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The Cyphellaceous Fungi

A Study in the Porotheleaceae

By

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Cincinnati, Ohio, USA.

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INTRODUCTION

Historical

Cyphella, *Solenia* and *Porotheleum* are genera of fungi of wide distribution in the temperate and tropical regions of the world. They were established by Fries in 1822 and 1825 for a dozen species of tubular or discoid Hymenomycetes. The first two genera were treated at first as Discomycetes, which they resemble, while the latter was treated with the polypores, which it resembles in advanced stages of development. Fries later treated *Cyphella* with the Thelephoraceae, and *Solenia* and *Porotheleum* with the Polyporaceae. They are usually understood in North America today as members of the Thelephoraceae. However, following Lloyd, Overholts and Lowe (until recently, Lowe, 1958) have maintained *Porotheleum* in the Polyporaceae as a synonym of the genus *Poria*.

While Fries recognized the genera *Cyphella* and *Solenia*, which he thought of in the Systema Mycologicum as Discomycetes because of their habit, he apparently did not realize that a number of species which he assigned to *Peziza* really belonged here. As the differentiation between Ascomycetes and Basidiomycetes became better understood, this situation was gradually corrected by other workers and, in the meantime, additional species were discovered. By 1888, Saccardo was able to list 102 species of *Cyphella*, 24 of *Solenia*, and 14 of *Porotheleum*, some of which were undoubtedly synonyms or misdeterminations.

No comprehensive treatment of the group has been attempted, although at present some 283 species, subspecies, varieties and forms of *Cyphella*, 58 of *Solenia*, and 20 of *Porotheleum* have been described. The most recent treatment for North America is that of Burt (1914, 1924, 1926), who recorded 21 species of *Cyphella* and 11 of *Solenia*. The most recent treatments in Europe are those of Bourdot and Galzin (1928), who recorded 27 species of *Cyphella* (including *Solenia*), 1 of *Phaeocyphella*, and 1 of *Porotheleum* in France, and of Pilát (1925), who recorded 23 species of *Cyphella*, 6 of *Solenia*, 1 of *Phaeocyphella* and 1 of *Porotheleum* in Czechoslovakia. Cunningham (1953) in New Zealand and Talbot (1956) in South Africa have made recent local contributions.

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Recent Treatments

Bresadola, Burt, and Pilát, as well as others, have considered *Cyphella*, *Solenia*, and *Porotheleum* as distinct genera on the basis of such classical characters as the shape of the receptacle and the amount of subiculum associated with the receptacles. On the basis of the characters of the hymenium, basidia, and spores the genera have not been considered distinct. On the basis of characters of the subiculum a small select series of specimens, such as may have been used by any of the students mentioned above, will show the classic distrinctions between the genera although larger series of specimens from widely separated localities will show little or no basis for generic segregation. On the basis of characters of the surface of the receptacles a number of segregates has been established. While Pilát gave these characters subgeneric rank, Donk (1931, 1959) has recently given some of them generic rank in his treatment of the Agaricales, extended in his identifications of specimens in the Farlow Herbarium. and the Hungarian National Museum Herbarium, and culminating in the recently published first report on the "Cyphellaceae". Murill (1916) proposed that *Porotheleum* should be segregated into the *Porotheleaceae*, the only validly published family name available for this group of fungi according to Cooke (1957). *Porotheleum* has been placed in the Fistulinaceae by Bondartsev and Singer (1941).

The most conservative treatment of the group is that of Bourdot and Galzin (1928), who, following Patouillard (1900), merged *Cyphella* and *Solenia* under the name *Cyphella*. Throughout these genera it can be shown that there are transitions between the cupulate and tubular receptacles, and between the degrees of density of the subiculum. Where a receptacle is more urceolate than tubular and where its subicular development has been retarded through some environmental or genetic factor we have *Cyphella* characters in *Solenia* and the novice is at a loss to determine the specimen in more available works. Where an otherwise typical *Cyphella* has developed tubular rather than discoid receptacles with even a little superficial mycelium, we have a *Solenia* habit in *Cyphella* and again the novice will have difficulty in making a satisfactory determination. While transitions between these habit or habitat (ecotype) forms are not uncommon in series of herbarium specimens which have been examined, these transitions may not occur strikingly in the small series of specimens upon which some of the monographic treatments published to date have been based. *Porotheleum* is more consistent in its growth form, since the receptacles are always seated on a usually membranous subiculum.

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Morphology and Anatomy

There is little essential difference in the microscopic characters of the hymenium of the species studied. Usually it is formed of a compact layer of clavate basidia without sterile structures between them. The basidia are usually 4-sterigmate and may be 2-sterigmate. This character does not seem to be constant within a species as understood here. When larger series of specimens become available for study, this character may prove to be of greater importance. Basidium size seems to be constant although it varies with spore size and may be a result of reaction to environmental influences. In the few specimens of a number of species of *Solenia* which were mounted in Melzer's reagent, the reaction was negative and no amyloid condition was found. Where there are no special surface hairs the context is usually thin, consisting of from 2 to 5 layers of cells; specimens have been observed in which it is only a cell or two in thickness. Where surface hairs arise there are several layers of cells which appear to produce the surface hairs in addition to the layers of cells from which the hymenium arises. In many species clamp connections are present on all hyphae; in many species of which specimens were observed, there appeared to be clamps in the subhymenial tissue and at or near the bases of the basidia, although this was sometimes difficult to observe because of the small size and compact arrangement of the hyphae in this tissue. Spore size is fairly constant within a species in the group but spore shape can be quite varied: from allantoid to ovate with modifications to somewhat almond-shaped and spherical. The term "dochmiosphorous" occurs in the literature of *Cyphella* both to describe a spore shape and to name a variety or species. Spores of this shape are flattened ovate with pointed distal ends, so that they appear asymmetrically almond-shaped. Pyriform and turbinate spores are modifications of the dochmiosporous type which eventually may not prove to have specific value. In *Solenia sensu lato* and *Porotheleum* the receptacles are discoid to tubular. In some cases transitions between these conditions occur in large series of collections of one species. In all specimens examined the hyphae and tissue systems are monomitic. In *Leptotus* and *Chromocyphella* the context is more dense but still simple and monomitic.

Variability

A large percentage of the more than 4800 collections studied from most North American herbaria, and many herbaria in other parts of the world (Table 1) represent a few common species. The less common, or less frequently observed, species are represented only poorly and then usually only in the larger herbaria. In some of the

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common species there is a wide variation within the species from habitat to habitat, from season to season. Some of these variations will be discussed more fully under such species as *Merismodes fasciculata*, *Lachnella alboviolascens* and *L. villosa*, *Cyphellopsis anomala*, *Phaeocyphellopsis ochracea*, and others. It is possible that some of the less well known species have a wide range of variation but as long as they are represented by only a few collections, transitions between the maximum variations expressed cannot be postulated and these variants, if that is what they are, must be recognized as distinct species. For instance, *Maireina monacha* has had no fewer than 7 names under which it has been collected from 9 countries on 19 different host plants and shrubs; it is represented among the collections seen by only 36 specimens. Throughout the study of variability within well known and poorly known species the methods of experimental systematic mycology can become useful.

In preparing descriptions of the species presented in this report, the writer has used two techniques. In the case of new species the description is based on the type specimen. When descriptions of established species were prepared, most, if not all, the specimens, including one or more type specimens, observed were made the basis of the description. These latter descriptions are thus composites including as much of the variation found in such species as possible.

Developmental Series

Within the group which Bourdot and Galzin call *Cyphella* there are several trends of development. One of the more striking of these is that associated with mosses. The species may fruit on the moss plants, on the gametophyte or sporophyte, or both, and receptacles may be found on adjacent soil, bark, and litter, possibly associated with moss protonemata. Within this group there is a tendency, as the receptacles increase in size, for the hymenium to become veined. Thus large specimens of species in this group have been referred to such genera as *Craterellus* or *Cantharellus*, and several genera such as *Dictyolus*, *Leptoglossum*, *Arrhenia*, and *Leptotus* have been erected to take care of these species. Since *Dictyolus* and *Leptotus* are not available it seems best to include these species in *Leptoglossum* as intermediates between *Solenia* and *Arrhenia*. *Arrhenia* includes larger species with more definitely veined hymenia, as described by Singer (1945). *Leptoglossum*, and its brownspored correlated genus *Chromocyphella*, are different from true solenias not only because of their habitat on mosses but because of their structure and are removed to a family recently redescribed by Singer (1945), the *Leptotaceae*.

If species of *Leptoglossum* and *Chromocyphella* are parasitic on mosses, a point which has not yet been proved although such a re-

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lationship is suspected, the species of those genera based on *Solenia*, *Phaeosolenia*, and *Porotheleum* are probably all saprobic. A few species are found in habitats in which a pathogenic relationship may be suspected but has not been proved. Thus, *Maireina marginata* is known only from collections made from recently dead twigs on fruit trees and ornamental shrubs in Australia and Oregon. In this case the pathogenic relationship is most strongly suspected. *Merismodes fasciculata* on various species of *Alnus*, *Lachnella tiliae* on species of *Tilia*, and *Cyphellopsis anomala* in lenticels of various amentiferous shrubs and trees have never been actually associated with diseased conditions of the host plant, probably because the host plants concerned are of little economic importance. Thus no segregation of the group can be made on the basis of pathogenicity.

Within *Cyphella* in the sense of Burt (1914), there are two main series of species based on spore color. On the one hand there are a few species with colored spores in which the spore coloring is apparently in the spore wall, and on the other hand there is a large number of species with hyaline spores. Patouillard (1900) decided that the species with colored spores should be placed in a separate genus and so he erected the genus *Phaeocyphella* to hold them. This name is the result of two earlier attempts to create a genus for this group. *Cymbella* was found to be preoccupied by a genus of diatoms, while *Phaeocarpus* was preoccupied by a genus of the Sapindaceae. However, the type of this group of genera is *Phaeocyphella crouanii*, a name applied by Patouillard to a brown-spored form called earlier *Cyphella galeata*, a moss-dwelling species better referred to as *Leptoglossum*. If this brown-spored form is segregated form *Leptoglossum* it must carry the name *Phaeocyphella*. Spegazzini used *Phaeosolenia* in 1902 for an Argentinian specimen which looks very much like the commonest species of the darkspored cyphellas, and although he used *Phaeocyphella* in his own sense for an obscure Argentinian species, it appears that *Phaeosolenia* should be used for the dark-spored cyphellas if they are to be segregated. It should be noted that De Toni and Levi, in 1888, suggested the name *Chromocyphella* for the group which is based on *Cyphella galeata*, so that the name *Phaeocyphella* is superfluous.

After removing *Phaeosolenia*, *Leptoglossum*, and *Chromocyphella* from *Cyphella sensu lato*, we still have a wide assemblage of species which have variously modified receptacles. Two alternatives are available for the treatment of this group of species: 1. The species can be considered as belonging to one genus composed of a number of subgenera; or 2. the species can be considered as belonging to a number of genera. The writer prefers to adopt the current trend in mycology toward the use of smaller generic units in place of the large genera of earlier workers. In the Basidiomycetes this trend was

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started long ago when the Friesian subgenera of *Agaricus* were raised to generic rank. In the Polyporales such manipulation usually leads to realignments of groups of species. Patouillard (1900) started this trend and Donk (1931, 1933) elaborated on it. Imazeki (1954) suggested a further type of revision. Recently Eriksson (1958) has developed a system for the Corticiaceae in which a large number of genera in a number of subfamilies replace the large genera *Corticium*, *Peniophora*, and *Tomentella*. One advantage of this course is that the problem of choosing a generic name which would be valid for the group of species assigned to the invalidated genus *Cyphella* is avoided. If the group were to be united in one genus the logical epithet for it would be *Solenia*.

Several species assigned to *Cyphella sensu lato* are fasciculate or conglobate, as indicated by the specific name assigned to them. The group containing *Merismodes fasciculata* is wide-spread. The receptacles may occur singly but are usually to be found growing in clusters on tufts of mycelium protruding from lenticels or cracks in the bark. This growth habit, and the fact that the hymenium may become wrinkled in age, suggesting an agaric, are the bases of the genus *Merismodes* Earle. *Stromatocyphella conglobata* has a similar habit and habitat although there are differences in surface hairs, spores, and lack of a somewhat lateral stipe. Each receptacle is separate but the fructification presents the appearance of a minute *Poria*. The suggestion of Burt, quoted by Singer (1945), that better knowledge of this species may result in establishment of a separate genus for it should be borne in mind by students interested in a problem in experimental mycological taxonomy or in ecological life-history studies.

Evolutionary Tendencies

Sporne (1959) states: "A knowledge of the fossil record is essential to the study of evolutionary relationships in the plant kingdom, otherwise, it can be nothing but conjecture. Fossil remains of fungi and bryophytes are so few that the course of evolution in these groups is almost entirely a matter for speculation". Sporne quoted a warning written by Gilbert White in a letter to Thomas Pennant, Esq., 29 May 1769: "Ingenious men will readily advance plausible arguments to support whatever theory they shall choose to maintain; but then the misfortune is, everyone's hypothesis is each as good as another's since they are all founded on conjecture".

Apparently the ancestral form of this group, assuming it is a homogenous group, could have been a resupinate form with a simple hymenium, such as some sort of a *Corticium*. If we assume that the margin of such a resupinate fruit body became free we have a primitive cup. We have no desire at present to indicate just which species is

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the more primitive, but a number of groups of species has developed from the primitive type and from one or more of these groups of species, species in other genera have probably arisen. As delimited at present, within several of these groups the surface of the receptacle is covered with a mat of dichophysoid hyphae. Species with such surface coverings may not be related to each other but they may have arisen through parallel evolution. If we consider *Glabrocyphella* as including the most primitive group of species, the other genera probably have arisen from it.

These genera fall into a number of lines one of which may lead into and end with the genus *Calyptella*, in which smooth surfaced receptacles are produced on very short to elongate stipes. A second line may lead through the genus *Cellypha*, with smooth surface hairs, to *Lachnella* with hyaline hairs whose incrustations lead into a branch terminating with the genus *Flagelloscypha*. The former genus has small crystalline incrustations while the latter has large acicular crystals. Proceeding beyond *Crustotricha* we come to the genus *Maireina* with brown surface hairs of which some or all are granule incrusted. With a subiculum of brown, granule-incrusted hyphae we come to the porotheleoid genus *Stigmatolemma*. Several short lines of development appear to have arisen along the main line of development. The genus *Rhodocyphella* is close to the assumed parental type except that the spores are angular. The genus *Solenia*, *sensu stricto*, has advanced beyond a parental type to the extent of the development of a small amount of subiculum and tubular receptacles. The genus *Stromatocyphella* includes three species which may be related to the genus *Mairina* but of which the cups are united on a common stromatic base. The genus *Cyphellopsis* includes a wide-spread species or species complex in which a large number of separate receptacles is seated on or in a weakly to strongly developed subiculum. The receptacles are covered with special granule-incrusted brown hairs. Possibly near *Cyphellopsis*, but with the receptacles fasciculate, is the genus *Merismodes*. It is possible that this genus could be related to the "polypore" genus *Porodisculus*. From *Cellypha*, with the development of a rather massive subiculum, the genus *Porotheleum* appears to have arisen. Through the production of brown spores, and a perennial habit, the genus *Phaeoporotheleum* may have arisen from *Porotheleum;* and through the production of brown spores the species assigned to *Phaeosolenia* and its segregates could have arisen from several of the genera mentioned above. Thus *Pellidiscus* could have arisen from *Glabrocyphella; Phaeoglabrotricha* from *Cellypha* and *Phaeocyphellopsis* from *Cyphellopsis*. *Asteroslenia* arose independently through the production of asperulate brown spores.

Arising from the primitive line of development in *Solenia*, but modified by a thickening of the context and possible parasitic relation

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with their moss hosts, have arisen the various species assigned to the genus *Leptoglossum*. One line of development leading from *Leptoglossum* leade to the genus *Chromocyphella* with brown spores. With the development of larger fruit bodies and pronounced gill-like veins on the hymenial surface, the genus *Arrhenia* may have arisen from *Leptoglossum*. Other genera which may also occur in this complex have been described by Singer.

Relationships with Other Groups

In recent years there has been a tendency to relate various members of this group with the "higher" groups of the Homobasidiomycetes. Earle (1909) established *Merismodes*, typified by *Cyphella fasciculata*, as a genus of the *Agaricaceae* related to *Cantharellus*. Recently, Singer (1951) placed this genus in the Tricholomataceae, although he did not admit lamellate members of the Cantharellaceae to the Agaricales.

On the basis of various similarities between certain morpholigical characters and the chemical reaction of certain structures, Romagnesi (1950) was able to indicate that in four species of *Cyphella* the morphological and chemical similarities were great enough so that relationships with four species of agarics in as many groups could be postulated. However, he warned against snap judgment and indicated that: "Certes, des études très précises et très poussées sur la structure sporale et anatomique de ces champignons devront être entreprises pour dégager la valeur exacte de ces rapprochements, qui ont quelques chance d'être tout fortuits ou dus à des phénomènes de convergence morphologique".

On the other hand, using the similarity between morphological and anatomical characters, and the chemical reaction of the walls of surface hairs, Singer (1951) transferred four generic segregates of *Cyphella* to the Tricholomataceae. These cyphellaceous fungi were considered to have been derived from homologous agaricaceous groups by reduction to a resupinate habit and the consequent breaking up of the fruit bodies along and across gill lines, producing a number of individual cups rather than one or several small gilled mushrooms.

So far the writer has found very few references to cultural work on members of this group. Since cultural work is thought to be the key to ontogenetic and phylogenetic studies in the development of these and other fruit bodies, dispositions of the type of Singer may be considered premature. In the present study it is preferred to derive the group from the corticiums and to retain them as a monophyletic group. Within *Cyphella sensu lato* there is considerable variation. Based on such variation a number of generic units have been recognized, of which some may appear similar in some points with genera of

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other groups in the Polyporales and Agaricales. It is thought that convergent evolution could have played a large part in the development of fruit bodies with such structures.

Cyphella and Solenia

Donk (1941) has given an elaborate review of the situation as regards typification of the genus *Cyphella* Fr. It boils down to the fact that the type species can only be understood as *C. digitalis* Fr. Rogers (1949: 433) points out that Corda definitely designated *C. digitalis* as the type of *Cyphella*. As understood by Donk, Rogers, and others at present, this species is a good *Aleurodiscus*. The name *Aleurodiscus* has accordingly been conserved against *Cyphella*. This leaves *Cyphella* unavailable as a generic name; it must be replaced by one which is available. At the present time, *Solenia* seems to be best suited for this purpose. Both Fries and Persoon knew this genus and both understood it in the same sense. Bourdot and Galzin, following Patouillard, merged it with *Cyphella* and treated its species first. However, should we decide to use it as a generic repository for all hyaline-spored species of cupulate and tubular Basidiomycetes with simple hymenia, a very heterogenous group of species will result even should the genus be broken down into subgeneric units. The name *Cyphella* will not be used in the following treatment and the name *Solenia* will be used in the restricted sense in which it has been used by most writers on these fungi. *Solenia* in the sense of pre-Persoonian and pre-Friesian writers is not considered valid and so is ignored here.

Sources of Material and Acknowledgements

Forty herbaria have co-operated in sending material to Pullman and Cincinnati for study. More than 4800 specimens have been examined from most of the states in the United States, most provinces of Canada, and from many countries or political units on all of the continents. From this material 180 species have been recognized in 18 genera. Specimens have been studied from the herbaria listed in Table 1.

Members of the staff of the Department of Botany, and of the Department of Plant Pathology, Washington State University, cooperated in encouraging the continuance of this study during the writer's residence at Pullman. Dr. Paul W. Kabler, Chief of Microbiology, the Robert A. Taft Sanitary Engineering Center has continued this encouragement during the Cincinnati period of the study. The directors of the several herbaria listed in Table 1 have kindly loaned materials for study. Various libraries have aided in bibliographic research including those of the New York Botanical Garden, National

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Fungus Collections, Washington State University, the New York City Public Library, and the Lloyd Library. Constructive criticism during the progress of this work has been given by Donald P. Rogers, C. Gardner Shaw, P. H. B. Talbot, John A. Stevenson, and others too numerous to mention. None of these people is responsible for ideas expressed herein above the specific level. Assistance with Latin diagnoses has been given by Miss Elizabeth C. Bridge, and Donald P. Rogers who aided in the final editing of the paper.

Table I. Sources of Collections

Code	*Number seen*	*Name and Location of Herbarium*
S	756	Botanical Department, Naturhistoriska Riksmuseet, Stockholm
NFC		National Fungus Collections, Beltsville
PR	636	Botanical Department, National Museum, Prague
NY	613	New York Botanical Garden, New York
FH	486	Farlow Herbarium, Cambridge, Massachusetts, Including: Farlow, Burt, Patouillard and von Hoehnel Collections
K	243	Royal Botanic Gardens, Kew
PC	223	Museum National d'Histoire Naturelle, Lab. de Cryptogamie, Paris
CGL	198	C. G. Lloyd Mycological Collections (at NFC), Beltsville
TRTC	186	Cryptogamic Herbarium, University of Toronto, Toronto
NYS	107	New York State Museum, Albany
BP	105	Department of Botany, Museum of Natural History, Budapest
CUP	98	Mycological Herbarium, Cornell University, Ithaca
UC	91	University of California, Berkeley
B	91	Botanisches Museum, Berlin
MICH	87	University of Michigan, Ann Arbor
IA	79	State University of Iowa, Iowa City
DAOM	74	Mycological Herbarium, Science Service, Ottawa
PAC	52	Overholts Herbarium, Pennsylvania State University, University Park
OC	45	Mycological Herbarium, Oberlin College, Oberlin
LPS	39	Herbarium Spegazzini, La Plata
CM	36	Carnegie Museum, Pittsburgh
WIN	33	University of Manitoba, Winnipeg
TENN	30	University of Tennessee, Knoxville
WBC	31	Wm. Bridge Cooke, Cincinnati
WIS	28	University of Wisconsin, Madison
PRE	26	National Herbarium, Division of Botany, Pretoria
NCU	25	University of North Carolina, Chapel Hill
DPR	22	Donald P. Rogers, Urbana
ILL	14	University of Illinois, Urbana
WSP	14	Mycological Herbarium, Washington State University, Pullman
MSC	12	Michigan State University, East Lansing
NZPD	9	Herbarium, Plant Disease Division, Auckland
NYFP	7	New York State University, College of Forestry, Syracuse

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UIFP	6	Forest Pathology Collections, University of Idaho, Moscow
LIL	6	Institute Lilloa, University of Tucuman, Tucuman
OTB	6	Research Station, Kentville, Nova Scotia
MSD	5	Maxwell S. Doty, Honolulu
BRUS	3	Brown University, Providence
WTU	2	University of Washington, Seattle
GA	2	University of Georgia, Athens
MELU	2	Melbourne University Herbarium, Melbourne
MELFP	2	Australia Forest Products Laboratory, Melbourne
CINC	2	University of Cincinnati, Cincinnati
MINP	1	Mycological Herbarium, University of Minnesota, St. Pau
PH	1	Schweinitz Herbarium, Philadelphia Academy of Sciences, Philadelphia

SYSTEMATICS

To orient the reader in the writer's position concerning the systematics of the cyphelloid fungi, the following analysis of the *Polyporales*, the suborders of the *Polyporales*, and the families assigned to the *Cyphelliineae*, is presented.

Polyporales Gäumann

Fungi with resupinate, reflexed, sessile or laterally or centrally stipitate fruit bodies on the under side of which the hymenium may be arranged on smooth, venose, toothed, porose or lamellate surfaces, whose growth is indeterminate, or the hymenium may be amphigenous on the surfaces of simple or complex coralloid structures; composed of a sporophore with a context formed of variously arranged systems of tissues which may be monomitic (generative hyphae only), dimitic (generative and binding hyphae, or generative and skeletal hyphae), or trimitic (generative, binding and skeletal hyphae), and a hymenophore composed of tramal tissues similar to those of the context (reduced or absent in resupinate species), a subhymenium and a hymenium; sporophore and hymenophore composed of hyphae at first thin-walled, with ampullate swellings, clamp connections, or not, sometimes with obvious gelatinous walls, at least the younger hyphae with gelatinous surfaces, in all cases walls becoming thickened and weakly to strongly colored, and in some cases becoming so thickened as to obscure the lumen, in some species the hyphae terminating in bovistoid branch systems; hymenium composed of fertile and sometimes of sterile elements, the sterile elements variously modified hyphal tips (acanthophyses, dendrophyses, or dichophyses), sterile basidia (paraphysoid hairs, cystidia, setae) or hyphal pegs (bundles of sterile hair-like cells), the fertile elements being homobasidia produced from subhymenial cells with or without clamp connections, arranged in loose (tomentelloid) to compact (merulioid) fascicles, the

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fascicles becoming so compact as to become obscured, and eventually being reduced to one or two terminal cells of a pseudoparenchymatous subhymenial tissue (hymenochaetoid); basidia usually 4-spored, sometimes 2-spored and in a few cases more than 4-spored; spores always discharged violently (ballistospores), smooth or with various surface markings, of a wide variety of shapes, usually apiculate, usually asymmetrical and flattened on one side, with an endospore (wall of the spore) and an exospore (wall of the basidium) which may become modified to form markings on the endospore, or into which the endospore markings may project.

Habitat: Usually saprobic on a wide variety of substrata, sometimes perthogenic on living plants and trees, rarely truly parasitic and then not obligately so, that is, usually obtained and maintainable in pure culture (with the possible exception of species producing endotrophic mycorrhizae).

Distribution: World wide.

Included in the Polyporales are the following suborders:

Corticineae Bond. and Sing. with usually resupinate, sometimes pileate, rarely stipitate fruit bodies characterized by white or light-colored, smooth, venose, toothed, porose or lamellate hymenophore; spores hyaline or light colored.

Cyphellineae Bond. and Sing. with receptacles usually cupulate, sometimes stipitate, free to subicular or fused on a stroma, with or without specialized sterile organs in the hymenium, white or light-colored to brown sporophores with smooth, venose to porose or rarely lamellate hymenophore; spores hyaline to brown.

Phylacterineae Bond. and Sing. with receptacles resupinate to stipitate, with or without specialized sterile organs in the hymenium; dark-colored or brown sporophores with smooth to variously modified hymenophores; spores usually colored, smooth to rough walled.

Clavarineae Bond. and Sing. with amphigenous hymenium on simple to smooth, variously branched fruit bodies, rarely resupinate; fruit bodies with or without specialized sterile hymenial organs; spores hyaline to colored, smooth to variously roughened.

Hydnineae W. B. Cooke with resupinate, reflexed, sessile or stipitate fruit bodies, the hymenophore covering teeth.

Phellinineae W. B. Cooke with resupinate, reflexed, sessile or stipitate fruit bodies, the hymenophore smooth, covering teeth or lining tubes; usually with brown setae, sometimes without; usually turning black in KOH because of the presence of "thelephoric acid"

Polyporineae Bond. and Sing. with resupinate, reflexed, sessile or stipitate fruit bodies, the hymenium lining tubes, tube-like remnants of tubes, or gill-like modifications of the hymenophore.

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Cyphellineae Bond. and Sing.

Receptacles usually cupulate, sometimes stipitate, free, with or without a subiculum, conglobate or fasciculate, produced on a subiculum or stroma; hymenophore with a smooth hymenium or variously modified with incipient veins, or well developed veining which may anastomose to form a pore-like hymenium; hymenium composed only of basidia, or having cystidia, dichophyses, or acanthophyses; hyphal system monomitic; clamp connections not present in all species; spores hyaline to brown, smooth, rarely roughened.

Habitat: On decaying plant materials of various types or on living mosses, rarely on living or recently dead parts of vascular plants.

Distribution: World wide.

Key to Families

1. Receptacles simple, borne singly, in a subiculum, or on a mass of subicular hyphae, rarely conglobate or fasciculate ..... *Porotheleaceae*
1. Receptacles simple to complex; living on mosses, wood of living or dead trees, rotten wood, or soil; hymenium smooth to wrinkled, lamellate or porose in appearance 2
   2. Receptacles occurring on living mosses or other substrata, simple to complex, hymenium smooth or variously wrinkled ..... *Leptoglossaceae*
   2. Receptacles occurring on decaying wood or on the wood of living or dead trees 3
3. Receptacles developed as fascicles of separate tubules pendant from the fleshy tramal subiculum .... *Fistulinaceae*
3. Receptacle developed on the under side of a tough subicular tissue, becoming split at the distal edges into lamella-like segments ..... *Schizophyllaceae*

In the following treatment we are concerned with only those species usually placed by conservative workers in the genera *Cyphella* and *Solenia*. Species related to these, or confusable with them, will also be considered. The treatment of the *Porotheleaceae* will be rounded out by summarizing work on *Porotheleum sensu lato* published earlier. Those species found on or associated with mosses, included in *Leptoglossum*, will be considered in the *Leptoglossaceae*. Other members of this family and representatives of the other families mentioned in the above key will not be considered in this paper.

Porotheleaceae Murr.

Porotheleaceae Murr. emend. W. B. Cooke, Mycologia 49: 681. 1957.

Porotheliaceae Murr., Mycologia 8: 56. 1916.

Receptacles cup-shaped to tubular, seated directly on the substratum, with or without an associated subiculum, or seated on or, in a membrandous to coriaceous subiculum; hymenium rarely with special structures other than basidia.

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Type genus: *Porotheleum* (Pers. ex Fr.) Fr.

Since it has been decided to remove fungi with cupulate receptacles and simple hymenia from the *Thelephoraceae*, a family name must be chosen for the group. Murrill established the name *Porotheliaceae* specifically for the genus *Porotheleum*. This genus includes only a small number of the fungi now being assigned to the family. The subicular habit upon which this genus is based is relatively rare in the group but represents the highest development in the family.

The use of the name Cyphellaceae is dicussed at length in a quixotic manner by Donk, 1959. The basis of his discussion is an apparent fear that someone wants to retain the family name in preference to some other. However, the use of the name "*Cyphella*" is illegitimate, as a result of which the use of names based on it such as "Cyphellaceae" is considered illegitimate. By his own admission, through the synonymy he presents, Porotheleaceae is the only legitimate name available for the family.

Key to Subfamilies

1. Receptacles produced directly on the substratum, in, not on, the subiculum when present ..... *Solenioideae*
1. Receptacles produced separately on a thin to thick, usually annual, subiculum ..... *Porotheleoideae*

Solenioideae Subfam. nov.

Cupula cylindrica et cupulata, repanda ad cornucopiformis, cum vel sine pilis superficialibus; pilis, si adsunt, laevibus vel incrustatis, hyalinis ad pallide luteis, luteis vel brunneis; cum vel sine hyphis subiculatis.

Receptacles cylindric to cupulate, open repand to funnel-shaped, or goblet-shaped, with or without surface hairs; surface hairs, when present, smooth or granule-incrusted, hyaline to cream colored, yellowish or brown; arising directly from the substratum, with or without subicular hyphae arising from the substratum and rarely surrounding the receptacles, simulating the porotheleoid condition.

Habitat: On dead wood or dying parts of vascular plants.

Distribution: World wide.

Type genus: *Solenia* Pers.

Key to Tribes

1. Spores hyaline ..... *Solenieae*
1. Spores colored ..... *Chromosolenieae*

Solenieae trib. nov.

Ut in subfamilia, sporis hyalinis.

Characters of the subfamily, but spores hyaline.

Type genus: *Solenia* Pers.

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Key to the Genera

1. Spores angular ..... *Rhodocyphella*
1. Spores smooth 2
2. Receptacles fasciculate or conglobate 3
2. Receptacles separate, rarely occurring so close together as to appear fasciculate or conglobate, or rarely with branched stipes 4
3. Receptacles fasciculate ..... *Merismodes*
3. Receptacles conglobate ..... *Stromatoscyphella*
4. Receptacles covered with brown hairs, of which at least some have inflated tips ..... *Cyphellopsis*
4. Receptacles without such surface hairs 5
5. Receptacles without special surface hairs, or if these are present they are mycelioid or without incrusting granules 6
5. Receptacles with special granule-incrusted surface hairs, hairs usually with thick walls 8
6. Receptacles without special surface hairs or with mycelioid surface, usually stipitate, campanulate ..... *Calyptella*
6. Receptacles cupulate, with or without special hairs 7
7. Receptacles without special surface hairs ..... *Glabrocyphella*
7. Receptacles with smooth surface hairs ..... *Cellypha*
8. Surface hairs hyaline to pale colored 9
8. Surface hairs yellow to brown ..... *Maireina*
9. Receptacles cupulate 10
9. Receptacles cylindric 11
10. Granules formed of minute crystalline material ..... *Lachnella*
10. Granules formed of large acicular crystals ..... *Flagelloscypha*
11. Spores globose or ovate ..... *Solenia*
11. Spores fusiform ..... *Woldmaria*

Solenia Pers., Myc. Eur. 1: 334. 1822.

Solenia Pers. ex Fr., Syst. Myc. 2: 201. 1822. Non *Solenia* Hill ex O. Kuntze, 1898 = Boletaceae, nec *Solenia* Agardh 1824 = *Ulva* subgen. *Solenia* (Agardh) Agardh 1822 = Chlorophyta

Cyphella Fr., Syst. Myc. 2: 201. 1822, sensu Bourd. & Galz., pr. min. p., excl. typo.

Tubularia Colla, Herb. pedemont 1: 187. 1837. pr. p.

?Trabecularia Bon., Bot. Zeit. 15: 209. 1857. pr. p.

Henningsomyces O. Kuntze, Rev. Gen. 3(2): 483. 1898 non *Henningsomyces* Sacc., 1905 = Capnodiaceae

Receptacles membranaceous to coriaceous, urceolate, turbinate, or cylindric, sessile to short-stalked, solitary to gregarious or crowded; subiculum absent in many specimens, but in others present as a fine evanescent superficial mycelium, or forming a floccose to felt-like mat in which the receptacles are inserted; receptacles usually pendant, the hymenium facing the ground and lining the inside of the variously shaped receptacles, usually smooth; surface of the receptacles covered more or less densely with specialized hairs which may be rarely smooth or usually incrusted with small crystalline granules; basidia simple, usually with 4 sterigmata, usually subtended by clamp connections

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which may also be present on the hyphae of the context; spores hyaline, one-celled, apiculate, sphaerical to ovate and cylindrical.

Lectotype: *S. candida* Pers.

Habitat: On bark, wood, woody and herbaceous litter.

The genus *Solenia* Pers., Myc. Eur. 1: 344. 1822, is considered valid and is herein used to include most of the light colored tubular species assignable to this family. Donk (1951) claims that this genus is "impriorable on account of the earlier homonyms" as a result of which he accepts Otto Kuntze's *Henningsomyces* as a suitable legal substitute. Among the homonyms he cites are two orthographic variants, Solenas which are Phanerogams, and two Solenias, one algal, the other fungal. No reason is given for considering *Solena* Lour. (1790: Cucurbitaceae), and *Solena* Willd. (1797: Rubiaceae) as orthographic variants for *Solenia* of Hoffmann, Persoon, Fries, J. Hill, or other mycologists who used this name for two distinct groups of fungi. Agardh used the name *Solenia* as a subgenus of *Ulva* in the Chlorophyceae in 1822. He did not raise this to generic rank until 1824 so that it becomes a homonym of *Solenia* Pers., 1822. *Solenia* J. Hill ex O. Kuntze, a genus placed in the Boletaceae in 1898, is also a homonym of *Solenia* Pers. Since it is thought that the Persoon use of the genus *Solenia* antedates that of Fries in the same year, the genus is attributed solely to the former author. It is herein considered valid, the oldest post-Friesian genus in the group of genera which the tubular cyphellas have been assigned. It is used here for those species.

Key to Species of *Solenia*

1. Receptacles smooth on surface ....*S. minima*
1. Receptacles covered with hairs of various types 2
2. Receptacles covered with a weak to well developed layer of dichophyses which usually form a rim around the mouth of the receptacle..... 3
2. Receptacles covered with simple, rarely branched, usually elongate, hairs 8
3. Dichophyses clamped ..*S. araneosa*
3. Dichophyses not clamped 4
4. Dichophyses with wide bases, spores reaching 8,5 μ long or in diameter ....*S. pubera*
4. Dichophyses with narrow bases, spores rarely 6 μ in length or in diameter. 5
5. Receptacles crowded on the substratum, appearing poroid ..*S. calamicola*
5. Receptacles scattered to gregarious, not poroid 6
6. Receptacles brown, spores 7,2 × 3,6 μ .*S. pallido-cinerescens*
6. Receptacles white to cream-color, spores smaller 7
7. Spores 3,5—6 × 3,5—5 μ, context cells elongate .....*S. candida*
7. Spores 5—6 μ in diameter, context cells globose to subglobose *S. subnivea*
7. Spores 3,6 × 2,4 μ, context cells elongate .....*S. palmicola*
8. Surface hairs dichotomously branched, produced in concentric zones on the receptacle ....*S. zandbaiensis*
8. Surface hairs simple, unbranched 9

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9. Hairs twisted spirally in the outer half 10
9. Hairs straight to flexuous 11
10. Spores 3—4 × 2,5—3,5 μ ..... *S. natalensis*
10. Spores 7—9 × 3,5—4,5 μ ..... *S. australiensis*
11. Spores globose 12
11. Spores cylindric to ovate 13
12. Receptacles cylindric, spores 5—7(—8) μ in diameter, surface hairs hyaline .... *S. fasciculata*
12. Receptacles more or less cupulate, spores 5—6 μ in diameter, surface hairs yellow ..... *S. sphaerospora*
13. Surface hairs very narrow, 1,5 μ in diameter *S. epiphylla*
13. Surface hairs 3—4 μ in diameter 14
14. Tips of hairs twisted or hairs irregular 15
14. Surface hairs straight to flexuous or contorted 17
15. Tips of surface hairs twisted 16
15. Surface hairs irregular in shape ..... S. *subvillosa*
16. Spores 3—4 × 1,5—2 μ ..... *S. rickiana*
16. Spores 3—4 × 2,5 —3,5 μ ..... *S. natalensis*
17. Surface hairs hyaline to cream-colored 18
17. Surface hairs yellow 22
18. Receptacles on a thin subiculum, surface hairs flexuous *S. canadensis*
18. Receptacles without noticeable subiculum, surface hairs straight to contorted 19
19. Spores cylindrical, 8—12 μ long ..... *S. hakgallae*
19. Spores reaching 7 μ long 20
20. Spores small, 2—3 × 1—1,5 μ ..... *S. moelleri*
20. Spores larger 21
21. Spores 3,5—7 × 2,5—4 μ, temperate regions ..... *S. idahoensis*
21. Spores 5,8 × 2,9 μ, tropical regions ..... *S. farinacea*
22. Spores 4,5—5,5 × 2,5—3,0 μ, surface hairs more or less flexuous, 100—200 μ long ..... *S. conferta*
22. Spores reaching 7μ long, surface hairs straight to flexuous, 70—150 μ long 23
23. Receptacles cylindric, 500 μ tall, 200—300 μ in diameter *S. sulphurea*
23. Receptacles cylindric-cupulate, 100—200 μ tall and in diameter ..... *S. andropogonis*

Solenia andropogonis sp. nov.

Cupula campanulata vel cyathiformis nec cylindracea, subsessilis, pallide lutea, 100—200 μ diam. et alta; extus pilis luteis, laevibus, rectis vel flexuosis, 70—100 × 3—4 μ obtecta; basidiis 4-sporis, 18—22 × 6—7 μ; sporis hyalinis, laevibus, apiculatis, ovoideis vel cylindraceis, 7 × 3,5 μ.

Receptacles campanulate to cupulate, not cylindric, subsessile, cream-color, 100—200 μ in diameter and in height; covered with hairs which are yellow, smooth, straight to flexuous, spreading to appressed, 70—100 × 3—4 μ. with no observable lumen to a wide lumen; basidia probably 4-sterigmate, 18—22 × 6—7 μ; spores hyaline, smooth, apiculate, ovate to cylindric or slightly curved, 7 × 3,5 μ.

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Habitat: On base of dead culm of *Andropogon virginicus*.

Type and specimen examined: Louisiana: near St. Martinsville. Coll. A. B. Langlois, Dec. 10, 1884. (NFC)

Solenia araneosa (Bourd. & Galz.) comb. nov.

Cyphella (*Solenia*) *araneosa* Bourd. & Galz., Hym. de France 162. 1928.

Receptacles cylindric, to 500 μ high and wide, seated in a weak, white subiculum; subiculum white to cream-color, hyphae branching at right angles, apparently anastomosing; surface hairs dichophysoid, strongly branched, with clamp connections, up to 45 μ long, 2—2,5 μ in diameter; basidia 18—24 × 6—7 μ, 4-sterigmate; sterigmata reaching 4,5 μ long; spores hyaline, smooth, apiculate, finely granular, spherical, 5,4—7,2 μ in diameter, or broadly ovate, 6—7 × 5—6 μ.

Habitat: On bark of *Prunus* sp. (cherry), chestnut, *Fagus silvatica*, and other trees.

Specimens examined from: Czechoslovakia (1), France (2).

Type specimen examined: France: Pl. de l'Aveyron, Mar. 3, 1910. Galzin, No. 5404. Bourdot Herbarium No. 7095. (PC).

A second specimen from the Bourdot Herbarium (3487) is similar but was identified by Bourdot as *S. nivea* Quél. Apparently authentic material of Quélet's species more nearly corresponds to *S. candida* Pers. ex Fr.

Solenia australiensis sp. nov.

Cupula cylindracea, 1—2 mm. alta. 500—750 μ diam.; e subiculo albo, laxo oriunda, extus pilis albis, continuis vel flexuosis, 200—800 × 3—4 μ obtecta; basidiis 25—30 × 7—9 μ, 4-sterigmaticis; sporis hyalinis, laevibus, apiculatis, ovoideis vel cylindraceis, 7,2—9 × 3,5—4,5 μ.

Receptacles white, 1—2 mm. in height, cylindric, 500—750 μ in diameter; seated in a weak subiculum of hyphae similar to the surface hairs; covered with elongate surface hairs more or less straight to curved or spiral shaped, 200—800 μ long, 3—4 μ in diameter, contents staining from base to tip; context hyphae hyaline, compact; subhymenial hyphae 2—2,5 μ in diameter, clamped; basidia 25—30 × 7—9 μ, 4-sterigmate, with clamps at the base; spores hyaline, smooth, long ovate, flattened on one side, apiculate, 7,2—9 × 3,5—4,5 μ.

Habitat: On *Acacia melanoxylon*.

Type and specimen examined: Australia: Tarra Valley Park, Victoria. Collected by K. Healey, June 9, 1958. (Aust. For. Prod. 6863).

Solenia calamicola P. Henn. & E. Nym., Monsunia 1: 7. 1899.

Receptacles tan when dry, cylindric, scattered to gregarious, 400—500 × 200—250 μ, under microscope surface light brownish;

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receptacles with a fringe of pale tan dichophyses, 14,5×1—1,5 μ, branched; receptacles formed of three tramal layers, the outer 5—8 μ thick, formed of several layers of dichophysoid hairs, middle layer formed of parallel arranged, light brownish hyphae, up to 15 μ thick, and hymenial layer composed only of basidia, 15 μ thick; basidia 14,5×6 μ, 4-sterigmate, arising almost directly from the context; subhymenium 1—2 cells thick, no clamps seen; spores hyaline, globose, apiculate, smooth, 4 μ in diameter; adjacent receptacles more or less cemented together but not grown together.

Habitat: On leaves of *Calamus* sp.

Type and specimen examined: Java: Bogor botanical garden. Collected by E. Nyman, March 3. 1898. (S).

Solenia canadensis sp. nov.

Cupula cylindracea, alba vel pallide lutea, 200—800 μ longa, 100—400 μ diam. subiculo albo, tortuoso ex hyphis 3—4 μ crassis composito praedita; basidiis 4-sporis, 14—20×5—7 μ; sporis hyalinis, laevibus, apiculatis, subglobosis vel ellipsoideis, 4—6×2,5—4 μ.

Receptacles cylindric, whitish to light cream-colored, 200—800 μ high, 100—400 μ in diameter, seated in a white subiculum, gregarious, appearing macroscopically like a *Poria*, under a hand lens like an *Odontia*, but hymenium lining the inside of tubules; subiculum loose, of spiral-shaped hyphae 3—4 μ in diameter, rarely septate, not clamped, covering the cups when dry, appearing as surface hairs or tissue when moistened, on outer half or three-fourths of cups surface hairs 100—200 μ long, hyaline, mostly smooth; basidia 4-sterigmate, 14—20×5—7 μ; spores hyaline, smooth, apiculate, subglobose to ellipsoid, flattened on one side, 4—6×2,5—4 μ.

Habitat: On wood, especially of *Abies balsamea*, *Picea* sp., and *Fagus* sp.

Type: Ontario: Lake Temagami, Bear Island, Aug. 14, 1931. Coll. R. F. Cain 846 (NFC).

Other specimens examined: Same location: July 22, 1939. Coll. H. S. Jackson (TRTC 15292); Island 725, Lake Temagami, Aug. 8, 1939. Coll. R. F. Cain (TRTC 17953); Odell Park, Frederickton, New Brunswick, Sept. 4, 1959. Coll. K. A. Harrison (OTC 4205).

Solenia candida Pers., Myc. Eur. 1: 334. 1822.

Calyptella nivea Quél., Ench. Fung. 216. 1886 non *Cyphella nivea* Crouan, Fl. Finist. 61. 1867 nec *Cyphella nivea* Fckl., Symb. Myc. 1: 26. 1870 (*C. niveola* Sacc., 1886) — *Solenia candida* var. *polyporoidea* Pk., Ann. Rep. N. Y. St. Mus. 41: 86. 1886. — *Solenia fascicularis* var. *palmicola* Henn., Verh. Bot. Ver. Prov. Brandenb. 40: 120. 1898. — *Henningsomyces candidus* (Pers.) O. Kuntze, Rev. Gen. 3(2): 483. 1898. — *Cyphella candida* (Pers.)

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Pat., Ess. Taxon. 55. 1900. — *Cyphella* (*Calyptella*) *nivea* (Quél.) Bourd. & Galz., Hym. Fr. 155. 1928. — *Solenia polyporoidea* (Pk.) Burt, Mo. Bot. Gard. Ann. 11: 16. 1924. — *Solenia candida* var. *herbarum* Pilát, Ann. Mycol. 23: 167. 1925.

Receptacles tubular, white at first, then cream color in some specimens when dry, free to confluent, when confluent not separating without damage, with an evanescent subiculum which may not be evident in some specimens, 200—800 μ, sometimes reaching 3 mm. tall, 200—500 μ in diameter, appearing sessile at first, with a stipe-like base which may be as much as half the length of the receptacle at maturity; covered with a fine network of clamped hyphae 1—2 μ in diameter, finely branched. forming a dichophysoid pellicle, dichophysoid hyphae 10—25—(50)×0,5—1,0—(1,5) μ; mouth of receptacles somewhat inrolled when dry, with a palisade of dichophyses around the margin, dichophyses hyaline, branched dichotomously, 1—2 μ in diameter, branch tips slender, probably a continuation of the dichophysoid network of surface hyphae; basidia 14,5—21×(4—5)—7—8 μ, 2—4-spored, in a compact, whitish to creamcolored hymenium; spores hyaline, smooth, apiculate, globose to subglobose, or ovoid, 3,5—6,0×3,0—5,0 μ, or 3—6 μ in diameter.

Habitat: On rotting coniferous and hardwood wood and bark, especially of: *Abies* sp., *A. alba*, *A. balsamea*, *A. bornmulleriana*, *A. concolor*, *A. magnifica* var. *shastensis*, *A. pectinata*, *Chamaecyparis thyoides*, *Juniperus virginiana*, *Larix* sp., *Picea* sp., *P. excelsa*, *Pinus* sp., *P. monticola*, *P. ponderosa*, *Pseudotsuga menziesii*, *Taxodium distichum*, *Thuja occidentalis*, *Tsuga canadensis*, *Acer* sp., *Alnus* sp., *A. glutinosa*, *Anona reticulata*, *Betula* spp., *B. alba*, *B. verrucosa*, *Bignonia capreolata*, *Bixa orellana*, *Citharoxylum spinosa*, *Cocos nucifera*, *Eucalyptus regnans*, *Fagus* sp., *F. silvatica*, *Fraxinus* sp., *Mimusops* sp., *Palmaceae* spp., *Phylicia* sp., *Populus* sp., *P. tremuloides*, *Quercus* sp., *Q. alba*, *Q. morbeckii*, *Q. suber*, *Robinia pseudacacia*, *Sabal* sp., *S. blackburnianum*, *Salix alba*, *Tecoma radicans*, *Umbellularia californica*, *Vitis* sp.

Specimens examined from: Austria (8), Czechoslovakia (25), France (9), Germany (21), Great Britain (8), Hungary (7), Italy (1), Latvia (3), Holland (1), Poland (1), Portugal (3), Sweden (44), Yugoslavia (1), Macedonia (1), Turkey (2), Algiers (1), French Morocco (2), Sierra Leone (1), Tunis (1), Ceylon (4), Japan (2), Australia (3), New Zealand (3) Philippine Islands (3), Brazil (6), Ecuador (2), Chile (1), Tristan da Cunha (1), Bermuda (14), Jamaica (2), Trinidad, B. W. I. (1), Canal Zone (1), British Columbia (2), Ontario (30), Nova Scotia (5), Quebec (3), California (13), Connecticut (1), Delaware (1), Florida (3), Georgia (1), Idaho (2), Iowa (4), Kentucky (2), Louisiana (21), Maine (2), Massachusetts (4), Michigan (1), Missouri (1), New Hampshire (10), New Jersey (8), New York (22), North Carolina (1), Ohio (6), Oregon (1),

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Pennsylvania (5), Tennessee (3), South Carolina (5), Texas (2), Vermont (4), Virginia (1), Washington (3).

One of the specimens received from Malençon from Morocco had spores $4-5 \times 2-3$ μ. Surface hairs on the Australian specimen were weakly developed. The type of surface covering exhibited in the receptacles of this species is referred to by Singer in his descriptions of certain species of *Campanella* as "numerous dichophyses on the sterile surface form[ing] a cuticle with asterostromelloid structure". Such dichophysoid surface coverings are found in several of the genera treated here. At present no phylogenetic significance is attached to the possession of such pellicles by certain species.

Solenia candida var. *polyporoidea* differs from *Solenia candida* only in growth habit. In the species the tubules are always widely enough spaced so that they remain separate if only by a fraction of a millimeter. In the variety, if it should be recognized, at least some, if not all, of the tubules are close enough together on the substratum so that in reaching maturity they touch and hyphae of adjacent tubules become permanently interwoven. The ranges of the two habits overlap. On the basis of fresh material found during Mycological Society of America Forays near Ithaca, New York, and Madison, Wisconsin, the writer thinks that the division of this species into varieties is not justified. In both cases specimens were found which could be divided into specimens of each type of growth habit. Neither specimen covered more than five square inches of area on the under side of rotting sticks. This type of crowded growth on a palm leaf sheath in the Berlin Botanical Garden's Palm House prompted P. Hennings to erect the new variety *Solenia fasciculata* var. *palmicola* which otherwise agrees with material seen of *S. candida*.

Type specimens examined: *Solenia candida* var. *polyporoidea* Pk., on *Tsuga canadensis*. New York: Adirondack Mountains, July 1887. Coll. C. H. Peck. (NYS).

Porothelium anastomosans Burt in herb. (FH) (Farlow)

Chile: Corral, Dec. 1905, R. Thaxter 4157 and 4158 (FH)

Burt noted in the packet: "This is a beautiful and very distinct *Porothelium*".

Solenia candida var. **hydnoidea** (Berk. & Br.) comb. nov.

Solenia hydnoidea Berk. & Br., Jour. Linn. Soc. Lond., Bot. 14: 74. 1875.

Microscopic skeletal appearance like that of *S. candida*; receptacles seated on thin subiculum-like surface hairs; macroscopic appearance like that of *S. candida*, receptacles crowded, seated on the thin concolorlous subiculum; basidia present but collapsed.

Type: Ceylon, Peradeniya, Dec. 1868, No. 149.

Specimens examined: Ceylon (2)

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This growth form is maintained as a distinct variety because the receptacles are produced on a distinct subiculum in a restricted area whereas *S. polyporoidea* is not because its cupules are gregarious to scattered on a nearly subiculum-free surface.

Solenia conferta Burt, Mo. Bot. Gard. Ann. 11: 17. 1924.

Receptacles tubular, separate, yellow, densely crowded together, not distorted by mutual pressure, not becoming confluent; 2—5 mm. long, up to 500 μ in diameter; covered with hairs, appressed, parallel, more or less interwoven, yellowish, smooth, non-septate, pointed at the tip, more or less flexuous, not stiff, 100—200 × 3—4 μ; trama 1—2 cells thick, giving rise to a compact hymenium on one side, to the surface hairs on the other; basidia short-clavate, 10—14 × 4—5 μ, 4-sterigmate; spores smooth, apiculate, hyaline, subglobose to ellipsoid, 4,5—5,5 × 2,5—3,0 μ.

Habitat: On rotten wood.

Type: Missouri: Meramec Highlands, Dec. 6, 1913, L. O. Overholts. (LOO 12990 in PAC; MO 14505 in NFC).

Specimens examined from: Alabama (3), South Carolina (6), Kentucky (3), Missouri (2), Virginia (1).

A specimen from Barro Colorado Island, Panama Canal Zone, is similar to this species but more cupulate and with narrower surface hairs (IA).

Solenia epiphylla Dur. & Lév., Fl. Alg., t. 29, f. 1. 1846.

Receptacles cylindrical, cream color, gregarious, up to 500 μ long, 100—200 μ in diameter, covered with special hairs; surface hairs ivory to hyaline, non-septate, not incrusted, not stiff, wavy, sometimes weakly spiral tipped, simple, 75—100 × 1,5 μ; context thin, hyphae 2,5—3 μ in diameter, no clamps seen; basidia crowded, 14—17 × 5,5—8 μ, 4-sterigmate; spores hyaline, broad ovate, apiculate, smooth, flattened on one side, 4 × 3 μ.

Habitat: On leaves of *Arbutus unedo*.

Specimens examined: France, La Calle. On leaves of *Arbutus unedo* and other trees. Oct. 21. 1846. (PA) (probably ex herb Léveillé)

Solenia farinacea P. Henn. & E. Nym., Monsunia 1: 7. 1899.

Receptacles gregarious, cylindrical, with no special subiculum, 500 μ high, 100 μ in diameter; surface hairs hyaline, thick-walled, contorted, 125—150 × 3—4 μ; context composed of hyaline hyphae, 3—4 μ in diameter, giving rise to the subhymenium composed of hyaline hyphae 2—3 μ in diameter; basidia crowded in a tight palisade, 10 × 3 μ, 4-sterigmate; spores hyaline, smooth, ovate, apiculate, 5,8 × 2,9 μ; no clamp connections seen.

Habitat: On dead plant materials.

Type and specimen examined: Java: Zandbai. Coll. E. Nyman, Dec. 17, 1897. (S).

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Solenia fasciculata Pers. Eur. 1: 335. 1822.

Solenia villosa Fr., Syst. Myc. 2: 200. 1822. — *Tabularia fasciculata* (Pers.) Colla, Herb. pedemont 1: 187. 1837. — *Henningsomyces villosus* (Fr.) O. Kuntze, Rev. Gen. 3(2): 483. 1898. — ?*Solenia gracilis* Copeland, Ann. Mycol. 2: 508. 1904.

Receptacles sessile to substipitate, separate to gregarious, with scanty, usually evanescent, subiculum, at first white, fading to cream-color, 0,5—3,0 mm. long, 200—300 μ in diameter, tubular, appearing confluent in densely crowded patches, stipe-like base darker in color; surface hyphae hyaline, parallel to intertwined, rarely interwoven, rarely branched, appressed to surface of tubule, 30—100×2—5 μ; basidia 25—30×5—7 μ, 4-sterigmate; spores hyaline, apiculate, smooth, globose, 5—7—(8) μ in diameter; in the Nova Scotia collection two or three seasons of growth were observed, tubules of the first season proliferating at the margin to form 1—3 tubules which again proliferate to form 1 tubule, each increment shorter than the preceding one.

Habitat: On rotten woody remains of such plants as: *Acer* sp., *A. saccharum*, *Aesculus hippocastanum*, *Alnus incana*, *Betula* sp., *B. lenta*, *B. lutea*, *Castanea sativa*, *Chamaecyparis thyoides*, *Euonymous atropurpureus*, *Eupatorium purpureum*, *Liquidambar styraciflua*, *Magnolia* sp., *Ostrya* sp., *Pinus* sp., *Quercus* sp., *Q. alba*, *Rubus* sp., *R. allegheniensis*, *Vitis vinifera*.

Specimens examined from: France (6), Ceylon (1), Manitoba (1), Nova Scotia (1), Ontario (5), Quebec (2), Delaware (2), Iowa (1), Louisiana (1), Maine (2), Maryland (1), Massachusetts (10), New Hampshire (3), New Jersey (9), New York (11), North Carolina (2), Ohio (1), Pennsylvania (16), South Carolina (2), Tennessee (1), Vermont (3), Virginia (6), West Virginia (3).

Lee Bonar, at the University of California, reported that E. B. Copeland stated that the type of *S. gracilis* Copeland was deposited in the Herbarium of the California Academy of Sciences, San Francisco. John Thomas Howell, Curator of that herbarium, wrote that this specimen is not among those saved by Miss Alice Eastwood from the 1906 fire.

A young specimen with the superficial appearance of *S. candida* was labeled *Solenia villosa* Fr. forma *abbreviata* by M. C. Cooke in his herbarium at Kew. Collected by Ellis in New Jersey, No. 2824.

Solenia fasciculata Pers. sensu Bourdot, in herb.

Receptacles sessile to substipitate, separate to scattered, 1,0—1,5 mm. high, 200—300 μ in diameter, in a thin, white subiculum; surface hairs straight, lower ones appearing like a continuation of the subiculum, 30—100×2—5 μ, smooth; basidia 4-sterigmate, 18—20×5—6 μ; spores hyaline, smooth, apiculate, globose, 3—3,5 μ in diameter.

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Habitat: On decaying chestnut wood.

Specimens examined from: France (2). Part of at least one of these collections is deposited at Paris, Prague and Kew.

A form was described by Bourdot under the name of *rosella* in which the subiculum and receptacles assume a pinkish color. This appears to be a reaction to habitat and appears only in older specimens or on older parts of specimens. This may also have been the result of an incipient infection by some hypocreaceous fungus.

This material is different from material reportedly compared with authentic specimens. It is intermediate between *S. minima* and *S. fasciculata* in size but the spores are small.

A specimen labeled *S. candida* Pers. var. *herbarum* Pilát, collected on stems of *Hypericum perfoliatum* in Czechoslovakia in 1924 is also close to *S. fasciculata* because of the surface hairs which are arranged in a tight parallel palisade around the receptacle surface. However, no spores were seen and it is not possible to place it with certainty.

Solenia hakgallae sp. nov.

Cupulae pallide luteae, sparsae vel gregariae, 1—2 mm. longae, 200—300 μ latae, sessiles vel substipitatae, extus pilis paucis, 100× 3—4 μ obtectae; basidiis clavatis, 4-sterigmatis, 25—30×6—8 μ; sporis hyalinis, laevibus, apiculatis, cylindraceis, 8,5—11,5×4—4,5 μ.

Receptacles cream color, scattered to gregarious, 1—2 mm. long, cylindric to very narrowly funnel-shaped, 200—300 μ in diameter at base, 250—500 μ in diameter at top, sessile to substipitate; with a weak cover of surface hairs similar to those of *S. fasciculata*, up to 100 μ long, 3—4 μ in diameter; golden masses of embedded crystals 25—40 μ in diameter scattered throughout context, context hyphae 3—4 μ in diameter, simpleseptate; subhymenial hyphae 2,5—3 μ in diameter; hymenium formed only of basidia; basidia clavate, 4-sterigmate, 25—30×6—8 μ; spores hyaline, smoothly apiculate, flattened on one side, cylindric, 8,5—11,5×4—4,5 μ.

Habitat: On decaying wood.

Type and specimens examined: Ceylon, Hakgalla, January 1914. The numbers 3867 and 6591 appear on the packet. (K).

Solenia idahoensis sp. nov.

Cupula subcylindracea vel discoidea, 300—500 μ longa, 150—300 μ lata, alba, pilis flexuosis, hyalinis nec incrustatis, 125—150 μ longis, 3—4 μ crassis praedita; basidiis 4-sporis, 20—23×4—7 μ; sporis hyalinis, ovoideis, laevibus, apiculatis, 3,5—7,0×2,5—4,0 μ.

Receptacles subcylindric to discoid, 300—500 μ high, 150—300 μ in diameter, white when dry; with flexuous, hyaline, smooth surface hairs 125—250×3—4 μ; basidia 4-sterigmate, 20—23×4—7 μ; spores hyaline, ovate, smooth, apiculate, 3,5—7,0×2,5—4,0 μ.

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Habitat: On wood of *Pinus monticola.*

Type and specimen examined: Idaho: Coolin, Sept. 1919. Coll. J. R. Weir 10950. (NFC).

Solenia minima Cke. & Phill., Grev. 10: 123. 1882.

Receptacles cylindric, small, 100—300 μ tall, 100 μ in diameter, sessile, white when fresh, white to cream-color when dry, scattered; surface smooth, without special surface hairs; context hyphae 1,5—2,0 μ in diameter; with clamp connections; basidia 2—4-sterigmate, (12)—16—19×4,8—6,4 μ; spores globose to subglobose, smooth, apiculate, hyaline, 3—4×2,5—3,0 μ, or 3—4 μ in diameter.

Habitat: On rotting trunk of *Strelitzia* sp.

Type and specimen examined: Union of South Africa: Inanda, Natal. Coll. J. M. Wood, 482, Jan. 1881. (PRE 11145, 10706, K).

This species is distinguished from *S. candida* by the absence of surface hairs, smaller size, and smaller spores; and from *S. natalensis* by its lack of surface hairs, smaller size, and more scattered receptacles.

Solenia moelleri Lloyd, Myc. Writ. 7: 1332. 1924.

Receptacles cream-colored, not crowded, separate, 450 μ high, 300 μ in diameter, subiculum none or faintly developed; receptacles with elongate, appressed hairs 100—200 μ long, 2 μ in diameter, with pointed tips; basidia 10,8×3,5 μ, 4-sterigmate; spores 2—3× 1—1,5 μ, hyaline, smooth, ovate, apiculate.

Habitat: On bark.

Type and specimen examined: Brazil: Coll. J. Rick (CGL 17635 in NFC).

Solenia natalensis W. B. Cooke in Talbot, Bothalia 6: 481. 1956.

Receptacles cylindric, 0.5 mm. tall at margins of colony, separate, in center of fruiting area up to 1,0—1,5 mm. tall, sometimes up to 2 mm., becoming densely gregarious, apparently adnate in sheaths; subiculum evanescent or absent, not evident; surface hairs when present strongly appressed, up to 3 μ in diameter, with thick walls, the outer half in the shape of medium to tight spirals, mostly toward the upper part of the receptacle; toward the lower part scattered, hyaline, thick-walled, branched hyphae occur; context hyphae 2,0—2,5 μ, up to 3,5 μ in diameter, simple septate and with clamp connections; hymenium formed of a tight palisade of basidia, basidia with basal clamps, mostly 12,5×5,5 μ, 4-sterigmate; spores hyaline ovate, apiculate, smooth, somewhat flattened on one side, 3—4× 2,5—3,5 μ.

Habitat: On "indigenous" wood.

Type and specimen examined: Union of South Africa: Town Bush, Pieter Martizburg, Natal, Coll. W. G. Raup (223), Oct. 1934. (PRE 28297).

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This specimen was determined by Miss E. M. Wakefield as *Solenia candida*. It can be distinguished from that species by its smaller, ovate spores and its surface hairs which are spiral in the outer half rather than dichophysoid. Its marginal cupules resemble superficially those of *S. candida* while those in the center of the colony appear like those of the "variety" *polyporoidea*. On examination the adjacent receptacles are not grown together, which would be the case if the cupules were truly adnate, and are not damaged when separated in mounting.

Solenia pallido-cinerescens P. Henn., Voeltskow Reise Ostafrika 3: 18. 1908.

Receptacles cylindric, brown with a white margin, sessile, separate, without a subiculum; surface smooth, brown; rim of receptacles covered with dichophyses 10×1 μ, finely branched; basidia 12×3 μ, 4-sterigmate; spores hyaline, apiculate, smooth, ovate, $7{,}2 \times 3{,}6$ μ; no clamp connections observed.

Habitat: On decorticated branches.

Type and specimen examined: Madagascar: East Madagascar, Fe'ne'rive. Coll. A. Voeltskow, June 1904. (S).

Solenia palmicola (P. Henn.) stat. nov.

Solenia fasciculata var. *palmicola* P. Henn., Verh. Bot. Ver. Brandenb. 40: 120. 1898.

Receptacles shallow cylindric, strongly clustered, 200—300 μ high. 100 μ in diameter; no subiculum seen; surface hairs dichophysoid, up to 10 or more μ long. 1 μ in diameter, branched below, finely branched toward tip; no clamp connections seen; context of parallel hyphae, 3,5 μ in diameter, no clamps seen; basidia 11×5 μ, 4-sterigmate; spores hyaline, smooth, apiculate, ovate, $3{,}6 \times 2{,}4$ μ.

Habitat: On surface of dead parts of palm flowers.

Type and specimen examined: Germany: Berlin Botanical Garden, Palm House, Coll. P. Hennings. Aug. 1891. (S).

Solenia pubera Romell, sp. nov. in herb.

Cupula cylindracea, 1—2 mm. $\times$ 250—500 μ, extus pilis dichophysoideis, $60—75 \times 5{,}8—6{,}7$ μ praedita; basidiis $24 \times 7{,}5$ μ, 4-sterigmatis; sporis hyalinis, globosis vel subglobosis, apiculatis, granulosis, laevibus, $5{,}8—8{,}7 \times 5{,}8—8{,}7$ μ.

Receptacles white, cylindrical, 1—2 mm. tall, 250—500 μ in diameter; no subiculum observed; covered with large dichophyses; dichophyses 5,8—8,7 μ in diameter at base, reaching 60—75 μ long, finely branched at tips; context hyphae more or less pseudoparenchymatous, 3,5—5 μ in diameter, no clamp connections seen; subhymenial hyphae 2,5—3 μ in diameter; basidia $24 \times 7{,}5$ μ, 4-sterigmate, forming

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a compact hymenium; spores hyaline, globose to subglobose, apiculate, strongly granular, appearing roughened under lower magnifications, smooth under oil, 5,8—8,7 × 5,8—8,7 μ.

Habitat: On rotten wood of *Betula* sp.

Type and specimen examined: Sweden: Sdl. par Tyresö: Bollmora. Collected by L. Romell, No. 12140, May 7, 1922. (S).

This species is similar to *S. candida* except that it is larger throughout. The name adapted for use here is that applied on packets by Romell who named it *S. alba* var. *pubera* in the herbarium. I have been unable to determine what was meant by *S. alba* since material so labeled is referred to *S. candida*.

Solenia rickiana sp. nov.

Cupula cylindracea, sparsa vel gregaria, 0,1—1,0 mm. longa, 150—200 μ lata, subiculo mox evanescenti, avellaneo praedita, extus hyphis hyalinis, tortuosis, septatis, 100—250 μ longis 3 μ latis obtecta; basidiis 12—14,5 × 5—6 μ, 4-sterigmaticis; sporis laevibus, apiculatis, hyalinis, ellipsoideis, 3—4 × 1,5—2 μ.

Receptacles cylindric, single to gregarious, with evanescent avellaneous subiculum, 0,1—1,0 mm. long, up to 150—500 μ in diameter, avellaneous; surface covered with hyaline, somewhat tortuous, septate, hyaline hyphae which long exceed the mouths of the receptacles, tips more or less twisted, gradually drawn to a point, 100—250 × 3 μ; basidia 12—14,5 × 5—6 μ, with 4-sterigmata 2—3 μ long; spores smooth, apiculate, hyaline, ellipsoid, 3—4 × 1,5—2 μ.

Habitat: On old bark.

Type: Brazil: Nova Petropolis, Rio Grande do Sul. Coll. Rev. J. Rick. (NFC).

Specimens examined: Brazil (2).

Solenia sphaerospora Ellis sp. nov.

Cupula substipitata vel sessilis, cyathiformis, 100—200 μ lata vel longa, extus pilis 70—100 longis 3—4 μ latis tomentosa basidiis 4-sporis, clavatis, 22—29 × 6—7 μ; sporis hyalinis, globosis, laevibus, apiculatis, 5—6 μ diam.

Receptacles sessile to substipitate, cupulate, 100—200 μ wide and high, clothed with yellow, densely and finely granule-incrusted hairs which are 70—110 × 3—4 μ, with round, hyaline tips; context only a cell in thickness, infrequently clamped; basidia 4-sterigmate, clamped at base, clavate with long slender stalk, 22—29 × 6—7 μ in main body of basidium, stalk-like base 3 μ in diameter; spores hyaline, globose, smooth, apiculate, with granular contents, 5—6 μ in diameter.

Habitat: On wood of *Maclura pomifera*.

Type and specimen examined: Louisiana: St. Martinsville, July 29, 1889, A. B. Langlois 2252 (NFC).

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The following note by Ellis on the type packet is of interest: "I am inclined to think what you take for asci are basidia and that this is a true *Solenia*. Call it *Solenia sphaerospora*".

Solenia subnivea sp. nov.

Solenia nivea A. Möller, in herb. (S).

Cupula alba, breviter cylindracea, 150—200 μ diam. vel alta, extus pilis dichophysoideis, 10 longis 1 μ crassis obtecta; basidiis 11,6×5,8 μ, 4-sterigmatis; sporis hyalinis, apiculatis, globosis, 5—6 μ diam.

Receptacles white, 150—200 μ in diameter, sessile, globose to short cylindric; covered with dichophyses most of which occur near mouth, narrow at the base, 10×1 μ, with fine pointed tips; context cells up to 4—6 μ in diameter, joined together in hypha-like chains; basidia 11,6×5,8 μ, 4-sterigmate; spores hyaline, apiculate, globose, 5—6 μ in diameter.

Habitat: On rotten wood.

Type and specimen examined: Brazil: Blumenau, collected by A. Möller, No. 290. (S).

Since two other species have been called *S. nivea*, Möller's use of this name in correspondence, and Sydow's in the herbarium, are here considered matters of convenience and the name is rewritten *S. subnivea*.

Solenia subvillosa sp. nov.

Solenia villosa Auctt. non. *S. villosa* Fr.

Cupula cylindracea, gregaria, 0,5—2 mm. longa, 200—300 μ lata, avellanea, breviter stipitata, subiculo evanescenti praedita, extus tomentosa; basidiis 20—22×6—7 μ, 4-sporis; sporis hyalinis, laevibus, apiculatis, cylindraceis, 6,5—7,5×2,5—3,5 μ.

Receptacles cylindric, gregarious, 0,5—2,0 mm. long, 200—300 μ in diameter, buff to tan in color when dry, short stipitate; subiculum may be present, evanescent, remaining on tubules as a basal tomentum; surface of tubules weakly covered with a fine tomentum of hyaline, thick-walled, unbranched to sparsely branched, non-staining hyphae 2—3 μ in diameter, arranged irregularly; basidia with basal clamps, 20—22×6—7 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 6,5—7,5×2,5—3,5 μ.

Habitat: On rotten (deciduous?) wood.

Type and specimen examined: Illinois: Canton, 1877. Coll. J. Wolf 4514. (ILL).

Solenia sulphurea Sacc. & Ellis, Mich. 2: 564. 1882.

Henningsomyces sulphureus (Ell. & Sacc.) O. Kuntze, Rev. Gen. 3(2): 483. 1898.

Receptacles cream to yellow, stipitate, 500 μ tall, 200—300 μ in diameter, subcylindric to cup-shaped, mouth covered with incurved

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hairs when dry; surface hairs yellow, erect, straight, stiff to more or less flexuous, densely, finely granular incrusted, 75—150×3—4 μ; basidia 20—30×5—8 μ, 4-sterigmate, clamped at base; spores hyaline, smooth, apiculate, globose to subglobose, 4—7×3,5—6 μ, or 4—7 μ in diameter.

Habitat: On *Magnolia glauca*, all collections seen apparently collected from the same tree.

Lectotype: New Jersey: Newfield, Jan. 25, 1882, Coll. J. B. Ellis. (NY; MO 61697, 61698 in NFC). This collection was chosen as the type because it is the best of all the collections seen.

Specimens examined: New Jersey (16).

Solenia zandbaiensis P. Henn. & E. Nym., Monsunia 1: 140. 1899.

Receptacles cylindric, vinaceous, 1 mm. tall, 0,5 mm. in diameter, clustered; surface hairs brown on lower part of receptacle, hyaline toward top of cup, appearing to have developed upwardly in concentric zones, the older becoming brown; hairs smooth, not incrusted, thin-walled, not septate, 1—2—3 dichotomously branched, 50—60×2,5—3,5 μ; context thin, composed of hyphae up to 3,5 μ in diameter; no clamp connections observed; spores hyaline, becoming slightly yellowish, apiculate, ovate, smooth, 5,6×2,8 μ, apparently produced 4 to a basidium but basidia not seen.

Habitat: On rotten wood.

Type and specimen examined: Java: Zandbai. Collected by E. Nyman, Nov. 27, 1897. (S).

Woldmaria gen. nov.

Cupula cylindracea, brunnea; sporis hyalinis, fusiformibus.

Receptacles brown, cylindric, gregarious; subiculum absent; surface covered with yellow hairs; spores hyaline, fusiform.

Type species: *Solenia crocea* Karst.

The elongated cylindrical receptacles place this genus near *Solenia*, but the surface hairs are more like thouse of *Maireina*. However, no other member of this subfamily has spores like those of the type species. It is named for a Swedish student of fungi who has given the best description of the type species available.

Woldmaria crocea (Karst.) comb. nov.

Solenia filicina Peck, Rep. N. Y. St. Mus. 28: 52. 1876 non *Cyphella filicina* Karst., 1871. — *Solenia crocea* Karst., Hedwigia 23: 88. 1884. — *Henningsomyces croceus* (Karst.) O. Kuntze, Rev. Gen. 3(2): 483. 1898. — *Henningsomyces filicina* (Pk.) O. Kuntze, l. c. — *Cyphella struthiopteridis* Pilát, Hedw. 66: 261. 1926.

Receptacles sessile, brown, with whitish tips, up to 1,5×0,5 mm.,

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cylindric, densely gregarious; surface smooth, of brown, elongate, closely packed cells, 3—4 μ wide, up to 50 μ long, arranged parallel to the long axis of the receptacle, terminating in yellow-brown hairs arranged around the receptacle up to its mouth, mouth narrowed; hairs 100—150×4—5 μ, hyaline toward the tip, hyaline portion up to 50 μ long, smooth, septate, unbranched, even; subhymenium composed of narrow, clamped, hyaline hyphae, very thin; tubules lined with hymenium composed of basidia; basidia 4-sterigmate, 18—24×5—8 μ; spores hyaline, smooth, apiculate, fusiform, homogeneous in phloxine, with central globule in cotton blue, appearing ellipsoid with two dead ends, 10—12,5×3—4,5 μ; basidia produced in compact fascicles subtended by clamps.

Habitat: At the base of dead fronds and on old stipes of *Matteuccia struthiopteris*, *Onoclea struthiopteris*, *Struthiopteris germanica*, and *Pteretis* sp.

Specimens examined: Czechoslovakia (5), Poland (5), Sweden (4), Manitoba (1), Nova Scotia (2), Ontario (4).

For additional notes see Woldmar (1955).

Calyptella Quél., Ench. Fung. 216. 1886.

Cyphella Fr., Syst. Myc. 2: 201. 1822., pr. p.

Cyphella subg. *Hydrocyphella* Pilát, Ann. Mycol. 23: 144. 1925.

Receptacles watery-fleshy to cartilaginous, fragile, more or less stipitate to sessile, outside smooth, glabrous, or with special surface hairs.

Lectotype: *Calyptella capula* (Holmsk. ex Fr.) Quél.

The choice of this type was made by Donk. For one who has seen a number of collections of the several species assigned to this genus this is a logical selection.

Key to the Species of *Calyptella*

1. Surface of receptacles smooth or with few hyphae 2
1. Surface of receptacles with specialized hairs 17
2. Receptacles vinaceous to purple 3
2. Receptacles white, cream, yellow, brown or some other color 4
3. Receptacles grey to vinaceous ..... *C. bakeriana*
3. Receptacles dark purple ..... *C. griseo-violacea*
4. Hyphae on surface of receptacles aggregated into fascicles ..... *C. stepposa*
4. Surface hyphae free when present 5
5. Stipe 1 cm or more long ..... *C. longipes*
5. Stipe shorter 6
6. Spores small, reaching 5μ in length 7
6. Spores larger, ovate to cylindric, longer than 5 μ 8
7. Spores globose, 3—4 μ in diameter ..... *C. nabambissoensis*
7. Spores ovate, 4—5×2,5—3 μ ..... *C. gibbosa*

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8. Receptacles with a black-celled stromatic base ..... *C. pulcherrima*
8. Receptacles without an apparent sclerotic base 9
9. Receptacles white to grey and brown, spores cylindric to subcylindric 10
9. Receptacles cream to yellow or brown, spores ovate 13
10. Receptacles white to grey 11
10. Receptacles tan to brown 12
11. Spores 12—13 × 4—5 μ ..... *C. hebe*
11. Spores 9 × 3 μ ..... *C. cernua*
12. Receptacles stipitate, funnel-shaped ..... *C. australis*
12. Receptacles substipitate, pendant, to sessile, cupulate *C. totara*
13. Receptacles sessile ..... *C. puiggari*
13. Receptacles stipitate 14
14. Species known from tropical areas 15
14. Species known from temperate areas 16
15. Receptacles short-stipitate ..... *C. grandis*
15. Receptacles with an elongate stipe ..... *C. crateriformis*
16. Receptacles pale yellow, spores 6—8 × 3—4 μ ..... *C. laeta*
16. Receptacles brown, spores 6 × 4 μ ..... *C. cyathoidea*
16. Receptacles yellow to light tan, spores 7—9 × 4—6 μ.. *C. campanula* var. *campanula*
17. Surface of receptacles with a mycelioid covering ..... *C. campanula* var. *myceliosa*
17. Surface of receptacles covered with other types of hyphae 18
18. Surface hairs include acanthophysoid cells 19
18. Surface hairs not including acanthophysoid cells 23
19. Stipe and lower portion of cupule with elongate cottony hairs ..... *C. flos-alba*
19. Stipe and lower portion of cupule not cottony 20
20. Acanthophysoid hypae forming rim around margin of receptacle and occurring on surface of receptacles 21
20. Acanthophysoid hyphae forming rim around margin of receptacle, other types of hairs on surface of cupule 22
21. Spores cylindric, 6—11 × 3—4,5 μ ..... *C. capula*
21. Spores subglobose, 9 × 7,5 μ ..... *C. duemmeri*
22. Surface covered with mycelioid hyphae with stiff septate hair-like branches ..... *C. urbanii*
22. Surface covered with stiff hairs ..... *C. cejpii*
23. Surface hairs incrusted 24
23. Surface hairs not incrusted 25
24. Surface hairs brownish ..... *C. aripoensis*
24. Surface hairs hyaline ..... *C. musae*
25. Spores ovate ..... *C. capensis*
25. Spores cylindric to suballantoid ..... *C. gayana*

Calyptella aripoensis sp. nov.

Cupula luteo-brunnea, cornucopiaeformis, 1—1,8 × 0,5—0,65 μ; stipite 0,4—0,5 × 0,25 mm., extus pilis pallide brunneis, incrustatis, 60—90 longis 3—4 μ crassis obtecta; basidiis 4-sterigmatis, 15—17 × 4—5 μ; sporis globosis, apiculatis, laevibus, hyalinis, 5—6 μ diam.

Receptacles deeply goblet- to funnel-shaped, 1—1,8 mm. tall, 0,5—0,65 mm. in diameter; stipe 0,4—0,5 mm. long, 0,25 mm. in diameter; surface covered with occasionally branched, pale brownish, granule incrusted hairs 60—90 × 3—4μ; granules large, easily broken

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off in mouting; outer layer of receptacular tissue formed of parallel hyphae apparently arising from the stipe, surface hairs and subhymenium arising in opposite directions perpendicular to this layer of tissue; hymenium composed of basidia only, basidia clamped at the base, 15—17×4—5 μ, 4-sterigmate; spores globose, apiculate, smooth, hyaline, 5—6 μ in diameter.

Habitat: On dead herbaceous stems.

Type and specimen examined: Trinidad, B. W. I.: River Crossing, Cerro del Aripo, Oct. 23, 1949, 461. (K).

Calyptella australis (Speg.) comb. nov.

Cyphella australis Speg., Anal. Soc. Cient. Argent. 11: 17. 1881. — *Chaetocypha australis* (Speg.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles pendant, 1—2 mm. in diameter, 1—3 mm. long, stipe 1—2 mm. long, tan to light brown in color, without surface hairs, produced singly, scattered rather than gregarious; hyphae of context 2—3 μ in diameter, with abundant clamps; basidia 28—32× 6—8 μ, 4-sterigmate; spores hyaline, smooth, apiculate, flattened on one side, ovate to tear-shaped, 8—10×4—6 μ.

Habitat: On dead herbaceous litter, including that of *Conium maculatum*.

Specimens examined from: Brazil (1), Argentina (1).

The type packet, kindly loaned by Juan C. Lindquist, from Buenos Aires, Argentina, had no materials in the packet.

Calyptella bakeriana (P. Henn.) comb. nov.

Cyphella bakeriana P. Henn., Hedwigia 48: 102. 1908.

Receptacles gray to vinaceous, surface paler than hymenium, deep campanulate to otideoid, short stipitate, 1—2 mm. long, 1—1,5 mm. in diameter, stipe less than 0,5 mm. long; surface covered with sandy crystalline material, with some free surface hyphae; hyphae branched at right angles, producing hair-like branches extending 20—30 μ, 2—3 μ in diameter; tissues mostly broken down; no clamps, basidia or spores seen.

Habitat: On dead twigs of *Sapota* sp.

Type and specimen examined: Brazil: Pará: Pará (Belem), Hort. bot. Goeldi. Collected in Jan. 1908 by C. F. Baker, No. 209. ex herb. Sydow (S).

Calyptella campanula (Nees ex Pers.) comb. nov. var. **campanula**

Peziza sulphurea Batsch., Cent. 1, f. 146. 1786. (sensu Fries) — *Peziza campanula* Nees, Syst. 71. 1816. — *Peziza campanula* Fr., Syst. Myc. 2: 123. 1822. — *Peziza campanula* Nees ex Pers., Myc. Eur. L; 284. 1822 non *P. campanula* Rab., H. Myc. 417 = *Helotium calyculus* var. *infundibulum* Fr. — *Cyphella sulphurea* Batsch. ex Fr., Hym. Eur. 665. 1874. — *Chaetocypha sulfurea*

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(Batsch. ex Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Calyptella sulphurea* (Batsch. ex Fr.) Big. & Guil., Fl. Champ. Fr. 479. 1909.

Receptacles single, thin-walled, delicate, yellow to light tan, 2—3 mm. long, 1 mm. in diameter, with slender stipe 0,5—1,5 mm. long, campanulate; surface hairs few, mycelioid, hyaline; margin straight to inrolled; hymenium yellow; hyphae of context hyaline, clamped; basidia 14,5—23×5—7 μ, 4-sterigmate; some paraphysoid hairs seen in Dexter, Michigan, collection 30—50×1—2 μ; spores hyaline, smooth, apiculate, ovate to tear-shaped, 7—9,5×4—6 μ.

Habitat: On herbaceous stems near the ground, especially of: *Beta vulgaris*, *Impatiens* sp., *Scrophularia* sp., *Solanum tuberosum*, and *Urtica dioica*.

Specimens examined from: Belgium (3), Czechoslovakia (3), England (1), Hungary (3), Italy (1), Russia (1), Michigan (2), New Hampshire (1), New York (2), Pennsylvania (1).

Specimens from Czechoslovakia have some acanthophyses. In all three specimens observed there were some around the rim of the receptacles, and in one they were also scattered over the surface.

According to both Persoon and Fries, the concept of the basic species in this complex is based on specimens and illustrations supplied by Nees. Apparently both writers saw this material.

Calyptella campanula var. **myceliosa,** var. nov.

Cupula ut in *S. campanula* var. *campanula*, extus strigosopilosa; basidiis 30—35×6—8 μ, 2—4-sterigmaticis; sporis hyalinis, laevibus, apiculatis, ovoideis, 10—12×4—5 μ, vel. 10,5—14,5×6—10 μ.

Receptacles as in *C. campanula* var. *campanula*; covered with a loosely arranged hyphal network composed of hyphae 3—4 μ in diameter, rarely clamped, short-celled, branched, more or less appressed; basidia 30—35×6—8 μ, 2—4-sterigmate; spores hyaline, smooth, apiculate, ovate to tearshaped, 10—12×4—5 μ when found in groups of 4 on the basidia; some spores present apparently from 2-sterigmate basidia measure 10,5—14,5×6—10 μ.

Habitat: On dead stems of *Impatiens* sp. near the ground.

Type and specimen examined: Ontario: south of Aurora, Oct. 1, 1935, Coll. by H. S. Jackson. (TRTC).

In this species, var. *campanula* and var. *myceliosa* may be distinguished by the presence in the latter of the mycelioid surface, the slightly longer spores, and the two sizes of spores present in the receptacles.

Calyptella capensis W. B. Cooke & J. H. W. Talbot, Mycologia 52. 160 (1961).

Receptacles subsessile to substipitate, pendant, gregarious, tending to cohere to each other above, white when fresh; stipe to 0,3 mm.

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in diameter, and 0,3 mm. long; cupules narrowly funnel-shaped, 1,6—2,3 mm. tall, 1 mm. broad; surface white to gray, formed of a cuticle from which arise surface hairs; cuticle formed of elongate cells 10—20×3—4 μ, light brown, thin-walled, with H-pieces; surface hairs (3)—4,6 μ in diameter, up to 100 μ long, hyaline, thick-walled, with little or no lumen, undulate to zig-zag, not spirally twisted, hymenium smooth, light yellow, formed of a tightly packed palisade of basidia; basidia 34—40×7,4—8,3 μ; clavate, 2—4-sterigmate; spores oblong, ellipsoid, flattened on one side; hyaline, smooth, minutely punctate under oil immersion objectus, apiculate, (7,9)—9,3—10,64 (4,2)—4,5—5,5 μ; no clamps observed.

Habitat: On litter of forest floor.

Type and specimen examined: Hogsback, Cape Province, Union of South Africa, Apr. 14, 1957. Rhodes University No. 10120. Collected by A. R. A. Noel. (Pretoria, WBC).

Calyptella capula (Holmsk. ex Pers.) Quel., Fl. Mycol. Fr. 25. 1878. *Peziza capula* Holmsk., Acta Nov. Havn. 1: 286. 1799. — *Peziza capula* Holmsk. ex Pers., Myc. Eur. 1: 281. 1822. — *Cyphella capula* (Holmsk. ex Pers.) Fr., Epicr. 568. 1838. — *Chaetocypha capula* (Holmsk. ex Pers.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles sessile (rarely) to stipitate (usually), pendant, single to gregarious, without subiculum; stipe 0,5—2,0 mm. long, cups urceolate, becoming discoid to funnel-shaped in age, 2—5 mm. in diameter, 1—3 mm. long; surface white to avellaneous, to grey and yellowish grey, smooth to more or less floccose with few hyaline, clamped, branched, rarely fasciculate hyphae; in some specimens the margin of the receptacle rimmed with hyaline, clamped, perpendicular hairs up to 25 μ long which are sometimes dichotomously branched and acanthophysoid; hymenium whitish to grey, formed by a tight palisade of basidia 21—25 μ thick; context very thin, of clamped hyphae 2—3 μ in diameter reaching 8 μ in diameter in outer tissues of some specimens; basidia 16—23×3,5—8 μ, 4-sterigmate; spores hyaline, ovate, smooth, apiculate, flattened on one side, 6—11× 3—4,5 μ.

Habitat: On dead wood and herbaceous and grass litter especially of: *Achillea millefolium*, *Adiantum* sp., *Antirrhinum* sp., *Aspidium spinulosum* var. *intermedium*, *Chaerophyllum tenulum*, *Cirsium* sp., *C. palustre*, *C. oleracum*, *Conium maculatum*, *Echium vulgare*, *Epilobium angustifolium*, *E. hirsutum*, *Fagus silvatica*, *Funiculum* sp., *Glyceria maxima*, *Juncus* sp., *Lappa sp.*, *Lupinus angustifolium*, *L. polyphyllus*, *Lythrum salicornia*, *Mentha* sp., *Oxydendrum arboreum*, *Petastites* sp., *Polygonum* sp., *Rosa* sp., *Scrophularia* sp., *Senecio jacobea*, *Solanum tuberosum*, *Stachys silvatica*, *Symphytum officinale*, *Triticum aestivum* (rusted), *Trifolium* sp., *Typha* sp., *T. latifolia*, *Urtica dioica*, *Vicia faba*, *Zea mays*, and apparently living stems of a species of *Eupatorium*.

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Specimens examined from: Austria (8), Czechoslovakia (28), England (25), Finland (1), France (4), Germany (19), Holland (2), Ireland (2), Italy (2), Latvia (3), Sweden (4), Tasmania (1), Argentina (2), Ecuador (1), Guadeloupe (1), Newfoundland (1), Ontario (1), Florida (1), Idaho (1), Louisiana (2), Maryland (1), Massachusetts (1), New Jersey (2), New York (2), South Carolina (4), Virginia (1), Washington (2).

Calyptella crateriiformis (Pat.) comb. nov.

Cyphella crateriiformis Pat., Bull. Soc. Myc. Fr. 31: 31. 1915.

Receptacles pale yellow, up to 8 mm. deep and wide, on stipes up to 1 cm. long. single to fasciculate at base, some receptacles nearly sessile; surface smooth; basidia $18-27\times5{,}5-7{,}4$ µ, 4-sterigmate; spores hyaline, ovate, flattened on one side, apiculate, $10{,}5\times7{,}5$ µ.

Habitat: On dead wood.

Type and specimen examined: New Caledonia, July 1909. Collected by A. Le Rat, No. 218 (Pat. in FH).

According to the original description the receptacles were white, 1—2 mm. high, long stipitate and glabrous; the hymenium was smooth to venose; the 2-sterigmate basidia were 28×6 µ; and the spores were hyaline, ovoid, smooth, and measured 6×4 µ. The above description was drawn from the type specimen about 40 years after it was collected and 35 years after Patouillard reported it. Except for the discrepancy in spore size, the two descriptions compare favorably.

Calyptella cejpii (Pilát) comb. nov.

Cyphella cejpii Pilát, Ann. Mycol. 22: 208. 1924.

Receptacles stipitate, pendant, single to gregarious, gray to tawny, without subiculum; stipe up to half the length of the receptacle; receptacles becoming discoid to funnel-shaped, 2—5 mm in diameter, 1—3 mm. high, surface covered with special hairs; surface hairs stiff, perpendicular to the surface, simple, $20-50\times4-6$ µ, hyaline to yellowish, with rounded to pointed tips; with rim of acanthophyses around mouth of cup $20-30\times5-8$ µ, well branched, branches terminating in abundant processes up to 3×1 µ; no clamps seen; context hyphae 5—8 µ in diameter, simple septate; subhymenial hyphae 3—4 µ in diameter; basidia clavate, $30-35\times5-6$ µ, 4-sterigmate; spores hyaline long ovate to cylindric, smooth, apiculate, $7-8\times2{,}5-3{,}5$ µ.

Habitat: On decaying plant stems including those of an umbellifer and of *Zea mays*.

Specimen examined: Czechoslovakia (3).

Type: Czechoslovakia: Bohemia: Mnichovice, June 1923. A. Pilát. (PR. CGL.).

The specimen in the Lloyd herbarium at NFC is nearer to *C. capula* in type of surface covering.

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Calyptella cernua (Schum.) comb. nov.

Peziza capula var. *cernua* Schum., ex Pers. Myc. Eur. 1: 281. 1822. — *Cyphella cernua* (Schum. ex Pers.) Mass., in herb.

Receptacles brownish, short stipitate to subsessile, 1—2 mm. in diameter and high; surface smooth; margin more or less wavy, possibly as a result of drying; context compact, formed of hyaline hyphae 2,5—3,5 μ in diameter; subhymenial hyphae 2—2,5 μ in diameter; hymenium formed only of basidia; basidia clamped at the base, 27×9 μ, apparently 4-sterigmate; spores smooth, hyaline, apiculate, cylindric, flattened on one side, 9×3,5 μ.

Habitat: On furrowed bark of *Sambucus nigra*.

Specimen examined: England (1). (M. C. Cooke Herb., K). Italy (2).

Calyptella cyathoidea Karst. sp. nov.

Cyphella cyathoidea Karst. in litt., in Herb. (PC). — *Cyphella laeta* Fr. ex Pat., in Herb. (PC).

Cupula brunnea, breviter stipitata, 2—3 mm. diam., cyathiformis, extus laevis; basidiis 29×4—5 μ, 4-sterigmaticis; sporis hyalinis, ovoideis, apiculatis, laevibus, 6×4 μ.

Receptacles brown, short stipitate, 2—3 mm. in diameter, cupulate, cupules up to 2 mm. high above the 1 mm. long stipe; surface smooth, composed of parallel hyphae 3—4 μ in diameter, cells elongate, hyaline to yellowish; no special surface hairs; context two-layered, the outer layer forming the context tissue, hyaline, 30—50 μ thick, incurved at the cupule margin, carrying the hymenium on its inner surface; hymenium brownish, 30—50 μ thick, venose in cross section, veins not readily observable without the aid of a microscope; basidia apparently arising directly from the context, 29×4—5 μ, 4-sterigmate; spores hyaline, ovate, apiculate, smooth, 6×4 μ.

Habitat: On dead plant debris.

Type and specimen examined: I. Coudrier. (PC).

Calyptella duemmeri sp. nov.

Cupula pallide lutea, 3 mm. diam., 1—2 mm. alta, sessilis vel subsessilis, extus pilis acanthophysoideis 18—25 μ longis 4—5 μ latis praedita; basidiis 4-sterigmaticis, 27×7 μ; sporis subglobosis vel ovoideis, laevibus, apiculatis, hyalinis, 9,0×7,5 μ.

Receptacles when dry cream yellow, 3 mm. in diameter, 1—2 mm. high, sessile or subsessile; surface covered with acanthophyses, 18—25 ×4—5 μ with many fine terminal branchlets; receptacles about 160 μ thick, composed of several layers including the hymenium approximately 25—30 μ thick, the subhymenium 9—12 μ, context 72 μ, and outer layer 36 μ; medullary hyphae of the context 3,5 μ in diameter, thick-walled, loosely interwoven, with more compactly arranged outer and inner layers, acanthophyses projecting from the outer layer;

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hymenium composed only of basidia; basidia 4-sterigmate, clamped at the base, 27×7 μ; spores subglobose or broad ovate, smooth, apiculate, hyaline, 9,0×7,5 μ.

Habitat: On twigs in the forest.

Type and specimen examined: Uganda Protectorate: Kipago. Collected by R. Dümmer, April 1915. (Kew, H 2825/58. 93. K).

This species differs from all others assigned to this genus by the presence of acanthophyses in the outer surface of the receptacles.

Calyptella flos-albus (Velenovsky) comb. nov.

Cyphella flos-albus Velenovsky, Ceske Houby 767. 1922.

Receptacles stipitate, to 1 cm. high, 6 mm. in diameter, campanulate, cream color; stipe 1—1,5 mm. long, covered with hyaline, separate to fasciculate hyphae extending 100—550 μ from the surface; receptacles covered with acanthophyses, more pronounced toward the rim, more or less dichotomously branched, 10—40 μ long, 1—3 μ in diameter, narrower toward the regularly to irregularly spaced tips; receptacles thin walled, context in three layers, surface layer 15 μ thick, context to 45 μ thick, hymenial layer 30 μ thick; context hyphae 5—8 μ in diameter, thin walled; subhymenial hyphae to 4 μ in diameter; no clamps seen; basidia forming a tightly packed hymenial palisade, 29×5—6 μ, clavate, 4-sterigmate; spores hyaline, apiculate, smooth, flattened on one side, cylindric to slightly kidney shaped or long ovate, 7—7,5×3—3,5 μ.

Habitat: On dead plant stems including those of *Solanum tuberosum*.

Specimens examined: Czechoslovakia (4).

Type: Czechoslovakia: Mnichovice, Sept. 1922, J. Velenovsky (P).

A specimen from Kurim, Moravia, at Prague has somewhat larger spores: 8—10,5×3,5—4 μ.

Calyptella gayana (Lév.) comb. nov.

Cyphella gayana Lév., Ann. Sci. Nat. Bot. III. 7: 153 1846. — *Chaetocypha gayana* (Lév.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles scattered, when dry funnel-shaped, short stipitate to sessile, pale cream color, to 3 mm. long, 1,5—2 mm. in diameter at the mouth, mouth white, grey to cream color increasing below; surface hairs very finely granule incrusted, straight, irregularly arranged on the surface, more or less interwoven, not parallel, 3—4 μ in diameter, up to 150 μ long, the hairs fringing the mouth tipped with tight spiral coils up to 50 μ long. 8—10 μ in diameter; hymenium composed only of basidia, 20×3—5 μ, 4-sterigmate, clamped at the base; spores hyaline, smooth, apiculate, cylindric, flattened on one side to weakly allantoid, 4—4,8×1,6—2,4 μ.

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Habitat: On dead wood.

Type: Chili: Herbier du Chili Austr. envoye par M. Gay 3me Envoi. (PC).

Specimens examined: Chile (5).

Of the 5 specimens examined, all were collected by Gay in Chili on his 3rd expedition. Four are at the Paris Museum (PC) and one is at Kew (K). The above description was drawn from notes made after examining each of these collections. In one of the specimens at Paris spores 9×3 μ were noted. From observations of the other collections it may be suggested that these spores belong to some other fungus collected at the same time.

Calyptella gibbosa (Lév.) Quél., Ench. Fung. 216. 1886

Chaetocypha gibbosa (Lév.) .O Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella gibbosa* Lév., Ann. Sci. Nat. Bot. III. 9: 126. 1848. — *Cyphella velenovskyi* Pilát, Ann. Mycol. 22: 206. 1924.

Receptacles whitish gray to greyish, clear, 2—5 mm. high, infundibuliform, stipitate, stipe up to half the total length; surface smooth, or with weakly developed dichophyses; hymenium formed of basidia $20—24 \times 5—6$ μ, 4-sterigmate; spores hyaline, ellipsoid to ovate, smooth, apiculate, flattened on one side, $4—4{,}5(—5—)6—7 \times 2{,}5—3{,}5$ μ.

Habitat: On old stems of *Solanum tuberosum.*

Specimens examined from: England (1), Germany (5), Sweden (1), Czechoslovakia (11).

Type specimen examined: *Cyphella velenovskyi* Pilát: Czechoslovakia: Budyně usd Ohr, Aug. 1918, Coll. A. Pilát.

Lundell states that the specimens from Sweden are very similar to the description and illustration of *C. cejpii* Pilát. However, examination of the type material of that species indicates that it is not easily separated from *C. capula.* Receptacles of the Swedish specimen had a smooth surface while those of one German specimen had a weak development of dichophysoid hairs.

Specimens of *Cyphella velenovskyi* Pilát at Prague (PR) have spores $6—7 \times 2{,}5—3$ μ. Other characters confirm the observation that this is a synonym of *C. gibbosa.* The type of the species reported above was chosen as the better of two specimens loaned by Dr. Pilát. The writer does not agree with Donk who placed *C. velenovskyi* in synonymy with *Cellypha goldbachii* (Weinm.) Donk.

Calyptella grandis (Pat). comb. nov.

Cyphella grandis Pat. in Lloyd, Myc. Writ. 2: 258, f. 97. 1906.

Receptacles when dry cream to yellowish in color, 5—8 mm. long, 3—5 mm. wide at the mouth, 1—2 mm. wide at the point of attachment, substipitate to stipitate, funnel-shaped, pendant, surface

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smooth, context up to 500 μ thick, of loosely arranged hyphae, not gelatinous, clamped; hymenium 18—25 μ thick, rather compact, developing from loosely interwoven, irregularly arranged, subhymenial tissues; basidia 15—18 × 5—6 μ, 4-sterigmate; spores not seen.

Habitat: On rotten wood.

Type and specimen examined: Samoa: Probatly collected in 1901, but dates 1904 and 1905 noted on one packet, C. G. Lloyd 05152. (CGL 35033 in NFC, PAT. in FH, PC).

Calyptella griseo-violacea (Pilát) comb. nov.

Cyphella griseo-violacea Pilát, Ann. Mycol. 22: 207. 1924.

Receptacles blackish to dark purplish, stipitate, narrow campanulate, 1 mm. in diameter, 2 mm. high; stipe half the length of the receptacle; surface of receptacles smooth; context hyphae parallel to axis of stipe and cupule, hyphae 3—4 μ in diameter; subhymenium thin, hyphae 2—2,5 μ in diameter; no clamps seen; basidia forming a compact hymenium, 23 × 6 μ, 4-sterigmate; spores hyaline, apiculate, smooth, cylindric, flat on one side, 10 × 3 μ.

Habitat: On dead stems of plants such as *Urtica dioica.*

Specimens examined: Czechoslovakia (2).

Type: Czechoslovakia: Mnichovice, May 1923. A. Pilát. (P).

This species differs from other species of *Calyptella* in its color which is dark purple to black.

Calyptella hebe (G. H. Cunningham), comb. nov.

Cyphella hebe G. H. Cunningham, R. Soc. N. Z. Trans. 81: 181. 1953.

Receptacles scattered, membranous, tough, cupulate, 1—2,5 mm. in diameter, attached by a narrow base; exterior bay-brown, tan, or ferruginous, concolorous, finely radiate-striate, often splitting on the posterior side, not tomentose though sometimes with a few scattered hairs; margin acute, slightly inturned, entire or with one or two deep incisions; hymenial surface concave, even, pallid cream; context white, save at the periphery, where a few hyphae are tinted, to 80 μ thick, base to 350 μ, of radiately arranged densely packed sclerotioid hyphae; generative hyphae to 5 μ in diameter, wall to 2 μ thick, branched, septate, hyaline; hymenial layer to 40 μ deep, paraphyses subclavate; basidia subclavate, 35—42 × 10—12 μ, 4-spored; spores elliptic-fusiform, a few suballantoid, bluntly acuminate at ends, 12—13 × 4—5 μ, smooth, hyaline.

Habitat: On *Hebe salicifolia.*

Type and specimen examined: New Zealand: Mt. Egmont, 4000 ft., Taranaki Distr. Coll. J. M. Dingley, Apr. 1946. (NZPD).

In the portion of the type examined, the surface was covered with fine, appressed, dichophysoid, hyaline hyphae, 2—3 μ in diameter;

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the context and subhymenial tissue possess clamp connections and some context hyphae are apparently gelatinized; the so-called paraphyses are apparently immature basidia. Description from Cunningham's paper.

Calyptella laeta (Fr.) comb. nov.

Cyphella laeta Fr., Epicr. 568. 1838. — *Cyphella pimii* Phil., Grevillea 13: 49. 1884. — *Cyphella capula* var. *flavescens* Pat., Tab. An. 56. 1883. — *Chaetocypha laeta* (Fr.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella laeta* var. *verrucipes* Pilát, Ann. Mycol. 23: 147. 1925. — *Cyphella capula* var. *flocculosa* Bourd. & Galz., Hym. Fr. 156. 1927.

Receptacles pale yellow, fragile, on basal portions of stems, cups 3—5 mm. long, funnel-shaped, 3—5 mm. in diameter at tip, on a stipe 3—10 mm. long; surface hyphae mycelial, cream-color, without regular arrangement; context of two kinds of hyphae: 5—6 μ in diameter, parallel, interlaced with a network of branched, clamped hyphae, 1—3 μ in diameter; basidia in a compact hymenium, 14,5—(22)—27×4—6 μ, 4-sterigmate, clamped at the base; spores smooth, apiculate, hyaline, ovate to tear-shaped, 8—(8)—9—(10)×3—(4)—5 μ.

Habitat: At the base of large dead herb stems such as those of: *Cirsium* sp., *Cynara cardunculus*, *Impatiens* sp., *I. parviflora*, *Lupinus angustifolius*, *Mentha longifolis*, *Petastites* sp., *Ranunculus* sp., *Scrophularia* sp., *S. allata*, *S. nodosa*, *Stellaria holostea*, *Symphytum officinale*, *Tumbagus farfarus*, *Urtica* sp., *U. dioica*.

Specimens examined from: Austria (4), Czechoslovakia (23), England (2), France (3), Germany (4), Latvia (1), Netherlands (1), Argentina (1), Ontario (1), New York (3).

Type specimen examined: *Cyphella capula* var. *flocculosa* Bourd. & Galz.:

A specimen from New York was labeled by Peck as *Cyphella flavida*. One of the specimens from France in the Bourdot Herbarium was labeled as *Cyphella subfloccosa* Bourd. Two of the varietal names were given to specimens at the base of whose stipes the surface hairs occur in more dense arrangement giving a hairy appearance to the area near the base of the stipes. Acanthophysoid hairs rim the margin of the receptacles in some of the collection seen from Europe.

Calyptella longipes (Cooke and Massee) comb. nov.

Cyphella longipes Cooke and Massee, Grevillea 21: 38. 1892.

Receptacles yellow to yellow-brown, 1—1,5 cm. long, pendant, smooth, 2—5 mm. in diameter and in depth, slender, funnel-shaped, horn-like; stipe up to 1 cm. long, or at least about half the whole length of the receptacle; no special surface hairs found; context

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hyphae 3—4 μ in diameter, with clamps; subhymenial hyphae 2—2,5 μ in diameter; basidia 23—27 × 5—7 μ, 4-sterigmate, with basal clamps; spores ovate to subglobose, apiculate, hyaline, smooth, 7—7,5 × 5,5—6 μ.

Habitat: On wood and bark.

Type and specimen examined: Australia: Queensland. Bailey 938. (NY, K).

Specimens have been examined from the herbaria of both Cooke and Massee. In the latter are large subglobose spores 13,5—16,5 × 12—15 μ, with punctate exospores. These may be spores of a contaminating mold since those basidium-like bodies were without sterigmata and were too small to have produced spores of this size.

Calyptella musae (Jungh.) comb. nov.

Cyphella musae Jungh., Batav. Genootsch. Verhanh 17: 28. 1837. — *Chaetocypha musae* (Jungh.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles campanulate, to 5 mm. long, opening widely to 5 mm. across, cream-colored, drying to dark brown, stipitate; surface with thin-walled surface hairs perpendicular to the surface, more numerous toward and on the stipe, 50—75 × 5—7 μ, with brownish incrustation, hyaline, straight to more or less contorted, single to branched, simple septate; surface and context hyphae strongly parallel to direction of growth of cupule and stipe, no clamps seen, 3—4 μ in diameter; subhymenial hyphae 2,5—3 μ in diameter; hymenium composed of tightly packed clavate basidia 20—23 × 5—6 μ, 4-sterigmate, clamped at the base; spores hyaline, smooth, apiculate, cylindric, flattened on one side, 7,5—8 × 3 μ.

Habitat: On *Musea enseta.*

Specimen examined: Germany: Berlin, in the fern house, Berlin Botanical Garden, Collected by P. Hennings, ex herb Sydow (Stockholm). 2 collections.

Calyptella nabambissoensis (P. Henn.) comb. nov.

Cyphella nabambissoensis P. Henn., Hedw. 1898: 284. 1898.

Receptacles up to 1 cm. in diameter, broad campanulate, stipe 1—2 mm. long; surface even, no special hairs on surface, context hyphae terminating in acanthophysoid hyphae; context 200—250 μ thick, outer layer 29—58 μ thick, hymenium 30 μ thick, both layers arising from the loosely interwoven context hyphae; context hyphae very thick walled, 4,5—6 μ in diameter; subhymenial hyphae thin walled, 2,5—3 μ in diameter; all hyphae with clamp connections; basidia clavate, clamped at the base, 4-sterigmate, 23—26 × 5—7 μ; spores smooth, apiculate, ovate, hyaline to very pale yellowish, 3 × 4,5 μ.

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Habitat: On wood.

Type: Collected at Nabambisso, Niam-Niam, Mlange, Central Africa by G. Schweinfurth May 6, 1870. "ex herb Sydow" (S).

Specimens examined from: West Africa (1), Central Africa (1).

A specimen in the C. G. Lloyd herbarium (NFC) from West Africa was identified as this species by Lloyd who complained that this came nearer than any of the other 16 species described from Africa. His specimen was funnelshaped, 5—6 mm. long, 4—5 mm. in diameter at the mouth and had a few spores 3—4 μ in diameter which were hyaline, smooth and apiculate.

Calyptella puiggari (Speg.) comb. nov.

Cyphella puiggari Speg., Bol. Acad. Nac. Cienc. Cordoba 11: 464. 1889.

Receptacles erumpent through sheaths from culms, sessile or subsessile, when cupulate up to 2×3 mm., when repand reaching 1 cm. in diameter when dry and more or less connected with the sheath; cupule thin, composed mostly of hymenial and subhymenial tissues, no surface hairs; no sterile organs; cystidioles present, of same size as basidia but with pointed tips; subhymenial tissue and content composed of more or less densely interwoven hyphae 1,5—2 μ in diameter, with clamps; basidia 25,2×7,2 μ, 4-sterigmate; spores few, 12—13×5,5—6,5 μ, hyaline, apiculate, smooth, ovate.

Habitat: On old grass stems.

Type and specimen examined: Brazil: Apiahy. 1888. Collected by G. Puiggari. (LPS).

Calyptella pulcherrima sp. nov.

Cupula pallide lutea, ad basin brunnea vel nigra. infundibuliformis, 0,5—2,0 mm. longa, non gregaria, 0,1—0,5 mm. lata, substipitata vel breviter stipitata; basidiis 4-sterigmatis, 15—18×5—6 μ; sporis late ellipsoideis, breviter apiculatis, hyalinis, laevibus, 7—8×5,5—6,5 μ.

Fruit bodies cream-color when dry, with a brown to blackish base, elongate funnel-shaped, 0,5—2 mm. long, not strictly gregarious, 0,1—0,5 mm. in diameter at the top, no subiculum hyphae observed, substipitate to shortstipitate; base with browned cells, outer part of the lower portion pseudoparenchymatous on the surface, the inner and upper part composed of parallel arranged hyphae perpendicular to the substratum, hyphae septate and branched; hymenium arising from the parallel hyphae; special surface hairs not found; no clamps observed; basidia apparently 4-sterigmate, 15—18×5—6 μ; spores broad-ellipsoid, flattened on one side, short-apiculate, hyaline, smooth, 7—8×5,5—6,5 μ.

Habitat: On outer and inner side of old palm sheaths.

Specimens examined: Canal Zone: Barro Colorado Island. Coll.

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by G. W. Martin and A. L. Welden. No. 7275 (TYPE), 29 June 1952; No. 7277, 28 June 1952 (IA). The latter specimen was slightly less mature, since the fruit bodies were smaller and the spores were slightly smaller than the average of the type specimen (6,5—7,5× 3,2—4 μ).

Dr. Martin stated that: "These things were beautiful and conspicuous and were extremely common on palm sheaths all over Barro Colorado Island. I do not think there was any day we went out on the trails where we did not see them".

When dry the specimens were very fragile and pressed very closely to the substratum. Many of them apparently had fallen away from the palm sheaths. They appeared like many other cyphellaceous fungi and in the dry specimen there was nothing to indicate the beauty described for them from fresh material.

Calyptella stepposa (Pilát) comb. nov.

Cyphella stepposa Pilát, Act. Mus. Nat. Pragae 9B(2): 84. 1953.

Receptacles single to gregarious, not confluent, cream colored, up to 1 mm. in diameter, subsessile; reverse side with more or less ropy masses of hyaline hyphae forming fine veins, with no special surface hairs; context hyphae up to 6 μ in diameter, hyaline, becoming yellowish to pale brown on outer surface; subhymenial hyphae 3—4 μ in diameter; no clamp connections found; hymenium composed of fascicle tightly packed basidia; basidia clavate, 4-sterigmate, 20—25× 6—8 μ, fasciculate, fascicles separating upon crush mounting of receptacle; no basal clamps or clamps on hyphal portion of fascicle (subhymenium); spores tear-shaped, hyaline, smooth, apiculate, flattened on one side, 7—8,5×3—4 μ.

Habitat: On stems of grasses and herbs.

Specimen examined: Czechoslovakia (3)

Type: Czechoslovakia: Nová ves prope Jimonice hand procul Pragam. Nov. 7, 1952. Z. Pouzar. (P. 174302).

The specimens collected by F. Kotlaba (P. 174304) in the St. Prokopii Valley near Reporyje near Prague show receptacles like those published with the type description. These are 1—3 mm. in diameter, are sessile and when open are wrapped around the stems on which they are produced.

This species is a good *Calyptella* but superficially resembles *Glabrotricha lactea.*

Calyptella totara (G. H. Cunningham) comb. nov.

Cyphella totara C. G. Cunningham, R. Soc. N. Z.. Trans. 81: 182. 1953.

Receptacles scattered, membranous, tough, 2—3 mm. long, 1—3 mm. broad, pendulous when attached by a narrow vertex, or

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conical-cupulate when seated upon a somewhat broad base; exterior surface fawn or tan, darker peripherally, finely radiate-striate, or wrinkled, naked; margin acute, inturned or plane, entire or slightly lacerate; hymenial surface even, concave, bay-brown; context white, brown in some old specimens, 150—250 μ thick, to 500 μ at the base, of radiately arranged, sclerotioid, compact hyphae; generative hyphae to 5 μ in diameter, wall 1 μ thick, hyaline, branched, septate, tortuous; hymenial layer to 70 μ deep, paraphyses subclavate; basidia clavate, 40—56×7—9 μ, 2—4-spored; spores obovate or elliptical, apiculate, 6—9,5×5—6 μ, smooth, hyaline.

Habitat: On *Podocarpus hallii*.

Specimen examined: Topotype: New Zealand: Mt. Tongariro, 2500 ft., Auckland District, Mar. 1952, Coll. G. H. Cunningham. (NZPD).

Distribution: Known only from New Zealand, represented by 10 specimens cited by Cunningham (1953).

The above description was taken from Cunningham's paper. An additional note based on the specimen sent by Dr. Cunningham is presented. No surface hairs, hyphae densely interwoven, more or less parallel to the outer surface, clamp connections present at the base of the basidia and in the densely interwoven subhymenial area, subhymenial hyphae thin-walled, to 3 μ in diameter, context hyphae thick-walled, to 5 μ in diameter, spores hyaline, smooth, apiculate, cylindric to tear-shaped, 12,6×5,4 μ. The "paraphyses" mentioned in Cunningham's description may be immature basidia or cystidioles which have not been observed to any extent by the writer.

Calyptella urbanii (P. Henn.) comb. nov.

Cyphella urbanii P. Henn., in Sacc. Syll. Fung. 9: 247. 1891.

Receptacles more or less campanulate, pendant, 1—3 mm. high and wide; surface covered with a mycelial layer from which project septate hairs up to 145×3—4 μ, thick walled, with a narrow, protoplasm filled, lumen; hairs around edge of receptacle 30—45×4—5 μ, acanthophysoid, hyaline, with irregular hyaline tips 5×1 μ; context of parallel hyphae, appearing pseudoparenchymatic in cross section, 4—6 μ in diameter; subhymenial hyphae 2,5—3,5 μ in diameter; no clamp connections seen; basidia clavate, in a tightly packed hymenium, 4-sterigmate, 20—23×5—6 μ; spores hyaline, smooth, apiculate, flattened on one side, ovate to tear-shaped, 7—8×3—4 μ.

Habitat: On *Canna* sp.

Type: Germany: Berlin, Botanical Garden, in the Palm house. Collected in April, 1889, by P. Hennings. ex herb. Sydow. (Stockholm).

Specimen examined: Germany (2).

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Glabrocyphella gen. nov.

Cupulae tenuiter membranaceae, sessiles vel stipitatae, cyathiformes vel repandae; superficie glabris ad tomentosis; sine pilis specialibus.

Cupules thin, membranous, stipitate to sessile, cupulate to repand; outer surface glabrous to tomentose, without special surface hairs.

Lectotype: *Cyphella palmarum* Berk. & Curt.

Key to Spacies of *Glabrocyphella*

1. Receptacles seated on a subiculum of hyaline, branched hyphae 1 μ in diameter ..... *G. ailanthi*
1. Receptacles without noticeable subiculum 2
2. Surface of receptacles formed of special cells 3
2. Surface of receptacles without special cells 4
3. Anastomosing fascicles of hyphae appressed to cup surface, with brown crystalline material in angles of branches ..... *G. brunneocrystallina*
3. Surface cuticle formed of ovate cells tipped by stellate cluster of hair-like fibers ..... *G. epileuca*
4. Receptacles turning flesh-color upon bruising, spores 4,5 × 3,5 μ ..... *G. rubescens*
4. Receptacles not turning flesh-color, spores longer than 4,5 μ 5
5. Receptacles brown to black 6
5. Receptacles white or light colored 7
6. Receptacles brownish, spores 6—8 × 2—3 μ ..... *G dermatoides*
6. Receptacles becoming black, spores 8,5—9 × 2,5—3 μ *G. bananae*
7. Receptacles cupulate 8
7. Receptacles cylindric to funnel-shaped 9
8. Spores 6—7 × 3—4 μ ..... *G. palmarum*
8. Spores 8 × 6 μ or 7—8 μ in diameter ..... *G. upplandensis*
9. Spores reaching 8 μ long *G. ohiensis*
9. Spores 8—11 μ long 10
10. Receptacles turning reddish when bruised, spores 9—11 × 4—5 μ ..... *G. ellisiana*
10. Receptacles turning color only when drying 11
11. Receptacles long cylindric, 0,75 × 0,25 mm ..... *G. filicola*
11. Receptacles deeply cup-shaped, 0,5—5 mm in diameter and high ..... *G. epileucina*

Glabrocyphella ailanthi sp. nov.

Cupulae albae, 300 μ latae vel longae circa lenticellas concentrice ordinatae cyathiformes subiculo ex hyphis hyalinis composito insidentes, extus laeves; contextu 29—35 μ, hymenio 10—15 μ crasso; basidiis 10—15 × 4—5 μ; sporis ovoideis vel subglobosis, hyalinis, laevibus, apiculatis, 5—6 × 4,5 μ.

Receptacles white, forming concentric rings around lenticels in which are sclerotioid masses of fungus tissue; cups cyphelloid, 300 μ wide and high, on a common subiculum composed of hyaline, branched hyphae 1 μ in diameter which extend half way up the cups; surface of

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cups smooth; context 29—35 μ thick; hymenium 10—15 μ thick; basidia 10—15×4—5 μ; spores broadaly ovoid to subglobose, hyaline, smooth, apiculate, 5—6×4,5 μ.

Type and specimen examined: New Jersey: New Brunswick, Aug. 25, 1920. Collected by L. O. Overholts and E. West. (LOO 7856 in PAC).

Habitat: On bark of *Ailanthus altissimus.*

Glabrocyphella bananae (M. C. Cooke) comb. nov.

Cyphella bananae M. C. Cooke, Grevillea 6: 132. 1877. — *Chaetocypha bananae* (M. C. Cooke), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles sessile, 1—2 mm. in diameter, up to 1 mm. high, broad cupulate, smooth outside, dark to nearly black in color; context thick; context hyphae to 3,5 μ in diameter, hyaline; all hyphae with clamp connections; subhymenial hyphae 2,0—3,0 μ in diameter; hymenium smooth, composed of a palisade of tightly packed basidia; basidia 20—25×6,5—7,5 μ, 4-sterigmate; spores hyaline, smooth, apiculate, curved cylindric, 8,5—9×2,5—3 μ.

Habitat: On dead banana leaf.

Type and specimen examined: Florida: Gainesville, H. W. Ravenel. 1885 (K).

Glabrocyphella brunneocrystallina sp. nov.

Cupula grisea, cyathiformis vel applanata, 1×1—2 mm., sessilis ad breviter stipitata, extus pilis fasciculatis, cohaerentibus, crystallis brunneis asperula; hymenio pallide brunneo; basidiis 28—30×11—12 μ, 4-sterigmaticis; sporis hyalinis, apiculatis, laevibus, ovatis, 10,5—11,5×5,5—6 μ.

Receptacles grey, pendant, opening to wide cupulate to applanate but free, to 1 mm. long, opening to 1—2 mm. in diameter, sessile to short stipitate; surface covered with a reticulum of fasciculate hyphae, fascicles branch and anastomose by single hyphae, appressed to the surface; brown granular material reaching 15—20 μ in diameter occurring in the angles of the fascicle branches; context hyphae hyaline, 4—5 μ in diameter, simple septate, without clamps; hymenium light brownish, formed of tightly packed clavate basidia 28—30× 11—12 μ, 4-sterigmate; sterigmata 5—6 μ long; spores hyaline, apiculate, smooth, tearshaped, 8,5—11,5×5,5—6 μ.

Habitat: On bark of living twigs of *Pyrus malus.*

Type and specimen examined: Sweden: Uppsala: Slottsträdgarden, Collected Jan. 4, 1885 by L. Romell, 12147. (Stockholm).

A note on the packet indicates that part of the specimen had been sent as No. 26 to M. C. Cooke who reported it as "Cyphella n. sp.". This species differs from other species in this genus by the presence of fasciculate hyphae on the surface of the receptacles which accumulate brown crystalline materials.

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Glabrocyphella dermatoides Ellis sp. nov.

Cupula cyathiformis, brunnea, 500 μ alta et lata, substipitata, nuda; basidiis 23,5—26,5 × 6—7 μ, 4-sterigmaticis; sporis laevibus, hyalinis, apiculatis, cylindraceis vel allantoideis, 6—8 × 2—3 μ.

Receptacles cup-shaped, brownish when dry, 500 μ high and wide, substipitate, single or 2—3 to a lenticel, or gregarious on naked wood, without special surface hairs; basidia 23,5—26,5 × 6—7 μ, 4-sterigmate; spores smooth, apiculate, hyaline, cylindric to allantoid, 6—8 × 2—3 μ in recent mounts although Ellis' notes indicate they measured 6—7 × 1,25 μ when he saw them.

Habitat: On *Corylus americana.*

Type and specimen examined: Ontario: London, May 18, 1893. Coll. J. Dearness 2175 (NY).

Glabrocyphella ellisiana sp. nov.

Cupulae sparsae, albae vel brunneae, membranaceae, 0,5—2 mm. diam., 1—2 mm. altae, subsessiles, cyathiformes; basidiis 15—17 × 4—6 μ, 4-sterigmaticis; sporis laevibus, apiculatis, hyalinis, ovatis, 9—11 × 4—5 μ.

Receptacles scattered, dull white to brownish, membranaceous, 0,5—2 mm. in diameter, 1—2 mm. high, subsessile, cup-shaped; no special surface hairs; basidia 15—17 × 4—6 μ, 4-sterigmate; spores smooth, apiculate, hyaline, ovate, flattened on one side, 9—11 × 4—5 μ; some specimens reported by Ellis as turning flesh color when bruised.

Habitat: On herbage of *Oenothera* sp., *Populus* sp., *Zea mays.*

Type: New Jersey: Newfield, July 21, 1877. Coll. J. B. Ellis (NY).

Specimens examined from: New Jersey (2).

Ellis noted that these specimens were either *Cyphella fissilis* Berk. or *C. lacera* Fr. Until these species are clarified by examination of type or authentic material the writer feels that he cannot make any assignment to them.

Glabrocyphella epileuca (Berk. & Curt.) comb. nov.

Cyphella epileuca Berk. & Curt., Proc. Amer. Acad. Arts. Sci. 4: 124. 1858. — *Chaetocypha epileuca* (Berk. & Curt.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles cupulate, sessile to subsessile, white, 0,5 mm. in diameter and high; outer surface a cuticle formed of large globose cells, thin walled, up to 10 μ in diameter spherical to pear-shaped or ovoid, capped with easily dislodged cell-like central points from which five processes radiate; processes 2,5—5 × 1 μ, brownish with red staining contents; with crystalline balls in the tissues up to 25 μ in diameter; basidia clavate, compact, 17,5—20 × 7,5—8,5 μ, 4-sterigmate; spores tear-shaped, hyaline, smooth, apiculate, 11—12 × 3—4 μ; few seen.

Habitat: On decaying wood.

Type and specimen examined: Bonin Islands: collected by C. Wright on the U. S. North Pacific Exploring Expedition 1853—56.

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Glabrocyphella epileucina (Sacc.) comb. nov.

Cyphella epileucina Sacc., Syll. Fung. 6: 681. 1888 for *C. epileuca* Berk. & Br., Jour. Lim. Soc. Lond. Bot. 14: 74. 1875. not *C. epileuca* Berk. & Curt., 1858. — *Cyphella culmicola* Fckl.. Symb. Myc. 1: 25. 1870. — *Chaetocypha epileucina* (Sacc.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Chaetocypha culmicola* (Fckl.), O. Kuntze, l. c. — *Cyphella porrigens* Burt., Mot. Bot. Gard. Ann. 1: 368. 1914.

Receptacles 0,5—5 mm. in diameter, 0,5—5 mm. long, deeply cup-shaped, attached at one point, sessile to subsessile, not stipitate, scattered to gregarious, cream-color to grey when dry, white when fresh; no special surface hairs but sometimes with a weak mycelial covering; context more or less compactly interwoven, hyphae 3—4 μ in diameter, clamps abundant, no gelatinous tissues present; basidia 4-sterigmate, 27—33,5×6—10 μ; blunt, fusiform, cystidium-like sterile cells of the same size as the basidia present in the hymenium; sterigmata up to 3 μ long; spores ovate, hyaline, smooth, apiculate, flattened on one side, cylindric to teardrop-shaped, abundant, (7—) 8—10×(3—)3,5—4,5 μ.

Habitat: On sticks and leaves of various plants including: *Triticum repens* and *Rubus* sp.

Specimens examined from: France (1), Ceylon (8), Brazil (3), Grenada, B. W. I. (1), Jamaica (1).

Type specimens examined: *Cyphella porrigens* Burt: Jamaica: Cinchona, 4500—5200 ft., Dec. 25 — Jan. 8, 1908—09, W. A. and E. L. Murrill 607 (NY, Burt in FH).

Cyphella epileuca Berk. & Br.: Ceylon. Among eight collections in the Berkeley herbarium at Kew (K) two were obtained in Nov. 1867, by H. K. T. at Hakgalla and Peradeniya. No. 98 may be considered the type.

Burt assigned a specimen collected at Coconut Grove, Florida, Nov. 1897, by R. Thaxter N-105 tri (MO 63049 in NFC) to this species. This specimen was collected on grass. It has receptacles soft, sessile, cream-color, 1—2 mm. in diameter, hyphae on the outher suface mycelioid, hyphae covered with yellow granules. 2—3 μ in diameter; basidia 12—14×6—7 μ, 4-sterigmate; no spores seen although Burt reported seeing one spore 7×3 μ. Until better material is available no further disposition can be made of this collection.

Before a number of specimens assignable to a species of the above description were studied it was planned to recognize four different species in this complex. The material from Grenada, B. W. I., Brazil, France and Ceylon seemed sufficiently distinct to permit this method of treatment. However, in comparing notes made on all specimens observed it was decided to refer them all to one species.

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Glabrocyphella filicicola (Berk. & Curt.) comb. nov.

Cyphella filicicola Berk. & Curt., Grev. 2: 5. 1873 not *C. filicola* Cke., Grev. 14: 129. 1886. — *Chaetocypha filicicola* (Berk. & Curt.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles 0,75 mm. in height, 0,25 mm. in diameter, subcylindric, subsessile, without special surface hairs, light brown on outer surface; context hyphae hyaline, clamps not seen; basidia clavate, 16—26×6—8 μ, 4-sterigmate; spores often adhering in groups of four, hyaline, smooth, apiculate, cylindric, flattened on one side, 8,5—10,5×3,5—4 μ.

Habitat: On *Pteris* (according to Curtis's note book).

Type and specimen examined: From Royal Botanic Gardens, Kew.

Through the kindness of the Director of the Royal Botanic Gardens, Kew, one of the two remaining receptacles of this fungus was mounted in aniline blue-lactic acid, and drawings were prepared by Mr. D. A. Reid. This material was loaned for further examination by the writer. The above description was drawn from Reid's notes confirmed by the writer's observatoins.

Glabrocyphella ohiensis sp. nov.

Cupula 1—1,5 mm. alta, sessilis, tubulosa, 200 μ diam., laevis, pallide lutescens, glabra; basidiis 14,5—18×3,5—5 μ, 4-sterigmaticis; sporiis ovoideis, laevibus, apiculatis, hyalinis, 6—8×3,5—4 μ.

Receptacles 1—1,5 mm. tall, sessile, tubular, 200 μ in diameter, smooth, yellowish, without special hairs on the surface or around the top; basidia 14,5—18×3,5—5 μ, 4-sterigmate; spores ovoid, smooth, apiculate, hyaline, 6—8×3,5—4 μ.

Habitat: On rotten wood.

Type and specimen examined: Ohio: Linwood, Hamilton, Co., Oct. 5, 1920. Coll. C. G. Lloyd. (CGL 57882 in NFC).

This species appears macroscopically similar to *S. candida*. It differs in the smooth surface and the non-globose spores.

Glabrocyphella palmarum (Berk. & Curt.) comb. nov.

Cyphella palmarum Berk. & Curt., Jour. Linn. Soc. Bot. 10: 337. 1668. — *Chaetocypha palmarum* (Berk. & Curt.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles cupulate, when dry cream to light yellow in color, 0,5—3 mm. in diameter, subsessile, 0,5 mm. high, without special surface hairs or hyphae; hymenium composed of basidia, 23—26× 6—7 μ, 4-sterigmate; spores ovate to tear-shaped, apiculate, smooth, hyaline, 6—7×3—4 μ.

Habitat: On dead grass culm and palm frond.

Type: Collected on Palm, Cuba. Wright. (K).

Specimens examined from: Cuba (1), Colombia (1).

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Glabrocyphella rubescens Rick, sp. nov.

Cupula cyathiformis, pallide lutea vel rubescens, sparsa vel gregaria, 500 μ alta, 200—300 μ diam.; basidiis 10—14×3,5—4,5 μ, 4-sterigmaticis; sporis hyalinis, ovoideis, laevibus, apiculatis, 4,5×3,5 μ.

Receptacles cup-shaped, cream-color, with reddish tints, separate to more or less gregarious, 500 μ high, 200—300 μ in diameter, no special surface hairs seen, surface of cups brownish in mounts; basidia 10—14×3,5—4,5 μ, 4-sterigmate; spores hyaline, ovate, smooth, apiculate, 4,5×3,5 μ.

Habitat: On old wood.

Type and specimen examined: Brazil: Rev. J. Rick (NFC).

Glabrocyphella upplandensis sp. nov.

Cupula cyathiformis, applanata, alba, 1—3 mm. diam., sessilis; extus laevis; basidiis 17,5—20×5—6 μ, 4-sterigmaticis; sporis hyalinis, apiculatis, laevibus, globosis vel ovoideis, 7—8 μ diam., vel 8×6 μ.

Receptacles cupulate, applanate, white, 1—3 mm. in diameter, subsessile; without special surface hyphae, smooth on outer surface; hyphae of surface and context loosely and irregularly arranged, formed of hyaline clamped hyphae 5—6 μ in diameter, inflated at the septa, quickly becoming smaller, 3—4 μ in diameter, then narrowing to 2,5—3 μ in diameter in the subhymenium; hymenium smooth to irregularly and weakly wrinkled formed of a tightly packed palisade of basidia 17,5—20×5—6 μ, clamped at the base, 4-sterigmate; sterigmata to 6 μ long; spores hyaline, apiculate, smooth, globose to tear-shaped, 7—8 μ in diameter or 8×6 μ.

Habitat: On rotting wood.

Type and specimen examined: Sweden: Uppland. Bondkyrka: Ultuna, Kungsparken. Collected Oct. 24, 1891 by H. von Post. (Stockholm).

This species resembles *G. palmarum* but the spores are globose to subglobose instead of long ovate.

Cellypha Donk, Persoonia 1: 84. 1959.

Cyphella subg. *Glabrotricha* Pilát, Ann. Mycol. 23: 148. 1925.

Fruit-body more or less cup-shaped, erect to pendulous, small (0,1—3 mm.), sessile with rounded cup to spuriously short-stalked, white outside and rather conspicuously tomentose; margin sometimes becoming inrolled; outside clothed with hairs with clamp-connections at the base in some species, undivided, narrow, cylindrical, capitate in come species, thin- to somewhat firm-walled; hymenium rather waxy, smooth to wrinkled and often even with folds radiating towards the margin; context monomitic, of thin-walled hyphae with clamp connections in some species; basidia clavate, with 2—4 apical sterig-

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mata; spores globose, ellipsoid, club- to wedge-shaped or cylindric, hyaline, smooth, non-amyloid.

Type species (only species in original publication): *Cyphella goldbachii* Weinm.

The above description is modified from Donk's original description. In it consideration is given to the fact that 15 species are now assigned to this genus instead of the one species for which the genus was first recognized. Variations within the genus occur in such characters as size and shape of receptacles, size and shape of surface hairs which may be inflated at the tip to greater or less extent in at least three species, size and shape of basidiospores and accompanying variations in size of basidia, presence or absence of clamp connections in context tissues and at the bases of the basidia.

Key to Species of *Cellypha*

1. Surface covered with smooth, mycelioid hyphae ..... *C. griseopallida*
1. Surface hairs not mycelioid 2
2. Surface hairs straight, unbranched, dendroid or geniculate 3
2. Surface hairsdichophysoid 11
2. Surface hairs irregular ..... *C. berkeleyi*
3. Surface hairs straight 4
3. Surface hairs dendroid or geniculate, even 9
4. Surface hairs short, with inflated tips . 5
4. Surface hairs of varying lengths, even 7
5. Spores small, 5—6,5 × 2,5—3 μ ..... *C. lactea*
5. Spores large, 12—14,5 × 3—5 μ 6
6. Surface hairs geniculate, 30—35 × 2 μ ..... *C. caricina*
6. Surface hairs straight, 20—25 × 1,5—3 μ ..... *C. goldbachii*
7. Surface hairs narrow, 50—80 × 1—2 μ ..... *C. algieriensis*
7. Surface hairs broader, 2,5—7 μ broad 8
8. Surface hairs 25—75 × 2,5—4,0 μ ..... *C. rhoina*
8. Surface hairs clavate, 45—50 × 5—7 μ ..... *C. clavata*
9. Spores large, 12,5—14,5 × 5,5—9,0 μ ..... *C. stictoidea*
9. Spores smaller 10
10. Spores 8,5—9,5 × 2,5—4 μ ..... *C. subgelatinosa*
10. Spores 7 × 3,5 μ ..... *C. musaecola*
11. Receptacles closely packed, sometimes marginally fused ..... *C. reticulata*
11. Receptacles gregarious to scattered, not fused 12
12. Dichophyses on the whole cup surface 13
12. Dichophyses only at the cup margin ..... *C. cycadis*
13. Spores cylindrical, 12 × 4 μ ..... *C. panamensis*
13. Spores ovate, 12 × 8 μ ..... *C. arenosa*

Cellypha algieriensis sp. nov.

Cupula alba, minuta, 100—300 μ diam. et alta, discoidea, extus pilis laevibus, continuis, 50—80 μ longis 1—2 μ latis obtecta, contextu ex hyphis hyalinis, 3—3,5 μ crassis composito; basidiis clavatis, 4-sterigmaticis, 19—23 × 6—8 μ; sporis hyalinis vel pallide luteis, laevibus, apiculatis, globosis, 5—5,6 μ diam.

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Receptacles white, small, 100—300 μ in diameter and high, discoid with inrolled margin; covered with special hairs; surface hairs smooth, mostly simple, sometimes apparently branched, 50—80 × 1—2 μ; context hyphae hyaline, 3—3,5 μ in diameter; subhymenial hyphae 2,5—3 μ in diameter; hymenium composed only of basidia; basidia clavate, 4-sterigmate, 20—23 × 6—8 μ; spores hyaline to pale yellowish, smooth, apiculate, globose, 5,5—6 μ in diameter.

Habitat: On debris of palm (Phoenix dactylifera ?).

Type: Algiers. Collected by Miss J. C. Eyre, Jan. 1922 (K).

Cellypha arenosa sp. nov.

Cupula pallide lutea, quasi arenosa, 250—500 μ diam. et alta, extus pilis acanthophysoideis, 40—50 longis 1,5—2,0 μ crassis obtecta; hyphis contextu 1,5—2,0 μ crasso; basidiis 22,5 × 6,5 μ, 4-sterigmaticis; sporis ovoideis, laevibus, hyalinis, apiculatis, 12 × 8 μ.

Receptacles cream-colored, appearing smooth, glistening, like small grains of sand, 250—500 μ high and in diameter; surface hairs acanthophysoid dichophyses, branches complex, antler-like, short, to 40—50 × 1,5—2,0 μ, branches reaching 0,8—1,0 μ in diameter, 4 μ long, branching area reaching 8—10 μ long by 5—8 μ wide, smooth, not granular, not septate, thin-walled, with or without red staining contents in phloxine KOH mounts; hyphae of context with clamps, 1,5—2,0 μ in diameter; basidia 22,5 × 6,5 μ, clamped at base, 4-sterigmate; spores smooth, ovate, hyaline, apiculate, 12 × 8 μ.

Habitat: On decaying wood.

Type: Argentina: Cordoba. Coll. C. Spegazzini (LPS 25856).

Specimens examined: Argentina (2). A specimen collected by Spegazzini in 1907 at La Plata (LPS 25845) has also been studied.

These specimens were originally identified by Spegazzini as *Cyphella farinacea* Kalchbr. & Cke. Examination of the type of this species, from Pretoria, Union of South Africa (PRE), gives convincing evidence that these species are entirely different, and since they compare with no other species seen by the writer, warrant recognition as a new species. This name was chosen because of the sandy appearance of the dry state of the collection.

Cellypha berkeleyi Massee, sp. nov.

Cyphella berkeleyi Massee, in herb. (K).

Cupula alba, ad 1 mm. diam., sessilis, ex hyphis hyalinis, 3—4 μ crassis contexta; basidiis 20—25 × 5—7 μ, 4-sterigmatis; sporis hyalinis, laevibus, ovoideis, apiculatis, 5—5,5 × 3,5—4 μ.

Receptacles up to 1 mm. in diameter and high, white, sessile to subsessile; context loosely arranged, formed of hyaline hyphae 3—4 μ in diameter; subhymenium hyphae 2,5—3 μ in diameter; no clamps

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seen; hymenium composed of basidia; basidia 20—25×5—7 μ, 4-sterigmate; spores hyaline, smooth, apiculate, 5—5,5×3,5—4 μ.

Habitat: On dead holly leaves.

Type and specimen examined: England: Queen's Cottage. Collected by G. Nicholson, Oct. 28, 1907. (K).

Cellypha clavata sp. nov.

Cupula pallide lutea, ad 1 mm. diam., sessilis vel subsessilis; in superficie e pilis clavatis, hyalinis, laevibus, parallele ordinatis, 45—50 longis 5—7 μ latis composita; basidiis clavatis, 4-sterigmatis; 18—20× 6 μ; sporis hyalinis, laevibus, apiculatis, ovoideis, 8—8,5×3—3,5 μ.

Receptacles cream color, up to 1 mm. in diameter, sessile to subsessile, surface covered with special hairs; surface hairs clavate, hyaline, smooth, formed in a palisade on the surface of receptacle, 45—50×5—7 μ; context hyphae hyaline, simple septate, 3—3,5 μ in diameter; hymenium formed only of basidia; basidia clavate, 4-sterigmate, 18—20×6 μ; spores hyaline, smooth, apiculate, ovate, 8—8,5×3—3,5 μ.

Habitat: On fallen twig.

Type and specimen examined: England: Bucks, Burnham Beeches. Collected by D. A. Reid, Oct. 14, 1956. (K).

Cellypha cycadis sp. nov.

Cupulae cyathiformes, nec confluentes, sparsae vel gregariae; dendrophysibus margine involutis, hyalinis, 10—20 longis 0,5—1,0 μ latis; basidiis 14,5—18×4—5 μ; sporis ellipsoideis, laevibus, apiculatis, hyalinis, 7—7,5×3,5—4 μ.

Receptacles cupulate, when dry cream-color, touching, not confluent, with an inrolled margin, gregarious to scattered; surface of cups without differentiated hyphae; margin of cup with granule-incrusted, hyaline, dendrophyses, 10—20×0,5—1 μ; hyphae with clamps, context very thin; hymenium composed of basidia 14,5—18× 4—5 μ, and sterile cells which may be young basidia or paraphyses, fusiform, hyaline, 14,5—18×4—5 μ; spores ellipsoid to tear-shaped, flattened on one side, smooth, apiculate, hyaline, 7—7,5×3,5—4 μ.

Habitat: On petiole of *Cycas* sp.

Type and specimen examined: Guam: Tumon Bay, Nov. 27, 1948. Collected by M. Rose 4199 (NFC).

Cellypha goldbachii (Weinm.) Donk, Persoonia 1: 85. 1959.

Cyphella goldbachii Weinm., Hym. East. Ross. 522. 1836. — *Cyphella caricina* Pk., Rep. N. Y. St. Bot. 33: 22. 1880. — *Calyptella goldbachii* (Weinm.) Quél., Ench. Fung. 216. 1886. — *Chaetocypha variabilis* Corda in Sturm t. 63, sensu Sacc., Syll. Fung. 6: 679. 1888.

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Receptacles substipitate to short stipitate, cream color to pale yellow, 0,5—2—5 mm. in diamter, up to 1 mm. high, with a weakly developed subiculum or on pale colored areas on twig bark; surface hairs smooth, 20—25 × 1,5—3 μ, with a knob at the tip of each hair 5—6 μ in diameter; hymenium formed only of basidia; basidia 30—36 × 8 μ, 4-sterigmate; no clamps seen; spores narrow lanceolate-cylindric, (10—)12—14,5(—15) × 3—5 μ, hyaline, smooth, apiculate.

Habitat: On dead twigs, leaves, and on culms and leaf sheaths of various plants including: *Brachypodium pinnatum*, *Carex* sp., *C. riparia*, *Dactylis glomerata*, *Glyceria* sp., *Juncus* sp., *Impatiens* sp., *Picea* sp., and *Rubus* sp.

Type specimen examined: *Cyphella caricina* Pk.: New York: Oneida Co., Verona. Coll. C. H. Peck. (NYS).

Specimens examined from: Bulgaria (1), Czechoslovakia (2), England (6), France (4), Germany (3), Luxembourg (1), Ontario (3), New York (1), Pennsylvania (1).

This species is separable from *C. lactea* (Bres.) W. B. Cooke on the basis of the larger size of most structures, especially the spores.

In specimens from France (PC) the knobs at the tips of the surface hairs measured up to 20 μ. Specimens examined in United States herbaria from Europe had spores which had a size range of 11—17 × 2,5—4,5 μ.

According to Saccardo, Syll. Fung. 6: 679. 1888, *Chaetocypha variabilis* Corda in Sturm, t. 63, is the same as this species.

Material has not been seen of *Cyphella cuticulosa* (Dicks. ex Purt. in Fr.) Berk. in J. G. Smith, *C. ochroleuca* Berk. & Rav., and *C. dumetorum* Bomm. & Rouss. which Donk (1959) places in synonymy with this species.

Cellypha griseopallida (Weinm.) comb. nov.

Cyphella griseopallida Weinm., Hym. Gast. Ross. 522. 1836. — *Chaetocypha griseopallida* (Weinm.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella lloydeana* Pilát, Ann. Mycol. 23: 150. 1925.

Receptacles sessile, 1 mm. in diameter, 1 mm. high, membranaceous, with no special surface hairs but surface covered with hyaline, more or less interwoven hyaphe 3—5 μ in diameter, smooth, septate, not clamped; clamps present in subhymenial tissue, context hypochnoid, loose, not compact, hymenium cream, smooth; basidia 13,5—16,5—(20) × 5—7 μ in one collection, 25—30 × 6—8 μ reported in second portion of same collection, 4-sterigmate; spores hyaline, smooth, apiculate, ellipsoid to cylindric and suballantoid, (5,5)—7—8,4 × (2,5)—3,5—4,2 μ.

Habitat: On dead leaves and twigs especially of: *Abies* sp., *Baccharis oblongifolia*, *Cupressus sempervirens*, *Fagus* sp., *Juniperus sabina*, *Lonicera* sp., *L. xylosteum*, *Onoclea struthiopteris*, *Pinus* sp.,

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Populus canadensis, *Pyrus malus*, *Quercus* sp., *Salix* sp., *S. alba* *Syringa vulgaris* and *Typha latifolia*.

Type specimen examined: *Cyphella lloydeana* Pilát: Czechoslovakia: Sokěslav-Blata, Bohemia. Collected by F. Kotlaba, Aug. 14, 1952. (PR 174251).

Specimens examined from: Austria (1), Czechoslovakia (4), France (3), Germany (5), Hungary (1), Italy (2), Luxembourg (1), Sweden (1), Ecuador (1), Manitoba (1), Iowa (1), New Hampshire (1).

The reverse of the cupules of the type specimen of *C. lloydeana* is covered with appressed ropes of hyaline hyphae 3—4 μ in diameter which are simple septate. If the spores were brown this species would be synonymous with *Pellidiscus pallidus*.

Cellypha lactea (Bres.) comb. nov.

Cyphella lactea Bres., Hedwigia 1885: 115. 1885. — *Calyptella lactea* (Bres.) Quél., Ench. Fung. 216. 1886. — *?Cyphella malbranchea* Pat., Tab. An. Fung. 5: 464. 1886. — *Chaetocypha lactea* (Bres.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Chaetocypha malbranchea* (Pat.) O. Kuntze, l. c.

Receptacles 500 μ in diameter, sessile, white, with cream-colored hymenium, surface smooth, context loose, hymenium compact; outer portion of context terminates in some special hyphae 8—20 × 4—5 μ with globose tips 4—5 × 4—6 μ which may break off and appear as conidia; basidia 4-sterigmate; spores ovate, hyaline, apiculate, smooth, flattened on one side, 5,0—6,5 × 2,5—3,0 μ.

Habitat: On old litter including plant parts of: *Brachypodium silvaticum*, *Carex hudsonii*, *Cirsium arvense*, *Glyceria altissima*, *G. coerulea*, *Juncus* sp., *J. effusus*, *J. maritimus*, *Juniperus communis*, *Lupinus* sp., *Melampyrum* sp., *Mentha* sp., *Phalaris arundinacea*, *Phragmites* sp., *Poa pratensis*, *Rubus* sp., *Sesleria coerulea* and *Typha latifolia*.

Specimens examined from: Austria (1), Czechoslovakia (29), France (4), Germany (6), Sweden (10), Ecuador (1), Tunis (1).

Material collected in Ecuador and named by Patouillard corresponds in all respects with material from Europe. It is preferred to retain the name used for the European material for this specimen until a wider series of specimens of this species or species complex is available for study.

Quélet's method of listing *C. lactea* could be taken by some (cf. Donk, 1959) as reference to varietal status under *C. goldbachii*.

Cellypha musaecola (Berk. & Curt.) comb. nov.

Cyphella musae Berk. & Curt., in herb. non *C. musae* Jungh., 1837. — *Cyphella musaecola* Berk. & Curt., Jour. Lim. Soc. 10: 337. 1868. — *Chaetocypha musaecola* (Berk. & Curt.), O.

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Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella fumosa* Cke., Grevilea 20: 9. 1893.

Receptacles 1—2 mm. in diameter, cupulate, substipitate, becoming blackish; hyphae with clamp connections, 2—3 μ in diameter; surface of cupules, and cup margin, covered with acanthophyses, acanthophyses 20—50 μ long, 9 μ in breadth of branching; hymenium formed of closely packed basidia 13—15×5—5,5 μ, clavate, 4-sterigmate; spores hyaline, smooth, ovate, apiculate, 7,2×3,6 μ.

Habitat: On leaf sheaths of "plantain" *Musa* sp.; and on wet rotting leaves of *Gladiolus* sp.

Types and specimens examined:

Cyphella musae Berk. & Curt.: Cuba: Collected by Wright (Curtis Collection, Berkeley Herbarium, K, PC).

Cyphella fumosa M. C. Cooke: South Carolina: Aiken. Collected by H. W. Ravenel 3071 (K).

It is possible that *C. subgelatinosa*, *C. musaecola*. and *G. bananae* are more closely related than indicated here. All were collected in or near the Caribbean area, and three of the four collections examined occurred on dead monocotyledonous leaf debris. Color of the receptacles, presence of clamp connections, and the peculiar surface hairs in three of the four collections examined indicate the possibility of relationship. Should a larger series of specimens become available for study, it is possible that these three species could become combined under the name used for this species.

Cellypha panamensis sp. nov.

Cupula alba vel pallide lutea, cyathiformis, sessilis vel subsessilis, extus dichophysibus obtecta; basidiis 21×7 μ, 4-sterigmaticis; sporis 12×4 μ, hyalinis, laevibus, apiculatis, cylindraceis.

Receptacles white to cream-color, cupulate, sessile to subsessile, with few dichophysoid hairs on the surface; context rather thick, of parallel hyphae more or less interwoven; clamps occur at septa and on base of basidia; basidia 21×7 μ, in dense palisade, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 12×4 μ.

Habitat: On sheaths of dead palm leaves.

Type and specimen examined: Canal Zone: Fort Sherman, 1945. Coll. G. W. Martin 6375 (IA).

The above description was drawn from a culture sent by Dr. Martin. The fungus eventually fruited on a piece of cornstalk imbedded in the wateragar medium after much of the agar had dried up. The receptacles in this condition were tubular although those of the original collection and of some cultures made from it were cupulate.

Cellypha reticulata (Berk. & Br.) comb. nov.

Cyphella reticulata Berk. & Br., Jour. Lim. Soc. Lond. Bot. 14: 74.

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1875. — *Chaetocypha reticulata* (Berk. & Br.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles white, gregarious, 100—200 μ in diameter and high, marginally fused or closely packed to give an irregular reticulum; context of 4—5 layers of hyaline hyphae 2,5 μ in diameter, clamped; on outer surface giving rise to palisade 10 μ thick of nonstaining dichophysoid hairs up to 10 μ long, branches 2,5 μ in diameter at base, 1,0 μ diameter at tip; basidia clamped at base, 11—13 × 4—5 μ, 4-sterigmate; spores hyaline, smooth, apiculate, subglobose to globose, 5,6 × 6,4 μ or 5,6—6,4 μ in diameter.

Habitat: On rotten wood.

Type: Ceylon: Peradeniya 1858 No. 258 HKT (K).

Specimens examined: Ceylon (5).

Cellypha rhoina (W. B. Cooke) comb. nov.

Solenia rhoina W. B. Cooke in Talbot, Bothalia 6: 481. 1956.

Receptacles densely crowded in definite areas, with a thin layer of arachnoid subiculum hyphae on substratum where cups do not occur; receptacles up to 0.5 mm. in diameter, sessile, broad cupulate, cream-color when dry; margin entire, silky, appearing like a minute *Stereum*; context very thin, the several layers of hyphae giving rise on the one hand to surface hairs, on the other to basidia; surface hairs hyaline, solid, parallel, appressed, progressively shorter toward the margin, less appressed near the base, 25—75 × 2,5—4,0 μ; hymenium of tightly packed basidia each with a basal clamp, 4-sterigmate; 14,5—18 × 5—7 μ; spores smooth, hyaline, ovate, apiculate, flattened on one side, 6—7,5 × 4,5—5,5 μ.

Habitat: On *Rhus lancea* (Karreeboom).

Type and specimen examined: Union of South Africa: Kennops River, Pretoria District. Collected by P. H. B. Talbot, Aug. 15, 1948. (PRE 39049).

This species is distinct from other species in this genus. The subiculum is *Solenia*-like rather than *Porotheleum*-like, but the colonies are as discrete as in some species in the latter genus.

Cellypha stictoidea (Speg.) comb. nov.

Cyphella stictoidea Speg., Anal. Soc. Cant. Argent. 16: 288. 1883. — *Chaetocypha stictoidea* (Speg.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles pale yellow, apparently fuzzy, erumpent on the surface or sessile on the surface of sheath of leaf, up to 2 mm. in diameter and 1 mm. high; surface of some cupules clothed with branched surface hairs 10—20 × 3—5 μ, some branch tips granule incrusted; hyphae of subhymenium and context densely interwoven, appearing subgelatinous, with clamps, 1,5—3,0 μ in diameter; basidia 45,0 × 12,6 μ, 4-sterigmate; spores rarely seen, ovate, smooth, apicu-

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late, hyaline, 12,5—14,5×5,5—9,0 μ (10—11×6—7 μ in portions of the type collection).

Habitat: On *Bambusa spinosa*.

Type: Paraguay: Caa-gnazu, Jan. 17, 1882. Coll. B. Balansa No. 3506 (also as 3106). (LPS 25863, K. S, FH, NY, NFC).

Specimens examined from: Brazil (1), Paraguay (2).

Portions of the type collection seen from several herbaria appear similar to material seen from the Spegazzini Herbarium except that in some the basidia are smaller than those in that portion of the type collection on which the above description is based. A description of these specimens follows: receptacles smooth, subfleshy, substipitate, 0,5—1,0 mm. in diameter, scattered; flesh 300—400 μ thick, hyphae with gelatinous walls, 2—3 μ in diameter, with clamps; basidia 20—23×4—5 μ, 4-sterigmate, densely compacted; some sterile, fusiform hymenial elements 20—23×5—6 μ, with pointed tips, are cystidioles or immature basidia; spores 10—11×6—7 μ.

Cellypha subgelatinosa (Berk. & Curt.) comb. nov.

Cyphella subgelatinosa Berk. & Curt., Grevillea 2: 5. 1873. — *Chaetocypha subgelatinosa* (Berk. & Rav.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles single to gregarious, in groups of two or three. dark olive green or blackish, 0,5—1 mm. in diameter and in height; surface and margin covered with dark brown, dendroid hyphae 2—3 μ in diameter, geniculate; context hyphae with clamp connections, 2—3 μ in diameter, becoming subgelatinous; hymenium at maturity lining a shallow cupule, formed of a dense palisade of basidia; basidia clavate, 14—16×5—6 μ, 4-sterigmate; spores hyaline, broad cylindric, smooth, apiculate, 8,5—9,5×3—4 μ.

Habitat: On bark of *Alnus serrulata*.

Type and specimen examined: South Carolina: Aiken, collected by H. W. Ravenel 1714 (K).

Flagelloscypha Donk in Singer, Lilloa 22: 312. 1949.

"Habit of the carpophores cyphelloid (pezizoid), outside of the cup covered with hyaline, thick-walled, thin, nonamyloid hairs which are incrusted with crystals of calcium oxalate (insoluble in acetic acid, soluble in HCl and HNO_3); spores hyaline, medium sized, cylindric, or amygdaliform, etc., nonamyloid; basidia medium sized, 4-spored; cystidia none; hyphae of the trama with clamp connections, nonamyloid; subhymenium present but indistinctly delimited."

Type: *Cyphella minutissima* Burt (by original designation).

The above description was taken from the original description. It should be noted that in the context of the present work this genus is

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interpreted as including all those cyphelloid fungi in which the crystals on the surface hairs are large and acicular, in contrast with those of *Lachnella* which are small and granular.

Key to Species of *Flagelloscypha*

1. Receptacles narrowly cylindric, spores 9—12 × 3—4 μ .... *F. solenioides*
1. Receptacles cupulate to repand 2
2. Receptacles applanate, sessile, but with free margin .. *F. applanata*
2. Cupules sessile to subsessile, discoid 3
3. Surface hairs capitate ..... *F. punctoidea*
3. Surface hairs pointed, usually whip-lash-like 4
4. Spores large, reaching more than 9 μ in lenght 5
4. Spores smaller, reaching up to 9 μ in length 8
5. Spores narrow, 8,5—10,5 × 1,5—2,5 μ ..... *F. coloradensis*
5. Spores broader 6
6. Spores large, 11,5—13 × 3—4 μ ..... *F. morlichensis*
6. Spores smaller 7
7. Spores 9 × 5,5 μ ..... *F. flagellata*
7. Spores 9—10 × 4—4,5 μ ..... *F. faginea*
8. Spores broad, 7—7,5 × 4—4,5 μ ..... *F. abieticola*
8. Spores longer, 8—9 μ long 9
9. Surface hairs 40—75 × 4—5 μ, spores 8,5 × 4 μ ..... *F. kavinae*
9. Surface hairs 85—110 × 3—5 μ, spores 8—9 × 4—5 μ ..... *F. malmei*
10. Spores narrower 11
10. Spores subglobose, 5,4 × 3,6 μ ..... *F. globosa*
11. Spores 5—6 × 2—3 μ ..... *F. virginea*
11. Spores 6—7,5 × 2,5—4 μ ..... *F. trachychaeta*

Flagelloscypha abieticola (Karst.) comb. nov.

Cyphella abieticola Karst., Fung. Fenn. exs. n. 718, 1868. — *Chaetocypha abieticola* (Karst.). O. Kuntze. Rev. Gen. 2: 847. 1891.

Fructification white, sessile or subsessile, 100—200 μ in diameter; surface hairs hyaline, coarsely aciculate, 70—100 × 3—6 μ, thick-walled; basidia 18—22 × 5—7 μ, 4-sterigmate; spores 7—8 × 3,5—4.5 μ, hyaline, smooth, ellipsoid, flattened on one side, apiculate; subhymenial clamps present.

Habitat: On rotting wood and bark of various trees and plants including: *Abies* sp., *Cornus mas*, *Humulus lupulus*, *Quercus lusitanica* and *Q. robur*.

Specimens examined from: Austria (11), Belgium (3), England (1), Germany (6), Italy (1), Spain (1).

Flagelloscypha applanata (Talbot) comb. nov.

Cyphella applanata Talbot, Bothalia 6: 472. 1956.

Receptacles 0,5—2,0 mm. in diameter, sessile, subresupinate, with upturned margin forming a flat, saucer-like body of membranous texture; margin lobed, white, villose. the hairs covered with white mineral incrustations; surface hairs hyaline, 60—100 × 2,5 μ wide below, 3—4 μ wide above; densely incrusted with acicular granules

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up to 3,5×1,5 μ; some hairs naked or denuded at the tip, fine whip-like or thread-like; context hyphae 2—4 μ in diameter, with clamp connections on the subhymenial hyphae; basidia broad clavate, 4-sterigmate, 14—25×4,5—7,0 μ; spores hyaline, smooth, cylindric to suballantoid or allantoid, apiculate, 9,0—12,6×3,2—5,4 μ.

Habitat: On dead wood.

Type and specimen examined: Union of South Africa: Eshowe Forest, Zululand. Collected by E. M. Laughton, Nov. 1941. (PRE 33350).

Flagelloscypha coloradensis sp. nov.

Cupula, alba, sessilis, 1—3 mm. in diameter; extus pilis hyalinis granulosis, granulis aciculatis; basidiis 14—22×3—5 μ, 4-sterigmaticis; sporis cylindraceis vel allantoideis, hyalinis, laevibus, apiculatis, 8,5—10,5×1,5—2,5 μ.

Receptacles cupulate, white when dry, 1—3 mm. in diameter, sessile; covered with surface hairs, hyaline, incrusted with acicular granules, unbranched, not septate, those at the cup edge shorter than those from below, brittle, tortuous, appearing interwoven but straight and parallel at the cup margin, 150—300×3—4 μ, but reaching 500 μ long; cup wavy margined, hymenium light brown in dry specimen, composed of densely compacted basidia 14—22×3—5 μ, 4-sterigmate, sterigmata 2 μ long; clamps present at base of basidia and in subhymenial region; spores cylindric to allantoid, hyaline, smooth, apiculate, produced in considerable quantity, 8,5—10,5×1,5—2,5 μ.

Habitat: On branches of *Salix* sp.

Type and specimen examined: Colorado: Mesa Lakes, Grand Mesa, June 16, 1935. Collected by R. W. Davidson (NFC).

Flagelloscypha faginea (Libert) comb. nov.

Cyphella faginea Libert, Cr. Arden. 331, 1837; Desm. in Ann. Sci. Nat. 1842: 100. 1842. — *Calyptella faginea* (Lib.) Quél., Ench. Fung. 216. 1886. — *Chaetocypha faginea* (Lib.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella punctiformis* var. *villosa* Bourd. & Galz., Bull. Soc. Myc. Fr. 26: 223. 1910. — *Cyphella citrispora* Pilát, Ann. Mycol. 22: 209. 1924. — *Cyphella citrispora* f. *citrispora* Pilát, Ann. Mycol. 23: 155. 1925, — *Cyphella citrispora* f. *lobata* Pilát, Ann. Mycol. 23: 155. 1925. — *Cyphella janchenii* Pilát, Ann. Mycol. 22: 210. 1924. — *Cyphella punctiformis* var. *corticola* Bourd. & Galz., Hymen. Fr. 161. 1928.

Receptacles sessile, scattered on leaves, white; surface hairs 50—110×4—6 μ, tapering, covered with coarse, acicular granules; hyphae with well developed clamps; basidia 15—25×5—8 μ, 4-sterigmate, with basal clamps; spores hyaline, smooth, apiculate, ovate to tear-shaped, flattened on one side, 9—10×4—4,5—(5) μ.

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Habitat: On wood and rotting plants of various sorts on the ground and on litter from such plants as: *Acer campestris*, *Aconitum napellus*, *Alnus* sp., *A. glutinosa*, *Blechnum spicant*, *Centaurea jacea*, *Cirsium spinosissimum*, *Cladium mariscus*, *Crataegus oxyacanthus*, *Epilobium* sp., *E. angustifolium*, *Fagus* sp., *Juncus* sp., *Phellinus ferruginosus*, *Picea* sp., *Populus* sp., *P. tremula*, *Pteridium aquilinum*, *Quercus* sp., *Rosa canina*, *Rubus* sp., and *Viola odorata*.

Type specimens examined:

Cyphella faginea Lib.: Belgium: Arduennes. Coll. M.-A. Libert. Distributed as Pl. Crypt. Ard., Fasc. IV, No. 331. 1837. (NFC, PR).

Cyphella citrispora Pilát: Czechoslovakia: Zvalnovice, Bohemia, June 1924 (PR).

Cyphella citrispora f. *crataegi* Pilát: Czechoslovakia: Mnichovice, Sept. 1924 (PR).

Cyphella citrispora f. *lobata* Pilát: Czechoslovakia: Mnichovice, Collected by A. Pilát, Sept. 1924. (PR).

Cyphella janchenii Pilát: Czechoslovakia: Praha-Cibullea prope Pragae (As *C. dolloris* sp. n. in packet). Collected by A. Pilát, July 1929. (PR) (NFC).

Cyphella janchenii var. *ciliata* (Sauter) Pilát: Czechoslovakia: Mazies prope Sokéslav. Collected by A. Pilát, July 1923. (PR).

Cyphella punctiformis var. *corticola* Bourd: France: St. Priest, Moulin-Montrat. Bourdot 15744 (PC).

Cyphella punctiformis var. *villosa* Bourd.: France: Grenville. Bourdot 32781 (PC).

Specimens examined from: Austria (1), Belgium (1), Czechoslovakia (27), England (5), Finland (1), France (5), Germany (5), Sweden (1), Manitoba (1).

In some specimens from Czechoslovakia the distal end of the spore is slightly pointed, suggesting lemon-shape. *Cyphella patouillardii* Bourdot, ?in herb. (Bourdot 15747, PC) differs only in a slightly different spore size: $9-11 \times 5-6$ µ.

A specimen from England (K) had somewhat larger spores, $10-12 \times 3-4{,}5$ µ, but no clamp connections were noted.

Flagelloscypha flagellata (Petch) comb. nov.

Cyphella flagellata Petch, Ann. Roy. Bot. Gard. Peradeniya 7: 289. 1922.

Receptacles cream-colored, stipitate, 750—1000 µ in diameter and tall; surface covered with special hairs $100-150 \times 3{,}5-4$ µ, hairs covered with acicular granules up to 5,5 µ long; context hyphae hyaline, 3—4 µ in diameter; subhymenial hyphae compactly arranged, 2,5 µ in diameter; hymenium composed only of basidia; basidia

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18—27×7—9 μ, 4-sterigmate, with basal clamps; spores smooth, hyaline, apiculate, subcylindric, flattened on one side, 9×5,5 μ.

Habitat: On old wood.

Specimen examined from: Ceylon (1).

Flagelloscypha globosa (Pat.) comb. nov.

Cyphella globosa Pat., Bull. Soc. Myc. Fr. 11: 209. 1895.

Receptacles white, minute, 100—250 μ in diameter and high, sessile, hairy cottony; surface hairs acicular incrusted, 36—100×3—4 μ; hymenium pale cream, formed of basidia only; basidia 15×7 μ; spores hyaline, smooth, apiculate, ovate, 5,4×3,6 μ.

Habitat: On fern leaves.

Type and specimen examined: Ecuador. San Jorg. July 1892, Lagerheim (Pat. in FH).

Flagelloscypha kavinae (Pilát) comb. nov.

Cyphella kavinae Pilát, Ann. Mycol. 23: 157. 1925.

Receptacles appearing as minute to small granules, 100—200 μ high and in diameter, covered with special hairs; surface hairs covered with acicular granules to near the tip, 45—75×4—5 μ, terminating in a short whiplash; basidia clavate, forming a compact hymenium, 14—16×6—7 μ, 4-sterigmate, clamped at the base; spores hyaline, tear-shaped to long ovate, cylindric, flattened on one side, smooth, apiculate, 8,5×4 μ.

Habitat: On dead stems including those of *Aconitum napellus*.

Specimens examined: Czechoslovakia (6) (in Carpatorossia and Tatary).

Type: Czechoslovakia: Vijsoké Tatry, on *Aconitum napellus*, July, 1924. Coll. A. Pilát. (PR 174185).

Flagelloscypha malmei sp. nov.

Cupula alba, solitaria vel gregaria, cyathiformis, applanata, substipitata; extus pilis 85—110 longis 3—5 μ latis aciculari-granulosis obtecta; basidiis 22—24×8—9 μ, 4-sterigmaticis; sporis hyalinis, apiculatis, laevibus, ovoideis ad cylindraceis, 8—9×4—5 μ.

Receptacles white, single to gregarious, on bark, cupulate to applanate, free, substipitate; surface hairs 85—110×3—5 μ, with acicular granules, tips smooth, short to elongate, narrowed, whiplash-like; basidia 22—24×8—9 μ, 4-sterigmate; spores hyaline, apiculate, smooth, long ovate to cylindric, 8—9×4—5 μ.

Habitat: On bark of twigs.

Type and specimen examined: Brazil: Rio Grande do Sal: Santo Angelo, Jan. 28, 1893. Coll. by G. A. Malme, Exped. Imae Regnellian, Fungi No. 221. (Stockholm).

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Because of the type of cupules and the whip-lash tips of the surface hairs this species is nearest to *F. applanata* from which it differs in the somewhat shorter and broader spores.

Flagelloscypha morlichensis sp. nov.

Cupula alba, 0,5 mm. diam. et alta, extus pilis 85—110 longis 2,5—3,5 μ latis hyalinis, aciculari-granulosis obtecta; basidiis 20—25× 6—8 μ, 4-sterigmaticis; sporis hyalinis, apiculatis, laevibus, ovoideo-cylindraceis, 11,5—13×3—4 μ.

Receptacles white, 0,5 mm. diameter and high; covered with hairs, 85—110×2,5—3,5 μ, hyaline, covered with acicular granules, with narrowed tips, some appearing whip-lash-like, context hyphae 3—4 μ diameter, clamped; subhymenial hyphae 2,5—3 μ diameter, clamped; hymenium formed only of basidia; young basidia 12—15× 6—8 μ, mature 20—25×6—8 μ; 4-sterigmate, clamped at base; spores hyaline, tear-shaped, strongly apiculate, smooth, 11,5—13× 3—4 μ (8—10×3—4.5 μ according to Reid's notes).

Habitat: On dead fronds of *Blechnum spicant*

Type: Scotland: Invernessshire, Loch Morlich, Sept. 10, 1937. Collected by D. A. and P. M. Reid (K).

Specimens examined: Scotland (1), England (1).

Flagelloscypha punctoidea (P. Henn.) comb. nov.

Cyphella punctoidea P. Henn., Hedwigia 36: 194. 1897.

Receptacles punctate, sessile, white, 250—400 μ in diameter; surface hairs hyaline, heavily acicular-granule-incrusted, capitate, 100—150×5—7 μ; basidia and spores not seen.

Habitat: On decaying leaves of *Cecropia adenopus*.

Type and specimen examined: Brazil: Estado de Ste. Catharina, Blumenau, July 1888. Collected by E. Ule. Herb. Brasiliense 844. (FH).

Flagelloscypha solenioides (Karsten) comb. nov.

Cyphella solenioides Karsten, Nat. Sällsk. Foun. Fl. Fenn. Förh 11: 221. 1871. — *Chaetocypha solenioides* (Karst.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles white, gregarious, not confluent, with no subiculum, cylindric, 500—1000 μ tall, subsessile, 250—300 μ in diameter, covered with hairs; hairs covered with acicular granules, hairs stiff, more or less erect, mostly subparallel to the receptacle, 70—100×3,5—4,5 μ; basidia 20—25×8—9 μ, clavate, 4-sterigmate, clamped at base; spores hyaline, cylindric, smooth, tear-shaped, long apiculate, flattened on one side, 9—12—(14)×3—4 μ.

Habitat: On dead stems of *Cirsium* sp. and dead petioles of leaves of *Petasites*.

Specimens examined: Czechoslovakia (4).

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Flagelloscypha trachychaeta (Ell. & Ev.) comb. nov.

Cyphella trachychaeta Ell. & Ev., Journ. Myc. 4: 73. 1888. — *Cyphella langloisii* Burt, Mo. Bot. Gard. Ann. 1: 365. 1914. — *Cyphella minutissima* Burt, Mo. Bot. Gard. Ann. 1: 367. 1914. — *Cyphella punctiformis* var. *stenospora* Bourd. & Galz., Hym. Fr. 160. 1928. — *Cyphella punctiformis* var. *juncicola* Bourd. & Galz., Hym. Fr. 160. 1928. — *Cyphella bourdotii* Pilát, Hedwigia 67: 115—116. 1927. — *Cyphella roseicola* Pilát, Ann. Mycol. 22: 208—209. 1924.

Receptacles 100—500 μ in diameter, white, with a pale yellow disk, some collections becoming cream-colored to yellow in age; gregarious to scattered, sessile; surface hairs hyaline. 70—150 × 3—4 μ, medium to densely incrusted with acicular granules which are easily removed in mounting, up to 2,5 μ long. to 2 μ in diameter at the base, not staining in phloxine; hairs forming an incurved crown over the hymenium when dry; basidia 18—25 × 5—7 μ, 4-sterigmate; clamps occur at the bases of the basidia, in the subhymenial and the tramal tissues; spores smooth, hyaline, ellipsoid, apiculate, flattened on one side, (3)—6—7,5 × 2,5—4—(5) μ.

On litter of all sorts including grasses on the ground, especially of: *Alnus* sp., *Arundinaria* sp., *Betula* sp., *Carya* sp., *Cocos* sp., *Equisetum palustre*, *Populus* sp., *Picea* sp., *Potentilla arenaria*, *Prunus* sp., *P. persica*, *P. spinosa*, *Quercus* sp., *Rosa canina*, *Rubus idseus*, *Salix* sp., *S. humboldtiana*, *Ulmus* sp., *Tilia* sp., *Zea mays*.

Type specimens examined:

C. trachychaeta Ell. & Ev.; Louisiana: St. Martinsville, July 1888. A. B. Langlois 1424. (NY, NFC, MO 40596 in NFC).

C. langloisii Burt: Louisiana: St. Martinsville, Sept. 21, 1888. A. B. Langlois 802. (FH, MO 4940 in NFC).

C. minutissima Burt: New Hampshire: Chocorua, Aug. 1914. W. G. Farlow 3. (MO 43803 in NFC).

C. roseicola Pilát: Czechoslovakia: Mnichovice, Sept. 1923, Velenovsky. (P).

C. bourdotii Pilát: Czechoslovakia: Mnichovice, Aug. 1923, Velenovsky (P).

C. punctiformis var. *stenospora* Bourdot: France: St. Priest, Bourdot 37318 (PC).

C. punctiformis var. *juncicola* Bourdot: France: St. Priest, Bourdot 15740 (PC).

Specimens examined from: Czechoslovakia (14), France (2), Great Britain (2), Sweden (1), Ceylon (1), Argentina (1), Puerto Rico (1), Manitoba (1), Nova Scotia (1), Ontario (3), Iowa (1), Louisiana (10), Maine (1), Missouri (1), New Hampshire (2), New Jersey (1), New York (2), Ohio (1).

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One of the Langlois collections from Louisiana at National Fungus Collections (NFC) has been given the herbarium name *C. affinis* by Donk. In contrast with Burt's opinion, the type material of *C. trachychaeta* seen by the writer was quite adequate for determination. According to the writer's interpretation, *C. punctiformis* is assigned to *Lachnella*. It has longer, more cylindric spores and different surface hairs.

Flagelloscypha virginea Massee, sp. nov.

Cyphella virginea Massee, in Herb. (K).

Cupula alba, cyathiformis 250—300 μ diam. vel alta, extus pilis hyalinis, 90—100 longis 3—4 μ latis, aciculari-granulosis praedita; basidiis 14—15×5—6 μ, 4-sterigmaticis; sporis hyalinis, subcylindraceis, apiculatis, 5—6×2—3 μ.

Receptacles, white cupulate, 250—350 μ in diameter and high; surface covered with special hairs; surface hairs 90—100×3—4 μ, hyaline, thick-walled, covered with acicular granules; hymenium composed only of basidia; basidia 14—15×5—6 μ, 4-sterigmate; spores hyaline, subcylindric, flattened on one side, apiculate, 5—6×2—3 μ.

Habitat: On old leaves.

Type and specimen examined: Africa: Masdi, 6000 ft., Scott Elliot No. 63. (K).

Lachnella Fr., Fl. scan. 343. 1835.

Cyphella subgen. *Crustotricha* Pilát, Ann. Mycol. 23: 152. 1925. pr. p.
Cyphellopsis Donk, Nederl. Myc. Verh. Med. 18—20: 128. 1931. pr. p.
Pseudodasyscypha Velenovsky, Novit. Mycol. 167. 1939.

Receptacles cupulate, the surface covered with hyaline or white, or yellow hairs, rarely with brown hairs interspersed, incrustations on surface hairs finely granular, crystalloid; spores hyaline, varying in shape from subspherical to cylindric, having a wide range of size; basidia clavate, usually 4-sterigmate; basidia and hyphae of subhymenium and trama with or without clamp connections; receptacles sessile to stipitate, with or without a sclerotic base.

Type: *Lachnella alboviolascens* Alb. & Schw. ex Fries.

Key to Species of *Lachnella*

1. Receptacles borne on a black sclerotium, spores 10—20×4—10 μ, mostly on Tilia ..... *L. tiliae*
1. Receptacles without a sclerotic base 2
2. Receptacles occurring on stroma of a Pyrenomycete ..... *L. parasitica*
2. Receptacles occurring on dead organic matter 3
3. Spores small, ovate to subglobose, less than 6 μ long 4
3. Spores larger, ovate to cylindric 7

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4. Fruiting on fern stems, spores 5,5—6 × 3,5—4 ..... *L. mairei*
4. Not fruiting on fern stems 5
5. Surface hairs arising as branches from mycelial cover of receptacle ..... *L. myceliosa*
5. Surface hairs single, elongate, arising from receptacle surface 6
6. Fruiting on pine twigs ..... *L. pinicola*
6. Fruiting on dead leaves ..... *L. paraguayensis*
7. Usually fruiting on *Populus* wood, but also on other substrata 8
7. Fruiting on all types of substratum 10
8. Surface hairs white to pale yellow 9
8. Surface hairs both white and brown ..... *L. dichroa*
9. Spores 5—9 × 2,5—4 μ ..... *L. eruciformis* var. *eruciformis*
9. Spores 3—4,5 × 2—3 μ ..... *L. eruciformis* var. *microspora*
10. Receptacles whitish to bluish gray, stipitate to substipitate 11
10. Receptacles white to cream-color or yellow, sessile to stipitate 15
11. Spores large, 12—20 × 9—12 μ 12
11. Spores smaller 14
12. Spores ovate, becoming round angular ..... *L. alboviolascens*
12. Spores elongate ovate 13
13. Spores finally turbinate ..... *L. turbinata*
13. Spores finally pyriform ..... *L. pyriforma*
14. Spores 7—12 × 5—9 μ ..... *L. villosa*
14. Spores 5—8 × 2,5—4 μ ..... *L. ciliata*
15. Spores 10—15 μ long 16
15. Spores 6—9 μ long 21
16. Spores reaching 15 μ long 17
16. Spores reaching 12 μ long 18
17. Spores cylindric, 12—14 × 4,5—5,5 μ ..... *L. libertiana*
17. Spores long ovate, 10—15 × 6,5—7 μ ..... *L. punctiformis*
18. Surface hairs of two types ..... *L. rosae*
18. Surface hairs of only one type 19
19. Surface hairs elongate, fruiting on wood ..... *L. alboflavida*
19. Surface hairs short, fruiting on the fruits of *Vitis* sp. .... *L. uvicola*
20. Surface hairs dichophysoid or mycelioid 21
20. Surface hairs simple, elongate 22
21. Surface hairs dichophysoid, terminating in bottle-brush structures ..... *L. manitobensis*
21. Surface hairs mycelioid ..... *L. septentrionalis*
22. Surface hairs 65—110 μ long ..... *L. filicina*
22. Surface hairs 150 μ long or longer 23
23. Hymenium white to pale colored 24
23. Hymenium brown ..... *L. oregonensis*
24. Surface hairs with elongate narrow tips 25
24. Surface hairs of equal diameter their entire length ... *L. albolivida*
25. Outer third of hairs smooth ..... *L. tongariro*
25. Outer third of hairs granule incrusted ..... *L. pseudopanax*

Lachnella alboviolascens (Alb. & Schw. ex Fr.) Fr., Sum. Veg. Scand. 365. 1849.

Peziza sclerotium Pers., Obs. Mycol. 2: 84. 1799 ss. Auctt. non Donk. — *Peziza sessilis* Sow., Col. Figs. Engl. Fung. pl. 389, f. 1. 1803. — *Peziza nivea* Schum., Pl. Saell. 2: 435. 1803. — *Peziza*

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granuliformis Nees, Syst. 2: 67. 1817. — *Peziza alboviolascens* Alb. & Schw., Consp. Fung. 322. 1820. — *Peziza pulveracea* Alb. & Sche., Consp. Fung. 342. 1820. — *Peziza sessilis* Sow. ex Purt., Ap. Midl. Fl. 466. 1821. — *Peziza fallax* β*albo-violascens* Pers., Myc. Eur. 1: 266. 1822. — *Peziza granuliformis* Nees ex Pers., Myc. Eur. 1: 267. 1822. — *Peziza alboviolascens* Alb. & Schw. ex Fr., Syst. Myc. 2: 96. 1822. — *Peziza alboviolascens* β*alba* Fr., Syst. Myc. 2:96 1822. — *Peziza velutina.* Desm., Cat. Pl. omniv. Bot. Belg. 14. 1823. — *Cyphella alboviolascens* var. *alba* Desm., Pl. Cr. Nord. Fr. n. 119. 1826. — *Peziza syringae* Wallr., Fl. Crypt. Germ. 2: 455. 1833. — *Cyphella curreyi* Berk. & Br., Ann. Mag. Nat. Hist. III. 7: 379. 1861. — *Cyphella alboviolascens* (Alb. & Schw. ex Fr.) Karst., Nat. Söllsk. Fam. Fl. Fenn. 11: 221. 1870. — *Trichopeziza villosa* (Pers.) Fckl., Sym. Myc. 296. 1870. — *Cyphella dochmiospora* Berk. & Br., Ann. Mag. Nat. Hist. IV. 11: 339. 1873. — *Cyphella stuppea* Berk. & Br., Ann. Mag. Nat. Hist. V. 1: 25. 1878. — *Corticium dubium* Quél., Champ. Jura Vosg. 16. 1878. — *Lachnella alboviolascens* var. *caraganae* Karst., Fung. Fenn. 329. — *Cyphella pezizoidea* Zopf in Sydow, Mycotheca marchica 1. 1880. — *Cyphella villosa* f. *lutescens* Roumeguère, Fung. Gall. exs. 1810. 1882. — *Cyphella alboviolascens* f. *minuscula* Roumeguère, Fung. Gall. exs. 1906. 1882. — *Cyphella villosa* f. *solani* Sydow, Mycotheca marchica 1233. 1887. — *Cyphella alboviolascens* f. *sambuci* Sacc., in Syd., Mycoth. March. 1806. 1887. — *Chaetocypha stuppea* (Berk. & Br.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Chaetocypha alboviolascens* (Alb. & Schw. ex Fr.), O. Kuntze l. c. — *Chaetocypha dochmiospora* (Berk. & Br.), O. Kuntze, l. c. — *Cyphella alboviolascens* var. *dubia* Quél., in Krüger, Fung. Sax. 1807. 1902. — *Cyphellopsis alboviolascens* (Alb. & Schw. ex Fr.) Donk, Med. Ned. Myc. Ver. 18—20: 129. 1931. — *Cyphella pseudovillosa* P. Henn., Engl. Bot. Jahrb. 37: 43. 1904. — *Cyphella bicolor* Bres., in herb.

Receptacles 0,1—1.5×0,4—1.0 mm., densely gregarious to scattered. white to grey, pale bluish or lilaceous grey, margin inrolled; hymenium yellowish or bluish grey to pale violet; surface hairs densely and finely granule incrusted, tapered, thick-walled, with a very narrow lumen. 100—300×3—10 μ; basidia 33—70×10—15 μ, 4-sterigmate, sterigmata up to 10 μ long; spores hyaline, smooth, apiculate, ellipsoid, subglobose or tear-shaped, usually flattened on one side, sometimes pointed at the distal end (f. *dochmiospora*), but not consistently so, (10—)13,5—15—(17)×(6,5—)9—11 μ; hyphae 3—6 μ in diameter, with occasional clamps, clamps present in the subhymenial tissue and at the bases of the basidia.

Habitat: On woody herbaceous stems and on the bark and branches of trees and shrubs including: *Acacia* sp., *Acanthopanax*

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sessilis, *Acer pseudoplatanus*, *Achillea millefolium*, *Agave* sp., *A. americana*, *Alnus* sp., *Ammophila arenaria*, *Ampelopsis quinquefolium*, *Antirrhinum* sp., *Arctium lappa*, *Artemisia californica*, *A. vulgaris*, *Aster* sp., *Astragalus glycyphyllus*, *Ballota nigra*, *Berberis* sp., *Blanivillea rhomboidea*, *Bupleuron fruticosun*, *Caprifolium hortense*, *Caragana arborescens*, *Carduus* sp., *Cassia* sp., *Centaurea* sp., *C. jacea*, *Chusquea* sp., *Cirsium chloroconium*, *Clematus vitalbus*, *Cornus* sp., *C. mas*, *Coronilla* sp., *Corylus rostratus*, *Cyclostegia sp.*, *Cytisus capitatus*, *C. laburnum*, *C. radiatus*, *Daucus carota*, *Desmodium* sp., *Epilobium sp.*, *E. angustifolium*, *Equisetum sp.*, *E. fluviatile*, *Erechtites prenanthoides*, *Ervum sylvaticum*, *Eucalyptus* sp., *Eupatorium* sp., *E. cannabinum*, *Euonymous bungeanus*, *E. europaeus*, *Euphorbia* sp., *Fagus menziesii*, *Ficus carica*, *Fraxinus* sp., *F. excelsior*, *Galium aparine*, *Genista florida*, *G. tinctoria*, *Gentiana cruciata*, *Glyciridia sepium*, *Glycinus* sp., *Helianthus* sp., *Heracleum lanatum*, *Hieracium umbellatum*, *Hibiscus* sp., *Holodiscus discolor*, *Humulus lupulus*, *Hyssopus officinalis*, *Hypericum perforatum*, *Ilex paraguayensis*, *I. rotunda*, *Jasminum* sp., *Juglans regia*, *Juniperus virginiana*, *Laburnum* sp., *Lathyrus pratensis*, *Lebanotus montana*, *Lavendula vera*, *Liriodendron tulipifera*, *Lonicera* sp., *L. caprifolia*, *L. hylosteus*. *L. nitida*, *L. tatarica*, *Lupinus polyphyllus*, *L. arboreus*, *L. rivularis*, *Medicago sativa*, *Melilotus albus*, *Mentha* sp., *Myoporum* sp., *Ononia repens*, *O. spinosa*, *Olea* sp., *Philadelphus lewisii*, *Periploca greciae*, *Pipturus* sp., *Populus* sp., *P. tremula*, *Prunus spinosa*, *Rhamnus* sp., *Rhus glabra*, *Ribes aureum*, *Robinia pseudacacia*, *Rosa canina*, *Rubus* sp., *R. idaeus*, *R. imperialis*, *Rumex acetosella*, *Ruscus hypolysus*, *Salix* sp., *S. alba*. *S. caprea*, *Sambucus ebulus*. *S. nigra*, *Sarothamnus scoparius*, *Schinus molle*, *Scrophularia californica*, *Secale cereale*, *Senecio canina*, *S. jacobea*, *Serratula arvensis*, *Sesbania* sp., *Solanum tuberosum*, *Solidago canadensis*, *S. serotina*, *Sophora japonica*, *Spiraea* sp., *Symphoricarpos* sp., *S. racemosa*, *Symphytum* sp., *Syringa vulgaris*, *Tanacetum* sp., *Taxus baccata*, *Thuja* sp., *Trifolium medium*, *Ulex* sp., *Ulmus* sp., *U. montana*, *Urtica* sp., *U. dioica*, *U. lyallii*, *Viburnum opulus*, *Vitis* sp., *V. vinifera* and *Wisteria chinensis*.

Type specimens examined:

Cyphella pezizoides Zopf: Germany: In Zopf and Sydow, Mycotheca marchica No. 1. (B, K, NY).

Cyphella villosa (Pers.) Karst. var. *dochmiospora* (Berk. & Rav.) Bres.: Italy: Appianum, Coll. Prof. Schmoranzer. (NFC).

Cyphella stuppea Berk. & Br.: England: On broom, Coll. Rev. M. Anderson. Specimen in Herb. Berkeley (K).

Lachnella alboviolascens forma *caraganae* Karst.: Finland: Mustiala, on *Caragana arborescens*, P. A. Karsten, in Karsten, Fungi fennica, No. 329 (K).

Cyphella alboviolascens var. *rubra* Quél.: Bulgaria: ad Monasteriam

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Aripes in ramis *Juglandis regiae*, Fr. Bubak, July 28, 1908 (PR).

Cyphella alboviolascens f. *minuscula* Roumeguère: France: Vicinity of Nimes, Oct. 1881, C. Roumeguère. In Roumeguère, Fungi Gallici exsiccati 1906 (K, NY).

Cyphella bicolor Bres.: Italy: Castel Gondolfo, July 1905. D. Saccardo (S).

Cyphella alboviolascens var. *alba* Desm.: France: Vicinity of Senlis (Oise), May 1884, Capt. F. Sarrasin, in Roumeguère, Fungi Gallici exsiccati 2915 (K, NY, MO in NFC).

Cyphella curreyi Berk. & Br.: England: Batheaston, on twigs of *Ulmus* ,C. E. Broome. In Rabenhorst, Fungi Europaei 416. (S).

Cyphella alboviolascens var. *dubia* Quél.: Germany: On fallen leaves and twigs of *Juglans regia* L., at Schandau, May 1902, W. Krieger, in Fungi Saxonici No. 1807. (NFC).

Cyphella pseudovillosa P. Henn.: East Africa: Skagajuwald, Sept. 1902. Collected by A. Engler (S).

Cyphella villosa (Pers.) Karst. var. *lutescens* Roumeguère: France: Bois de la Fontaine, Oct. 1881. In C. Roumeguère, Fungi Gallici exsiccati 1810 (K, NUBG).

Cyphella villosa f. *solani* Sydow: Germany: Lichterfelde bei Berlin, Nov. 1886, P. Sydow. In Sydow, Mycotheca marchica 1233 (B).

Cyphella villosa f. *sambuci* Sacc.: Germany: Thiergarten bei Berlin, Nov. 1887, P. Sydow. In Sydow, Mycotheca Marchica No. 1806. (K, NYBG).

Cyphella sydowii Bres.: Germany: Steglitz bei Berlin, Oct. 1892. P. Sydow. In Sydow, Mycotheca Marchica 3706 (B, S).

Specimens examined from: Austria (20), Belgium (6), Bulgaria (1), Carinthia (3), Caucasus (1), Czechoslovakia (35), Denmark (1), Finland (4), France (61), Germany (99), Great Britain (49), Luxembourg (2), Hungary (10), Italy (15), Latvia (2), Netherlands (7), Portugal (8), Russia (3), Sweden (39), Switzerland (4), Algiers (7), Crimea (1), Cyprus (1), East Africa (1), Gold Coast (1), Kenya (1), Tangiers (3), Tunis (2), India (1), China (2), Australia (1), New Zealand (3), Hawaii (1), Argentina (6), Brazil (2), Ecuador (4), Cuba (2), British Columbia (4), Ontario (3), California (15), Delaware (1), Idaho (1), Maine (8), Maryland (1), Massachusetts (1), Missouri (2), Ohio (3), Pennsylvania (1), South Carolina (5), Virginia (1), Washington (1), Wisconsin (1).

A specimen from the Hawaiian Islands in the Burt Collection at the Farlow Herbarium (FH) is filed under what appears to be the herbarium name of *Cyphella compressa*, probably an unpublished name by Burt.

The type specimen of *Cyphella henningsii* Sydow, "leg Koorders" in the Sydow Herbarium at Stockholm (S), has no clamps, basidia or spores but on the basis of surface hairs and general appearance is assigned here.

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Specimens in herberia have been observed which are labeled *Cyphella villosa* f. *dochmiospora* Berk. & Br., and *C. villosa* var. *dochmiospora* (Berk. & Br.) Bres. To date, the place of publication, if any. for these two uses of one specific epithet used in this complex has not been found. The term was used as a specific epithet by Berkeley and Broome in 1873 and applies to the shape of the spores. Since this is variable throughout the group it is not considered sufficient evidence to remove a certain group of collections, as yet undetermined as to numbers of collections involved, to a separate specific or subspecific category.

A specimen at Paris (PA) from the Desmazières herbarium is labeled as having been from Fries himself. A question on the packet asks: "Est cela type ?". It is a good specimen of *L. alboviolascens*.

Upon checking Purton's text it appears to this writer that the specimen cited by him as *Sphaeria tomentosa* Rehl. ex Purt., App. Midl. Flora 3: 287. 1821, could very well belong to this species complex. However, Donk (1959) considers such assignment a probable misapplication.

The only difference between *L. alboviolascens* and other closely related species such as *L. villosa*, *L. libertiana*, *L. ciliata*, and *L. cruciformis*, in that descending order, is in spore size and accompanying reduction in size of basidia, thickness of hymenium, and sometimes size of receptacle.

Lachnella alboflavida Bres., sp. nov.

Cupula membranacea, sessilis, cyathiformis, centro adfixa. alba, tomentosa. 1—2 mm. lata; pilis glabris, 300—450 longis 4 μ crassis obtecta; hymenio laevi, flavido; sporis ellipsoideis, hyalinis, 8—10× 6—7 μ, basidiis 24—26×6—8 μ, cystidiis 40—48×6—8 μ.

Receptacles membranaceous, sessile, cupulate, white, with a smooth, yellowish hymenium, surface white tomentose, 1—2 mm. broad; surface hairs 300—350×4 μ, smooth, hyaline, thick-walled, with pointed tips; cystidia 40—48×6—8 μ; basidia 24—26×6—8 μ, 4-sterigmate; spores elliptical, hyaline, apiculate, smooth, 8—10× 6—7 μ; clamps present at the base of the basidia, and in the subhymenial tissues.

Habitat: On leaves and wood in litter.

Type and specimen examined: Brazil: J. Rick. Herbarium of G. Bresadola 355 (NFC).

Lachnella albolivida Ellis sp. nov.

Cupulae caesiae, sparsae vel gregariae, urceolatae, 0,5—1,0 mm. latae, 0,5 mm. altae, extus pilis, granulosis, 150—175 μ longis 5—7 μ latis praeditae; basidiis 17—20×5—7 μ, 4-sterigmaticis; sporis 6—7×3—3 5 μ. laevibus. hyalinis, cylindraceis, apiculatis.

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Receptacles grey, scattered to gregarious, urceolate, 0,5—1,0 mm. wide, 0,5 mm. high, closed by incurving of mouth when dry; livid white within (according to Ellis who saw reasonably fresh material); surface hairs 150—200×5—7 μ in one collection, 200—275×5—7 μ in another, densely granule-incrusted, hairs covering the whole surface of the receptacle; basidia 17—20×5—7 μ, 4-sterigmate; spores 6—7×3—3,5 μ (3—3,5×1,5—2 μ according to Ellis' notes), smooth, hyaline. cylindric, apiculate.

Habitat: On bark of *Betula* sp. and *Salix* sp.

Lectotype: Colorado: Golden, Jan. 16, 1897. E. Bethel 178. (NY).

Specimens examined from: Colorado (2).

Lachnella dichroa sp. nov.

Cupula cyathiformis, cinerea. sessilis vel substipitata, gregaria, extus ad basin pilis brunneis, granulosis, 150—200 longis 4—7 μ latis obtecta; basidiis 12—15×3—4 μ. 4-sterigmaticis; sporis laevibus, suballantoideis, apiculatis, hyalinis, 4—6×1,5—2,5 μ.

Receptacles cupulate, dark grey, sessile to substipitate, gregarious but not crowded, when dry 1 mm. high, 1 mm. in diameter; lower part of cup with appressed, parallel, brown hairs, mouth fringed with hyaline hairs. densely and finely granule-incrusted, granules subacicular, easily removable in mounting, hairs 150—200×4—7 μ; hymenium simple, composed of basidia 12—15×3—4 μ, 4-sterigmate; spores smooth, suballantoid, apiculate. hyaline, 4—6×1,5—2,5 μ.

Habitat: On wood of *Populus* sp.

Type and specimen examined: Manitoba: Manitoba Agricultural College, Winnipeg, July 11, 1927, G. R. Bisby and W. L. Gordon 3473. (LOO 11387 in PAC).

Lachnella ciliata (Sauter) comb. nov.

Cyphella ciliata Sauter, Flora 134. 1845. — *Chaetocypha ciliata* (Sauter), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella lachneoides* Pilát, Ann. Mycol. 23: 153. 1925. — *Cyphella villosa* var. *orthospora* Bourd. & Galz., Hym. de Fr. 160. 1928.

Receptacles whitish, substipitate, with wrinkled margin, 100—500 μ in diameter and high, covered with erect, bristle-like hairs; surface hairs 50—80 μ long, sometimes 175—250×5,5—6,5 μ, tapering to a point from a base 5,5 μ in diameter, or even and rounded at the tip, finely incrusted with crystalline granules; context thin, of hyaline hyphe 3—4 μ in diameter, subhymenial hyphae 2—3 μ in diameter, no clamps seen; basidia 14,5—16×5—7 μ, 4-sterigmate; spores 5—(7)—8×2,5—(3,5)—4 μ, hyaline, apiculate, ovate, to tear-drop shaped, smooth.

Habitat: On dead twigs and herbage of various plants especially: *Aconitum septentrionale*, *Alnus* sp., *A. glutinosa*, *Artemisia vulgaris*, *Cornus mas*, *Cytisus scoparius*, *Equisetum silvaticum*, *Impatiens* sp.,

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Lathyrus pratensis, *Petastites* sp., *Populus* sp., *Prunus spinosa*, *Quercus pedunculata*, *Rumex acetosa*, *Ruscus aculeatus*, *Salix auriata*, *S. caprea*, *S. cinerea*, *Sambucus ebulus*, *Solidago canadensis*, *Sorbus aucuparia*, *Syringa vulgaris*, *Vitis vinifera*.

Specimens examined from: Belgium (1), Czechoslovakia (12), England (1), Finland (2), France (4), Germany (7), Hungary (1), Italy (1), Latvia (1), Luxembourg (1), Norway (3), Ontario (1), Maine (2), Oregon (1), Virginia (1).

Type specimen examined: *Cyphella lachneoides* Pilát: Czechoslovakia:

This species is intermediate between *L. villosa* and *L. eruciformis*, spore size being the primary method of differentiation. According to the label on the packet of a specimen (Bourdot 4725) at Paris (PC), this species is the same as Pilát's interpretation of *C. bloxami* Berk. & Phil.

A specimen collected in 1887 by Gaillard (S) on dead leaves was collected on the Upper Orinoco in Venezuela. It is assigned here although the spores, which measure 6×4 µ, are more ovate than those of other specimens placed here, because other characters agree with those of this species.

Lachnella eruciformis (Fr.) comb. nov., var. **eruciformis**

Cyphella eruciformis Fr., Syst. Myc. 2: 201. 1822. — *Cyphella albo-carnea* Quél., Soc. Bot. Fr., Bull. 25: 287. 1878. — *Cyphella eumorpha* Karst., Hedw. 24: 271. 1890. — *Chaetocypha eruciformis* (Fr.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles grey-white, 0,2—1,0 mm. in diameter, subsessile to sessile, margin inrolled when dry, single to gregarious; surface hairs white, appearing yellow in mass, finely to coarsely granule incrusted their whole length, thick-walled, $90—325 \times 5—10$ µ, hairs at margin of cup with a broad base; context compact, of clamped hyphae. 3—4 µ in diameter; subhymenial hyphae 2,5 µ in diameter, clamped; basidia $17—23{,}5 \times 4—7$ µ, 4-sterigmate, clamped at the base; spores hyaline, smooth, apiculate, ovate to cylindric to suballantoid, $5—9 \times 2{,}5—4$ µ.

Habitat: On dead wood and herbage, usually of *Populus* species but reported on: *Acer* sp., *Alnus tenuifolia*, *Myrica octoneura*, *Juncus* sp., *Populus* spp., *P. balsamifera*, *P. tremula*, *P. trichocarpa*, *Pyrus malus*, *Robinia pseudacacia*, *Salix caprea* and *Sorbus aucuparia*.

Specimens examined from: Belgium (1), Finland (1), France (4), Czechoslovakia (1), Hungary (1), Italy (1), Luxembourg (1), Macedonia (1), Sweden (26), Asiatic Turkey (2), Guadeloupe (1), Alberta (1), British Columbia (1), Ontario (5), Idaho (2). The specimen from Finland was collected and identified by Karsten.

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Based on a specimen in the Bourdot Herbarium (PC) with spores 6—7,5 × 3,5—4 μ, and identified as this species with the note: "(*albissima* Maire)", *C. albissima* Pat. and Doass. appears to be a synonym of this species. In a note in Bull. Soc. Myc. Fr. 49: 47. 1933, Pilát places *C. albissima* Pat. & Doass., Tab. An. Fung. 464, in synonymy with *C. eruciformis*.

Lachnella eruciformis (Fr.) W. B. Cooke var. **microspora** var. nov.

Ut in species, sporis 3—4,5 × 2—3 μ.

Receptacles sessile, white, 200—500 μ in diameter, covered with surface hairs which are finely granule-incrusted, straight to curved, more or less spiral or geniculate at the tip, 100—200 × 3—4 μ; basidia 12—15 × 4—6 μ, 4-sterigmate; spores smooth, strongly apiculate, hyaline, ovate, sometimes pointed at the distal end, 3—4,5 × 2—3 μ.

Habitat: On *Populus* sp.

Type: Ontario: On *Populus* sp., woods south of Aurora. Collected by H. S. Jackson, Sept. 13, 1931. (TRTC 22982).

Specimens examined from: Ontario (3).

Lachnella libertiana (M. C. Cooke) comb. nov.

Cyphella libertiana M. C. Cooke, Grevillea 8: 81. 1880. — *Chaetocypha libertiana* (M. C. Cooke), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Peziza* species nova Lib. in herb.

Receptacles cream-colored, 400 μ in diameter and height; covered with special surface hairs 80—100 × 3,5 μ, granule-incrusted, opaque or yellowish; context hyphae compact, 2,5—3,5 μ in diameter; subhymenial hyphae 2,5 μ in diameter, with clamp connections; hymenium formed of basidia only; basidia clamped at the base, 21,5—24 × 7—9 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, flattened on one side, 12—14 × 4,5—5,5 μ.

Habitat: On decorticated branches of *Cornus mas*.

Type: Belgium: Collected by M. A. Libert near Malmedy. Apparently the specimen in the Cooke Herbarium at Kew is a portion of the specimen distributed by Roumeguère as No. 604, Fungi Selecti Gallici exsiccati. All this material was seen from specimens loaned by Kew (K).

Specimens examined: Belgium (1), Holland (1).

Lachnella mairei (Pilát) comb. nov.

Cyphella mairei Pilát, Ann. Mycol. 22: 211. 1924.

Receptacles scattered, minute, 100—200 μ to 0,5—1 mm. in diameter and 500 μ high, white; surface hairs strongly granule-incrusted, hyaline, thickwalled, 65—80 × 4—5 μ; basidia 15—18 × 3—4 μ, 4-sterigmate; spores hyaline, smooth, apiculate, ovate, 5,5—6 × 3,5—4 μ (when young and still attached to the basidia frequently noted as 3,5—4 × 3 μ.)

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Habitat: On dead fronds of *Blechnum spicant*, *Pteris* sp., and *Pteridium aquilinum*.

Type specimen examined: *Cyphella filicina* Karst. f. *mairei* Pilát: Czechoslovakia: Krkowose: Roesengrund. A. Pilát, Sept. 1923. (PR 174168).

Specimens examined from: Czechoslovakia (4), Finland (1), Sweden (5).

Lachnella manitobensis sp. nov.

Cupula alba, subsessilis vel breviter stipitata, 0,5—1 mm. diameter extus dichophysibus granulato-incrustatis, 20—50×3—4 μ; basidiis 20—25×4—6 μ, 4-sterigmaticis; sporis laevibus, hyalinis, apiculatis, ovatis, 6×3 μ.

Receptacles white, subsessile to short stalked, 0,5—1,0 mm. in diameter, covered with branched dendrophyses (dichophyses) terminating in granule-incrusted bottle-brushes 20—50×3—4 μ below, ultimate branches 1 μ or less in diameter; hymenium 27—30 μ thick, basidia 20—25×4—6 μ, 4-sterigmate; spores smooth, hyaline, apiculate, ovate, 6×3 μ.

Habitat: On dead sticks and fern fronds.

Type and specimen examined: Manitoba: Winnipeg, E. Manitoba Agr. College, July 7, 1931. Collected by G. R. Bisby. (WIN).

Lachnella myceliosa nom. nov.

non *Cyphella cinereofusca* Schw. sensu Sacc., Michelia 2: 303. 1880. — *Peziza cinereofusca* Schw., Schr. Naturf. Ges. Leipzig 1: 119. 1822. — *Chaetocypha cinereofusca* (Schw. Sacc.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles ashy to dark grey, up to 50 μ in diameter, and 250—300 μ high, sessile; surface covered with a reticulum of septate, clamped, hyaline to yellowish, hyphae, hyphae branched, to 150×3 μ, appressed and with weakly projecting branches, encrusted with large, coarse, yellow crystals, tips somewhat enlarged; context formed of hyaline clamped hyphae 2,5—3,5 μ in diameter; subhymenial hyphae 2,0—2,5 μ in diameter; hymenium composed of clavate basidia 16—18×6—7 μ, 4-sterigmate, clamped at the base; spores hyaline, apiculate, smooth, ovate to globose-triangular, 6 μ in diameter or 5,5—6×3—4,5 μ.

Habitat: On twigs of *Vitis vinifera*.

Type: Germany: Lichterfelde bei Berlin. Collected in September 1891 by P. Sydow. Original specimen from Rehm herbarium, noted "Rarissime". Portion of specimen issued as Mycotheca Marchica No. 3435 by Sydow in Sydow Herbarium (Stockholm).

Specimens examined: France (2), Germany (4).

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Lachnella oregonensis sp. nov.

Cupulae albae, stipitatae, sparsae vel gregariae, 1—10 mm. diam.; extus pilis hyalinis, flexuosis, granulosis, 275—325×4—5 μ; hymenio brunneo; basidiis 16,5—20×3,5—5 μ, 4-sterigmaticis; sporis laevibus, allantoideis, hyalinis, apiculatis, 8—9×3—3,5 μ.

Receptacles cupulate, white, stalked, single to gregarious, 1—10 mm. in diameter; stalk up to 1 mm. long, dark colored; surface hairs white, hyaline, flexuous, clothed with minute granules the whole length, giving the cup a white color, 275—325×4—5 μ; hymenium brown, formed of basidia, 16,5—20×3,5—5 μ, 4-sterigmate; spores smooth, allantoid, hyaline, apiculate, 8—9×3—3,5 μ.

Habitat: On branches of *Salix* sp.

Type and specimen examined: Oregon: Union Co., at U. S. B. M. 5084, 0,7 mi. S. of Spout Springs, Umatilla National Forest, along Ore. St. Rte. 204. SE quarter, S. 10, T. 3 N., R. 38 E. June 17, 1948, W. B. & V. G. Cooke 23947. (WBC).

Lachnella paraguayensis sp. nov.

Cupula 300—500 μ diam., alba, dense villosa; pilis 400—500×2—3 μ, hyalinis, laevis vel sparse granulosa; hyphis 1,5—2,0 μ diam.; hymenio cum cystidiolis; basidiis 9,0×3,6 μ, 4-sterigmaticis; sporis globosis, raro subglobosis, laevibus, hyalinis, apiculatis, 3—4 μ diam.

Receptacles 300—500 μ in diameter, white densely villose; surface hairs 300—400×2—3 μ, hyaline, smooth to slightly granule-incrusted, elongate, evenly curved over the top of the receptacle; context hyphae 1,5—2,0 μ in diameter, clamped; hymenium a dense palisade of basidia with a few cystidioles; basidia 9,0×3,6 μ, 4-sterigmate, clamped at base; spores globose, rarely subglobose, smooth, hyaline, apiculate, 3—4 μ in diameter, or 3×4 μ.

Habitat: On dead leaves.

Type and specimen examined: Paraguay: Paraguarí, Cerao Hu, Dec. 10, 1881. B. Balansa 3435. Obtained by C. Spegazzini. (LPS 25864).

Lachnella parasitica (Berk. & Br.) comb. nov.

Cyphella parasitica Berk. & Br., Jour. Linn. Soc. Lond. Bot. 14: 74. 1875. — *Chaetocypha parasitica* (Berk. & Br.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles 200—500 μ in diameter, 100—200 μ high, closed when dry, opening flat when fresh, cream color, covered with special hairs; surface hairs hyaline, dense granule incrusted, 36—55×3,5—5 μ, with pointed tips; context hyphae 2,5 μ in diameter, no clamps seen; basidia 19,8×5,4 μ, 4-sterigmate; spores hyaline, smooth, slightly apiculate, acuminate, 9,0×3,5 μ.

Habitat: On stroma of a Pyrenomycete.

Type and specimen examined: Ceylon: Peradeniya Dec. 1868. (K).

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Lachnella filicina (Karst.) comb. nov.

Cyphella candida Peck, Rept. N. Y. St. Bot. 27: 99. 1875 not *C. candida* Jungh., Crypt. Jav. 28. 1839. — *Cyphella filicina* Karst., Sällsk. Faun. Fl. Fenn. Förh. Nat. 11: 220. 1871 not *C. filicina* Peck, 1876. — *Cyphella peckii* Sacc., Syll. Fung. 6: 684. 1888. — (established for *C. candida* Pk., 1875). — *Chaetocypha filicina* (Karst), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Chaetocypha peckii* (Sacc.), O. Kuntze, l. c. — *Cyphella villosa* var. *stenospora* Rea, Brit. Basid. 700. 1922.

Receptacles 100—200 μ in diameter, sessile, white to greyish white or pale cream-color; surface hairs hyaline, medium to coarsely granule-incrusted, granules medium acicular, (40)—65—100 × 3—5 μ; basidia 13,5—18 × 4—7 μ, 4-sterigmate; spores smooth, hyaline, long-pointed aciculate, ovate to cylindric or tear-shaped, 6—9 × 3—5 μ, 6—7 × 1,5—2 μ in one specimen from Pilát.

Habitat: On fern fronds including those of: *Aspidium filix-mas*, *Athyrium alpestre*, *Athyrium* (*Asplenium*) *filix-foemina*, *Blechnum spicant*, *Onoclea sensibilis*, *Osmunda cinnamomea*, *Pteridium* sp., and *P. aquilinum*.

Type specimen examined: *Cyphella candida* Peck: New York: Forestburgh. Collected by C. H. Peck. (NYS).

Specimens examined from: Czechoslovakia (15), Finland (1), Germany (1), Sweden (7), Ontario (3), New York (3).

A specimen in the Sydow Herbarium at Stockholm (S), which may be the type of *Cyphella filicina* Karst., collected by Karsten on *Pteris aquilina* at Mustiala, Finland, has larger receptacles up to 1 mm. in diameter and 500 μ high, with spores 5,5—6 × 3,5—4 μ. Otherwise the material agrees with the description given above.

A specimen in the Sydow Herbarium at Stockholm (S) labeled as *C. punctoidea* P. Henn., collected by E. Ule No. 844 at Blumenau, St. Catherine, Brazil, agrees with the above description except that the spores are slightly narrower, the few seen measuring 8—10 × 3 μ. Another part of this specimen at Berlin (B) has no definite characters. A third portion of this specimen at the Farlow Herbarium (FH) is a good *Flagelloscypha* and is described in that genus.

Lachnella pinicola sp. nov.

Cupula minuta, cyathiformis, gregaria, sessilis, 200—400 × 200—500 μ, extus pilis tortuosis, plus minusve granulosis, 58 longis, 1—2 μ crassis obtecta; basidiis 16—18 × 4,4—6,2 μ, 4-sterigmaticis; sporis hyalinis, ovoideis vel subglobosis, apiculatis, laevibus, 4,8—6,6 × 4—5,5 μ.

Receptacles minute, cupulate, gregarious, sessile, 200—400 × 200—500 μ, the opening constricted; covered with contorted, branched, more or less roughened hairs up to 58 × 1—2 μ; basidia 16—18 × 4,4—

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6,2 μ, 4-sterigmate; spores hyaline, ovate to subglobose, apiculate, smooth, 4,8—6,6×4—5,5 μ, white in print (according to a note by Coker), hymenium yellowish.

Habitat: On a decorticated fallen pine branch.

Type and specimen examined: North Carolina: Chapel Hill, Dec. 3, 1929. Collected by J. N. Couch 4917 (NCU, NFC).

The above description was drawn in part from notes made on fresh material by Dr. Coker. Dr. Coker noted that the hairs were incrusted but no incrustations were noted by the writer. In Melzer's reagent all structures were yellow.

Lachnella pseudopanax (G. H. Cunn.) comb. nov.

Cyphella pseudopanax G. H. Cunn., Roy. Soc. N. Z. Trans. 81: 186. 1953.

Receptacles scattered, waxy, fragile, 0,2—0,5 mm. in diameter, attached by a narrow base, cupulate or as often pendant; exterior white, drying cream, tomentum of long, unbranched, aseptate hyphae, tortuous, 3 μ in diameter, finely crystal coated, tapering gradually to long-acuminate apices; margin inturned, lacerate when old; hymenial surface concave, even, pallid buff or cream; context white, to 40 μ thick, base to 250 μ, of parallel hyphae radiately arranged; generative hyphae to 2,5 μ in diameter, wall 0,25 μ thick, sparsely branched, septate; hymenial layer to 35 μ deep, paraphyses subclavate; basidia subclavate, 12—16×7—8 μ, 4-sterigmate; spores broadly fusiform or lemon-shaped, apiculate, 6—9×4,5—5,5 μ, smooth, hyaline.

The above description was taken from Cunningham (1953). The writer would add that the surface hairs are 150—250×5—6 μ, arising directly from the context hyphae without apparent septation; all hyphae and the base of the basidia possess clamps.

Habitat: On *Pseudopanax crassifolium.*

Type and specimen examined: New Zealand: Mt. Egmont, 2700 ft., Taranaki District, Feb. 1952. Coll. by G. H. Cunningham. (NZPD).

Lachnella punctiformis (Fr.) comb. nov.

Trichopeziza punctiformis (Fr.) Fckl., Symb. Myc. 296. 1870. — *Peziza punctiformis* Fr., Syst. Myc. 2: 105. 1822. — *Peziza dryophila* Pers., Myc. Eur. 1: 265. 1822. — *Cyphella punctiformis* (Fr.) Karst., Fung. Fenn. 714. 1867. — *Chaetocypha punctiformis* (Fr. & Karst.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella nivea* Fckl., Symb. Myc. 26. 70 not *C. nivea* Crouan, Fl. Finist. 61. 1867. — *Cyphella punctiformis* var. *stipitata* Sacc., Mich. 2: 303. 1880. — *Calyptella nivea* (Fckl.) Quél., Ench. Fung. 216. 216. 1886. — *Cyphella niveola* Sacc., Syll. Fung. 6: 678. 1888. — *Chaetocypha niveola* (Sacc.), O. Kuntze, Rev. Gen. 2: 847. 1891.

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Receptacles gregarious, white, 0,1—2,0 mm. wide and high, stipitate to substipitate; surface hairs with very narrow lumen, hyaline, granuleincrusted, 125—175 × 6—10 μ, tapering to a point; basidia 60—70 × 6—10 μ, 4-sterigmate; spores ovate, smooth, hyaline, apiculate, 10—15 × 6,5—7,0 μ.

Habitat: On dead pieces of *Crataegus oxyacanthus*, *Equisetum* sp., *Eupatorium cannabinum* and *Salix caprea*.

Specimens examined from: Austria (2), Finland (1), France (3), South Carolina (1).

Some of this description was taken from notes in a packet of a specimen of *Cyphella niveola* Sacc. at the National Fungus Collections (NFC). Both this and a duplicate specimen at the Farlow Herbarium (FH) were too inadequate for satisfactory study. A specimen from the Rehm Herbarium at Stockholm (S) has narrower spores measuring 11,5 × 4 μ.

Lachnella pyriformis (G. H. Cunn.) comb. nov.

Cyphella pyriformis G. H. Cunn., Trans. Roy. Soc. N. Z. 81: 184. 1953.

Receptacles scattered, membranous, brittle, 0,2—1,0 mm. in diameter, attached by a short narrow base, at first subglobose, becoming pezizoid; exterior white, covered with a dense tomentum of fine hairs curved over the hymenium, 5—6 μ in diameter, wall 1 μ thick, finely crystal coated with occasional inflated areas at or near the apex; magin inturned, fimbriate; hymenium surface concave, white becoming cream; context white, to 100 μ thick, to 250 μ at the base of radiately arranged compact parallel hyphae, outer few layers tinted; generative hyphae to 4 μ in diameter, wall 0,25 μ thick, branched, septate; hymenial layer to 60 μ deep, paraphyses filiform, numerous, apically acuminate; basidia subclavate. 40—50 × 10—12 μ, 2—4-spored; spores pyriform, flask-shaped or tear-shaped, base rounded, apex long-acuminate, 15—20 × 9—11 μ, smooth, hyaline.

The above description was taken from Cunningham (1953). The writer would add that this is an elaboration on the dochmiosporous type of spore with slightly larger spores than *L. alboviolascens*, but with the same type of surface hairs and receptacles. Subhymenial clamps are abundant in the portion of the type sent by Dr. Cunningham. This species is slightly larger in all respects than *L. turbinata*.

Type and specimen examined: New Zealand: Mt. Egmont, 4000 ft., Taranaki District. J. M. Dingley, Apr. 1946. (NZPD).

Habitat: On *Hebe salicifolia*.

Lachnella rosae sp. nov.

Cupula alba, gregaria, subsessilis, vel sessilis, 200—500 μ diam., extus pilis hyalinis biformibus praedita; basidiis 4-sterigmaticis,

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36×7 μ; sporis hyalinis, laevibus, apiculatis, ovoideis 10—11× (4)—5—7 μ.

Receptacles white, gregarious, subsessile to sessile, 200—500 μ in diameter; surface hairs hyaline, of two types, one without staining contents, simple, granule-incrusted, with large non-acicular granules which adhere to the wall, round pointed, (75)—100—125×4—5 μ; the other with contents staining red in phloxine, simple or branched at the outer quater, with pointed tips, (85)—100—160×1—2 μ; subhymenial hyphae 1—2 μ in diameter, clamped; basidia 4-spored, 36×7 μ; spores hyaline, smooth, apiculate, ovate, 10—11×(4)—5—7 μ.

Habitat: On dead canes of *Rosa spauldingii*.

Type: Idaho: Lewis Co., near Mohler between Nez Perce and Craigmont, Oct. 29, 1949. Collected by H. W. Smith and W. B. Cooke (WBC 26106).

Specimens examined from: Lewis Co., Idaho (1), Whitman Co., Washington (1).

Lachnella septentrionalis sp. nov.

Cupula alba vel pallide lutea, 100—200 μ diam., sessilis, extus tomentosa; basidiis 4-sterigmaticis, 12—18×4—5 μ; sporis cylindraceis vel ovoideis, hyalinis, laevibus, apiculatis, 6—8×2—4 μ.

Receptacles whitish to cream-colored, 100—200 μ in diameter, sessile; surface without special hairs but covered with loosely interwoven yellowish hyphae 5—7 μ in diameter, septate, sometimes constricted at the septa, without clamps; context of parallel arranged, thin-walled, hyaline hyphae, 3—5 μ in diameter; basidia 4-sterigmate, 12—18×4—5 μ; spores cylindric to tear-shaped, straight to somewhat curved, flattened on one side, hyaline, smooth, apiculate, 6—8×2—4 μ.

Habitat: On dead leaves and sticks in litter.

Type: Ontario: Lake Temagami, Bear Island, Sept. 3, 1937. Collected by H. S. Jackson. (TRTC 22986).

Specimens examined from: Ontario (8).

Lachnella tiliae (Pk.) comb. nov.

Peziza tiliae Pk., N. Y. St. Bot. Rept. 24: 98. 1872. — *Trichopeziza tiliae* (Pk.) Sacc., Syll. Fung. 8: 428. 1889. — *Cyphella tiliae* (Pk.) M. C. Cooke, Grev. 20: 9. 1891.

Receptacles white, with a whitish to yellowish hymenium, 0,2—1,0 mm. high, 0,2—3,0 mm. in diameter; arising from a black sclerotic base; short-stipitate, scattered to gregarious; surface hairs white, straight, densely and finely granule-incrusted, 100—200×4—8 μ; basidia 33—60×10—15 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, ovate-allantoid to tear-shaped, flattened on one side, 10—(13,5)—20×4—(5,5—8) 10 μ.

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Habitat: On the bark of twigs and branches of *Tilia* spp. and *Tilia americana*. Also reported on *Juglans regia*, *Acer* spp., and *Populus tremuloides*. In some instances, at least, the *Acer* determinations of host material have been in error.

Type: *Peziza tiliae* Pk.: New York: On dead limbs of *Tilia americana*, Knowersville. C. H. Peck. (K).

Specimens examined from: Manitoba (5), Ontario (21), Quebec (1), Iowa (5), Maine (1), Michigan (2), Minnesota (2), Missouri (3), New Jersey (1), New York (15), North Dokata (2), Ohio (1), Oregon (1), Utah (2), Vermont (2), Wisconsin (5).

This species is easily recognizable from its habitat on *Tilia*, to which host genus it is rather strictly confined, and from the black sclerotic base from which the receptacles arise. In the past it has been given such herbarium names as *Cyphella villosa* and *C. pezizoides*. It is reasonable to expect such treatment since, except for the two characters noted in this paragraph it appears very much like these species.

Lachnella tongariro (G. H. Cunn.) comb. nov.

Cyphella tongariro G. H. Cunn., Roy. Soc. N. Z. Trans. 81: 185. 1953.

Receptacles scattered, waxy, brittle, cupulate, 0,5—0,75 mm. in diameter, attached by a narrow base; exterior white, tomentum composed of tortuous aseptate thick-walled branched hyphae, 5 μ in diameter, with lumen almost obliterated, coated with coarse deciduous crystals, terminating in long, gradually tapering spirally coiled naked apices; margins inturned, lacerate when old; hymenial surface concave, buff or honey-colored; context white, to 50 μ thick, to 500 μ at the base, of parallel radiately arranged hyphae; generative hyphae to 3,5 μ in diameter, wall 0,25 μ thick, sparsely branched, septate; hymenial layer to 40 μ deep, paraphyses subclavate; basidia subclavate, 16—20×5—6 μ, 4-sterigmate; spores fusiform-elliptical, apex rounded, base pointed and apiculate, 7—8×3—3,5 μ, smooth, hyaline.

The above description was taken from Cunningham (1953). The writer would add that the basidia have basal clamps and some context hyphae are clamped. The surface hairs reach 150 μ long with the outer third of the whiplash type described above.

Habitat: On *Phyllocladus trichomanoides*.

Type and specimen examined: New Zealand: Mt. Tongariro, 2500 ft., Auckland District. Mar. 1952. Collected by G. H. Cunningham. (NZPD).

Lachnella turbinata (G. H. Cunn.) comb. nov.

Cyphella turbinata G. H. Cunn., Roy. Soc. N. Z. Trans. 81: 185. 1953.

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Receptacles scattered, membranous, waxy, fragile, 0,1—0,5 mm. in diameter, attached by a brief stem-like base, at first subglobose becoming urecolate or discoid; exterior dingy white, covered with a scanty tomentum, hairs 4—6 μ in diameter, wall 0,5 μ thick, hyaline, finely crystal coated; margin inturned, fimbriate; hymenial surface slightly concave, white or cream; context white, to 80 μ thick, to 250 μ at the base, of radiately arranged mainly parallel hyphae; generative hyphae 5—6 μ in diameter, wall 0,25 μ thick, branched, septate, hyaline; hymenial layer to 80 μ deep, paraphyses filiform, somewhat scanty, apices acuminate; basidia clavate, some almost capitate, 60—80×16—20 μ, 4-spored; spores turbinate, 14—16×10—12 μ, smooth, hyaline.

The above description was taken from Cunningham (1953). The writer found abundant surface hairs 200—250 μ long, 7,2—9,0 μ in diameter, covered with fine crystalline material; the basidia in the portion of the type kindly loaned by Dr. Cunningham measured 50—55×7,2—9,0 μ. The spores measured 18×12,5 μ and the basidia have clamps at the base. The paraphysis-like bodies were 5—6 μ in diameter. In this and in *L. pyriforma* these bodies are either young basidia or cystidioles.

Habitat: On *Olearia paniculata.*

Type and specimen examined: New Zealand: Invercargill, Otago. Oct. 1950. Collected by W. Faithful. (NZPD).

Lachnella uvicola (Speg.) comb. nov.

Cyphella uvicola Speg., Ann. Mus. Nac. Buenos Aires 1899: 182. 1899.

Receptacles sessile, 0,5 mm. in diameter; surface hairs hyaline, thick-walled, not noticeably granule-incrusted, 72×4 μ, sometimes with contents staining red in KOH-phloxine mounts; basidia 36×9 μ, 4-sterigmate; spores hyaline, ovate, apiculate, smooth, 10,5×8 μ.

Habitat: On fruits of *Vitis vinifera.*

Type and specimen examined: Argentina: Tucuman, Famaillá. Feb. 5, 1895. Collected by C. Spegazzini. (LPS 25854).

Lachnella villosa (Pers. ex Schw. in Fr.) Gillet, Champ. Fr., Disc. 80. 1881.

Peziza villosa Pers. ex. Fr., Syst. Myc. 2: 104. 1822. — *Cyphella villosa* (Pers. ex Fr.) Crouan, Fl. Finist. 61. 1867. — *Trichopeziza villosa* (Pers. ex Fr.) Fckl., Symb. Myc. 296. 1870. — *Calyptella villosa* (Pers. ex Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella villosa* var. *major* Pilát, Ann. Mycol. 23: 153. 1925.

Receptacles white to bluish-gray, gregarious to separate, sessile to subsessile, 100—1000 μ in diameter and in heigh, margin inrolled when dry; surface hairs hyaline, 100—275(—500)×3—8 μ, densely,

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finely granule-incrusted, occasionally ending in a whip-lash, tapering to a point; context hyphae 3—4 μ in diameter, clamped; subhymenial hyphae 2—3 μ in diameter; hymenium white to cream-color, composed of basidia 26—50 × 6—10 μ, 4-sterigmate, clamped at the base; spores smooth, hyaline, apiculate, ovate to cylindric, flattened on one side, 7—12 × 5—9 μ.

Habitat: On herbaceous litter and twigs of woody plants including; *Alnus glutinosa*, *A. jorullensis* ssp. *spachii*, *Anthriscus silvestris*, *Artemisia campestris*, *A. major*, *A. rigida*, *Astragalus glycyphyllus*, *Boehmeria nivea*, *Bupleuron falcatum*, *Cercis libquastris*, *Chenopodium vulgaris*, *Cimcifuga racemosa*, *Cirsium arvense*, *Cladium* sp., *Cornus mas*, *Cytisus capitatus*, *Digitalis* sp., *Encelia californica*, *Epilobium angustifolium*, *Eupatorium cannabinum*, *Eugenia jambolina*, *Erica* sp., *Fagus silvaticus* (hulls), *Galium aparine*, *G. mollugo*, *Genista florida*, *Geranium pratense*, *Heleborus foetidus*, *Humulus lupulus*, *Ilex* sp., *Latyrus pratensis*, *Lonicera caprifolium*, *Melilotus alba*, *M. officinalis*, *M. longifolia*, *Mentha* sp., *Oenanthe* sp., *O. crocata*, *O. canadensis*, *Ononia spinosa*, *Rubus* sp., *Rumex* sp., *Ruscus aculeatus*, *Sambucus ebulus*, *S. nigra*, *Sarothamnus riparum*, *Sedum maximum*, *Senecio jacobea*, *S. fuchneri*, *Solanum tuberosum*, *Solidago serotina*, *Symphytum officinale*, *Syringa vulgaris*, *Telekia speciosa*, *Teucrium chamaedrys*, *Trifolium medium*, *Ulmus* sp., *Urtica* sp., *U. dioica*, *U. lyallii*, *Valeriana officinalis* sp., *Verbascum* sp., *V. austriacum*, *V. thapsiforme*, *Veronica chamaedrys*, *Vicia faba* and *Vitis* sp.

Type specimens examined:

Cyphella villosa var. *major* Pilát: Czechoslovakia: Zarssice, Moravia. Aug. 17, 1946, V. Vacek (PR).

Specimens examined from: Austria (2), Belgium (1) Czechoslovakia (3), England (34), France (4), Germany (35), Hungary (4), Italy (5), Portugal (1), Sweden (27), Switzerland (1), Tunis (1), China (1), Ceylon (2), Philippine Islands (1), Australia (1), Argentina (1), Chile (1), Ecuador (1), California (2), Oregon (3), South Carolina (2), Virginia (1).

As in other genera and groups of cyphellaceous fungi, the complex of *L. alboviolascens* and *L. villosa* is largely separable only on spore size. The color of the receptacles and hymenium varies from white to whitish grey and bluish. In nearly 700 specimens including replicates and duplicates filed in most of the herbaria from which material was studied, the only constant variation occurred in spore size. These two species include most of the specimens assigned to categories based on spore size. Where spores are lacking it is not possible to assign a collection to either of these categories accurately. Species based on specimens or descriptions in which this information is not given accurately are also difficult to assign with certainty and most of those are included under *L. alboviolascens*.

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The following information on habitats and locations from which specimens in which spores were not found or reported will supplement distribution records for this group of fungi.

Habitat: On dead herbaceous and woody sticks including those of: *Caprifolium hortense*, *Cornus* sp., *Equisetum silvaticum*, *Galium aparine*, *Geranium* sp., *Pinus* sp., *Solanum tuberosum*, *Solidago canadensis*, *Sambucus ebulus*, *Syringa vulgaris* and *Teucrium chamaedrys*.

Specimesn examined from: Austria (1), Belgium (1), Czechoslovakia (4), Germany (1), Great Britain (1), Russia (1), Sweden (1), Cuba (1), British Columbia (1), Ontario (1), California (1), Delaware (1), Georgia (1), Louisiana (1).

Maireina (Pilát) stat. nov.

Cyphella subg. *Maireina* Pilát, Ann. Mycol. 23: 160. 1925.

Cyphella subg. *Maireiella* Pilát, Publ. Fac. Sci. U. Charles 29: 60. 1925.

Receptacles tubular to cupulate, covered with yellow brown to brown, smooth or granule-incrusted hairs, mostly without a subiculum, spores hyaline.

Type species: *Cyphella monacha* Speg.

Key to Species of *Maireina*

1. Brown subiculum hairs present on the substratum ..... *M. jacksonii*
1. No subiculum hairs present 2
2. Surface hairs with special tips 3
2. Surface hairs straight, stiff to flexuous or geniculate 6
3. Surface hairs with hooked tips 4
3. Surface with otherwise modified tips 5
4. Spores 6—8 × 4—5 μ ..... *M. stevensonii*
4. Spores 10,5—11,5 × 2,5—3,5 μ ..... *M. fulvescens*
5. Surface hairs with spiral tips ..... *M. spiralis*
5. Surface hairs with acanthophysoid tips ..... *M. amorpha*
6. Surface hairs smooth 7
6. Surface hairs incrusted 9
7. Spores up to 4,5 μ long, hairs 60—90 μ long ..... *M. subspiralis*
7. Spores 9—11 μ long 8
8. Spores 10,5—11 × 3,5—4 μ, hairs 30—50 μ long ..... *M. pseudogrisella*
8. Spores 9—11 × 7—9 μ, hairs up to 200 μ long ..... *M. malayensis*
9. Surface hairs covered with scales ..... *M. stilboidea*
9. Surface hairs incrusted with crystalline granules 10
10. Spores longer than 9 μ, cylindric to ovate 11
10. Spores not or barely reaching 9 μ in length, cylindric to ovate 18
11. Receptacles cylindric, hairs stiff, 70—100 μ long, spores 10—11,5 × 4—5 μ ..... *M. cinerea*
11. Receptacles cupulate to subcylindric 12
12. Receptacles with a short stipe, spores 13,4 × 6,7 μ ..... *M. spegazzinii*
12. Receptacles sessile to subsessile 13
13. Spores globose to subglobose, 8—9 μ in diameter or 9—10 × 8—9 μ ..... *M. regnelliana*
13. Spores ovate to cylindric 14

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14. Spores up to 11 μ long, 9—11 × 5—6 μ ..... *M. leonina*
14. Spores longer, reaching 15—17 μ in length 15
15. Spores up to 15 μ long, cylindric to subcylindric, 12,5—14,5 × 6,5—7,5 ..... *M. monacha*
15. Spores up to 17 μ long 16
16. Receptacles shallowly cup-shaped, spores 10—16,8 × 6—10,5 μ 17
16. Receptacles deeply cup-shaped, spores 13,5—17 × 7—9 μ, surface hairs tortuous to geniculate ..... *M. thujae*
17. Receptacles reaching 1 mm. in diameter, surface hairs reaching 375 μ long, incrusted on outer ¼ of length ..... *M. marginata*
17. Receptacles reaching 0,5 mm. in diameter, surface hairs reaching 150 μ long, incrusted on outer ¾ of length ..... *M. texensis*
18. Surface hairs 15—20 μ long ..... *M. pseudurceolata*
18. Surface hairs usually more than 70 μ long 19
19. Spores less than 6 μ long 20
19. Spores more than 6 μ long 22
20. Surface hairs yellow, spores 4,5—5 × 2,5—3 μ ..... *M. paraensis*
20. Surface hairs brown 21
21. Surface hairs stiff, spores 3—3,5 × 2—2,5 μ ..... *M. ilicis*
21. Surface hairs lax, spores globose, 4,5—5,5 μ in diameter .. *M. disseminata*
22. Receptacles strongly cylindric 23
22. Receptacles cupulate 24
23. Receptacles 5 mm. tall, 1 mm. in diameter, hairs 90—150 μ long, spores 6—7 × 3,5—4 μ ..... *M. maxima*
23. Receptacles reaching 1 mm. long, 0,5 mm., in diameter, spores 5—7 × 1,5—3,5 μ ..... *M. linderi*
24. Receptacles urceolate, surface hairs 75—85 × 3—4 μ, spores 8,5—9 × 5,5—6 μ ..... *M. pseudochracea*
24. Receptacles discoid 25
25. Spores 6 × 3,5 μ, mouth of receptacle yellow ..... *M. callostoma*
25. Mouth of receptacle not yellow, spores larger 26
26. Receptacles small, 100—200 μ in diameter, spores 6—8 × 3—4 μ ..... *M. caulium*
26. Receptacles larger, reaching 1 mm. in diameter 27
27. Spores 7—8 × 3—4 μ ..... *M. crispula*
27. Spores 8,5—9 × 5—6 μ ..... *M. hyperici*

Maireina amorpha sp. nov.

Cupula grisea, 0,5—2 mm. diam.; extus pilis hyphoideis, superne acanthophysoideo-ramulosis, 20—40 μ longis obtecta; basidiis 18—20 × 4—6 μ, 4-sterigmaticis; sporis laevibus, apiculatis, hyalinis, ovoideis, 4,5—5 × 3,5—4 μ.

Receptacles dark grey, 0,5—2 mm. in diameter; surface covered with a web of branched anastomosing light brown hyphae, incrusted with amorphous brownish crystalline material; hyphae 2—4 μ in diameter. loosely arranged, septate, terminating in projecting acanthophysoid branches forming an apparent palisade of hyphae 20—40 μ long, terminating in short fine branches; context loosely interwoven, formed of clamped hyphae 2—3 μ in diameter; subhymenial hyphae clamped, 1,5—2 μ in diameter; hymenium composed only of basidia; basidia 18—20 × 4—6 μ, 4-sterigmate, clamped at the base; spores smooth, apiculate, hyaline, broad ovate, 4,5—5 × 3,5—4 μ.

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Habitat: On rotten wood.

Type and specimen examined: England: Forden No. 34. Herbarium of M. C. Cooke (K).

Maireina callostoma (Pilát) comb. nov.

Cyphella callostoma Pilát, Hedwigia 67: 113. 1927.

Receptacles subcylindric, 450—550 μ high, up to 350 μ in diameter, subsessile, orange, covered with special hairs; surface hairs yellow brown, stiff, straight, covered with fine granular crystals, 100—150× 2,5—3,5 μ; context hyphae 2,5—3 μ in diameter, simple septate; subhymenial hyphae 2—2,5 μ in diameter, basidia in a tightly packed palisade, 14,5×3,6 μ when young, 4-sterigmate, with basal clamps; spores hyaline, smooth, apiculate, triangular-ovate, 6×3,5 μ.

Habitat: On root masses at base of *Polypodium vulgare* and *Platycerium alicorne.*

Specimens examined from: Czechoslovakia (3).

Type: Czechoslovakia: Prague: Hortus botanicus Aug. 1926, A. Pilát (P. 174108).

This species is very similar to *M. maxima.* It is retained as a distinct species because of the broad ovate, triangular spores, the smaller receptacles the habit on fern roots and the geographic separation of the two species. If additional collections from intermediate areas are found, these gaps may be filled and the two species may be considered synonymous.

Maireina caulium (Fckl.) comb. nov.

Tapesia caulium Fckl., Symb. Myc. 1: 301. 1870. — *Solenia caulium* (Fckl.) Fckl., Symb. Myc. 1 Nachtrag 290. 1871. — *Henningsomyces caulium* (Fckl.) O. Kuntze, Rev. Gen. 3 (2): 483. 1898.

Receptacles 100—300 μ in diameter, cupulate, not cylindric, clothed with brown, granule-incrusted hairs with hyaline tips 95—125×3—4 μ; basidia 4-sterigmate, 18—20×6—7 μ; spores hyaline, apiculate, smooth, ovate to cylindric, 6—8×3—4 μ.

Habitat: On dead stems of *Epilobium hirsutum.*

Type: Austria: ex Herb. Fuckel. (FH, Hoehn. in FH)

Specimens examined from: Austria (3).

Maireina cinerea (Burt) comb. nov.

Solenia cinerea Burt, in Millspaugh and Nuttall, Flora Santa Catalina Island 315. 1922.

Receptacles gregarious, grey, possibly fasciculate; covered with stiff brown hairs which become more or less incurved on drying at the mouth of the receptacle; surface hairs covered with easily removable hyaline crystalline granules which give a grey color to the receptacles

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when dry, 70—100×3—4 μ, basidia 28—36×6—7 μ, clavate, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 10—11,5×4—5 μ.

Habitat: On bark of *Quercus* sp.

Type and specimen examined: California: Los Angeles Co., Santa Catalina Island, Avalon, May 28, 1920. L. W. Nuttall 396. (MO 57610 in NFC, FH).

Maireina crispula Rick, sp. nov.

Cupula cyathiformis sessilis, usque ad 1 mm. diam., extus pilis brunneis, plus minusve granulosis obtecta basidiis 4-sterigmaticis, 18—22×5—6 μ; sporis cylindraceis vel ellipsoideis, hyalinis, apiculatis, laevibus, 7—8×3—4 μ.

Receptacles discoid, sessile, up to 1 mm. in diameter; surface smooth, brown, made up of appressed, brown, more or less granule-incrusted hyphae 3—4 μ in diameter; basidia 4-sterigmate, 18—22×5—6 μ, with sterigmata 2—3 μ long; spores cylindric to tear-shaped, hyaline, apiculate, smooth, flattened on one side, 7—8×3—4 μ.

Habitat: On herbaceous stems.

Type and specimen examined: Brazil: J. Rick. (CGL 32932 in NFC).

With this specimen there was a second which was very much like it except that it appeared white becuase of the white granules incrusting the surfaces of the surface hyphae which measured 25—50×3—4 μ.

Maireina disseminata (Berk & Br.) comb. nov.

Cyphella disseminata Berk. & Br., Jour. Lim. Soc. Lond. Bot. 14: 74. 1875. — *Chaetocypha disseminata* (Berk. & Br.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles like fine grains of tan sand on brown substratum, 100—200 μ in diameter and high, cupulate, tending toward cylindrical, clothed with special hairs; surface hairs loosely arranged, brown to tip, 50—110×3,5 μ, even, somewhat granule incrusted, pointed at tip, weakly spiraled to geniculate; context thin, hyphae hyaline; basidia 11—13×3—4 μ, 4-sterigmate; no clamps seen; spores hyaline, smooth, apiculate, subglobose to nearly globose, 4,5—5,5 μ in diameter.

Habitat: On wood.

Type: Ceylon: Collected by H. K. T., Nov. 1867. (K).

Specimens examined from: Ceylon (2).

Maireina fulvescens (Bourd. et Galz.) comb. nov.

Cyphella fulvescens Bourd. & Galz., Hym. de France 162. 1928.

Receptacles cream colored, cupulate, sessile to subsessile, 500 μ in diameter and high, crowded, covered with special hairs; surface hairs brown, incrusted with fine crystalline granules, 100—125×3—4 μ,

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with collapsed inflated tips curled back as a shepherd's crook context hyphae 3—4 μ in diameter; subhymenial hyphae 2,5—3 μ in diameter; no clamp connections seen; basidia clavate, crowded in a tight hymenial palisade, 29×6—8 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 10,5—11,5×2,5—3,5 μ.

Habitat: On *Salix cinerea*.

Specimen examined: Germany (1).

The surface hairs are similar to those of *Merismodes anomala* as in the shape of the spores. However, the subsessile cupulate fruit bodies place this species with other cyphelloid fungi with brown surface hairs.

The name *C. grisella* Bourd. & Galz. appears on a note in the packet examined from Prague.

Maireina hyperici (Vel.) comb. nov.

Cyphella (*Pseudodasyscypha*) *hyperici* Vel., Nov. Mycol. 1: 167. 1939.

Receptacles brown, discoid, sessile, up to 1 mm. in diameter, 0,5 mm. high, covered with brown hairs; surface hairs brown, thin-walled, toward the tip incrusted with fine crystalline granules, up to 150 μ long, 5—6 μ in diameter; context hyphae compact, 2,5—3,5 μ in diameter; subhymenial hyphae 2—2,5 μ in diameter; basidia clavate, in a compact hymenial palisade, 4-sterigmate, 40—45×7—8 μ, clamped at the base; spores hyaline, smooth, apiculate, flattened on one side, triangular ovate, 8,5—9×5—6 μ.

Habitat: On dead stems of *Hypericum perforatum*.

Type and specimen examined: Czechoslovakia: Bohemia: Mnichovice, July 1939, J. Velenovsky (P. 153573).

This species differs from other members of the genus in the type of surface hairs and from most other species in the triangular spores.

Maireina ilicis sp. nov.

Cupula brunnea, cylindracea, 250 μ longa, 100 μ diam., sessilis, strigoso-pilosa; pilis minute granulosis, 72—100 longis 2,5—3,5 μ latis; basidiis 4-sterigmaticis, 6—7—(9)×3,5—4 μ; sporis late ellipsoideis, laevibus, hyalinis, apiculatis, 3—3,5×2—2,5 μ.

Receptacles brown, cylindric, 250 μ long, 100 μ in diameter, sessile, covered with straight, stiff, brown hairs which point upward and are appressed to the side of the receptacle, hairs covered with minute, hyaline, crystalline granules easily removed in mounting, 72—108×2,5—3,5 μ; context composed of only 1—3 layers of cells between the brown surface hairs and the hymenium; basidia 4-sterigmate, 6—7—(9)×3,5—4 μ, sterigmata 1,5 μ long; spores broadly ellipsoid, smooth, hyaline, apiculate, 3—3,5×2—2,5 μ.

Habitat: On wood of *Ilex* sp.

Type and specimen examined: Tennessee: Great Smoky Mountains

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National Park, Cades Cove, Aug. 19, 1939. Collected by L. O. Overholts. (LOO 23107 in PAC).

Maireina jacksonii sp. nov.

Cupula pallide lutea, cyathiformis, sessilis, ad 1 mm. diam., subiculo brunneo insidens, extus pilis luteis vel luteo-brunneis, incrustatis, 90—200 longis 3—4 μ latis praedita; basidiis 2—4-sterigmaticis, 12—15×4—5 μ; sporis hyalinis, apiculatis laevibus, ovoideis, 3—5×2—3 μ.

Receptacles cream-colored, cup-shaped, sessile, reaching 1 mm. in diameter; on a subiculum of loosely interwoven, brown hyphae at each septum of which occurs a clamp; hyphae becoming thick-walled, at first hyaline, up to 7 μ thick; surface hairs yellow to yellowish-brown, incrusted with medium to fine granules on outer half to third of length, more or less flexuous, 90—200×3—4 μ; basidia 2—4-sterigmate, 12—15×4—5 μ; spores hyaline, apiculate, smooth, ovate, 3—5×2—3 μ.

Habitat: On stems of ferns such as *Pteridium* and *Osmunda*.

Type: Ontario: Lake Temagami, Kokoko Bay, July 19, 1938. Collected by H. S. Jackson. (TRTC 23000).

Specimens examined from: Ontario (4).

Maireina leonina (Speg.) comb. nov.

Cyphella leonina Speg., Ann. Soc. Cient. Argent. 11: 17. 1881. — *Chaetocypha leonina* (Speg.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella laevipila* Speg., Ann. Mus. Nac. Buenos Aires 17: 115. 1908.

Receptacles single to densely gregarious, not fasciculate, 1—2 mm. high and wide, fulvous hairs covering the mouth; surface hairs brown, not or inconspicuously septate, thick-walled, pointed, with fine granules over whole length, or only on outer quarter, 150—325×5—7 μ; context hyphae clamped; basidia 36—45×7—11 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric to allantoid, 9—(11—12)—14,5×4,5—6,0 μ.

Habitat: On dead wood, bark and herbage, including that of *Celtis tela* and *Tillandsia lorentziana*.

Type specimens examined:

Cyphella leonina Speg.: Argentina: Montes Largos, Jan. 1881. Collected by C. Spegazzini. (LPS).

Cyphella laevipila Speg.: Argentina: La Plata, Jardim Botanico. July 6, 1903. Collected by C. Spegazzini. (LPS).

Specimens examined from: Argentina (3).

Maireina linderi sp. nov.

Cupula tubulosa, 200—1000 μ longa, 100—500 μ diam., sessilis, vel subsessilis, strigoso-pilosa; pilis brunneis, granulosis, 90—100

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longis 3—4 μ crassis; basidiis 4-sterigmaticis, 7—13,6×3—5 μ; sporis laevibus, ellipsoideis, apiculatis, hyalinis, 2—7×1,5—3,5 μ.

Receptacles tubular, 200—400—1000 μ long, 100—(200)—500 μ in diameter, with the macroscopic aspect of *S. candida*, sessile to subsessile; covered with brown hairs arising at all points on the surface of the receptacle, appressed, granule-incrusted on outer 2/3 to 1/2 of length, 90—110×3—4 μ, when dry bending over and closing the mouth of the receptacle; basidia apparently 4-sterigmate, 7—13,6× 3—5 μ; spores smooth, ellipsoid, apiculate, hyaline, 2—3×1—2 μ in one portion of one specimen, 5—7×1,5—3,5 μ in the other portion.

Habitat: On fallen leaf of *Astrocaryon* (Palm).

Type and specimen examined: British Guiana: Koreai Creek, Essequibo River, Jan. 1924. Coll. D. H. Linder 671. (NFC, FH).

Maireina malayensis sp. nov.

Cupula subcylindracea, 2,0×0,5 mm., gregaria, extus pilis densis, pallide brunneis, undulatis, ad 200 longis 2—3 μ latis obtecta; contextu ex hyphis pallide brunneis composito; basidiis 27—36×7—9 μ, 4-sterigmatis; sporis ovoideis, laevibus, hyalinis, apiculatis, 9—11× 7—9 μ.

Receptacles subcylindric to narrow funnel-shaped, 2 mm. high, 0,5 mm. in diameter when dry, clustered but not fasciculate not conglobate; densely clothed with light brown, weakly spiral or curled hairs, smooth, up to 200×2—3 μ; context appearing layered, hymenium 45 μ thick, subhymenium up to 54 μ thick, context up to 72 μ, and surface hair layer up to 144 μ thick; context hyphae 2—2,5 μ in diameter, light brown; subhymenial hyphae 1,5—2,0 μ in diameter, with clamp connections; hymenium composed only of basidia; basidia 27—36×7—9 μ, 4-sterigmate; spores ovate, smooth, hyaline, apiculate, 9—11×7—9 μ.

Habitat: On dead mangrove in salt water.

Type and specimen examined: Malay Peninsula: Selangor: Port Twettenham. Collected Jan. 25, 1920, by T. F. Chupp. (K).

Maireina marginata (MacAlpine) comb. nov.

Cyphella marginata MacAlpine, Stone Fruit Dis. in Aust. 120. 1902.

Receptacles cup-shaped, sometimes nearly repand, margin inrolled, erumpent on outer bark, scattered to subgregarious, yellowish with a darker margin, 0,3—1,0 mm. in diameter, mostly sessile to occasionally substipitate; hymenium cream to yellowish; surface hairs brown, incrusted on outer fourth to half of length, tips hyaline, pointed, 125—375×6—10 μ; basidia clavate, 50—65×10—15 μ, somewhat enlarged above, 4-sterigmate; spores hyaline, smooth, apiculate, ovate to cuneate, tear-shaped, cylindric or allantoid, flattened on one side, 10—16,8×6—10 μ.

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Habitat: On dead twigs of fruit trees including those of *Pyrus malus*, *Prunus persica* and *P. amygdalus*, and on twigs of *Cytisus scoparius*. These dead twigs are usually found on living plants.

Specimens examined from: Oregon (6).

Maireina maxima (Massee) comb. nov.

Cyphella maxima Massee, Brit. Fungus Flora 1: 143. 1892. — *Henningsomyces maximus* (Massee) O. Kuntze, Rev. Gen. 3(2): 483. 1898.

Receptacles gregarious, elongate, tubular, yellowish, subsessile, 5 mm. long, 1 mm. in diameter; surface hairs brown, straight to curved, outer third of length granule-incrusted, 90—150 × 3—4 μ; basidia 15—17 × 5—7 μ, 4-sterigmate; spores hyaline, smooth, apiculate, ovate, 6—7 × 3,5—4 μ.

Habitat: On dead wood.

Type and specimen examined: England: Lyndhurst, Coll. G. Massee (NY).

Maireina monacha (Speg.) comb. nov.

Cyphella monacha Speg., in Sacc., Mich. 2: 303. 1880. — *Cyphella obscura* Roumeguère, Fung. Gall. exs. 1905. 1882. — *Cyphella leochroma* Bres., Fung. Trid. 2: 49. 1884. — *Cyphella tephroleuca* Bres., Fung. Trid. 2: 57. 1884. — *Cyphella sydowii* Bres., in Sydow, Mycoth. March. 3706. 1892. — *Cyphella gregaria* Sydow, Hedw. 1900: 116. 1900. — *Cyphella bresadolae* Grélet, Soc. Myc. Fr. Bull. 38: 174. 1922. — *Cyphella bresadolae* var. *leochroma* (Bres.) Grél., Soc. Myc. Fr. Bull. 38: 174. 1922. — *Cyphella bresadolae* var. *tephroleuca* (Bres.) Grél., Soc. Myc. Fr. Bull. 38: 174. 1922. — *Cyphella bresadolae* var. *gregaria* (Syd.) Pilát, Ann. Mycol. 23: 162. 1925.

Receptacles brown, short-stipitate to sessile, 0,5—1,0 mm. wide, 0,5—1,0 mm. high, subgregarious; surface hairs brown, smooth to minutely granule-incrusted, upper hairs curled around edge of cup, lower hairs projecting outward, mostly originating at or just above the point of insertion of the stipe-like base, 70—250 × 3,5—7,0 μ, with hyaline tips, roughened mostly on the outer third of their length; subhymenial hyphae 1—2 μ in diameter, with clamps; basidia (25)—36—43 × 5,5—8,0 μ, 4-sterigmate, young basidia appearing as sterile cells 30—38 × 2—4 μ; spores hyaline, smooth, apiculate, ovate to ellipsoid to tear-shaped, flattened on one side, (10,8)—12,5—14,5 × (5,5)—6,5—7,5 μ.

Habitat: On dead stems and twigs of plants including: *Artemisia campestris*, *Berberis vulgaris*, *Bupleuron fraxinum*, *B. fruticosum*, *B. falcatum*, *Centaurea jacea*, *Corylus avellana*, *Davisia latifolia*, *Genista tinctoria*, *Hieracium umbellatum*, *Humulus lupulus*, *Ledum*

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tenuifolium, *Lingustrum vulgare*, *Lonicera* sp., *Sarothamnus scoparius*, *Syringa vulgaris*, *Vitis* sp., *V. vinifera*.

Type specimens examined:

Cyphella obscura Roumeguère: France: Bosquet de Ia Fontaine, Nancy. Oct. 1881. Coll. C. Roumeguère. In Roumeguère, Fungi Gallici exsiccati 1905.

Cyphella sydowii Bres.: Germany: Steglitz bei Berlin. Oct. 1890. Coll. P. Sydow. In Sydow, Mycotheca Marchica 3706. (NY).

Specimens examined from: Austria (3), France (7), Germany (16), Great Britain (1), Hungary (1), Italy (2), Czechoslovakia (8), Sweden (2), Australia (1).

Pilàt (1925) indicated that *C. gregaria* with spores 5—6×1,8—2,3 μ, based on type specimens from the Cryptogamic Herbarium of the University of Vienna, was a variety of *C. bresadolae* with spores 13—14×6—8 μ as reported by Bresadola. Type or authentic material of each of the species listed in the synonymy above has been seen and all agree well with the description presented above.

Maireina paraensis (P. Henn.) comb. nov.

Cyphella paraensis P. Henn., Hedw. 48: 102. 1908.

Receptacles sessile to subsessile, cream to yellow brown, 0,2—1 mm. in diameter, 0,5 mm. high; surface hairs yellow, 80—125×2,5—4 μ, outer third to half weakly roughly granule incrusted; context thin, hyphae 3—4 μ in diameter; subhymenium thin, hyphae 2—3 μ in diameter; basidia 10—12×3,5—4 μ, 4-sterigmate, no clamps seen; spores hyaline, smooth, apiculate, ovate, flattened on one side, 4,5—5×2,5—3 μ.

Habitat: On dead leaf sheaths of *Bactris major* (palm).

Type and specimens examined: Brazil: Para, Hort. Bot. Goeldi. Coll. C. F. Baker No. 202, in Plants of the Amazon, Herbarium Museum Goeldi, Para. (FH, S). (The specimen at Stockholm was from the herbarium of Sydow.).

Maireina pseudogrisella sp. nov.

Cupula 400—550×300—400 μ cyathiformis, stipitata extus pilis pallide brunneis, 30—50 longis, 2,5—3,0 μ latis obtecta, e basi pseudostromatica oriunda, nec subiculata; basidiis 27×7—8 μ 4-, sterigmatis; sporis hyalinis, laevibus, apiculatis, cylindraceis, 10,5—11×3,5—4,5 μ.

Receptacles 300—400 μ in diameter, 400—550 μ tall, expanded cupulate, cupule a flat disk at top of stipe; stipe 80 μ in diameter, 300—450 μ tall; receptacle and stipe clothed with light brown hairs 30—50×2,5—3,0 μ; hairs reach above hymenial disk and cover it when dry; subiculum absent but receptacles may have a common pseudostromatic base; hymenium composed only of basidia, sub-

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hymenial hyphae 1,5—2 μ in diameter, basidia 27×7—8 μ, with clamps at base, 4-sterigmate; sterigmata up to 7 μ long; spores hyaline, smooth, apiculate, cylindric, 10,5—11×3,5—4,5, abundant.

Habitat: On rotten wood of *Tilia* sp.

Type and specimen examined: Germany: Oberlausitz, Nov. 10, 1900. Collected by Feurich. (PR 171895).

The specimen was first identified by P. Hennings as. *S. endophila* Ces. which it superficially resembles when young and the cupules are unopened. Pilàt reidentified this material as *S. grisella*, which is now referred to as *Porotheleum poriaeformis*. Spore size, receptacle shape, and lack of subiculum prevent this specimen from being included in *S. grisella*.

Maireina pseudochracea sp. nov.

Cupulae sparsae, 0,5×0,2 mm., urceolatae, subsessiles, extus pilis granulosis, brunneis, 75—85 longis 3—4 μ latis praeditae; basidiis clavatis, 4-sterigmatis, 17,5×5,8 μ; sporis ovoideis vel subglobosis, laevibus, apiculatis, hyalinis, 8,5—9×5,5—6 μ.

Receptacles few, scattered, 0,5 mm. tall, urceolate, subsessile, 200 μ in diameter, covered with brown hairs; surface hairs brown, 75—85×3—4 μ, encrusted with minute granular crystals, narrowed to a pointed tip; context thin, hyphae hyaline, 3 μ in diameter; subhymenial hyphae 2,5 μ in diameter; no clamps seen; hymenium composed only of clavate basidia, 4 — sterigmate, 17,5×5,8 μ; spores broad ovate to subglobose, smooth, apiculate, hyaline, with granular contents giving appearance of rough surface at low magnifications, with one large oil drop, 8,5—9×5,5—6 μ.

Habitat: On pieces of plant debris.

Type: Jamaica: Catherine's Peak, St. Andrews Park — Fern Trail. Collected Aug. 15, 1957, No. 695. (K).

Maireina pseudurceolata sp. nov.

Cupula pallide brunnea, ad 1 mm. diam. vel alta, sessilis vel subsessilis, cylindracea; extus pilis pallide brunneis, ramulosis, 18—25 longis, 2,5—3 μ crassis obtecta; basidiis fasciculatis, 4-sterigmatis, 25—27×7—7,5 μ; sporis hyalinis, laevibus, globosis vel subglobosis, apiculatis, 5—6 μ diam., vel 5—5,5×5,5—6 μ.

Receptacles light brown, up to 1 mm. in diameter and high, sessile or subsessile, more or less barrel shaped, covered with a thin layer of light brown hyphae terminating in short, sharp-pointed branches; branches of surface hyphae 18—25×2,5—3 μ, nearly smooth but with some granular roughening; context hyphae 2—3 μ in diameter, hyaline, with clamp connections; hymenium composed only of basidia, basidia 25—27×7—7,5 μ, fasciculate, clamped at the base, 4-sterigmate; spores hyaline, smooth, spehrical to subspherical, apiculate, 5—6 μ in diameter, or 5—5,5×5,5—6 μ.

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Habitat: On twigs of *Clematis alba.*

Type and specimen examined: France: St. Sernin, Aveyron. Coll. by Galzin No. 1809, Herb. Bourdot No. 3979. Nov. 14, 1905. (PR 171929).

The specimen, or a portion of it, was identified by Bresadola as *Solenia urceolata* (Wallr.) Fr., but the receptacles are larger than those of *Porotheleum poriaeformis*, of which that is a synonym, and there is no subiculum in this material.

Maireina regnelliana sp. nov.

Cupula 0,5—1,0 mm. diam. vel alta, luteola, extus pilis brunneis, granulosis, 100—150 longis, 2,5—3 μ crassis obtecta, basidiis clavatis, 40—45×8—9 μ, 4-sterigmaticis; sporis hyalinis, globosis vel subglobosis, apiculatis, laevibus, 8—9 μ diam., vel 9—10×8—9 μ.

Receptacles 0,5—1,0 mm. tall and in diameter, yellowish in a dry specimen; covered with brown surface hairs 100—150×2,5—3 μ, weakly covered with minute crystalline granules or appearing smooth, with rounded hyaline tips; context hyphae hyaline, 4—5 μ in diameter, with clamp connections; subhymenial hyphae 2,5—3 μ in diameter; hymenium with no sterile elements, formed of tightly packed basidia; basidia clavate, 40—45×8—9 μ, clamped at the base, 4-sterigmate; sterigmata up to 6 μ long; spores hyaline, globose to subglobose, apiculate, smooth, 8—9 μ in diameter or 9—10×8—9 μ.

Habitat: On rotting wood.

Type and specimen examined: Brazil: Rio Grande do Sul, Ijuhy. Collected June 4, 1893 by G. A. Malme. Exped. l^mae^ Regnelliae, Fungi No. 334. (Stockholm).

This species approaches *M. leonina*, from which it differs in its shorter surface hairs and its globose to subglobose spores.

Maireina spegazzinii sp. nov.

Cupula sparsa vel gregaria, 0,5—1,0 μ diam., albida, extus pilis brunneis, laevibus vel incrustatis, crasse tunicatis, rigidis, 150—250 longis, 5—9 μ crassis obtecta; basidiis 33,5—54×9—10 μ, 4-sterigmatis; sporis ovoideis, hyalinis, laevibus, apiculatis, 12,5—13.5× 6,7—7,2 μ.

Receptacles scattered to gregarious, 0,5—1,0 mm. in diameter, whitish; surface hairs brown, thick-walled, smooth to rather loosely granule-incrusted on the outer quarter to third of length, straight, incurved when dry, 150—250×5—9 μ; context hyphae 1—2 μ in diameter to 3—4 μ in diameter, with clamps; basidia clamped at the base, 33,5—54×9—10 μ, 4-sterigmate; spores ovate, hyaline, smooth, apiculate, flattened on one side, 12,5—13,5×6,7—7,2 μ.

Habitat: On a stem.

Type specimen examined: Argentina: Museo Institute. Spegazzini No. 25879.

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Maireina spiralis (Coker) comb. nov.

Cyphella spiralis Coker, Jour. Elisha Mitchell Sci. Soc. 43: 137. 1927.

Receptacles brown, single, scattered to subgregarious, 0,5—1,0 mm. in diameter; surface hairs brown, granule-incrusted on outer quarter to third of length, spirally coiled to curved tips, 100—200 × 3—5 μ; basidia clamped at base, 21—33 × 8—11 μ, 4-sterigmate; spores smooth, apiculate, hyaline, ellipsoid to tear-shaped, more or less flattened on one side, 11—15 × 7—9 μ.

Habitat: On canes of *Rosa* sp.

Type and specimen examined: North Carolina, Wilmington, Nov. 9, 1926. Coll. C. L. Shear 5569. (NFC, NCU).

Maireina stevensonii sp. nov.

Cupula cyathiformis, luteo-brunnea, non fasciculata, subsessilis, 0,2—0,4 mm. in diam., extus strigoso-pilosa, pilis brunneis dense granulosis, 110—150 longis 4—6 μ crassis; basidiis 4-sterigmaticis, 16,5—20 × 4—8 μ; sporis laevibus, apiculatis, hyalinis, ovoideis, 6—8 × 4—5 μ.

Receptacles cupulate, yellow brown, not fasciculate, with incurved margin when dry, subsessile, 0,2—0,4 mm. in diameter; surface of the cups covered with brown, densely granule-incrusted hairs with hooked tips, 110—150 × 4—6 μ; hymenium formed of basidia 16,5—20 × 7—8 μ, 4-sterigmate; spores smooth, apiculate, hyaline, ovate, 6—8 × 4—5 μ.

Habitat: On dead sticks.

Type and specimen examined: Puerto Rico: Rio Piedras, June 18, 1917, J. A. Stevenson and R. C. Rose 6532. (NY).

Maireina stilboidea (Speg.) comb. nov.

Cyphella stilboidea Speg., Bol. Acad. Nac. Cienc. Cordoba 25: 29. 1921.

Receptacles up to 1 mm. in diameter, stipe up to 1 mm. long, entire stipe and cup covered with subiculum-like hyphae; subiculum poorly developed; surface hairs brown, 100—150 × 5—6 μ (100—200 × 5—7 μ according to Spegazzini), covered with roundish, granular scales; basidia of specimen examined mostly disintegrated, one seen 27 × 7 μ, with 4-sterigmata; spores smooth, hyaline, apiculate, ovate, 10 × 6 μ in portion of type examined, 3—5 × 1,5—2,0 μ according to notes on packet by Spegazzini.

Habitat: On dead branches.

Type and specimen examined: Chile: Los Perales, 1918. Coll. by C. Spegazzini (LBS).

Usually notes by Spegazzini on his packets well represent the material in the packet. In this case spore measurements reported by him and observed by the writer were at variance.

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Maireina subspiralis sp. nov.

Cupula brevis, subsessilis, 100—250 μ alta, 100 μ diam., brunnea, strigoso-pilosa; pilis laevibus, brunneis, tortuosis, 60—90 longis, 3,5—4,5 μ crassis; basidiis 20—24×4,5—5,5 μ, 4-sterigmaticis; sporis subglobosis, hyalinis, laevibus, apiculatis, 4—4,5×3,5—4 μ.

Receptacles short, subsessile, 100—250 μ tall, 100 μ in diameter, brown, clothed with curled, smooth, brown, hairs, not incrusted, receptacles not fasciculate; hyphae of context hyaline, with clamps; surface hairs roughened toward the tips; curved to somewhat spiraled, 60—90×3,5—4,5 μ; basidia 4-sterigmate, 20—24×4,5—5,5 μ; spores subglobose, hyaline, smooth, apiculate, 4—4,5×3,5—4 μ.

Habitat: On rotten wood.

Type and specimen examined: Massachusetts: Fresh Pond, Cambridge, Nov. 1887. Coll. K. Miyabe, Comm. W. A. Setchell (UC 421385).

Maireina texensis (Berk. & Curt. ex Cooke) comb. nov.

Peziza texensis Berk. & Curt. in herb. — *Cyphella taxensis* Berk. & Curt. in herb. ex Cooke, Grevillea 20: 9. 1893. — *Cyphella macrospora* Berk. & Curt., in herb.

Receptacles brown, sessile or subsessile, cup-shaped, up to 500 μ in diameter; surface hairs brown but becoming almost hyaline at the tips, straight, thick-walled below, thin-walled toward the tip, granule-incrusted toward the outer three-fourth of length, granules fine, crystalline, up to 150×8 μ; context hyphae hyaline, with clamp connections; basidia irregularly clavate, 76×12 μ; spores hyaline, ovate, apiculate, flattened on one side, 11—16,5×6,5—11,5 μ.

Habitat: On wood of *Quercus* sp.

Type and specimen examined: Texas: Collected by Wright, No. 3779. (K).

The above notes were made by Mr. D. A. Reid of the Royal Botanic Gardens, Kew, on a specimen too fregmantary to be shipped. The slide, mounted in 10% KOH, then in lactic acid-aniline blue, was kindly loaned by the Director and these notes confirmed by the writer except that few basidia were noted, the cupule being filled mostly with basidiospores.

Several of the large-spored species of this genus may eventually prove to be cospecific. However, their scattered geographic and habitat distributions, together with apparently valid variations in morphology, keep them in separate categories at present.

Maireina thujae sp. nov.

Cupula cyathiformis, sessilis, 0,5—1 mm. diam. et alta, strigoso-pilosa; pilis brunneis, granulosis, continuis vel tortuosis, 60—100 longis 3—4 μ crassis; basidiis 4-sterigmaticis, 40—50×7—9 μ; sporis hyalinis, laevibus, apiculatis, ellipsoideis, 12,5—16×7—9 μ.

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Receptacles cupulate, sessile, 0,5—1,0 mm. high and in diameter, buff colored when fresh, covered with brown hairs, granule-incrusted, straight to tortuous or geniculate, 60—100×3—4 μ, not at all or rarely septate, with dilute to hyaline tips; subhymenial hyphae brown, with occasional clamps; hymenium formed of basidia and occasional paraphysoid hyphae, hyaline, 35—40×2—4 μ, basidia densely granular when young, at maturity with 4-sterigmata, sterigmata up to 7 μ long, basidia 40—45×7—9 μ; spores hyaline, smooth, apiculate, with granular contents, ellipsoid, flattened on one side, 12,5—16×7—9 μ.

Habitat: On wood and bark of *Thuja plicata.*

Type and specimen examined: 100 yards from highway opposite Granite Creek, Bonner Co., Idaho, N. W. 40, S. W. quarter, S. 28, T. 62 N., R. 5 W., approximately 3000 ft., on branch of windfall in over 200 year old climax stand of *Thuja plicata* and *Tsuga heterophylla*; intermediate mesosere approximately 100 feet vertically above level of stream bottom on gentle southwest slope, A. W. Slipp Station 1, Nov. 11, 1941. Coll. by A. W. Slipp. (Herb. Slipp 1321; UIFP 3321).

Cyphellopsis Donk, Med. Nederl. Mycol. Ver. 18—20: 128. 1931.

Receptacles brown, cupulate to urceolate, subsessile to stipitate, with varying degrees of brown subiculum similar to the surface hairs, surface hairs brown, straight to weakly curved, usually with inflated tips.

Type species: *Solenia anomala* (Pers. ex Fr.) Fckl.

Only one species is assigned to this genus at present.

Cyphellopsis anomala (Pers. ex. Fr.) Donk, Med. Nederl. Mycol. Ver. 18—20: 128. 1931.

Peziza anomala Pers. ex. Fr., Syst. Myc. 2: 106. 1822. — *Peziza stipata* Pers., Myc. Eur. 1: 270. 1822. — *Tapesia anomala* (Pers. ex Fr.) Fckl., Symb. Myc. 300. 1870. — *Peziza stipitata* Fckl., Jahrb. Nass. Ver. Nat. 25—26: 290. 1871. — *Solenia anomala* (Pers. ex Fr.) Fckl., Jahrb. Nass. Ver. Nat. 25—26: 290. 1871. — *Solenia exigua* Sacc., Mich. 1: 117. 1878. — *Solenia anomala* f. *vitis-vinifera* Sacc., Myc. Ven. 1408. 1881. (nomen nudum). — *Solenia populicola* Pat., Tab. Anal. 201. 1883. — *Peziza* (*Lachnea*) *anomala* Fr. f. *quercina* Roum., Fung. Gall. exs. 2814, 1884. — *Solenia amoena* Oud., Contr. Myc. Pays-Bas 12: 19. 1888. — *Solenia connivens* Karst., Hedw. 1890: 270. 1890. — *Solenia anomala* var. *orbicularis* Pk., N. Y. St. Mus. Rept. 47: 168. 1894. — *Solenia anomala* var. *cerasi* Roumeguère, Fungi Selecti exsicciati 7182. 1897. — *Solenia anomaloides* Pk., Torr. Bot. Cl. Bull. 25: 326. 1898. — *Henningsomyces anomalus* (Fr.) O. Kuntze, Rev. Gen. 3 (2): 483. 1898. — *Henningsomyces stipitatus* (Fr.) O. Kuntze, l c. — *Henningsomyces stipatus* (Pers.) O. Kuntze,

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l. c. — *Henningsomyces exiguus* (Sacc.) O. Kuntze, l. c. — *Henningsomyces amoenus* (Oud.) O. Kuntze, l. c. — *Henningsomyces populicola* (Pat.) O. Kuntze, l. c. — *Cyphella anomala* (Pers.) Pat., Ess. Taxon. 56. 1900. — *Solenia confusa* Bres., Ann. Mycol. 1: 84. 1903. — *Solenia anomala* var. *mali* Pilát, Ann. Mycol. 23: 167. 1925. — *Cyphella anomala* var. *stipata* (Pers. ex Fr.) Bourd. & Galz., Hym. de Fr. 164. 1928. — *Cyphella anomala* var. *stipitata* (Pers. ex Fr.) Bourd. & Galz., Hym. de Fr. 164. 1928. — *Cyphella confusa* (Bres.) Bourd. & Galz., Hym. de Fr. 164. 1928.

Receptacles gregarious, either on bark or on decorticated wood, when on bark usually at lenticels on a stroma-like base or on old stroma of *Diatrype*-like nature, in orbicular patches, usually in subiculum which in some collections may be dense enough to compare with *Porotheleum* subiculum, densely gregarious, growing out onto the bark and then several colonies becoming confluent, or forming rather large gregarious colonies on the bark surface which may become confluent with colonies on adjacent decorticated wood; when growing on decorticated wood occurring in a weakly to strongly developed subiculum composed of brown, more or less-granule-incrusted hyphae, forming patches several centimeters in extent, with a weak to well defined margin, appearing as a brown *Poria* at first sight, but separate receptacles not confluent, usually not appreciably distorted by mutual pressure in the usually densely crowded mass of receptacles; receptacles sessile to short-stipitate when the subiculum is weakly developed, becoming long-stipitate when the subiculum is strongly developed; cup-shaped to goblet-shaped or urceolate, with the margin weakly to strongly inrolled when dry, rarely tubular, as many as 3—5 per mm., 0,2—1,0 mm. high, 200—400 μ in diameter; the whole surface of the receptacle clothed with hairs originating at all parts from the stipe or stipe-like base to the margin of the cup, hairs 75—150×3—5 μ, finely and densely granule-incrusted on the outer third to half of the length, at least several hairs in each mount terminating in a hyaline to yellowish, smooth, inflating tip measuring 10—12×4,5—6 μ which is easily detachable in mounting and mistakeable for a basidiospore because of the asymmetrical shape; granules on surface of hairs easily detached in mounting, hyaline, crystalline, not becoming stained in phloxine mounts; hairs straight to incurved over the hymenium in drying, not spiral; basidia clamped at the base, 18—27×3,5—5 μ, 4-sterigmate; context hyphae 1—2 μ in diameter, with clamps, growing in a very compact, interwoven arrangement; spores hyaline, smooth, apiculate, cylindric to allantoid (6)—7—9—(10)×1,5—2—3—(3,5) μ in typical collections. (See below for exceptions.)

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Habitat: On dead wood and branches of deciduous trees, rarely on herbaceous litter and on coniferous wood, especially on: *Acer* sp., *A. circinatum*, *A. macrophyllum*, *A. pseudoplatanus*, *A. rubrum*, *A. saccharinum*, *A. spicatum*, *Aesculus hippocastanum*, *Alnus* spp., *A. glutinosa*, *A. incana*, *A. mollis*, *A. oregona*, *A. rubra*, *A. sinuata*, *A. sitchensis*, *A. tenuifolia*, *Amelanchier* sp., *Artemisia campestris*, *Betula* spp., *B. alba*, *B. lenta*, *B. lutea*, *B. nigra*, *B. papyrifera*, *B. populifolia*, *B. pubescens*, *B. verrucosa*, *Carpinus* sp., *C. betula*, *C. caroliniana*, *Carya* sp., *C. amara*, *C. aquatica*, *C. porcina*, *Cerasophora* sp. *Clethria alnifolia*, *Celtis* sp., *C. crassifolia*, *Cornus* sp., *Corylus* sp., *C. avellana*, *C. californica*, *Cotoneaster* sp., *Crataegus* sp., *Epilobium hirsutum*, *Erica* sp., *Euonymus atropurpureus*, *Eupatorium cannabinum*, *Fagus* sp., *F. silvatica*, *Hamamelis* sp., *Holodiscus discolor*, *Juniperus virginiana*, *Liriodendron tulipifera*, *Lonicera japonica*, *Nyssa multiflora*, *Ostrya* sp., *O. virginiana*, *Picea* sp., *P. excelsa*, *Platanus* sp., *Populus* sp., *P. balsamifera*, *P. canadensis*, *P. grandidentata*, *P. nigra*, *P. tremula*, *P. tremuloides*, *P. trichocarpa*, *Prunus avium*, *P. cerasus*, *P. melanocarpa*, *P. persica*, *P. speciosa*, *P. spinosa*, *P. virginiana*, *Pyrus communis*, *P. malus*, *Quercus* sp., *Q agrifolia*, *Q. alba*, *Q. ilex*, *Q. robur*, *Q. rubra*, *Rhamnus californica*, *R. purshiana*, *Ribes aurea*, *Ribes rubra*, *Robinia pseudacacia*, *Rosa canina*, *Rubus* sp., *R. idaeus*, *Salix* spp., *S. aurita*, *S. capraea*, *S. cinerea*, *S. discolor*, *S. lasiandra*, *S. grandifolia*, *S. nigra*, *S. pentandra*, *S. phylicifolia*, *S. repens*, *S. requiphodea*, *S. scouleriana*, *Sarothamnus* sp., *Sorbus americanus*, *S. aucuparia*, *Symphoricarpos occidentalis*, *Tecoma radicans*, *Tilia* sp., *T. americana*, *T. microphylla*, *T. platyphylla*, *Ulmus* sp., *U. campestris*, *Umbellularia californica*, *Vitis* sp.

Type specimens examined:

Solenia stipitata Fckl.: Nassau, Fuckel 1927, Fungi Rhenani 2397. (NFC).

Solenia anomala f. *vitis-vinifera* Sacc.; Italy: Padova, Jan. 1881. Distributed in Saccardo, Mycotheca veneta 1408. (MO in NFC, NFC, PRE, K, NY).

Solenia anomaloides Pk.: Michigan. Coll. by Beal. Feb. 24, 1898. (NYS).

Solenia anomala var. *piceae* Pilát: Bulgaria: On *Picea excelsa* in monte Vibosa prope Sofiam. Pilát. Aug. 1925. (PR 171826).

Solenia anomala var. *mali* Pilàt: Czechoslovakia: On *Pyrus malus*. Mnichovice, June 1923, Coll. A. Pilàt. (PR 171833).

Solenia anomala f. *quercina* Roumeguère: France: On oak, Environs de Seulis (Oise), Jan., Feb., 1884, Capt. Sarazen. Distributed in: Roumeguère, Fungi gallici exsiccati 2814. (K, NY).

Solenia anomala f. *cerasi* Roumeguère: France: Montagne de Bard, on *Cerasus* 1897. Fautrey. Distributed in Romeguère, Fungi selecti exsiccati 7182. (BP, NY).

Solenia confusa Bres.: Italy: ad ramos Alni/glut., Sept. (S).

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A portion labeled "Genn. 6, 1901, Eichler", was originally labeled *S. podlachia* Bres., which presumably remains a herbarium name.

A specimen at Budapest (BP 11504) collected by Hazslinsky, No. 2752, was labeled *Peziza anomala* var. *lichenoides*. A specimen at Stockholm (S), collected July 25, 1885, at Nrk. Kumla, Sweden, in ligno betulae, by L. Romell, No. 12076, is labeled *Solenia anomala* Pers. f. *betulae*, a name used several times by Romell in labeling specimens. A specimen at Stockholm (S), collected Apr. 9, 1887, in Erksbergs Tradgard, Stockholm, Sweden, by L. Romell, No. 12077, is labeled *Solenia anomala* f. *ribis-rubi*. A specimen at Stockholm (S), collected May 10, 1891, at Carlberg, Stockholm, Sweden, is labeled *Solenia anomala* (Pers.) Fr. f. *salicis*. Presumably Romell planned to consider each host report a different form. However, later collections only bear the letter "f" after the specific spithet.

Specimens examined from: Austria (46), Belgium (7), Bulgaria (2), Czechoslovakia (90), Denmark (1), Eire (2), Finland (2), France (53), Germany (91), Great Britain (75), Hungary (43), Italy (23), Jugoslavia (1), Macedonia (2), Netherlands (10), Norway (2), Poland (5), Portugal (2), Russia (2), Switzerland (7), Sweden (136), Turkey (1), French Morocco (1), Tunis (1), French Indochina (1), Japan (1), Siberia (4), New Zealand (1), Tasmania (2), Ceylon (4), Bolivia (1), Chili (3), Ecuador (2), Cuba (1), Jamaica (1), Juan Fernandez Island (1), British Columbia (19), Manitoba (11), Newfoundland (3), Northwest Territories (1), Nova Scotia (2), Ontario (49), Quebec (9), Alabama (1), California (9), Colorado (7), Connecticut (3), Delaware (2), Georgia (2), Idaho (2), Illinois (7), Indiana (3), Iowa (4), Kansas (1), Louisiana (9), Maine (2), Massachusetts (21), Michigan (10), Missouri (8), Montana (9), Nebraska (1), New Hampshire (7), New Jersey (4) New York (57), North Carolina (1), North Dakota (1), Ohio (4), Oregon (4), Pennsylvania (11), South Carolina (5), Vermont (5), Virginia (6), Washington (14), West Virginia (4), Wisconsin (2).

Several trends in spore size can be illustrated by the following additional series of collections. None of these appears to the writer to be sufficiently constant to warrant specific or even subspecific rank since variations in climatic conditions as well as in other conditions of the habitat appear to be at least partly responsible for this variation. Lentz, working with a smaller group of collections, came to a similar conclusion.

Spores (5)—6—7—(9) × 1—2,5 μ.

Specimens examined from: Finland (1), France (2), Germany (3), Great Britain (2), Italy (1), Russia (1), British Columbia (1), Ontario (8), Quebec (1), Alabama (1), Colorado (2), Delaware (1), Illinois (1), Iowa (3), Kansas (1), Maine (2), Maryland (1), Massachusetts (3), Michigan (1), New Hampshire (1), New York (8), Ohio (1), Pennsylvania (1), Tenessee (1), West Virginia (2).

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Spores 8—12,5×2,5—6 μ.

Specimens examined from: Austria (1), Germany (2), Italy (1), British Columbia (3), California (2), Louisiana (1), Michigan (1), Montana (1), New York (1), North Carolina (1), Oregon (1), Washington (1).

Spores 7—11×2,5—5 μ.

Specimens examined from: Belgium (1), Italy (3), Alberta (1), Manitoba (1), Nova Scotia (1), California (2), Colorado (4), Georgia (1), Maine (1), Massachusetts (1), Montana (1), Washington (1).

Spores hyaline, 5—7,5×2,5—5 μ (possibly those of immature specimens of *Phaeocyphellopsis ochracea*).

Specimens examined from: Austria (1), Belgium (1), Italy (1), Puerto Rico (1), Ontario (2), New Jersey (1).

Spores (10—11)—13—14,5—(15)×3,5—4,5—(5) μ.

Specimens examined from: New York (1), Washington (1).

Spores 9—10×6—7 μ.

Specimens examined from: Ecuador (1).

Spores 7—9×5—6 μ.

Specimens examined from: Germany (1), Louisiana (1).

Spores 6×4 μ.

Specimen examined from: Argentina (1).

Spores 4—6 μ in diameter.

Specimen examined from : Iowa (1).

The writer has seen over 650 specimens, with duplicates and replicates of some, of this species from all over the world deposited in more than 30 North American herbaria and a number of herbaria from other parts of the world. Nine trends in spore size were noted as described above. On the basis of a few specimens from Czechoslovakia, Pilát was able to recognize three species: *S. anomala* with spores 9—13×2—3 μ; *S. ochracea* with spores 6—7×2,5—3 μ and *S. stipitata* with spores 8—10×4—5 μ. However, with the few specimens he saw he could not have observed the intermediate spore-size materials. On the other hand, Donk sorted the specimens he studied from The Netherlands into a species with broader pores, *S. anomala*, and one with narrower spores, *S. confusa*. It is suggested that before further work is done in the segregation of species in this group the methods of experimental taxonomy be applied to a large number of collections from many locations.

Solenia anomala var. *mali* Pilát has several receptacles which arise from a stalked base, The separate receptacles are stalked. This type of development is similar to that described by Petch in his genus *Dendrocyphella*, material of which has not been seen.

In the herbarium of the National Museum at Prague (PR) are specimens labeled with the following combinations in *Solenia anomala* which have not as yet been found in the literature: *S. anomala* var.

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confusa Bres., *S. anomala* f. *confusa* (Bres.) Bourd. & Galz., *S. anomala* subsp. *confusa* (Bres.), *S. anomala* f. *exigua* (Sacc.) Pilát, *S. anomala* f. *fasciculata* (Schw. ex Berk. & Curt.) Pilát, and *S. anomala* var. *piceae* Pilát.

Merismodes Earle, N. Y. Bot. Gard. Bull. 5: 406. 1909.

Receptacles fasciculate, brown with cream-colored hymenium, covered with brown hairs at least some of which are spirally twisted in the outer portion.

Type species: *Merismodes fasciculatus* (Schw.) Earle.

At present only one species is assigned to this genus.

Merismodes fasciculatus (Schw.) Earle, N. Y. Bot. Gard. Bull. 5: 406. 1909.

Peziza solenia DC., Fl. Fr. 17. 1806. — *Cantharellus fasciculatus* Schw., Trans. Am. Phil. Soc. n. s. 4: 153. 1832. — *Cyphella fulva* Berk. & Rav. in Berk. & Br., Ann. Mag. Nat. Hist. III. 7: 379. 1861. — *Cyphella fulva* Berk. & Rav., Grev. 2: 5. 1873. — not *Cyphella fulva* Berk. & Br., in Berk. & Br., 1861. — *Cyphella furcata* Berk. & Curt., Grev. 2: 5. 1873 — *Cyphella fasciculata* (Schw.) Berk. & Curt., Grev. 2: 6. 1873. — *Cyphella brunnea* Phill., Grev. 13: 49. 1884. — *Cyphella ravenelii* Sacc., Syll. Fung. 6: 672. 1888. (for *C. fulva* Berk. & Br.) — *Cyphella saccardoi* Sydow, in Sacc., Syll. Fung. 14: 233. 1900. (for C. *ravenelii* Sacc.)— *Chaetocypha brunnea* (Phill.) O. Kuntze, Rev. Gen. 2: 847. 1891. *Chaetocypha furcata* (Berk. & Curt.) O. Kuntze l. c. — *Chaetocypha fasciculata* (Schw.) O. Kuntze l. c. — *Chaetocypha fulva* (Berk. & Br.) O. Kuntze l. c. — *Chaetocypha binominata* O. Kuntze. l. c. — (for *C. ravenelii* Sacc., non Berk. & Br.).

Receptacles fasciculate, rarely single, in clusters of 3—10 or more from lenticels or from cracks in the bark, clusters reaching 1 cm. across, 2—5 mm. in diameter, shallow cup-shaped, margin straight to more or less undulate, in robust specimens becoming split to somewhat fimbriate, stipitate, but the stipe sometimes remaining within the lenticel, when the stipe is extended the receptacles pendant, surface covered with hairs, zonate in older specimens; hymenium cream-colored, smooth to weakly wrinkled in some older or larger specimens; surface hairs brown, thick-walled, smooth below, closely and finely granule incrusted on outer half to three-quarters of length, granules easily removed in mounting, with pointed, hyaline, incrusted tips, straight to flexuous, curled, hooked or spiraled, 100—275 × 3—4 μ; clamps common especially in the subhymenial tissue and at the base of the basidia; spores hyaline, smooth, apiculate, cylindric to allantoid, typically 7—9—(10—11) × (1,5)—2—3—(3,5) μ.

Type specimens examined:

Cyphella fasciculata (Schw.) Berk. & Curt.: Collected by Sartwell

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in New York State. (A note by Burt on the packet indicated that part of the type specimen may be MO 4937 in NFC).

Cyphella fulva Berk. & Rav.: Ravenel, North Carolina. Distributed as No. 16 of fascicle 4, Ravenel, Fungi Caroliniana exsiccati. (NY, FH, NFC, CGL in NFC, K).

Habitat: On bark of branches of *Alnus* spp., *A. incana*, *A. mollis*, *A. rugosa*, *A. serrulata*, *A. viridis*, *Betula lenta*, *Corylus rostrata*, and on unidentified substrata. Two host determinations, *Prunus serotina* and unidentified conifer twigs, are to be questioned.

Key to Varieties of *M. fasciculatus*

1. Spores mostly shorter than 10 μ 2
1. Spores mostly longer than 10 μ 3
   2. Spores 6—8 × 1—2 μ ..... var. *quercinus*
   2. Spores 7—9—(11) × 2—3,5 μ ..... var. *fasciculatus*
3. Spores longer than 15 μ ..... var. *carolinensis*
3. Spores rarely reaching 15 μ in length 4
   4. Spores 9—11 × 3,5—4,5 μ ..... var. *occidentalis*
   4. Spores 9—13 × 5—7,5 μ ..... var. *oregonus*

Merismodes fasciculatus var. *fasciculatus*

Characters and habitat as described above.

Specimens examined from: Austria (2), Italy (8), British Columbia (3), Manitoba (6), Newfoundland (8), Northwest Territories (1), Nova Scotia (4), Ontario (38), Quebec (4), Alabama (6), Colorado (1), Delaware (1), Georgia (1), Indiana (2), Louisiana (1), Maine (7), Maryland (3), Massachusetts (9), Michigan (4), Missouri (1), New Hampshire (4), New Jersey (4), New York (47), North Carolina (2), Oregon (1), Pennsylvania (11), Rhode Island (1), South Carolina (11), Vermont (5), Virginia (9), Wisconsin (2), Wyoming (1).

Merismodes fasciculatus var. **occidentalis** var. nov.

Ut in specie; sporis 9—11 × 3,5—4,5 μ.

Characters as described for the species but the spores measure 9—11 × 3,5—4,5 μ, averaging somewhat larger than those for the species.

Habitat: On *Salix* sp., *Alnus oregona* and *Umbellularia californica*.

Type: Idaho: Idaho Co., Idaho Mountain, June 12, 1948. Coll. W. B. & V. G. Cooke (WBC).

Specimens examined from: California (1), Colorado (1), Idaho (1), Oregon (1), Washington (1).

Merismodes fasciculatus var. **oregonus** var. nov.

Ut in specie; sporis 9—13 × 5—7,5 μ.

Characters as described for the species but the spores measure 9—13 × 5—7,5 μ.

Habitat: On *Alnus oregona*.

Type: Oregon: Benton Co., Corvallis, Feb. 22, 1915.

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Coll. F. D. Bailey .(NY, TRTC, OSC 6203, MO 44144 in NFC).

The varietal name was used because it was chosen for use on the species label in reporting the identification to Mr. Bailey by Dr. Burt. It was never published as a specific name because Burt thought that there was not enough difference between it and typical material to warrant such treatment. The writer thinks that within this species suficient material has been seen and sufficient variation appears in rather consistent patterns to warrant segregation.

Specimens examined from: Oregon (2), Washington (2).

Merismodes fasciculatus var. **caroliniensis** var. nov.

Ut in specie; sporis 16,75 × 10,0 μ.

Characters as described for the species, but the spores measure 16,75 × 10,0 μ.

Habitat: On wood.

Type and specimen examined: South Carolina: Ravenel No. 1755. (FH).

The much larger spores of this specimen appear to warrant the establishment of a variety for it.

Merismodes fasciculatus var. **quercinus** (Lloyd) comb. nov.

Cyphella quercina Lloyd, Myc. Writ. 7: 1357, pl. 336, f. 3196, upper fig. 3198, July 1925.

Characters as described for the species but the spores 6—8 × 1—2 μ, thus averaging much smaller than those of the other varieties.

Habitat: On bark of *Castanopsis pubinervis* and *Quercus glandulifera*.

Type: Japan: From A. Yasuda 707, Sendai. Oct. 3, 1915. (TRTC, CGL 35025 in NFC).

Specimens examined from: Japan (3).

Some of the material of this variety which has been seen by the writer was identified as *Cyphella pendula* (Schw.) Fr. Fries made this combination in Syst. Myc. 2: 201. 1822, on the basis of a description published by Schweinitz of material from Carolina. However, this material is of a polypore now assigned to *Porodisculus pendulus* (Fr.) Murill, so that Lloyd's name must take precedence for this variety.

It should be noted that within the several spore-size groups described above, there is a corresponding increase or decrease of basidial size. Also, the hymenial layer becomes thicker or thinner as the lenght of the basidia increases or decreases. Little, if any, appreciable difference appears to occur in the size of the respective receptacles beyond the normal range of sizes found within any one collection.

Cultural studies following methods of experimental mycological taxonomy may eventually indicate that some of the varieties here proposed are no more than reactions to favorable habitat conditions, or ecotypes.

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Stromatocyphella gen. nov.

Cupula conglobata, cinerascentia, pilis incrustatis.

Receptacles conglobate, united on a stroma, grey, with granule-incrusted surface hairs.

Type species: *Cyphella conglobata* Burt.

Key to Species of *Stromatocyphella*

1. Thick-walled sterile bodies present in the hymenium	...*S. aceris*
1. Thick-walled sterile bodies absent	 2
2. Spores 7—10 × 3—3,5 μ, surface hairs brown	...*S. conglobata*
2. Spores 6—7 × 2—2,5 μ, surface hairs hyaline	.....*S. lataensis*

Stromatocyphella conglobata (Burt) comb. nov.

Cyphella conglobata Burt, Mo. Bot. Gard. Ann. 1: 375. 1914.

Receptacles arising from lenticels, 2—16 in a cluster, 2—3 mm. in diameter, 2—3 mm. high, fused below or even to the upper edge, dark grey, arising from a common sclerotic structure 1—2 mm. in diameter on the wood or cambium; rarely short stalked or subsessile; surface hairs brown, like the subiculum hyphae but arising on the receptacles, irregular in length, granule-incrusted, with clamps; basidia appearing at first as fusiform structures with granular contents, finally 20—25 × 7—9 μ, with 4-sterigmata 6—7 μ long; spores hyaline, smooth, cylindric, apiculate, 7—10 × 3—3,5 μ; clamps present in subhymenial tissue; Overholts noted that the subhymenium was gelatinous in the Pennsylvania material.

Habitat: In lenticels on bark of *Alnus* sp., *A. incana*, *Betula* sp., and *Juglans cinerea*.

Type: New Hampshire: Lower Bartlett, July 1907. Coll. R. Thaxter. (FH, MO 43806 in NFC).

Specimens examined from: British Columbia (2), New Brunswick (1), Ontario (4), Quebec (1), New Hampshire (1), New York (3), Pennsylvania (1).

Stromatocyphella aceris sp. nov.

Cupula cyathiformis, gregaria, breviter stipitata vel subsessilis, strigoso-pilosa, pilis brunneis, granulosis, 90—115 longis 4—6 μ latis; basidiis 10—15 × 3—4 μ, 4-sterigmaticis; sporis hyalinis, laevibus, apiculatis, cylindraceis, 5—6 × 2—2,5 μ.

Receptacles cupulate, up to 50 in a cluster on a black stroma, cluster up to 3 mm. in diameter, on outer or inner bark; cups short-stalked to subsessile, with inrolled margin, separate to somewhat adnate to each other; covered with surface hairs, brown, granule-incrusted on outer fourth, 90—115 × 4—6 μ; hymenium composed of basidia and infrequent irregular thick-walled sterile bodies whose contents stain red in phloxine, basidia 10—15 × 3—4 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 5—6 × 2—2,5 μ.

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Habitat: On branches probably of *Acer* sp.

Type and specimen examined: Vermont: Haystack Mountain, Pawlet, April 18, 1923, C. W. Dodge and D. H. Linder, 527. (NY).

Stromatocyphella lataensis sp. nov.

Cupula cinerea, caespitosa, strigoso-pilosa, pilis hyalinis, dense granulosis, 150—200 longis 5—8 μ latis; basidiis 4-sterigmaticis, 15—17×4—5 μ; sporis hyalinis, apiculatis, cylindraceis, 6—7× 2—2,5 μ.

Receptacles grey, caespitose on a stroma. 2 to many in a fascicle, appearing through cracks in the bark, 2 mm. in diameter, 2 mm. high, margin incurved; surface hairs hyaline, strongly and finely granule-incrusted, 150—200×5—8 μ; basidia 15—17×4—5 μ, 4-sterigmate; spores hyaline, smooth, apiculate, cylindric, 6—7×2—2,5 μ.

Habitat: On bark of *Populus trichocarpa*.

Type and specimen examined: Idaho: Latah Co., 5 miles south of Moscow, Dec. 8, 1934. Collected by J. Ehrlich, A. Schade and R. K. Pierson. (UIFP 875, NY).

This specimen is nearest to *S. conglobata*, from which it may be separated by its longer, regular, hyaline surface hairs and the smaller size of the basidia and spores.

Rhodocyphella gen. nov.

Sporis angulosis, hyalinis vel lutescentibus.

Spores strongly angular, hyaline to yellowish.

Type species: *Cyphella cupuliformis* Berk. & Rav.

The writer prefers to maintain this genus distinct from other cyphellaceous fungi but within the phylogenetic pattern of the simple cupulate Basidiomycetes. The fact that the spores bear a striking resemblance to those of certain pink-spored agarics is considered a result of convergence rather than a result of reduction from the potential agaric ancestor.

Key to Species of *Rhodocyphella*

1. Surface hairs simple, straight, 90—110×4 μ ..... *R. cupuliformis*
1. Surface hairs acanthophysoid, 15—30×3—5 μ ..... *R. grisea*

Rhodocyphella cupuliformis (Berk. & Rav.) comb. nov.

Cyphella cupuliformis Berk. & Rav., Grev. 2: 5. 1873. — *Chaetocypha cupuliformis* (Berk. & Rav.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles 1—3 mm. in diameter, but 0,1—0,3 mm. in diameter in one specimen on *Robinia*, sessile to subsessile, margin inrolled when dry and in young specimens, gregarious; surface clothed with closely appressed hairs which are heavily granule-incrusted, hyaline to yellowish-brown, 90—110×4 μ; hymenium avellaneous; basidia

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20—23 × 6—8 μ, 4-sterigmate, sterigmata 2—4 μ long; spores subglobose, angular, 6—8 μ in diameter, with projections up to 2 μ long, spores with angles 6—9,2 × 5—5,8 μ.

Habitat: On bark of *Juniperus virginiana*, *J. bermudiana*, *Robinia pseudacacia* (Tenn.), and *Thuja accidentalis*.

Type: South Carolina: Aiken, Coll. in Jan. by Ravenel (FH, K). A specimen at NY in the Ellis Collection from Ravenel 1709 b is probably topotype rather than type material.

Specimen examined from: Bermuda (6), Georgia (7), North Carolina (1). Ohio (1), South Carolina (2), Tennessee (1).

Rhodocyphella grisea (Petch) comb. nov.

Cyphella grisea Petch, Ann. Roy. Bot. Gard. Peradeniya 7: 289. 1922.

Receptacles grey white, up to 1—2 mm. in diameter and height, shortstipitate; surface hairs acanthophysoid, brownish, incrusted with fine granules, 15—30 × 3—5 μ, with fine-branched, tapered tips; hymenium composed only of basidia; basidia 16—22 × 5—7 μ, 4-sterigmate; spores ovate, hyaline, apiculate, 7,2 × 5,4 μ, clothed with scattered spines approximately 1 μ long, thus spores 7—9 × 5,5—7 μ.

Habitat: On a thorny, *Rubus*-like, stem.

Type and specimen examined: Ceylon: Habgalla, Dec. 1917. Collected by Petch, No. 5509 (K). The specimen at Kew is labeled "cotype".

Doubtful and Excluded Species

Cyphella aeruginascens Karst., Hedwigia 28: 191. 1889.

Chlorocyphella aeruginascens (Karst.) Keissler, Ann. naturh. Mus. Wien 41: 159. 1927.

According to Donk (1959), this is *Pyrenotrichum splitgerberi* Mont., a lichen.

Cyphella albissima Pat. & Doass., in Pat., Tab. Anal. Fung. 464. 1886.

Chaetocypha albissima (Pat. & Doass.) O. Kuntze, Rev. Gen. 2: 847. 1891.

For one opinion of the identity of this fungus see above under *Lachnella eruciformis* (Karst.) W. B. Cke.

Cyphella albomarginata Pat., Tab. Anal. Fung. 4: 164. 1886.

Chaetocypha albomarginata (Pat.) O. Kuntze, Rev. Gen. 2: 847. 1891.

A packet in the Patouillard Herbarium (FH), presumably the type, contained no material.

Cyphella ampla Lév., Ann. Sci. Nat., Bot. III. 9: 126. 1848.

See under *Auriculariopsis* in Donk (1959).

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Cyphella auricularioides P. Henn. & Nym., Monsunia 1: 7. 1899.

Apparently type material at Stockholm (S) from Java is an Ascomycete.

Cyphella australiensis M. C. Cooke, Grevillea 20: 9. 1891.

Type: Australia: Melbourne, No. 378 (K).

The specimen examined compares favorably with *C. zeylandica* and thus is assigned as a synonym of this species in *Aleurodiscus*.

Cyphella byssacea P. Henn. & E. Nym., Monsunia 1: 7. 1899.

Type material of this species appears similar to material like *C. pulcher* now assigned to *Marasmius*, although the combination is not proposed at this time.

Cyphella cartilaginea Ell. & Ev. in herb. (NY) (nomen nudum).

Type: New Jersey: Newfield, Nov. 14, 1892. (NY).

The specimen at New York is an immature Discomycete.

Cyphella cinereofusca (Schw.) Sacc., Michelia 2: 303. 1880. *Peziza cinereofusca* Schw., Schr. Naturf. Ges. Leipzig. 1: 119. 1822. — *Chaetocypha cinereofusca* (Schw.) O. Kuntze, Rev. Gen. 2: 847. 1891.

A specimen from the Schweinitz Herbarium, Philadelphia Academy of Sciences, proved to have only an immature Pyrenomycete upon it. Presumably the material seen was the basis for Schweinitz's species since no material under this name was found in the Michener Herbarium at the National Fungus Collections. Saccardo probably had no knowledge of this material. Since two different cyphellaceous fungi have been given this name in herbaria they have been renamed and this name is rejected for further use.

Cyphella convoluta M. C. Cooke, N. Y. Acad. Sci. Ann. 1: 179. 1878. *Chaetocypha convoluta* (Cke.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Type: Texas. April 1869, Ravenel 295. (NY, K).

After study of the type specimen, I agree with Burt (1914) that the material is insufficient to decide the nature of the specimen. The portion of the type loaned by Kew (K) is an inoperculate Discomycete.

Cyphella cookei Sacc. & Syd., Syll. Fung. 14: 231. 1899.

Cyphella filicola Cooke, Grev. 14: 129. 1886. not *C. filicicola* Berk. & Curt., Grev. 2: 5. 1873. — *Cyphella pteridophila* Cke., in herb., Kew (nomen nudum). — *Cyphella pteridophila* Sacc., Syll. Fung. 6: 683. 1886. — *Chaetocypha pteridophila* (Cke.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cunningham (1953) reported that this species was based on specimens of insect egg capsules without definite structure. Through the courtesy of the Director of the Royal Botanical Gardens, Kew, the type, and three other specimens on the type sheet (all discussed by Cunningham) were examined. The specimen was of an exci-

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pulaceous Ascomycete with definite structure and possessing two-celled, cylindric, hyaline spores. See also Donk (1959).

Cyphella coriacea Ell. & Ev., in herb. (NY) (nomen nudum).

Type: Louisiana: St. Martinsville, A. B. Langlois, Feb. 20, 1890. (NY).

The specimen at New York is apparently an immature Discomycete.

Cyphella cupressi (Schw.) Fr., Epicr. 567. 1838.

Chaetocypha cupressi (Schw.) O. Kuntze, Rev. Gen. 2: 847. 1891.

This species is based on a leaf gall caused by an insect on living leaves of *Taxodium distichum*.

Cyphella cupula Ell. & Ev., in herb. (NY) (nomen nudum).

Basidia are present but no spores were seen in the specimen at New York.

Cyphella cyclas Cooke & Phill. in Cooke, Grevillea 9: 94. 1881.

Chaetocypha cyclas (Cooke and Phill.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Type: England: Ely, Dec. 1880, W. Marshall (K).

The type is a good specimen of *Cytidia flocculenta*. See Donk (1959) under *Auriculariopsis*.

Cyphella digitalis (Alb. & Schw.) Fr., Syst. Myc. 2: 201. 1822.

This species is the type of the genus *Cyphella* Fr. Since it has been shown to be an *Aleurodiscus*, and since *Aleurodiscus* has been conserved over *Cyphella*, *Cyphella* becomes unavailable for use as a generic name unless a suggestion made by Donk (1959) is carried out in the future. For additional information see Donk (1959).

Cyphella discoidea Cooke, Grevillea 12: 85. 1884.

Type: New Zealand: On Hawkweed, near Napier. Rev. O. Colenso, Aug. 1883 (K).

The type specimen contains empty spider egg capsules. For further discussion see G. H. Cunningham (1953) p. 187, and Donk (1959).

Cyphella erica Pat., Bull. Soc. Myc. Fr. 11: 209. 1895.

Type: Ecuador: San Jorge, July 1892. Lagerheim. (Pat. in FH).

The type specimen contains only a Discomycete.

Cyphella flocculenta (Fr.) Bres., Ann. Mycol. 1: 111. 1903.

This is a synonym of *Cytidia flocculenta*.

Cyphella gigas Pat., Bull. Soc. Myc. Fr. 25: 4. 1909.

The one specimen in the type packet (Pat. in F. H.) was insufficient for study.

Solenia globosa Lloyd, in herb., nomen nudum.

The type specimen (CGL in NFC) is a species of *Hypoxylon*.

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Cyphella hebeae Massee, Kew Bull. 1914: 157. 1914.

Specimen is *Dasyscyphus hebeae* (Massee) Dennis and Reid, Kew Bull. 1957: 287. 1957. See also Donk (1959).

Cyphella integra Zoll.

A packet in the Patouillard Herbarium (FH) had no material in it.

Cyphella irregularis (Fee).

Cyphella aeruginosa Karst.

The original label on the packet loaned by the Cryptogamic Herbarium at Paris (PC) indicates that the specimen was collected at Rio de Janeiro, by Glaziou, No. 3459. It is labeled also as probably identical with the lichen *Lecidea irregularis* Fee.

Cyphella juniperi Vel., Novit. Myc. Novis., Opera Bot. Cech. 4: 92. 1947.

Material which may be the type specimen, loaned by Dr. Pilát (PR) apparently contains only a *Tomentella*.

Cyphella mauritiae Pat. & Gail., Bull. Soc. Myc. Fr. 4: 40. 1888.

On decaying petioles of *Mauritia flexuosa*, Puerto-Zamuro, Upper Orinoco. Collected by A. Gaillard, No. 20, May, 1887. (FH, PC).

The packet at the Farlow Herbarium, which presumably contained the type, was empty when examined. That portion of the type at Paris contains cream colored receptacles 1—3 mm. in diameter and high, sessile, soft, occuring on leaves. No special hairs or hymenial elements or spores were observed.

Cyphella microthele Speg., Ann. Mus. Nac. Buenos Aires 1909: 277. 1909.

The type packet at Institute Spegazzini (LBS) contained no identifyable material.

Cyphella ?pandani (Pat.) Sacc., Syll. Fung. 21: 423. 1912.

Examination of the type specimen (Pat. in FH) indicated that this is *Catilla pandani* Pat., a sessile species resembling *Physalacria* and not a cyphelloid fungus.

Cyphella pendula (Schw.) Fr., Epicr. 567. 1838.

Chaetocypha pendula (Schw. ex Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891.

This is the polypore *Porodisculus pendulus* (Schw.) Murill.

Cyphella pulchra Berk. & Br., J. Linn. Soc. Bot. 14: 74. 1875.

Chaetocypha pulchra (Berk. & Br.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Type: Ceylon: Coll. H. W. Thwaites, No. 368. Herb. Berkeley (K).

Other specimen examined: Ceylon: On netmeg, Peradeniya, Dec. 1918. Collected by Petch (K).

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This species is now assigned as follows:

Marasmius pulcher (Berk. & Br.) Petch, Ann. Roy. Bot. Gard. Peradeniya 9: 21. 1924. See Dennis and Reid (1957) for descriptions and discussion of cyphelloid and marasmioid fungi assigned to the genus *Marasmius*. See also Donk (1959).

Cyphella reineckiana P. Henn., Engl. Bot. Jahrb. 23: 279. 1896.

A specimen at Stockholm (S) from the Sydow Herbarium collected by Reinecke in Samoa is not a *Cyphella*. It is probably the type of this species.

Cyphella spermoides Berk. & Br., Jour. Linn. Soc. Bot. 14: 74. 1875.

Chaetocypha spermoides (Berk. & Br.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Type: Ceylon: Doloshagy, 300 M., May 1868, No. 578. (K).

The type specimen contains cyphelloid fruit bodies filled with insect eggs. Since the original description indicates that Berkeley also saw these bodies, the species is not considered to be a valid publication in the cyphelloid fungi.

Cyphella subceracea P. Henn., Hedwigia 36: 194. 1897.

Material in what may be the type packet (S) is similar to *C. pulchra* and thus assignable to a complex in *Marasmius* although the combination is not proposed at this time.

Cyphella subcyanea Ell. & Ev., Journ. Myc. 2: 37. 1885.

Type: Louisiana: Point à la Hache, Nov. 30, 1885. A. B. Langlois (NY).

This is the lichen *Heterothecium augustinii* Tuckermann, now known as *Pyrenotrichum splitgerberi* Mont. See Donk (1959).

Chlorocyphella subtropica Speg., Ann. Mus. Nac. Buenos Aires 19: 279. 1909.

According to R. Santesson, this is the lichen *Porina nitidula* Müll. Arg. For comments on this genus and species see Donk (1959).

Cyphella taxi Lév., Ann. Sci. Nat., Bot. II. 8: 336. 1837.

Chaetocypha taxi (Lév.) O. Kuntze, Rev. Gen. 2: 847. 1891.

On the basis of a specimen which appears to be the type, loaned by the Cryptogamic Herbarium of the Paris Museum (PC), this is a synonym of *Cyphella ampla* Lév., Ann. Sci. Nat. Bot. III. 9: 126. 1848. Donk (1959: 103) gives a different interpretation of this species.

Cyphella tela (Berk. & Curt.) Massee, Journ. Linn. Soc. Bot. II. 35: 117. 1901.

Peziza tela Berk. & Curt., Grevillea 3: 156. 1875.

The specimen at NYBG which is presumably Massee's type is a water color of a specimen accompanied by a description.

Solenia tinctoria Eschw. in herb.

Material seen of this species at Berlin (B) is not cyphellaceous.

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Coniocyphella tremulae Pilát, in herb.

A specimen loaned by Dr. Pilát, which may be the type specimen, contained no identifiable cyphellaceous fungus.

Cyphella venustula (Desm.) Cooke, Grevillea 20: 9. 1893.

Peziza venustula Desm., Ann. Sci. Nat., Bot. II. Pl. Crypt. 1058.

Type: Desm., Crypt. France 1058 (K).

In a specimen loaned by Kew no spores nor mature basidia were seen.

Cyphella zeuneri Pilát, Ann. Mycol. 23: 150. 1925.

The type specimen including a piece of burlap, contained no identifiable cyphellaceous material. CPR).

Cyphella zeylandica Cke. & Phill. in Cooke, Grevillea 8: 57. 1879.

Chaetocypha zeylandica (Cke. & Phill.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Type: New Zealand: Winton, on bark. No. 230. (K).

This material represents a species of *Aleurodiscus* according to Cunningham (1953). See also Donk (1959).

Species not yet Studied

Cyphella agariciformis Pilát, Hedwigia 66: 262. 1926. — See Donk (1959).

Cyphella arborum Fries, in herb. — According to Cooke, Grevillea 20: 9, 1893, "There is a specimen from Léveille under this name at Herb. Kew, but we do not know where he described any species under that name".

Cyphella brayerae P. Henn., Pilze Ostafr. in Engler, Die Pflanzenwelt Ostafr. 55. 1895.

Cyphella capula f. *chilensis* P. Henn., Ofvers. K. Vet.-Akad. Förhandl. 57: 318. 1900.

Cyphella catilla Smith, Journ. Bot. 11 (N. S. 2): 337. 1873. — *Chaetocypha catilla* (Smith) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella cheesmani Massee, Jour. Linn. Soc. 38: 411. 1909. — See Donk (1959).

Cyphella chromospora Pat., Tab. Anal. Fung. 32. 1883. — *Chaetocypha chromospora* (Pat.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella cirrato-pilosa P. Henn., Engl. Bot. Jahrb. 38: 107. 1905.

Cyphella cirsii Crouan, Fl. Finist. 61. 1867. — *Chaetocypha cirsii* (Crouan) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella cuticulosa (Dicks. ex Purt. in Fr.) Berk. in J. E. Smith, Engl. Fl. 5(2): 215. 1836. — ?*Peziza cuticulosa* Dicks., Fasc. Pl. crypt. Brit. 3: 22, pl. 9, f. 11. 1793. — *Peziza cuticulosa* Dicks. ex Purt., Appl. Midl. Fl. 263. 1821. — *Chaetocypha cuticulosa* (Dicks. ex Purt. in Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891. — See also Donk (1959).

Cyphella cyathus P. Henn., Ofvers. K. Vet.-Akad. Förhandl. 57: 318. 1900.

Cyphella dumetorum Romm. & Rouss., Fl. mycol. Bruz. 88. 1884. — *Chaetocypha dumetorum* (Romm. & Rouss.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella elegans Sauter, Hedwigia 15: 152. 1876. — *Chaetocypha elegans* (Sauter) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella episphaeria Quél., Mem. Soc. Emul. Montbéliard Ser. 2, Comp. 5: 537—8, 1875. — *Chaetocypha episphaeria* (Quél.) O. Kuntze, Rev. Gen. 2: 847. 1891.

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Cyphella farinosa Pat., Bull. Soc. Myc. Fr. 9: 135. 1893.

Cyphella ferruginea Crouan, Fl. Finist. 61. 1867. — *Chaetocypha ferruginea* (Crouan) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella fissilis (Fr.) Berk. in Herb. ex Cooke, Grevillea 20: 9. 1893. — *Cantharellus fissilis* Fr., Syst. Myc. 1: 324. 1821. — The following comment is quoted from Cooke's original citation: "On the authority of Rev. M. J. Berkeley this is a *Cyphella*, distinct from *C. lacera*." Except for material so identified by Ellis, no authentic specimens of this species have been seen.

Cyphella fuscospora Currey in Herb. ex Cooke, Grevillea 20: 9. 1893.

Cyphella gilletii Pat., Rev. Myc. 4: 211. 1882. — *Chaetocypha gilletii* (Pat.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella globosa Rodway, Pap. Rroc. R. Soc. Tasmania 1917: 108. 1918.

Cyphella griseopallida var. *alba* Pat., Tab. Anal. Fung. 583. 1887.

Cyphella infundibuliformis (Alb. & Schw.) Fr., Hym. Eur. 665. 1874. — *Helotium infundibuliformis* Alb. & Schw., Consp. Fung. 2: 350. 1820. — *Chaetocypha infundibuliformis* (Alb. & Schw. ex Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891. — See Donk's interpretation of this species (1959).

Cyphella irenes Maire, Bull. Soc. N. H. Afr. Nord. 1917: 155. 1917.

Cyphella junci Crouan, Fl. Finist. 61. 1867. — *Chaetocypha junci* (Crouan) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella juruensis P. Henn.,Hedwigia 43: 173. 1904.

Cyphella lacera Pers. ex Fr., Syst. Myc. 2: 202. 1822. — *Peziza membranacea* Alb. & Schw., Consp. Fung. 2: 316. 1820. — *Peziza lacera* Pers., Myc. Eur. 280. 1801. — *Chaetocypha lacera* (Pers. ex Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella lateritia Rostr., Med. om Grönland 3: 600. 1889.

Cyphella ochroleuca Berk. & Rav., Ann. Mag. Nat. Hist. II. 13: 405. 1854. — *Chaetocypha ochroleuca* (Berk. & Br.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Calyptella ochroleuca* (Berk. & Br.) Big. & Guil., Fl. Champ. spp. France Compl. 483. 1913. — *Phaeocyphella ochroleuca* (Berk. & Br.) Rea, Brit. Basid. 704. 1922.

Cyphella oudemansii Sacc., Syll. Fung. 6: 681. 1888 for *C. musae* Oud., Aanw. Mycol. Ned. 9—10: 22. 1885. — *Chaetocypha oudemansii* (Sacc.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella patens A. L. Smith, Jour. Linn. Soc. Bot. 35: 10. 1901.

Cyphella perexigua Sacc., Michelia 2: 136. 1882. — *Chaetocypha perexigua* (Sacc.) O. Kuntze, Rev. Gen. 2: 847. 1891. — Based on a specimen collected by Ravenel in Carolina and reported to be smaller than *C. eruciformis* and *C. cupuliformis* which it resembled.

Cyphella perpusilla Berk., Jour. Linn. Soc. 15: 51. 1877. — *Chaetocypha perpusilla* (Berk.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella polycephala Sacc., Hedwigia 28: 126. 1889.

Solenia populicola Pat., Tab. Anal. Fung. 4: 201. 1886.

Cyphella pusilla Oud., Contr. Myc. Pays- Bas. 14: 26. 1892.

Cyphella reniformis Pat., Ann. Bot. Jard. Buitenzorg, Suppl. 1: 115. 1897.

Cyphella roseo-cinerea Pat., Bull. Soc. Myc. Fr. 4: 40. 1888.

Cyphella rufo-brunnea P. Henn., Engl. Bot. Jahrb. 22: 85. 1895.

Cyphella ?rugulosa Lév. in Zoll. Verz. 17. (Phlebophora). 1854—5.

Cyphella scariosa Ces., Atti Acc. Sci. fis. nat. Napoli 8: 10. 1880.

Cyphella schneideri Berk. & Br., Trans. Linn. Soc. Bot. 2: 220. 1886.

Cyphella straminea Schroet. in Cohn, Krypt. Fl. Schles. 3(1): 345. 1889. — *Chaetocypha straminea* (Schroet.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella subvillosa P. Henn. & E. Nym., Monsunia 1: 7. 1899.

Solenia svrcekii Pilát, Bull. Soc. Myc. Fr. 3: 203. 1947.

Cyphella tenerrima Karst., Hedwigia 34: 8. 1895.

Cyphella terrigena Karst., Medd. Soc. Faun. Fl. Fenn. 16: 21. 1888.

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Cyphella tijucensis P. Henn., Hedwigia 43: 81. 1904. — Reported as similar to *C. subceracea* except that the receptacles occur as single cupules.

Cyphella tuba Weinm., Ross. 520. 1836. — *Chaetocypha tuba* (Weinm.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella usambarensis P. Henn., Pilze Ostafr. in Engler, Die Pflanzenwelt Ostafrika 55. 1895.

Cyphella variolosa var. *volkenii* P. Henn., Pilze Ostafr. in Engler, Die Pflanzenwelt Ostafrika 55. 1895.

Cyphella vernalis Weinm., Ross. 522. 1836. — *Chaetocypha vernalis* (Weinm.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella villosa var. *cycadearum* P. Henn., Ver. Bot. Ver. Prov. Brandenb. 40: 121. 1898.

Cyphella vitellina (Lév.) Pat., Soc. Myc. Fr. Bull. 3: 121. — *Exidia vitellina* Lév., Ann. Sci. Nat., Bot. III. 5: 219. 1844. — *Chaetocypha vitellina* (Lév.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella neckerae Fr., Syst. Myc. 2: 203. 1822. — *Chaetocypha neckerae* (Fr.) O. Kuntze, Rev. Gen. 2: 847. 1891.

Cyphella inconspicua (Berk. & Curt.) Cke., Grevillea 20: 9. 1893. — *Peziza inconspicua* Berk. & Curt., (In Sacc. Syll. 8: 1888).

Solenia verticalis (Hoffm.) Sacc., Syll. Fung. 21: 362. 1912. — *Solenia verticalis* Hoffm., Veget. Hereyn. Subterr. 1811: 26. 1811. — According to Saccardo, this is similar to *S. fasciculata* Pers.

Solenia subfasciculata P. Henn. & E. Nym., Monsunia 1: 7. 1899. — Saccado placed this near *S. fasciculata*.

Cyphella byssacea P. Henn. & E. Nym., Monsunia 1: 7. 1899.

Cyphella globosa Pat., Bull. Soc. Myc. Fr. 1895: 209. 1895.

Solenia maxima Massee, Brit. Fung. Flora 1: 143.

Solenia purpurea Romell, Bot. Notis. 1889: 26. 1889. — No specimen observed. Described as being weakly purple, tubular, 1 mm. × 0.5—0.75 mm., scattered to subgregarious, sessile, hard when dry, smooth. Reported from Ronneby Blekingiae, Sweden, on oak wood, Aug. 1887.

Cyphella soleniiformis (Berk. & Curt.) Massee, Jour. Linn. Soc. Bot. II. 35: 116. 1901. — *Peziza soleniiformis* Berk. & Curt., Grev. 3: 160. 1875. — *Pezizella soleniiformis* (Berk. & Curt.) Sacc., Syll. Fung. 8: 280. 1889.

Phaeosolenieae tribus nov.

Ut in subfamilia, sed sporis coloratis.

As in the subfamily but spores colored.

Type: *Phaeosolenia* Speg.

Key to the Genera of the *Phaeosolenieae*

1. Receptacles without special surface hairs ..... *Pellidiscus*
1. Receptacles with special surface hairs 2
   2. Spores asperulate ..... *Asterosolenia*
   2. Spores smooth 3
3. Surface hairs without granular incrustation ..... *Phaeoglabrotricha*
3. Surface hairs with some granular incrustation 4
   4. Receptacles broadly tubular to narrowly cup-shaped .. *Phaeocyphellopsis*
   4. Receptacles cup- to goblet- or funnel-shaped ..... *Phaeosolenia*

Pellidiscus Donk, Persoonia 1: 89. 1959.

As in *Glabrocyphella*, but spores yellow to brown.

Type: *Cyphella pallida* Berk. & Br. in mss. ex Rab.

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Key to the Species of *Pellidiscus*

1. Receptacles 0,5—1,0 mm. in diameter, spores 6,5—7×3—5μ .... *P. pallida*
1. Receptacles 0,1 mm. in diameter, spores 7—8×4—5 μ *P. subiculosa*

Pellidiscus pallidus (Berk. & Br.) Donk, Persoonia 1: 90. 1959. *Peziza floccosa* Lasch, in Klotzsch-Rab., Herb. Myc. No. 1225. 1849. — *Cyphella pallida* Berk. & Br. in Rab., Fung. europ. exs. No. 1415. 1871. — *Cyphella bloxami* Berk. & Phill. in Berk. & Br., Ann. Mag. Nat. Hist. V. 7: 129. 1881. — *Calyptella pallida* (Berk. & Br.) Quél., Ench. Fung. 216. 1886. — *Chaetocypha pallida* (Berk. & Br.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Chaetocypha bloxami* (Berk. & Phill.) O. Kuntze, l. c. — *Cyphella disciformis* Pilát, Ann. Mycol. 22: 212. 1924. not *Cyphella disciformis* P. Henn., Engl. Bot. Jahrb. 22: 85. 1895. — *Cyphella floccosa* (Lasch) Jaap, Fung. Sel. exs. No. 584. 1912. — *Cyphella involuta* Pilát, Ann. Mycol. 23: 151. 1925. — *Cyphella bloxami* var. *disciformis* (Pilát) Pilát, Publ. Fac. Sci. Univ. Charles 29: 34. 1925. — *Cyphella sarothamni* Pilát, Ann. Mycol. 23: 149. 1925.

Receptacles white to cream-color, repand but attached only at the center, sessile, 200—300 μ to 0,5—1 mm. in diameter; covered with smooth, thin-walled, hyaline, simple-septate, subiculum-like hyphae 3—6 μ in diameter, forming a loose hyphal network; context of loosely arranged, hyaline, hyphae, subhypochnoid, 3—4 μ in diameter, simple septate; subhymenial hyphae up to 3 μ in diameter, clamped in some specimens; hymenium formed of clavate basidia produced in easily separated fascicles, 15—20×4—7 μ, 4-sterigmate, without basal clamps; spores at first hyaline, becoming light yellow-brown, then yellow-brown, apiculate, teardrop-shaped to cylindric flattened on one side, remaining in groups of four in some specimens examined, 8,5—9,5×3,5—4,0 μ.

Habitat: On twigs and stems of various herbs, shrubs and trees including: *Alnus* sp., *Clematis vitalba*, *Corylus* sp., *Lamium maculatum*, *Larix* sp., *Lythrum valicium*, *Melamyprum* sp., *Populus tremula*, *Rubus suberecta*, *Salix* sp., *Sambucus nigra*, *Sarothamnus scoparius* and *S. vulgaris*.

Type specimens examined:

Cyphella pallida Berk. & Br. in mss. ex Rab.: England: Batheaston. On twigs of *Clematis vitalba*, Dec. 1870, C. E. Broome, in Rabenhorst, Fungi europaei No. 1415 (B, PR).

Cyphella floccosa (Lasch) Jaap: Germany: On branches of *Sarothamnus scoparius* (L.) Koch, Prov. Brandenburg, Triglitz in der Prignitz. Collected by Otto Jaap, Aug. 8, 1912. In Otto Jaap, Fungi selecti exsiccati No. 584. (B).

Cyphella disciformis Pilát: Czechoslovakia: Mnichovice. On *Populus tremula*, June 1923, Coll. A. Pilát.

Specimens examined from: Czechoslovakia (31), Germany (5),

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Great Britain (5), Norway (1).

Quélet, l. c., placed *Cyphella ochroleuca* here as a doubtful synonym. A specimen collected by R. W. G. Dennis (K) on the east slope of Vaadelsjell, Norway, has spores 5,5—8,0 × 3,5—4,5. Otherwise it agrees with the description given above. Some of the specimens from Czechoslovakia have slightly shorter spores measuring 6,5—7,0 × 3,5 μ.

Pellidiscus subiculosus sp. nov.

Cupula 100 μ diam. vel alta; e subhymenio et hymenio tantum composita; basidiis 4-sterigmaticis; sporis ovatis, apiculatis, laevibus, luteis, 7—8 × 4—5 μ.

Receptacles 100 μ in diameter and height; no special surface hairs but a few rarely septate subicular hyphae present; cups composed only of subhymenium and hymenium tissue; basidia 4-sterigmate; spores ovate, apiculate, smooth, yellowish, 7—8 × 4—5 μ.

Habitat: On fairly well decomposed litter.

Type and specimen examined: Ontario: Brant Co., East of New Durham, Aug. 1941. Coll. R. F. Cain. (TRTC 18014).

Phaeoglabrotricha gen. nov.

Ut in *Glabrotricha*, sed sporis lutescentibus vel brunneis.

As in *Glabrotricha*, but spores yellow to brown.

Type: *Cyphella sessilis* Burt.

Key to Species of *Phaeoglabortricha*

1. Surface hairs subiculoid 2
1. Surface hairs simple or dichophysoid, short or elongate 6
2. Spores globose 3
2. Spores ovate and cylindric 4
3. White granular material enmeshed in surface hyphae, spores 5,5—7 μ in diameter ..... *P. farinacea*
3. No such granular material present, spores 12—13 μ in diameter ..... *P. globosa*
4. Receptacles produced on stroma bearing *Helminthosporium* spores ..... *P. helminthosporii*
4. Receptacles not produced on such a stroma 5
5. Tissues of receptacles bearing clamp connections ..... *P. disciformis*
5. Tissues of receptacles without clamp connections ..... *P. floccosa*
6. Surface hairs dichophysoid ..... *P. puertoricensis*
6. No dichophyses present 7
7. Surface hairs with bulbous tip ..... *P. rubi*
7. Surface hairs elongate, pointed, simple ..... *P. sessilis*

Phaeoglabrotricha globosa sp. nov.

Cupula 500 μ diam., sessilis, albida, extus hyphis mycelioideis, 2 μ diam. crassis induta; sporis globosis, apiculatis, laevibus, crasse tunicatis, deinde luteis, 12—13 μ diam.

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Receptacles 500 μ in diameter, sessile, whitish; no special surface hairs but a mycelial web covers the cup completely, hyphae 2 μ in diameter; spores globose, with a minute apiculus, smooth, thin-walled at first, then thick-walled, yellow at maturity, 12—13 μ in diameter.

Habitat: On twigs of *Fraxinus americana.*

Type and specimen examined: Delaware: Wilmington. Coll. by. A. Commons, March 18, 1890. In the Ellis Collection (NY).

A portion of the type of *Cyphella fraxinicola* Berk. & Br., to which the above specimen was assigned, loaned by the Director, Royal Botanic Gardens, Kew, has no special surface hairs but is covered with sand-like particles ,and spores which are hyaline, ovate, smooth, and apiculate and measure 5,5—6 × 2,5—3 μ.

Phaeoglabrotricha farinacea (Kalchbr. & Cooke) comb. nov.

Cyphella farinacea Kalchbr. & Cooke, Grev. 9: 18. 1880. — *Chaetocypha farinacea* (Kalchbr. & Cooke) O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles gregarious, often touching one another, sessile to subsessile, 0,3—1,5 mm. in diameter when dry, discoid, becoming flattened, with inrolled margin when dry; exterior composed of greyish-white meal consisting of crystals enmeshed among surface hyphae; hymenium olivaceous to cinereous or black-brown; surface appearing sandy granular, covered with a more or less loose web of hyphae, the layer being 20—30 μ thick, in which crystalline material is enmeshed, hyphae hyaline to yellowish, 1,5—3,0 μ in diameter, with simple septa, simple clamp connections, and medallion clamps, subgelatinous 1,4—1,8 μ in diameter in subhymenial area; basidia clamped at base, in tight palisade, 15—20 × 6—8 μ, 4-sterigmate; no sterile hymenial elements; spores globose to subglobose, smooth, granular inside, appearing minutely punctate, yellowish, 5,5—7,0 μ in diameter.

Habitat: On rotting wood.

Type and specimen examined: Union of South Africa: Somerset East, Cape Province. Coll. MacOwan 1221. (PRE 20807).

Phaeoglabrotricha helminthosporii Pat., sp. nov.

Phaeocyphella helminthosporii Pat., in herb.

Cupula ad 1 cm. diam., repanda, subiculo effuso, albo praedita extus pilis hyphoideis densis granulosis luteolis obecta basidiis 13,5—17 × 5,0 μ, 4-sterigmaticis; sporis laevibus, brunneis, ellipsoideis, apiculatis, 5—8,5 × 2,5—5 μ.

Receptacles up to 1 cm. in diameter, on a weakly developed white subiculum, broadly disk-shaped to flat, effused for 10 cm. on a stick covered with a *Helminthosporium*; surface covered with a white tomentum similar to the subiculum, tomentum hyphae yellowish,

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granule-incrusted when free, but not in the subiculum; hyphae of receptacle clamped; basidia 13,5—17 × 5,0 μ, 4-sterigmate, no sterile hymenial bodies; spores smooth, brown, ellipsoid, apiculate, 5—8,5 × 2,5—5 μ.

Habitat: On or among an effused *Helminthosporium* stroma on a dead stick.

Type and specimen examined: French Indochina: Tonkin, Jan. 1922. (Pat. in FH).

Phaeoglabrotricha puertoricensis sp. nov.

Cupula alba vel brunnea, 1 mm. alta, infundibuliformis, extus strigoso-pilosa, pilis dichophysoideis; basidiis 15—24 × 6—7 μ, 2—4-sterigmaticis; dendrophyses 21—36 × 3—4 μ, hyalinae; sporis laevibus, apiculatis, pallide luteo-brunneis, ovoideis, 10—11 × 5,5—7 μ.

Receptacles white, with brownish undertones, 1 mm. high, funnel-shaped, stipe about half the total length, no special surface hairs seen on the outher surface but stipe and cup clothed with dichophysoid hyphae, abundant, branched; hyphae of context with clamps; dichophyses 15—36 × 3—4 μ, terminal branches 0,5—1,0 μ in diameter, hyaline; basidia 15—24 × 6—7 μ, 2—4-sterigmate; spores abundant, smooth, apiculate, flattened on one side, at first hyaline, then light yellow brown, ovate, 10—11 × 5,5—7 μ.

Habitat: On dead herbaceous stems.

Type and specimen: Puerto Rico: Rio Piedras, Oct. 24, 1912. Coll. J. R. Johnston 643. (LOO 10040 in PAC).

Phaeoglabrotricha rubi (Fckl.) comb. nov.

Cyphella rubi Fckl., Symb. Myc. 26. 1870. — *Chaetocypha rubi* (Fckl.) O. Kuntze, Rev. Gen. 2: 847. 1891. — *Cyphella lactea* Bres. var. *rubi* (Fckl.) Pilát, Ann. Mycol. 23: 149. 1925.

Receptacles sessile, 0,5—1,0 mm. in diameter, cream-colored, gregarious; surface hairs with bulbous tip, hyaline, smooth, to 40 μ long, 4 μ in diameter below, to 8,7 μ in diameter at the tip: context hyphae 3—4 μ in diameter, with clamps; subhymenial hyphae 2—2,5 μ; basidia 18—29 × 5—7 μ; clamped at base, 4-sterigmate; spores hyaline, becoming brown while attached, smooth, apiculate, elongate, tear-shaped, to cylindric flattened on one side 10—13,5(14,5) × 3—5 μ.

Habitat: On canes of *Rubus idaeus*.

Specimens examined from: Germany (3), Czechoslovakia (1).

Type: Germany: Nassau on canes, *Rubus idaeus*, collected by Fuckel. „ex herb. Rehm" (S).

Phaeoglabrotricha sessilis (Burt) comb. nov.

Cyphella sessilis Burt, Ann. Mo. Bot. Gard. 13: 317—8. 1926.

Receptacles scattered to gregarious or fused, white, sessile, repand, cup-shaped not tubular, 0,2—1,0 mm. in diameter; surface

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covered with parallel ascending pointed hairs, pale yellow in color, 100×3 μ, smooth, thin-walled, projecting beyond the edge of the cup; basidia in a compact hymenium, 12—18×4—5 μ, 4-sterigmate; spores hyaline, ovate, apiculate, flattened on one side, 5—7×3—4 μ, hyaline at first, becoming brown.

Habitat: On rotting leaves of *Sabal blackburnianum* (*S. bermudana* Bailey).

Type and specimen examined: Bermuda: Paget Marsh, Feb. 29, 1922. Coll. H. H. Whetzel (FH, MO 58708 in NFC). A specimen from the same place but dated Feb. 12, 1922, H. H. Whetzel, is labeled as type in (CU 34570).

Asterocyphella gen. nov.

Cupula sessilis vel subsessilis alba vel pallide lutea, extus pilis strigosis, ramulosis, anastomosiantibus vel simplicibus, elongatis praedita; sporis brunneis, asperulis.

Receptacles sessile or subsessile, covered with a floccose network of surface hairs which form stands which branch and anastomose or with simple, elongate surface hairs; receptacles composed of three layers of tissue, a loose to compact layer of hyphae giving rise to the surface hairs, a compact layer of context tissue, and the hymenium composed of basidia; spores brown, globose to ovate, asperulate.

Type: *A. floccosus* W. B. Cooke.

Key to Species of *Asterocyphella*

1. Spores long ovate, 7,2—9×3,6 μ ..... *A. floccosa*
1. Spores globose 2
   2. Spores 4 μ in diameter, surface hairs brown ..... *A. friesii*
   2. Spores 3—4 μ in diameter, surface hairs yellow green .... *A. theiacantha*

Asterocyphella floccosa sp. nov.

Cupula alba, sessilis, 1 mm. extus hyphis diam., sat laxe dispositis, vel in funiculos singulos usque ad 54 μ longis, ex hyphis ramulosis, anastomosantibus compositos conjunctis obtecta; basidiis 15—18×4—5 μ, 4-sterigmaticis; sporis brunneis, asperulatis, apiculatis, ovoideis, 7,2—9×3,6 μ.

Receptacles white when fresh, grey when dry, sessile, 1 mm. in diameter, margin reflexed; hyphae on surface of receptacle loosely arranged, with single strands up to 54 μ long forming a floccose network, hyphae of strands branching and anastomosing; no clamps seen; receptacles 100—150 μ thick, composed of a loose outer layer, a rather compact layer 50 μ thick, and a hymenium up to 25 μ thick; hymenium composed only of basidia; basidia loosely arranged, 15—18×4—5 μ, 4-sterigmate; spores brown, asperulate, apiculate, ovate, 7,2—9×3,6 μ.

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Habitat: On dead branches of *Serjana fulta*.

Type and specimen examined: Argentina: Prov. Tucuman: Quebrada de Tules, in shaded marginal tropical forest, Feb. 18, 1951. Coll. R. Singer T. 1283. (LIL).

Asterocyphella friesii (Crouan) comb. nov.

Cyphella friesii Crouan "non Weinm.", Fl. Finist. 62: 1867. — *Calyptella friesii* (Crouan) Quél. Ench. Fung. 217. 1886. — *Chaetocypha friesii* (Crouan), O. Kuntze, Rev. Gen. 847: 1891.

Receptacles sessile to substipitate, cream color, pendant, to 5 mm. long, bell shaped, 3 mm. in diameter; covered with surface hairs, hairs 3—4 μ in diameter, to 200 or more μ long, brown, granule-incrusted toward the outside, weak, undulating; context hyphae hyaline, 3—4 μ in diameter; suvhymenial hyphae 2,5—3 μ in diameter; hymenium formed by a dense palisade of clavate basidia 20—25× 5—6 μ, 4-sterigmate; spores brown, globose, apiculate, minutely roughened, 4 μ in diameter.

Habitat: On wood.

Type and specimen examined: Only information on label: "Cap. b. sp. leg. MacOwan." (Cape of Good Hope) ex herb. Sydow (Stockholm).

Asterocyphella theiocantha (Sydow) comb. nov.

Cyphella theiacantha Sydow, Engl. Bot. Jahrb. 54: 253. 1916.

Receptacles golden yellow, more or less solenioid, 100—200 μ in diameter, tip up to 500 μ high, goblet-shaped, stipe may include ⅓ to ½ total height, up to 75 μ in diameter; receptacle, stipe, and base clothed with short colored hairs; hairs under low powers brownish, when viewed separately under higher powers yellow green colored, incrusted with fine granules 35—50×3 μ; basidia and spores not seen.

Habitat: On dead palm branches.

Type and specimen examined: New Guinea: Etappenberg Station. Collected by C. Ledermann, No. 9506, Oct. 25, 1912, on the Sepik Expedition. "ex herb. Sydow". (S).

According to the original description: "Spores globose to subglobose, minute asperulate, yellow, 3—4 μ diam."

Phaeocyphellopsis gen. nov.

Ut in *Cyphellopsis*, sed cupulis lutescenti-brunneis, sporis ovoideis, denique brunneis.

As in *Cyphellopsis*, but receptacles paler, honey-colored; spores ovate, finally brown, and surface hairs without observable knob-like tips.

Type: *Solenia ochracea* Hoffm. ex Pers.

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Phaeocyphellopsis ochracea (Hoffm. ex Pers.) comb. nov.

Peziza hoffmannii Sprengl. Sept. Veg. ed. 1 b(4)(1): 516. 1827. — *Solenia ochracea* Hoffm. ex Pers., Myc. eur. 1: 334. 1822. — *Henningsomyces ochraceus* (Hoffm.) O. Kuntze, Rev. Gen. 3(2): 483. 1898. — *Cyphella mellea* Burt, Ann. Mo. Bot. Gard. 1: 372. 1914. — *Solenia anomala* var. *ochracea* (Hoffm. ex Pers.) Berk. in Rea, Brit. Basid. 702. 1922.

Receptacles sessile to short-stipitate, honey-yellow to brown in color, scattered to closely gregarious, 0,5—3 mm. high, 200—600 μ in diameter, broadly tubular to narrowly cup-shaped; surface hairs straight, brown, appressed, smooth below, granule-incrusted on outer half to two-third of length, tapered to a point, 50—150×3—6 μ; basidia 13,5—24×5—7 μ, 4-sterigmate; hymenium cream to yellowish; spores at first hyaline, becoming brown, in some collections more than half the spores brown, in others very few brown, ovate, smooth, apiculate, (5)—6—8—(10,5)×3—5,5 μ, contents granular, giving the appearance of a rough wall at lower magnifications, usually abundant; within many collections the range of spore size is large; in some collections spore size is fairly constant. The brown color of the spores is apparently not developed before spore discharge.

Habitat: On rotting wood and litter, especially of species of: *Alnus*, *Benzoin*, *Betula*, *Cinnamomum*, *Cornus*, *Corylus*, *Ficus*, *Fraxinus*, *Hibiscus*, *Holodiscus*, *Juglans*, *Liquidambar*, *Liriodendron*, *Plantanus*, *Populus*, *Pyrus*, *Quercus*, *Rhus*, *Salix*, *Sorbus*, *Tilia*, *Ulex* and *Ulmus*.

Type specimen examined: *Cyphella mellea* Burt: Louisiana: Bohemia, Dec. 23, 1886, Coll. A. B. Langlois 864A. (FH).

Specimens examined from: Austria (2), Czechoslovakia (15), France (5), Germany (6), Great Britain (15), Hungary (6), Italy (5), Latvia (1), Poland (2), Russia (1), Sweden (31), Algeria (1), Ceylon (2), Java (1), Australia (2), Argentina (1), Brazil (1), Venezuela (1), Cuba (1), St. Domingo (1), Manitoba (3), Ontario (21), Alabama (3), California(2), Colorado (3), Delaware (2), Florida (2), Illinois (1), Indiana (1), Iowa (5), Kansas (1), Kentucky (1), Louisiana (15), Maryland (1), Massachusetts (1), Michigan (8), Missouri (2), Nebraska (1), New Jersey (1), New York (11), North Carolina (1), Ohio (7), Pennsylvania (6) Tennessee (4), West Virginia (1).

A small group of specimens has the following characteristics: As above, but all structures except the surface hairs appear to have been reduced to resting spores or chlamydospores: thick-walled, smooth, regular to irregular, more or less like basidiospores, apiculate to symmetrical, yellow-brown, wall 1—2 μ thick, contents stain red in phloxine, rarely becoming two-celled, 6—10×10,5—18,5 μ.

Habitat: On very rotten wood of *Salix* and *Tilia*.

Specimen examined from: Louisiana (1).

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As above but chlamydospores verrucose, brown, ovate to subglobose, $9-10 \times 6-7$ μ.

Habitat: On rotten wood.

Specimen examined from Colorado (1).

Specimens assigned to this species in this treatment have usually been identified as *Solenia anomala* or *S. ochracea* in herbaria. In establishing *Cyphella mellea* and relegating *S. ochracea* to synonymy under *S. anomala*, Burt indicated unfamiliarity with authentic material of *S. ochracea*. Authentic material from Sweden sent by Seth Lundell cleared up this problem and indicated that all material previously assigned to *S. mellea* belongs here. The presence of the colored spores with granular contents and ovate shape, together with the (usually) lighter color of the receptacles and somewhat differently shaped surface hairs, will usually separate specimens of this species from *Cyphellopsis anomala*. A further source of confusion in this group was the assumption on Burt's part that there was little if any difference between *C. anomala* and *C. fasciculata*. Examination of the authentic material of *S. ochracea* cleared up this problem also.

A specimen at Kew in the M. C. Cooke herbarium is labeled "ex Fries ipse". This is probably an authentic specimen and agrees with the material on which the description above was based.

Phaeosolenia Speg., Anal. Mus. Nac. Buenos Aires 8: 53. 1902. (III. 1: 53. 1902).

Phaeocyphella Speg., An. Mus. Nac. Buenos Aires III. 12: 278. 1909. not *Phaeocyphella* Pat., 1900 = *Chromocyphella* de Toni & Levi, 1888.

Receptacles membranaceous to coriaceous, cup-shaped to urceolate or cylindric, sessile to stalked, single to gregarious or crowded, not fasciculate, subiculum weakly developed to absent; receptacles pendant, covered with special surface hairs which may be densely granule-incrusted, giving a white appearance to an otherwise brown structure; basidia clavate, usually with 4-sterigmata, usually subtended by clamps; spores yellow to brown, smooth, sometimes displaying granular contents, spherical to ovate or cylindric.

Type: *P. platensis* Speg. = *Cyphella densa* Berk.

While a number of species of brown-spored cyphellaceous fungi occur in North America, no attempt has been made to recognize this fact through the use of a special genus in which to segregate them. Neither has any attempt been made to set up subgeneric units within *Cyphella* or *Solenia* to recognize these species. Since *Phaeocyphella* Pat. is based on *Cyphella galeata*, a brown-spored *Leptotus*, the next name available for brown-spored cyphellas is the one used above. *P. platensis* Speg. is synonymous with the widespread *P. endophila* or *P. densa*.

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Key to the Species of *Phaeosolenia*

1. Outer third of length of surface hairs usually geniculate ... *P. betulae*
1. Hairs straight, not geniculate ... 2
2. Spores at first hyaline, becoming yellow-brown to brown 3
2. Spores brown from the first ... 6
3. Spores with a thick wall ... *P. ravenelii*
3. Spore wall relatively thin ... 4
4. Surface hairs 40—70 × 5—6 μ, spores 11,5 × 7 μ ... *P. pelargonii*
4. Surface hairs 150—200 × 4—5 μ ... 5
5. Spores up to 12 μ long, 6—7 μ wide ... *P. granulosa*
5. Spores up to 12 μ long, 7—9 μ wide ... *P. ochro-pilosa*
6. Spores small, 5—7 × 3,5—4,5 μ ... *P. brenckleana*
6. Spores 7—10 μ long ... 7
7. Surface hairs with acanthophysoid branches ... *P. paraguayensis*
7. Surface hairs straight, simple ... 8
8. Spores almond-shaped, 8,5—10,5 × 4,5—5,5 μ ... *P. densa*
8. Spores ovate, 7,3—10 × 4,8—6,4 μ ... *P. pruinosa*

Phaeosolenia betulae sp. nov.

Cupula brunnea, breviter stipitata, 1 mm. alta, 500 μ diam., extus strigoso-pilosa, pilis brunneis, continuis, laevibus, tortuosis, ad 150 μ longis, 3—4 μ crassis; basidiis clavatis, 45—50 × 9—11 μ, aut 28—30 × 9—11 μ; sporis globosis vel subglobosis, 9—11 μ diam., aut 9—11 × 9,5—12 μ, laevibus, apiculatis, brunneis.

Receptacles brown, short-stalked, up to 1 mm. tall, to 500 μ in diameter; covered on the outside with brown surface hairs, straight, smooth, more or less geniculately twisted at the tips, not noticeably septate, up to 150 μ long, 3—4 μ in diameter; context hyaline, septate, without clamp connections; basidia clavate, with or without long, slender stalks, in the first case 45—50 × 9—11 μ, in the second 28—30 × 9—11 μ, with intermediate sizes also represented; spores globose or subglobose, 9—11 μ in diameter, or 9—11 × 9,5—12 μ, smooth, apiculate, at first hyaline, becoming brown.

Habitat: On bark of *Betula lutea*.

Type and specimen examined: Ontario: Woods west of Maple. Sept. 1943. Coll. H. S. Jackson. (TRTC 22994).

Phaeosolenia brenckleana (Sacc.) comb. nov.

Solenia brenckleana Sacc., Notae Mycol. 22, in R. Acc. Pad. 33: 163. 1917.

Receptacles cylindric, 700—1000 μ high, 400—500 μ in diameter, brown; clothed with brown surface hairs appressed to the receptacle, curving over mouth of receptacle when dry, densely and finely granule-incrusted, 125—175 × 3—4 μ, with a hyaline, thin-walled tip, not inflated; receptacles subsessile; basidia 4-sterigmate, 18 × 7 μ; spores brown, smooth, apiculate, ovate, 5—7 × 3,5—4,5 μ.

Habitat: On rotten wood of *Ulmus* and other species.

Type: North Dakota: Skeyenne River, Anselm, Aug. 13, 1916.

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Coll. J. F. Brenckle, Herb. J. R. Weir (NFC).
Specimens examined from: Kansas (1), North Dakota (1).

Phaeosolenia densa (Berk.) comb. nov.

Cyphella densa Berk., Fl. N. Seal. 184. 1855. — *Cyphella endophila* Ces. in Rab., Fung. Eur. n. 1513. 1872. — *Solenia endophila* (Ces.) Fr., Hym. Eur. 705. 1874. — *Cyphella versicolor* Berk. & Br., Journ. Linn. Soc. Lond., Bot. 14: 73. 1875. — *Cyphella fraxinicola* Berk. & Br., Ann. Mag. Nat. Hist. IV. 15: 28. 1875. — *Cyphella pruinosa* Berk. & Br., Jour. Linn. Soc. Lond. Bot. 14: 74. 1875. — *Cyphella cinereo-fusca* (Schw.) Sacc. & Roum. sense Roum., Fungi Gallici exsiccati No. 1504, specimen in Kew. — *Solenia fasciculata* var. *pircuniae* Speg., Anal. Soc. Cient. Argent. 12: 15. 1881. — *Cyphella variolosa* Kalchbr., Grev. 10: 104. 1882. — *Cyphella tabacina* Cke. & Phill. in Cooke, Grev. 10: 123. 1882. — *Cyphella fulvo-fusca* Cke. & Mass., Grev. 18: 50. 1890. — *Chaetocypha densa* (Berk.), O. Kuntze, Rev. Gen. 2: 849. 1891. — *Chaetocypha fraxinicola* (Berk. & Br.), O. Kuntze, l. c. — *Chaetocypha pruinosa* (Berk. & Br.), O. Kuntze, l. c. — *Chaetocypha tabacina* (Cke. & Phill.), O. Kuntze, l. c. — *Chaetocypha variolosa* (Kalchbr.), O. Kuntze, l. c. — *Chaetocypha versicolor* (Berk. & Br.), O. Kuntze, l. c. — *Phaeocyphella hibisci* (Pat.) Pat., Soc. Myc. Fr. Bull. 8: 48. 1892. — *Phaeocyphella chusquae* Pat., Bull. Soc. Myc. Fr. 9: 135. 1893. — *Phaeocyphella euphorbiaecola* Pat., Bull. Soc. Myc. Fr. 9: 136. 1893. — *Phaeocyphella variolosa* (Kalchbr.) Pat., Ess. Taxon. 58. 1900. — *Cyphella chusquae* (Pat.) Sacc., Syll. Fung. 11: 133. 1895. — *Cyphella euphorbiaecola* (Pat.) Sacc., Syll. Fung. 11: 133. 1895. — *Cyphella hibisci* (Pat.) Sacc., Syll. Fung. 11: 134. 1895. — *Cyphella holstii* P. Henn., in herb. — *Cyphella lilacina* Massee, Kew Bull. 1901: 164. 1901. — *Henningsomyces endophilus* (Ces.) O. Kuntze, Rev. Gen. 3(2): 483. 1898. — *Phaeocyphella endophila* (Ces.) Pat., Ess. Taxon. 58. 1900. — *Phaeosolenia platensis* Speg., Anal. Mus. Nac. Buenos Aires 8: 53. 1902. — *Solenia villosa* var. *sub-ochracea* Speg., Ann. Mus. Nac. Buenos Aires. 17: 115. 1908.

Receptacles white to greyish with brownish to vinaceous undertones, 0,1—1,5 mm. long, cylindric, sessile to short-stipitate, cup-shaped to urceolate or tubular, 0,1—0,7 mm. in diameter when dry, to 2 mm. in diameter when fresh, gregarious to scattered; with an evanescent, brown subiculum; context hyphae 1,5—3 μ in diameter, with clamp connections, producing two palisades both arising directly from the context hyphae; surface hairs produced in one palisade, brown, stiff, branched below, straight above, perpendicular to the surface or pointed upward and incurved toward the cup margin, covering the hymenium when dry, incrusted with crystals up to 2 μ

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long by 1 μ in diameter, easily removed in mounting, revealing the thin- to thick-walled, non-septate, brown hairs 20—100—(250)× 3,5—7 μ, with pointed tips; hymenium produced as the internal palisade, composed only of tightly packed basidia; basidia (18)—23—40×4—(7,5)—9 μ, 4-sterigmate, with clamps at the base; spores pale yellow brown to brown, smooth, apiculate, ovate to subglobose, ellipsoid or almond-shaped or lemon-shaped, flattened on one side (but not strongly so), (5)—8,5—10,5—(11)×(3)—4,5—5,5—(7,0) μ, or 3—6 μ in diameter.

Habitat: On dead materials of such plants as: *Alangium bignoniaefolium*, *Arenya saccharifolia*, *Astonia scholaris*, *Chusquea* sp., *Discoxylum hexandrum*, *Euphorbia* sp., *Ficus* sp., *F. hawili*, *Erythrina tomentosa*, *Fraxinus* sp., *F. excelsior*, *Hibiscus* sp., *Ilex paraguayensis*, *Manihot utilissima*, *M. caragenensis*, *Paromynia*, *Pelargonium* sp., *Phytolacca dioica*, *Pircunia dioica*, *Populus angustifolia*, *P. deltoides*, *Robinia pseudacacia*, *Schefflera odorata*, *Schyzolobium* sp., *Tectona grandis*, *Theobroma cacao*, *Vitis* sp.

Type specimens examined:

Phaeosolenia platensis Speg.: Argentina: La Plata, on *Manihot cartagenensis*. Apr. 9, 1902. Coll. C. Spegazzini (LBS, 15915).

Solenia villosa var. *sub-ochracea* Speg.: Argentina: Misiones, San Pedro, on *Ilex paraguayensis*. Feb. 1907. Coll. C. Spegazzini. (LBS 25877).

Solenia pircuniae Speg.: Argentina: Buenos Aires, San Jose de Flores, on *Pircunia dioica*, June 16. 1881. Coll. C. Spegazzini. (LPS 25874).

Cyphella endophila Ces.: Italy: In horte bot. Neapolitano. Coll. Cesati. In Rabenhorst, Fungi Europaei 1513 (NY, BD).

Cyphella versicolor Berk. & Br.: Ceylon: Central Province. No. 105, Nov. 1867. L. H. K. T. (K).

Solenia euphorbiaecola Pat.: Ecuador: Pululahua, on bark of *Euphorbia* sp. May 1892. Coll. Lagerheim. (FH).

Cyphella fraxinicola Berk. & Br.: England: C. E. Broome, on ash poles. Dec. 20, 1873. (K).

Cyphella pruinosa Berk. & Br.: Ceylon: Peradeniya. "81". (K).

Cyphella tabacina Cke. & Phill.: Union of South Africa: Natal, Inanda. On bark. Coll. J. Medley Wood 524, Feb. 1881. (PRE 11146, K).

Cyphella fulvo-disca Cke. & Mass.: Madagascar: Ft. Dauphin. Coll. Scott-Elliot. (NY).

Cyphella variolosa Kalchbr. "cotype": Union of South Africa: Boschberg Mts., Somerset Strand, Cape Province. Coll. "in ligno" by MacOwan 1381. (PRE 20939, S.)

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Cyphella holstii P. Henn., Latinda, Usumbara, Africa. July 1893. C. Holst. (S).

Specimens examined from: England (5), France (2), Italy (5), Germany (2), Africa (4), Madagascar (2), Southern Nigeria (1), Uganda (2), Union of South Africa (5), Ceylon (13), French Indo-China (1), Malaya (1), Philippine Islands (12), Bonin Island (1), Revillagigedo Islands (2), Argentina (6), Brazil (25), British Guiana (2), Colombia (1), Ecuador (5), Paraguay (4), Venezuela (2), British West Indies (1), Cuba (1), Ontario (1), Colorado (3), Delaware (1), Florida (3), Maine (2), Massachusetts (1), Pennsylvania (2), South Carolina (1).

Italian material of *P. endophila* has been well described and illustrated by Mattirolo (1887).

It is possible that *Cyphella microthele* Speg. belongs in this complex. The type was collected in Argentina at Entre Rios in Jan. 1902 by C. Spegazzini. It was found on *Chloris distichophylla*. Spegazzini's notes indicate that the spores were smooth, fulvous, $5-6\times5$ μ, produced on basidia $15-18\times6-7$ μ, with surface hairs hyaline to fulvous, incrusted, $50-150\times5-6$ μ. No material was found in the type packet loaned by Dr. Lindquist of (LPS) so that the exact position of this species must remain uncertain.

The combination *Phaeocarpus hibisci* Pat. appears on herbarium packets (FH) but has not been found in published form.

Cyphella variolosa Kalchbr. may be distinguished from *P. densa* by the ovate rather than almond-shaped spores which are slightly larger, and the surface hairs which form a rather regular palisade and which are granule-incrusted but whose granules are not present in such large quantities as in *P. densa*. Also clamps are present at the base of many of the surface hairs. However, these differences are rather superficial and non-critical so that specimens assigned to this species are now added to *P. densa*.

Phaeosolenia granulosa (Fckl.) comb. nov.

Solenia granulosa Fckl., Symb. Myc., Nachtrag 2: 7. 1873. — *Calyphtella granulosa* (Fckl.) Quél., Ench. Fung. 216. 1886.

Receptacles up to 1 mm. high and in diameter; covered with brown, smooth hairs which are slightly granule-incrusted below, $150-200\times5-6$ μ; basidia not seen; spores $10-12\times6-7$ μ, hyaline, becoming brown, smooth, apiculate, ellipsoid.

Habitat: On dead stems of *Artemisia campestris*.

Type: Germany: Budenheimerwald. Fuckel, Fung. rhen. No. 2504. (Hoehn. in FH. FH).

Specimen examined: Germany (4), Czechoslovakia (1).

Phaeosolenia ochro-pilosa (Torrend) comb. nov.

Cyphella ochro-pilosa Torrend, Broteria, Ser. Bot. 11: 75. 1913.

Receptacles substipitate, 1—2 mm. in diameter, light-brown,

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scattered, margin incurved when dry; surface hairs brown, 150—200 × 4—5 μ, roughened with minute, easily removed granules, thin-walled, collapsed, pointed at tips; incurved at margin; basidia 36—54 × 7—11 μ, 4-sterigmate; spores at first hyaline, then yellow-brown, subglobose to ellipsoid, smooth, apiculate, 1-several guttulate, contents granular, somewhat flattened on one side, 8—12,5 × 7—9 μ.

Habitat: On wood of *Erica arborea*.

Specimen examined: Portugal (2).

Type: Portugal: Serra da Arrabida. Collected by C. Torrend, April 1910. "ex herb. Bresadola" (S).

Phaeosolenia paraguayensis (Speg.) comb. nov.

Cyphella paraguayensis Speg., Am. Soc. Cient. Argent. 16: 288. 1883. — *Chaetocypha paraguayensis* (Speg.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Phaeocyphella sphaerospora* Speg., Ann. Mus. Nac. Buenos Aires 19: 278. 1909.

Receptacles sessile, up to 1 mm. in diameter, 0,5 mm. high, pale but not white; hyphae 1,5—3,0 μ in diameter, clamped; surface hairs mostly found around rim of cup, enlarged below, round pointed, or with few to many acanthophysoid branches up to 6 μ long, up to 8—12 μ in diameter at base, 3—5 μ in diameter above, branched head 8—25 μ in diameter, branches 2—3 μ in diameter, 3—5 μ long, dichotomously branched, surface with amorphous, brown matter; basidia 18—22 × 6—9 μ, 4-sterigmate, clamped at base; spores smooth, apiculate, ovate, 8,0 × 6,5 μ while on the basidium, pale colored, following discharge becoming brown, lemon-shaped, smooth, up to 9 × 7 μ in size.

Habitat: On leaves of *Blechnum occidentale*.

Specimens examined: Argentina (1), Paraguay (1).

Type specimens examined:

Cyphella paraguayensis Speg.: Paraguay: Caa-gnazu, Jan. 1882, collected by B. Balansa nr. 3495 (LPS 25862).

Phaeocyphella sphaerospora Speg.: Argentina: Buenos Aires, Levallol, Santa Catalina, Oct. 26, 1905. Collected by C. Spegazzini (LPS 25882).

A specimen labeled "tipo" was found on *Eugenia jambosa* at Asunciàn, Paraguay, Feb. 1920, by Spegazzini. No cyphellaceous material was found in the packet but Spegazzini's notes indicate that the original specimen had hyaline spores 7—8 × 4 μ, basidia 25 × 7 μ, the receptacle outside was cinereous to velutionous, and the inside was white and smooth. A sketch showed cupulate to repand, subsessile receptacles.

This species differs from *P. endophila* in the surface hairs with their special tips, the somewhat broader, usually globose, spores, and the habitat on fern fronds.

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Phaeosolenia pelargonii (Kalchbr.) comb. nov.

Cyphella pelargonii Kalchbr. in de Thuemen Flora. 59 (NS 34): 363. 1876. — *Chaetocypha pelargonii* (Kalchbr.), O. Kuntz, Rev. Gen. 2: 847. 1891.

Receptacles up to 1 mm. in diameter, 2 mm. long, stipitate, pendant, point of insertion may produce curved stipe; surface covered with brown hairs, thin-walled, outer half granule-incrusted, 40—70× 5—6 μ; context hyphae hyaline, 2—3 μ in diameter, subhymenial hyphae hyaline, 2—2,5 μ in diameter; no clamps seen; hymenium composed only of basidia; basidia clavate, 4-spored, 34×8,5 μ; spores brown, smooth, ovate, apiculate, 11,5×7 μ.

Habitat: On stems of *Pelargonium zonale*.

Type: South Africa: Collected by P. MacOwan in Monte "Boschberg" prope, Somerset East, Promont: bonae spei 1874 P. MacOwan No. 1035. No other data on label. One specimen from herb. Kalchbrenner, one from herb Sydow, obviously parts of the same collection (S).

Specimens examined from: South Africa (2).

Phaeosolenia ravenelii (Berk. & Curt.) comb. nov.

Cyphella ravenelii Berk. & Curt., Ann. Mag. Nat. Hist. II. 12: 417. 1853. — *Phaetocypha ravenelii* (Berk. & Curt.), O. Kuntze, Rev. Gen. 2: 847. 1891.

Receptacles single to gregarious, 500 μ high, 300 —800 μ in diameter; surface hairs yellow to brown, straight, heavily granule-incrusted, sometimes tapering to a long, smooth, straight, hyaline point; 90—200×3—6 μ; basidia 50—70×8—12 μ, 4-sterigmate; spores smooth, minutely apiculate, ovate, at first hyaline, then with a thick, yellow wall, 13,5—17×8—10 μ.

Habitat: On bark of *Carya* sp. (Reported as hard to find and when found difficult to remove.)

Type specimen examined:

Peziza ravenelii Berk., in herb.; *Cyphella ravenelii* Berk. & Curt.: South Carolina: On bark of *Carya*, Aiken, Oct. Coll. by H. W. Ravenel (K).

Specimen examined from: South Carolina (6).

Porotheleoideae Subfam. nov.

Fructus annuus vel perennis, resupinato-expansus; subiculo submembranaceo primo papillis prominulis distinctis, mox poroso-apertis, demum elongato-tubulosis, confluentibus vel separatis obtecto; sporis hyalinis vel brunneis.

Fructification annual or perennial, formed by a thick membranous subiculum on or in which are seated numerous cup-shaped receptacles which arise as papillae and develop into independent fruit bodies

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whose walls may eventually become confluent and then the whole fructification assumes the aspect of a *Poria*; hymenium composed of basidia on each of which four hyaline spores are produced.

Type: *P. fimbriatum* Pers. ex. Fr.

A monograph of the genus *Porotheleum* was presented by the writer recently (1957). At this point it is only necessary to realign the generic pattern to conform with the generic concept developed in the present paper. Thus the concept *Porotheleum* of that paper becomes the subfamily *Porotheleoideae* of the present work. The subgenera of that paper will become the genera of this treatment.

Key to the Genera of the *Porotheleoideae*

1. Spores hyaline 2
1. Spores colored ..... *Phaeoporotheleum*
2. Subiculum thin to thick, annual or perennial ..... *Porotheleum*
2. Subiculum usually thin, annual, hairs covered with white crystalline granules ..... *Stigmatolemma*

Porotheleum (Pers. ex Fr.) Fr., Syst. Orb. Veg. 80. 1825.

Synonymy and characters as given in the 1957 monograph.

Those species assigned at that time to the subgenus *Porotheleum* are the species which are now the only ones assigned to this genus. No changes in nomenclatural status are necessary and no additional species are being cited at this time.

Stigmatolemma Kalchbr., Grev. 10: 104. 1882.

Porotheleum subgen. *Stigmatolemma* (Kalchbr.) W. B. Cooke, Mycologia, l. c. Characters as given in 1957.

Stigmatolemma poriaeformis (Pers. ex Fr.) comb. nov.

Porotheleum poriaeformis (Pers. ex Fr.) W. B. Cooke, Mycologia, l. c.

Stigmatolemma huia (G. H. Cunn.) comb. nov.

Porotheleum hia (G. H. Cunn.) W. B. Cooke, Mycologia, l. c.

In addition to the two species cited above, material observed among specimens sent from Stockholm (S) is transferred to this genus.

Stigmatolemma poriformis (P. Henn.) comb. nov.

Cyphella poriformis P. Henn., Engl. Bot. Jahrb. 21: 85. 1897.

Receptacles cupulate, crowded, not confluent, opening to 0,5 mm. in diameter and high, on a thin white subiculum, cream color, in patches of $0{,}5 \times 1$ cm. to 2×5 cm.; surface of receptacles with a network of hyaline hyphae like those of the subiculum, smooth, clamped at septae, branched, 2,5—4 μ in diameter, thick-walled; context very thin, giving rise to both surface hyphae and hymenium; basidia clavate, 4-sterigmate, clamped at base, $14-18 \times 7-9$ μ; spores smooth,

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broad ovate to subglobose, apiculate hyaline, slightly flattened on one side, 8,4 × 6 μ.

Habitat: On bark of a branch.

Type and specimen examined: Africa: Kamerun, Stocki. Collected by P. Duses in Feb. 1891. ex herb. Sydow. (S).

Phaeoporotheleum (W. B. Cooke) stat. nov.

Porotheleum subgen. *Phaeoporotheleum* W. B. Cooke, Mycologia, l. c.

Spores brown, smooth to asperulate, subiculum pulvinate, annual to apparently perennial in development.

Type: *Porotheleum revivescens* Berk. & Curt.

Phaeoporotheleum revivescens (Berk. & Curt.) comb. nov.

Porotheleum revivescens Berk. & Curt., Cub. Fung. 339. 1867.

Phaeoporotheleum bombycinum (Speg.) comb. nov.

Porotheleum bombycinum Speg., Fung. Guaran. 1; Ann. Soc. Cient. Arg. 16: 242. 1883.

Complete specific synonymies and descriptions together with habitat data and distribution information will be found in Cooke (1957). In addition, several excluded species are listed there.

Leptoglossaceae R. Maire em. Singer, Lloydia 8: 188. 1945.

Dictyolaceae Gäumann, Vergl., Morph. Pilze 511. 1926.

Characters as defined by Singer, l. c.

Only two genera are considered here. These include those cyphellaceous to cantharellaceous fungi which have been included by previous authors in the genus *Cyphella*. Singer includes other genera in this family, either as members of the family or as temporary repositories for the species involved. The species included in *Leptotus* and *Chromocyphella* could have arisen from one or another point in the Porotheleaceae. The other genera assigned to the Leptotaceae appear to be more nearly related to such genera as *Cytidia* and *Aleurodiscus* than to the genera treated here.

Key to the Cyphelloid Genera

1. Cupules sessile to subsessile or stipitate, on moss plants, spores hyaline ....*Leptoglossum*
1. Cupules sessile to subsessile, on moss plants, spores colored .*Chromocyphella*

Leptoglossum Karst., Hattsv., xvii. 1879.

not *Leptoglossum* (Cke.) Sacc., Bot. Cent. 18: 214. 1884. (*Geoglossaceae*); = *Geoglossum* subgen. *Leptoglossum* Cke., Myc. p. 250, 1879.

Corniola S. F. Gray, Nat. Arr. Brit. Pl. 1: 637. 1821.

not *Corniola* Adanson, 1821.

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Leptoglossum Karst., Hattsv., xvii. 1879.

Dictyolus Quél., Ench. Fung. 139. 1886.

Stereophyllum Karst., Med. Soc. Faun. Fl. Fenn. 29: 104. 1890.

Receptacles seated on various portions of moss plants or on nearby soil and litter, with or without arachnoid subiculum, sessile or asymmetrically spathulate, without special surface hyphae but sometimes with a mycelial covering on the upper part of the outer surface; hymenium white to cream-colored, smooth to irregularly so or, in large specimens, regularly veined; basidia in a hymenial palisade, rarely interrupted by sterile cells; spores hyaline, smooth to asperulate, globose to subglobose or ovate.

Type species: *L. retirugis* (Bull. ex Fr.) Karst.

Key to Species of *Leptoglossum*

1. Receptacles large, strongly venose 2
1. Receptacles small, not or indistinctly venose 3
2. Receptacles sessile, spores reaching 11 μ ...*L. lobatus*
2. Receptacles stipitate, spores reaching 5,5 μ .....*L. spathulatus*
3. Receptacles 0,1—1,0 mm. in diameter, or an arachnoid mycelium .....
.....*L. arachnoideus*
3. Receptacles of varying sizes, without an arachnoid mycelium 4
4. Receptacles 0,2—0,5 mm. in diameter, yellow when fresh *L. lutescens*
4. Receptacles larger, white to cream-color 5
5. Spores narrowly cylindric, 5—7 × 1—2 μ ...*L. retirugis*
5. Spores subglobose to ovate 6
6. Spores subglobose to globose 7
6. Spores ovate 8
7. Spores 5—7 μ in diameter, or 5 × 7 μ .....*L. peckii*
7. Spores 3—4 μ in diameter or 3—4 × 3,5—4,5 μ ....*L. septentrionalis*
8. Spores 3—4,5 × 1,5—3 μ ...*L. levis*
8. Spores 5—8 × 3—5 μ ..*L. galeatus*
8. Spores 7—13 × 4—6 μ ..*L. muscigenus*

Leptoglossum arachnoideum (Pk.) comb. nov.

Cyphella arachnoidea Pk., Rep. N. Y. St. Bot. 44: 134. 1891.

Receptacles subsessile to sessile, 0,1—1 mm. in diameter, very thin and delicate, single to gregarious in an arachnoid subiculum which may be weakly to strongly developed; surface of receptacles white to cream-colored, smooth to arachnoid without surface hairs; hymenium yellowish; context loosely interwoven, subhypochnoid: hyphae of subiculum 2—3 μ in diameter, of cup context 3—4 μ in diameter; hyphae of all tissues with clamps; basidia 10—(15)—18 × 3,5—5,5 μ, 4-sterigmate; spores smooth, hyaline, apiculate, flattened on one side, ovate, to tear-shaped to subglobose, apiculus elongate in one Ontario specimen, spores 4,5—5,5 × 3,5—4,5 μ.

Habitat: On mossy debris, on old wood near mosses, and on such mosses as *Climacium americanum* and *Mnium affine* var. *ciliare*.

Type specimen examined:

Cyphella arachnoidea Peck: New York: Carrollton, Set. C. H. Peck.

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(NYS).

Specimens examined from: Ontario (1), New York (3), Vermont (1).

Leptoglossum galeatum sp. nov.

Cyphella muscicola Berk. & Mont., Jour. Linn. Soc. 10: 337. 1868. not *Cyphella muscicola* Fr., Syst. Myc. 2: 202. 1822.

Cyphella galeata (Schum) Fr. sensu Burt, 1917.

Cupula 0,5—1,0 cm. diam., albida, grisea vel pallide brunnea, subsessilis; hymenio laevi vel laxe rugoso; basidiis 23,5—27 × 5—7 μ, 4-sterigmaticis; sporis laevibus, apiculatis, hyalinis, oblongo-ovoideis, 5—8 × 3—5 μ.

Receptacles 0,5—1,0 cm. in diameter, whitish to grey to avellaneous to light brown, subsessile, attached at one point; in section 500—750 μ thick, composed of rather densely compacted, interwoven hyphae which become somewhat matted on the surface and produce the hymenium below; hyphae more or less parallel, rather thick-walled, possibly gelatinous, clamped, 7—8 μ in diameter; hymenium smooth to slightly rugose, composed only of basidia, 25—30 μ thick; basidia 14(—23,5—)27 × 5—7 μ, 4-sterigmate, sterigmata 3—3,5 μ long; spores smooth, apiculate, hyaline, tear-shaped, flattened on one side, 5—(7)—8 × 3—5 μ.

Habitat: On mosses including *Climacium americanum*, *Hypnum dolisetulum*, *Dicranella* sp., *Thuidium delicatulum*.

Specimens examined from: Austria (1), Czechoslovakia (1), France (14), Germany (4), Italy (1), Sweden (1), Manitoba (1), Ontario (2), Alabama (1), New York (3), Ohio (2), Oregon (1).

Pilát (1951) listed *Dictyolus conchatus* (Velen.) Pilát (with synonyms *Leptoglossum conchatum* Velen. and *L. bryophilum* Velen.) as occurring on such large mosses as *Mnium*. The characters listed for this species, including spore size, indicate that it is probably *L. galeatum*.

Leptoglossum laevis (Fr.) comb. nov.

Cantharellus laevis Fr., Syst. Myc. 1: 324. 1821. — *Cantharellus bryophilus* Fr., Syst. Myc. 1: 325. 1821. — *Cantharellus auriscalpium* Fr., El. 1: 54. 1828. — *Cantharellus buxbaumiaeformis* Wallr., Fl. Crypt. Germ. 2: 626. 1833. — *Cyphella muscigena* (Pers.) Fr., Epicr. 567. 1838. — *Arrhenia auriscalpium* Fr., Sum. Veg. Scand. 312. 1849. — *Craterellus pogonati* Pk., Torr. Bot. Cl. Bull. 33: 218. 1906. — *Cyphella laevis* (Fr.) Lundell, Fungi exsiccati Suecici in Lundell & Nannfeldt Fasc. 41—42: 35 (No. 2058. 1953. —

Receptacles membranous, 3—15 mm. in diameter. on moss stems of gametophytes and sporophytes, sessile or with a stipe-like base formed by increased basal tissue, up to 5 mm. long by 5 mm. wide;

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receptacles may be reduced to a subhypochnoid tissue on the moss stem and repand on the leaves, receptacles may be marginate, the stipe-like base appearing eccentric; hymenium cream-color, usually rugose-wrinkled, wrinkles radiating from the point of insertion of the stipe-like base, or hymenium plane; clamps abundant; subhymenium tissue of loosely interwoven hyphae; hyphae on surface of cups interwoven, 2—3 μ in diameter; basidia 10—17,5×2—7 μ, 4-sterigmate; a few paraphysoid hairs in some specimens extend 11,5 μ from the hymenium surface; spores smooth, hyaline, apiculate, ellipsoid to subglobose, 3—4,5—(5,5)×1,5—3 μ.

Habitat: On mosses including species of *Polytrichum*, *Atrichum*, *Pogonatum*, and on bare soil near such mosses (associated with protonema ?).

Type specimen examined:

Craterellus pogonati Pk.: Connecticut: East Hartford, Sept. 1904. Coll. by. C. C. Hourner (NFC).

Specimens examined from: Austria (1), Czechoslovakia (12), Finland (2), France (3), Germany (4), Italy (7), Sweden (5), Connecticut (2), New Hampshire (1), New York (2), Oregon (3), Vermont (1).

This should not be confused with *Cantharellus cupulatus* Fr., Epicr. 367, 1838, which is reported to have rather well developed cantharelloid gills and spores 8—9×4,5—5,5 μ, and also grows in association with polytrichoid mosses.

Leptoglossum lobatum (Pers.) Karst.

Merulius lobatus Pers. Myc. Eur. 2: 23. 1825. — *Cantharellus lobatus* Pers. ex Fr., Sept. Myc. 1: 323. 1821. — *Merulius lobatus* Pers., Syn. 494: 1801.

Receptacles seated upon mosses or adjacent debris, sessile by the base of the pileus being attached to the substratum, lobate to spathulate, grey-brown, surface smooth, 1—5 cm. in diameter and length; hymenial surface with venose configuration, grey, veins indistinct toward the center and more or less reticulate toward the margin, major veins directed from point of attachment toward the margin; hymenium continuous over the veins, composed only of basidia; context hyphae 3—5 μ in diameter, simple septate, branched, interwoven; subhymenial hyphae not clamped, 2—3 μ in diameter; basidia 27×5—7 μ, 4-sterigmate; spores hyaline, smooth, broad ovate to tear-shaped, apiculate, 10,5—11×7—7,5 μ.

Habitat: On *Hypnum* species.

Specimens examined from: Germany (2).

Leptoglossum lutescens (Pers.) comb. nov.

Thelephora lutescens Pers., Myc. Eur. 1: 116. 1822. — *Cyphella lutescens* (Pers.) Lloyd, Myc. Writ. 7: 1228. 1923.

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Receptacles 200—500 μ in diameter, smooth, yellowish when fresh, reddish after 20 years, sessile; surface without special surface hairs; context thin, compact, spaces filled with gelatinous appearing material, hyphae not gelatinous; basidia 18—20 × 5—6 μ, 4-sterigmate; spores subglobose, apiculate, smooth, hyaline, 4—5 × 4,5—6 μ.

Habitat: On mosses.

Specimens examined from: Belgium (1), Germany (1), Holland (1).

A specimen labeled as *Thelephora lutescens* Pers in Persoon's handwriting proved to be of *Chromocyphella galeata* (K).

Leptoglossum muscigenum (Bull. ex Fr.) Lundell in Lundell and Nannfeldt, Fung. suec. Exs. 44. 1934.

Merulius muscigenus (Bull.) Schum., Enum. Pl. Saell. 1: 370. 1801. — *Merulius muscigenus* Pers., Syn. 493. 1801. — *Thelephora muscigena* Pers., Syn. 572. 1801. — *Peziza inaequilatera* Schum., Fl. Dan. t. 2083, f. 2. — *Cantharellus muscigenus* Bull. ex Fr., Syst. Myc. 1: 323. 1821. — *Merulius muscigenus* DC. ex St.-Amans, Fl. Agen. IV. 22—28: 557. 1821. — *Cyphella muscicola* Fr., Syst. Myc. 2: 202. 1822. — *Arrhenia muscigena* (Pers. ex Fr.) Quél., Fl. Myc. Fr. 33. 1886. — *Calyptella muscigena* (Pers. ex Fr.) Quél., Ench. Fung. 216. 1886. — *Chaetocypha muscigena* (Pers. ex Fr.) O. Kuntze, R. 2: 847. 1891. — *Chaetocypha muscicola* (Fr.) O. Kuntze, l. c. — *Dictyolus muscigenus* (Pers. ex Fr.) Quél., in Pat., Ess. Taxon. 131. 1900. — *Cyphella cochlearis* Bres., Broteria 2: 88. 1903. — *Cyphella galeata* (Schum.) Fr., sensu Burt, 1917.

Receptacles 2—10 mm. in diameter, cream to brownish with a white margin, arising from a mass of mycelium which occurs around the moss stem and produces a base 0,5—1,0 cm. long for the cup; surface of receptacles with few mycelioid hyphae 5—6 μ in diameter; edge of cup with short straight hairs 25—40 × 3—4 μ, hyaline, smooth; basidia 18—(22—25)—30 × 5—8 μ, 4-sterigmate; spores hyaline, smooth, ovoid to cylindric, apiculate, 7—(9)—13 × 4—6 μ.

Habitat: On mosses growing on the ground and on bark, including species of *Hypnum aspidatum*, *H. commutatum*, *Neckera* and *Polytrichum commune*.

Specimens examined from: Austria (1), France (3), Czechoslovakia (9), Germany (1), Sweden(2), England (14), Hungary (11), Scotland (1), Switzerland (4), Ohio (1), Washington (4), Behring's Straits (1).

L. galeatus and *L. muscigenus* are included in Burt's concept of *Cyphella galeata* according to herbarium specimens examined.

Lundell and Nannfeldt (1949) note that this species has been found in Sweden in a calcareous fen on *Drepanocladus exannulatus* and *Calliergon sarmentosum*.

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Pilát (1951) lists *Cyphella muscigena* Fr. as occuring on *Pogonatum aloides, Polytrichum juniperinum, Discranella heteromalla* and *Hypnum* sp. div. The spores are listed under three size classes without reference to moss hosts. It is possible that the larger spore sizes belong to specimens found on *Dicranella, Hypnum* and other genera, while the small spore size class belongs to specimens found on *Pogonatum* and *Polytrichum*. The former could be *L. muscicola*, the latter *L. laevis*.

Leptoglossum peckii sp. nov.

Cyphella muscigena (Pers.) Fr. sensu Pk. in Herb. not *Cyphella muscigena* Pers. ex Fr.

Cupula membranacea, ad 5 mm. diam., extus hyphis myceloideis, induta; basidiis 20×6—7 μ, 4-sterigmaticis; sporis hyalinis, apiculatis, globosis ad ellipsoideis, 5—7 μ diam., vel 5×7 μ.

Receptacles membranous, up to 5 mm. in diameter, no special surface hairs, but surface weakly covered with mycelioid hyphae; basidia 20×5—7 μ, 4-sterigmate; spores hyaline, apiculate, globose to ellipsoid, 5—7 μ in diameter or 5—7 μ.

Habitat: On mosses.

Specimens examined from: Ecuador (1), New York (1).

Leptoglossum retirugis (Pers.) comb. nov.

Agaricus fissus Leyss, Hal. 297. 1783. — *Helvella dimidiata* Bull., t. 498, f. 1. 1790. — *Merulius retirugis* Pers. Syn. 494. 1801. — *Merulius retirugis* Schum., Enum. Pl. Saell. 1: 370. 1801. — *Thelephora vulgaris* Pers., Syn. 572. 1801. — *Merulius retirugis* Pers. ex St.-Amans. Fl, Agen. IV. 20—28: 557. 1821. — *Merulius serotinus* Pers., Myc. Eur. 2: 22. 1822. — *Merulius candicans* Pers., Myc. Eur. 2: 21. 1822. — *Cantharellus retirugis* Fr., Epicr. 368. 1836. — *Stereophyllum boreale* Karst., Med. Soc. Faun. Fl. Fenn. 29: 104. 1890.

Receptacles single, 2—5 mm. in diameter, pileus wood brown (R) to tilleul buff (R), paler toward margin, minutely hirsute, obscurely zonate, soft; surface mycelial threads interwoven to parallel, 5—15 μ in diameter; no clamps observed; basidia 13,5—23×4—8 μ, elongating to 36×7 μ at maturity; 4-sterigmate; no sterile hymenial structures seen; spores hyaline, smooth, apiculate, ovate- to tear-shaped or apple-seed-shaped, flattened on one side, 5,5—(10)—11×3,5—7 μ; in the Pennsylvania collection oblong crystals were found abundantly, 5—7×1—2 μ.

Habitat: On mosses and nearby soils, including: *Barbula* sp., *Bryum roseum, Funaria hygrometrica, Hypnum* sp., *Neckera* sp., *Catharinia* sp., and *Brachythecium* sp.

Specimens examined from: Austria (1), Czechoslovakia (1), England (1), Germany (1), Holland (1), Poland (1), Sweden (5), Australia

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(1), Alaska (1), Manitoba (1), North Carolina (2), New York (1), Oregon (4), Pennsylvania (1), Washington (1).

Leptoglossum septentrionale sp. nov.

Cyphella muscigena (Pers.) Fr. sensu H. C. Jackson in herb.

Cupulae ad folia muscorum sessiles, sine subiculo, 100—500 μ diam., pallide luteae; basidiis 18×4 μ, 4-sterigmaticis; sporis globosis vel subglobosis, apiculatis vel fere pedicellatis, laevibus, hyalinis, 3—4×3,5—4,5 μ, vel 3—4 μ diam.

Receptacles sessile on leaves of mosses, without subiculum, 100—500 μ in diameter, cream-color when dry; context loosely interwoven, of hyaline hyphae several layers thick, 4—6 μ in diameter, with occasional clamps, septate, with H-pieces; basidia in a more or less compact palisade, with a very thin subhymenial area, otherwise apparently directly from the context; basidia 4-sterigmate, 18×4 μ; spores globose to subglobose, strongly apiculate to apparently pedicellate, smooth, hyaline, 3—4×3,5—4,5 μ, or 3—4 μ in diameter.

Habitat: On mosses on the ground or on tree trunks.

Specimens examined from: Ontario (2), Quebec (1), New York (2).

Leptoglossum spathulatum (Velen.) comb. nov.

Receptacles (pilei) on soil or mosses, stipe up to 1 cm. high, 3—5 mm. in diameter, of the same color as the pileus; pileus grey-brown, spathulate, appearing agaricoid, veins strongly pronounced, grey, not anastomosing but running from the stipe to the periphery, decurrent on the stipe, branching toward the periphery, cantharelloid; context hyphae interwoven, 3—5,5 μ in diameter, septate, no clamps seen, subhymenial hyphae 2—3 μ in diameter; basidia 15—18×3—5 μ, 4-sterigmate; spores hyaline, smooth, apiculate, tear-drop-shaped, 3,5—5,5 μ in diameter, or 3,5—5×4—5,5 μ.

Habitat: On mosses and on calcareous soils near mosses.

Specimens examined from: Czechoslovakia (3); Latvia (2).

Leptoglossum sublutescens sp. nov.

Phaeocyphella lutescens (Pers.) Pilát, in herb. not *Cantharellus lutescens* Pers. — *Cyphella muscicola* sensu Schroet., fide Pilát.

Cupula ad 1 mm. diam. vel alta, lutea, extus glabra; hymenio luteo, laevi; basidiis 16—18×6—7 μ, 4-sterigmaticis; sporis hyalinis late ovoideis postice abruptiscule ad lacrimae instar attenuatis, laevibus, apiculatis, 5—7 μ diam., vel 5—6,5×5,5—7 μ.

Receptacles up to 1 mm. wide and high, reverse smooth, no special surface hairs, yellow; hymenium darker yellow than surface, no veins observed in dry material; context hyphae hyaline, branched, parallel, little interwoven, no clamps seen; basidia 16—18×6—7 μ, 4-sterigmate; no cystidia; spores hyaline, broad tear-shaped, smooth, apiculate, 5—7 μ in diameter or 5—6,5×5,5—7 μ.

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Habitat: On large mosses.

Specimens examined from: Czechoslovakia (1), Poland (2).

This material is larger, in size of both receptacles and spores, than material assigned to *L. lutescens* above. A sketch with a specimen from Poland, PC 497190, shows a venose hymenium with simple veins radiating from the point on the hymenium opposite the point of attachment of the subsessile receptacle.

Chromocyphella De Toni and Levi, The Naturalist 1888: 158. 1888.

Cymbella Pat.& Doass., Champ. fig. & des., Paris. 1880. not *Cymbella* Agardh. 1830. (Bacillariophyceae).

Phaeocarpus Pat., Hym. Eur. 154. 1887. not *Phaeocarpus* Mart. & Zucc. 1824 (Sapindaceae).

Phaeocyphella Pat., Soc. Myc. Fr. Bull. 9: 135. 1893. nomen nudum.

Phaeocyphella Pat., Ess. Taxon. 57. 1900.

Characters as in the genus *Leptoglossum* but spores brown.

Type species: *Cymbella crouani* Pat. & Doass.

Key to Species of *Chromocyphella*

1. Spores ovate, asperulate ..... *C. galeata*
1. Spores globose, smooth ..... *C. burtii*

Chromocyphella galeata (Schum. ex Fr.) comb. nov.

Merulius muscorum Pers., Syn. Meth. Fung. 495. 1801. — *Merulius galeatus* Schum., Fl., Dan. t. 2027, f. 1. — *Cantharellus galeatus* Schum. ex Fr., Syst. Myc. 1: 324. 1821. — *Cantharellus muscorum* Fr., Syst. Myc. 1: 325. 1821. — *Cyphella muscicola* Schum. ex Fr., Syst. Myc. 2: 202. 1822. — *Merulius muscorum* Sommerf., Suppl. Fl. Lapp. 268. 1826. — *Peziza inaequilatera* Schum., Flor. Dan., fasc. 35. 1832. — *Cyphella galeata* Schum. ex Fr., Epicr. 567. 1838. — *Cyphella abieticola* Crouan, Fin. 61. 1867. not *C. abieticola* Karst., Fung. Fenn. exs. 718. 1868. — *Cymbella crouani* Pat. & Doass., Champ. Fig. & Des., Paris. 1880. — *Cyphella crouani* Pat., Tab. Anal. Fung. 204. 1884. — *Arrhenia galeata* (Schum. ex Fr.) Quél., Fl. Myc. Fr. 33. 1886. — *Calyptella galeata* (Schum. ex Fr.) Quél., Ench. Fung. 216. 1886. — *Arrhenia muscicola* (Fr.) Quél., Fl. Myc. Fr. 33. 1886. — *Calyptella muscicola* (Fr.) Quél., Ench. Fung. 216. 1886. — *Phaeocarpus crouani* (Pat. & Doass.) Pat., Hym. Eur. 154. 1887. — *Chaetocypha crouani* (Pat. & Doass.), O. Kuntze, Rev. Gen. 2: 847. 1891. — *Phaeocyphella crouani* (Pat. & Doass.) Pat., Ess. Taxon. 57. 1900. — *Phaeocyphella galeata* (Schum. ex Fr.) Bourd. & Galz., Hym. de Fr. 165. 1928.

Receptacles membranaceous, outside whitish to cream-color, inside reddish, up to 5 mm. in diameter; some thin-walled, hyaline

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hyphae on the surface, incrusted with large granules, 30—40 × 6—7 μ; clamps occasional on context hyphae; basidia 30—36 × 6—8,5 μ, 4-sterigmate; spores ovate to subglobose, brown, asperulate, apiculate, 7,5—10 × 6—9 μ.

On wood among mosses and on mosses including *Hypnum* sp., *H. cupressiforme*, and *H. purum*.

Type specimen examined:

Phaeocarpus crouanii (Pat. & Doass.) Pat: France: Fintenay, Oct. 1883. (Pat. in FH).

Specimens examined from: France (6), England (8), Holland (1), Germany (1), Italy (1), Australia (2), New Zealand (1), Tasmania (1), Ohio (2).

Chromocyphella burtii sp. nov.

Cupula cyathiformis, alba, laevis; hymenio brunneo; basidiis 26 × 7 μ, 4-sterigmaticis; sporis brunneis, sphaeroideis, apiculatis, 6—8 μ diam.

Receptacles cupulate, white, smooth, without differentiated hyphae on the surface, open to incurved when dry, 0,3—1,0 mm. in diameter; hymenium brown, with clamps in subhymenium and context hyphae, composed of basidia 26 × 7 μ, 4-sterigmate; spores brown, spherical, minutely apiculate, appearing roughened asperulate under high power, smooth under oil immersion, 6—(7,5)—8 μ in diameter.

Habitat: On mosses.

Type and specimen examined: British West Indies: Grenada: St. Andrews Road, Nov. 1912, R. Thaxter (FH).

An undated note in the type packet indicates that Burt saw this specimen and compared it with notes taken on similar cyphellas at Kew. It answered neither his description of material of *C. muscicola* Fr. nor *C. chromospora* Pat. and he could not match it with descriptions of tropical species in the literature.

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Exsiccata Examined

No attempt has been made to examine systematically the specimens of species of cyphellaceous fungi distributed in the many exsiccati of fungi which have been issued during the last 125 years. However, most of those specimens filed in general herbarium collections, rather than as special exsiccati sets, have been noted and a list of such specimens is presented below.

The list is developed by citing in alphabetical order the name of the species used in the preceding treatment, followed parenthetically by the name of the genus to which it is therein assigned. Under each species is the list of exsiccati arranged alphabetically by name of issuer, and by number where more than one specimen of a species was issued in one series. The exsiccatum is cited by name of person issuing it, where known, name of exsiccatum, number of specimen, name under which specimen was issued preceded by initial of genus to which it was assigned (C = *Cyphella*, S = *Solenia*, P = *Peziza*, L = *Lachnella* or *Leptotus*, T = *Trichopeziza*), and 1956 Index Herbariorum code letters of herbaria from which specimens of the particular number have been examined.

It should be noted that in some instances one or more packets bearing these exsiccatum numbers have been annotated with one name, other packets with another name. For instance, Petrak, Mycotheca generalis, No. 1501, labeled as *Cyphella villosa*, has been annotated in some herbaria as *Lachnella villosa*, in others as *L. albo-violascens*. Since these two species are separated only on the basis of spore size, it is thought that it should not be unusual to find within a wide number of specimens in one collection a wide variety of spore sizes. Probably the difficulty in the cited example lies primarily in specimens in which spores reach the upper size limits of one species or the lower size limits of the other. Thus it is not to be assumed that names used in the above list are those to be applied to all portions of an exsiccatum number, especially

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when such portions came from more than one piece of substratum within a collecting area.

abieticola (Flagelloscypha)

Jaap, Fungi sel. exs., No. 824, as *C. abieticola* (F, K, NFC, S)
Sydow, Myc. march., No. 3213, as *C. goldbachii* (S)
Thümen, Myc. univ., No. 1608, as *C. villosa* (NFC, S)

albo-violascens (Lachnella)

Baker, Pacific Slope Fungi No. 3611, as *C. villosa* (MO in NFC, NY)
Cooke, Fungi brit. exs. No. 507, as *C. villosa* (K)
Crypt. exs. Vindob. No. 3520, as *C. villosa* (K, NY, S, UC)
Desmazières, Crypt. France, No. 690, as *P. villosa* (K) — No. 1744, as *P. villosa* (K)
Ellis & Everhart, N. Amer. Fungi, 2nd. Ser. No. 2316b, as *C. pezizoides* (K, NFC, NY)
Erbario Critt. Ital., Ser. II, No. 1352, as *C. alboviolascens* (F, NY)
Jaap, Fungi sel. exs. No. 778, as *C. villosa* (F, K, NFC, S)
Karsten, Fungi fenn. exs. No. 329, as *L. alboviolascens* (K)
Krieger, Fungi sax. No. 1807, as *C. alboviolascens* var. *dubia* (NFC, S)
Libert, Pl. Crypt. Ard., No. 126, as *C. alboviolascens* (K, NFC)
Lundell & Nannfeldt, Fungi exs. suec. No. 1024, as *C. alboviolascens* (PR, S) — No. 1420, as *C. alboviolascens* (NFC, PR, S)
Petrak, Myc. gener. No. 1501, as *C. villosa* (B, PR, RM, S, WSP)
Pilát, Fungi carp. lign. exs. No. 147, as *C. villosa* (K)
Rabenhorst, Fungi europ. No. 32, as *P. syringae* (K, S) — No. 616, as *P. nivea* (S) — No. 616b, as *P. nivea* (S)
Rabenhorst, Herb. mycol. Ed. 2, No. 705, as *P. nivea* (S)
Rabenhorst-Pazschke, Fungi europ. extraeur., No. 4342, as *C. villosa* (K, NFC, S)
Rabenhorst-Winter, Fungi europ. No. 3134, as *C. pezizoides* (F, K, NY, S)
Reliquiae Farlowianae, No. 719, as *C. alboviolascens* (B, FH, PC, PR, RM, S)
Romell, Fungi exs. No. 131, as *C. alboviolascens* (NY, S)
Roumeguère, Fungi gall. exs. No. 1503, as *C. alboviolascens* (K, NY) — No. 1810, as *C. villosa* (K, NY) — No. 1906, as *C. alboviolascens* f. *minuscula* (K, NY) — No. 2915, as *C. alboviolascens* var. *alba* (K, MO in NFC, NY)
Roumeguère, Fungi sel. exs. No. 4425, as *C. ampla* (NY) — No. 6110, as *C. ampla* (NY) — No. 7118, as *C. alboviolascens* (NY)
Sydow, Myco. germ. No. 206, as *C. pezizoides* (F, ILL, K, NFC, S, WISC) — No. 353, as *C. alboviolascens* (F, ILL, K, NFC, PC, S)
Sydow, Myc. march. No. 1, as *C. pezizoides* (B, K, NY) — No. 413, as *C. pezizoides* (B, NY, S) — No. 417, as *C. villosa* (B, K) — No. 503, as *C. pezizoides* (B, K, NY, S) — No. 922, as *C. griseo-pallida* (NY) — No. 1415, as *C. pezizoides* (B, NY, S) — No. 1806, as *C. villosa* f. *sambuci* (B, K, NY, S) — No. 2407, as *C. griseo-pallida* (B, K, NY, S) — No. 3706, as *C. sydowii* (S) — No. 3707, as *C. pezizoides* (B, NY, S) — No. 4010, as *C. ciliata* (B, S)
Vize, Micro-fungi Brit. No. 203, as *C. curreyi* (NY) — No. 301, as *C. villosa* (K, NY)
Vestergren, Micromyc. rar. sel. No. 905, as *C. villosa* (F)
Westendorp and Wallays, Herb. Crypt. Belg. No. 397, as *P. velutina* (K, NY) — No. 690, as *P. villosa* (NY)

anomala (Cyphellopsis)

Berkeley, British Fungi, No. 260, as *P. anomala* (K)
Cavara, Fungi Longob. exs. No. 108, as *S. anomala* (NY, S)

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Clements, Crypt. form. colorad. No. 159, as *S. ochracea* (ILL, OC, RM, UC)
Desmazières, Pl. Crypt. France, No. 1059, as *P. anomala* (K, NY)
Ellis, North Amer. Fungi, No. 611, as *S. ochracea* (K, MICH, MSC, NFC, NY)
Jaap, Fungi sel. exs. No. 121, as *S. confusa* (BP, F, IA, K, NFC, S) — No. 121 Suppl., as *S. confusa* (BP, F, IA, K, S)
Karsten, Fungi fenn. exs. No. 7, as *P. anomala* (K)
Kunze, Fungi sel. exs. No. 301, as *S. ochracea* (B, BP, K, MO in NFC, NFC, NY, S)
Ellis & Everhart, Fungi columb. No. 2085, as *S. ochracea* (F, MICH, MSC, NFC, OC, WISC, WSP)
Libert, Fl. Crypt. Ard. No. 227, as *P. anomala* (K, NFC, S)
Lundell & Nannfeldt, Fungi exs. suec. No. 565, as *S. ochracea* (NFC) — No. 1417, as *S. anomala* (NFC, PR, S) — No. 2666, as *S. anomala* (S)
Rabenhorst, Fungi europ. No. 1708, as *P. anomala* (K, S)
Rabenhorst, Herb. mycol., Ed. 2, No. 307, as *P. anomala* (K, NY, PR, S)
Ravenel, Fungi amer. exs. No. 223, as *S. anomala* (K, NFC, NY)
Ravenel, Fungi carol. exs., Fasc. 4, No. 20, as *P. anomala* (K, NFC, NY, PC)
Reliquiae Farlowianae, No. 363, as *S. anomala* (K, MICH, NFC, PC, RM, S, UC)
Roumeguère, Fungi gall. exs., No. 773, as *P. anomala* (K) — No. 2514, as *S. anomala* (K, NY) — No. 2515, as *S. ochracea* (BP, K, NY) — No. 2814, as *P. anomala* f. *quercina* (K, NY)
Roumeguère, Fungi sel. exs. No. 6789, as *S. anomala* (BP, NY) — No. 7182, as *S. anomala* (BP, NY)
Saccardo, Myc. veneta, No. 1407, as *S. anomala* (K, NFC, NY, PRE) — No. 1408, as *S. anomala* f. *vitis-vinifera* (K, MO in NFC, NFC, NY, PRE)
Shear, New York Fungi, No. 308, as *S. anomala* var. *orbicularis* (MSC, NFC, NY, OC, S)
Sydow, Fungi exot. exs. No. 323, as *S. ochracea* (BP, FH, K, NFC, NY, PRE, S, WISC)
Sydow, Myc. germ. No. 452, as *S. confusa* (BP, ILL, K, NFC, S) — No. 3205, as *S. anomala* (PR, S) — No. 3206, as *S. confusa* (BP, PR, S) — No. 3219, as *S. stipitata* (B, BP, NY, S)
Sydow, Myc. march. No. 1054, as *S. anomala* (B, K, NY, S) — No. 1055, as *S. ochracea* (B, NY, S) — No. 1807, as *S. stipitata* (B, K, NY, S) — No. 1808, as *S. spadicea* (B, K, NY, S) — No. 1809, as *S. ochracea* (B, K, NY, S)
Underwood and Cook, A Century of Illustr. Fungi, No. 20, as *S. ochracea* (NY)
Westendorp, Herb. Crypt. Belg. No. 398, as *P. anomala* (K)

campanula (Calyptella)

Roumeguère, Fungi gall. exs. No. 1308, as *C. campanula* (K, NY)

candida (Solenia)

Cooke, Mycobiota of North America, No. 44, as *S. candida* (NY, S)
Ellis, North Amer. Fungi, No. 937, as *S. villosa* (K, MSC, NFC)
Lundell & Nannfeldt, Fungi exs. suec. No. 1418, as *S. candida* (NFC, PR, S)
Mougeot and Nestler, Stirpes crypt., No. 96, as *P. solenia* (K)
Rabenhorst, Fungi europ. No. 1825, as *S. candida* (BP, K, NY, PR, PRE)
Sydow, Myc. march. No. 4011, as *S. fasciculata* (B, NY, S)

capula (Calyptella)

Karsten, Fungi fenn. exs. No. 911, as *C. capula* (K)
Krypt. exs. vindob., No. 1801, as *C. capula* (B, BP, K, NFC, NY, PC, PR, S)
Lundell & Nannfeldt, Fungi exs. suec. No. 1421, as *C. capula* (NFC, PR, S)
Ravenel, Fungi amer. exs. No. 458, as *C. capula* (K, NFC, NY)

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Sydow, Myc. march. No. 3212, as *C. capula* (B, BP, NY, S) — No. 3606, as *C. capula* (B, BP, NY, S)

caulium (Maireina)

Roumeguère, Fungi gall. exs. No. 2916, as *S. caulium* (K, MO in NFC, NY)

ciliata (Lachnella)

Karsten, Fungi fenn. exs. No. 715, as *C. alboviolascens* (K)

Sydow, Myc. march. No. 4010, as *C. ciliata* (NY)

conferta (Solenia)

Ravenel, Fungi carol. exs. Fasc. 4, no. 21, as *S. fasciculata* (FH, K, NFC, NY, PC) — Fasc. 5, No. 42, as *S. villosa* (K, NFC, NY)

crocea (Woldmaria)

Lundell & Nannfeldt, Fungi exs. suec. No. 2369, as *S. filicina* (PC, S)

cupressi (Cyphella) — insect gall

Ravenel, Fungi carol. exs. No. 40, as *C. cupressi* (FH)

cupulaeformis (Rhodocyphella)

Ravenel, Fungi amer. exs. No. 224, as *C. cupulaeformis* (K, NFC, NY, S)

densa (Phaeosolenia)

Rabenhorst, Fungi europ. No. 1513, as *S. endophila* (BP, K, NY, PRE, S) — No. 1816, as *C. fraxinicola* (BP, S)

Rick, Fungi austro-amer. No. 58, as *S. endophila* (FH, NFC, PC, S)

Roumeguère, Fungi gall. exs. No. 1504, as *C. cinereo-fusca* (K, NY)

digitalis (Aleurodiscus)

Mougeot and Nestler, Stirp. crypt. No. 585, as *C. digitalis* (K, S)

Rabenhorst-Winter, Fungi europ. No. 2631, as *C. digitalis* (F, K, NY, S)

Thümen, Myc. univ. No. 515, as *C. digitalis* (B, K, NFC, NY, PR, S)

eruciformis (Lachnella)

Romell, Fungi exs. scand., No. 132, as *C. eruciformis* (NY, S) — No. 133, as *C. eruciformis* (NY, S)

Roumeguère, Fungi gall. exs. No. 1410, as *C. eruciformis* (NY)

faginea (Flagelloscypha)

Jaap, Fungi sel. exs. No. 17, as *C. faginea* (NFC)

Libert, Pl. Crypt. Ard. No. 331, as *C. faginea* (NFC, PR, S)

Sydow, Myc. march. No. 3901, as *C. faginea* (B, S) — No. 3904, as *C. faginea* (NY)

fasciculata (Solenia)

Ellis, North Amer. Fungi, No. 937, as *S. villosa* (MICH, NY)

fasciculata (Merismodes)

Ellis, North Amer. Fungi, No. 936, as *C. fulva* (K, NFC, NY, S)

Ellis & Everhart's Fungi Columb. No. 1818, as *C. ravenelii* (F, NFC, NY, OC, RM, S, UC, WISC, WSP) — No. 2085, as *S. ochracea* (UC)

Ravenel, Fungi amer. exs. No. 129, as *C. fulva* (K, NFC, NY)

Ravenel, Fungi carol. exs. No. 16, as *C. fulva* (K, NFC, NY, PC)

Saccardo, Myc. ital. No. 418, as *C. ravenelii* (NFC, NY, S)

Shear, New York Fungi, No. 56, as *C. fulva* (F, NFC, NY, OC, S, WISC)

Underwood and Cook, A Century of Illustr. Fungi, No. 26, as *C. fulva* (NFC, NY)

filicina (Lachnella)

Lundell & Nannfeldt, Fungi exs. suec. No. 566, as *C. filicina* (NFC, PC, PR, S)

gibbosa (Calyptella)

Jaap, Fungi sel. exs. No. 391, as *C. gibbosa* (BP, F, K, NFC, PC, S)

Lundell & Nannfeldt, Fungi exs. suec. No. 1025, as *C. gibbosa* (F, PR, S)

Sydow, Myc. germ. No. 861, as *C. gibbosa* (B, BP, F, ILL, K, NFC, PC, S)

goldbachii (Cellypha)

Sydow, Myc. march. No. 3213, as *C. goldbachii* (NY)

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griseo-pallida (Cellypha)
Jaap, Fungi sel. exs. No. 493, as *C. griseo-pallida* (NFC) — No. 584, as *C. griseo-pallida* (NFC)
Sydow, Myc. march. No. 922, as *C. griseo-pallida* (S)
lactea (Cellypha)
Lundell & Nannfeldt, Fungi exs. suec. No. 1026, as *C. lactea* (NFC, PR, S) — No. 1422, as *C. lactea* (NFC, PR, S) — No. 1423, as *C. lactea* (PR, S) — No. 2057, as *C. lactea* (PR, S)
laeta (Calyptella)
Krypt. exs. Vindob. No. 2313, as *C. laeta* (B, SP, K, NFC, NY, PR, S)
Sydow, Myc. march. No. 3605, as *C. laeta* (B, BP, NY, S)
laevis (Leptoglossum)
Karsten, Fungi fenn. exs. No. 441, as *C. muscigena* (K)
Krieger, Fungi sax. No. 1564, as *C. muscigena* (S)
Lundell & Nannfeldt, Fungi exs. suec. No. 2058, as *C. laevis* (PR, S)
Saccardo, Myc. ital. No. 222, as *C. muscigena* (PR, S)
lobatum (Leptoglossum)
Sydow, Myc. germ. No. 1419, as *Leptotus lobatus* (BP, PR)
mairei (Lachnella)
Karsten, Fungi fenn. exs. No. 717, as *C. filicina* (K)
monacha (Maireina)
Jaap, Fungi sel. exs. No. 96, as *C. gregaria* (BP, F, K, NFC, S)
Roumeguère, Fungi gall. exs. No. 768, as *C. monacha* (BP, NY) — No. 1504, as *C. cinereo-fusca* (BP) — No. 1905, as *C. obscura* (BP, NY)
Sydow, Myc. march. No. 3, as *C. gregaria* (BP, F, ILL, K, NFC, S) — No. 922, as *C. griseo-pallida* (B) — No. 3706, as *C. sydowii* (B, BP, NY)
Vestergren, Micromyc. rar. sel. No. 598, as *C. gregaria* (F, NFC, S)
muscigenum (Leptoglossum)
Krieger, Fungi sax. No. 1564, as *C. muscigena* (NFC)
Lundell & Nannfeldt, Fungi exs. suec. No. 1775, as *L. musicgenus* (NFC, PR)
Saccardo, Myc. ital. No. 222, as *C. muscigena* (NFC, NY)
myceliosa (Lachnella)
Sydow, Myc. march. No. 3405, as *C. cinereofusca* (B, NY) — No. 3435, as *C. cinereofusca* (S)
ochracea (Phaeocyphellopsis)
Cavara, Fungi longob. exs. No. 108, as *S. anomala* (MICH, NFC)
Clements, Crypt. form. colorad. No. 159, as *S. ochracea* (NY)
Lundell & Nannfeldt, Fungi exs. suec. No. 565, as *S. ochracea* (PR, S)
Reliquiae Farlowianae, No. 363, as *S. anomala* (NY, WISC)
Saccardo, Myc. ven. No. 1407, as *S. anomala* (MO in NFC)
Vize, Micro-fungi brit. No. 202, as *S. ochracea* (K)
pallidus (Pellidiscus)
Jaap, Fungi sel. exs. No. 584, as *C. floccosa* (BP, S)
Rabenhorst, Fungi europ. No. 1415, as *C. pallida* (BP, FH, NFC, PR, S)
pelargonii (Phaeosolenia)
Thümen, Fung. exot. decad. No. 23, as *C. pelargonii* (BP)
punctiformis (Lachnella)
Karsten, Fungi fenn. exs. No. 714, as *C. punctiformis* (K)
Roumeguère, Fungi gall. exs. No. 1309, as *C. punctiformis * stipulata* (NY) — No. 3632, as *C. punctiformis* (NY)
ravenelii (Phaeosolenia)
Ellis, North Amer. Fungi, No. 721, as *C. ravenelii* (NY, S)
Ravenel, Fungi amer. exs. No. 130, as *C. ravenelii* (NY)
subcganea (Cyphella) — a lichen
Ellis & Everhart's North Amer. Fungi, 2nd Ser. No. 2602, as *C. subcyanea*

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(NY, UC)

tiliae (Lachnella)

Ellis & Everhart's North Amer. Fungi, 2nd Ser. No. 2316, as *C. pezizoides* (MO in NFC, NY, OC) — No. 2316a, as *C. tiliae* (K, NFC)

Ellis & Everhart, Fungi Columb. No. 5, as *C. pezizoides* (F, NY, OC, UC, WSP)

North Dakota Fungi No. 20, as *T. tiliae* (TRTC) — No. 50, as *T. tiliae* (S, TRTC)

Rabenhorst-Winter-Pazschke, Fungi europ. No. 3942, as *C. tiliae* (F, NFC, NY, S)

Shear, New York Fungi, No. 55, as *C. tiliae* (F, NFC, NY, OC, S, UC, WISC)

trachychaeta (Flagelloscgpha)

Roumeguère, Fungi sel. gall. exs. No. 604, as *C. villosa* (NY)

villosa (Lachnella)

Klotzsch, Herb. mycol. No. 225, as *P. villosa* (K)

Krieger, Fungi sax. No. 1457, as *C. villosa* (NFC, S)

Lundell & Nannfeldt, Fungi exs. suec. No. 719, as *C. villosa* (NFC) — No. 731b, as *C. villosa* (PR) — No. 736a, as *C. villosa* (PR, S) — No. 736b as *C. villosa* (NFC, S) — No. 1027, as *C. villosa* (NFC, PR, S) — No. 1424, as *C. villosa* (NFC, PR, S) — No. 1425, as *C. villosa* (NFC, PR, S) — No. 2059, as *C. villosa* (PR, S)

Petrak, Flora boh. et mor. exs. No. 2397, as *C. villosa* (PR, S)

Phillips, Elvell. brit. No. 75, as *P. villosa* (K, NFC)

Rabenhorst, Fungi europ. No. 416, as *C. curreyi* (K)

Rabenhorst-Winter, Fungi europ. No. 3028, as *C. villosa* (F, K, NY, S)

Ravenel, Fungi amer. exs. No. 459, as *C. villosa* (K, NFC, NY)

Saccardo, Myc. ven. No. 1423, as *C. villosa* (NFC, NY, PR, S)

Sydow, Myc. march. No. 717, as *C. villosa* (NY, S) — No. 921, as *C. villosa* (B, K, NY, S) — No. 1233, as *C. villosa* f. *solani* (B, K, NY, S) — No. 1415, as *C. pezizoides* (K)

Thümen, Myc. univ. No. 1608, as *C. villosa* (NY, PR)

Vestergren, Microm. rar. sel. No. 905, as *C. villosa* (FN, NFC)

Vize, Micro-fungi brit. No. 203, as *C. curreyi* (K)

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