milk-white). The gills are whitish, nearly free, not much crowded. Stem 1—2 mm, somewhat fuscous (apex whitish) rather tough, sligthly rooting or (when growing on bark) truncate with a few radiating hyphæ.

The form *pumila* differs very much from the main type in general appearance; but transitional forms show clearly, that it is merely a dwarfy form produced by the habitat (like the form *pumila* of M. polygramma). —

M. lineata Bull. seems to be a very disputed species. Cooke's figure agrees fairly well with my plant. Whether the var. *expallens* figured by Fries belongs here is perhaps rather doubtful. The yellowish forms described by OUDEMANS (l.c.p.113) and FRIES possibly is *M. citrino-marginata* (which Fries did not know); (v. sup. p. 19). The form 2 mentioned by FRIES in his Monograph as growing on open hill-slopes is probably *M. avenacea* Fr. (sensu Schroet.) without a distinct edging on the gills. — The *M. lineata* of Schroeter and Sev. Petersen (l. c.) appears to me to be a fungus closely allied to *M. flavo-alba;* but the fungus characterised by SEV. PETERSEN (l. c. pag. 122) as an intermediate link between *chlorantha* and *lineata* is without doubt identical with my plant. To judge from the figure of LUCAND (l. c.) this may also be true of the M. lineata var. *olivascens* of Quélet.

(M. phlojophila Fr. (sketch from the time of Fries in the Stockholm museum) seems to be identical with the dwarfy form here named var. *pumila* (and probably also with the *M. epiphloea* of Schroeter).

41. **M. metata** Fr. (?).

Spores obovate-ellipsoid $7\frac{1}{2}$—9×4—$4\frac{1}{2}\ \mu$ (or 9—10×4—$5\ \mu$). Basidia generally 4-spored (a 2-spored form observed in a few cases). Cystidia obovate or pyriform, 12—19 μ across, set with setulous warts.

Fig. specim.: Glamsbjærg on the ground in fir-plantation, gregarious, Oct. 18. 1902.

Strange to say, this characteristic Mycena, which grows everywhere in our coniferous woods, often in myriads, seems to be nowhere adequately described. It is closely related to the preceding species but never grows on bark and is not met with in foliaceous woods. It has rather more crowded gills, but it can be more easily distinguished from no. 40. by the somewhat pinkish cap (although in most cases the colour is less clear, more dirty brownish or pale than shown by the specimens figured). When dry it is almost whitish. —

As this Mycena is so very common it seems almost impossible that it should have been overlooked by Fries. The only one of his descriptions that fairly well fits our plant is that of *M. metata,* and I have therefore selected this name, although the fungus is nearly

devoid of smell, while Fries writes about M. metata: »odore obsolete alcalino«. He expressly states that it grows profusely in coniferous woods, and the M. metata of Fries therefore can hardly be identical with Schroeter's »M. lævigata Pers. = M. metata Fr.«, which is a plant of fields and pastures. (Vide M. ammoniaca).

(*M. Zephira* Fr. The figure of Cooke (l. c. tab. 158.) might represent a big and bright-coloured specimen of No. 41. Fungi which really correspond to Fries' description and figure of *M. Zephira* I have never seen.)

M. atro-alboides Peck.

In pine-woods near Aarup and Kirkeby I found in Oct. 1911 small flocks of a Mycena, agreeing precisely with the description of M. a. — It is very closely allied to nos. 40 and 41, only to be distinguished by the dark fuscous colour of the striæ and centre of cap, (almost like the colour of M. ammoniaca) and by the gills having a small decurrent tooth. Microscopically it presents no differences, and I cannot at present decide, whether it is a »good species«, identical with the American species.)

42. **M. capillaris** Schum.

Spores obovate-lanceolate. $7\frac{1}{2}$—9×3—$3\frac{3}{4}$ μ (or 9—11×3—$3\frac{3}{4}\mu$). Basidia 4-spored. Cystidia crowded, obovate-globular, set with wartlike setæ.

Fig. specim.: Hjallese, on dead leaves of beech, Nov. 4. 1899. — Everywhere in beech-woods, late in the autumn.

43. **M. Mucor** Batsch.

Spores oblong-ellipsoid, $10 \times 3\frac{1}{2}$—4 μ. Basidia 4-spored. Cystidia sparse, their protruding portion rounded and set with delicate setæ.

Fig. specim.: Hjallese, on leaves of beech and oak, in troops, Nov. 1905.

Differs from M. capillaris chiefly by the (very small) basal disc and by the lower portion of the stem being slightly pilose. The gills are more broadly adnate, the stem generally shorter (almost like *Omphalia polyadelpha,* with which it is likely to be confounded (O. p. has 2-spored basidia).

(*M. setosa* Sow. probably is identical.)

44. **M. supina** Fr.

Spores almost spherical, smooth, $7\frac{1}{2}$—9×7—8 μ. Basidia 4-spored. Cystidia elongated pyriform, minutely setulous; (the cystidia form a sterile, about 50 μ broad marginal zone at the edge of the gills). —

Fig. specim.: Hjallese, on a mossy Salix alba, Oct. 17. 1903 (and 1904).

From grayish forms of *M. corticola* (to which it bears a superficial likeness) it is distinguished by the cap being conical-convex

(not truncate-campanulate) finely striate (not grooved) and by the gills, which are rather narrow and extenuate-adnate, at first white, then somewhat fuscous. It does not wither suddenly like M. corticola. FRIES (Hymen. Europ.) says the gills are almost free, but in his Monograph they are said to be »adnate, ventricose« more in accordance with my plant.

45. **M. corticola** Schum.

Spores almost spherical 7—10 × 7½—8 μ (or 9½—11 × 9—10 μ). Basidia 4-spored. Cystidia clubshaped, set with short warts and occasionally some few hairshaped appendices.

Fig. specim.: Hjallese, on mossy willow (pinkish variety), Nov. 1896; and on beech (bluish variety), Oct. 1903. —

Grows everywhere on the trunk of various deciduous trees (Ulmus, Tilia, Fagus etc.). There are two distinct colour-varieties, the one pinkish brown, the other glaucous or blue-gray. The latter occasionally, when nestling in deep moss, grows to double its ordinary size (cap up to 1 cm) with a »rooting« stem. — SCHROETER erroneously gives the dimension of the spores 9—11 × 4—5 μ.

(*M. juncicola* Fr. This species — to judge from the dark-coloured stem (»Stipite e fusco nigricans« FRIES' Monogr.) — seems to be a *Marasmius* of the section *Rotularia*. At least this is certainly the case with the »M. juncicola« figured and described by Cooke, which evidently is very close to *Mar. graminum*. An exactly corresponding, bright tile-red form I have met with twice here in Denmark (vide Marasmius).

46. **M. galericulata** Scop.

Spores broadly ovato-oval, when fully developed 11—13 × 6½—8 μ. Basidia 2-spored. Cystidia club-shaped, apex set with short or somewhat elongated hairs.

Fig. specim.: »Lammehave« near Pederstrup on stump of alder, Sept. 23. 1899. — Very common, especially on stumps of alder and birch, often in small clusters or bunches, but not really tufted. (As for the tufted *M. galeric. calopus* Fr. see M. inclinata). clinata).

(*M. rugosa* Fr. can hardly be sustained as a distinct species. The rugose cap (its principal specific character) is also to be met with in specimens which are indubitable M. galericulatae and the gray colour of the gills is not a reliable character. As a rule specimens of M. galericulata are at first more or less livid-gray; when fully developed they become paler, the gills almost white, until at last the gills turn pink, the cap pale brownish (colour of undyed sheepskin).

47. **M. parabolica** Fr.

Spores ovate, 8—10 × 5—6 μ. Basidia 2-spored. Cystidia obovate-subglobose (set with minute wartlike setæ) forming a rather broad sterile zone at edge of gill.

Fig. specim.: Hjallese, on the foot of a standing pole (of fir) Nov. 8. 1900.

To be met with occasionally — solitary or in small bunches — springing from the buried part of poles etc. (coniferous wood), more rarely at the foot of living, foliaceous trees (elms).

A somewhat disputed species, the more prominent features of which I shall therefore describe. — Cap 1½—2 cm, conical, (unexpanding) central part dark gray with a faint lilac or bluish tint, gradually shading off towards a whitish margin, faintly and minutely striate. Gills narrow, whitish, extenuato-adnate, rather crowded; stem more or less rooting, apex pale, gradually shading off downward into lilac-fuscous, rather tall and slender, with a faint bloom, minutely striate (sub lente).

48 a. **M. filipes** Bull.

Spores obovate 8½—9 × 5 or 10 × 5½ μ. Basidia 2-spored. Cystidia obovate-globular, set with minute wartlike setæ. The cystidia form a sterile marginal zone at the edge of the gills.

Fig. specim.: Hjallese, moist copsewood on the ground among leaves and on rotten twigs, Nov. 1897 and 1902. Rather common, solitary, in foliaceous woods.

Not very well distinguished from n. 47, to which it bears the same proportion as M. vitilis to M. polygramma. It is paler, more slender, the cap hardly half the size of M. parab., the stem almost filiform.

48 b. **M. filipes** forma **tetraspora**.

Spores ovato-ellipsoid, 9—10 × 4½—5 μ. Basidia 4-spored. Cystidia as in the type.

Fig. specim.: Hjallese, mixed copsewood, on twigs and among dead foliage, Nov. 1897 (and 1902).

Smaller than the type. Only noticed a few times. (Not to be confounded with small specimens of M. vitilis).

49. **M. debilis** Fr. (?)

Spores obovate-lanceolate 11—12½ × 5 μ. Basidia 2-spored. Cystidia almost globular, setulously warted.

Fig. specim.: A) Hjallese on a small twig (of oak?) copsewood, Nov. 28. 1897. B) Hjallese on the central rib of rotten oakleaf, Nov. 1901. — Here and there, chiefly on small twigs.

It differs from the preceding species in being much more delicate (only $^1/_3$ the size of no. 48), in the rather broadly adnate gills and the whitish cap with a faint tint of dusky pink. It forms a transition to M. capillaris. The description of Fries fits fairly

well, except that my plant has not the slightest outward likeness to M. sanguinolenta.

50 a. **M. tenerrima** Berk.

Spores broadly ovate, 8—9½ × 6—6½ μ. Basidia 2-spored. Cystidia somewhat variable, apex either obtuse, obtuse with a hairlike appendice or gradually tapering off into a hairlike appendice. The surface is always granulately warted. The cells on the surface of the cap are spherical (near the margin oval), densely warted. The long hairs on the lower part of the stem are devoid of partition, pointed, base somewhat inflated.

Fig. specim.: Hunderup, growing solitary on the bark of living elm and poplar, Oct. 17. 1903. — Rather rare.

50 b. **M. tenerrima** Berk. var. **carpophila** n. v.

Spores ovato-ellipsoid, 8—8½ × 4—4½ μ. Basidia 4-spored, for the rest microscopically like 50 a.

Fig. specim.: Hjallese, on dead pericarps of beech in wood June and July 1898 (a number of specimens). — More slender than the type, cap more campanulate, but hardly to be regarded as a separate species.

51. **M. osmundicola** n. sp.

Spores ovate-ellipsoid, 7½—9 × 4—4½ μ. Basidia 4-spored. Cystidia oblong or oval, set with minute setulous warts. Cells on surface of cap globular, 35—40 μ across, minutely warted.

Fig. specim.: (Supplem.) Odense, gregarious (occasionally in small bunches) on »Osmunda-fibre« used for growing orchids in hothouse, June 1910 (and the following years).

Cap conical, at last somewhat expanded, grooved with distinct striæ almost to the apex, before opening pale grayish, then white, membranaceous, densely clad with snow-white »meal«. Gills rather distant, rather narrow, reaching the stem, which is 3 cm long, base 1 mm thick, apex only $^1/_3$ mm, everywhere minutely pilose, without basal disc. The plant forms a transition to the *Hiatula*-type.

Evidently an introduced species. The so-called »Osmunda-fibre« appears to be a dense mass of fern-roots (of a tree-fern?). It is said to come from South America, a statement which I have not been able to verify.

(*M. chlorina* P. Henn. which grows on the stem of Alsophila (in the botanic garden of Berlin) seems to be closely related to this species, but differs in having small, nearly globular spores etc.).

C. GUMMOSÆ.

52. **M. epipterygia** Scop.

Spores ovate, base somewhat obliquely tapering into a point, 8—9 × 4—4½ μ. Basidia 4-spored. Edge of gills formed by an elastic, somewhat slimy filament.

Fig. specim.: Grib Skov, on the ground amongst moss and needles in fir-wood, Sept. 29. 1896. — Very common in coniferous woods (growing on leaves, twigs, decaying stumps etc.; also met with on heaths, but only exceptionally in beech-woods.

The stem varies from clear lemon-yellow to almost watery-white. (KARSTEN gives the dimensions of the spores 5—6 × 3—4 μ).

53. **M. vulgaris** Pers.

Spores ovate-ellipsoid, 7½—9 × 4—4½ μ (or 9—10 × 4 μ). Basidia 4-spored. Edge of gill as in no. 52.

Fig. specim.: Hjallese, growing on dead leaves in fir-wood. Nov. 2. 1895. Very common, gregarious, often in myriads on the ground in dense fir-plantations.

The viscid cuticle on surface of cap is not so conspicuous, more delicate and less separable than in the preceding species. By the shape of its gills it approaches the Omphalia (Mycenarii)-type.

II. MYCENELLA.

54. **M. lasiosperma** Bres.

Spores spherical, coarsely warted, 6—7 μ (exclusive of the warts). Basidia 2-spored. Cystidia deeply set in the gill, their free portion conical. 12—15 μ broad.

Fig. specim.: Vormark, growing in small bunches on a fir-stump in mixed wood, Oct. 8. 1901. (Also met with in Fruens Bøge (small bunch springing from buried stump in mixed wood).

This plant answers fairly well to the description of Bresadola. However the stem is not »chesnut« but rather fuscous, and the cap is devoid of pellucid striæ. It comes near to the description of *M. bryophila*. The following are its main features: Cap expanded campanulate or somewhat conical-convex (1—1½ cm) without pellucid striæ, gray, with a pale bloom (when dry somewhat wrinkled and grooved). Gills rather thick and dry, whitish with a creamy tint, rather distant and narrow, extenuate-adnate almost free. Stem short, rather tough, everywhere powdery-velvety, apex whitish, base fuscous, slightly tubular. —

55. **M. margaritispora** n. sp.

Spores spherical, 5—6 μ (exclusive of warts), set with a number of coarse warts. Basidia 2-spored. Cystidia (free portion) awl-shaped, apex not rarely somewhat forked, about 35 μ long. — Fig. specim.: Hjallese, on mossy stump of Salix capræa, July 29.1900 and fig. B. (an uncommonly large and dark specimen) Sept. 05. — Always solitary; observed several times in different localities on Salix capræa and once on a decayed stump of beech (»Grøften« near Skalbjærg 1906).

Cap about 0,4 (rarely 0,8) cm, campanulate or expanded-conical with minute umbo, striate, of a pale and dingy ochraceous colour, umbo darker, margin light yellowish. Gills free, almost distant, rather narrow, whitish with a faint yellowish tint. Stem 2 (rarely 4) cm long, almost filiform, 0,4(0,8)mm thick, almost without »root«, more or less fuscous with a pale, delicate velvety coating (ɔ: densely set with minute cystidium-like hairs).

Seems to come close to *M. lutea* Bres. Macroscopically it somewhat resembles the description of *M. amicta* (which species I have never seen); its microscopic characters show it to be very closely related to no: 54.

To the 55 Danish Mycena here mentioned some others will probably — as a result of further investigation — have to be added. Thus I have sought in vain the following species: *M. sudora*, *M. chlorantha*, *M. atrocyanea* and *M. citrinella*, which have been noticed by other mycologists and which probably are distinct.

The total number of European Mycena known was, according to E. Fries »Hymenomycetes Europæi«, 100. From these a few (3) must needs be deducted as belonging to the genus Marasmius, and the number of true Mycena recorded by Fries himself from Sweden is only about 80. Of the 55 species mentioned above a good many have been found in Jylland and Sjælland, but all the species without an exception have been met with in the central part of Fyn (an area hardly 40 km either way). When taking into consideration that this small territory is geologically not of a very varied nature and has no coastline, the fact that so many species are indigenous to it provides a striking example of the very extensive distribution of the agarics.

BIBLIOGRAPHY.

A. Blytt: Norges Hymenomyceter. Kristiania. 1905.

J. Bresadola: Fungi Tridentini. Tridenti 1881—1890.

M. C. Cooke: Handbook of British Fungi. II. ed. London 1883.

— Illustrations of British Fungi. London 1881—91.

E. Fries: Hymenomycetes Europæi. Upsaliæ 1874.

— Icones selectæ etc. I. Holmiæ 1867.

— Monographia Mycenarum Sueciæ. Upsaliæ 1854.

R. Fries: Anteckningar af Svenska Hymenomyceter 1897.

Flora Danica. Hauniæ 1763—1883.

P. A. Karsten: Kritisk öfversigt af Finlands basidsvampar. Helsingfors 1889 & suppl. 1891.

— Symbolae ad Mycologiam Fennicam. XXIX. Helsingfors 1889.

C. G. Lloyd: Synopsis of the known Phalloids. Cincinnati 1909.

L. Lucand: Figures peintes de Champignons. Autun 1881—96.

G. Massee: European Fungus-flora. London 1902.

— British Fungi. London (no date).

C. Oudemans: Révision des Champignons des Pays-Bas. II. Amsterdam 1892.

Sev. Petersen: Danske Agaricaceer. København 1907.

Rolland: Atlas des Champignons de France etc. Paris 1909.

E. Rostrup: Den danske Flora. II. København 1904.

P. A. Saccardo: Sylloge Fungorum. V. Patavii 1887 & supplement. vols.

J. Schroeter: Die Pilze Schlesiens. I. Breslau 1885—89.

Schumacher: Flora Hafniensis. Fungi delineati. II. (manuscr.)

SPECIFIC INDEX.

Mycena	Page
acicula	24
Adonis	25
aetites	22
alcalina	21
— var. chlorinella n. var.	21
— — nivea	21
amicta	37
ammoniaca	22
atro-alboides	32
atrocyanea	37
aurantio-marginata	28
avenacea	19
balanina	18
bryophila	36
capillaris	32
calorhiza	21
chlorantha	37
chlorina	35
chelidonia	29
cinerella	29
citrino-marginata	19
citrinella	37
clavularis	27
Clavus (Collybia)	26
consimilis	22
cohærens	18
coccinea	25
coerulescens	21
collariata	30
corticola	33
cruenta	19
crocata	28

Mycena	Page
debilis	34
echinipes	25
elegans	28
epiphloea	26
epipterygia	36
erythropus (Marasmius)	18
excisa	23
fagetorum	30
fellea n. sp.	26
filipes	34
flavo-alba	24
floridula	26
fusco-marginata	19
galericulata	33
— v. calopus	29
galopoda	20
— v. candida	20
gracillima (Omphalia)	24
grisea (Omphalia)	29
gypsea	26
hæmatopoda	20
— v. marginata n. var.	20
hiemalis	27
inclinata	29
Iris	21
juncicola	33
lactea	25
— v. pithya	25
lævigata Pers.	22
— Lasch.	22
lasiosperma	36
leptocephala	22

Mycena	Page
leucogala	20
lineata	30
— f. pumila	30
— f. expallens	31
— var. olivascens	31
limbata	21
lutea	37
luteo-alba	19
margaritispora n. sp.	36
marginella	21
metata	31
mirabilis	21
Mucor	32
olivaceo-marginata	19
osmundicola n. sp.	35
parabolica	33
pelianthina	18
phlojophila	31
pinetorum n. sp.	30
polygramma	23
— f. pumila	23
— f. candida	23
plicosa	18

Mycena	Page
plicosa var. marginata n. var.	18
polyadelpha (Omphalia)	32
pterigena	28
pseudo-galericulata n. sp.	22
pura	24
prolifera	19
rorida	27
rosella	28
rubella	26
rubro-marginata	18
rugosa	33
sanguinolenta	19
setosa	32
strobilina	25
stylobates	27
sudora	37
supina	32
tenerrima	34
– var. carpophila n. var.	35
Tintinnabulum	29
vitilis	24
vulgaris	36
Zephira	32

PLATE I.

a. Mycena plicosa var. marginata.
b. — alcalina var. chlorinella.
c. — — var. nivea.
d. — pseudo-galericulata.
e. — polygramma f. pumila.
f. — fellea.
g. — pinetorum.
h. — tenerrima var. carpophila.
i. — lineata (type and f. pumila).
j. — osmundicola.
k. — margaritispora.

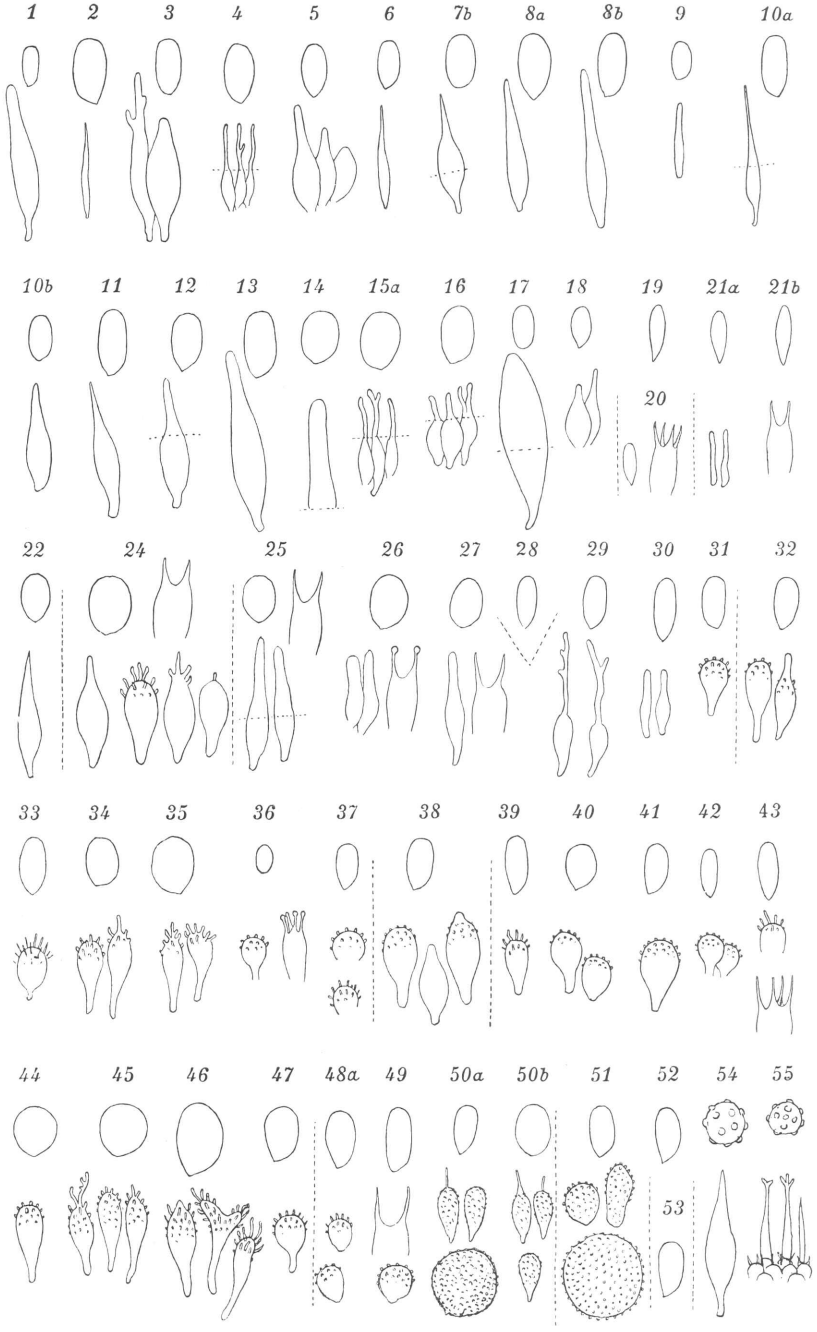
Jakob E. Lange del. N. Halkjær lith. Nord. Repr. Anstalt Tryk.

PLATE II.

All spores and basidia shown magnified 800 times; cystidia and surface-cells 300 t. The numbers correspond with the current no. of each species in the text.

1.	M. pelianthina . . .	spore,	cystidium
2.	- rubro-marginata	—	—
3.	- plicosa var. . . .	—	—
4.	- avenacea	—	—
5.	- citrino-marginata	—	—
6.	- sanguinolenta . .	—	—
7b.	- hæmatosperma .	—	—
8a.	- galopoda	—	—
8b.	- - leucogala . . .	—	—
9.	- Iris	—	—
10a.	- alcalina	—	—
10b.	- - chlorinella . .	—	—
11.	- leptocephala. . .	—	—
12.	- ammoniaca . . .	—	—
13.	- pseudo-galericulata	—	—
14.	- excisa	—	—
15a.	- polygramma. . .	—	—
16.	- vitilis.	—	—
17.	- pura	—	—
18.	- flavo-alba	—	—
19.	- acicula	—	
20.	- echinipes.	—	basid.
21a.	- lactea	—	cyst.
21b.	- - pithya . .	—	basid.
22.	- Adonis	—	cyst.
24.	- fellea	—	— basid.
25.	- gypsea	—	— —
26.	- epiphloea	—	— —
27.	- hiemalis	—	— —
28.	- stylobates	—	

29.	M. clavularis .	spore,	cyst.
30.	- rorida . . .	—	—
31.	- elegans. . .	—	—
32.	- rosella . . .	—	—
33.	- pterigena .	—	—
34.	- crocata . .	—	—
35.	- inclinata .	—	—
36.	- Tintinnabulum	—	—
37.	- cinerella. .	—	—
38.	- pinetorum.	—	—
39.	- fagetorum .	—	—
40.	- lineata . . .	—	—
41.	- metata. . .	—	—
42.	- capillaris .	—	—
43.	- Mucor . . .	—	— basid.
44.	- supina . . .	—	—
45.	- corticola . .	—	—
46.	- galericulata	—	—
47.	- parabolica.	—	—
48a.	- filipes . . .	—	—
49.	- debilis . . .	—	— basid.
50a.	- tenerrima .	—	— surface-cell.
50b.	- - carpo-phila . . .	—	—
51.	- osmundicola	—	— —
52.	- epipterygia	—	
53.	- vulgaris . .	—	
54.	- lasiosperma	—	cyst.
55.	- margariti-spora. . . .	—	—



Jakob E. Lange del.

DANSK BOTANISK FORENING

udgiver siden 1913 to Tidsskrifter:

1. BOTANISK TIDSSKRIFT, som udgives i ca. 4 Hefter aarlig og tilstilles alle ordinære Medlemmer.
2. DANSK BOTANISK ARKIV, som udgives i tvangfri Hefter, der kan købes særskilt i Boghandelen. Medlemmer af Foreningen kan abonnere paa dette Tidsskrift for 4 Kr. om Aaret. I 1913 er udgivet:

Nr. 1. E. ØSTRUP: Diatomaceæ ex Insulis Danicis Indiæ occidentalis imprimis a F. Børgesen lectæ. Pris 1 Kr. 35 Øre.

Nr. 2. M. VAHL: The growth-forms of some plant formations of Swedish Lapland. Pris 50 Øre.

Nr. 3. OLAF GALLØE: Forberedende Undersøgelser til en almindelig Likenøkologi. 3 Kr.

Nr. 4. F. BØRGESEN: The Marine Algæ of the Danish West-Indies. I. Chlorophyceæ. Pris 4 Kr.

Indmeldelse af nye Medlemmer i *Dansk Botanisk Forening* sker ved Henvendelse til Bestyrelsen, Adr. *Botanisk Museum, København K.* Det aarlige Medlemskontingent er 6 Kr. for Medlemmer i København med Forstæder og i Udlandet, 5 Kr. for indenlandske Medlemmer udenfor København.

REDAKTION L. KOLDERUP ROSENVINGE OG C. H. OSTENFELD

Færdigt fra Trykkeriet den 17. April 1914.