

# LLOYDIA

*A Quarterly Journal of Biological Science*

Published by the Lloyd Library and Museum, Cincinnati, Ohio



## A Monograph of the Arachnopezizeae<sup>1, 2</sup>

RICHARD P. KORF  
(Cornell University, Ithaca, New York)

The tribe Arachnopezizeae comprises a small number of species of the Inoperculate Discomycetes belonging to the order Helotiales. Three genera are recognized in this paper, *Eriopezia*, *Tapesina* and *Arachnopeziza*. The tribe was provisionally erected by Nannfeldt (1932) as one of three subdivisions of the family Hyaloscyphaceae Nannf. (roughly corresponding to the "hairy" Helotiaceae of earlier authors).

This monograph is designed as a guide to the taxonomy of the Arachnopezizeae, but includes also references to all those species known to the writer which from time to time have been placed by other workers in what would correspond to this tribe. It is an outgrowth of taxonomic studies on the hairy Inoperculate Discomycetes begun in 1945.

Many of the species included are known to the writer only from herbarium specimens, though a number of the species occurring in the northeastern United States have been repeatedly collected by him and studied in the fresh condition. Notes on cultural characters of those species successfully cultured on artificial media are recorded in the descriptions, though in no case has apothecial development been obtained in culture. The relationships of the various genera and species have, under the circumstances, been approached from an investigation of the structure of the apothecial tissues, and of other microscopic characters.

The Arachnopezizeae as delimited in this paper include the subcuculate forms of the family Hyaloscyphaceae. With the exception of a single species (*Eriopezia caesia*), the ascospores are at least one-septate at maturity, and commonly 3-, 5-, and 7-septate. The number of septa developed at maturity is one of the most characteristic features of a species. In some, the number hardly varies, while in others the variation is diagnostic. Certain forms seem to show a relationship with the Lachneae, while others tend to indicate a relationship with the Hyaloscyphaeae.

<sup>1</sup>A thesis presented to the Faculty of the Graduate School of Cornell University in partial completion of the requirements for the degree of Doctor of Philosophy, June, 1950.

<sup>2</sup>Publication of this paper was facilitated by a Grant-in-Aid from the Sigma Xi-Resa Research Fund, for which the writer is duly grateful.

THE PRESENT STATUS OF TAXONOMY IN THE  
INOPERCULATE DISCOMYCETES

That the taxonomic status of the Inoperculates is one of great confusion has perhaps been most fully pointed out by White (1941: 154-156). The problems confronting the taxonomist of the Discomycetes are two-fold: the first concerns the identity of the species; the second, the question of the genera and higher groups.

The literature on the Inoperculate Discomycetes seldom enables one to identify a species with any degree of certainty, as descriptions and measurements of the characters considered critical by the modern taxonomist are often missing or are incorrectly reported. This fact alone has led to the erection of many uncalled-for "new" species, even by careful workers. Except for those groups of the Discomycetes which have been adequately monographed (the Geoglossaceae, for example), it is rarely possible to interpret a species solely from the literature. This is particularly true of the species of the Inoperculate Discomycetes described from North American material. While in Europe a number of common or conspicuous species are well known through different floras, and many type specimens have been critically examined, for example by von Höhnelt and Nannfeldt, the majority of American species have never been critically reworked, and lacking an adequate flora little is known of them except for their original descriptions. Fortunately, however, the majority of the types of the American species are in existence and readily available in the herbaria of this country. In this respect, the situation is more favorable than in Europe, for as a rule there are no types to be found of most of the older European species. In addition, the study of as complete a series of collections as possible is necessary to understand the range of variability exhibited by the species in question.

Referring to the taxonomic tangle above the species level, White (*l.c.*: 154) writes: "Turning to the four above mentioned systems of classification"—those of Rehm, Lindau, Boudier, and Nannfeldt—"and others that are perhaps of somewhat lesser significance, we find a state of confusion prevailing also with regard to genera and other categories of higher rank that is so acute as to make impossible satisfactory study of these fungi by the general student. Even the systematist, after having succeeded in identifying a species, is usually unable to gain more than a hazy notion as to its proper generic disposition."

However, the taxonomy of the species of the Arachnopezizeae has, in general, been less confused than that of many other groups. The species have seldom been transferred to unrelated groups, since a single character—the subiculum—has usually been considered a valid generic character. The use of the subiculum as the prime determining character did keep closely related forms together, but it also led to the retention of alien species within the group. The writer's investigations have shown that in the species accepted by him there is a correlation between the subiculum and several other characters. These clearly differentiate this tribe from other members of the Hyaloscyphaceae.

The important work of Starbäck, and later that of von Höhnelt and of Nannfeldt, on relationships through tissue structure was a

distinct advance over the early, arbitrary arrangements, such as those of Saccardo, Engler and Prantl, etc. However, too much emphasis must not be placed upon tissue structure, which appears to vary appreciably between species as well as between genera (see Whetzel, 1945: 649-650).

Despite its obvious shortcomings, the work of Nannfeldt (1932) offers probably the best groundwork for a study of the Inoperculate Discomycetes available today, just as the classification of Boudier (1907) offers the most acceptable basis for a study of the Operculates. When investigations of all the species concerned or at least the great majority of them have been undertaken, a number of Nannfeldt's conclusions, based in many cases on the study of but one or a few species of a genus, will need to be modified or revoked. But until a more satisfactory classification is presented, his will stand as the most logical one for a study of the Inoperculate Discomycetes.

#### METHODS AND MATERIALS

The methods employed in the anatomical study of specimens are in common use. Essentially, the method used was a modification of that employed by Martin (1934), Overholts (1929) and White (1941). The apothecia were usually moistened with a small drop of 95 per cent ethyl alcohol to make them readily wettable, and placed in a drop of three per cent aqueous potassium hydroxide solution. An additional drop of one per cent aqueous phloxine dye was added. The apothecia were then hand sectioned, using a razor blade, and the sections placed in the KOH-phloxine solution where they could be examined directly. Crush mounts were made in the same manner. Permanent mounts were made by transferring the sections to a drop of slightly acidified 50 per cent aqueous glycerine, in order to fix the stain, and thence to a drop of 100 per cent glycerine. The use of the acidified glycerine technique was essential for the interpretation of the septation of the ascospores of a number of the species. The color reaction of the ascus pore to iodine was determined by mounting in the standard iodine solution.<sup>3</sup> Cultural studies were carried out on potato dextrose agar.<sup>4</sup>

The materials for this study were secured by extensive collecting, particularly in the rich areas around Ithaca, New York, and in Connecticut, as well as by examination of dried specimens filed under various names in a number of the larger herbaria in this country and abroad. These fungi appear to be much more common than the number of specimens in our herbaria would indicate. They are usually not difficult to find in the field, as they occur on all sorts of moist, decaying vegetation. Their fruiting period, at least in the temperate zones, is almost completely restricted to the Spring and Fall seasons. The apothecia, while minute, are usually made more conspicuous by the spider web-like subiculum upon which they are borne, though occasionally the subiculum is so poorly developed as to be scarcely visible even under the hand lens.

<sup>3</sup>0.5 gm. iodine, 1.5 gm. potassium iodide, 20 gm. chloral hydrate, 20 ml. distilled water.

<sup>4</sup>400 gm. potatoes, 20 gm. dextrose, 15 gm. agar, 1000 ml. water.

An attempt has been made to cover the literature dealing with the Arachnopezizeae as fully as possible. However, since many of the species have been placed in totally unrelated and divergent genera, a literature review of almost the entire Inoperculates, followed by locating and examining the type specimens, would be necessary for true completeness. Such a task is beyond the scope of the present paper. Unquestionably other species, poorly or incorrectly described, or published in obscure journals, will in time be placed among the Arachnopezizeae, either as valid species or as synonyms.

## HISTORY AND NOMENCLATURE

### EARLY HISTORY

Since the Arachnopezizeae are, for the most part, rather minute fungi, it is understandable that few, indeed, were recognized in the pre-Friesian period, when the emphasis was upon the larger fungi. The first species described was, nevertheless, one with very minute and dark-colored apothecia. The early description of this particular species can presumably be accounted for by its strikingly copious and white subiculum. In 1800, Persoon named this species *Peziza lichenoides*, renaming it *Peziza caesia* in the following year. The second species described was *Peziza aurelia*, published by the same author in 1822. This is one of the largest species of the group, the apothecia commonly ranging up to 2.5 mm. in diameter, and usually of a bright orange color. A similarly large and closely related species was described by Schweinitz in 1832 as *Peziza candido-fulva*.

### ESTABLISHMENT OF THE GENERA OF THE ARACHNOPEZIZEAE

#### 1. ARACHNOPEZIZA Fuckel

In 1870, Fuckel erected the genus *Arachnopeziza*, with the following description: "Cupulae subiculo arachnoideo insidentes, gregariae, subminutae, sessiles, ceraceo-carnosae, extus villosae furfuraceae, disco concavo, demum subplano, discolori. Asci oblongi, 8-spori. Sporidia anguste cylindracea filiformiave, longissima, continua, hyalina. Paraphyses filiformes." It included four species in which the apothecia are borne on a light-colored subiculum, namely *A. aurelia* (Pers.), *A. delicatula* Fuckel, *A. aurata* Fuckel, and *A. asteroma* (Fuckel). His generic description required long, filiform spores (the septations he did not see). In examining *A. aurelia*, he mistook the detached paraphyses of young apothecia for spores, which he later acknowledged (1871-2). Since *A. aurelia* possesses fusoid spores, he (*l.c.*, p. 337) specifically excluded the species from the genus ("Hiernach muss er von Arachnopeziza geschieden werden"), making it a member of the "emended" genus *Polynema* Levéillé *emend.* Fuckel. *Polynema*, a member of the Fungi Imperfecti, he thus "transferred" to the Ascomycetes. His belief that *A. aurelia* was the perfect state of a *Polynema* has never been confirmed, and appears to be erroneous.

The designation of a type species for *Arachnopeziza* requires some discussion. Despite the fact that Fuckel misinterpreted *A. aurelia* originally, and then excluded it from the genus shortly after his original publication, a number of mycologists have considered this species to be the type of the genus. Perhaps this is because it is the most commonly

collected form, or because Fuckel had placed it first in his list of species [a *pseudotype* in the sense of Nannfeldt (1932) and of Arnaud (1949)]. Schröter (1893) places only *A. aurelia* in the genus, thus possibly selecting a lectotype, though the fact that nowhere in this work does he include *A. delicatula* or *A. aurata* leaves one to question whether he had any knowledge of these two species. Von Höhnelt (1923, 1225) states: "Arachnopeziza wurde in Fuckel, Symb. mycol. 1869, p. 303, mit der Grundart *Arachnopeziza Aurelia* (P.) Fuck. aufgestellt." He further treats the genus as monotypic, definitely excluding the other species, thus effectively designating a lectotype. The same species is designated the type by Clements and Shear (1931), Nannfeldt (1932), Seaver (1938), Svrcek (1948), and Dennis (1949).

Despite the apparently universal agreement in typification expressed by recent authors, the writer feels that the intent of the original author is most important. By excluding *A. aurelia* from the genus, Fuckel enforced the choice of a lectotype from the three remaining species. Further, everyone seems to have overlooked the fact that Saccardo (1884), when transferring *Arachnopeziza* to a subgenus under *Belonidium*, designated *B. auratum* (Fuckel) Sacc. as the subgeneric type. Since the writer knows of no earlier choice of a type from among these three species, *A. aurata* is accepted as the lectotype of the genus. Inasmuch as he considers both *A. aurelia* and *A. aurata* to be congeneric, this will entail no change in the nomenclature, but should these species be considered by others as belonging in different genera, the name *Arachnopeziza* should be permanently associated with the type constituent, namely *A. aurata*. It is the writer's belief that this disposition of the type concept is in best agreement with the intent of the International Rules of Botanical Nomenclature.<sup>5</sup>

## 2. ARACHNOSCYPHA Boudier

Boudier (1885) erected the genus *Arachnoscypha* in a key, giving sufficient characters to delimit a genus, and designated *Peziza aranea* Notaris as "L'espèce typique." By 1907, when he published his treatise covering the European species of Discomycetes, he had decided that *P. aranea* belonged in the genus *Arachnopeziza* Fuckel, and had abandoned *Arachnoscypha*. The generic name has seen very little use, though Nannfeldt (1932) includes it in his list of the three genera assigned to the Arachnopezizeae. He is followed by Dennis (1949), who separates the genus on the basis of one-septate as opposed to multiseptate spores, which division appears reasonable from an examination of the British species. However, when all the species are assembled, such a separation appears untenable. The writer agrees with Boudier in placing *Arachnoscypha* in synonymy with *Arachnopeziza*.

## 3. TAPESINA Lambotte

In 1888, Lambotte erected the genus *Tapesina*, which was placed in a division, "Phragmosporae." The whole generic description reads:

<sup>5</sup>When and if an appendix to the Rules is accepted, establishing the procedure for selecting a type when none is originally designated, this decision may have to be reversed, or, indeed, may well be upheld. It would be in accord with the regulations proposed by Rogers (1949) and by Singer (1950).

"C'est le genre *Tapesia* avec les spores septées." Two species are included and described, *Tapesina ruborum* (Cooke et Phil.) and *T. retincola* (Rabenh.). Von Höhnel (1923, 1223) emended the genus, removing the latter species (a true *Tapesia*). He then transferred this monotypic genus to his "Dasyscyphéen." It was treated as a doubtful genus by Nannfeldt (1932), and is accepted as a monotypic genus of the Arachnopezizeae by Dennis (1949) and by the writer.

#### 4. ERIOPEZIA (Saccardo) Rehm

In 1889 Saccardo erected the subgenus *Eriopezia* in the genus *Tapesia* (Pers. ex Fr.) Fuckel. The first species listed (i.e., the *pseudotype*) was *Tapesia caesia* (Pers.) Fuckel. In 1892, Rehm raised the subgenus to generic rank, radically reducing the limits of the group, and at the same time creating an orthographic variant by "correcting" Saccardo's spelling to "*Eriopeziza*." The change was apparently intentional, as Rehm retained this spelling in later publications. Saccardo, later recognizing the genus, and von Höhnel, both use the original spelling, while other authors have, in general, followed Rehm. The re-establishment of Saccardo's spelling is necessary in view of Article 70 of the International Rules, to retain the name as originally published. Since these are but orthographic variants and not different names, the preferred spelling is used throughout this monograph, but a combination using either variant is considered to have been validly published.

In the Rehm treatment, the genus included the following species: *E. orbilioides* Rehm, *E. aureliella* (Nyl.), *E. caesia* (Pers.), *E. porioides* (Alb. et Schwein.) and *E. aurea* (Fuckel). Of these, only *E. caesia* (and the synonymous *Peziza chavetiae* Lib.) had been included by Saccardo in his subgenus *Eriopezia*, and that species must be considered the type of the genus. This same species was designated the type by von Höhnel (1923, 1225), who apparently considered the genus to be monotypic, as well as by Clements and Shear (1931) and Nannfeldt (1932). The species brought together by Rehm have little in common (each of the five apparently belongs in a separate genus). The present writer, as well as others, considers the genus to be monotypic.

#### 5. ? CHRYSOTHALLUS Velenovsky

This genus was erected by Velenovsky (1934) as a member of the Hyaloscyphaceae, including eight new species with no designation of a type. Later (1939) he added two new species, and then (1947) four new species and a variety. His generic description leaves much doubt as to the correct position of the genus, which he refers to as "Transitum praebet inter Tapesiam, Eriopezizam et Hyaloscypham." While his species descriptions are so brief that they defy usage, his drawings leave little doubt concerning a number of the species. Certain of these appear unquestionably to belong to the genus *Tapesia*, while others probably represent members of the Hyaloscyphaceae. Some, perhaps, are truly members of the Arachnopezizeae; others more likely are species of the Hyaloscyphaceae growing upon substrates which also support the growth of the aerial hyphae of other fungi, thus simulating a subiculum. Until such time as Velenovsky's specimens become available for study, the genus must remain doubtful.

## 6. ARACHNOPEZIZELLA Kirschstein

Kirschstein (1938) erected the genus *Arachnopezizella* after an investigation of the three more common species of *Arachnopeziza*, namely, *A. aurelia*, *A. delicatula*, and *A. aurata*. He concluded that the first two, with fusoid, 3-septate spores, were congeneric, but that *A. aurata*, bearing its multiseptate spores parallel in the ascus, deserved a separate genus. The writer's investigations of this species fail to show any other character than the fasciculate spores upon which such a genus can be based. Other species of the genus *Arachnopeziza*, in particular *A. delicatula*, likewise show a tendency toward this condition. Kirschstein's genus must therefore be placed in synonymy with *Arachnopeziza*. Further, for the reasons explained above, *A. aurata* must be chosen as the lectotype of Fuckel's genus.

## RECENT TREATMENTS

Rehm (1892) treated several of the species included here in the subfamily Euhelotieae, tribe Pezizelleae, a group of non-hairy forms, recognizing the genera *Arachnopeziza* and *Eriopezia*. The genera were similarly treated by Schröter (1893). Lindau (1897), however, included both genera in the tribe Trichopezizeae, thus recognizing these to be hairy forms. Sydow (1897) referred *Arachnopeziza* to synonymy under *Belonidium*, where it had been falsely placed as a subgenus by Saccardo (1884). The treatment by Durand (1900) was but a translation of Lindau's key.

Boudier (1907) placed *Arachnopeziza* in his tribe Trichoscyphées, while a number of other species were placed in the Urcéolées, etc., with no emphasis on the presence of a subiculum. His concept of the genus *Arachnopeziza* was much advanced, though it included several species belonging elsewhere on the basis of their structure.

Migula (1913) included in *Arachnopeziza* and in *Eriopezia* exactly those species placed there by Rehm, though the genera were treated as belonging to the Trichopezizeae.

Von Höhnel discussed *Tapesina* (1923, 1925) as well as *Eriopezia* and *Arachnopeziza* (1923, 1925), regarding all three as monotypic. Concerning the last named, he pointed out that Rehm had removed *A. asteroma* (Fuckel) Fuckel to *Trichobelonium*. In *A. delicatula* and *A. aurata*, the remaining two original species, von Höhnel failed to see the characteristic hairs, and transferred these two species to *Gorgoniceps*, leaving only *A. aurelia* in the genus.

Clements and Shear (1931) placed *Eriopezia* in the subfamily Helotiae (apothecia not hairy) and *Arachnopeziza* in the Dasyscyphae (apothecia hairy).

Nannfeldt (1932) erected the tribe Arachnopezizeae to include three genera: ? *Eriopezia*, *Arachnopeziza*, and *Arachnoscypha*. The group was known to him only imperfectly, and no descriptions were given of the genera or species.

Velenovsky (1934, 1939, 1947) treated both *Eriopezia* and *Arachnopeziza* as members of the Hyaloscyphaceae, and added a large number of new species, most (all?) of which must remain doubtful because of inadequate descriptions. His genus *Chrysothallus* has been discussed above. None of his specimens have been available for study, and

apparently none are deposited in any North American herbarium nor in any of the larger European herbaria visited by the writer.

Seaver is apparently the only American mycologist to publish a monographic treatment of any of the genera of the tribe. His brief paper on *Arachnopeziza* (1938) lists but three species, all included by Fuckel in his original description.

Svrcek (1948) treats *Arachnopeziza* as monotypic, with *A. aurelia* as the type. It should be noted that he disregards the significance of the method of ascus dehiscence, and includes the genus in the Pezizaceae, subfamily Lachneoideae, along with such Operculate genera as "*Lachnea*" and *Desmazierella*.

Dennis (1949) has presented an admirable basis for the study of the British Hyaloscyphaceae. In addition to the three genera recognized by the present writer, Dennis also accepts the genus *Arachnoscypha*.

#### VALIDITY OF THE TRIBE

When the family Hyaloscyphaceae was erected, Nannfeldt subdivided it into three tribes, the Lachneae, the Hyaloscyphaeae, and the Arachnopezizeae (this last, "rein provisorisch."). He writes (1932: 279): "Ebensowenig wie beispielweise die auf Grund desselben Merkmals" [i.e., the subiculum] "errichtete Gruppe '*Tapesiae*' dürfte *Arachnopezizeae* phylogenetisch sein. Die hierher gehörigen Formen sind in gut entwickeltem Stadium selten, und ich bin nicht in der Lage gewesen, sie näher zu untersuchen." He writes later (1936) regarding *Arachnopeziza tapesioides* (= *A. cornuta*): ". . . the presence of a subiculum is of very slight taxonomic value." Dennis (1949) is similarly doubtful regarding the tribe, for he writes: "The family is divided into two sub-families," [tribes] "mainly on the basis of apothecial size, with a third rather ill defined group segregated because they are seated on a conspicuous subiculum."

The problem concerning the validity of the tribe has been carefully investigated by the writer. He has come to the conclusion that *the subiculum, which, in this group, is correlated with several other characters, provides a particularly useful and natural division*. The species of *Arachnopeziza* cannot conceivably find closer relationship among the non-subiculate forms than among those with a subiculum: their distinctive apothecial structure, their typically septate spores, and their characteristic hairs leave no doubt but that they must all be congeneric. The three genera of this tribe differ appreciably, one with another, but there are significant similarities as well.

While it is quite true that the subiculum is but an arbitrary character in the separation of such genera as *Tapesia* and *Mollisia*, where correlated characters do *not* appear to exist, the same cannot be said for the subiculum as evidenced by the genera of the Arachnopezizeae. The fact that the subiculum is nearly useless as a taxonomic character in the Mollisioideae in no way invalidates its possible value in the Hyaloscyphaceae. For example, the paraphyses in one group of the Discomycetes may be particularly diagnostic, while in another group the paraphyses may be of little or no taxonomic value.

Some of the species which the writer includes in the tribe develop a scanty subiculum at most, and even some of the species with a normally well-developed subiculum at times form almost none, depending upon the substrate. It is then on the correlated characters that one would



assign a species to the tribe, rather than on the subiculum itself. The rare specimen in which the subiculum does not develop will prove a source of confusion to the general student not intimately acquainted with the Arachnopezizeae, but it is doubtful if he could find a place for such a specimen elsewhere in the Hyaloscyphaceae. Sessile apothecia combined with septate spores in a species of this family are strong indications to the student that he may be dealing with a member of this tribe. A section of the apothecium will often reveal the otherwise overlooked subicular hyphae.

While the writer is now convinced that the subiculate forms which he includes in the tribe constitute a fairly natural grouping, he fully realizes that additional material may prove that his arrangement is partially incorrect. The writer believes that the conclusions reached from his investigation of the genus *Arachnopeziza* will furnish a firm foundation for further studies of the closely related species constituting this genus. Somewhat broader species limits than those defined by earlier authors have resulted from his recognition of the natural variation within each species. In a number of cases, minor morphological variants have been classified in the same species, but this has been necessitated by the examination of specimens with intermediate characters. It is possible that some of the species recorded here may be divisible into categories below the rank of species, on the basis of seasonal differences or substrate specificity correlated with minor morphological variations. In no case, however, has the material at hand justified the use of any infraspecific categories in the tribe.

#### SPECIAL TERMINOLOGY, ABBREVIATIONS, AND ARRANGEMENT OF THE SPECIES

The terminology employed here for the various types of tissues which may be encountered in the Inoperculate Discomycetes is an adaptation of that proposed by Starbäck (1895). The following is a revision of Starbäck's key to tissue types:

- I. Short-celled tissue: the separate hyphae not distinguishable.
  - A. Cells round to polyhedral, almost isodiametric.
    1. Cells rounding up, with intercellular spaces: *textura globulosa*.
    2. Cells polyhedral by mutual pressure, no intercellular spaces: *textura angularis*.
  - B. Cells more or less rectangular in section, not isodiametric: *textura prismatica*.
- II. Long-celled tissue: the separate hyphae easily distinguishable.
  - C. Hyphae running in all directions, not parallel.
    3. Hyphae with their walls not united, usually with distinct interhyphal spaces: *textura intricata*.
    4. Hyphae with their walls united, without interhyphal spaces, usually forming a membranaceous tissue: *textura epidermoidea*.
  - D. Hyphae running in one direction, more or less parallel.
    5. Hyphae with narrow lumina and strongly thickened walls, cohering: *textura oblita*.
    6. Hyphae with wide lumina and non-thickened walls, not cohering: *textura porrecta*.

Intergradations of these basic tissue types may often occur in the Discomycetes, but the boundary between adjacent tissue zones may be strikingly abrupt.

The other technical terms utilized in this monograph are those known to any student of the fungi.

The abbreviations of the names of authors and of literature citations conform in general with the rules and recommendations of the International Rules of Nomenclature, though more complete citations are occasionally given to facilitate their use. All species epithets, however, have been decapitalized.

Where the actual date of publication of an article is known to differ from that indicated on the paper itself, the corrected date is given, enclosed in brackets.

The sign (!!) indicates that type or isotype material has been examined; the sign (!), that syntype, paratype, or other authentic material has been examined.

The illustrations cited are those which definitely represent the species in question; doubtful or schematic ones are, in general, omitted. Citations to particularly complete and accurate illustrations are indicated with an exclamation point.

The references to herbarium specimens employ the abbreviations of Lanjouw (1939), with an additional letter added in many cases to designate the special collections of the various institutions. The following are the abbreviations used in this paper: BM = British Museum (Natural History), London; BM-B = their Broome Herbarium; BPI = Bureau of Plant Industry, Beltsville; CU-A = Cornell University, their Atkinson Herbarium; CU-D = their Durand Herbarium; CU-P = their Department of Plant Pathology Herbarium; FH = Farlow Herbarium, Harvard University; FH-C = their Curtis Herbarium; FH-H = their von Höhnell Herbarium; G = Institute de Botanique Systématique, Geneva; GRO = Rijksuniversiteit, Groningen; K = Kew Botanic Gardens; MICH = University of Michigan; NY = New York Botanical Garden; NY-C = their Columbia Herbarium; NY-E = their Ellis Herbarium; NY-M = their Masee Herbarium; NY-U = their Underwood Herbarium; PC = Muséum National d'Histoire Naturelle, Paris; PC-B = their Boudier Herbarium; PC-LG = their Le Gal Herbarium; PH-S = Academy of Natural Sciences, Philadelphia, their Schweinitz Herbarium; RPK = personal herbarium of the author; S = Naturhistoriska Riksmuseet, Stockholm; S-R = their Rehm Herbarium; S-S = their Sydow Herbarium; UPS = Uppsala University.

The species are arranged under each genus in the following categories:

1) Species accepted by the writer. Of the fourteen accepted species, two are known only from America, two only from Europe, one only from Australia, and nine appear to be rather cosmopolitan in their distribution, being known from at least America and Europe. Of these fourteen species, one is described as new, and six are new combinations.

2) Species imperfectly known, mostly European.

3) Excluded species and synonyms.

In addition, a list of species which appear to be *nomina dubia* forms an appendix.

KEY TO THE TRIBES OF THE FAMILY HYALOSCYPHACEAE

- I. Subiculum absent. Apothecia sessile to stipitate. Hairs strongly roughened to smooth.
  - A. Apothecia fairly large, long-stipitate to sessile. Ascospores usually non-septate (if septate, ectal excipulum of several layers of *thin-walled* textura prismatica and hairs strongly roughened). Paraphyses usually lanceolate, longer than the asci, rarely filiform.....*Lachneae*
  - B. Apothecia minute, sessile. Ascospores non-septate (rarely 1-septate?). Paraphyses always filiform.....*Hyaloscyphaceae*
- II. Subiculum always present. Apothecia sessile to rarely substipitate, minute to fairly large. Hairs smooth or faintly roughened. Ascospores always septate (except *Eriopezia caesia*). Ectal excipulum of *gelatinized, thick-walled* textura prismatica to textura angularis. Paraphyses filiform, never lanceolate, occasionally deformed at the apex.....*Arachnopezizeae*

TAXONOMY OF THE TRIBE ARACHNOPEZIZEAE

DIAGNOSIS OF THE TRIBE

A tribe of the Hyaloscyphaceae Nannf., characterized by sessile or very rarely substipitate apothecia borne on a copious to scanty, whitish, orange or even darker subiculum. Apothecia whitish, rarely brown, sometimes with orange pigments, minute to fairly large, usually less than 1 mm. in diameter, rarely exceeding 3 mm.; ectal excipulum composed of a rather definite layer or layers of hyaline to brownish, gelatinized, rather thick-walled textura prismatica to textura angularis, giving rise to hairs. Hairs usually abundant, generally longest at the margin, almost always smooth, hyaline to light brown, septate. Asci 8-spored, arising singly or in fascicles from croziers, the apical pore blueing in iodine. Ascospores hyaline, ellipsoid to fusoid or filiform, septate (except *Eriopezia*). Paraphyses usually filiform, branched or not, hyaline, apex occasionally deformed. Saprophytes, mostly lignicolous.

Type genus: *Arachnopeziza* Fuckel.<sup>6</sup>

KEY TO THE GENERA OF THE ARACHNOPEZIZEAE

- I. Ectal excipulum with one or more layers of decidedly brownish tissue.
  - A. Apothecia sessile or short-stipitate, appearing brown or black, immersed in a copious white subiculum. Excipulum with a layer of dark brown textura prismatica. Hairs hyaline. Spores non-septate.....*Eriopezia*
  - B. Apothecia sessile, brownish; subiculum scanty, brownish. Excipulum of several layers of light brown textura prismatica to textura angularis. Hairs spirally coiled, brownish to hyaline. Spores 3-septate.....*Tapesina*
- II. Ectal excipulum of hyaline tissue. Apothecia on a white or light-colored, often scanty subiculum. Hairs hyaline to orange. Spores 1- to 7-septate at maturity.....*Arachnopeziza*

<sup>6</sup>Inasmuch as the tribe was erected only provisionally by Nannfeldt (1932), the following Latin diagnosis is provided to validate the name:

*Arachnopezizeae* Nannfeldt, trib. nov.

Tribus Hyaloscyphacearum cupulis in subiculo albo vel fulvo insidentibus, sessilibus; ascosporis 1-7-septatis (in *Eriopezia* cupulis substipitatis, ascosporis continuis); excipulo ectali textura prismatica vel textura angulari, gelatinifacto, muris incrassatis; pilis septatis, hyalinis vel spadiceis; ascis e lituis natis, octosporis, poro in Iodo coerulecente. Saprophyticae.

Genus typicum: *Arachnopeziza* Fuckel.

ERIOPEZIA (Sacc.) Rehm *emend.* Höhnel

*Tapesia* (Pers. ex Fr.) Fckl. subgen. *Eriopezia* Sacc., Syll. fung. 8: 381. 1889 (in part).

*Eriopezia* (Sacc.) Rehm, in Rabenh., Krypt.-Fl. 13: 695. 1892 (in part). [As "*Eriopeziza*".]

*Eriopezia* (Sacc.) Rehm *emend.* Höhn., Sitz.-ber. Akad. Wiss. Wien, Math.-nat. Kl., Abt. I, 132: 116. 1923.

LECTOTYPE: *Peziza caesia* Pers. ex Fr., effectively selected by Rehm (1892).

NAME: From Greek, *erion* = wool + *pezis* = a stalkless fungus: woolly-cup.

*Subiculum* white, copious. *Apothecia* minute, sessile, or substipitate, olivaceous or darker; ectal excipulum of one or a few layers of dark brown *textura prismatica*. *Hairs* mostly at the margin, short, hyaline. *Asci* 8-spored, minute, clavate, arising from croziers, with an apical pore blueing in iodine. *Ascospores* hyaline, subfusiform, minute, non-septate. *Paraphyses* hyaline, branched or simple, rather broad, filiform. *Saprophytic*. Presumably monotypic.

## ACCEPTED SPECIES

## 1. ERIOPEZIA CAESIA (Pers. ex Fr.) Rehm

*Peziza lichenoides* Pers., Icon. et descr. fung. 29. 1800.

*Peziza caesia* Pers., Syn. meth. fung. 657. 1801.

*Peziza caesia* Pers. ex Fr., Syst. myc. 2: 108. [1822].

? *Peziza erratica* Fr., Syst. myc. 2: 108. [1822].

*Peziza chavetiae* Lib., Pl. crypt. Ard. exs. n° 26. 1830. (!!)

*Tapesia caesia* (Pers. ex Fr.) Fckl., Symbol. myc. 301. [1870].

? *Tapesia erratica* (Fr.) Fckl., Symbol. myc. 301. [1870].

*Tapesia chavetiae* (Lib.) Fckl., Symbol. myc. 301. [1870.]

*Lachnea caesia* (Pers. ex Fr.) Gill., Disc. 92. 1879.

? *Lachnea alboviridis* Gill., Disc. 91. 1879.

? *Lachnea albo-olivacea* Gill., Disc. 92. 1879.

? *Phialea legeriana* Gill., Disc. 111. 1879.

*Lachnella caesia* (Pers. ex Fr.) Quél., Enchir. fung. 316. 1886.

? *Lachnella erratica* (Fr.) Quél., Enchir. fung. 316. 1886.

*Humaria chavetiae* (Lib.) Quél., Enchir. fung. 290. 1886.

? *Tapesia alboviridis* (Gill.) Sacc., Syll. fung. 8: 384. 1889.

? *Tapesia albo-olivacea* (Gill.) Sacc., Syll. fung. 8: 385. 1889.

? *Tapesia legeriana* (Gill.) Sacc., Syll. fung. 8: 372. 1889.

*Eriopezia caesia* (Pers. ex Fr.) Rehm, in Rabenh., Krypt.-Fl. 13: 696. 1892.

? *Eriopezia erratica* (Fr.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

*Eriopezia chavetiae* (Lib.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

? *Eriopezia alboviridis* (Gill.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

*Trichopeziza caesia* (Pers. ex Fr.) Boud., Hist. classific. disc. Europe 131. 1907.

? *Trichopeziza erratica* (Fr.) Boud., Hist. classific. disc. Europe 131. 1907.

*Trichopeziza chavetiae* (Lib.) Boud., Hist. classific. disc. Europe 131. 1907.

? *Arachnopeziza alboviridis* (Gill.) Boud., Hist. classific. disc. Europe 126. 1907.

? *Trichopeziza albo-olivacea* (Gill.) Boud., Hist. classific. disc. Europe 131. 1907.

FIGS. 1, 15.

*Subiculum* white, copious; hyphae 2–2.7 $\mu$  in diameter, fairly thick-walled, smooth or with external particles; septa frequent. *Apothecia* gregarious, sessile to substipitate, 200–500 (700) $\mu$  in diameter, cupulate; *receptacle* olivaceous to dark brown or black, giving rise to hairs mostly at the margin and to subicular hyphae over the remainder of the surface, often contracted at the base to form a foot or short stipe; *margin* acute, elevated on drying; *disc* bluish- to greenish-gray, plane to concave. *In section*: *hymenium* ca. 40 $\mu$  thick; *hypothecium* not differentiated;

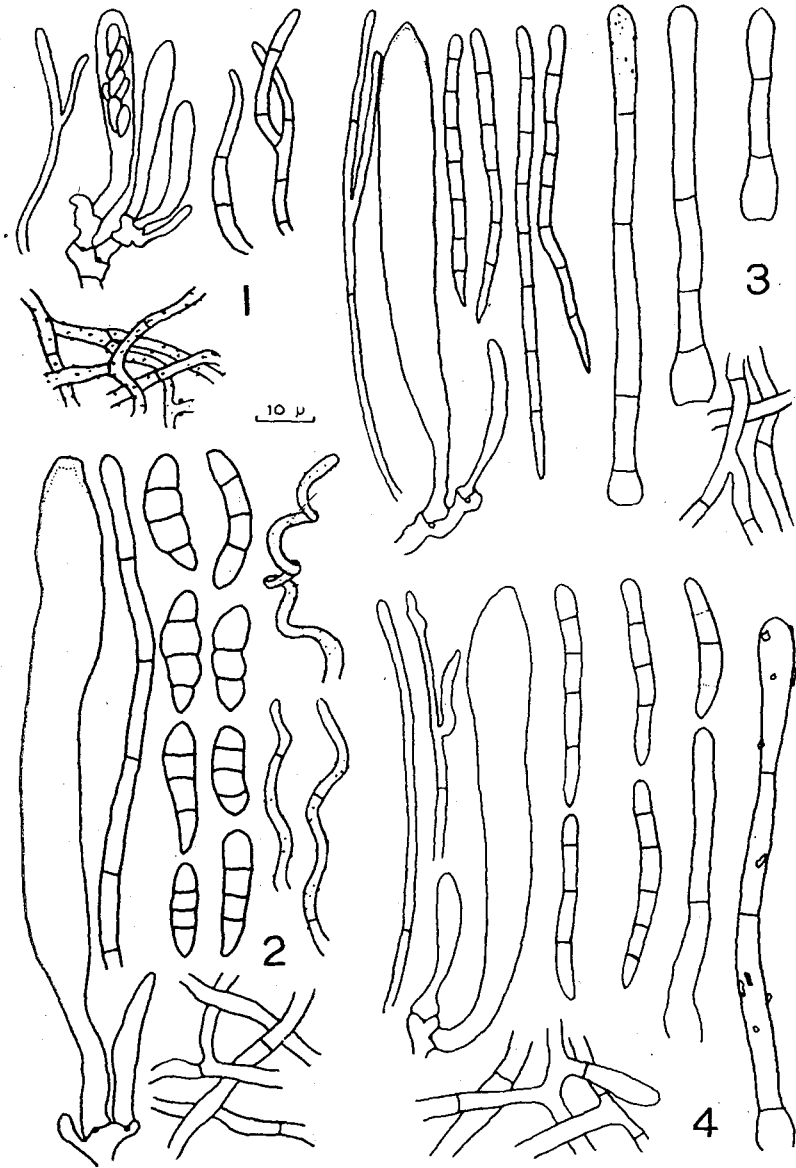


FIG. 1, *Eriopezia caesia*: paraphysis, ascus, spores, hairs (12. X. 1935. UPS); subiculum (Cooke, F. Brit. exs. II, 555, FH). FIG. 2, *Tapesina griseo-vitellina*: ascus, paraphysis, 6 upper spores, subiculum, hairs (isotype, FH); 2 lower spores (*Peziza ruborum*, type, BM). FIG. 3, *Arachnopeziza aurata*: paraphysis, ascus, 2 left spores, hairs (CU-P 37430); 2 right spores, subiculum (27. V. 1936. MICH). FIG. 4, *A. delicatula*: paraphyses, ascus, 4 spores, hairs, subiculum (2. VII. 1932. NY); lower left spore (isotype, FH-H). Drawn with the aid of a camera lucida at  $\times 1500$ , and reduced in reproduction to  $\times 750$ .

*medullary excipulum* 7–15 $\mu$  thick; of textura intricata; hyphae ca. 2 $\mu$  wide, fairly thick-walled, hyaline; *ectal excipulum* — 75 $\mu$  thick; towards the margin of fairly thick-walled textura prismatica, walls hyaline to yellowish, contents yellowish-brown to brown, hyphae 2.7–3.4 $\mu$  wide, giving rise to hairs; below of thinner-walled textura angularis to almost textura globulosa, walls yellowish-brown, contents yellowish, cells — 7.5 $\mu$  in diameter, intermixed with hyphae giving rise to the subiculum. *Hairs* hyaline, 2–2.7 $\mu$  wide below, tapering to a blunt or pointed apex, occasionally branched, 30–40 $\mu$  long, septate, fairly thick-walled, smooth or with external particles. *Asci* 8-spored, arising from croziers, clavate; apex rounded, with the pore blueing in iodine; 30–47 x 4.1–5.5 $\mu$ . *Ascospores* hyaline, subfusiform, usually attenuate below, irregularly bi- to multiseriate, non-septate, 4.1–6.1 (9.6) x 1.4–2 $\mu$ . *Paraphyses* hyaline, simple or branched, filiform, not enlarged at the apex, about as long as the asci, 0.75–1.4 $\mu$  wide; septa rare.

**CULTURAL CHARACTERS:** Brefeld (1891) described the conidial state of this species from cultural studies; no other reports of attempts to culture this species have been encountered.

**HABITAT:** Decorticated wood, especially of *Quercus*.

**NAME:** From Latin, *caesius* = blueish gray.

**TYPE LOCALITY:** Not specified. Europe.

**TYPE SPECIMEN:** Rijksherbarium, Leiden.<sup>7</sup>

**ILLUSTRATIONS:** Brefeld, *Untersuch. Mykol.* 10: pl. 13, f. 14–15. 1891; Cooke, *Grevillea* 4: pl. 51, f. 250–251. 1875; Ditmar, *in Sturm, Deutschl. fl.* 3<sup>1</sup>: pl. 31. 1817; Massee, *Brit. fungus-fl.* 4: 156. f. 39–40. 1895; Nees, *Syst. Pilze Schwämme* pl. 37, f. 272. 1816; Persoon, *Icon. descr.* 2: pl. 8, f. 1–2. 1800; Rehm, *in Rabenh.*, *Krypt.-Fl.* 1<sup>2</sup>: 693. 1892; Saccardo, *F. ital. f.* 1431. 1883.

**EXSICCATI:** Cooke, *F. Brit. exs.* 562 (*Peziza*); Cooke, *F. Brit. exs.* II, 555 (*Peziza*); Doassans et Patouillard, *Champ. fig. des.* 77 (not seen); Erbar. Crittogam. *Ital.* 589 (*Peziza epitheliphora* Saut.); Fuckel, *Fungi rhen.* 2574 (*Tapesia*); Jaap, *F. sel. exs.* 204; Libert, *Pl. crypt. Ard. exs.* 26 (*Peziza chavetiae*); Lundell et Nannfeldt, *F. exs. Suecici* 988; Phillips, *Elv. Brit.* 76 (*Peziza*); Rabenhorst, *Klotzsch. Herb. viv. myc.* 529 (*Peziza*); Rabenhorst-Wint.-Paz., *Fungi eur.* 3967; Sydow, *Myc. march.* 3489 (*Tapesia*).

**SPECIMENS EXAMINED:** *Ohio:* Morgan, n° 804, (no locality, no date) NY-E, CU-P 38081.

*England:* C. B. P[lowright], *Hereford*, (no date), Cooke *F. Brit. exs.* II, 555, FH; (no collector), on oak wood, *Carlisle*, (no date), NY-M; (no collector), *Shrewsbury*, (no date), Phillips *Elv. Brit.* 76, FH; (no collector), *Highgate*, XI, 1892, Cooke *F. Brit. exs.* 562, NY-E.

*France:* (no collector), *In cryptis ad ligna dejecta quercina*, (no locality, no date), Libert *P. crypt. Ard. exs.* 26, isotype of *Peziza chavetiae*, BM; Lorton, (sub *Tapesia legeriana*), *Saône-et-Loire*, VII, (no year), ex Herb. Boudier, PC; Lorton, n° 87, (sub *Trichopeziza albo-olivacea*), *Clessy*, IX, 1912, PC; Buisson, (sub *Trichopeziza albo-olivacea*), sur fragment pourri de bois en chêne, *Mesland, Loire-et-Cher*, I, 1933, PC.

*Germany:* (no collector), ad *Quercus*, *Oestrich*, (no date), Fuckel *Fungi rhen.* 2574, FH; Fuckel, n° 1292, an faulem Holz von *Quercus*, *Oestricher Hinterwald*, (no date), NY; Lasch, ad ligni humi jacentia, *Driesen*, (no date), Rabenh. Klotzsch. *Herb. viv. myc.* 529, FH; Sydow, *Botan. Garten, Berlin*, X, 1891, NY-E; Winter, ad lignum quercinum, *Harth prope Leipzig, Saxonia*, 1895–6, Rab.-Wint.-Paz. *Fungi eur.* 3967, NY-E; Jaap, auf feucht liegenden Spänen von *Quercus robur*, bei *Friedrichsruh im Sachsenwalde, Schleswig-Holstein*, 24. IX. 1905, Jaap *F. sel. exs.* 204, FH.

<sup>7</sup>Nannfeldt studied this specimen (910,256–1985 ‘Prope Gotting. lecta’) in 1932. It agrees with what has later passed under this name. Three other specimens in the Persoon Herbarium seem to be different.

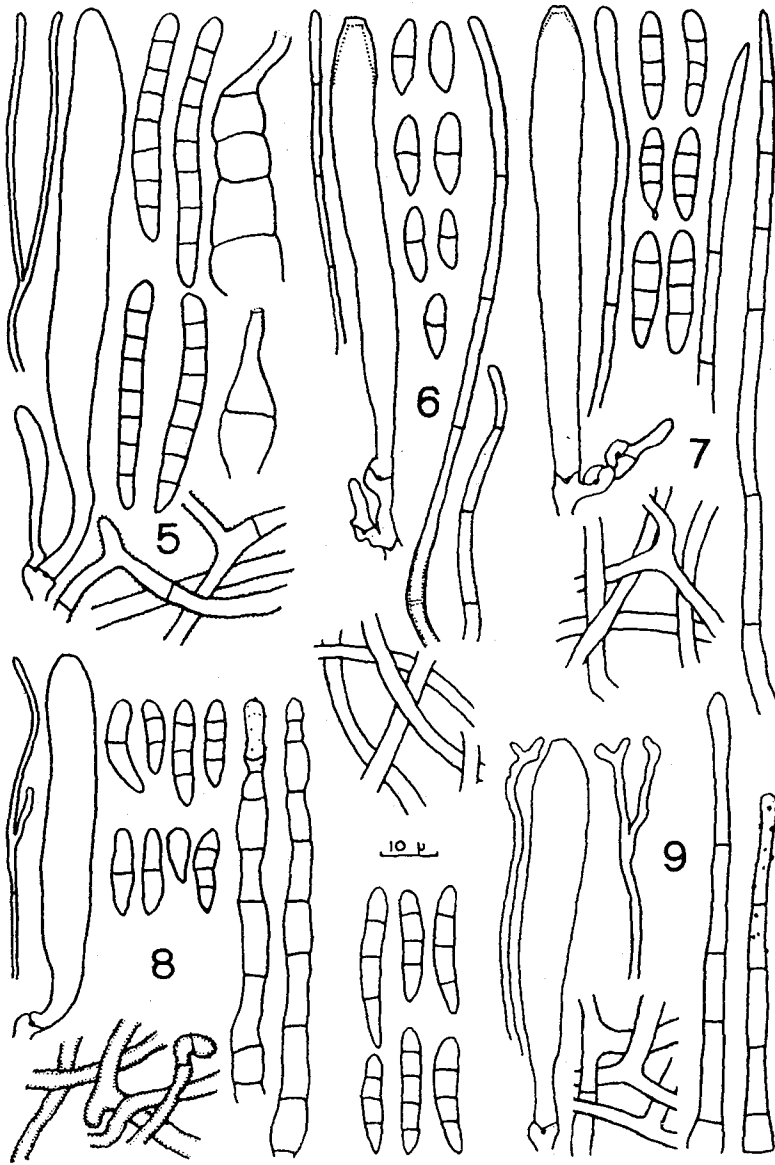


FIG. 5, *Arachnopeziza araneosa*: paraphysis, ascus, spores, hairs (broken), subiculum (type, K). FIG. 6, *A. candido-fulva*: paraphysis, ascus, 4 upper spores, hairs, subiculum (CU-P 38085); 3 lower spores (isotype, NY). FIG. 7, *A. aurelia*: ascus, paraphysis, spores, hairs, subiculum (RPK 1235). FIG. 8, *A. cornuta*: paraphysis, ascus, 4 upper spores, hairs, subiculum (type, NY); 4 lower spores (16. V. 1929. UPS). FIG. 9, *A. obtusipila*: spores, paraphyses, ascus, hairs, subiculum (XII. 1927. PC). Drawn with the aid of a camera lucida at  $\times 1500$ , and reduced in reproduction to  $\times 750$ .

*Italy:* Cesati, sui ceppi fracidi dei Faggi, *S. Giovanni d'Andorno, Biella*, VIII. 1860, Erbar. Crittogam. Ital. 589, FH.

*Sweden:* Åberg, *Upl. Funbo s.n. Hofgården*, 12. X. 1935, UPS; Åberg, on the underside of cleft, hard oak wood, *Upland: Funbo parish, Hofgården*, 12. X. 1935 et 20. XII. 1936, Lund. et Nannf. F. exs. Suecici 988, BPI; Morander, Pa ved av *Quercus, Närke: Gotlunda s.n. N. Hammaren*, 30. X. 1947, UPS.

NOTES: This species is known to the writer only from dried, herbarium specimens, and appears to be rare in North America. The type material of a number of the species in the list of synonymy is apparently no longer in existence, and therefore these are listed as doubtful.

This is an exceedingly curious and characteristic discomycete, and apparently widespread in Europe. The substipitate habit, darkened cell-walls and non-septate spores might indicate that the fungus is incorrectly placed in this tribe; it would, however, be even more anomalous were it placed in the Mollisioideae. For the time being, at least, its most natural disposition seems to be among the Arachnopezizeae. Fig. 15 shows a specimen with an abnormally well-developed stipe.

#### SPECIES IMPERFECTLY KNOWN

The following species which have been referred to *Eriopezia* are known to the writer only from their descriptions. Probably none or few belong in the genus, but the descriptions are not sufficient to place them correctly. Republication of Velenovsky's wholly insufficient descriptions would be of little value to taxonomic science; they are therefore omitted.

2. *ERIOPEZIA CAESIA* (Pers. ex Fr.) Rehm var. *SORDIDA* Vel., Monogr. disc. Bohem. 1: 265. 1934.
3. *ERIOPEZIA CAPILLARIS* Vel., Monogr. disc. Bohem. 1: 265. 1934.
4. *ERIOPEZIA CARICINA* Vel., Novit. myc. 190. 1939.
5. *ERIOPEZIA CARPINACEA* Vel., Novit. myc. noviss. 134. 1947.
6. *ERIOPEZIA GLOMERATA* Vel., Novit. myc. noviss. 134. 1947.
7. *ERIOPEZIA LOTI* Vel., Novit. myc. 191. 1939.
8. *ERIOPEZIA LUPINI* Vel., Monogr. disc. Bohem. 1: 266. 1934.
9. *ERIOPEZIA MICROSCOPICA* Vel., Monogr. disc. Bohem. 1: 265. 1934.
10. *ERIOPEZIA NECTRIOIDEA* P. Henn., Hedwigia 14: 23. 1902.

Apothecia gregarious, surrounded by arachnoid, hyaline, septate, branching hyphae, at first globose and closed, then hemispherical, yellowish-brown, minute, about 100–150 $\mu$  in diameter, the margin finely pilose, the disc concave, waxy, amber-colored, smooth; asci clavate, curved to straight, apex rounded-obtuse, base attenuate-stipitate, 50–65 x 9–11 $\mu$ ; paraphyses filiform, guttulate, about 1.5 $\mu$  across; spores sub-biseriate to obliquely uniseriate, ellipsoid, obtuse at both ends to subacute, straight, at times with 1–2 minute guttules, non-septate, hyaline to slightly yellowish, 8–11 x 3–3.5 $\mu$ .

In groups on the sharp edges of rotted wood. The mostly closed, amber-colored fruitbodies look very much like *Nectria* under the hand-lens. [Translated from German.]



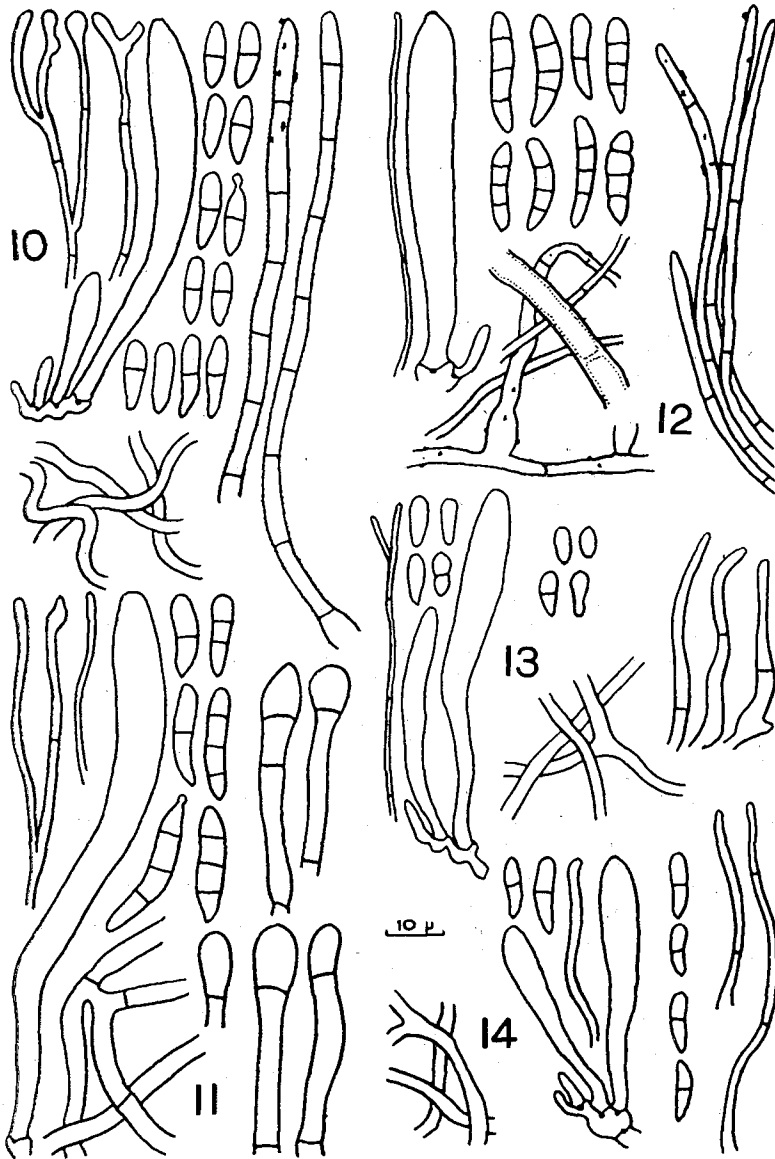


FIG. 10, *Arachnopeziza trabinelloides*: paraphyses, ascus, 6 upper spores, hairs, subiculum (type, S); 6 lower spores (*Helotiella nuttallii*, type, NY). FIG. 11, *A. major*: paraphyses, ascus, spores, hairs, subiculum (isotype, CU-D). FIG. 12, *A. fitzpatrickii*: paraphysis, ascus, spores, hairs, subiculum (type, CU-P). FIG. 13, *A. aranea*: paraphysis, spores, ascus, subiculum, hairs (CU-P 11788). FIG. 14, *A. eriobasis*: subiculum, paraphysis, ascus, 4 spores, hairs (RPK 1979); 2 left spores (type, K). Drawn with the aid of a camera lucida at  $\times 1500$ , and reduced in reproduction to  $\times 750$ .

TYPE LOCALITY: Blumenau, Santa Catherina, Brazil.

TYPE SPECIMEN: Berlin. Presumably lost during World War II. Reported collected by A. Möller, n° 1047, 27. III. 1893.

ILLUSTRATIONS: None.

EXSICCATI: None.

NOTES: Known to the writer only from the above description. Though many of Hennings's types are represented in the Sydow herbarium at Stockholm, this species was not encountered there by the writer.

11. ERIOPEZIA PECULIARIS Vel., Monogr. disc. Bohem. 1:266. 1934.
12. ERIOPEZIA POLYTRICHI Vel., Monogr. disc. Bohem. 1:267. 1934.
13. ERIOPEZIA ROSARUM Vel., Novit. myc. noviss. 134. 1947.
14. ERIOPEZIA TENTACULIFERA Vel., Monogr. disc. Bohem. 1:265. 1934.
15. TAPESIA (ERIOPEZIA) ERYSIPOIDES (Rabenh.) Sacc.

*Peziza erysipoides* Rabenh., Deutschl. Krypt.-Fl. 1:357. 1844.

*Tapesia erysipoides* (Rabenh.) Sacc., Syll. fung. 8:386. 1889.

NOTES: A lost species? The description suggests *E. caesia*.

#### EXCLUDED SPECIES AND SYNONYMS

1. ERIOPEZIA ALBO-LATERITIA Rehm ex Jaap, Verh. Bot. Ver. Prov. Brandenburg 52:114. 1910 (*nomen nudum*).

NOTES: No description of this fungus is known to the writer. Jaap (*l.c.*) writes: "Ist mit *Tapesia cruenta* P. Henn. zu vergleichen!" [*T. cruenta* Henn. et Plöttner, apud Henn., Verh. Bot. Ver. Prov. Brandenburg 41:96. 1900, certainly is *Durella sanguinea* (Pers. ex Fr.) Nannf. See von Höhnelt (1909, 248).]

2. ERIOPEZIA ALBOVIRIDIS (Gill.) Sacc. et Sacc. = ? *E. caesia*.

3. ERIOPEZIA AUREA (Fuckel) Rehm

*Tapesia aurea* Fckl., Fungi rhen. n° 2476. 1872. (!).

*Eriopezia aurea* (Fckl.) Rehm, in Rabenh., Krypt.-Fl. 1:697. 1892.

*Micropodia aurea* (Fckl.) Boud., Hist. classif. disc. Europe 128. 1907.

SPECIMENS EXAMINED: *Germany*: (no collector), ad *Pini sylvestris* folia putrida, *prope Eberbach*, (no date), Fuckel Fungi rhen. 2476, ISOTYPE of *Tapesia aurea*, BM-B; Fuckel, n° 1268, an faulenden Nadeln von *Pinus sylvestris*, *bei Eberbach*, (no date), NY; Sydow, an Kiefernadeln, *am Wannsee bei Berlin*, X. 1893, Sydow Myc. march. 3956, NY, S.

NOTES: Though the writer has seen ample material of this discomycete, its correct generic disposition has so far remained an unsolved problem. It will certainly find its place in the Helotiaceae *sensu stricto*; none of the genera above named can conceivably accommodate this species. Rehm (*l.c.*, p. 698) suggests that *Peziza messerschmidii* Weinm. may be an older name.

4. ERIOPEZIA AURELIELLA (Nyl.) Rehm = *Arachnopeziza eriobasis*.
5. ERIOPEZIA AURELIELLA var. SULPHUREA Vel.  
An *Arachnopeziza* (see there under Species Imperfectly Known).
6. ERIOPEZIA CANDIDO-FULVA (Schw.) Rehm = *Arachnopeziza candido-fulva*.
7. ERIOPEZIA CHAVETIAE (Lib.) Sacc. et Sacc. = *E. caesia*.
8. ERIOPEZIA CORNI (Fuckel) Sacc. et Sacc.

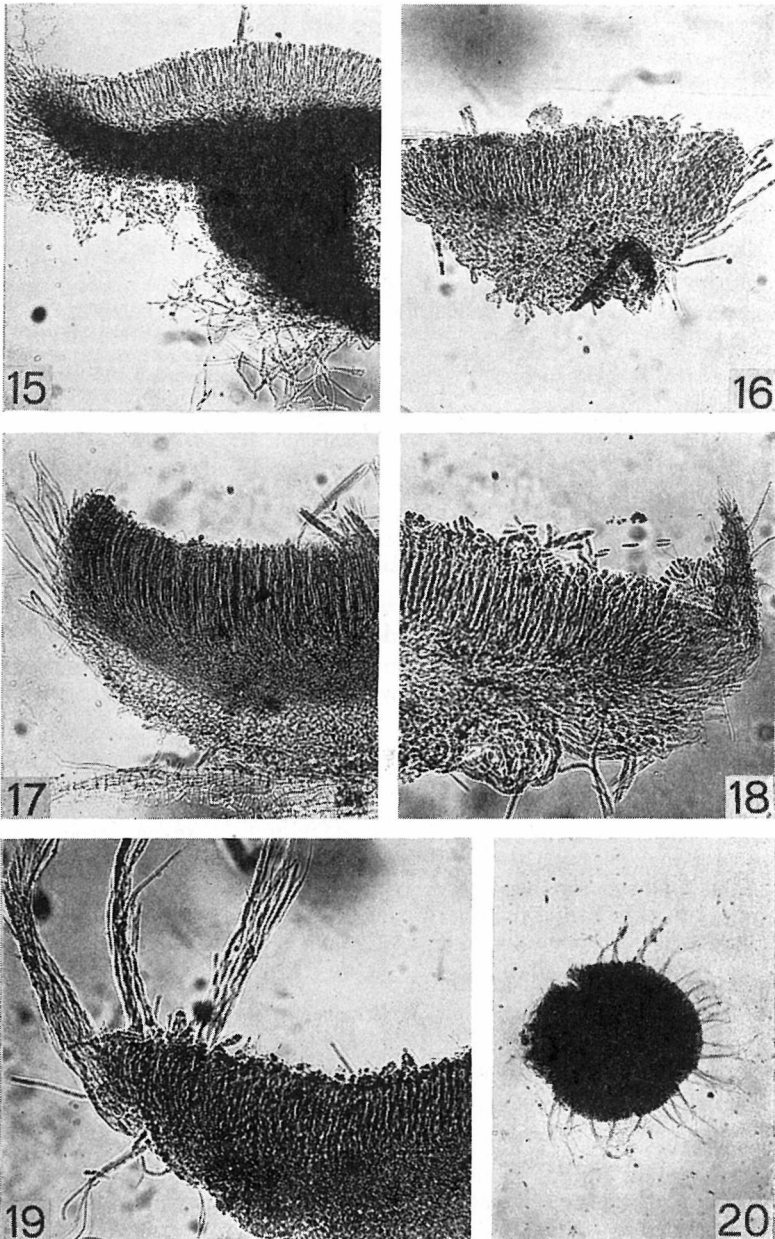


FIG. 15, *Eriopezia caesia*: freehand section through an apothecium (CU-P 38081). FIG. 16, *Arachnopeziza cornuta*: freehand section through an apothecium (isotype, CU-P). FIG. 17, *A. aurata*: freehand section through an apothecium (CU-P 38080). FIG. 18, *A. aurelia*: freehand section through an apothecium (CU-P 37960). FIG. 19, *A. fitzpatrickii*: freehand section through an apothecium (type, CU-P). FIG. 20, *A. fitzpatrickii*: fruitbody mounted whole, from below (type, CU-P). Figures 15-19 reproduced at  $\times 130$ , figure 20 at  $\times 61$ .

*Tapesia corni* Fckl., Symbol. myc. 302. [1870] (not *T. corni* Vel., Novit. myc. 179. 1939, a later homonym).

*Lachnella corni* (Fckl.) Quél., Enchir. fung. 316. 1886.

*Eriopezia corni* (Fckl.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

NOTES: A good *Tapesia*.

9. ERIOPEZIA CUPULARUM Vel.

An *Arachnopeziza*? See there under Species Imperfectly Known.

10. ERIOPEZIA ERIOBASIS (Berk.) Sacc. et Sacc. = *Arachnopeziza eriobasis*.

11. ERIOPEZIA ERRATICA (Fr.) Sacc. et Sacc. = ? *E. caesia*.

12. ERIOPEZIA FUSCO-UMBRINA (Fckl.) Sacc. et Sacc.

*Peziza varicolor c. extus fusco-umbrina* Fr., Syst. myc. 2: 100. [1822].

*Tapesia varicolor* (Fr.) Fckl. *c. fusco-umbrina* [Fr.] Fckl., Symbol. myc. 302. [1870].

*Tapesia varicolor* ("varicolor") (Fr.) Fckl. var. *fusco-umbrina* (Fckl.) Sacc., *Michelia* 1: 65. 1877.

*Tapesia fusco-umbrina* (Fckl.) Sacc., Syll. fung. 8: 382. 1889.

*Dasyscypha fusco-umbrina* (Fckl.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 843. 1893.

*Eriopezia fusco-umbrina* (Fckl.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

*Trichopeziza fusco-umbrina* (Fckl.) Boud., Hist. classific. disc. Europe 131. 1907.

NOTES: This species is unknown to the writer, but judging by the descriptions none of the fungi described under this name appear to belong in this genus. It may be a *nomen dubium* or a *nomen ambiguum*.

13. ERIOPEZIA GLOBULIFERA Vel., Monogr. disc. Bohem. 1: 267. 1934.

NOTES: Velenovsky's description and drawing leave no doubt but that this species is not congeneric with *E. caesia*. Its correct position is problematical.

14. ERIOPEZIA LUTAMENTORUM (Brondeau) Sacc. et Sacc.

*Peziza lutamentorum* Brond., Act. Soc. Linn. Bordeaux 17: 296. 1851.

*Tapesia lutamentorum* (Brond.) Sacc., Syll. fung. 11: 410. 1895.

*Eriopezia lutamentorum* (Brond.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

*Ascophanus lutamentorum* (Brond.) Boud., Hist. classific. disc. Europe 76. 1907.

NOTES: Boudier's disposition of this fungus would appear correct judging by the original description and plate. It is certainly an Operculate Discomycete.

15. ERIOPEZIA ORBILIOIDES Rehm

*Eriopezia orbilioides* Rehm, in Sydow, Myc. march. n° 3479. 1891 (nomen nudum); in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 695. 1892. (!!)

*Tapesia orbilioides* (Rehm) Sacc., Syll. fung. 11: 410. 1895.

*Ascophanus orbilioides* (Rehm) Boud., Hist. classific. disc. Europe 76. 1907.

SPECIMENS EXAMINED: *Germany*: Sydow, an Weinranken, *Lichterfelde bei Berlin*, IX. 1891, Sydow Myc. march. 3479, TYPE of *Eriopezia orbilioides*, S-R, ISOTYPE NY-E, S-S.

NOTES: The fungus is unquestionably an Operculate Discomycete belonging to the genus *Ascobolus*. Rehm apparently realized his error, for the specimen in his herbarium bears, apparently in his own handwriting, a later determination as *Ascobolus crouani* Boud.

16. ERIOPEZIA PALUDOSA Vel., Monogr. disc. Bohem. 1: 266. 1934.

NOTES: Velenovsky's description and drawing leave no doubt that this species is referable to *Lachnum* (*Dasyscypha*). It is close to *L. prasinum* (Quél.) Nannf.

## 17. ERIOPEZIA PICEA Vel., Monogr. disc. Bohem. 1: 267. 1934.

NOTES: The peculiar paraphyses and completely naked apothecia (?) pictured by Velenovsky leave one to wonder how this species was ever placed in the genus. If the drawings are correct, it must certainly be excluded from the Hyaloscyphaceae.

## 18. ERIOPEZIA PILEOCROCATA (Crouan) Sacc. et Sacc.

An *Arachnopeziza*? See there under Species Imperfectly Known.

## 19. ERIOPEZIA PROLIFICA (Ellis) Sacc. et Sacc.

*Peziza prolifica* Ellis, Bull. Torrey Club 8: 73. 1881. (!!).

*Tapesia prolifica* (Ell.) Sacc., Syll. fung. 8: 332. 1889.

*Eriopezia prolifica* (Ell.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

SPECIMENS EXAMINED: *New Jersey*: (no collector, n° 3562, on the end of a stick of white oak firewood in the woodpile, *Newfield*, 13. XII. 1880, TYPE of *Peziza prolifica*, NY-E.

NOTES: A good *Tapesia*.

## 20. ERIOPEZIA PRUNICOLA (Fuckel) Sacc. et Sacc.

*Tapesia prunicola* Fckl., Symbol. myc. 302. [1870].

*Tapesia rosae* (Pers. ex Fr.) Fckl. var. *prunicola* (Fckl.) Phil., Manual brit. disc. 279. 1887.

*Tapesia fusca* (Pers. ex Fr.) Fckl. forma *pruni* Sydow, Myc. march. n° 1585. 1887 (nomen nudum). (!!).

*Eriopezia prunicola* (Fckl.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

NOTES: Fuckel's species is clearly a good *Tapesia* (compare also Rehm, 1891: 582).

## 21. ERIOPEZIA REHMIANA (Bomm. et Rouss. apud Rehm) Sacc. et Sacc.

*Peziza rehmana* Sacc., Bomm. et Rouss., Mém. Soc. Roy. Bot. Belgique 26: 189. 1887 (not *P. rehmana* Sacc., *Michelia* 1: 544. 1879). (!!).

*Tapesia rehmana* Bomm. et Rouss. apud Rehm, *Hedwigia* 26<sup>3</sup>: 85. 1887. [A new name, not a new combination.]

*Eriopezia rehmana* (Bomm. et Rouss.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

SPECIMENS EXAMINED: *Belgium*: Bommer et Rousseau, auf faulenden Holz von *Quercus ruber*, Boitsfort, X. 1886, Rehm, Asc. 860, ISOTYPE of *Peziza rehmana*, FH.

NOTES: A *Tapesia*. Rehm (1914) is probably right in synonymizing this species with *T. torulae* Fuckel.

## 22. ERIOPEZIA SMARAGDINA Kirschst., Ann. myc. 36: 379. 1938.

NOTES: This species is unknown to the writer, but judging by the description it cannot be congeneric with *E. caesia*; perhaps it belongs in the Mollisioideae. Apparently Kirschstein's type specimen was at Berlin, and may be destroyed.

23. ERIOPEZIA VANDAE Vel. =? *Arachnopeziza eriobasis*.24. TAPESIA (ERIOPEZIA) ALBO-OLIVACEA (Gill.) Sacc. =? *E. caesia*.

## 25. TAPESIA (ERIOPEZIA) ARACHNOIDEA (Schw.) Sacc.

See Appendix: Nomina dubia.

## 26. TAPESIA (ERIOPEZIA) DISCINCOLA (Schw.) Sacc.

See Appendix: Nomina dubia.

## 27. TAPESIA (ERIOPEZIA) SCUTELLIFORMIS (Wallr.) Sacc.

*Peziza scutelliformis* Wallr., Fl. crypt. germ. 2: 484. 1833.  
*Tapesia scutelliformis* (Wallr.) Sacc., Syll. fung. 8: 385. 1889.

NOTES: This is apparently a lost species; the description suggests a *Tapesia*.

28. TAPESIA (ERIOPEZIA) STIPATA (Fr.) Sacc., Syll. fung. 8: 385. 1889.

NOTES: This is a basidiomycete: *Solenia stipata* (Fr., Syst. myc. 2: 106. [1822], not Pers., Myc. eur. 1: 270. 1822, both as *Peziza*) Fr., Hymen. eur. 597. 1874. See Bresadola (1903).

29. TAPESIA (ERIOPEZIA) VINACEA (Rabenh.) Sacc.

*Peziza vinacea* Rabenh., Fungi eur. n° 2314. 1877; Hedwigia 17: 31. 1878 (not *P. vinacea* Clem., Bot. Survey Nebr. 4: 9. 1896, a later homonym). (!!)  
*Tapesia vinacea* (Rabenh.) Sacc., Syll. fung. 8: 383. 1889.  
*Humaria vinacea* (Rabenh.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 1242. 1896.  
*Cheilymenia vinacea* (Rabenh.) Boud., Hist. classific. disc. Europe 63. 1907.

SPECIMENS EXAMINED: *Italy*: Cesati, in vinaceis dejectis et putrescentibus, in horto botanico Neapolitano, (no date), Rabenhorst Fungi eur. 2314, ISOTYPE of *Peziza vinacea*, CU-P.

NOTES: An Operculate Discomycete of the "Lachnea" generic complex.

#### TAPESINA Lambotte emend. Höhnel

*Tapesina* Lamb., Mém. Soc. Roy. Sc. Liège, sér. 2, 14<sup>7</sup>: 305. 1888 (in part).  
*Tapesina* Lamb. emend. Höhn., Sitz.-ber. Akad. Wiss. Wien, Math.-nat. Kl., Abt. I, 132: 110. 1923.

LECTOTYPE: *Peziza ruborum* Cooke et Phillips, selected by von Höhnel (1923).

NAME: From Latin, *Tapesia* (a genus of the Mollisioideae) + *-ina* = like: *Tapesia*-like.

*Subiculum* brownish, poorly developed. *Apothecia* medium large, sessile, light brown; ectal excipulum of several layers of light brown textura prismatica to textura angularis. *Hairs* undulate or loosely or tightly coiled, approximately cylindrical, brownish. *Asci* 8-spored, large, cylindric-clavate, arising from croziers, apical pore blueing in iodine. *Ascospores* hyaline, subfusoid, rather large, 3-septate. *Paraphyses* hyaline, rarely branched, broad, septate. *Saprophytic*. Presumably monotypic.

#### ACCEPTED SPECIES

1. TAPESINA GRISEO-VITELLINA (Fuckel) Höhnel

*Peziza griseo-vitellina* Fckl., Fungi rhen. n° 1873. 1866. (!!)  
*Velutaria griseo-vitellina* (Fckl.) Fckl., Symbol. myc. 300. [1870].  
*Peziza ruborum* Cke. et Phil., Grevillea 9: 105. 1881. (!!)  
*Tapesina ruborum* (Cke. et Phil.) Lamb., Mém. Soc. Roy. Sc. Liège, sér. 2, 14<sup>7</sup>: 305. 1888.  
*Belonidium ruborum* (Cke. et Phil.) Sacc., Syll. fung. 8: 501. 1889.  
*Belonidium griseo-vitellinum* (Fckl.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 562. 1891.  
*Arachnopeziza ruborum* (Cke. et Phil.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 701. 1892; emend. Kill., Krypt. Forsch. Bayerisch. Bot. Ges. 2<sup>3</sup>: 285. 1935.  
*Trichobelonium griseo-vitellinum* (Fckl.) Rehm, Ber. Bayerisch. Bot. Ges. 14: 106. 1914.  
*Tapesina griseo-vitellina* (Fckl.) Höhn., Ber. Deutsch. Bot. Ges. 37: 108. 1919.  
*Tapesia griseo-vitellina* (Fckl.) Höhn. ex Petrak, Just's Bot. Jahresb. 47<sup>1</sup>: 343. 1919 (*lapsus calami*).

FIG. 2.

*Subiculum* brownish, scanty; hyphae 2–3.4 $\mu$  wide, rather thin-walled, smooth; septa frequent. *Apothecia* gregarious or scattered, sessile, 0.5–1.5 mm. in diameter, drying patellate; *receptacle* tan, bearing hairs over the surface; *margin* acute to obtuse, usually inrolled on drying; *disc* pallid to yellowish, drying convex to plane. *In section: hymenium* ca. 120 $\mu$  thick; *hypotheceum* 25–35 $\mu$  thick, of contorted hyphae 3.4–4.1 $\mu$  wide, thin-walled, hyaline, not sharply differentiated; *medullary excipulum* of textura intricata, 15–30 $\mu$  thick, hyphae 1.4–2 $\mu$  wide, fairly thick-walled, hyaline; *ectal excipulum* –100 $\mu$  thick, the outer 20–35 $\mu$  with brownish, fairly thin walls, inner portion with hyaline, gelatinized, thick walls, of textura prismatica toward the margin, hyphae 2–4.1 $\mu$  wide, below of textura angularis to textura epidermoidea, with cells –6.8 $\mu$  in diameter; giving rise to hairs. *Hairs* hyaline to brownish, usually hyaline at the apex, loosely undulate to tightly coiled, approximately cylindrical, ca. 2 $\mu$  wide, 35–90 $\mu$  long, thin- to thick-walled, often roughened with external particles; septa frequent to rare. *Asci* 8-spored, arising from croziers, cylindrical-clavate; apex flattened and rather thick-walled, with the apical pore intensely blue in iodine; 105–125 x 11.5–13.6(15.7) $\mu$ . *Ascospores* hyaline, subfusoid, obliquely uniseriate to irregularly biseriate, 3-septate at maturity, often constricted at the septa, 13.6–24.6 x 3.4–6.8 (7.5) $\mu$ . *Paraphyses* hyaline, simple, filiform, not enlarged at the apex, about as long as the asci, ca. 2.7 $\mu$  wide, septate.

**CULTURAL CHARACTERS:** Unknown. Accompanying the subicular hyphae is the hyphomycete *Chalara rubi* Sacc. et Briard, which is assumed to be the imperfect state by von Höhnelt, Dennis, etc.

**HABITAT:** On canes of *Rubus idaeus*.

**NAME:** From Latin, *griseus* = gray + *vitellinus* = yolky; grayish-yellow.

**TYPE LOCALITY:** Dornbachs-Graben, Oestrich, Germany.

**TYPE SPECIMEN:** Institute de Botanique Systématique, Genève.

**ILLUSTRATIONS:** Cooke, *Grevillea* 3: pl. 39, f. 143. 1875; Dennis, *Commonw. Myc. Inst. Myc. Papers* 32: f. 98. 1949.

**EXSICCATI:** Fuckel, *Fungi rhen.* 1873 (*Peziza*).

**SPECIMENS EXAMINED:** *France:* Libert, n° 936 bis, sur *Rubus* (no locality, no date), *TYPE* of *Peziza ruborum* Cke. et Phil., BM.

*Germany:* Fuckel, ad *Rubi fruticosi sarmentos putridos, Dornbachs-Graben ca. Oestrich*, (no date), Fuckel *Fungi rhen.* 1873, *TYPE* of *Peziza griseo-vitellina*, G, *ISOTYPE*, FH.

**NOTES:** This is an exceedingly rare discomycete, and appears to be restricted to *Rubus*. It is known to the writer only from dried specimens. His investigation of the species confirms the work of Dennis (1949), who was the first to assign the genus to the Arachnopezizeae. It appears sufficiently isolated to deserve a separate genus.

#### EXCLUDED SPECIES AND SYNONYMS

##### 1. TAPESINA RETINCOLA (Rabenh.) Lambotte

*Peziza kneiffii* Wallr., *Fl. crypt. germ.* 2: 483. 1833.

*Peziza retincola* Rabenh., *Fungi eur.* n° 225. 1860.

*Mollisia retincola* (Rabenh.) Karst., *Bidr. Kännedom Finl. Nat. och Folk* 19: 209. 1871.

*Tapesia kneiffii* (Wallr.) J. Kunze, *Fungi sel. exs.* n° 293. 1880.

*Tapesia retincola* (Rabenh.) Karst., *Acta Soc. Fauna Fl. Fenn.* 2<sup>o</sup>: 137. 1885.

*Tapesina retincola* (Rabenh.) Lamb., *Mém. Soc. Roy. Sc. Liège, sér. 2*, 14: 305. 1888.

*Belonium retincolum* (Rabenh.) Sacc., *Syll. fung.* 8: 495. 1889.

*Helotium retincolum* (Rabenh.) Rabenh. in Kalchbr. ex Sacc. pro synonym., Syll. fung. 8: 495. 1889.

*Trichobelonium retincolum* (Rabenh.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 592. 1891.

*Belonidium rhenopalaticum* Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 565. 1891.

*Trichobelonium kneiffii* (Wallr.) Schröt., in Cohn, Krypt.-Fl. Schlesien 3<sup>2</sup>: 103. 1893.

*Belonium rhenopalaticum* (Rehm) Boud., Hist. classific. disc. Europe 117. 1907.

*Trichobelonium distinguendum* Sydow, Ann. myc. 6: 479. 1908.

*Belonidium rhenopalaticum* Rehm forma *distinguendum* (Sydow) Rehm, Ber. Bayerisch. Bot. Ges. 14: 106. 1914.

SPECIMENS EXAMINED: Germany: Kunze, ad basin culmorum *Phragmites communis*, "Aue" prope Islebiam, (no date), Kunze F. sel. exs. 293, BPI.

Hungary: Kalchbrenner, ad *Phragmites communis* culmorum emortuorum, prope Petrocz, V. 1860, Rabenhorst Fungi eur. 225, ISOTYPE of *Peziza retincola*, BPI.

Sweden: Romell, n° 16969, on floating last year's culms of *Phragmites communis*, Upland: Stockholm, the shore of Uggewiken Cove, 21. VI. 1896, Lund. et Nannf. F. exs. Suecici 968, BPI.

NOTES: As pointed out by von Höhnelt (1923, 1923) and by Nannfeldt (1932), this is a true *Tapesia*.

## 2. TAPESINA RUBORUM (Cke. et Phil.) Lamb. = *T. griseo-vitellina*.

### ARACHNOPEZIZA Fuckel emend.

*Arachnopeziza* Fuckel, Symbol. myc. 303. [1870] (in part).

*Polynema* Lévl. emend. Fuckel, Symbol. myc. Nachtr. I, 49. 1871-2 (not *Polynema* Lévl. sensu stricto).

*Belonidium* Mont. et Dur. subgen. *Arachnopeziza* (Fuckel) Sacc., Bot. Centralbl. 18: 219. 1884.

*Arachnoscypha* Boudier, Bull. Soc. Myc. France 1: 118. 1885.

*Arachnopezizella* Kirschst., Ann. myc. 36: 397. 1938.

LECTOTYPE: *Arachnopeziza aurata* Fuckel, selected by Saccardo (1884).

NAME: From Greek, *arachne*=spider web + *pezis*=a stalkless fungus: spider web cup.

*Subiculum* whitish or some shade of orange to buff, copious to scanty. *Apothecia* minute to medium large, cupulate to patellate, sessile, white to some shade of orange or buff; ectal excipulum hyaline, of one to several layers of thick-walled textura prismatica at the margin, becoming thick-walled textura angularis below in well developed specimens. *Hairs* of various types, hyaline to orange. *Asci* 8-spored, small to fairly large, clavate to cylindrical, arising from croziers, with the apical pore blueing in iodine. *Ascospores* hyaline, ellipsoid to fusoid to filiform, 1- to 7-septate, usually tapering below. *Paraphyses* hyaline, simple or branched, filiform, usually septate, the apex deformed in some species. *Saprophytic*.

### KEY TO THE ACCEPTED SPECIES OF ARACHNOPEZIZA

NOTE: In some species, the septation of the spores cannot be made out in water mounts, and should be interpreted by use of the KOH-phloxine-glycerine technique outlined above. Eosin or erythrosin can substitute for phloxine. Iodine solutions are distinctly inferior.

I. Spores 7-septate at maturity.<sup>8</sup>

A. Spores 1.4-2.7 $\mu$  wide, in one parallel bundle.....1. *A. aurata*

B. Spores 3.4-4.8 $\mu$  wide, in two bundles, one above the other. . . . .8. *A. araneosa*

<sup>8</sup>If spores more than 7-septate, in a parallel bundle; hairs of two kinds, straight and coiled; subiculum absent or rarely a false subiculum present: see *Dasyscyphella miniopsis* (Ellis) Kanouse.



- II. Spores 1- to 5-septate at maturity.
- C. Hairs cemented into narrow teeth ca. 200 $\mu$  in length, apothecia less than 1 mm. in diameter.....11. *A. fitzpatrickii*
- D. Hairs not cemented into teeth, or into short, blunt ones.
1. Spores 3-5-septate at maturity.
- a. Spores 24-40 (48) x 2-2.7 (3.4) $\mu$ , 3-5-septate, in a parallel bundle or multiseriate.....2. *A. delicatula*
- b. Spores less than 30 $\mu$  long, not in a parallel bundle.
- (1) Apothecia fairly large, -2 mm. or more in diameter.
- (a) Hairs long (100-500 $\mu$ ), tapering to an apex 1.5-3 $\mu$  broad, usually yellowish; spores 3-septate.....5. *A. aurelia*
- (b) Hairs short (-40 $\mu$ ), apex enlarged to 6 $\mu$  broad, hyaline; spores 1-3-septate.....7. *A. major*
- (2) Apothecia smaller, -1 mm. in diameter.
- (c) Spores 9-14(18) x 2-2.7 $\mu$ , irregularly 1-, 2-, and 3-septate.....4. *A. cornuta*
- (d) Spores 16-30 x 2.7-3.4 $\mu$ , 3-(4-) septate.....3. *A. obtusipila*
2. Spores 1-septate at maturity.<sup>9</sup>
- c. Spores mostly less than 10 $\mu$  long, hairs delicate.
- (3) Apothecia urceolate to turbinate; on chestnut (*Castanea*) involucre.....9. *A. aranea*
- (4) Apothecia patellate, on wood, hickory (*Carya*) nuts, etc. ....10. *A. eriobasis*
- d. Spores mostly more than 10 $\mu$  long, hairs robust.
- (5) Hairs faintly roughened their whole length. ....12. *A. trabinelloides*
- (6) Hairs smooth, or roughened only at the apex.
- (e) Apothecia less than 1 mm. in diameter.....4. *A. cornuta*
- (f) Apothecia usually 1-2 mm. in diameter.
- x. Hairs -40 $\mu$  long, with few septa, hyaline...7. *A. major*
- y. Hairs 50-150(250) $\mu$  long, multiseptate, usually yellowish. ....6. *A. candido-fulva*

ACCEPTED SPECIES

I. TYPICAE

Apothecia small, hyaline to orange; ectal excipulum usually thin; spores (1)3-7-septate.

1. ARACHNOPEZIZA AURATA Fockel

*Arachnopeziza aurata* Fockl., Symbol. myc. 304. [1870]. (!!)

*Peziza rhabdosperma* Berk. et Br., Ann. Mag. Nat. Hist., ser. 4, 17: 143. 1876. (!!)

*Belonidium auratum* (Fockl.) Sacc., Michelia 1: 66. 1877.

*Peziza phlegmacea* Ellis, Bull. Torrey Club 9: 19. 1882. (!!)

*Tapesia rhabdosperma* (Berk. et Br.) Phil., Manual brit. disc. 280. 1887.

*Tapesia phlegmacea* (Ell.) Ell. ex Sacc. pro synon., Syll. fung. 8: 500. 1889.

*Belonidium phlegmaceum* (Ell.) Sacc., Syll. fung. 8: 500. 1889.

*Belonidium rhabdospermum* (Berk. et Br.) Sacc., Syll. fung. 11: 417. 1895.

*Tapesia aurata* (Fockl.) Masee, Brit. fungus-fl. 4: 299. 1895.

*Trichobelonium virginicum* Rick apud Rehm et Rick, Brotéria 5: 224. 1906. (!!)

*Belonium rhabdospermum* (Berk. et Br.) Boud., Hist. classif. disc. Europe 118. 1907.

*Arachnopeziza filamentosa* Torrend, Brotéria, ser. bot., 11: 102. 1913. (!!)

*Arachnopeziza nivea* Lorton, Bull. Soc. Myc. France 30: 224. 1914. (!)

*Gorgoniceps aurata* (Fockl.) Höhn., Sitz-ber. Akad. Wiss. Wien, Math.-nat. Kl., Abt. I, 132: 116. 1923.

*Tapesia nivea* (Lort.) Sacc., Syll. fung. 24<sup>2</sup>: 1199. 1928.

*Arachnopeziza arctostaphyli* Cash, Mycologia 28: 247. 1936. (!!)

*Arachnopezizella aurata* (Fockl.) Kirschst., Ann. myc. 36: 397. 1938.

*Arachnopeziza aurata* Fockl. var. *alba* Grelet, mss. (Fasc. 22 of Disc. France d'après classif. Boudier, to be published in Rev. de Mycol.) (!!)

FIGS. 3, 17.

<sup>9</sup>If spores about 21 x 6.8 $\mu$ ; hymenium cinereous: see *Belonidium melaneres* (Berk. et Br.) Sacc., treated under Species Imperfectly Known.

*Subiculum* white to somewhat orange, scanty to copious; hyphae 2–5.5 $\mu$  wide, fairly thick-walled, frequently septate, smooth, or with external roughenings. *Apothecia* gregarious or occasionally separate, sessile, 0.2–1 mm. in diameter, drying cupulate to urceolate to turbinate; *receptacle* white to yellow or even orange, hairs borne over the surface; *margin* obtuse to acute, elevated or not on drying; *disc* white to dilute yellow-orange, convex when fresh, concave or plane on drying. *In section: hymenium* ca. 110 $\mu$  thick; *hypotheecium* not differentiated; *medullary excipulum* none, or forming a layer –110 $\mu$  thick, of thin- to fairly thick-walled *textura intricata*, the hyphae 1.4–2 $\mu$  wide, hyaline; *ectal excipulum* of one to several layers of *textura prismatica*, hyphae 2–4.1 $\mu$  wide, or in well developed specimens forming *textura angularis* with cells –16 $\mu$  in diameter, the tissue –50 $\mu$  thick, the walls always thick and gelatinized; hyaline or a bit yellowish, giving rise to hairs. *Hairs* variable, walls and contents hyaline to decidedly yellow-orange, 60–125 $\mu$  long, the apex usually slightly enlarged, sometimes strikingly so, the base usually swollen to 6.8–8.2 $\mu$  wide, thin- to thick-walled, multi-septate, smooth or with external roughenings. *Asci* 8-spored, arising from croziers, clavate; apex usually abruptly narrowed, truncate and rather thick-walled, with the pore blueing in iodine; 78–115 x 8.2–9.6 $\mu$ . *Ascospores* hyaline, filiform, attenuate below, in a parallel bundle, 7-septate at maturity, (43)48–73(80) x 1.4–2.7(3.4) $\mu$ . *Paraphyses* hyaline, simple or branched, filiform, not enlarged at the apex, about as long as the asci, ca. 1 $\mu$  wide; septa frequent.

**CULTURAL CHARACTERS:** Very slow growth on agar, forming humped-up colonies. No conidia produced, though occasional, intercalary, chlamydospore-like bodies –8.9 $\mu$  in diameter may be formed in old cultures. Brownish-red pigments may be formed.

**HABITAT:** Almost any decaying plant material, but particularly on rotted wood of *Quercus*.

**NAME:** From Latin, *auratus* = gilded.

**TYPE LOCALITY:** Oestrich, Germany.

**TYPE SPECIMEN:** Institute de Botanique Systématique, Genève.

**ILLUSTRATIONS:** Berkeley et Broome, *Ann. Mag. Nat. Hist.*, ser. 4, 17: pl. 10. f. 6. 1876; Cash, *Mycologia* 28: 250., f. 1. 1936; Cooke, *Grevillea* 4: pl. 51, f. 252. 1875; Dennis, *Commonw. Myc. Inst. Myc. Papers* 32: f. 97. 1949; Kanouse, *Pap. Mich. Acad.* 20: pl. 15. 1935; Lorton, *Bull. Soc. Myc. France* 30: pl. 12, f. 3. 1914; Saccardo, *F. ital. f.* 1283. 1883.

**EXSICCATI:** Fuckel, *Fungi rhen.* 2480; Phillips, *Elv. Brit.* 170 (*Peziza rhabdosperma*); Torrend, *F. sel. exs.* 177 (*Arachnopeziza filamentosa*).

**SPECIMENS EXAMINED:** *California:* Parks, n° 5329, on *Arctostaphylos tracyi*, Spruce Cove, Trinidad, 16. II. 1935, TYPE of *Arachnopeziza arctostaphyli*, BPI.

*Connecticut:* F. Korf et R. P. Korf, on rotted wood, *Bogus Hill, Candlewood Lake*, 19. VI. 1947, RPK 1091; F. Korf, on rotten wood, *Bogus Hill, Candlewood Lake*, 28. V. 1948, RPK 1538.

*Massachusetts:* Piquet, on bark, *Sharon*, 10. X. 1918, CU-D 10981.

*Michigan:* Hayes, on rotted wood, *Hillsdale Co.*, 22. V. 1922, MICH 2855; Cummins, n° 6, on very wet wood of *Acer, Chelsea*, 10. V. 1929, NY; A. H. Smith, n° 33–31, on oak, *Pinckney, George Reserve*, 13. V. 1933, MICH; A. H. Smith, n° 33–115, *George Reserve, Pinckney*, 17. V. 1933, MICH; A. H. Smith, on *Sphagnum, Mud Lake Bog, Whitmore Lake*, 26. V. 1936, MICH, CU-P 38080; A. H. Smith, on *Typha, Mud Lake Bog*, 27. V. 1936, MICH.

*New Jersey:* Ellis, n° 1007, on old blackened rotting *Magnolia* on the ground in the swamp, *Newfield*, 15. IX. 1881, TYPE of *Peziza phlegmacea*, NY-E, ISOTYPE CU-D 8600; Anderson, on rotten oak stump, *Newfield*, 21. IV. 1890, NY-E, NY-C; Ellis, on decaying limbs of *Andromeda*?, *Newfield*, 4. VI. 1893, NY-E, CU-D 8599.

*New York:* Atkinson, on rotten wood, *Six Mile Creek, Ithaca*, 26. V. 1894,

CU-D 688; Seaver, Whetzel, et al., on wood, *Enfield Gorge, Ithaca*, 2-7. VI. 1919, CU-P 12188, NY; Seaver, Whetzel, et al., on bark, *Labrador Lake*, 2-7. VI. 1919, CU-P 11187, NY; Korf, on old wood, *Cascadilla Creek, Ithaca*, 11. V. 1947, RPK 598; Honey et Korf, on decorticated stick on the ground, *Enfield Glen, near Ithaca*, 19. V. 1947, CU-P 36933; Rogerson, Ford et Korf, on decorticated wood, *Lloyd-Cornell Preserve, McLean*, 31. V. 1947, RPK 968; Korf, on very rotted wood, *Cascadilla Creek, Ithaca*, 5. VI. 1947, RPK 984; another collection, RPK 988; Perkins et Korf, on very rotted wood of log, and on duff, *Lloyd-Cornell Preserve, Ringwood*, 4. V. 1948, CU-P 37430; Korf, on rotted branch, *Cascadilla Creek, Ithaca*, 15. V. 1948, RPK 1542; Muenschler, Rogerson, et Korf, on wood and bark, *Bergen Swamp, Genesee Co.*, 17. V. 1948, CU-P 37517; Korf, on rotted wood, *Coy Glen, Ithaca*, 21. V. 1949, RPK 1603; another collection, RPK 1606; Korf, on *Poria* sp. and on bark, *Coy Glen, Ithaca*, 21. V. 1949, RPK 1604; Korf, on rotted wood, *Cascadilla Creek, Ithaca*, 30. V. 1949, RPK 1685; Korf, on rotted wood, *Six Mile Creek, Ithaca*, 31. V. 1949, RPK 1688; Korf, on rotted branch, *Woods North of Beebe Lake, Ithaca*, 7. V. 1950, RPK 2119; Burk, Trejo et Korf, on decorticated log, *Lloyd-Cornell Preserve, Ringwood*, 20. V. 1950, RPK 2128.

*North Carolina*: Durand, on ament of *Castanea*, *Blue Ridge Mountains*, 7. IX. 1901, CU-A 12394.

*Ohio*: Morgan, *Preston*, (no date), CU-D 2123.

*England*: (no data), Phillips *Elv. Brit.* 170, NY-E, CU-D 11171; (no collector), *Leigh Down, Bristol*, TYPE of *Peziza rhabdosperma*, BM-B; Rea, *Crew's Hill Wood, Worcestershire*, 27. IX. 1927, BPI.

*France*: Patouillard, bois pourri de *Salix*, *Macornay (Jura)*, IX. 1890, S; Lorton, (sub *Arachnopeziza*, the epithet an unpublished species honoring Lorton), *Saône-et-Loire*, ex Herb. Boudier, VII. 1912, PARATYPE of *Arachnopeziza nivea*, PC; Grelet, en tronc pourri et décortiqué de hêtre, *Fôret de Chise*, V. 1914, PC; A. de Crozals, sur base de feuille pourri de *Phoenix canariensis*, *San-Salvador*, V. 1927, PC; Buisson, sur éclat de bois de pin, *Latouche, Loire-et-Cher*, V. 1933, TYPE of var. *alba*, PC; Le Gal, sur bois pourri, *Bellême*, 25. IV. 1942, PC-LG; Le Gal, *Clairefontaine, Seine-et-Oise*, V. 1947, PC-LG.

*Germany*: Fuckel, lignum putridum, *Oestrich*, (no date), TYPE of *Arachnopeziza aurata*, G; (no collector), ad *Quercus corticem putridem, in sylvis ca. Eberbach*, (no date), Fuckel *Fungi rhen.* 2480, BM-B, CU-D 3672.

*Portugal*: Torrend, (sub *Arachnopeziza*, the epithet an unpublished species honoring Torrend), ad lignum cariosum *Eucalypti*, *Lisbonne*, ex Herb. Boudier, III. 1908, PC; Torrend, ad corticem *Eucalypti*, *Lisbonne*, 1910, ISOTYPE of *Arachnopeziza filamentosa*, FH.

*Brazil*: Rick, n° 30, *Sct. Leopoldo, Rio Grande do Sul*, 9. IX. 1905, TYPE of *Trichobolium virgineum*, S.

NOTES: This is probably the commonest member of the genus in North America and in Europe, though it is not often collected because of its minute size.

The species is very variable. Collections may be pure white throughout, or yellowish to bright orange, the pigments usually localized in the hairs and subicular hyphae. Certain populations differ strikingly from one another. The typical European form has a very thin ectal excipulum, and the spores measure mostly 60-73 $\mu$  long. In New York and Connecticut, the predominant form is similar but the spores are mostly 48-60 $\mu$  long; some specimens with a highly developed excipulum have been found, the structure recalling that of *A. aurelia*, as well as occasional specimens indistinguishable from European collections. In Michigan, however, we find the European form predominant, but also long-spored specimens with a well developed excipulum (see FIG. 17), and others indistinguishable from the North-eastern form. The length, width, and apical swelling of the hairs vary so much between adjacent apothecia on the same subiculum that these characters cannot be used for species criteria.

That *A. aurata* (*sensu meo*) may be a species complex, and that it might be divisible into infraspecific categories, is freely admitted. Every attempt by the writer to delimit groups within this species has been negated by the discovery of intermediate forms. Since the substrate of many of the collections is not known, there is a possibility that some correlation between substrate specificity and morphological variants may exist. It might then be feasible to divide *A. aurata* into subspecies (or even species?). Without such data at hand, it seems most logical to maintain all the variants under the one species epithet.

## 2. ARACHNOPEZIZA DELICATULA Fuckel

*Arachnopeziza delicatula* Fckl., Symbol. myc. 304. [1870]. (!!).

*Belonidium delicatulum* (Fckl.) Sacc., Syll. fung. 8: 499. 1889.

*Erinella byssacea* Henn. et Nym. apud Henn., in Warburg, Monsunia 1: 32. [1900]. (!!).

*Arachnopeziza pineti* Feltg., Mém. Tr. Soc. Bot. Gr.-D. Luxemb. 15: 38. [1902]. (!).

*Belonidium pineti* (Feltg.) Sacc. et Syd., Syll. fung. 16: 1149. 1902.

*Gorgoniceps delicatula* (Fckl.) Höhn., Sitz.-ber. Akad. Wiss. Wien, Math.-nat. Kl., Abt. I, 132: 116. 1923.

### FIG. 4.

*Subiculum* whitish, usually scanty; hyphae 2.7–4.1 $\mu$  wide, fairly thick-walled, smooth; septa few to many. *Apothecia* gregarious to scattered, sessile, 0.2–1 mm. in diameter, patellate to turbinate, drying turbinate to urceolate; *receptacle* whitish, with hairs mostly at the margin; *margin* acute to obtuse, usually elevated on drying; *disc* white, plane to convex, plane to concave on drying. *In section: hymenium* ca. 90 $\mu$  thick; *hypothecium* not differentiated; *medullary excipulum* none, or forming a layer 70 $\mu$  thick, of *textura intricata*, hyphae 1.4 $\mu$  wide, thin-walled, hyaline; *ectal excipulum* of a few layers of thick-walled, gelatinized *textura prismatica*, or in well developed specimens of *textura angularis* to *textura epidermoidea*, and 55 $\mu$  thick, hyphae 2–4.8 $\mu$  wide, hyaline, giving rise to hairs. *Hairs* hyaline, sometimes with slightly yellowish contents, variable, fairly thin-walled, 9 $\mu$  wide at the base, tapering to the apex which may be somewhat swollen and 3.5–7.5 $\mu$  broad, 50–130 $\mu$  long, smooth, often with external particles. *Asci* 8-spored, arising from croziers, clavate; apex narrowed, with the pore blueing in iodine; 79–95 x 8.9–10.2 $\mu$ . *Ascospores* hyaline, filiform to fusoid-filiform, slightly attenuate below, in a parallel bundle or irregularly multiseriate, 3–5-septate at maturity, (24)28–40(48) x 2–2.7(3.4) $\mu$ . *Paraphyses* hyaline, simple or branched, filiform; apex not enlarged or variously misshapen; about as long as the asci, 1.4 $\mu$  wide; septa few.

**CULTURAL CHARACTERS:** Very slow growth on agar, forming humped-up colonies. No conidia produced, though intercalary, chlamydospore-like bodies 10 $\mu$  in diameter may be formed quite abundantly in old cultures. Brownish-red or grayish-purple pigments may be produced; some isolates produce a zoned effect, others give rise to saltants with differing amounts of pigment.

**HABITAT:** Decaying wood of *Quercus*, *Pinus*, etc.

**NAME:** From Latin, *delicatus*=delicate+*-ulus*, a diminutive suffix: small and fragile.

**TYPE LOCALITY:** Eichberg forest, Eberbach, Germany.

**TYPE SPECIMEN:** Institute de Botanique Systématique, Genève.

**ILLUSTRATIONS:** Rehm, in Rabenh., Krypt.-Fl. 13: 694, f. 6. 1892 (spores).

**EXSICCATI:** Ellis, N. Am. F. 842 (*Peziza raphidospora*); Fuckel, Fungi rhen. 2384.

SPECIMENS EXAMINED: *Connecticut*: F. Korf et R. P. Korf, on old bark, *Bogus Hill, Candlewood Lake*, 16. IX. 1947, RPK 919; same locality, 1. V. 1948, RPK 1546.

*Massachusetts*: Piguet, *Sharon*, X. 1922, FH.

*Michigan*: Kauffman, *Ann Arbor*, 9. VI. 1909, MICH.

*New Jersey*: (no collector), on rotten oak, *Newfield*, IV. 1890, NY-E.

*New York*: Durand, *Bergen Swamp*, 28. VII. 1900, CU-D 1477; Fitzpatrick, decaying wood of log, *Taughannock Falls*, 23. IV. 1917, CU-P 9889, 30769; Perkins et Korf, on very rotten wood, *Newfield-Nina Station Road*, 25. IV. 1948, RPK 1195; another collection, RPK 1196; Korf, on decorticated wood, *Arnot Forest, near Newfield*, 21. X. 1948, RPK 1465; Korf, on rotted wood, *Coy Glen, Ithaca*, 21. V. 1949, RPK 1607; Korf, *Upper Cascadilla Creek, Ithaca*, 22. X. 1949, RPK 2004.

*Pennsylvania*: (no collector), n° 917, *West Chester*, VI. 1879, NY-E; (no collector), chestnut rails, *W. Chester*, VI. 1879, CU-D 8952; Everhart, Haines et Wood, on decaying wood of *Castanea*, *West Chester*, VI. 1879, Ellis N. Am. F. 842, NY-U, CU-A.

*Ohio*: Morgan, n° 63, rotten wood, *Preston*, 1895, NY-M, CU-D 2729; Bachman, n° 13, on old wood, *Oxford*, 15. 1907, S.

*Canada*: Bisby et Timonin, n° 4911, on old deciduous sticks, *Winnipeg, Manitoba*, 2. VII. 1932, NY.

*Germany*: Fuckel, ad *Quercus corticem vestustum, prostratum, in sylvis ca. Eberbach*, (no date), Fuckel Fungi rhen. 2384, TYPE of *Arachnopeziza delicatula*, G, ISOTYPE BM-B, FH-H, NY, S.

*Luxemburg*: Feltgen, (no locality, no date), AUTHENTIC and probably TYPE of *Arachnopeziza pineti*, FH-H 5624 (a slide).

*Java*: Nyman, *Tjibodas*, 28. VI. 1898, ISOTYPE of *Erinella byssacea*, S.

NOTES: Most of the specimens seen have a thin ectal excipulum, but occasionally a collection with a well-developed excipulum (as in *Erinella byssacea*) has been found. There appears to be a fairly sharp break between such forms, and less conservative taxonomists might easily recognize two species. This is closely related to *A. aurata*, and differs mainly in the shorter spores with fewer septa.

### 3. ARACHNOPEZIZA OBTUSIPILA Grelet emend.

*Arachnopeziza obtusipila* Grel., L'amateur Champ. 8<sup>o</sup>: 45. 1922; descr. emend. Korf, Mycologia 43: 213. 1951. (!!).

*Arachnopeziza obtusipila* Grel. var. *minor* Grel., mss. (Fasc. 22 of Disc. France d'après classif. Boudier, to be published in Rev. de Mycol.) (!!).

FIG. 9.

*Subiculum* whitish, scanty; hyphae 2.7–4.8 $\mu$  wide, fairly thick-walled, smooth or slightly roughened; septa occasional. *Apothecia* gregarious, sessile, 225–300 $\mu$  in diameter, drying turbinate; *receptacle* white, bearing hairs over the surface, tan on drying; *margin* acute to obtuse, usually elevated on drying; *disc* white, plane to concave on drying. *In section*: *hymenium* ca. 75 $\mu$  thick; *hypothecium* not differentiated; *medullary excipulum* none, or forming a layer –25 $\mu$  thick, of thin-walled textura intricata, hyphae ca. 1.4 $\mu$  wide, hyaline; *ectal excipulum* of one to a few layers of thick-walled, gelatinized textura prismatica, hyphae 5.5–8.2 $\mu$  wide, hyaline, giving rise to hairs. *Hairs* hyaline, 4.1–4.8 $\mu$  wide below, tapering gradually to an apex 3.4–4.1 $\mu$  wide, the apex occasionally slightly swollen; medium thick-walled, (40)70–100(120) $\mu$  long, at times constricted at the septa, smooth or with external particles. *Asci* 8-spored, arising from croziers, clavate; the tip rather abruptly truncate, with the pore blueing in iodine; 62–73 x 7.5–10.2 $\mu$ . *Ascospores* hyaline, subfusoid, attenuate below, irregularly biseriata, 3(4)-septate at maturity, 16.4–26(30) x 2.7–3.4 $\mu$ .

*Paraphyses* hyaline, simple or branched, filiform, apex often variously misshapen, about as long as the asci, ca.  $1.4\mu$  wide; septa few.

CULTURAL CHARACTERS: Unknown.

HABITAT: Rotted wood of *Pinus*, *Quercus*.

NAME: From Latin, *obtusus* = blunt + *pilus* = hair: with blunt hairs.

TYPE LOCALITY: Savigné, France.

TYPE SPECIMEN: Muséum National d'Histoire Naturelle, Paris.

ILLUSTRATIONS: Grelet, *L'amateur champ.* 8<sup>o</sup>: 47. f. 2. 1922.

EXSICCATI: None.

SPECIMENS EXAMINED: *France*: Grelet, sur branches de Pin tombées et décortiquées, *Coteau boisé du logis de Montazais*, 9. I. 1921, TYPE of *Arachnopeziza obtusipila*, PC; A. de Crozals, sur bois pourri de chêne-vert, *Marvino, Var.*, 1. III. 1925, TYPE of var. *minor*, PC; A. de Crozals, sur bois pourri de Pin d'Alep, *Environs de Toulon, Var.*, XII. 1925, PC; A. de Crozals, sur bois pourri de Pin d'Alep, *Durvennes près Toulon, Var.*, XII. 1927, PC.

NOTES: The necessity of emending Grelet's description has already been discussed at length (Korf 1951). The species is obviously closely related to *A. cornuta*, but differs particularly in the spores and paraphyses. See also *A. zonulata* under Species Imperfectly Known.

#### 4. *Arachnopeziza cornuta* (Ellis) Korf, comb. nov.

*Peziza cornuta* Ellis, *Bull. Torrey Club* 9: 73. 1882. (!!).

*Helotiella cornuta* (Ell.) Sacc., *Syll. fung.* 8: 474. 1889.

*Arachnopeziza tapesioides* Starb. apud Vestergren, *Sv. Bot. Tidsk.* 3: (40). 1909.

(!!).

*Cistella tapesioides* (Starb.) Nannf., *Sv. Bot. Tidsk.* 30<sup>o</sup>: 296. 1936.

FIGS. 8, 16.

*Subiculum* white to tan, rather copious; hyphae  $2.7-4.1\mu$  wide, with very thick walls, lightly roughened; septa frequent to scarce. *Apothecia* gregarious, sessile,  $150-300\mu$  in diameter, cupulate to patellate, drying urceolate to turbinate; *receptacle* pallid to fleshy-yellow, bearing hairs over the surface; *margin* obtuse, usually elevated on drying; *disc* whitish to pallid, convex to concave. *In section: hymenium* ca.  $70\mu$  thick; *hypotheecium* not differentiated; *medullary excipulum*  $-70\mu$  thick, of *textura intricata*, hyphae ca.  $1.4\mu$  wide, thin-walled, hyaline; *ectal excipulum* very thin, of one or a few layers of thick-walled, gelatinized *textura prismatica*, hyphae  $3.4-4.8\mu$  wide, hyaline, giving rise to hairs. *Hairs* few, hyaline, or with yellowish, resinous contents and excretions, stiff, (2) $4.1-6.8\mu$  wide below, tapering a bit to the apex, blunt, closely septate and often constricted at the septa,  $75-120\mu$  long, fairly thick-walled, smooth or with slight, external, apical roughenings. *Asci* 8-spored, arising from croziers, cylindrical-clavate; apex slightly flattened, with the pore blueing in iodine;  $57-68 \times 7.5-8.9\mu$ . *Ascospores* hyaline, subfusoid to subcylindric, usually attenuate below, irregularly biserial, (0)1-3-septate at maturity, (the apical spores of the ascus usually shorter, broader, and with few septa, the lower spores longer, narrower, and often with more septa),  $8.9-14.3(17.7) \times 2-2.7(3.4)\mu$ . *Paraphyses* hyaline, simple or branched, filiform, not enlarged at the apex, about as long as the asci,  $-1\mu$  wide; septa few.

CULTURAL CHARACTERS: Unknown.

HABITAT: Rotted, decorticated wood.

NAME: From Latin, *cornutus* = provided with horns.

TYPE LOCALITY: West Chester, Pennsylvania.

TYPE SPECIMEN: New York Botanical Garden.

ILLUSTRATIONS: None.

- EXSICCATI: Vestergren, Micr. rar. sel. 1082 (*Arachnopeziza tapesioides*).  
 SPECIMENS EXAMINED: *Maine*: Riddle, n° 14, on decorticated logs, *Rangley*, VIII. 1904, CU-D 5273-a.  
*New York*: Durand, rotten wood, *Enfield*, *Cayuga Lake Basin*, 13. X. 1900, CU-D 9566.  
*Pennsylvania*: (no collector), n° 794-a, on old chestnut rails, *West Chester*, 5. VI. 1879, TYPE of *Peziza cornuta*, NY, ISOTYPE CU-D 8578, CU-P 38083.  
*Sweden*: Starbäck, in ligno mucido quercino, *Östergötland*, *Wårdnäs*, IV. 1905, Vestergr. Micr. rar. sel. 1082, ISOTYPE of *Arachnopeziza tapesioides*, BM, FH; Lundell et Nannfeldt, n° 2088, ad lignum, *Uppland*: *Bondkyrka s:n*, *Gottsunda-bergen*, 16. V. 1929, UPS.

NOTES: This is not a common species, but easily recognizable. Nannfeldt (1936), in transferring the species to *Cistella*, writes: "STARBÄCK compared it very aptly with *Pezizella xylita*, and these two species are evidently congeneric, belonging to the genus *Cistella* Quél., emend. Nannf. The apothecia of *Arachnopeziza tapesioides*" [*cornuta*] "have rather few but long, septate hairs with often somewhat thickened and slightly rough apices. The hairs surpass the margin 100 $\mu$  or more, and are easily seen with a simple lens. The structure of the apothecia is widely different from that of *Arachnopeziza* and the presence of a subiculum is of very slight taxonomic value." Professor Nannfeldt clarified the last sentence (*pers. comm.*): "My comparison with *Arachnopeziza* refers—as you suggest—to *A. Aurelia*, which I regard as the type species." At one time, the present writer was of the opinion that the species with a thin ectal excipulum of gelatinized textura prismatica, like *A. cornuta*, might be kept distinct from those with a well-developed excipulum, such as *A. aurelia*. However, both *A. aurata* and *A. delicatula*, which normally have the same structure as *A. cornuta*, may at times develop a heavy excipulum very like that in *A. aurelia*. A thin ectal excipulum is thus apparently but a stage in the evolution of a more highly developed one. In any case, the structure of *A. cornuta* is the same as that of the typical forms of *A. aurata*, which this writer considers to be the type of the genus. Professor Nannfeldt has kindly communicated a specimen of *Cistella xylita* (Karst.) Nannf., which the writer has examined. It is a true *Cistella*, with the very short, granularly roughened hairs characteristic of the species of that genus. The ectal excipulum is of thin-walled textura prismatica, and the spores are, as is typical of the tribe Hyaloscyphaeae, non-septate. Under the circumstances, it does not seem possible to maintain these two species within the same genus.

Dennis (1949) discusses a fungus under the name of *Cistella tapesioides*, the collection having been determined by Nannfeldt. A portion of the collection, at the Farlow Herbarium, has been examined, and indicates that Dennis's description and drawings are correct, but that the fungus has nothing to do with *C. tapesioides*. It has, as his drawings show, non-septate spores with two guttules (this writer measures the spores a bit smaller than does Dennis), and delicate, tapering, thin-walled hairs. Professor Nannfeldt has written regarding this specimen (*pers. comm.*): "As to Dennis's treatment of *Cistella tapesioides* I feel sure that it is I who made the mistake. I cannot remember when I named the specimen for him but perhaps it was during a visit to Kew and then it would be easy to explain that I was hasty in my naming." The present writer's investigation leads him to

believe that the Dennis species belongs in the genus *Hyaloscypha* Boud. emend. Nannf., and perhaps near *H. leuconica* (Cooke) Nannf. The writer has not been able to trace any connection between the "subiculum" and the apothecia in the Dennis specimen, and has concluded that the "subiculum" may belong to another fungus.

Ellis described the species as having spores with a bristle-like appendage at each end. No such condition has been seen in any of the material examined. See the note under *A. aurelia* in regard to the similar condition in that species.

## II. AURELIAE

Apothecia large, with orange pigments in the hairs or hymenium; ectal excipulum usually well-developed; spores 1-7-septate.

### 5. ARACHNOPEZIZA AURELIA (Pers. ex Fr.) Fuckel

*Peziza aurelia* Pers., Myc. eur. 1: 270. 1822. (!).

*Peziza aurelia* Pers. ex Fr., Syst. myc. 2: 107. [1822].

*Peziza wauchii* Grev., Scot. crypt. fl. 3: pl. 139 et descr. 1825.

*Belonidium aurelia* (Pers. ex Fr.) Not., Comm. Soc. Crittogam. Ital. 1<sup>5</sup>: 381. 1864.

*Patellaria bicolor* Curr., Trans. Linn. Soc. London 24: 494. 1864. (!!).

*Arachnopeziza aurelia* (Pers. ex Fr.) Fckl., Symbol. myc. 303. [1870].

*Polynema aurelium* (Pers. ex Fr.) Fckl., Symbol. myc. Nachtr. I, 49. 1871-2.

*Lachnella aurelia* (Pers. ex Fr.) Quéf., Enchir. fung. 315. 1886.

*Tapesia aurelia* (Pers. ex Fr.) Phil., Manual brit. disc. 280. 1887.

*Tapesia fulgens* Hazsl., Verh. zool.-bot. Ges. Wien 37: 163. 1887. (!!).

*Belonidium fulgens* (Hazsl.) Sacc., Syll. fung. 8: 500. 1889.

*Arachnopeziza fulgens* (Hazsl.) Boud., Hist. classific. disc. Europe 126. 1907.

*Arachnoscypha aurelia* (Pers. ex Fr.) Boud., Hist. classific. disc. Europe 28. 1907 (*lapsus calami*).

FIGS. 7, 18.

*Subiculum* white to orange, scanty to copious; hyphae 2-3.4 $\mu$  wide, thick-walled, smooth; septa fairly frequent. *Apothecia* gregarious or scattered, sessile, 0.5-3(5) mm. in diameter, cupulate to patellate, drying usually cupulate; *receptacle* whitish, appearing bright orange from the hairs which are borne over the surface; *margin* obtuse to acute, elevated and usually inrolled on drying; *disc* white to dilute yellow, concave to plane. *In section: hymenium* 75-100 $\mu$  thick; *hypotheecium* not differentiated clearly, ca. 20 $\mu$  thick, hyphae contorted, fairly thick-walled, 2-3 $\mu$  wide, hyaline; *medullary excipulum* none to a layer -250 $\mu$  thick, of *textura intricata*, the hyphae ca. 5 $\mu$  wide, thin- to thick-walled, hyaline; *ectal excipulum* not clearly differentiated, near the margin of *textura prismatica*, becoming *textura angularis* below, 25-40 $\mu$  thick, cells 2.7-4.8 $\mu$  wide, all with fairly thick and gelatinized walls, hyaline to yellow-orange, giving rise to hairs. *Hairs* with hyaline to orange walls and contents, often cohering to form short teeth, flexuous, 3.5-4.1 $\mu$  wide below, tapering to an apex 1.5-3 $\mu$  wide, usually pointed, fairly thick-walled below, tending to be thin-walled toward the apex, multiseptate, 100-500 $\mu$  long, smooth; KOH dissolves the orange pigment. *Asci* 8-spored, arising from croziers, clavate; apex truncate, fairly thick-walled, with the pore blueing in iodine; 65-87 x 7.5-8.9 $\mu$ . *Ascospores* hyaline, fusoid-cylindric, attenuate below and often also above, obliquely uniseriate to irregularly biseriata, 3-septate at maturity; the basal cell occasionally producing a bud-like protrusion; 12.2-16.4(18.4) x 2.7-4.1 $\mu$ . *Paraphyses* hyaline,



simple, filiform, not or only slightly enlarged at the apex, about as long as the asci, 1–2 $\mu$  wide; septa few.

CULTURAL CHARACTERS: Produces a rather slow-growing, orange pigmented, sterile mycelium on agar.

HABITAT: Rotted wood, leaves, and especially on fruits and involucre of *Quercus*, *Fagus*, etc.

NAME: From Latin, *aurelius* = golden [colored].

TYPE LOCALITY: Vosges mountains, France.

TYPE SPECIMEN: Rijksherbarium, Leiden.<sup>10</sup>

ILLUSTRATIONS: Bachman, Proc. Ohio St. Acad. 5<sup>2</sup>: pl. 3, f. 1–4. 1908; Boudier, Icones Myc. 3: pl. 520. 1909; Cooke, Grevillea 4: pl. 51, f. 255, 1875; Currey, Trans. Linn. Soc. 24: pl. 51, f. 15–16. 1864; Dennis, Commonw. Myc. Inst. Myc. Papers 32: f. 96. 1949; Gillet, Disc. pl. 70, f. 2, 1879; Greville, Scot. crypt. fl. 3: pl. 139. 1825; Lindau, in Engler, Natur. Pfl.-fam. I, 1<sup>1</sup>: 199, f. 157 B-E. 1897; Patouillard, Tab. anal. f. 285. 1884; Phillips, Brit. disc. pl. 8, f. 50. 1887; Raymond, Botaniste 26<sup>4</sup>: pl. 31. 1934; Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 694, f. 1–5. 1892; Seaver, Mycologia 30: 660. 1938; Svrček, Sborník Nár. Mus. Praha 4B<sup>6</sup>: pl. 7, f. 1–6. 1948.

EXSICCATI: Cooke, F. Brit. exs. 563 (*Peziza*); Doassans et Patouillard, Champ. fig. des. (not seen); Ellis, N. Am. F. 59 (*Peziza*); Fückel, Fungi rhen. 1191 (*Peziza*); Libert, Pl. crypt. Ard. exs. 127 (*Peziza*); Maire, Myc. bor. Afr. 273; Mougeot et Nestler, Stirpes Crypt. 783 (*Peziza*); Phillips, Eiv. Brit. 29 (*Peziza*); Roumeguère, F. sel. Gall. exs. 448 (*Peziza*); Savulescu, Herb. myc. Rom. 1332; Sydow, Myc. march. 4368; Vize, Micro-f. Brit. 365 (*Peziza*). [Ravenel, F. Carol., fasc. 5, 41, issued as *Peziza aurelia*, is *Arachnopeziza candido-fulva*.]

SPECIMENS EXAMINED: *Connecticut*: F. Korf et R. P. Korf, on bark and acorns, *Bogus Hill, Candlewood Lake*, 1. V. 1948, RPK 1543; F. Korf, on acorns, *Bogus Hill, Candlewood Lake*, 8. V. 1948, RPK 1540; another collection, 15. V. 1948, RPK 1538; another collection, 23. V. 1948, RPK 1539; F. Korf, on rotted wood and bark of black birch, *Bogus Hill, Candlewood Lake*, 28. V. 1948, RPK 1537. *Indiana*: Cummins, on nuts and other debris, *Lafayette*, 28. IV. 1930, NY. *Iowa*: Martin, n° 225, *Tiffin*, 9. IV. 1927, NY.

*Massachusetts*: Sturgis, on dry twigs, *Manchester*, 13. V. 1888, NY; Linder, on under side of wet decaying chestnut bark, *Canton*, 15. VI. 1924, NY.

*Michigan*: Langdon, on rotten wood, nuts, etc., *Ann Arbor*, 27. V. 1893, CU-D 612; Kauffman, on rotten log, *S. E. of Lima Centre, Ann Arbor*, 15. V. 1909, CU-D 6804, MICH; Kauffman, on acorns, *Ann Arbor*, 9. V. 1917, MICH; Kanouse, on very rotten wood, *Ann Arbor*, 19. V. 1923, MICH; Kauffman, on acorns, *Ann Arbor*, 10. V. 1924, MICH; Cummins, n° 174, on moist oak wood under leaves, *Third woods, Ann Arbor*, 28. X. 1928, NY; Kanouse, on wet stick in brush pile, *Woods W. of Chelsea*, 9. V. 1929, MICH; Kauffman, near *Sugar Loaf Lake*, 10. V. 1929, MICH; Steere, on rotten wood, *Silver Lake, Ann Arbor*, 18. V. 1929, NY; Kanouse, *McCloy Woods, Stockbridge*, 17. XI. 1931, MICH; A. H. Smith, *George Reserve, Pinckney*, 13. V. 1932, MICH; Kanouse et Smith, on acorns, *George Reserve, Pinckney*, 13. V. 1932, MICH; A. H. Smith, n° 33–14, on sticks, *oak woods, Cascade Glen, Ann Arbor*, 10. V. 1933, MICH; A. H. Smith, n° 33–32-a, *Ann Arbor*, 10. V. 1933, MICH; Mains, n° 33–14, on rotten log, *Ann Arbor*, 11. V. 1933, MICH; Kanouse, *George Reserve, Pinckney*, 13. V. 1933, MICH; Mains, n° 33–78, on more or less buried sticks, *Au Train*, 19. VI. 1933, MICH; A. H. Smith, *Milford*, 10. V. 1937, MICH; A. H. Smith, n° 20481, *Waterloo*, 26. VI. 1945, MICH; Korf et al., on rotted wood and leaves, *the Gorge, Cheboygan*, 15. VI. 1948, RPK 1235; Korf et al., on bark, *Lake Shore Cut-off, near Harbor Springs*, 16. VI. 1948, CU-P 37960.

*New Hampshire*: Overholts, *N. Conway*, 11. VI. 1918, NY.

*New Jersey*: (no collector), inside an old stump, *Newfield*, (no date), Ellis N. Am. F. 59, CU-D 2991; (no collector), on rotten wood, *Newfield*, (no date), CU-D 4579; Ellis, on old oak leaves, twigs, etc., on the ground, *Newfield*, 10. V. 1877, NY-E, CU-D 4578; (no collector), on oak leaves, *New Brunswick*, 17. IV. 1921, NY; Timonin, on *Rhododendron, Dover*, XI. 1936, NY.

*New York*: Underwood, n° 69, *Syracuse*, V. 1889, NY-U; Herrick, on dead leaves, *Fall Creek, Ithaca*, 20. IV. 1895, CU-D 730; Durand, on dead leaves, *Fall*

<sup>10</sup>910,261–274. leg. Mougeot. (fide Nannfeldt, pers. comm.)

*Creek, Ithaca*, V. 1902, CU-D 1433; Jackson, on leaves, etc., *Fall Creek, Ithaca*, 10. VI. 1903, CU-D 2270; Kauffman, *Ithaca*, 28. V. 1904, MICH; Seaver, Whetzel, et al., on humus, near *Ithaca*, 2-7. VI. 1919, CU-P 11182; Drayton, Fitzpatrick, et White, on old fruits of *Hamamelis virginiana* and on decaying leaves, *Malloryville Bog, Ithaca*, 7. V. 1936, CU-P 25193; Korf, on decaying floral parts in woods, under leaves, *Coy Glen, Ithaca*, 13. V. 1947, RPK 535; Korf, on *Quercus* acorn cups, leaves, etc., *Coy Glen, Ithaca*, 15. V. 1947, RPK 606; Honey et Korf, on acorns, etc., *Coy Glen, Ithaca*, 19. V. 1947, CU-P 36934; Burk, Trejo et Korf, on bark of twigs and leaves, *Lloyd-Cornell Preserve, Ringwood*, 20. V. 1950, RPK 2125; another collection, RPK 2126.

*North Carolina*: F. A. Wolf, on acorns, *Durham*, (no date), NY.

*Ohio*: Morgan, *Cincinnati*, (no date), CU-D 10013; Walters, *Cleveland*, 20. IV. 1938, NY.

*Pennsylvania*: Adams, *State College*, 14. V. 1917, NY.

*West Virginia*: Sternthal, Orton et Hill, under beech growing on different hosts, *Happy Hollow, Morgantown*, 26. IV. 1936, CU-P 25185.

*Canada*: Bisby et Buller, n° 4375, on old wood of *Betula*, *Victoria Beach, Manitoba*, 4. V. 1931, NY.

*England*: Phillips, *Ludlow*, (no date), Cooke F. Brit. exs. 563, BPI; (no collector), *Ludlow*, (no date), Phillips Elv. Brit. 29, CU-D 11030; (no collector), near *Hereford*, (no date), Vize Micro-f. Brit. 365, FH; Currey, (data undecipherable), "the orange coloured plant," Spring 1864, TYPE of *Patellaria bicolor*, K.

*France*: (no collector), ad ligna et muscos, in fagetis, (no date), Libert Pl. crypt. Ard. exs. 127, BM; (no collector), in pericarpis foliisque deciduis Fagi et *Quercus*, (no locality, no date), AUTHENTIC, probably ISOTYPE of *Peziza aurelia*, Moug. et Nestl. Stirpes Crypt. 783, CU-P, CU-D 6284; same collection, Roumequère F. sel. Gall. exs. 448, CU-P; Mougeot, *Vosges*, (no date), PC; Riel, *Lyon*, V. 1897, PC-B; Yen, *Fontainebleau*, 11. IV. 1937, PC-LG.

*Germany*: (no collector), ad lignum putridum, in sylvia, *Oestrich*, (no date), Fuckel Fungi rhen. 1191, FH; Sydow, auf *Quercus*, *Zehlendorf bei Berlin*, X. 1895, Sydow Myc. march. 4368, NY-E.

*Luxemburg*: Feltgen, (sub *Trichobelonium*, the epithet an unpublished species referring to the golden color), *Baumburch*, IV. 1903, S.

*Netherlands*: Gremmen, *Quercus* sp. glandulae, *Doorwerth, Italiaanse Weg*, 24. IV. 1948, RPK 1684.

*Portugal*: Torrend, *Lisbonne*, I. 1908, PC-B.

*Roumania*: Racovitza, sur feuilles mortes de chêne et galles provoquées par *Neurotus lenticularis* Oliv., *Mutenia, distr. Ilfov. Baneasa*, V. 1943, Savul. Herb. myc. Rom. 1332, FH.

*Sweden*: Nannfeldt, n° 2153, ad lignum, *Småland: Kärda s:n Shogsåhra*, 28. VI. 1929, UPS.

*Yugoslavia*: Hazslinsky, Magyarbon virányából (remainder of label undecipherable), TYPE of *Tapesia fulgens*, S.

*Africa*: Maire, sur le rhytidome pourrissant d'*Eucalyptus rostrata*, *A. Souma*, 4. 2. 1915, Maire Myc. bor. Afr. 273, NY.

NOTES: This species is the one member of the genus most likely to be found in the herbaria. The apothecia are particularly beautiful, and are therefore often collected by persons with no particular interest in the Discomycetes. It is not uncommon on *Quercus* involucre, and also is often found on decaying oak wood and leaves. It is in general appearance almost indistinguishable from the less common *A. candido-fulva*, but microscopically easily differentiated. Even in the young apothecia, where only a few asci have cut out their spores, 3-septate spores are to be found, while in *A. candido-fulva* the spores remain 1-septate at maturity for the most part.

This is the only species known to have been investigated cytologically. Raymond (1934) figures four bivalents at each of the three divisions giving rise to the eight ascospore nuclei. The spores are uninucleate when young: the nucleus divides once, laying down a median septum; each nucleus divides again, and two more septa are

formed, parallel to the first, dividing the spore into four approximately equal, uninucleate cells.

The spores of this species were early described as bearing bristle-like appendages at one or both ends. This writer has never seen such a condition in any of the material examined, though perhaps the bud-like protrusions may have been mistaken for appendages by various investigators, almost all of whom have drawn appendaged spores, apparently following tradition rather than their own observations.

6. *Arachnopeziza candido-fulva* (Schweinitz) Korf, comb. nov.

*Peziza candido-fulva* Schw., Trans. Amer. Phil. Soc., n.s., 4: 174. [1832]. (!!).

*Tapesia candido-fulva* (Schw.) Sacc., Syll. fung. 8: 385. 1889.

*Tapesia derelicta* Morg., Jour. myc. 8: 186. 1902. (!!).

*Eriopeziza candido-fulva* (Schw.) Rehm, in Rehm, Ascom. n° 1456. 1903; Hedwigia 42: (289). 1903 [as "(Schw.) Sacc."].

FIG 6.

*Subiculum* whitish, scanty to copious; hyphae 2–3.4 $\mu$  wide, thin- to thick-walled, with few septa, smooth. *Apothecia* gregarious or scattered, sessile, 0.5–3.5 mm. in diameter, drying convoluted or circular, patellate; *receptacle* whitish, appearing orange from the hairs borne over the surface; *margin* acute, elevated or a bit inrolled on drying; *disc* whitish, plane to concave. *In section: hymenium* ca. 70–85 $\mu$  thick; *hypotheecium* 25–50 $\mu$  thick, hyphae intertwined, with thick, gelatinous walls, 2–3.4 $\mu$  wide, hyaline; *medullary excipulum* not clearly differentiated or ~60 $\mu$  thick, of rather thick-walled *textura intricata* to *textura oblita*, hyphae 2.7–4 $\mu$  wide, hyaline; *ectal excipulum* 30–50 $\mu$  thick, of *textura prismatica* toward the margin, becoming a mixture of *textura angularis* and *textura intricata* below in well-developed specimens, hyphae fairly thick-walled, cells 3.4–8 $\mu$  in diameter, hyaline, giving rise to hairs. *Hairs* with hyaline to yellow-orange walls and contents, flexuous, sometimes cohering to form short teeth, tending to branch occasionally, either thin- or thick-walled, but thickening uniform from base to apex, 2–4.1 $\mu$  wide at the base, apex nearly as broad or occasionally a bit swollen, blunt, multiseptate, 50–150(250) $\mu$  long, smooth; KOH dissolves the orange pigment. *Asci* 8-spored, arising from croziers, clavate; apex truncate, quite thick-walled, with the pore blueing in iodine; 70–85 x 6.8–8.9 $\mu$ . *Ascospores* hyaline, subfusiform, attenuate at both ends, but more so below, obliquely uniseriate to biseriate, (0)1-septate at maturity (very rarely a 3-septate spore may be found), (8.9)10.9–17.1 (19.1) x (2)2.7–3.4(4.1) $\mu$ . *Paraphyses* hyaline, simple, filiform, not or only slightly enlarged at the apex, about as long as the asci, ca. 1 $\mu$  wide; septa frequent.

CULTURAL CHARACTERS: Unknown.

HABITAT: Bark, old fungi, etc.

NAME: From Latin, *candidus*=pure white+*fulvus*=tawny: white and tawny in color.

TYPE LOCALITY: Bethlehem, Pennsylvania.

TYPE SPECIMEN: Academy of Natural Sciences, Philadelphia.

ILLUSTRATIONS: None. Some of the doubtful illustrations of *A. aurelia* may represent this species.

EXSICCATI: Ravenel, F. Carol., fasc. 5, 41 (*Peziza aurelia*); Rehm, Asc. 1456 (*Eriopeziza*).

SPECIMENS EXAMINED: *Alabama*: Earle et Underwood, *Auburn, Lee Co.*, 28. III. 1896, NY, CU-D 8575; Peters, trunks of *Liriodendron*, (no locality, no date), Ravenel F. Car. exs., fasc. 5, 41, NY-E, CU-D 6335, 8054.

*District of Columbia*: Shear, on rotten stump, *Washington*, (no date), Rehm Asc. 1456, S, CU-D 11867.

*Iowa*: McBride, n° 12, (no locality, no date), NY-E, CU-D 8786.

*New York*: Prentiss, *Ithaca*, (no date), CU-D 5897; Dudley, rotten wood, *Six Mile Creek, Cayuga Lake Basin*, 29. X. 1879, CU-D 9572; Dudley, rotten wood, *Fall Creek, Ithaca*, 12. IV. 1880, CU-D 1133; Burnham, on pine (?) log, *Shushan, Washington Co.*, 5. IV. 1907, CU-P 27780; Korf, on bark, wood and rotted remains of some fungus, *Coy Glen, Ithaca*, 17. V. 1947, CU-P 38085.

*Ohio*: Morgan, n° 833, (no locality, no date), NY-E, CU-D 8576; Morgan, n° 837, (no locality, no date), NY-E; Morgan, on rotted wood, (no locality, no date), CU-D 4576; Morgan, *Preston*, 1889, ISOTYPE of *Tapesia derelicta*, NY-M; Bachman, old logs, in a wood near *Oxford*, 3. XI. 1907, NY.

*Pennsylvania*: Schweinitz, *Beihl.*, (no date), ISOTYPE of *Peziza candido-fulva*, NY, CU-D 3875.

*Tennessee*: Hesler, n° 10992, on oak log, *Greenbriar, Great Smoky Mountains National Park*, 11-7-1937, MICH.

*West Virginia*: Nuttall, (sub *Trichopeziza*, the epithet an unpublished species meaning white-vermilion in color), *Fayette Co.*, 16. XII. 1893, NY-E.

*Canada*: Dearness, n° 1066, on rotten beech, *London*, 19. XI. 1889, NY, CU-D 8787; Dearness, n° 1145, under very rotten log, *London, Ontario*, 26. XI. 1889, NY-E, CU-D 4577.

*Sweden*: Romell, n° 16751, *Upl. Uppsala*, 22. IV. 1885, S.

NOTES: This species is closely related to *A. aurelia*. Seaver (1938) lists it as a synonym of that species, but it is easily distinguishable under the microscope, particularly by its spores. It is primarily a wood and bark-inhabiting species, while *A. aurelia* is more common on oak involucre, decorticated wood and leaves. It is much more rare than *A. aurelia*, and will usually be found misdetermined under that name. Though known to the writer from but one European collection, it may well occur there more frequently.

### 7. *Arachnopeziza major* (Ellis et Everhart) Korf, comb. nov.

*Helotiella major* E. et E., Proc. Acad. Nat. Sci. Philad. 46: 351. [1895]. (!!)

FIG. 11.

*Subiculum* whitish to tan, scanty; hyphae 3.4-4.1 $\mu$  wide, fairly thin-walled, smooth; septa occasional. *Apothecia* gregarious or scattered, sessile, 1-2 mm. in diameter, patellate, drying cupulate; *receptacle* dirty white when fresh, bearing hairs only near the margin; *margin* acute, drying elevated to inrolled; *disc* dirty orange, concave when dry. *In section*: *hymenium* ca. 100 $\mu$  thick; *hypothecium* ca. 35 $\mu$  thick, of contorted hyphae 2-2.7 $\mu$  wide, fairly thick-walled, hyaline; *medullary excipulum* lacking; *ectal excipulum* toward the margin of fairly thick-walled *textura prismatica*, hyphae 2.7-3.4 $\mu$  wide, gelatinized, below of definite *textura angularis*, cells fairly thin-walled, 11-15 $\mu$  in diameter, forming a tissue -200 $\mu$  thick, hyaline to yellowish, giving rise to hairs near the margin; KOH dissolves the pigment. *Hairs* few, hyaline, short, -40 $\mu$  long, 3.4-4.1 $\mu$  wide below, approximately cylindrical; apical cell often swollen -6.8 $\mu$  wide; rather thin-walled, smooth or with external particles; septa few. *Asci* 8-spored, arising from croziers, clavate; apex rounded to narrowed, rather thick-walled, with the pore intensely blue in iodine; 85-100 x 7.5-8.9 $\mu$ . *Ascospores* hyaline, subfusoid, attenuate below, irregularly biseriate, 1-3-septate at maturity; a bud-like protrusion occasionally produced from either end or from both; 12.2-21.8 x 3.4-4.8 $\mu$ . *Paraphyses* hyaline or slightly yellowish, simple or branched, filiform, not enlarged at the apex or slightly misshapen, about as long as the asci, 1.4-2 $\mu$  wide; septa rare.

CULTURAL CHARACTERS: Unknown.

HABITAT: Rotted wood.

NAME: from Latin, *major* = larger.

TYPE LOCALITY: Ann Arbor, Michigan.

TYPE SPECIMEN: New York Botanical Garden.

ILLUSTRATIONS: None.

EXSICCATI: None.

SPECIMENS EXAMINED: *Michigan*: Langdon, n° 12, *Ann Arbor*, 6-5-1893, TYPE, NY-E, ISOTYPE, CU-D 617.

NOTES: Known to the writer only from the type collection. The species is sufficiently characteristic to allow its easy identification if it should be recollected.

### 8. *Arachnopeziza araneosa* (Sacc.) Korf, comb. nov.

*Peziza araneosa* Berk., in Hooker, Bot. antarctic voy., Part III, Fl. Tasman., 2: 275. 1860 (not *P. araneosa* Bull. ex Fr., Syst. myc. 2: 69. [1822].). (!!).

*Peziza arachnoidea* Berk. ex Cooke, Grevillea 11: 102. 1883 (*nomen nudum*; not *P. arachnoidea* Schw., Trans. Amer. Phil. Soc., n. s., 4: 174. [1832].).

*Belonidium araneosum* Sacc., Syll. fung. 8: 500. 1889 [a new name, even though cited as "(Berk.) Sacc."].

FIG. 5.

*Subiculum* white, scanty; hyphae ca.  $3.5\mu$  wide, fairly thin-walled, frequently septate, lightly roughened. *Apothecia* sessile, large, several mm. across, drying patellate; *receptacle* white, attached along a wide base, hairs arising near the margin; *margin* obtuse, not elevated nor inrolled when dry; *disc* light orange when dry, presumably brighter when fresh, plane. *In section*: *hymenium* ca.  $110\mu$  thick; *hypothecium* ca.  $25\mu$  thick, of closely compacted hyphae, fairly thin-walled, ca.  $2.7\mu$  wide, yellowish-brown; *medullary excipulum* not differentiated; *ectal excipulum* ca.  $55\mu$  thick, of *textura angularis* to *textura globulosa* below, with cells 11– $20\mu$  in diameter, toward the sides forming a more definite *textura prismatica*, all with thick, gelatinized walls, giving rise to hairs. *Hairs* few, incompletely known, hyaline, very broad at the base and abruptly tapering to a narrow apical portion, apices broken-off in the specimen seen, 10.2– $12.9\mu$  wide at the base, fairly thin-walled, constricted at the basal septa, smooth. *Asci* 8-spored, arising from croziers, clavate-cylindrical; the apical pore blueing in iodine; ca.  $100 \times 9.6\mu$ . *Ascospores* hyaline, cylindrical, slightly attenuate below, in two fascicles of four spores each, 7-septate at maturity, 41– $51 \times 3.4$ – $4.8\mu$ . *Paraphyses* hyaline, usually once-branched, filiform, not enlarged at the apex, about as long as the asci,  $-1.4\mu$  wide; septa not seen.

CULTURAL CHARACTERS: Unknown.

HABITAT: Dead wood.

NAME: From Latin, *araneum* = spider web + *-osa*, a strengthening suffix: full of spider web.

TYPE LOCALITY: Tasmania.

TYPE SPECIMEN: Kew Botanic Gardens.

ILLUSTRATIONS: None.

EXSICCATI: None.

SPECIMENS EXAMINED: *Tasmania*: W. Archer, *Tasmania* (label reads, "*Peziza arachnoidea* B" [erkeley]), (no date), TYPE, K.

NOTES: Known to the writer only from the type specimen, which is in but a fair state of preservation. The species is so characteristic that it should be easily recognized if collected again. Its full interpretation awaits more recent and better preserved collections.

## III. ARACHNOSCYPHAE

Ascospores minute, 1-septate, hairs delicate.

## 9. ARACHNOPEZIZA ARANEA (Notaris) Boudier

*Peziza aranea* Not., Mem. Real. Accad. Sc. Torino, ser. 2, 3: 57. 1841.

*Trichopeziza aranea* (Not.) Sacc., *Michelia* 1: 253. 1878.

*Phialea aranea* (Not.) Gill., *Disc.* 111. 1879.

*Lachnella aranea* (Not.) Phil., *Manual brit. disc.* 272. 1887.

*Dasyscypha aranea* (Not.) Masee, *Brit. fungus-fl.* 4: 336. 1895.

*Arachnopeziza aranea* (Not.) Boud., *Icones Myc. Expl. Planches*, sér. 3: 2. 1906.

*Arachnoscypa aranea* (Not.) Boud. ex Dennis, *Commonw. Myc. Inst. Myc. Papers* 32: 87. 1949.

FIG. 13.

*Subiculum* white, scanty to rather copious; hyphae 2–3.5 $\mu$  wide, thick-walled, rarely septate, occasionally a bit roughened. *Apothecia* gregarious or scattered, sessile, minute, –500 $\mu$  in diameter, drying urceolate to turbinate; *receptacle* whitish, hairs borne mostly at the margin; *margin* obtuse, elevated or inrolled on drying; *disc* whitish, convex to concave on drying. *In section: hymenium* ca. 65 $\mu$  thick; *hypothecium* not clearly differentiated or –30 $\mu$  thick, hyphae fairly thick-walled, ca. 2.7 $\mu$  wide, hyaline; *medullary excipulum* none or –25 $\mu$  thick, of a loose textura intricata, hyphae thin-walled, 1 $\mu$  wide, hyaline; *ectal excipulum* of varying thickness, composed of one to several layers of thin- to medium-thick-walled, gelatinized textura prismatica, hyphae 2–3.4 $\mu$  wide, hyaline to slightly brownish, giving rise to hairs. *Hairs* hyaline, flexuous, short, mostly 35–40(75) $\mu$  long, 2–3.4 $\mu$  wide at the base, tapering to a blunt apex, fairly thick-walled, usually 1-septate, smooth. *Asci* 8-spored, arising from croziers, clavate; apex rounded to flattened, slightly thickened, with the pore blueing in iodine; 37–67 x 4.8–6.8 $\mu$ . *Ascospores* hyaline, pyriform to fusoid-elliptical, sometimes constricted at the middle, slightly attenuate below, irregularly biseriate, 0–1-septate at maturity, 5.5–9.6 x 2–2.7 $\mu$ . *Paraphyses* hyaline, simple or branched once, filiform, not enlarged at the apex, about as long as the asci, 0.75–1(1.4) $\mu$  wide, septate.

CULTURAL CHARACTERS: Unknown.

HABITAT: Involucres of *Castanea dentata* and *C. vesca*.

NAME: From Latin, *araneus*=spidery.

TYPE LOCALITY: "Valle Intrasca ad Verbanum," Italy.

TYPE SPECIMEN: Unknown to the writer.

ILLUSTRATIONS: ! Boudier, *Icones Myc.* 3: pl. 520. 1907; Dennis, *Commonw. Myc. Inst. Myc. Papers* 32: f. 95. 1949; ! Notaris, *Mem. Accad. Sc. Torino*, ser. 2, 3: pl. 1. 1841.

EXSICCATI: Ellis, *N. Am. F.* 843 (*Peziza*); Phillips, *Elv. Brit.* 165 (*Peziza*); Rabenh., *Klotzsch. Herb. viv. myc.*, ed. nov., 17 (*Peziza*); Saccardo, *Myc. Ven.* 1283 (*Trichopeziza*).

SPECIMENS EXAMINED: *New York*: Whetzel, on chestnut burrs, *Coy Glen, Ithaca*, 3. X. 1902, CU-P 563; Whetzel, on old burrs of *Castanea dentata*, *Ithaca*, 8. IX. 1922, CU-P 11788.

*Pennsylvania*: Ellis et Harkness, on old chestnut burrs, *Bethlehem*, X. 1880, Ellis *N. Am. F.* 843, NY-E.

*England*: (no collector), inside husks of *Castanea vesca*, (no locality, no date), Phillips *Elv. Brit.* 165, NY-M.

*France*: (no collector), as "*araneosa*," (no locality), 1896, PC-B.

*Italy*: Cesati, internae involucrorum *Castanearum*, *Brixen*, 1847, Rabenh. *Klotzsch. Herb. viv. myc.*, ed. nov., 17, FH; Spegazzini, in capsulis putrescentibus *Castanae vescae*, *Conegliano*, I. 1878, Saccardo *Myc. Ven.* 1283, NY-E.

NOTES: With the nearly complete extinction of the American Chestnut, the probability of encountering this species here is only slight. The species is known to the writer only from dried specimens. This is a particularly unusual species, and the only member of the genus known to the writer which is definitely restricted in its host range, as it is found only on *Castanea*, and then only on the spiny involucre which have fallen to the ground. Septate spores are more the exception than the rule in most collections of this discomycete; the septa appear only very late in the development of the ascospores.

#### 10. *Arachnopeziza eriobasis* (Berkeley) Korf, comb. nov.

- Peziza eriobasis* Berk., Ann. Mag. Nat. Hist., ser. 1, 13: 355. 1844. (!!).  
*Peziza aureliella* Nyl., Not. Sällsk. fauna fl. fenn. förh. 10 (n. s. 7): 49. 1869.  
*Mollisia aureliella* (Nyl.) Karst., Bidr. Kännedom Finl. Nat. och Folk 19 :206. 1871.  
*Tapesia aureliella* (Nyl.) Karst., Acta Soc. Faun. Fl. Fenn. 2<sup>o</sup>: 137. 1885.  
*Lachnella eriobasis* (Berk.) Quél., Enchir. fung. 317. (excl. descr.) 1886.  
*Tapesia eriobasis* (Berk.) Phil., Manual brit. disc. 278. 1887.  
*Eriopeziza aureliella* (Nyl.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>o</sup>: 695. 1892.  
*Eriopeziza eriobasis* (Berk.) Sacc. et Sacc., Syll. fung. 18: 73. 1906.  
*Trichopeziza eriobasis* (Berk.) Boud., Hist. classific. disc. Europe 131. 1907.  
? *Chrysothallus vandae* Vel., Monogr. disc. Bohem. 1: 269. 1934.  
? *Eriopeziza vandae* (Vel.) Vel. *pro synonym.*, Monogr. disc. Bohem. 1: 269. 1934.

FIG. 14.

*Subiculum* white, abundant, but not wide-spreading, usually forming a mat at the base of each apothecium; hyphae 2–3.1 $\mu$  wide, rather thick-walled, smooth; septa few. *Apothecia* usually occurring singly, sometimes gregarious, sessile, 0.5–1.5 mm. in diameter, flat, drying patellate or with the margins raised; *receptacle* whitish, pallid on drying, hairs borne over the surface; *margin* obtuse, flat or elevated on drying; *disc* yellowish to gray, plane. *In section: hymenium* ca. 50 $\mu$  thick; *hypohegium* not differentiated; *medullary excipulum* 10–20 $\mu$  thick, of thin-walled textura intricata, hyphae 1–1.4 $\mu$  wide, hyaline; *ectal excipulum* 25–40 $\mu$  thick, at the margin of textura prismatica, hyphae 2.7–5.5 $\mu$  wide, becoming textura angularis below, with cells as large as 9.6 x 10.9 $\mu$ , all with thickened, gelatinized walls, hyaline, giving rise to hairs. *Hairs* hyaline, flexuous, 1.4–2 $\mu$  wide below, tapering to a tip ca. 1 $\mu$  wide, 35–70 $\mu$  long, with a few septa, smooth or with external particles. *Asci* 8-spored, arising from croziers, clavate; apex narrowed, with the pore blueing in iodine; 40–50 x 4.1–5.5 $\mu$ . *Ascospores* hyaline, fusoid-elliptical to subfusiform, attenuate below, bi- to multiseriate, 1-septate at maturity, 6.1–10.8(12.9) x 1.4–2(2.7) $\mu$ . *Paraphyses* hyaline, simple, filiform, not enlarged at the apex, about as long as the asci, 1–2 $\mu$  wide; septa rare.

CULTURAL CHARACTERS: Mycelium fairly slow growing, appressed to the agar, cottony, pure white. Hyphae occasionally break apart at the septa to form conidium-like structures. Crystals abundant in the media.

HABITAT: Rotted wood, *Carya* involucre, etc.

NAME: From Greek, *erion* = wool + *basis* = base: woolly-based.

TYPE LOCALITY: Sherwood Forest, Notts., England.

TYPE SPECIMEN: Kew Botanic Gardens.

ILLUSTRATIONS: Masee, Jour. Linn. Soc. 31: pl. 18, f. 6. 1897 (habit); Velenovsky, Monogr. disc. Bohem. 2: pl. 6, f. 14. 1934.

EXSICCATI: None.

SPECIMENS EXAMINED: *New York*: Korf, on wood, *Cascadilla Creek woods, Ithaca*, 28. IX. 1947, RPK 913; Rogerson et Korf, on hull of *Carya, Lower Six Mile Creek, Ithaca*, 2. X. 1949, RPK 1979.

*England*: (no collector), *Notts.*, (no date), TYPE of *Peziza eriobasis*, K; ISOTYPE, BM-B.

NOTES: Apparently this is a very rare species. The characteristic hairs and spores are sufficiently diagnostic, as is the restricted subiculum. It is a close relative of *A. aranea*. The type specimen is in very poor condition, but is sufficiently preserved to allow its identification with the more recent material.

#### IV. ARACHNASTERAE

Hairs cemented into long teeth as in *Pezizellaster* and *Lachnaster*.

#### 11. *Archnopeziza fitzpatrickii* Korf, sp. nov.<sup>11</sup>

FIGS. 12, 19, 20.

*Subiculum* white, arachnoid; hyphae various, thin- to thick-walled, 2–5.5 $\mu$  wide, smooth; septa fairly frequent. *Apothecia* occurring singly, sessile, 300–600 $\mu$  in diameter, patellate, drying patellate to turbinate; *receptacle* white, with hairs in fascicles only at the very margin; *margin* acute, elevated or not on drying; *disc* whitish, plane to convex. *In section: hymenium* ca. 75 $\mu$  thick; *hypothecium* not differentiated; *medullary excipulum* –80 $\mu$  thick, of fairly thin-walled *textura intricata*, the hyphae 2 $\mu$  wide, hyaline; *ectal excipulum* of one or a very few layers of thick-walled, gelatinized *textura prismatica*, hyphae 2–3.4 $\mu$  wide, hyaline, at the margin running out to form the fascicles of hairs. *Hairs* hyaline, not sharply differentiated from the ectal excipulum, in fascicles of about 10 hairs each, cemented together nearly their whole length to form long, narrow teeth; each hair ca. 2.7 $\mu$  wide below, tapering to an apex 2 $\mu$  wide or to a definite point, 200(–350) $\mu$  long, thick-walled, smooth or with external particles; septa frequent. *Asci* 8-spored, arising from croziers, clavate; apex rather abruptly narrowed, with the pore blueing in iodine; 63–75 x 6.8–8.9 $\mu$ . *Ascospores* hyaline, subfusoid, attenuate below, obliquely uniseriate to irregularly biseriate, (1)3-septate at maturity, occasionally constricted slightly at the septa, 13.6–22.5 x 2.7–4.8 $\mu$ . *Paraphyses* hyaline, simple, filiform, not enlarged at the apex, about as long as the asci, ca. 0.75 $\mu$  wide; septa infrequent.

CULTURAL CHARACTERS: Unknown.

HABITAT: Rotted wood.

NAME: After Professor H. M. Fitzpatrick.

TYPE LOCALITY: Coy Glen, Ithaca, New York.

TYPE SPECIMEN: Cornell University, Department of Plant Pathology.

ILLUSTRATIONS: None.

EXSICCATI: None.

SPECIMENS EXAMINED: *New York*: Korf, on old wood, *Coy Glen, Ithaca*, 15. V. 1947, TYPE, CU-P 37285.

<sup>11</sup>*Archnopeziza fitzpatrickii* Korf, sp. nov.

Subiculo albo, arachnoideo; cupulis 300–600 $\mu$  diam., niveis; pilis hyalinis, in fasciculis marginalibus cohaerentibus, 200–350 $\mu$  longis, septatis; ascis octosporis, clavatis, e lituis natis, poro in Iodo coerulescente, 65–75 x 6.8–8.9 $\mu$ ; ascosporis hyalinis, sub-fusoideis, (1)3-septatis, 13.6–22.5 x 2.7–3.4 $\mu$ ; paraphysibus hyalinis, simplicibus, filiformibus, ca. 0.75 $\mu$  diam. In ligno putrido.



NOTES: This species is named in memory of the writer's friend and teacher, Professor Harry M. Fitzpatrick.

Those who like small genera would probably be justified in erecting a new genus for this species, but such a genus would have just as little validity as *Pezizellaster* and *Lachnaster*, erected for species of the *Hyaloscyphaeae* and *Lachneae*, respectively, that possess the same character of fasciculate hairs. Unquestionably, however, other species of *Arachnopeziza* exhibit a tendency toward this condition, and such a genus, based on a single character, can hardly be a natural one. It seems far better to keep this species in the genus *Arachnopeziza* along with the species closely related to it.

#### V. ANOMALAE

Hairs faintly roughened their whole length, cylindrical.

#### 12. *Arachnopeziza trabinelloides* (Rehm) Korf, comb. nov.

*Helotium trabinelloides* Rehm, *Hedwigia* 26<sup>3</sup>: 82. 1887. (!!)

*Solenopezia trabinelloides* (Rehm) Sacc., *Syll. fung.* 8: 477. 1889.

*Helotiella nuttallii* E. et E., *Proc. Acad. Nat. Sc. Philad.* 46: 351. [1895]. (!!)

*Dasyphypha trabinelloides* (Rehm) Massee, *Jour. Bot.* 34: 145. 1896.

*Helotiella trabinelloides* (Rehm) Rehm, *Ann. myc.* 2: 36. 1904.

*Helotiella trabinelloides* (Rehm) Rehm var. *nuttallii* (E. et E.) Rehm, *Ann. myc.* 2: 36. 1904.

*Trichopeziza trabinelloides* ("trabilennoides") (Rehm) Boud., *Hist. classif. disc. Europe* 131. 1907.

FIG. 10.

*Subiculum* whitish to tan, very scanty; hyphae 2.1–2.7 $\mu$  wide, fairly thick-walled, smooth; septa few. *Apothecia* gregarious or scattered, sessile, 0.3–1.2 mm. in diameter, drying cupulate; *receptacle* whitish to tan, bearing hairs over the surface; *margin* acute to obtuse, drying inrolled; *disc* whitish to dilute orange, concave on drying. *In section: hymenium* ca. 75 $\mu$  thick; *hypothecium* 6–15 $\mu$  thick, of compacted *textura intricata*, hyphae ca. 1.4 $\mu$  wide, thick-walled, hyaline; *medullary excipulum* none or forming a poorly defined layer –15 $\mu$  thick, of *textura porrecta*, running perpendicular to the asci, hyphae ca. 1.4 $\mu$  wide, thick-walled, hyaline; *ectal excipulum* 25–60 $\mu$  thick, of thick-walled, gelatinized *textura prismatica*, hyphae 4.1–4.8 $\mu$  wide, at times forming *textura angularis* with cells –8.2 $\mu$  in diameter, hyaline to yellowish, giving rise to hairs. *Hairs* with hyaline to yellowish walls, flexuous, sometimes a bit fasciculate, almost cylindrical and not sharply differentiated from the ectal excipulum, 2.7–3.4 $\mu$  wide below and fairly thick-walled, tapering to an apex ca. 2 $\mu$  wide and thin-walled, 55–85(125) $\mu$  long, faintly roughened their whole length with granules; septa frequent. *Asci* 8-spored, arising from croziers, clavate; apex narrowed, with the pore blueing in iodine; 60–78 x 6.8–7.5 $\mu$ . *Ascospores* hyaline, fusoid-elliptical to subfusiform, attenuate below, irregularly biseriolate, 1-septate at maturity; occasionally producing a bud-like protrusion from either end; (8.2)10.9–13.6(16.4) x (2)2.7–3.4(4.8) $\mu$ . *Paraphyses* hyaline, usually branched one or more times, filiform; the apex usually enlarged, often variously misshapen; about as long as the asci, ca. 1.4 $\mu$  wide below, apex –4.1 $\mu$  wide; septa frequent.

CULTURAL CHARACTERS: Unknown.

HABITAT: Decorticated wood.

NAME: From the species epithet *trabinellum*+ Greek, *-eides*=shape, appearance: like *Helotium trabinellum* Karst.

TYPE LOCALITY: Herculesbad, Hungary.

TYPE SPECIMEN: Naturhistoriska Riksmuseet, Stockholm.

ILLUSTRATIONS: Masee, Jour. Bot. 34: pl. 357, f. 4. 1896 (schematic).

EXSICCATI: Ellis et Everhart, N. Am. F. 3233 (*Helotiella nuttallii*); Rehm, Asc. 853 (*Helotium*).

SPECIMENS EXAMINED: *New York*: Durand, on rotten wood, *Cascadilla, Ithaca*, 11. IV. 1895, CU-D 708.

*West Virginia*: Nuttall, on dead *Castanea?*, near *Fern Spring Branch, Baber place, Fayette Co.*, 15. III. 1894, TYPE *Helotiella nuttallii* NY-E; Nuttall, on decaying wood of *Castanea, Nuttallburg*, XI. 1894, Ellis et Everh. N. Am. F. 3233, NY-U, FH.

*Hungary*: Lojka, auf einem entrindeten, faulenden Buchenstamm, *Herculesbad*, IV. 1885, Rehm Asc. 853, TYPE of *Helotium trabinelloides*, S, ISOTYPE, FH.

NOTES: This is an uncommon species and known to the writer only from dried specimens. In several regards it is anomalous: the subiculum is very scanty; the medullary excipulum is of textura porrecta rather than the more usual textura intricata; and the hairs are faintly roughened with granules their whole length, thus appearing more like those of a *Lachnum (Dasyscypha)*. Nevertheless, it seems to be more closely related to the other species of *Arachnopeziza* than to the Lachneae, in particular because of its septate spores, ectal excipular structure, deformed paraphysis tips, and the present if scanty subiculum. It is through such species as this that the Lachneae and the Arachnopezizae may prove to be closely related.

#### SPECIES IMPERFECTLY KNOWN

The following species which have been referred to *Arachnopeziza* are known to the writer only from description (in one case also from inadequate material). Some of the species appear to belong in the genus either as valid species or as synonyms. As already mentioned under *Eriopeziza*, republication of Velenovsky's wholly insufficient descriptions would be of little value to taxonomic science; they are therefore omitted.

13. ARACHNOPEZIZA CONTORTICA Vel., Monogr. disc. Bohem. 1:268. 1934.

14. ARACHNOPEZIZA GRAMINUM Vel., Monogr. disc. Bohem. 1:268. 1934.

15. ARACHNOPEZIZA LARICINA Vel., Monogr. disc. Bohem. 1:268. 1934.

16. ARACHNOPEZIZA LARICINA Vel. var. PINACEA Vel., Novit. myc. noviss. 135. 1947.

17. ARACHNOPEZIZA PILEOCROCATA (Crouan) Boudier

*Peziza pileocrocata* Crouan, Fl. Finest. 51. 1867.

*Lachnea pileocrocata* (Crouan) Gill., Disc. 91. 1879.

*Tapesia pileocrocata* (Crouan) Sacc., Syll. fung. 8: 384. 1889.

*Eriopeziza pileocrocata* (Crouan) Sacc. et Sacc., Syll. fung. 18: 73. 1906.

*Arachnopeziza pileocrocata* (Crouan) Boud., Hist. classif. disc. Europe 126. 1907.

NOTES: The Crouan brothers' herbarium is located at Quimper, in the province of Finistère, and is housed in a number of iron boxes at the Bibliothèque Municipale. This information was obtained for the

writer through the kindness of Dr. Marcelle Le Gal. She reports that the collection has, unfortunately, never been arranged or catalogued, so that there is no way of knowing whether the type of this species is still in existence. Further, by the terms of the will, the Crouan specimens may not be sent from Quimper. Under the circumstances, this name must remain a *nomen dubium*, at least for the time being. The description could apply equally well to any of a number of the species of *Arachnopeziza*.

18. *ARACHNOPEZIZA SALICINA* Vel., Novit. myc. noviss. 135. 1947.

19. *ARACHNOPEZIZA ZONULATA* (Rolland) Boudier

*Arachnoscypha zonulata* Roll., Bull. Soc. Myc. France 14: 83. 1898.

*Neottiella zonulata* (Roll.) Sacc. et Sydow apud Sacc., Syll. fung. 14: 760. 1899.

*Arachnopeziza zonulata* (Roll.) Boud., Hist. classific. disc. Europe 126. 1907.

Gregarious, white, exceedingly and finely ciliate. Apothecia turbinate, drying plane to depressed, when moist hemispherical, swollen, white, 0.5 mm. in diameter. Asci clavate, attenuate at the apex, with a short, rounded basal portion, the very apex blueing in iodine, 8-spored, 80 x 12 $\mu$ . Ascospores bi- to triseriate, hyaline, cylindrical, slightly attenuate below, full of oleaginous guttules which are often yellowish, pluriseptate in iodine, 28-30 x 4 $\mu$ . Paraphyses filiform, branching. Marginal hairs hyaline, stiff, pointed, closely septate, 100 $\mu$  or more x 3 $\mu$ . [Translated from Latin.]

HABITAT: On decaying cones of *Pinus maritimus*.

TYPE LOCALITY: Valley of the Restonica river, near Corte, Corsica.

TYPE SPECIMEN: Not known to the writer. Said to have been collected 7.

X. 1897.

ILLUSTRATIONS: Rolland, Bull. Soc. Myc. France 14: pl. 9, f. 4. 1898.

EXSICCATI: None.

NOTES: The description leaves no doubt but that this is an *Arachnopeziza*. If the drawings are correct, it may well be a good species. On the other hand, it may prove to be an older name for *A. obtusipila*, or a synonym of *A. delicatula*.

20. *BELONIDIUM* (*ARACHNOPEZIZA*) *MELANERES* (Berk. et Br.) Sacc.

*Peziza melaneres* Berk. et Br., Jour. Linn. Soc. (Bot.) 14: 106. 1875. (!!)

*Belonidium melaneres* (Berk. et Br.) Sacc., Syll. fung. 8: 501. 1889.

*Subiculum* not evident [1949] but originally described as forming a byssoid layer. *Apothecia* medium large, -2mm. in diameter, subglobose to patellate, now greyish-black, but described as white; *margin* not inrolled, obtuse; *disc* concave, cinereous. *In section: hymenium* ca. 175 $\mu$  thick; *hypothecium* very thin, hyphae perpendicular to the asci, forming a thin layer of light brown textura prismatica; *medullary excipulum* ca. 80 $\mu$  thick, of textura epidermoidea to textura oblita, the walls completely gelatinized, the lumina very minute; *ectal excipulum* not clearly differentiated, ca. 30 $\mu$  thick, walls somewhat brownish and the cells tending to round up a bit more. *Hairs* 50(150) $\mu$  long, approximately cylindrical, ca. 4.8 $\mu$  wide, very thick-walled, septate, smooth, appearing to be little more than extensions of the excipular hyphae. *Asci* only poorly preserved, very long; reaction of pore to iodine unknown. *Ascospores* mostly biseriate, hyaline, broad-fusoid, constricted slightly at the single septum, ca. 6.8 x 20.4 $\mu$ . *Paraphyses*

appearing to form an epithecium, ca.  $1.4\mu$  wide, filiform, not enlarged at the apex.

HABITAT: On dead sticks.

TYPE LOCALITY: Ceylon.

TYPE SPECIMEN: Kew Botanic Gardens.

ILLUSTRATIONS: None.

EXSICCATI: None.

SPECIMENS EXAMINED: *Ceylon*: (no collector), n° 283, (no date), TYPE, K.

NOTES: The above description is drawn from the type specimen, which is in poor condition. The cinereous hymenium, characteristic hairs and peculiar tissue structure, as well as the broad spores easily delimit this species. It is hoped that the above description will enable future mycologists to recognize this fungus. Only on the basis of more recent and better preserved specimens can any conclusions regarding this species be drawn. It is certainly atypical for the Arachnopezizeae, and very likely may have to be excluded from the tribe when it is again collected, and can be correctly interpreted.

21. *ERIOPEZIA AURELIELLA* (Nyl.) Rehm var. *SULPHUREA* Vel., Monogr. disc. Bohem. 1: 266. 1934.

22. *ERIOPEZIA CUPULARUM* Vel., Monogr. disc. Bohem. 1: 265. 1934.

23. *PEZIZA AURELIA* Pers. ex Fr. forma *MINOR* Weinmann

*Peziza aurelia* Pers. ex Fr. s. *minor* Weinm., Flora 15: 455. 1832.

*Peziza aurelia* Pers. ex Fr. var. *minor* (Weinm.) Weinm., Gastero-my. hucusque Imp. Rossico Obs. 453. 1836.

NOTES: Apparently lost. Nylander (1869) suggested his *Peziza aureliella* (= *A. eriobasis*) might approach Weinmann's form. In the absence of any material, it is impossible to place Weinmann's name in its correct synonymy. It should probably be considered a *nomen dubium*.

#### EXCLUDED SPECIES AND SYNONYMS

1. *ARACHNOPEZIZA ALBOVIRIDIS* (Gill.) Boud. =? *Eriopezia caesia*.

2. *ARACHNOPEZIZA ALICULARIAE* (Oudem.) Boudier

*Peziza aliculariae* Oudem., Vers. Med. Kon. Akad. Wetensch., Afd. Natuurk., Reeks 2, 18: 379. 1883. (!!)

*Mollisia aliculariae* (Oudem.) Oudem. ex Sacc. *pro synonym.*, Syll. fung. 8: 502. 1889.

*Belonidium aliculariae* (Oudem.) Sacc., Syll. fung. 8: 502. 1889.

*Arachnopeziza aliculariae* (Oudem.) Boud., Hist. classific. disc. Europe 126. 1907.

SPECIMENS EXAMINED: *Netherlands*: Lacoste, n° 502, Op *Alicularia Scalaris*, *Deurne*, 20. II. 1872, TYPE, GRO.

NOTES: Though the type specimen is in excellent condition, and quite abundant, the writer's investigation of it has failed to indicate the relationships of this fungus. In any case, it certainly must be excluded from the Hyaloscyphaceae, as it possesses no hairs, and the structure is quite different. It may well be congeneric with *Gorgoniceps barbilophoziae* Rac. (Rev. de Mycol. 14: 140. [1950]), and perhaps both forms represent members of an undescribed genus. It differs from *Racovitza's* form in having shorter asci and spores, but, judging by the description of the latter species, agrees fairly well in other characters. The writer finds: no trace of a subiculum; apothecia sessile, usually in the axils of the "leaves;" receptacle usually somewhat

sunken in the tissue; margin usually inrolled; hymenium ca.  $75\mu$  thick; hypothecium ca.  $15\mu$  thick, of textura intricata, hyphae ca.  $2\mu$  wide; medullary excipulum lacking; ectal excipulum  $15-20\mu$  thick below,  $-45\mu$  thick at the sides, of textura oblita, decidedly gelatinized, hyphae thick-walled, yellowish,  $1.4-2\mu$  wide; asci  $55-70 \times 6.1-7.5\mu$ , with a thick-walled apex not coloring in iodine; ascospores hyaline, attenuate below, 3-5-septate,  $24-30 \times 1.4-2.7\mu$ ; paraphyses less than  $1\mu$  wide, ramose.

3. ARACHNOPEZIZA ARCTOSTAPHYLI Cash = *A. aurata*.

4. ARACHNOPEZIZA ASTEROMA (Fuckel) Fuckel

*Peziza asteroma* Fckl., Fungi rhen. n° 2188. 1868. (!!)

*Arachnopeziza asteroma* (Fckl.) Fckl., Symbol. myc. 304. [1870].

*Belonidium asteroma* (Fckl.) Sacc., Atti. Soc. Ven.-Trent. Sci. Nat. Padova 2<sup>o</sup>: 164 (of reprint). 1873.

*Trichobelonium asteroma* (Fckl.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>o</sup>: 592. 1891.

SPECIMENS EXAMINED: Germany: Fuckel, *Carex glauca?*, Oestrich, (no date), TYPE of *Peziza asteroma*, G; (no collector), ad caracis paludosae folia putrida, Bechtelsteichwiesen prope Oestrich, (no date), Fuckel Fungi rhen. 2188, ? ISOTYPE OF *Peziza asteroma*, FH.

NOTES: The species belongs in the Mollisioideae, and presumably in the genus *Trichobelonium*. Nannfeldt (1932) suggests the species might better be referred to *Belonopsis*.

5. ARACHNOPEZIZA BASITRICHA (Sacc.) Boud., Hist. classific. disc. Europe 126. 1907.

NOTES: This unusual discomycete occurs among dematiaceous fungi on old wood. The synonymy involved is complex. That given by von Höhnelt (1923, 1223) is far from complete. The fungus is the type of the genus *Leptobelonium* Höhn. 1923 (in part), which is probably synonymous with *Strossmayeria* Schulzer 1881. A specimen sent to Rehm by Durand is determined by Rehm as a new (unpublished) species of *Arachnopeziza*. This herbarium name, which refers to the sulfur color of the "subiculum," appears on both packets. It is congeneric and probably conspecific with the Saccardo species. The writer hopes, eventually, to present a complete treatment of this genus, but the publication of this awaits life-history studies on living material.

6. ARACHNOPEZIZA FIBRILLOSA (Wallr.) Boud.

See Appendix: Nomina Dubia.

7. ARACHNOPEZIZA FILAMENTOSA Torrend = *A. aurata*.

8. ARACHNOPEZIZA FULGENS (Hazsl.) Boud. = *A. aurelia*.

9. ARACHNOPEZIZA NIVEA Lorton = *A. aurata*.

10. ARACHNOPEZIZA OBTUSIPILA Grelet var. MINOR Grelet = *A. obtusipila*.

11. ARACHNOPEZIZA PINETI Feltgen = *A. delicatula*.

12. ARACHNOPEZIZA RHAPHIDOSPORA (Ellis) Rehm

*Peziza raphidospora* Ellis, Bull. Torrey Club 6: 107. 1876 (not *P. raphidofera* Berk. et Curt. apud Berk., spelling emended to *raphidophora* by Saccardo (1899) sub *Erinella*, and to *raphidospora* by Massee (1894) sub *Peziza*). (!!)

*Erinella raphidospora* (Ellis) Sacc., Syll. fung. 8: 509. 1889.

*Arachnopeziza raphidospora* (Ellis) Rehm, Ann. myc. 2: 352. (excl. descr. et specim.) 1904.

SPECIMENS EXAMINED: *New Jersey*: Ellis, on old pine stump, *Newfield*, 31. X. 1875, TYPE of *Peziza raphidospora*, NY-E, ISOTYPE CU-D 8954.

*Pennsylvania*: Ellis et al., *Halliday Jackson's woods*, *West Chester*, 5. VI. 1879, NY-E, CU-D 8953.

NOTES: The type specimen is on pine, and is certainly *Gorgoniceps aridula* Karst. The above three names should be added to the synonymy of that species. However, the species has been misinterpreted, as the specimen distributed under this name in Ellis's exsiccati is *Arachnopeziza delicatula*, and on chestnut. Rehm (1892: 691) had apparently received a specimen on pine from Ellis, which he determined as *G. aridula*, but the exsiccati specimen he refers to *A. aurata*. Later (1904) he recognized the exsiccati material was not of *A. aurata*, and made the new combination, *A. raphidospora*. Masee's description (1894) follows Ellis's mistake, for the species on pine and that on chestnut are described as one.

13. ARACHNOPEZIZA RUBORUM (Cke. et Phil.) Rehm = *Tapesina griseovitellina*.

14. ARACHNOPEZIZA TAPESIOIDES Starbäck = *A. cornuta*.

15. BELONIDIUM (ARACHNOPEZIZA) HETEROMORPHUM (E. et E.) Sacc.

*Peziza heteromorpha* E. et E., *Jour. myc.* 2: 88. 1886. (!!)

*Belonidium heteromorphum* (E. et E.) Sacc., *Syll. fung.* 8: 502. 1889.

SPECIMENS EXAMINED: *Louisiana*: Langois, n° 458, base of culms of *Spartina polystachya*, *Point à la Hache*, 2. V. 1886, TYPE of *Peziza heteromorpha*, NY-E; Langois, n° 458, on foot of dead stems of *Spartina polystachya*, *Point à la Hache*, 2. V. 1886, ? ISOTYPE of *P. heteromorpha*, NY-E; Langois, n° 458, almost in the ground on base of dead stems of *Spartina polystachya*, *H. Co.*, 28. IV. 1886, NY-E.

NOTES: A member of the Mollisioideae. Nannfeldt (1932) suggests it might be placed in *Belonopsis*. The writer's investigations show a closer agreement with *Trichobelonium*.

16. BELONIDIUM (ARACHNOPEZIZA) LEUCORRHODINUM (Mont.) Sacc.

*Peziza leucorrhodina* Mont., in *Sagra*, *Hist. fis. pol. nat. Cuba*, II, 9: 219. 1845. (!!)

*Calonectria leucorrhodina* (Mont.) Speg., *Ann. Soc. Cien. Argentina* 12: 79 (of reprint). 1881.

*Scutula leucorrhodina* (Mont.) Speg., *Ann. Soc. Cien. Argentina* 26: 58. 1888.

*Belonidium leucorrhodinum* (Mont.) Sacc., *Syll. fung.* 8: 501. 1889.

SPECIMENS EXAMINED: *Cuba*: Montagne, exima specim., (no data), ISOTYPE of *Peziza leucorrhodina*, K.

NOTES: The portion of the type collection at Kew bears the annotation: "The cups are perithecia and the species is Hypocreaceous.—R. W. G. D"[ennis]. The specimen is too fragmentary to allow a complete examination, and Dr. Dennis is probably correct. A number of other *Meliola*-inhabiting species of the tropics and sub-tropics may be involved in the synonymy. One or more species which appear to be Discomycetes have been confused in the literature. The problem will have to be solved by someone more familiar with these hyperparasites. In any case, these species have nothing to do with the Hyaloscyphaceae.

17. BELONIDIUM (ARACHNOPEZIZA) PHLEGMACEUM (Ellis) Sacc. = *A. aurata*.

18. BELONIDIUM (ARACHNOPEZIZA) RHABDOSPERMUM (Berk. et Br.) Sacc. = *A. aurata*.

## APPENDIX: NOMINA DUBIA

The descriptions of the following species, formerly placed in what would correspond to the Arachnopezizeae *sensu meo*, are in all cases insufficient to identify the fungus in question, and the type specimens or authentic specimens seem no longer to exist, or are in such condition as to make identification impossible. These names should be struck from the lists of valid species of the Discomycetes.

## 1. PEZIZA ARACHNOIDEA Schweinitz

*Peziza arachnoidea* Schw., Trans. Amer. Phil. Soc., n. s., 4: 174. [1832] (not *P. arachnoidea* Berk. ex Cooke, Grevillea 11: 102. 1883, a later homonym). (!!). *Tapesia (Eriopezia) arachnoidea* (Schw.) Sacc., Syll. fung. 8: 384. 1889.

SPECIMENS EXAMINED: *Pennsylvania*: Schweinitz, n° 858, 115, *Beth[lehem]*, 1826, TYPE of *Peziza arachnoidea*, PH-S (mounted specimen: sterile; loose duplicate: only *Karschia lignyota*), ISOTYPE FH-C (sterile), K (sterile), NY (sterile), CU-D 3874 (sterile).

NOTES: Though all of the above portions of Schweinitz's type have been carefully examined, only one shows signs of any apothecia, and these are of *Karschia lignyota* (Fr.) Sacc. The name should probably not be considered a synonym of *K. lignyota*, however, as it is scarcely conceivable that that was the fungus Schweinitz had in mind. Morgan (1902) applies the name to a specimen of *Arachnopeziza delicatula* (a portion of which had been determined as *Tapesia aurata* by Masee), though there is no evidence that Morgan ever saw apothecia on any Schweinitz specimen. It is unfortunate not to be able to use this early name, but the description is so vague that its application would be completely uncertain, and the name must be rejected.

## 2. PEZIZA BLOXAMI Berkeley et Broome

*Peziza bloxami* Berk. et Br., Ann. Mag. Nat. Hist., ser. 2, 7: 181. 1851.  
*Tapesia bloxami* (Berk. et Br.) Sacc., Syll. fung. 8: 380. 1889.

NOTES: Rehm (1892: 696) has suggested that this may be synonymous with *Peziza eriobasis*, here accepted as a valid species of *Arachnopeziza*. Judging by the description, this is hardly likely. However, Phillips (1887: 408) has already rejected this species as a *nomen dubium*, as he was unable to find asci or spores in the type, "nor in a specimen found by me in North Wales." Perhaps this was a basidiomycete.

## 3. PEZIZA DISCINCOLA Schweinitz

*Peziza discincola* Schw., Trans. Amer. Phil. Soc., n. s., 4: 174. [1832]. (!!).  
*Tapesia (Eriopezia) discincola* (Schw.) Sacc., Syll. fung. 8: 384. 1889.

SPECIMENS EXAMINED: *Pennsylvania*: Schweinitz, n° 865, (no data), TYPE of *Peziza discincola*, PH-S (sterile), CU-D 3879 (sterile).

NOTES: On neither of the above specimens are apothecia present. The "subiculum" is somewhat brownish, and accompanied by large brown phragmosporous and dictyosporous conidia (borne on the "subiculum"?). Durand's herbarium notes contain the statement: "I can find no hymenium in the type."

## 4. PEZIZA FERRUGINEA Persoon

*Peziza ferruginea* Pers., Myc. eur. 1: 274. 1822 (not *P. ferruginea* Schumach. [Enum. pl. 2: 429, 1803] ex Fr., Syst. myc. 2: 134. [1822]).

NOTES: Persoon's description is so vague that it might apply to any of several fungi. The type specimen (910, 256-895 "circa Parisios") in the Persoon Herbarium was examined in 1932 by Professor Nannfeldt. His notes, to which he kindly allowed the writer access, indicate that no fungus is to be found on the Persoon specimen. The name is certainly a *nomen dubium*.

#### 5. PEZIZA FIBRILLOSA Wallroth

*Peziza fibrillosa* Wallr., Fl. crypt. germ. 2: 479. 1833 (not *P. fibrillosa* Curr., Trans. Linn. Soc. 24: 153. 1864, a later homonym).  
*Tapesia (Eriopezia) fibrillosa* (Wallr.) Sacc., Syll. fung. 8: 385. 1889.  
*Archnopezia fibrillosa* (Wallr.) Boud., Hist. classific. disc. Europe 126. 1907.

NOTES: This name was proposed as a substitute for *Peziza ferruginea* Pers. non Schumach., and hence must have the same type. Since the Persoon species is a *nomen dubium* (see above) Wallroth's species must necessarily be one also. It has also apparently been a lost species since 1833.

#### 6. PEZIZA PORIOIDES Albertini et Schweinitz

*Peziza porioides* A. et S., Consp. fung. Lusatae super. 327. 1805.  
 ? *Porothelium lacerum* Fries, Obser. myc. 2: 273. 1818.  
*Peziza porioides* A. et S. ex Fr., Syst. myc. 2: 111. [1822].  
*Solenia porioides* (A. et S. ex Fr.) Fckl., Fungi rhen. n° 2503. 1873.  
*Cyphella porioides* (A. et S. ex Fr.) Quél., Enchir. fung. 215. 1886.  
*Eriopezia porioides* (A. et S. ex Fr.) Rehm, in Rabenh., Krypt.-Fl. 1<sup>3</sup>: 697. 1892.

NOTES: This is apparently a lost species, and was probably a basidiomycete. Dr. D. P. Rogers and Dr. W. B. Cooke have provided the writer with extensive notes regarding the species, and both feel it is in fact lost. Fries had placed *Peziza porioides* as a synonym of *Porothelium lacerum*. A specimen of the latter in the Fries herbarium is fragmentary, and does not permit an investigation at this time. It is clearly not a member of the Hyaloscyphaceae, however.

#### ACKNOWLEDGMENTS

The work on which this paper is based was conducted at Cornell University under the direction of Professor H. M. Fitzpatrick, until his death in December, 1949, and completed under Professor D.S. Welch.

The following persons have made their respective herbaria accessible, and have provided facilities for the author's examination of specimens: Dr. R. W. G. Dennis, Kew Botanic Gardens; Dr. G. Haglund, Naturhistoriska Riksmuseet, Stockholm; Prof. R. Heim, Muséum National d'Histoire Naturelle, Paris; Dr. Bessie B. Kanouse, University of Michigan; Dr. Marcelle Le Gal, Muséum National d'Histoire Naturelle, Paris; Dr. S. Lundell and Prof. J. A. Nannfeldt, Uppsala University; Dr. F. W. Pennell, Academy of Natural Sciences, Philadelphia; Dr. J. Ramsbottom, British Museum (Natural History), London; Dr. D. P. Rogers and Dr. F. J. Seaver, New York Botanical Garden; Mr. J. A. Stevenson, Bureau of Plant Industry, Beltsville; Miss Elsie M. Wakefield, Kew Botanic Gardens; Prof. W. L. White, Harvard University.

The following have sent the author herbarium specimens or have supplied information regarding these: Prof. C. Baehni, Institute de Botanique Systématique, Geneva; Miss Edith K. Cash, Bureau of Plant Industry, Beltsville; Mr. J. Gremmen, Jr., Wageningen; Miss K. E. Kindleberger, Cornell University; Dr. J. C. Lindquist, Spegazzini Museum, La Plata; Dr. C. T. Rogerson, Cornell University; Sir Wm. Wright-Smith, Royal Botanic Garden, Edinburgh; Prof. R. v. d. Wijk, Rijksuniversiteit, Groningen.



Professor R. T. Clausen, Cornell University, and Dr. D. P. Rogers have been of invaluable assistance in the solving of certain problems in nomenclature. Dr. R. W. G. Dennis, Dr. Marcelle Le Gal, and Professor J. A. Nannfeldt have been most helpful in resolving several taxonomic problems. Assistance with the Latin diagnoses has been given by Mr. E. R. B. Willis, Cornell University. The photographs were taken by Mr. W. R. Fisher, Cornell University.

The author is particularly indebted to Professor J. A. Nannfeldt and Professor W. L. White for critical reading and editing of the manuscript, and for their many helpful suggestions.

To all of these persons the author wishes to express his thanks and gratitude for their aid and cooperation.

## LITERATURE CITED

- Arnaud, G.** 1949. Notes sur la nomenclature et la systématique mycologiques. Bull. Soc. Myc. France, Suppl., **65**: 9-16.
- Boudier, E.** 1885. Nouvelle classification naturelle des discomycètes charnus. Bull. Soc. Myc. France **1**: 91-120.
- . 1907. Histoire et classification des discomycètes d'Europe. p. 1-223. Paris.
- Brefeld, O.** 1891. Untersuchungen aus dem Gesamtgebiete der Mykologie, **10**: 157-378. Münster.
- Bresadola, J.** 1903. Fungi polonici. Ann. myc. **1**: 65-96.
- Clements, F. E., and C. L. Shear.** 1931. The genera of fungi. p. 1-496. New York.
- Dennis, R. W. G.** 1949. A revision of the British Hyaloscyphaceae with notes on related European species. Commonwealth Myc. Inst. Myc. Papers **32**: 1-97.
- Durand, E. J.** 1900. The classification of the fleshy Pezizineae with reference to the structural characters illustrating the bases of their division into families. Bull. Torrey Club **27**: 463-495.
- Fuckel, L.** 1871-2. Symbolae mycologicae. Erster Nachtrag. Jahrb. Nassauischen Ver. für Naturk. **25-26**: 287-346.
- Höhnelt, F. von.** 1909. Fragmente zur Mykologie. VI. Mitteilung, Nr. 182 bis 288. Sitz.-ber. Akad. Wiss. Wien, Math.-nat. Kl., Abt. I, **118**: 275-452.
- . 1923. Fragmente zur Mykologie. XXV. Mitteilung, Nr. 1215 bis 1225. *Ibid.*, **132**: 89-118.
- Kirschstein, W.** 1938. Über neue, seltene und kritische Ascomyceten und Fungi imperfecti. I. Ann. myc. **36**: 367-400.
- Korf, R. P.** 1951. *Arachnopeziza obtusipila* Grelet descr. emend. Mycologia **43**: 211-214.
- Lanjouw, J.** 1939. On the standardization of herbarium abbreviations. Chronica Botanica **5**: 142-150.
- Lindau, G.** 1897. Pezizineae, in Engler, A. und K. Prantl, Die natürlichen Pflanzenfamilien, I, **1\***: 178-243.
- Martin, G. W.** 1934. Three new heterobasidiomycetes. Mycologia **26**: 261-265.
- Massee, G.** 1894. Revised descriptions of type specimens in Kew herbarium. Grevillea **22**: 99-107.
- Migula, W.** 1913. Kryptogamen-Flora von Deutschland, Deutsch-Österreich und der Schweiz, III, in Thomé's Flora von Deutschland, Österreich und der Schweiz, **10\***: 685-1404.
- Morgan, A. P.** 1902. The discomycetes of the Miami Valley, Ohio. Jour. Mycology **8**: 179-192.
- Nannfeldt, J. A.** 1932. Studien über die Morphologie und Systematik der nicht-lichenisierten inoperculaten Discomyceten. Nova Acta Regiae Soc. Sc. Upsal., **4**, **3\***: 1-368.
- . 1936. Contributions to the mycoflora of Sweden. 3. Some rare or interesting inoperculate Discomycetes. Svensk Bot. Tidskrift **30\***: 295-306.
- Nylander, W.** 1869. Observationes circa Pezizas Fenniae. Not. Sallsk. fauna et fl. fenn. förhandl. **10** (n.s. **7**): 3-97, 403-404.
- Overholts, L. O.** 1929. Research methods in the taxonomy of the Hymenomyces. Proc. Intern. Congr. Pl. Sc. (Ithaca) **2**: 1688-1712.
- Phillips, W.** 1887. A manual of the British Discomycetes. p. 1-462. London.
- Raymond, J. R.** 1934. Contribution à la connaissance des Ascomycètes. Botaniste **26**: 371-537.

- Rehm, H.** 1891. Ascomyceten: Hysteriaceen und Discomyceten, in Rabenhorst, L., Kryptogamen-Flora von Deutschland, Oesterreich und der Schweiz, 1<sup>3</sup> [Lief. 36]: 529-592.  
 ———. 1892. *Ibid.*, [Lief. 38]: 657-720.  
 ———. 1904. Ascomycetes Americae borealis. *Ann. myc.* 2: 351-354.  
 ———. 1914. Zur Kenntnis der Discomyceten Deutschlands, Deutsch-Österreichs und der Schweiz. II. Nachtrag. *Berichte Bayerischen Bot. Gesellschaft* 14: 85-108.
- Rogers, D. P.** 1949. Proposals for the amendment of the International Rules. *Mycologia* 41: 215-221.
- Saccardo, P. A.** 1884. Conspectus generum Discomycetum hucusque cognitorum. *Bot. Centralbl.* 18: 213-220, 247-256.  
 ———. 1889. *Sylloge fungorum*, 8: 1-1143.
- Schröter, J.** 1893. Die Pilze Schlesiens, in Cohn, F., Kryptogamen-Flora von Schlesien, 3<sup>2</sup>: 1-128.  
 ——— (completed by G. Lindau). 1897. Pezizineae, in Engler, A. und K. Prantl, Die natürlichen Pflanzenfamilien, I, 1<sup>\*</sup>: 173-243.
- Seaver, F. J.** 1938. Photographs and descriptions of cup-fungi. XXX. *Arachnopeziza*. *Mycologia* 30: 659-663.
- Singer, R.** 1950. Should Dr. D. P. Roger's proposals for the regulation for fixing the generic types be accepted as published in *Mycologia* 41: 219, 1949? *Mycologia* 42: 195-197.
- Starbäck, K.** 1895. Discomyceten-Studien. *Bihang Kongl. Svenska Vet.-Akad. Handl.* 21, 3<sup>5</sup>: 1-42.
- Svrček, M.** 1948. Bohemian species of Pezizaceae subf. Lachneoideae. *Sborník Národního Musea v. Praze* 4B<sup>6</sup>: 1-95.
- Sydow, P.** 1897. *Index universalis*, in Saccardo, P., *Sylloge fungorum*, 12: 1-1053.
- Velenovsky, J.** 1934. *Monographia discomycetum Bohemiae*, 1: 1-436. 2: pl. 1-31. Prague.  
 ———. 1939. *Novitates mycologicae*. p. 1-208. Prague.  
 ———. 1947. *Novitates mycologicae novissimae*. p. 1-158. Prague.
- Whetzel, H. H.** 1945. A synopsis of the genera and species of the Sclerotiniaceae, a family of stromatic inoperculate Discomycetes. *Mycologia* 37: 648-714.
- White, W. L.** 1941. A monograph of the genus *Ruistroemia* (Discomycetes). *Lloydia* 4: 153-240.

## INDEX TO THE GENERA AND SPECIES

Accepted combinations appear in roman type, synonyms in italics, and new species or new combinations in boldface.

Arachnopeziza . . . . .	132,152	— var. <i>pinacea</i> . . . . .	170
<i>alboviridis</i> . . . . .	140	<b>major</b> . . . . .	164
<i>aliculariae</i> . . . . .	172	<i>nivea</i> . . . . .	153
<i>aranea</i> . . . . .	166	<i>obtusipila</i> . . . . .	157
<i>araneosa</i> . . . . .	165	— var. <i>minor</i> . . . . .	157
<i>arctostaphyli</i> . . . . .	153	<i>pileocrocata</i> . . . . .	170
<i>asteroma</i> . . . . .	173	<i>pineti</i> . . . . .	156
<i>aurata</i> . . . . .	153	<i>rhaphidospora</i> . . . . .	173
var. <i>alba</i> . . . . .	153	<i>ruborum</i> . . . . .	150
<i>aurelia</i> . . . . .	160	<i>salicina</i> . . . . .	171
<i>basitricha</i> . . . . .	173	<i>tapetoides</i> . . . . .	158
<i>candido-fulva</i> . . . . .	163	<i>trabinelloides</i> . . . . .	169
<i>contortica</i> . . . . .	170	<i>zonulata</i> . . . . .	171
<b>cornuta</b> . . . . .	158	<i>Arachnopezizella</i> . . . . .	135,152
<i>delicatula</i> . . . . .	156	<i>aurata</i> . . . . .	153
<i>eribasis</i> . . . . .	167	<i>Arachnoscypha</i> . . . . .	133,152
<i>fibrillosa</i> . . . . .	176	<i>aranea</i> . . . . .	166
<i>filamentosa</i> . . . . .	153	<i>aurelia</i> . . . . .	160
<i>fitzpatrickii</i> . . . . .	168	<i>zonulata</i> . . . . .	171
<i>fulgens</i> . . . . .	160	<i>Ascobolus crouani</i> . . . . .	148
<i>graminum</i> . . . . .	170	<i>Ascophanus lutamentorum</i> . . . . .	148
<i>laricina</i> . . . . .	170	<i>orbiloides</i> . . . . .	148

INDEX TO THE GENERA AND SPECIES—continued

Belonidium subgen. <i>Arach-</i>			
<i>nopeziza</i> . . . . .	152		
<i>aliculariae</i> . . . . .	172		
<i>araneosum</i> . . . . .	165		
<i>asteroma</i> . . . . .	173		
<i>auratum</i> . . . . .	153		
<i>aurelia</i> . . . . .	160		
<i>delicatulum</i> . . . . .	156		
<i>fulgens</i> . . . . .	160		
<i>griseo-vitellinum</i> . . . . .	150		
<i>heteromorphum</i> . . . . .	174		
<i>leucorrhodinum</i> . . . . .	174		
<i>melaneres</i> . . . . .	171		
<i>phlegmaceum</i> . . . . .	153		
<i>pineti</i> . . . . .	156		
<i>rhabdospermum</i> . . . . .	153		
<i>rhenopalaticum</i> . . . . .	152		
— f. <i>distinguendum</i> . . . . .	152		
<i>ruborum</i> . . . . .	150		
Belonium <i>retincolum</i> . . . . .	151		
<i>rhabdospermum</i> . . . . .	153		
<i>rhenopalaticum</i> . . . . .	152		
Calonectria <i>leucorrhodina</i> . . . . .	174		
Chalara <i>rubi</i> . . . . .	151		
Cheilymenia <i>vinacea</i> . . . . .	150		
Chrysothallus . . . . .	134		
<i>vandae</i> . . . . .	167		
Cistella <i>tapesioides</i> . . . . .	158		
<i>xylita</i> . . . . .	159		
Cyphella <i>porioides</i> . . . . .	176		
Dasyscypha <i>aranea</i> . . . . .	166		
<i>fusco-umbrina</i> . . . . .	148		
<i>trabinelloides</i> . . . . .	169		
Dasyscyphella <i>miniopsis</i> . . . . .	152		
Desmazierella . . . . .	136		
Durella <i>sanguinea</i> . . . . .	146		
Erinella <i>byssacea</i> . . . . .	156		
<i>rhapidospora</i> . . . . .	173		
Eriopezia . . . . .	134, 140		
<i>albo-lateritia</i> . . . . .	146		
<i>alboviridis</i> . . . . .	140		
<i>aurea</i> . . . . .	146		
<i>aurelilla</i> . . . . .	167		
— var. <i>sulphurea</i> . . . . .	172		
<i>caesia</i> . . . . .	140		
— var. <i>sordida</i> . . . . .	144		
<i>candido-fulva</i> . . . . .	163		
<i>capillaris</i> . . . . .	144		
<i>caricina</i> . . . . .	144		
<i>carpinacea</i> . . . . .	144		
<i>chavetiae</i> . . . . .	140		
<i>corni</i> . . . . .	146		
<i>cupularum</i> . . . . .	172		
<i>eribasis</i> . . . . .	167		
<i>erratica</i> . . . . .	140		
<i>fusco-umbrina</i> . . . . .	148		
<i>globulifera</i> . . . . .	148		
<i>glomerata</i> . . . . .	144		
<i>loti</i> . . . . .	144		
<i>lupini</i> . . . . .	144		
<i>lutamentorum</i> . . . . .	148		
<i>microscopica</i> . . . . .	144		
<i>nectrioides</i> . . . . .	144		
<i>orbilioides</i> . . . . .	148		
<i>paludosa</i> . . . . .	148		
<i>peculiaris</i> . . . . .	146		
<i>picea</i> . . . . .	149		
<i>pileocrocata</i> . . . . .	170		
<i>polytrichi</i> . . . . .	146		
<i>porioides</i> . . . . .	176		
<i>prolifera</i> . . . . .	149		
<i>prunicola</i> . . . . .	149		
<i>rehmiana</i> . . . . .	149		
<i>rosarum</i> . . . . .	146		
<i>smaragdina</i> . . . . .	149		
<i>tentaculifera</i> . . . . .	146		
<i>vandae</i> . . . . .	167		
Gorgoniceps <i>aridula</i> . . . . .	174		
<i>aurata</i> . . . . .	153		
<i>barbilophoziae</i> . . . . .	172		
<i>delicatula</i> . . . . .	156		
Helotiella <i>cornuta</i> . . . . .	158		
<i>major</i> . . . . .	164		
<i>nuttallii</i> . . . . .	169		
<i>trabinelloides</i> . . . . .	169		
— var. <i>nuttallii</i> . . . . .	169		
Helotium <i>retincolum</i> . . . . .	152		
<i>trabinelloides</i> . . . . .	169		
Humaria <i>chavetiae</i> . . . . .	140		
<i>vinacea</i> . . . . .	150		
Hyaloscypha <i>leuconica</i> . . . . .	160		
Karschia <i>lignyota</i> . . . . .	175		
Lachnaster . . . . .	168		
<i>Lachnea albo-olivacea</i> . . . . .	140		
<i>alboviridis</i> . . . . .	140		
<i>caesia</i> . . . . .	140		
<i>pileocrocata</i> . . . . .	170		
<i>Lachnella aranea</i> . . . . .	166		
<i>aurelia</i> . . . . .	160		
<i>caesia</i> . . . . .	140		
<i>corni</i> . . . . .	148		
<i>eribasis</i> . . . . .	167		
<i>erratica</i> . . . . .	140		
<i>Lachnum prasinum</i> . . . . .	148		
Leptobelonium . . . . .	173		
Micropodia <i>aurea</i> . . . . .	146		
Mollisia <i>aliculariae</i> . . . . .	172		
<i>aureliella</i> . . . . .	167		
<i>retincola</i> . . . . .	151		
Neottliella <i>zonulata</i> . . . . .	171		
Patellaria <i>bicolor</i> . . . . .	160		
Peziza <i>aliculariae</i> . . . . .	172		
<i>arachnoidea</i> Cooke . . . . .	165		
<i>arachnoidea</i> Schw. . . . .	175		
<i>aranea</i> . . . . .	166		
<i>araneosa</i> . . . . .	165		
<i>asteroma</i> . . . . .	173		
<i>aurelia</i> . . . . .	160		
— var. <i>minor</i> . . . . .	172		
<i>aureliella</i> . . . . .	167		
<i>bloxami</i> . . . . .	175		

INDEX TO THE GENERA AND SPECIES—*continued*

<i>caesia</i> . . . . .	140	<i>aureliella</i> . . . . .	167
<i>candido-fulva</i> . . . . .	163	<i>bloxami</i> . . . . .	175
<i>chavetiae</i> . . . . .	140	<i>caesia</i> . . . . .	140
<i>cornuta</i> . . . . .	158	<i>candido-fulva</i> . . . . .	163
<i>discincola</i> . . . . .	175	<i>chavetiae</i> . . . . .	140
<i>epithelephora</i> . . . . .	142	<i>corni</i> . . . . .	148
<i>eriobasis</i> . . . . .	167	<i>cruentia</i> . . . . .	146
<i>erratica</i> . . . . .	140	<i>derelecta</i> . . . . .	163
<i>erysiphoides</i> . . . . .	146	<i>discincola</i> . . . . .	175
<i>ferruginea</i> . . . . .	175	<i>eriobasis</i> . . . . .	167
<i>fibrillosa</i> . . . . .	176	<i>erratica</i> . . . . .	140
<i>griseo-vitellina</i> . . . . .	150	<i>erysiphoides</i> . . . . .	146
<i>heteromorpha</i> . . . . .	174	<i>fibrillosa</i> . . . . .	176
<i>kneiffei</i> . . . . .	151	<i>fulgens</i> . . . . .	160
<i>leucorrhodina</i> . . . . .	174	<i>fusca</i> f. <i>pruni</i> . . . . .	149
<i>lichenoides</i> . . . . .	140	<i>fusco-umbrina</i> . . . . .	148
<i>lutamentorum</i> . . . . .	148	<i>griseo-vitellina</i> . . . . .	150
<i>melaneres</i> . . . . .	171	<i>kneiffei</i> . . . . .	151
<i>messerschmidii</i> . . . . .	146	<i>legeriana</i> . . . . .	140
<i>phlegmacea</i> . . . . .	153	<i>lutamentorum</i> . . . . .	148
<i>pileocrocata</i> . . . . .	170	<i>nivea</i> . . . . .	153
<i>porioides</i> . . . . .	176	<i>orbiloides</i> . . . . .	148
<i>prolifera</i> . . . . .	149	<i>phlegmacea</i> . . . . .	153
<i>rehmiana</i> . . . . .	149	<i>pileocrocata</i> . . . . .	170
<i>retincola</i> . . . . .	151	<i>prolifera</i> . . . . .	149
<i>rhabdosperma</i> . . . . .	153	<i>prunicola</i> . . . . .	149
<i>rhaphidospora</i> . . . . .	173	<i>rehmiana</i> . . . . .	149
<i>ruborum</i> . . . . .	150	<i>retincola</i> . . . . .	151
<i>scutelliformis</i> . . . . .	150	<i>rhabdosperma</i> . . . . .	153
<i>varicolor</i> c. <i>extus</i>		<i>rosae</i> var. <i>prunicola</i> . . . . .	149
<i>fusco-umbrina</i> . . . . .	148	<i>scutelliformis</i> . . . . .	149
<i>vinacea</i> . . . . .	150	<i>stipata</i> . . . . .	150
<i>wauchii</i> . . . . .	160	<i>torulae</i> . . . . .	149
<i>Pezizella xylia</i> . . . . .	159	<i>varicolor</i> var. <i>fusco-umbrina</i> . . . . .	148
<i>Pezizellaster</i> . . . . .	168	<i>vinacea</i> . . . . .	150
<i>Phialea aranea</i> . . . . .	166	<i>Tapesina</i> . . . . .	133, 150
<i>legeriana</i> . . . . .	140	<i>griseo-vitellina</i> . . . . .	150
<i>Polynema</i> LéV. . . . .	152	<i>retincola</i> . . . . .	151
<i>Polynema</i> LéV. <i>emend.</i> Fekl. . . . .	152	<i>ruborum</i> . . . . .	150
<i>aurelium</i> . . . . .	160	<i>Trichobelonium asteroma</i> . . . . .	173
<i>Porothelium lacerum</i> . . . . .	176	<i>distinguendum</i> . . . . .	152
<i>Scutula leucorrhodina</i> . . . . .	174	<i>griseo-vitellinum</i> . . . . .	150
<i>Solenia porioides</i> . . . . .	176	<i>kneiffei</i> . . . . .	152
<i>stipata</i> . . . . .	150	<i>retincolum</i> . . . . .	152
<i>Solenopezia trabinelloides</i> . . . . .	169	<i>viriginium</i> . . . . .	153
<i>Strossmayeria</i> . . . . .	173	<i>Trichopeziza albo-olivacea</i> . . . . .	140
<i>Tapesia</i> subgen. <i>Eriopezia</i> . . . . .	140	<i>aranea</i> . . . . .	166
<i>albo-olivacea</i> . . . . .	140	<i>caesia</i> . . . . .	140
<i>alboviridis</i> . . . . .	140	<i>chavetiae</i> . . . . .	140
<i>arachnoidea</i> . . . . .	175	<i>eriobasis</i> . . . . .	167
<i>aurata</i> . . . . .	153	<i>erratica</i> . . . . .	140
<i>aurea</i> . . . . .	146	<i>fusco-umbrina</i> . . . . .	148
<i>aurelia</i> . . . . .	160	<i>trabinelloides</i> . . . . .	169
		<i>Velutaria griseo-vitellina</i> . . . . .	150