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SYNOPSIS OF THE HYALOSCYPHACEAE

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АКАДЕМИЯ НАУК ЭСТОНСКОЙ ССР
ИНСТИТУТ ЗООЛОГИИ И БОТАНИКИ

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lotiaceae and their medullary excipulum is more poorly developed, but the latter seems to be present in all typical members of Dasyscyphus, e.g. D. virgineus and D. nudipes. One can find extremely massive medullary excipulum of textura intricata in D. pygmaeus and the long-spored tropical species of the genus seem to have thicker layers of textura intricata than the North temperate species. I have also observed a medullary layer of textura intricata in the central part of the apothecium of Belonidium leucophaeum but it becomes considerably thinner towards the margins and in the marginal regions of the apothecium ectal excipulum is prevalent. There are no members of the Helotiaceae to which Lachnellula could be more or less closely related. On the other hand several tropical species of Dasyscyphus have not only filiform spores and a more or less conspicuous layer of textura intricata but cylindrical obtuse paraphyses too showing in these features affinities to Lachnellula. So I am inclined to regard Lachnellula as a member of the Hyaloscyphaceae. It has, however, to be pointed out that the medullary textura intricata layer is lacking in Hyaloscypha, Hyalopeziza and related genera, and probably in T. nidulus as well. The significance of this anatomical character in the taxonomy of the Hyaloscyphaceae is rather unclear so far.

The tribe Arachnopezizeae generally included in the Hyaloscyphaceae since Nannfeldt's classi cal work (1932) is excluded in the present study. In spite of the presence of hairs the apothecial anatomy of the Arachnopezizeae is very different from that of the remaining Hyaloscyphaceae and resembles the anatomy of Durelloideae and Phialeoideae (Helotiaceae). As the presence or absence of hairs seems to be of secondary importance in this

case the Arachnopezizeae are removed from the Hyaloscyphaceae into the Helotiaceae. Very probably the three tribes mentioned should be united into a new family but this is a problem to be resolved in the future.

15 genera are included in the family in the present study. This number is approximately the same as that in the last treatment of the Hyaloscyphaceae by Dennis (1968) - 17 genera without the Arachnopezizeae, but several important rearrangements have been made.

The very large and heterogenous genus Dasyscyphus is divided into 5 genera. All these genera are natural groups of closely related species distinctly different in hair characters but exposing series of parallel evolution within the genera.

Two of these genera - Belonidium and Trichopezizella have already been given subgeneric rank by Dennis (1962) but I cam see no reason to follow a very wide generic concept and I prefer to treat two taxa mentioned as independent genera. The so-called "acutipilae" group is also quite different from typical Dasyscyphas in its smooth conical pointed hairs and deserves generic rank as well as the "niveae" group with its peculiar smooth-tipped hairs. A new genus Albotricha is described and the old but misinterpreted genus Dasyscyphella is emended respectively.

Several species with one-celled and only more or less apically granulated hairs are removed from Dasyscyphus into Clavidisculum which is an earlier valid name to replace Cistella or Discocistella. So the genus Dasyscyphus is restricted to species characterized by totally granulate septate hairs.

The parallel or homologous evolution within these closely related genera is expressed by the species forming series according to the enlargement of

their spore length and ensuing septation and by the species possessing either lanceolate or cylindric lanceolate or cylindrical paraphyses. The phenomenon of parallel evolution is rather widely distributed and well expressed within the Hyaloscyphaceae and the existence of Vavilov's homologous series (an example is given in Tab.1) has caused confusion in the taxonomy of the family in earlier times when the genera were established in the basis of paraphyse and spore shape and septation.

The similar homologous series exist in certain groups of Aphyllophorales as pointed out by Parmasto (1970), who has made an attempt to analyse this phenomenon. As the characters connected with ectal excipulum and related structures such as hairs are more conservative in the evolution of Inoperculate Discomycetes than hymenial characters there is evidently good reasons to establish the genera on the basis of the first characters.

On the other hand the genera characterized by thick-walled glassy hairs are united under Hyalopeziza since the minor differences in the form of hairs and lumen cannot be considered significant in principle.

The genera Diplocarpa, Trichodiscus, Microscypha and Mollisina are excluded from the family. The first three genera belong probably to the Dermataceae whereas the last might be Helotiaceous.

A new genus Incrupila is erected for two species with very peculiar heavily incrusted hairs. Dennis (1962, 1963) has placed them into Pezizella, but in my opinion they are truly Hyaloscyphaceous and probably related to Hyalopeziza. Velenovsky's genus Uncinia is considered to be valid, different from Hyaloscypha and related to Clavidisculum.

TAB. 1.
HOMOLOGOUS SERIES WITHIN SOME GENERA OF HYALOSCYPHACEAE

Genus	Aseptate small spores	Aseptate large spores	3-septate spores	Multiseptate spores
Clavidiasculum	acuum	grevillei	tenuiculum	-
Dasyscyphella	nivea	dryina	-	cassandrae
Belonidium sect. Flavobelonidium	violascens	leucophaeum	sulphureum	discolor
Belonidium sect. Belonidium	mollissimum	adenostylidis	aeruginosum	-
Albotricha	albotestacea	acutipila	andina	-

COMPUTER ANALYSIS OF THE GENERA OF THE HYALOSCYPHACEAE

117 species of the Hyaloscyphaceae were included in an attempt at computer analysis. Both Sokal's taxonomic distance and squared correlation coefficient between the species r^2q were computed from a set of standardized characters. The details of tech niques used can be looked up in Sokal and Sneath (1963). A Ural-4 computer and programs were used to find d and r^2q values.

The computer programs were drawn up by S. Veldre (Zoological Museum, Tartu State University) to whom the author is greatly indebted for his generous help in this part of the present study.

The set of original characters included 36 characters as follows:

1. Apothecia stipitate or sessile - 1, 0.
2. Diameter of apothecium in millimeters.
3. Apothecia totally hairy or hairs predominantly at margins - 1, 0.
4. Colour of hymenium: white, light, bright, dark - - 1, 2, 3, 4.
5. Colour of the outside of apothecium: white, light, bright, dark - 1, 2, 3, 4.
6. Shape of apothecium: saucer-shaped or discoid, cupulate, funnel-shaped, urceolate or subglobose - 1, 2, 3, 4.
7. Length of spores in microns.
8. Width of spores in microns.
9. Spore ends pointed or obtuse - 1, 0
10. Shape of spores: vermiform, acicular, cylindrical, fusoid, clavate, ellipsoid, ovate, globose - 1, 2, 3, 4, 5, 6, 7, 8.
11. Length of asci in microns.
12. Diameter of asci in microns.

13. Asci J+ or J- - 1, 0.
14. Shape of ascus tip: conical, obtuse, rounded - 1, 2, 3.
15. Shape of paraphyse tip: pointed, obtuse - 1, 0.
16. Shape of paraphyses: cylindrical, cylindric-lanceolate, lanceolate - 1, 2, 3,
17. Paraphyses exceeding or not exceeding the asci - 1, 0.
18. Diameter of paraphyses in microns.
19. Paraphyses coloured or hyaline - 1, 0.
20. Number of hair cells.
21. Length of hairs in microns.
22. Diameter of hairs in microns.
23. Hairs tapering or cylindrical to clavate - 1,0.
24. Shape of hair tip: pointed, obtuse, swollen - 1, 2, 3.
25. Apical cells of hairs different from other ones or not - 1, 0.
26. Hair wall totally granulate - 1, 0.
27. Hair wall apically granulate - 1, 0.
28. Hair wall basally granulate - 1, 0.
29. Hair wall totally smooth - 1, 0.
30. Hair wall incrusted by loosely attached granules - 1, 0.
31. Hair wall thin, thick, very thick - 1, 2, 3.
32. Hair wall glassy or not - 1, 0.
33. Hair with normal lumen or not - 1, 0.
34. Hair wall coloured or hyaline - 1, 0.
35. Content of hairs coloured or hyaline - 1, 0.
36. Hairs tipped by crystals or not - 1, 0.

The published characters were used for most of the species but in several cases original measurements were also included.

The meristic and countable characters are represented by their mean values.

Comparing the d and r^2q matrices it became evi-

dent that the second technique has certain advantages, particularly the better resolution power at generic level, in the present case. For this reason only the r^2q matrix is taken into consideration. As for technical reasons it was impossible to print the full r^2q matrix for all 117 species several species of larger genera not affecting the final result were excluded and the matrix reduced to 85 species.

The results are presented in the form of a rearranged matrix (Fig. 1). This graphical method was used for the classification of certain Deuteromycetes by Kendrick and Proctor (1964) and I find it to be the most simple and representative one in the present case. The aim of the computer analysis was to gain support for my logical conclusions on the limits of the genera of the Hyaloscyphaceae derived from the logical analysis of morphological characters. 12 of the 15 recognized genera of the family are presented in the figure. Beginning from the top left there are three comparatively small but compact genera Phialina, Hyaloscypha and Hyalopeziza. The species of Hyalopeziza are so closely linked that I can see no basis for the recognition Hyalotricha, Urceolella and Unguicularia as independent genera.

Next comes a small but very loose genus Psilachnum. The genus Clavidisculum is a rather loose one, too, without well-defined subgenera. There are evidently some affinities between Psilachnum and Clavidisculum.

The following genus Albotricha is the first of five genera commonly included into Dasyscyphus. It is clearly visible that they are entirely different groups and there is no justification for including them into a single genus. It is remarkable that Dasyscyphella is so well separated from Dasyscyphus and forms a very compact and distinct group. Albo-

tricha is also a rather homogenous group although A. orientalis occupies a slightly distant position from the other species. The three remaining genera are heterogenous ones. There are two distinct subgenera in both Trichopezizella and Belonidium. It must be noted that in this analysis B. elegantulum links more closely to the subgenus Phaeobelonidium than to Belonidium where is its more natural place. This is due to the overemphazised colour characters, particularly of the external colour of apothecium, in the input data. The choise of input data and coding of characters have to be done extremely carefully in order to avoid wrong conclusions in the analysis of output data. For example, the intrageneric connections are somewhat loose in Dasyscyphus and Clavidisculum where they should be denser according to my intuition as a taxonomist. Using different sets of characters and differently coded characters it should be possible to obtain the optimal classification.

On the other hand some species belonging to different subgenera of Dasyscyphus are connected too closely. This is the result of using formula

$$x' = \frac{x - \bar{x}}{s}$$

for the standardization of all characters. This procedure undesirably weights up qualitative features with extremely unequal distribution. Spearman's correlation coefficient would smooth over these distortions, but it has serious shortcomings of its own and, moreover, it cannot be used for a set compounded of meristic and alternative characters as well as characters presented by the means of logical series. In the present case the crystal caps in hair tips which is a rare feature in the family acquires abnormally great weight and the result is

a false impression of close relationships between certain species with thin-walled and thick-walled hairs.

In the right lower end of the matrix the genera Lachnellula and Perrotia are presented as two distinct and rather compact groups.

The practical results of the computer analysis of the genera of the Hyaloscyphaceae are the following: (1) It corroborates the reality of my intuitively derived generic concepts. (2) It also reveals the subgeneric structure of several genera. (3) It draws the investigator's attention to some genera where the intrageneric connections are loose and which call evidently for more profound and detailed study. (4) It shows that for the study of phylogenetic relationships between the genera another type of analysis is needed since using species as input units the intergeneric connections become lost in the general background generated by parallel evolution in the genera and even in the subgenera (Vavilov's homologous series).

ВВЕДЕНИЕ

Автор настоящей работы подготовил монографическую обработку гиалосцифовых грибов и пришел в результате предаарительного изучения семейства к выводу, что его нельзя рассматривать в традиционных объеме и структуре. Некоторые роды были или исключены, или преобразованы, или описаны как новые. В результате этого возникли многие новые номенклатурные комбинации.

С другой стороны, отсутствует и пособие для определения многих видов семейства. В последнюю монографическую обработку семейства Деннисом /1949/ не включены многие континентальные альпийские виды, а данные о довольно многих видах разбросаны в мелких статьях.

По этим причинам я составил список гиалосцифовых грибов, которые мне известны или по гербарным материалам, или по адекватным описаниям. Чтобы такой конспект был полезным и для практических целей, он снабжен ключами для определения всех признанных родов и видов. Единственным исключением из этого правила являются тропические виды рода Dasyscyphus, которые составляют очень неясную группу, которую я не хочу рассматривать только на основе опубликованных данных.

Гиалосцифовые грибы

Семейство Hyaloscyphaceae было выдвинуто Наннфельдтом /1932/. Он включил в это семейство те роды порядка Helotiales, которые имели эксципулум из тонкостенных призматических клеток и были покрыты волосками. Последующие авторы использовали классификацию Наннфельдта без существенных изменений. Только Деннис /1962/ перенес наннфельдтовское подсемейство Trichoscyphelloideae из Helotiaceae в Hyaloscyphaceae. Джарне возражал, что на основе анатомии апотеций Lachnellula - единственный род подсемейства Trichoscyphelloideae должен остаться в Helotiaceae. Но в самом деле оказывается невозможным различать эти два семейства только на основе присутствия или отсутствия центрального слоя из рыхло переплетенных гиф. Гиалосцифовые грибы очень часто имеют более нежное строение, чем гелоциевые грибы, и в результате этого центральный слой их апотециев более слабо развит. Но все-таки типичные представители рода Dasyscyphus имеют этот слой. Очень толстую центральную траму из переплетенных гиф имеет D. pygmaeus, а длинноспоровые тропические виды, по-видимому, характеризованы более толстым слоем центральной трамы, чем виды северной умеренной зоны. Некоторые тропические виды рода Dasyscyphus имеют не только нитевидные споры и более или менее хорошо выраженный центральный слой из рыхло переплетенных гиф, но и цилиндрические тупые парафизы. По последним двум признакам они являются близкими к Lachnellula и я

считаю, что род Lachnellula следует включить в гиалосцифовые грибы. С другой стороны, отсутствует средний слой из рыхло переплетенных гиф у многих представителей гиалосцифовых грибов с очень маленькими плодовыми телами и придется отметить, что значение этого анатомического признака в систематике гиалосцифовых грибов далеко не выяснено.

Триба Arachnopezizeae обычно включается в гиалосцифовые грибы, но в настоящей работе они исключены из этого семейства, потому что имеют эктоэксципулум такого же типа, как и представители триб Durelloideae и Phialeoideae (Helotiaceae). По всей вероятности, эти трибы придется в дальнейшем соединить в одно семейство.

В настоящей работе 15 родов включены в семейство. Это примерно такое-же количество, как приводит Деннис /1968/ - 17 родов, не включая Arachnopezizeae - но сделаны некоторые важные рекомбинации.

Очень большой и гетерогенный род Dasyscyphus разделен на 5 родов на основе существенных различий в их волосках. Все эти роды составляют группы близкородственных видов и в них видны ряды параллельной эволюции. Параллельная или гомологичная эволюция в этих близкородственных родах выражена видами, которые образуют ряды, в которых увеличивается длина спор и появляются перегородки в спорах. Также изменяется форма парафиз в пределах одного рода от цилиндрической до ланцетовидной. Существование параллельной эволюции и вавиловских гомологичных рядов среди гиалосцифовых грибов причинило немало ошибок в их систематике в сравнительно недавние времена, когда роды определялись на основе формы парафиз, спор и наличия перегородок в спорах. Такие же гомологичные ряды выявлены среди афиллофоровых грибов /Пармасто, 1970/. Так как признаки, связанные с эктоэксципулумом и волосками, являются более консервативными, чем гимениальные признаки в эволюции гиалосцифовых грибов, то выделение родов на основе первых признаков можно считать весьма обоснованным.

С другой стороны, все роды с толстостенными стеклянистыми волосками объединены в один род Hyalopeziza, так как некоторые различия в форме волоска нельзя считать принципиально существенными.

Математический анализ родов гиалосцифовых грибов

В математический анализ были включены 117 видов гиалосцифовых грибов. Из нормированных признаков были вычислены и таксономическое расстояние Сокала и междувидовой коэффициент корреляции в квадрате при помощи ЭВМ Урал-4. Вообще было использовано 36 признаков.

При сравнении результатов матрица межвидовых коэффициентов корреляции оказалась более представительной и дальнейший анализ базировался на этом. По техническим причинам представлена матрица для 85 видов. Исключены виды, не оказывающие существенного влияния на окончательный результат.

Данные представлены в виде преобразованной матрицы, которая является наиболее

наглядным графическим выражением в данном случае. Целью математического анализа было утвердить мои логические выводы о границах родов гиалосцифовых грибов. В матрице представлены I2 из I5 родов, включенных в семейство.

На левой вершине расположены три маленьких, но компактных рода. Все виды рода Hyalopeziza так тесно соединены между собой, что я не вижу причин для выделения нескольких родов в этой группе.

Следующим идет маленький, но очень гетерогенный род Psilachnum. И следующий род Clavidisculum кажется гетерогенным без ясно выраженных подродов. По-видимому, эти два рода являются в некоторой мере родственными.

Следующий род Albotricha - один из пяти родов, которые обычно включают в Dasyscyphus. Ясно видно, что все эти роды являются весьма самостоятельными группами и никак не оправдано соединение их в единственный род. Dasyscyphella замечательно хорошо отличается от Dasyscyphus и образует очень гомогенную группу. В родах Trichopezizella и Belonidium ясно выделяются два подрода, что также видно и в роде Dasyscyphus. Приходится отметить, что B. elegantulum присоединяется более тесно к подроду Phaeobelonidium, хотя его место должно быть в подроде Belonidium. Такое искажение вызвано слишком большим весом признаков окраски в данном анализе. Правильные выбор и кодирование признаков чрезвычайно важны, чтобы избежать неправильных выводов при анализе результатов анализа. Так, например, в данном случае

внутривидовые связи кажутся искаженно слабыми в родах Dasyscyphus и Clavidisculum. Чтобы добиться оптимальной классификации, нужно пользоваться разными выборками признаков и кодировать признаки по-разному.

С другой стороны, некоторые виды, которые принадлежат к разным подродам рода Dasyscyphus являются слишком тесно связанными. Это является результатом нормирования всех признаков при помощи формулы

$$x' = \frac{x - \bar{x}}{s}$$

Эта процедура дает нежелательно большой вес квалитативным признакам с крайне неравномерным распределением. Эти искажения исправил бы коэффициент корреляции Спирмана, который, к сожалению, имеет свои недостатки, а тем более не может быть использован для выборки признаков, в которую включены признаки, представленные в виде логических рядов. В данном примере наличие накоплений кристаллов на верхушках волосков /сравнительно редкий признак в семействе/ приобретает ненормально большой вес, а результатом этого является фальшивое представление о близком родстве некоторых видов с тонкостенными волосками, с одной стороны, и некоторых видов с толстостенными волосками, с другой стороны.

В правом нижнем углу матрицы представлены два гомогенных рода Lachnellula и Perrotia.

Практические результаты математического анализа родов гиалосцифовых грибов следующие: I/ анализ подтверждает реальность мо-

их родовых концепций, основанных на таксономической интуиции. 2/ Анализ также выявил подроды в некоторых родах. 3/ Анализ направляет внимание исследователя на некоторые роды, в которых внутривидовые связи слабые, и которые, по-видимому, придется глубже и более тщательно изучить. 4/ Анализ показывает, что для изучения филогенетических связей между родами нужно пользоваться другим типом анализа, где признаки вводятся в анализ не по видам, а по родам. В настоящем случае связи между родами потеряются на общем фоне, причиной которого является параллельная эволюция в родах и даже в подродах /гомологичные ряды Вавилова/.

KEY TO THE INCLUDED GENERA

1. Hairs smooth or with smooth walls covered by loosely attached granules 2
- Hairs at least partially granulate 12

2. Hairs with very thick glassy walls 3
- Hairs with thin or moderately thickened but never glassy walls 4

3. Paraphyses filiform, simple; hairs with straight tips - Hyalopeziza (p. 32).
- Hairs with hooked tips; paraphyses with glassy hooked tips like hairs - Unguiculella (p. 37).

4. Hairs short, hooked, aseptate or up to 3-septate - Uncinia (p. 73).
- Hairs more or less straight 5

5. Hairs sharply pointed 6
- Hairs obtuse 7

6. Hairs aseptate; paraphyses filiform - Hyaloscypha (p. 29).
- Hairs multiseptate; paraphyses lanceolate - Albotricha (p. 40).

7. Hairs very strongly incrusted, with thin but glassy walls - Incrupila (p. 31).
- Hairs moderately or not incrusted; walls never glassy 8

8. Hairs 0-2-septate 9
- Hairs multiseptate 10

9. Paraphyses lanceolate - Psilachnum (p. 104).
- Paraphyses cylindrical, obtuse - Phialina (p.27).

10. Asci with broadly rounded, J- tips - Perrotia (p. 62).
- Asci with more or less conical, J+ tips . . 11
11. Hairs with thick, dark brown walls; apical cells paler - Trichopezizella (p. 58).
- Hairs with thin or moderately thickened walls, with coloured content or basally pale brown walls - Belonidium (p. 43).

12. Hairs partially granulate 13
- Hairs totally granulate 14

13. Hairs basally granulate with smooth apices 1-3 cells long - Dasyscyphella (p. 71).
- Hairs granulated apically or almost totally but basally smooth, aseptate or rarely up to 2-septate - Clavidisculum (p. 75).

14. Paraphyses lanceolate or at least pointed; asci with conical tips, always J+ - Dasyscyphus (p. 84).
- Paraphyses cylindrical, obtuse; asci with rounded tips, mostly J- - Lachnellula (p. 65).

Genus Phialina Höhn., Mitt. Bot. Inst. Techn. Hochsch. Wien 3: 67 (1926).

Apothecia sessile or subsessile, cupulate to discoid, yellowish, externally minutely pubescent. Hairs aseptate, thin-walled, cylindrical or conical, obtuse but sometimes pointed, hyaline or with yellowish content, smooth. Asci cylindric-clavate, 8- or 4-spored, J+. Spores narrowly fusoid, aseptate. Paraphyses cylindrical, obtuse.

Type species: Peziza deparcula Karst., Not. Sällsk. Fauna Flora Fenn. 10: 191 (1869).

This genus is placed into Hyaloscyphaceae with a great hesitation in the present study. It shows, of course, some affinities to Hyaloscypha, but on the other hand its some species resemble closely those of Calycellina, a member of Helotiaceae. As it is extremely difficult to decide the belonging of small species with reduced morphology to one or to another family the genus Phialina is regarded as a member of Hyaloscyphaceae until more detailed studies.

Included species:

PHIALINA LACHNOBRACHYA (Desm.)Raitv. comb. nova. Basionymum: Peziza lachnobrachya Desm., Ann. Sci. Nat., Bot. Ser. 3, 16: 322 (1851). /Lit.: Dennis, 1949: 72/.

Phialina puberula (Lasch)Höhn., Mitt. Bot. Inst. Techn. Hochsch. Wien 3: 106 (1926).

Phialina rosae Raitv., Eesti NSV TA Toim., Biol., 18: 68 (1969).

Phialina ulmariae (Lasch)Dennis Br. Cup Fungi 102 (1960). /=Phialina deparcula (Karst.)Höhn./.

Key to the included species

1. Growing on fallen leaves 2
- Growing on dead stems of Filipendula ulmaria Ap. 0.5 mm in diam., sessile, cupulate, ochraceous. Hairs cylindrical, thin-walled, hyaline, 15x2 μ. Asci cylindric-clavate, 25-30x4-5 μ. Sp. narrowly fusoid, 10-13x1.5 μ. Par. cylindrical, not exceeding the asci, 2 μ in diam., containing yellowish oil-drops. Eu -
P. ulmariae (Lasch)Dennis

2. Hairs obtuse 3
- Hairs sharply pointed, hyaline, smooth, 20-100x 3-6 μ. Ap. subsessile, discoid, 0.15-0.4 mm in diam., whitish to yellowish with hairy margin. Asci cylindric-clavate, 4- or 8-spored, 25-40x4-6 μ. Sp. narrowly fusoid, 10-16x1.5-2 μ. Par. cylindrical, not exceeding the asci. On fallen leaves of various deciduous trees. Eu, A -
P. lachnobrachya (Desm.)Raitv.

3. Sp. narrowly fusoid, 13-17x1.5-2 μ. Ap. sessile, discoid, 0.5 mm in diam., bright yellow to lemon yellow, with minutely hairy margin. Hairs cylindrical, containing yelllowish oil-drops, 20-25x 2-4 μ. Asci cylindric-clavate, 49-60x5-6.5 μ. Par. cylindrical, not exceeding the asci, 2-3 μ in diam. On fallen leaves of deciduous trees. Eu, A -
P. puberula (Lasch)Höhn.
- Sp. broadly fusoid, 6.5-11.3x2.4-3 μ. Ap. subsessile, cupulate, 0.1-0.3 mm in diam., whitish-yellow to pale ochraceous, externally minutely hairy. Hairs cylindrical, apically slightly swallen and with yellowish content, 24-28x2.5-3.5 μ. Asci cylindrical, 45-53x4-6 μ. Par. cylindrical, 2 μ in diam., not exceeding the asci. On fallen leaves of Rosa sp. MA -
P. rosae Raitv.

Genus Hyaloscypha Boud., Bull. Soc. Myc. Fr. 1: 118 (1885).

Apothecia sessile to subsessile, cup-shaped to saucer-shaped, hyaline to pale yellowish, externally downy by short hairs. Hairs conical or with cylindrical basis and sharply constricted narrowly conical apical part, sharply pointed, hyaline, thin-walled, aseptate. Ectal excipulum of thin-walled prismatical cells. Asci cylindric-clavate. Spores elliptical to fusiform-elliptical, sometimes flattened from one side, aseptate, sometimes containing distinct oil globules. Paraphyses narrowly cylindrical, obtuse, not exceeding the asci.

Type species: Peziza vitreola Karst., Not. Sällsk. Fauna Flora Fenn. 10: 180 (1869).

In this study the genus Hyaloscypha is restricted to a small group of closely related species. All they are wood-inhabiting, H. paludosa excluded, and it seems difficult to find their affinities to a rather large number of species earlier placed in the genus on arbitrarily chosen formal grounds. The removal of a pointed-hair species H. lachnobrachya into Phialina is the most disputable step, but I feel intuitively that the ascus shape and narrow pointed spores have nothing in common with the corresponding features in typical Hyaloscyphas.

Included species:

Hyaloscypha hyalina (Fr.)Boud. Discom. d'Eur. 127 (1907).

HYALOSCYPHA LECTISSIMA (Karst.)Raitv. comb. nova
Basionymum: Peziza lectissima Karst., Not. Sällsk. Fauna Flora Fenn. 10: 184 (1869).

Hyaloscypha paludosa Dennis, Kew Bull 16 : 325 (1962).

HYALOSCYPHA TIGILLARIS (Karst.)Raitv. comb. nova
Basionymum: Peziza tigillaris Karst., Not. Sällsk. Fauna Flora Fenn. 10: 184 (1869).

Hyaloscypha vitreola (Karst.)Boud., Bull. Soc. Myc. Fr. 1: 118 (1885). (sensu Karst. non Boud.).

Excluded or dubious species: H. dematiicola (Berk. et Br.)Nannf., H. flaveola (Cooke)Nannf./=Phialina ulmariae/, H. richonis (Boud.)Dennis*/belongs to Trichodiscus/, H. leuconica (Cooke)Nannf. /= H. hyalina/, H. stevensoni (Berk. et Br.)Nannf. /=H. hyalina/, H. australis Dennis /?=H. lectissima/, H. minutella Boud. /?=H. vitreola Karst./.

Key to the included species

1. Sp. 7-13x2.5-4.5μ, ellipsoid, with two distinct oil-drops. Hairs conical, 28-56x2.2-4μ. Asci cylindric-clavate, 41-65x5.5-10μ. On decaying wood. Eu, A - H. tigillaris (Karst.)Raitv.
- Sp. 1.5-3.5μ broad 2

2. Growing on rotting grasses and rushes in swamps. Hairs conical, 40-115x3-4μ. Asci clavate, 50-85x6-7μ. Sp. subcylindrical, 9-15x2-2.5μ. Eu - H. paludosa Dennis
- Growing on decaying wood 3

3. Sp. 9.3-15x2.3-3μ, fusoid-ellipsoid. Hairs conical, 22-46x2.5-4μ. Asci cylindric-clavate, 50-70x5.8-10μ. On decaying wood. Eu, A - H. vitreola (Karst.)Boud.
- Sp. 5-11μ long 4

4. Hairs usually conical, 13-55x1.7-5.5μ. Asci cylindric-clavate, 27-47x4-6.6μ. Sp. fusoid-ellipsoid, 5-9.3x1.5-2.7μ. On decaying wood. Eu, A, NAm - H. hyalina (Fr.)Boud.
- Hairs usually with broad cylindrical basis abruptly tapering into slender conical tip, 17-43x2.7-4.4μ. Asci cylindric-clavate, 33-53x5-8.3μ. Sp. fusoid-ellipsoid, 6.6-11x1.8-3.0μ. On decaying wood. Eu - H. lectissima (Karst.)Raitv.

Genus INCRUPILA Raitv. genus novum

Apothecia sessilia, minuta, albida, urceolata vel cupulata. Pili hyalini, cylindracei, subcrassiter tunicati, multicellulares, granulis hyalinis crassiter incrustati. Asci cylindracei. Sporae fusoideo-clavatae, unicellulares. Paraphyses cylindraceae, ascos non superantes.

Typus generis: Peziza aspidii Lib. Pl. Crypt. Ard., 3, 226 (1834).

The genus is characterized by its peculiar hairs which are septate, with firm walls. The walls are glassy in appearance like those of Hyalopeziza. These characters are, however, visible after the massive incrustation is removed. The genus occupies a rather isolated position in the family, the affinities are towards Hyalopeziza.

Included species:

INCRUPILA ACANTHONITSCHKEAE (Cash et Davids.) Raitv. comb. nova.
Basionymum: Dasyscypha acanthonitschkeae Cash et Davids., Mycologia 32: 730 (1940).

INCRUPILA ASPIDII (Lib.)Raitv. comb. nova.
Basionymum: Peziza aspidii Lib. Pl. Crypt. Ard., 3, 226 (1834).

Key to the included species

1. On fronds of ferns. Ap. sessile, urceolate to cupulate, 0.1-0.3 mm in diam., whitish to cream-coloured. Hairs 30-53x3-5μ, heavily incrusted. Asci clavate to subfusoid, 20-30x3-5μ. Sp. clavate-fusoid, 3.5-6x1μ. Par. filiform, obtuse, not exceeding the asci. Eu -
I. aspidii (Lib.)Raitv.

- On the stromata of Pyrenomycetes. Ap. sessile, nearly globose at first, then subglobose to cupulate, 0.1-0.2 mm in diam., white. Hairs 65-90x 3-4μ, heavily incrusted. Asci cylindrical, 22-24x3-3.5μ. Sp. elliptic-clavate to fusoid-clavate, 3.5-4x1.5-2μ. Par. filiform, obtuse, not exceeding the asci. NAm -
I. acanthonitschkeae (Cash et Davids.)Raitv.

Genus Hyalopeziza Fuckel Symb. Myc. 298 (1869) emend. Höhn., Sitzb. Akad. Wiss. Math-nat. I 61: 1003 (1902).

Syn.: Hyalotricha Dennis, Comm. Myc. Inst. Myc. Pap. 32: 75 (1949). Unguicularia Höhn., Ann. Myc. 3: 404 (1905). Urceolella Boud., Bull. Soc. Myc. France 1: 119 (1885). Olla Vel. Mon. Disc. Boh. 286 (1934). Pilatia Vel. Mon. Disc. Boh. 289 (1934). Pseudo-olla Vel. Mon. Disc. Boh. 288 (1934).

Apothecia minute, sessile or subsessile, subglobose, urceolate or cup-shaped, whitish, rarely reddish or brownish, externally covered by short hairs. Hairs cylindrical, conical or subpyriform, with very thick glassy walls, sometimes with very

small basal lumen or pseudoseptate. Asci cylindrical to cylindric-clavate. Spores of various shape, aseptate. Paraphyses filiform, not exceeding the asci.

Type species: Hyalopeziza ciliata Fuckel Symb. Myc. 298 (1869).

The genus is well characterized by the peculiar hairs with thick glassy walls. In the type species H. ciliata the hairs are often described as septate but there are, however, no true septa present. The false impression of septate hairs is given by the strongly swollen portions of hair walls interrupting the thin lumen.

The variability of the hairs is rather wide in the limits of the genus but in spite of the fact that the extremities could be well separated I propose no subgenera due to the presence of such intermediate forms as H. crispula, H. winteriana and H. carestiana. It is also remarkable that our computer analysis reveals no distinct constellations of species within this genus (Fig. 1).

There are several herbicolous species included in Unguicularia (vide Dennis, 1949: 78) different from H. millepunctata in larger spores and asci. I am not going to include these species in Hyalopeziza until it becomes clear how many of them are really good species to avoid unnecessary new combinations.

Included species:

HYALOPEZIZA ASPERA (Fr.)Raitv. comb. nova.
Basionymum: Excipula aspera Fr. Syst. Myc. 2: 597 (1822).

HYALOPEZIZA CARESTIANA (Rabenh.)Raitv. comb. nova
Basionymum: Peziza carestiana Rabenh., Hedwigia 5: 189 (1866).

Hyalopeziza ciliata Fuckel Symb. Myc. 298 (1869) /Lit.: Dennis, 1949: 63/.

HYALOPEZIZA CORTICICOLA (Dennis)Raitv. comb. nova
Basionymum: Hyalotricha corticicola Dennis, Comm Myc. Inst. Myc. Pap. 32: 75 (1949).

HYALOPEZIZA COSTATA (Boud.)Raitv. comb. nova
Basionymum: Urceolella costata Boud., Bull. Soc. Myc. Fr. 1: 95 (1881). /Lit.: Boudier, 1910: pl. 532/.

HYALOPEZIZA CRISPULA (Karst.)Raitv. comb. nova.
Basionymum: Peziza crispula Karst., Not. Sällsk. Fauna Flora Fennica 10: 181 (1869). /Lit.: Dennis, 1949: 77/.

HYALOPEZIZA GRAMINICOLA (Raitv.)Raitv. comb. nova.
Basionymum: Urceolella graminicola Raitv., Eesti NSV TA Toim. Biol. 17: 329 (1968).

HYALOPEZIZA MILLEPUNCTATA (Lib.)Raitv. comb. nova
Basionymum: Peziza millepunctata Lib. Pl. Crypt. Ard., II, 128 (1832). /Lit.: Dennis, 1960: 100, sub U. cirrhata (Crouan)LeGal/

HYALOPEZIZA TRICHODEA (Phill. et Plowr.) Raitv. comb. nova.
Basionymum: Peziza trichodea Phill. et Plowr., Grevillea 3: 125 (1875). /Lit.: Dennis, 1949: 76/.

HYALOPEZIZA TIANSCHANICA Raitv. sp. nova.
Apothecia cupulata, sessilia, 0.1-0.2 mm in diam., albida, extus longe raripilosa. Pili conocy indracei, acuti, hyalini, lumine interrupto vel minusculo basali, 70-205x1.5-6.5 μ. Asci cylindracei, 55-90x5-7 μ. Sporae ellipsoideo-fusoideae, aseptatae, 6.5-10.5x2 μ. Paraphyses cylindraceae, 1.5 μ in diam.
Ad folia caduca crescit.

Holotypus : U.R.P.S.S., R.P.S.S. Kirghizica, Tianschan interior, Montes Naryntau, ad folia caduca Populi, 22. VII 1967, H. Remm legit (TAA-44996).
H. ciliatae similis, sporis majoris differt.

HYALOPEZIZA WINTERIANA (Rehm)Raitv. comb. nova.
Basionymum: Trichopeziza winteriana Rehm, Hedwigia 24: 230 (1885).

Excluded, dubious or imperfectly known species: Unguicularia diaphana (Rehm) Nannf., U. digitalincola (Rehm)Höhn., U. galii (Mout.)Höhn., U. incarnatina (Quél.)Nannf., U. raripila Höhn., U. scrupulosa (Karst.)Höhn.

Key to the included species

1. Hairs 50-200 μ long 2
- Hairs 20-70 μ long 6

2. Ect. exc. brown 3
- Ect. exc. hyaline 4

3. On fallen pine needles. Ap. substipitate, cupulate, 0.5 mm in diam., brown, externally covered by hyaline hairs. Hairs cylindrical, tapering, up to 160x4 μ. Asci cylindrical, 30x3 μ. Sp. cylindric-fusiform, 6-7x1.5 μ. Par. cylindrical, 1 μ in diam. Eu - H. trichodea (Phill. et Plowr.) Raitv.
- On dead wood and bark of Myrica and Betula, Ap. substipitate, cupulate, 0.2 mm in diam., brown, densely covered by long white hairs. Hairs cylindrical, obtuse, up to 120x3 μ. Asci cylindric-clavate, 25x4 μ. Sp. narrowly fusoid, 4.5-6x1 μ. Par. cylindrical, 1 μ in diam. Eu - H. corticicola (Dennis)Raitv.

4. On fallen leaves 5
- On dead herbaceous stems. Ap. sessile, subglobo-

se, white, 0.1-0.3 mm in diam., with hairy margin. Hairs cylindrical, sharply bent near the base, 50-150x5μ. Asci cylindrical, 28-40x3.5-5.5μ. Sp. fusoid to clavate-fusoid, 5-8.5x1.5-2μ. Par. cylindrical. 1.5μ in diam. Eu, A - H. crispula (Karst.)Raitv.

5. Sp. ellipsoid, 4-5.5x1.5-2μ. Ap. sessile, cupulate, 0.1-0.2 mm in diam., white, covered by unnumerous long hairs. Hairs cylindrical or conic-cylindrical, sharply pointed, 125-150x2-4μ. Asci cylindric-clavate, 27-40x3.5-5μ. Par. cylindrical, 0.15μ in diam. On fallen leaves. Eu - H. ciliata Fuckel
- Sp. ellipsoid-fusoid, 6.5-10.5x2μ. Ap. sessile, cupulate, white, covered, by unnumerous long hairs. Hairs conic-cylindrical, sharply pointed, 70-205x1.5-6.5μ. Asci cylindrical, 35-60x4.5-6μ Par. cylindrical, 0.15μ in diam. On fallen leaves. MA - H. tianschanica Raitv.

6. Ect. exc. brown 7
- Ect. exc. hyaline 8

7. Ect. exc. of very thick-walled cells. Ap. sessile, 0.5 mm in diam., urceolate, brown. Hairs conic-cylindrical, obtuse, 45x4μ. Asci cylindric-oblong, 60-70x10-11μ. Sp. clavate, 10-15x3-3.5μ Par. cylindrical. On dead fronds of ferns.-Eu - H. aspera (Fr.)Raitv.
- Ect. exc. of thin-walled cells. Ap. sessile, urceolate, 0.2 mm in diam., grayish-brown with whitish margin. Hairs cylindric to conical, obtuse, 6.5-13x3-4μ. Asci cylindrical, 34-38x3.4-4μ. Par. cylindrical. On dead grasses. A - H. graminicola (Raitv.)Raitv

8. On fronds of ferns 9
- On stems of flowering plants 10

9. Sp. cylindrical or cylindric-fusoid or clavate-cylindrical, 15-23x3-4μ. Ap. sessile, urceolate, 0.1-0.2 mm in diam., white. Hairs cylindrical, 30-50x3-4μ. Asci cylindrical, 4-spored, 35-55x5-7μ. Par. cylindrical. On dead fronds of ferns. Eu - H. carestiana (Rab.)Raitv.
- Sp. clavate, 8-12x1.5-2.5μ. Ap. sessile, urceolate, white, 0.2-0.3 mm in diam. Hairs cylindrical, 25-70x2.5-4μ. Asci cylindrical, 8-spored, 30-45x5-8.5μ. Par. cylindrical. On dead fronds of ferns. Eu - H. winteriana (Rehm)Raitv.

10. Ap. sessile, urceolate, 0.1-0.3 mm in diam., white. Hairs cylindrical, 15-40x4-5μ. Asci clavate, 25-30x4-5μ. Sp. cylindric-fusoid or clavate-fusoid, 5-7.5x1-1.5μ. Par. cylindrical, 1.5μ in diam. On dead herbaceous stems. Eu - H. millepunctata (Lib.)Raitv.
- Ap. sessile, urceolate, 0.2-0.6 mm in diam., white. Hairs cylindrical, 35-50x3-5μ. Asci cylindrical, 30-35x5.5-7μ. Sp. fusoid, 9-11x1-2μ. Par. cylindrical, 1.5μ in diam. On dead stems of Juncus. Eu - H. costata (Boud.)Raitv.

Genus Unguiculella Höhn., Sitzb. Akad. Wiss. Math-nat. I 115: 1281 (1906).

Apothecia minute, subsessile, cup-shaped to saucer-shaped, light-coloured, externally covered by short hairs. Hairs mostly aseptate, with rather thick glassy walls and with brittle hooked apex. Asci clavate. Spores fusiform, aseptate. Paraphyses exceeding the asci, apically glassy and hooked like the excipular hairs.

Type species: Pezizella hamulata Feltg. Vorstud. Pilz. Luxemb. Nachtr. 3: 51 (1903).

The genus seems to be well characterized by its hooked hairs, but, however, it is a rather heterogenous one and at least partially doubtfully distinct from Hyalopeziza.

The species of this genus fall into two groups: one characterized by paraphyses with hooked glassy tips and another characterized by simple paraphyses. Unfortunately the species of this genus have been very rarely collected and the genus is nearly the most poorly studied group in the family. In this reason I can make no new suggestions on the taxonomy of the genus.

Included species:

Unguiculella aggregata (Feltg.) Höhn., Sitzb. Akad. Wiss. Math.-nat. I 115: 1281 (1906).

Unguiculella eurotioides (Karst.)Nannf., Trans. Brit. Myc. Soc. 20: 194 (1936). /Lit.: Dennis, 1949: 83/.

Unguiculella hamata (Sacc.)Höhn., Sitzb. Akad. Wiss. Math.-nat. I 115: 1281 (1906).

Unguiculella hamulata (Feltg.)Höhn., Sitzb. Akad. Wiss. Math.-nat. I 115: 1281 (1906).

Unguiculella meliolicola Dennis, Kew Bull. 10: 366 (1955).

UNGUICULELLA REHMII Raitv. nomen novum.
Syn.: Mollisia hamulata Rehm, Rabenh. Krypt.-Fl. 1(3): 534 (1896) There exists already an earlier U. hamulata (Feltg.)Höhn., so I had to choose a new name for this species.

Unguiculella robergei (Desm.) Dennis, Kew Bull. 10: 136 (1955).

Key to the included species

1. Parasiting on mycelium of Meliola sorindeae. Ap. sessile, brown, 0.2-0.3 mm in diam. Hairs 15-20 x1.5-3μ. Asci clavate, 25-35x5-6μ. Sp. ellipsoid, 5-7x1-1.5μ. Af - U. meliolicola Dennis
- Saprobic on dead plants 2

2. On herbaceous stems 3
- On wood and bark 5

3. Sp. up to 8μ long 4
- Sp. 12-15x3μ, fusoid. Ap. sessile, discoid, 0.3-1.2 mm in diam., ochraceous. Hairs 20x50x 8-12μ. Asci cylindric-clavate, 60-80x8-9μ. Par. cylindrical with swallen glassy tips ending with hook like hairs. On dead herbaceous stems. Eu, MA - U. rehmii Raitv.

4. Asci 20-25x5-6μ. Ap. sessile, 0.2 mm in diam., whitish. Hairs 20-30x3μ. Sp. broadly ellipsoid, 5-6x2-2.5μ. Par. cylindrical. On dead herbaceous stems. Eu - U. hamulata (Feltg.)Höhn.
- Asci 30-43x5-6μ. Ap. subsessile, 0.3 mm in diam., yellowish. Hairs 30-45x3-4μ. Sp. fusoid, 5-8x 2-2.5μ. Par. cylindrical with hooked tips. On dead herbaceous stems. Eu - U. eurotioides (Karst.)Nannf.

5. Hymenium yellowish 6
- Hymenium dark red. Ap. sessile, up to 1 mm in diam. Hairs 35-55x3-4μ. Asci 35x5-7μ. Sp. ellipsoid, biguttulate, 5-8x2.5μ. Par. cylindrical. On bark of Lonicera, Rosa etc. Eu - U. robergei (Desm.)Dennis

6. Ap. 0.3 mm in diam., yellowish. Hairs 60-80μ long. Asci 40x5-6μ. Sp. 5.5-6.5x2μ. On dead wood of Populus. Eu - U. hamata (Sacc.)Höhn.

- Ap. 0.3-0.5 mm in diam., gray-brown with yellow hymenium. Hairs 24-36μ long. Asci 30-36x4-5.5μ. Sp. 6-7x1.8-2μ. On Ribes twigs. Eu -
U. aggregata (Feltg.)Höhn.

Genus ALBOTRICHA Raitv. genus novum

Apothecia subsessilia vel breviter stipitata, pallide colorata, extus longe pilosa. Pili hyalini vel basaliter ochracei, conici, acuti, tenue glabrotunicati, multicellulares, granulis hyalinis incrustati. Asci cylindracei. Sporae fusoideae, ellipsoideae vel cylindraceae, uni- vel raro multicellulares. Paraphyses lanceolatae, ascos longe superantes.

Typus generis: Peziza acutipila Karst, Not. Sällsk. Fauna Flora Fenn. 10: 195 (1869). /Lit.: Dennis, 1949: 51/.

The genus is well characterized by its sharply pointed hyaline or basally light-coloured hairs. The wall of hair is thin and smooth, incrusted by loosely attached colourless granules of amorphous matter. The genus is a small natural group of closely related species. There is no such variability in spore size and paraphyse shape as, for instance, in the genus Belonidium closely related to it.

Included species:

ALBOTRICHA ACUTIPILA (Karst.)Raitv. comb. nova. Basionymum: Peziza acutipila Karst., Not. Sällsk. Fauna Flora Fenn. 10: 195 (1869). /Lit.: Dennis, 1949: 51/.

ALBOTRICHA ALBOTESTACEA (Desm.)Raitv. comb. nova. Basionymum: Peziza albotestacea Desm., Ann. Sci. Nat. Bot. II, 19: 368 (1843). /Lit.: Dennis, 1949: 50/.

ALBOTRICHA ANDINA (Pat.)Raitv. comb. nova. Basionymum: Erinella andina Pat., Bull. Soc. Myc. Fr. 9: 146 (1893). /Lit.: Dennis, 1954: 312/.

ALBOTRICHA LAETIOR (Karst.)Raitv. comb. nova. Basionymum: Lachnea acutipila† L. laetior Karst., Not. Sällsk. Fauna Flora Fenn. 11: 250 (1870)./Lit.: Nannfeldt, 1942: 294/.

ALBOTRICHA ORIENTALIS Raitv. sp. nova.
Apothecia cupulata vel cyathoidea, subsessilia, 0.5-1 mm in diam., albido-lutea vel pallide ochracea, extus longe pilosa. Pili cylindracea-conici, acuti, tenue glabrotunicati, 9-14-cellulares, basaliter ochraceo-lutei, pigmento in solutione KOH dissolubili, apicibus hyalinis, 110-175x4-6μ. Asci cylindracei, 55-90x5-7μ. Sporae ellipsoideae, unicellulares, 2-4-guttulatae, 8-15x2-3μ. Paraphyses lanceolatae, 5-7μ in diam., 35-40μ ascos superantes.
Ad caules herbarum emortuarum crescit.

Holotypus: U.R.P.S.S., Kamtschatka, Zhupanovo, ad caules emortuarum Cimicifugi simplicis, 11. IX 1960, E. Parmasto legit (TAA-12089).

A. albotestaceae similis, ascis majoribus et sporis latioribus differt.

Var. orientalis - sporae 9.5-15x2-3μ.

Var. SACCHALINENSIS Raitv. var. novum.
Varietati typicae similis, sporis brevibus, 8-10.5x 2-3μ differt.

Holotypus: U.R.P.S.S., Sacchalin, Novo-Aleksandrovsk, ad caules herbarum emortuarum, 28. VII 1960 (TAA-44997).

The localities of this species in Kamtshatka were erroneously published under Dasyscyphus leucophaeus (Weinm.) Massee due to misidentification (Raitviir, 1963).

ALBOTRICHA WASHINGTONENSIS (Dennis) Raitv. comb. nova.

Basionymum: Dasyscyphus washingtonensis Dennis, Kew Bull. 17(2): 376 (1963). (?=Hyalopeziza pteridis Kanouse, Mycologia 39: 660 (1947).

Key to the included species

1. On dead fronds of ferns. Ap. substipitate, white, 0.3 mm in diam. Asci cylindric-clavate, 33x5 μ. Sp. cylindric-fusoid, 5-7x0.7-1 μ. Par. lanceolate, 20 μ longer than asci, 4-5 μ in diam. NAm - A. washingtonensis (Dennis.) Raitv.
- On dead stems of flower plants 2

2. On dead grasses 3
- On dead stems of Dicotyledons 4

3. Ap. substipitate, 0.3-0.5-(1) mm, white or ivory, sometimes with reddish hymenium. Hairs hyaline, 6-9-septate, 116-185x3-4 μ. Asci cylindrical, 45-65x4-6.5 μ. Sp. narrowly fusoid, aseptate, 10-20x1.5 μ. Par. lanceolate, up to 30 μ longer than asci, 3.5-6 μ in diam. On dead grasses. Eu, A - A. acutipila (Karst.)Raitv.
- Ap. substipitate, 0.5-1 mm, rose-coloured, covered by whitish hairs. Hairs hyaline to pale ochraceous, 7-11-septate, 116-185x3-5 μ. Sp. narrowly fusoid, aseptate, 6.5-11.5x1.5 μ. Asci cylindrical, 38-53x4-5 μ. Par. lanceolate, 20-30 μ longer than asci, 3-4 μ in diam. On dead grasses. Eu, NAm - A. albotestacea (Desm.)Raitv.

4. Sp. 18-25x3 μ, cylindric-ellipsoid, 1-3-septate. Ap. broadly sessile, hymenium light brown, externally white. Hairs long, sharply pointed, hyaline, multiseptate. Asci cylindrical, 75-80x

7-8 μ. Par. cylindrical with pointed tips, not exceeding the asci, 1.5 μ in diam. On dead herbaceous stems. SAm - A. andina (Pat.)Raitv.
- Sp. 8-15 μ long, aseptate 5

5. Ap. substipitate, 0.5-1 mm, pale yellowish. Hairs hyaline, multiseptate, 110-150x4-5 μ. Asci cylindrical, 37-50x4-5 μ. Sp. narrowly fusoid, aseptate, 8.3-15.4x1.5 μ. Par. lanceolate, 25-40 μ longer than asci, 5 μ in diam. On dead stems of Rubus idaeus. Eu - A. laetior (Karst.)Raitv.
- Ap. substipitate, 0.5-1 mm, whitish-yellow to light ochraceous. Hairs ochraceous-yellow with hyaline tips, 8-13-septate, 110-175x4-6 μ. Asci cylindrical, 55-90x5-7 μ. Sp. ellipsoid, aseptate, containing several oil-drops, 8-15x2-3 μ. On dead herbaceous stems. EA - A. orientalis Raitv.
  - Sp. 9.5-15x2-3 μ - var orientalis
  - Sp. 8-10.5x2-3 μ - var. sacchalinensis Raitv.

Genus Belonidium Mont. et Dur. Fl. Alger. tab. 28 fig. 8 (1846) non auct. (DeNot. et al.).

Syn.: Dasyscyphus subgenus Belonidium (Mont. et Dur.) Dennis, Persoonia 2(2): 181 (1962). Dyslachnum Clements Gen. Fungi 87 (1909). Lachnella auct. p.p. non Fr. (1835). Trichopeziza Fuckel Symb. Myc. 295 (1870).

Apothecia broadly sessile to substipitate, hemisphaerical, cupulate or nearly plane, 0.5-2.5 mm in diam., externally whitish, yellow, brownish or brownish black, covered by long flexuous hairs.

Hymenium whitish, ochraceous or pinkish. Hairs long, flexuous, cylindrical or slightly tapering, obtuse, multiseptate, with hyaline or brownish, thin or moderately thick smooth walls, hyaline or containing coloured sap. The pigment often diffuses out into KOH solution or changes in hue. The smooth hairs are covered by loosely attached hyaline or brownish granules easily detached and dissolving in KOH solution. Asci cylindrical or cylindric-clavate, with amyloid pore. Spores variable from fusoid up to vermiform, aseptate, rarely 1- or multiseptate. Paraphyses lanceolate or cylindrical with acute tips, usually longer than asci.

Type species: Belonidium aeruginosum Mont. et Dur. Fl. Alger. Tab. 28 fig. 8 (1846).

The genus is divided into two subgenera and several sections since there exist clear-cut groups of closely related species arranged into parallel rows of homologous series. In the subgenus Belonidium the colour of hairs is due to sap in hair cells or loosely attached granules covering hair walls, but in the subgenus Phaeobelonidium the hair wall itself is pigmented.

Subgenus Belonidium

Hairs with hyaline walls, only the sap or attached granules are pigmented.

Section Belonidium

Hairs completely hyaline. Apothecia externally white.

Included species:

BELONIDIUM ADENOSTYLIDIS (Rehm)Raitv. comb. nova
Basionymum: Lachnum adenostylidis Rehm, Ann. Myc. 11: 392 (1913).

Belonidium aeruginosum Mont. et Dur. Fl. Alger. tab. 28 fig. 8 (1846). /Lit.: Dennis, 1962: 173/.

BELONIDIUM ERYNGIICOLUM (Ell. et Ev.)Raitv. comb. nova.
Basionymum: Dasyscypha eryngiicola Ell. et Ev., Bull. Torr. Bot. Club 25: 506 (1898) /Lit.: Dennis, 1963: 343/.

BELONIDIUM MOLLISSIMUM (Lasch)Raitv. comb. nova.
Basionymum: Peziza mollissima Lasch, Flora 41: 651 (1858). /Lit.: Rehm, 1896: 868/.

Section TRICHOPEZIZA (Fuckel)Raitv. comb. nova

Apothecia externally yellowish to light brownish.

Basionymum: Trichopeziza Fuckel Symb. Myc. 295 (1870).

Type species: Peziza sulphurea Fr. Syst. Myc. 2: 104 (1822) var. leucophaea Weinm. Enumeratio Stirp. Petrop. 236 (1837).

Included species:

BELONIDIUM DISCOLOR (Mout.)Raitv. comb. nova.
Basionymum: Erinella discolor Mout., Compt. Rend. Bull. Soc. Bot. Belg. 36(2): 20 (1897).

BELONIDIUM LEUCOPHAEUM (Weinm.)Raitv. comb. nova
Basionymum: Peziza sulphurea var. leucophaea Weinm. Enumeratio Stirp. Petrop. 236 (1837). /Lit.: Rehm, 1896: 890; Dennis, 1949: 41/.

BELONIDIUM RADIANS (Karst.)Raitv. comb. nova.
Basionymum: Peziza radians Karst., Not. Sällsk. Fauna Flora Fennica 10: 200 (1869). /Lit.: Dennis, 1963: 360/.

BELONIDIUM SULPHUREUM (Fr.)Raitv. comb. nova.
Basionymum: Peziza sulphurea Fr. Syst. Myc. 2: 104 (1822). /Lit.: Dennis, 1949: 43/.

BELONIDIUM VERMISPORUM (Raitv.)Raitv. comb. nova
Basionymum: Dasyscyphus vermisporus Raitv., Biol. Journ. Armenii 21 (8); 6 (1968).

BELONIDIUM VIOLASCENS Raitv. sp. nova.
Syn.; Lachnum sulphureum (Pers.) Rehm, Rabenh. Krypt.-Fl. 1(3): 891 (1896). /non Peziza sulphurea Fr./.

Apothecia sessilia, cupulata vel disciformia, 0.5-2 mm in diam., hymenio pallido, extus basaliter brunnea, margine sulphurea, longe pilosa. Pili cylindracei, obtusi, tenue glabrotunicati, multicellulares, granulis hyalinis incrustati, contentu luteo in solutione KOH violascenti., Asci cylindracei, 55-80x4-6 μ. Sporae fusoideae, unicellulares, 8-12x1.5-2 μ. Paraphyses lanceolatae, 2.5-4 μ in diam., 8-15 μ ascos superantes.
Ad caules herbarum emortuarum crescit.

Holotypus: U.R.P.S.S., Tianschan interior, Montes Terskei Alatoo, Teplokljutschenka, ad caules herbarum emortuarum, 26. VIII 1965, A. Raitviir legit (TAA-44106).

B. leucophaeo similis, sporis brevioribus differt.

It is a good species, clearly different from B. leucophaeum in its shorter spores as I have already illustrated (Raitviir, 1968). Following the Nylander-Dennis interpretation of Peziza sulphurea Fr. (Dennis, 1949, 1962) I had to choose a new name for this species.

Sectio FUSCOBELONIDIUM Raitv. sect. nov.

Apothecia extus fusca vel fusco-nigra, hymenium saepe roseum.

Typus sectionis: Peziza elegantula Karst. Syn.

Pez. et Asc. Fenn. 24 (1861).

Included species:

BELONIDIUM ALBOLABRUM (Ell. et Ev.)Raitv. comb. nova.
Basionymum: Lachnella albolabra Ell. et Ev., Bull. Torr. Bot. Club 24: 467 (1897)./Lit.: Dennis, 1963: 322/.

BELONIDIUM ATROPURPUREUM (Dur.)Raitv. comb. nova
Basionymum: Lachnum atropurpureum Dur., Journ. Mycol. 10: 100 (1904). /Lit.: Dennis, 1963: 328/.

BELONIDIUM CENANGIOIDES (Ell.)Raitv. comb. nova.
Basionymum: Peziza cenangioides Ell., Bull. Torr. Bot. Club 8: 123 (1881). /Lit.: Dennis, 1963: 337/.

BELONIDIUM ELEGANTULUM (Karst.)Raitv. comb. nova.
Basionymum: Peziza elegantula Karst. Syn. Pez. et Asc. Fenn. 24 (1861). /Lit.: Dennis, 1956: 186/.

BELONIDIUM EUPATORII (Schw.)Raitv. comb. nova.
Basionymum: Peziza eupatorii Schw., Trans. Amer. Phil. Soc. 4: 174 (1832). /Lit.: Seaver, 1951: 272; Dennis, 1963: 343/.

BELONIDIUM GRAMINOPHILUM Raitv. sp. nova.
Apothecia sessilia, cupulata, 1-2 mm in diam., extus fusca, longe pilosa, hymenio pallido. Pili cylindracei, obtusi, tenue glabrotunicati, multicellulares, granulis brunneis incrustati, contentu in solutione KOH violascenti vel brunnescenti, 4-5.5 μ in diam. Asci cylindracei, 65-80x4-6 μ. Sporae anguste fusoideae, 1- vel 2-cellulares, 11.5-18.5x 1.5-2 μ. Paraphyses lanceolatae, 3-5 μ in diam., 8-15 μ ascos superantes.
Ad caules emortuorum graminum crescit.

Holotypus: U.R.P.S.S., Tianschan Interior, Montes Terskei Alatoo, Teplokljutschenka, ad caules

emortuorum graminum, 24. VIII 1965, A. Raitviir legit (TAA-44016).

B. elegantulo similis, paraphysibus latis lanceolatis et sporis longioribus differt.

BELONIDIUM LEUCOSTOMUM (Rehm)Raitv. comb. nova.
Basionymum: Dasyscypha leucostoma Rehm, Ber. Naturf. Ver. Augsburg 26: 53 (1881). /Lit.: Rehm, 1896: 845/.

BELONIDIUM MELEAGRIS (Ell.)Raitv. comb..nova.
Basionymum: Peziza (Dasyscypha) meleagris Ell. Bull. Torrey Bot. Club 8: 123 (1881). /Lit.: Dennis , 1963: 353/.

BELONIDIUM REMMII Raitv. sp. nova.
Apothecia sessilia, cupulata, 0.5-1.5 mm in diam., extus fusca vel fusco-nigra, longe pilosa, hymenio roseo., Pili cylindracei, obtusi, tenue glabrotunicati, multicellulares, granulis brunneis incrustati, contentu in solutione KOH violascenti vel viride nigrescenti, 3.5-4.5 μ in diam. Asci cylindracei, 58-68x3.4-4.5μ. Sporae anguste ellipsoideae vel fusoideo-ellipsoideae, bicellulares, 9-13.5x1.8-2.5μ. Paraphyses lanceolatae, 3-4 μ in diam., 5-10 μ ascos superantes, granulis hyalinis incrustatae.
Ad caules emortuorum gramineum crescit.

Holotypus: U.R.P.S.S., Tianschan interior, Montes Terakei Alatoo, Teplokljutschenka, ad caules Phragmites communis, 4. VI 1968, A. Raitviir legit (TAA-60253).

Species aliis sectionis paraphysibus incrustatis differt.

Subgenus PHAEOBELONIDIUM Raitv. subgen. nov.

Apothecia extus brunnea. Pili basaliter parietibus coloratis, apicibus subhyalinis.

Typus subgeneris: Peziza (Dasyscypha) borealis Ell. et Holw. in Arthur et al., Bull. Minnesota Geol. Nat. Hist. Survey 3: 36 (1887).

Included species:

BELONIDIUM BOREALE (Ell. et Holw.) Raitv. comb. nova.
Basionymum: Peziza (Dasyscypha) borealis Ell. et Holw. in Arthur et al., Bull. Minnesota Geol. Nat. Hist. Survey 3: 36 (1887). /Lit.: Dennis, 1963: 331/.

BELONIDIUM CERINUM (Fr.)Raitv. comb. nova.
Basionymum: Peziza cerinea Fr. Syst. Myc. 2: 92 (1822). /Lit.: Dennis, 1949: 45/.

BELONIDIUM CORTICALE (Fr.)Raitv. comb. nova.
Basionymum: Peziza corticalis Fr. Syst. Myc. 2: 96 (1822). /Lit.: Dennis, 1949: 39/.

BELONIDIUM FLAVO-FULIGINEUM (Fr.)Raitv. comb. nova.
Basionymum: Peziza flavo-fuliginea Fr. Syst. Myc. 2: 99 (1822).

BELONIDIUM FUSCUM (Müller et Dennis)Raitv. comb. nova.
Basionymum: Perrotia fusca Müller et Dennis, Sydowia 13: 46 (1959).

BELONIDIUM HIMALAYENSIS (Müller et Dennis) Raitv. comb. nova.
Basionymum: Perrotia himalayensis Müller et Dennis, Sydowia 13: 48 (1959).

BELONIDIUM KARATALICUM Raitv. sp. nova.
Apothecia sessilia, cupulata, 0.5 mm in diam., brunnea vel ferruginea, extus longe pilosa, hymenio pallido. Pili cylindracei, angustati, obtusi, basa-

liter parietibus brunneis, apicibus subhyalinis, glabrae, multicellulares. Asci cylindraceo-clavati, 75-90x5-8μ. Sporae cylindraceo-fusoideae vel ellipsoideae, 10-15x2.3-3μ. Paraphyses cylindraceae, 1.6μ in diam., 8-15μ ascos superantes.

Ad corticem et lignum emortuum Piceae schrenkianae crescit.

Holotypus: U.R.P.S.S., Tianschan interior, Montes Moldotoo apud vallim fluvii Karatal, ad lignum emortuum Piceae schrenkianae, 31. VII 1967, A. et T. Raitviir legit (TAA-44589).

B. corticale similis, ascis longioribus differt.

BELONIDIUM LONICERAE (Fr.)Raitv. comb. nova.
Basionymum: Peziza lonicerae Fr. Syst. Myc. 2: 115 (1822).

BELONIDIUM SOLENIA (Peck)Raitv. comb. nova.
Basionymum: Peziza solenia Peck, Rep. New York State Museum 25: 99 (1873). /Lit.: Dennis, 1963: 364/.

BELONIDIUM SOLENIIFORMIS (Ell. et Ev.) Raitv. comb. nova.
Basionymum : Peziza soleniiformis Ell. et Ev., Journ. Mycol. 4: 55 (1888). /Lit.: Dennis, 1963: 365/.

Key to the included species

1. On herbaceous stems and fallen leaves 2
- On woody substrata 18

2. Ap. externally white, hairs hyaline 3
- Ap. externally coloured, hairs coloured . . . 6

3. Sp. aseptate 4
- Sp. 3-septate, cylindric-fusoid, 17-21x1.5-2μ. Hairs hyaline, up to 175x4-5μ. Asci cylindric-clavate, 60x7μ. Par. narrowly lanceolate,

10 longer than asci, 2-2.5μ in diam. NAf - B. aeruginosum Mont. et Dur.

4. Hymenium yellow to ochraceous 5
- Hymenium whitish. Asci cylindrical, 50-70x3.5-5μ. Sp. fusoid, 8-13x1.5-2μ. Par. lanceolate, 15-25μ longer than asci, 5-7.5μ in diam. Eu, A - B. mollissimum (Lasch)Raitv.

5. Par. broadly lanceolate, 15-30μ longer than asci, 4-8μ in diam. Ap. sessile, 1-2 mm in diam., hymenium bright ochraceous, externally white. Hairs up to 150x3-4.5μ. Asci cylindrical, 65-85x4.5-5.5μ. Sp. narrowly fusoid, 11.5--21x2-3μ. On dead herbaceous stems in subalpine meadows. Eu, MA - B. adenostylidis (Rehm)Raitv.

- Par. narrowly lanceolate, slightly longer than asci, 3.5μ in diam. Ap. sessile, 1-1.5 mm in diam. , hymenium yellow, externally white. Hairs up to 75x2.5-3μ. Asci cylindric-clavate, 60-67x6μ. Sp. elliptic-cylindrical to clavate, 12-16x2-2.5μ. On dead herbaceous stems. NAm - B. eryngiicolum (Ell. et Ev.) Raitv.

6. Ap. externally yellowish to light brown . . . 7
- Ap. externally dark brown to blackish brown . 12

7. Sp. fusoid, up to 40 μ long 8
- Sp. filiform, over 48 μ long 11

8. On herbaceous stems 9
- On fallen leaves. Ap. sessile, 1 mm in diam., ochraceous. Hairs ochraceous, their content dissolving and turning violaceous in KOH. Asci cylindric-clavate, 80x5μ. Sp. fusoid-clavate, 8-12x1.5-2μ. Par. narrowly lanceolate, not exceeding the asci, 2-3μ in diam. Eu - B. radians (Karst.)Raitv.

9. Sp. up to 18 μ long, aseptate 10
- Sp. 25-40x2-3 μ, narrowly fusoid, 0-3-septate. Ap. sessile, 0.5-2 mm in diam., sulphur-yellow with brownish base. Hairs yellowish, their content dissolving and usually turning violaceous in KOH. Asci cylindrical, 80-100x6.5-8 μ. Par. lanceolate, far exceeding the asci, 4-5 μ in diam. On dead herbaceous stems. Eu, A, NAm -
B. sulphureum (Fr.)Raitv.

10. Sp. 8-12x1.5-2 μ, fusoid. Ap. sessile with brownish base and yellow margin, 0.5-2 mm in diam. Hairs yellowish, their content turning violaceous and dissolving in KOH. Asci cylindrical, 55-80x4-6 μ. Par. lanceolate, 8-10 μ longer than asci, 2.5-4 μ in diam. On dead herbaceous stems. Eu, MA -
B. violascens Raitv.

- Sp. 11-18x1.5-2 μ, fusoid. Ap. sessile with brownish base and yellow margin. 0.5-2 mm in diam. Hairs yellowish, their content dissolving in KOH and only rarely turning violaceous. Asci cylindrical, 65-85x4-5 μ. Par. lanceolate, 15-25 μ longer than asci, 4-5 μ in diam. On dead herbaceous stems. Eu, A, NAm -
B. leucophaeum (Weinm.)Raitv.

11. Ap. sessile, 0.5-1.5 mm in diam., ochraceous with pale hymenium. Hairs pale ochraceous, apically incrusted by large masses of amorphous ochraceous matter. Asci cylindrical, 105-116x7-9 μ. Sp. cylindrical, flexuous, containing numerous oil-drops, 48-61x2 μ. Par. cylindrical, pointed, 8-10 μ longer than asci, 2 μ in diam. On dead stems of Urtica dioica. Eu -
B. discolor (Mout.)Raitv.

- Ap. sessile, 1-1.5 mm in diam., whitish-yellowish with whitish hymenium. Hairs with pale

brownish base, pale yellowish middle part and hyaline tip, incrusted by hyaline granules, apically incrusted by large masses of amorphous lemon-yellow matter. Asci cylindrical, 110-120x 7-8.5 μ. Sp. cylindrical, flexuous, 60-95x2.5-3.5 μ. Par. cylindrical, obtuse, 1-1.5 μ in diam. On dead fronds of ferns. The Transcaucasus -
B. vermisporum (Raitv.)Raitv.

12. On Dicotyledons; par. cylindrical to cylindric-lanceolate 13
- On Monocotyledons; par. distinctly lanceolate 17

13. Asci up to 71 μ long 14
- Asci 70-110 μ long 15

14. Hairs brown with hyaline walls, their content turning dark purple and dissolving in KOH. Ap. sessile, 0.5-1 mm in diam., hemisphaerical, dark reddish-brown to almost blackish. Asci cylindric-clavate, 63-71x4-5 μ. Sp. elliptic-fusoid, 11.5-15x2 μ, aguttate. Par. cylindrical with acute tips not exceeding the asci, 1.5 μ in diam. On dead herbaceous stems. Eu, A -
B. elegantulum (Karst.)Raitv.

- Hairs brownish with hyaline tips, walls brown, no reaction in KOH. Ap. sessile, up to 0.5 mm in diam., brown with whitish margin. Asci cylindric-clavate, 65x7 μ. Sp. elliptic-fusoid, 12-14x3 μ, 2- or 4-guttate. Par. cylindrical with acute tips, not exceeding the asci. On dead herbaceous stems. NAm -
B. solenia (Peck)Raitv.

15. Sp. longer than 15 μ 16
- Sp. 10-15x1.5-2 μ, narrowly fusoid. Ap. sessile, 0.5-1 mm in diam., dark brown with rosy hymenium. Hairs brownish, their content sometimes

turning dark violaceous and dissolving in KOH. Asci cylindrical, 80-100x5-6 μ. Par. cylindrical with acute tips, not exceeding the asci, 1.5 μ in diam. On dead herbaceous stems. Eu, A - B. leucostomum (Rehm)Raitv.

16. Ap. sessile, 0.3-0.5 mm in diam., dark brown with white margin. Hairs brown with brownish walls. Asci cylindrical, 70-110x6 μ. Sp. fusoid, 15-19x3 μ. Par. cylindric-lanceolate, slightly longer than asci, 3-4 μ in diam. On dead herbaceous stems. NAm - B. cenangioides (Ell.)Raitv.

- Ap. sessile, 2-5 mm in diam., brown. Hairs brown, their content turning dark violaceous and dissolving in KOH. Asci cylindrical, 100x8-9 μ. Sp. fusoid, 12-20x3 μ, often 1-septate. Par. cylindrical with pointed tips, not exceeding the asci, 2-3 μ in diam. On dead herbaceous stems. NAm - B. eupatorii (Schw.)Raitv.

17. Ap. sessile, 0.5-1.5 μ mm in diam., blackish brown with rose-coloured hymenium. Hairs brownish, incrusted with the granules of resinous matter dissolving and turning dark violaceous to blackish-green in KOH. Asci cylindric-clavate, 58-68x3-4.5 μ. Sp. narrow-ellipsoid to fusoid-ellipsoid, 1-septate, 9-13.5x1.8-2.5 μ. Par. lanceolate, 5-10 μ longer than asci, 3-4 μ in diam., incrusted with hyaline granules. On dead grasses. MA - B. remmii Raitv.

- Ap. sessile, 1-2 mm in diam., brownish with pale hymenium. Hairs brownish, incrusted with brown resinous matter dissolving and turning dark violaceous in KOH as the content of the apical cells of the hairs. Asci cylindric-clavate, 65-80x4-6 μ. Sp. narrowly fusoid, sometimes 1-septate, 11.5-18.5x1.5-2 μ. Par. lanceolate, 8-15 μ longer than asci, 3-5 μ in diam. On dead grasses. MA - B. graminophilum Raitv.

18. Hairs hyaline or yellowish: look for the species on herbaceous stems occasionally growing on wood 2
- Hairs brownish 19

19. Sp. longer than 8 μ 20
- Sp. up to 8 μ long 26

20. Sp. longer than 15 μ 21
- Sp. up to 16 μ long 22

21. Asci 75-110x6.5-10 μ, cylindric-clavate. Ap. sessile to substipitate, 0.5-1 mm in diam., light brown with pale hymenium. Hairs brownish with hyaline tips, walls brown. Sp. cylindric-fusoid or clavate-fusoid, 16-27x2.5-4 μ, aseptate or up to 3-septate. Par. cylindrical with acute tips, up to 10 μ longer than asci, 2 μ in diam. On dead bark and wood. Eu, A, NAm - B. boreale (Ell. et Holw.) Raitv.
- Asci 140-160x11-13 μ, cylindrical. Ap. substipitate, 0.7-1 mm in diam., brown with pale hymenium. Hairs brownish with hyaline tips, walls brown. Sp. cylindrical or clavate, 15-28x4.5-6.5 μ, 3-septate. Par. narrowly lanceolate, slightly longer than asci, 2-4 μ in diam. On dead wood. A - B. himalayensis (Müller et Dennis)Raitv.

22. Sp. fusoid 23
- Sp. broadly clavate-ellipsoid, 1-septate, constricted at the septum, 9-13x4-4.5 μ. Ap. substipitate, 0.5-0.8 mm in diam., brown with pale

hymenium. Hairs brownish with hyaline tips, walls brown. Asci cylindrical, 70-85x7-9 μ. Par. narrowly lanceolate, slightly longer than asci, 2-4 μ in diam. On dead wood. A -
B. fuscum (Müller et Dennis) Raitv.

23. Par. cylindrical to narrowly lanceolate . . 24
- Par. distinctly lanceolate, 20 μ longer than asci, 4 μ in diam., incrusted with hyaline granules. Ap. subsessile, 0.5-1 mm in diam., dark brown. Hairs dark brown. Asci cylindric-clavate, 78-86x6-7 μ. Sp. slightly allantoid, aseptate, 12-15x3 μ. On dead wood. Eu -
B. flavo-fuligineum (Fr.)Raitv

24. Asci longer than 60 25
- Asci 50-60x6-7 μ, cylindric-clavate. Ap. substipitate, 0.7-1 mm in diam., brownish. Hairs brownish with hyaline tips, walls brown. Sp. fusoid, 8-10x2-2.5 μ. Par. narrowly lanceolate, slightly longer than asci, 2-4 μ in diameter. On dead wood. Eu, A -
B. lonicerae (Fr.)Raitv.

25. Asci 60-80x5-8 μ, cylindric-clavate. Ap. sessile to substipitate, 0.5-1 mm in diam., light brown with pale hymenium. Hairs brownish with hyaline tips, walls brown. Sp. elliptic-fusoid, 8-16x2.5-3.5 μ, sometimes 1-septate. Par. cylindrical with pointed tips, up to 10 μ longer than asci, 2-2.5 μ in diam. On dead wood, Eu, A, NAm - B. corticale (Fr.)Raitv.

- Asci 75-90x5-8 μ, cylindric-clavate. Ap. sessile, 0.5 mm in diam., light brown with pale hymenium. Hairs brownish with hyaline tips, walls brown. Sp. cylindric-fusoid or ellipsoid, 10-15x2.3-3 μ, aseptate. Par. cylindrical with

pointed tips, 8-15 μ longer than asci, 1.6 μ in diam. On dead bark and wood of Picea schrenkiana. MA - B. karatalicum Raitv.

26. Sp. 4-5x2-2.5 μ, broadly ellipsoid. Ap. sessile, 1-2 mm in diam., dark brown covered by golden-brown hairs, hymenium yellowish. Hairs brownish with hyaline tips, yielding purple pigment in KOH. Asci cylindrical, 40-50x4-5 μ. Par. cylindrical to narrowly lanceolate, up to 10 μ longer than asci, 2 μ in diam. On dead wood. Eu, A, NAm - B. cerinum (Fr.)Raitv.
- Sp. longer than 5 μ 27

27. Hairs purple or purple-brown 28
- Hairs light brown or olive-brown 29

28. Asci 40-50x5-6 μ, cylindric-clavate. Ap. shortly stipitate, 0.7-1 mm in diam., dark purplish brown with pale purple hymenium. Hairs pale purple. Sp. ellipsoid, 6-8x2.5-3 μ, aseptate. Par. narrowly lanceolate, slightly longer than asci, 3-4 μ in diam. On dead Eucalyptus bark, NAm - B. atropurpureum (Dur.)Raitv.
- Asci 60x6-7 μ, cylindric-clavate. Ap. sessile, 1 mm in diam., dark brown. Hairs dark purple-brown. Sp. elliptic-cylindrical, 6-7x1.5-2 μ. Par. narrowly lanceolate, slightly longer than asci, 2.5-4 μ in diam. On dead wood. NAm -
B. meleagris (Ell.)Raitv.

29. Ap. subsessile to substipitate, 1-1.5 mm in diam., light brownish with pale hymenium. Hairs brownish with hyaline tips, walls brown. Asci cylindric-clavate, 50x4 μ. Sp. clavate-fusoid, 5-7x1.5-2 μ. Par. cylindric-lanceolate, scarcely exceeding the asci, 1.5-2.5 μ in diam. On dead wood. NAm -
B. soleniiformis (Ell. et Ev.) Raitv.

- Ap. broadly sessile, 1 mm in diam., dark olive brown with light ferrugineous margin. Hairs olive brown. Asci cylindric-clavate, 40x5μ. Sp. clavate-fusoid, 7-8x1.2μ. Par. lanceolate, slightly longer than asci, 3μ in diam. On dead wood NAm - B. albolabrum (Ell. et Ev.) Raitv.

Genus Trichopezizella (Dennis) Raitv., Eesti NSV TA Toim. Biol. 18: 68 (1969).

Apothecia broadly sessile to substipitate, cupulate to infundibuliform, or rather plane discoid, 0.2-1.5 mm in diam., externally brown to dark brown, covered by long, stiff, rarely flexuous hairs. Hymenium pale. Hairs long, cylindrical, with smooth, thick, brown walls, multiseptate, apical cells paler and thin-walled. Asci cylindrical or cylindric clavate, with amyloid pore. Spores fusoid, elliptical or cylindrical, aseptate or 1-septate. Paraphyses lanceolate or cylindrical with acute tips, usually longer than asci.

Type species: Peziza nidulus Fr. Syst. Myc. 2: 104 (1822).

The genus is at the first glance excellently homogenous, but as the rq comuter analysis also reveals, two clearly distinct subgenera are present. A larger number of species are characterized by more or less sessile cup-shaped apothecia and ectal excipulum of almost isodiametrical or globose cells. In contrast two remaining species T. relicina and T. macrospora have substipitate cyathiform apothecia and rather peculiar ectal excipulum of vertically compressed rectangular cells arranged in more or

less regular rows. These two sets of characters are different enough to justify proposing two subgenera in Trichopezizella.

Subgenus Trichopezizella

Included species:

TRICHOPEZIZELLA BADIELLA (Karst.) Raitv. comb. nova.
Basionymum: Peziza badiella Karst., Not. Sällsk. Fauna Flora Fenn. 10: 201 (1869). /Lit.: Dennis, 1963. 328/.

TRICHOPEZIZELLA BARBATA (Fr.)Raitv. comb. nova
Basionymum : Peziza Barbata Fr. Syst. Myc. 2 : 99 (1882). /Lit.: Dennis, 1949: 53/.

TRICHOPEZIZELLA BRUNNEA Raitv. sp. nova
Apothecia sessilia, cupulata, 0.5-1.5 mm in diam extus brunnea vel fusca, longe pilosa, hymenio pallido- Pili cylindracei, obtusi, parietibus crassis brunneis, apicibus subhyalinis, 7-12 cellulares, 125-250x5-7μ. Asci cylindracei, 50-80x4-5.5μ. Sporae cylindraceae, unicellulares, 11.5-16x1.5-2.5μ. Paraphyses lanceolatae, 4.5-6μ in diam., 20-35μ ascos superantes.

Ad caules herbarum emortuarum crescit.

Holotypus: U.R.P.S.S., Tianschan occidentalis, Montes Tschatkal, Reservatum Sary-tscheleк, ad caules emortuarum herbarum ad prata subalpina, 11. VIII 1966, A. Raitviir legit (TAA-4468).

T. nidulo similis, ascis et sporis majoribus differt.

TRICHOPEZIZELLA NIDULUS (Fr.) Raitv. comb. nova
Basionymum: Peziza nidulus Fr. Syst. Myc. 2 :104 (1822). /Lit.: Dennis, 1949: 54/.

TRICHOPEZIZELLA HORRIDULA (Desm.) Raitv. comb. va.

Basionymum: Peziza horridula Desm., Ann. Sci. Nat. Bot., III, 8: 185 (1850). /Lit.: Dennis, 1949: 54/.

TRICHOPEZIZELLA SETIGERA (Phill.) Raitv. comb. nova.

Basionymum: Peziza setigera Phill., Grevillea 7: 22 (878). /Lit.: Dennis, 1963: 364/.

Subgenus RELITRICHA subgen. novum

Apothecia substipitata, infundibuliformia. Ectoexcipulum cellulis rectangularis. Paraphyses cylindraceae, ascos minute superantes.

Typus subgeneris: Peziza relicina Fr. Syst. Myc. 2: 103 (1822).

Included species:

Trichopezizella macrospora Raitv., Eesti NSV TA Toim. Biol. 18: 68 (1969).

Due to a misprint the measurements of spores are absent in the original description. The spores of this species are cylindrical, 16.5-27x3.5-5.5μ.

TRICHOPEZIZELLA relicina (Fr.)Raitv. comb. nova

Basionymum: Peziza relicina Fr. Syst. Myc. 2: 103 (1822). /Lit.: Dennis, 1949: 55/.

Key to the included species

1 Growing on dead twigs, hairs flexuous. Ap. sessile, 1-1.5 mm in diam., rusty-brown. Hairs 200-250/4-5μ. Asci cylindrical, 55-60x5μ. Sp. fusoid, sometimes 1-septate, 9-11x2μ. Par. lanceolate, 15-20μ longer than asci, 3-4μ in diam., usually incrusted by hyaline or brownish amorphous matter -

T. barbata (Fr.)Raitv.

- Growing on dead herbaceous stems, hairs straight 2

2. On Monocotyledons 3
- On Dicotyledons 4

3. Sp. 8-10x2μ, cylindrical-clavate. Ap. sessile, 0.25 mm in diam., dark brown. Hairs up to 130x6μ Asci cylindrical-clavate, 40-50x5μ. Par. cylindrical-lanceolate, not exceeding the asci, 2μ in diam. On rotting stems of Scirpus maritimus -

T. badiella (Karst.)Raitv.

- Sp. 10-14x1.5μ, narrowly fusiform. Ap. sessile, 0.7 mm in diam., reddish-brown. Hairs up to 200x x6μ. Asci cylindric-clavate, 40-50x4-5μ. Par. lanceolate, 15μ longer than asci, 5μ in diam. On straw of Triticum vulgare -

T. horridula (Desm.)Raitv.

4. Ap. cupulate to discoid, broadly sessile . . .5
- Ap. cyathiform with constricted basis 7

5. Asci 38-55/3-5μ. Ap. 0.5-1.5 mm in diam., dark brown with pale hymenium. Hairs 75-160x5-6μ. Sp narrowly fusiform, 7.5-13x1.5μ. Par. lanceolate 15-30μ longer than asci, 3.5-6.5μ in diam. On dead herbaceous stems -

T. nidulus (Fr.)Raitv.

- Asci 50-80μ long 6

6. Ap. 0.5-1.5 mm in diam., dark brown with pale hymenium. Hairs 125-250x5-7μ. Asci cylindrical, 50-80x4-4.5μ. Sp. cylindrical, 11.5-16x1.5-2.5μ Par. lanceolate, 20-35μ longer than asci, 4.5--6μ in diam. On dead herbaceous stems in subalpine meadows. MA -

T. brunnea Raitv.

- Ap. 0.5 mm in diam., dark brown. Hairs 120-150x x5-7μ. Asci cylindric-clavata, 60-80x6-7μ. Sp.

fusoid. 10-14x2μ. Par. lanceolate, up to 30 longer than asci, 6μ in diam. On dead stems of Aralia sp. NAm - T. setigera (Phill.)Raitv.

7. Ap. 0.5-1.5 mm in diam., dark brown. Hairs 300-370/5-6μ. Asci cylindrical, 60-100x6-7.5μ. Sp. cylindrical to cylindric-fusoid. 11-18x2.5μ. Par. cylindrical to cylindric-lanceolate, up to 10 longer than asci, 1-3.5μ in diam. On dead herbaceous stems Eu, A -
T. relicina (Fr.)Raitv.

- Ap. 0.5-1 mm in diam., blackish-brown. Hairs 400-500/4-6μ. Asci cylindrical, 116-153x7.5-11μ. Sp. cylindrical, 16.5-27x3.5-5μ. Par. cylindrical, sharply pointed, 8-15μ longer than asci, 1.5-2μ in diam. On dead herbaceous stems. MA -
T. macrospora Raitv.

Genus Perrotia Boud., Bull. Soc. Myc. Fr. 17: 24 (1901).

Apothecia sessile or shortly stipitate, cupulate, usually coloured, rarely whitish, externally densely covered by long flexuous hairs. Hairs cylindrical, with comparatively thick walls, rarely thin-walled, multiseptate, usually with smooth walls incrusted by loosely attached granules. Asci cylindrical or cylindric-clavate, with broadly rounded nonamyloid apex. Spores cylindrical or fusoid, sometimes allantoid, from aseptate to multiseptate, hyaline. Paraphyses cylindrical, slender, obtuse, rarely longer than asci.

Type species: Peziza flammea Fr. Syst. Myc.2: 96 (1822).

This rather peculiar genus occupies an intermediate position between Belonidium and Lachnellula. The hairs of Perrotia are in general very similar

to those in Belonidium but the asci and paraphyses resemble those in Lachnellula. The distinguishing character of the genus is, however, the broadly rounded nonamyloid apex of ascus.

Included species:

PERROTIA ABIETIS (Karst.) Raitv. comb. nova
Basionymum: Helotium abietis Karst. Myc. Fenn. 1: 154 (1867). /Lit.: Dharne, 1965: 139/.

Perrotia andina (Speg.)Dennis, Kew Bull. 17: 325 (1963).

Perrotia atrocitrina (Berk. et Br.) Dennis, Kew Bull. 17: 327 (1963).

Perrotia flammea (Fr.)Boud., Bull. Soc. Myc. 17 : 24 (1901). /Lit.: Dennis. 1949: 45/.

Perrotia phragmiticola (P. Henn. et Ploettn.) Dennis, Kew Bull. 17: 357 (1963).

Perrotia succina (Phill.)Dennis, Kew Bull. 17: 367 (1963).

Excluded species: P. alba Dennis, P. aurea (Massee)Dennis, P. lutea (Phill.)Dennis, P. populina (Seaver)Dennis. These species differ from the typical members of the genus in possessing rough hairs similar to those of Lachnellula and Dasyscyphus. As they have Southern Hemispherical distribution, with the exception of P. populina, then they are probably worth a genus of their own. In the present study the corresponding proposal is, however, not suggested since the author has seen no herbarial material of these fungi.

Key to the included species

1. Ap. externally white, hymenium orange, sessile, 0.5-1.5 mm in diam. Hairs hyaline, 150-250x3-5μ.

Asci cylindrical, 60-80x8-11μ. Sp. fusoid, aseptate, 15-24x3-5μ. On dead coniferous wood. Eu, A - P. abietis (Karst.) Raitv.

Ap. externally coloured 2

. Sp. multiseptate, cylindrical, 20-40x4-5μ. Ap. sessile, 1 mm in diam., yellow to brown. Hairs brown, 90x4μ. Asci 175x14μ. On dead wood. Ceylon - P. atrocitrina (Berk. et Br.) Dennis

Sp. 0-1-septate 3

. On dead culms of Phragmites. Ap. 1 mm in diam., sessile, externally reddish-brown, hymenium cinnabar-red. Hairs hyaline, incrusted by brown granules, 90x4-4.5μ. Asci 80x8μ. Sp. cylindric-allantoid, 1-septate, 18-24x2-3μ. Eu - P. phragmiticola (P.Henn. et Ploettn.) Dennis

- On dead wood 4

4. Ap. shortly stipitate, 5 mm in diam., yellowish-brown. Hairs hyaline, incrusted by orange granules. Asci 110x10μ. Sp. ellipsoid, aseptate, 10-12x3-4μ. On dead wood. NAm - P. succina (Phill.) Dennis

- Ap. sessile 5

5. Ap. 1-2 mm in diam., reddish-brown. Hairs brownish, incrusted by orange granules dissolving and turning violaceous in KOH. Asci 80-100x7-10μ. Sp. cylindrical to allantoid, aseptate, 10-14x x2.5-3μ. On dead wood. Eu - P. flammea (Fr.) Boud.

- Ap. 1 mm in diam., externally brown, hymenium yellow. Hairs brown, smooth. Asci 75-80x9μ. Sp. cylindrical to allantoid, aseptate, 9-11x 2.5μ. On dead wood. SAm - P. andina (Speg.) Dennis

Genus Lachnellula Karst., Medd. Soc. Fauna Fl. Fenn. 11: 138 (1884).

Syn.: Trichoscyphella Nannf., Nova Acta Reg. Sci. Ups. IV 8(2): 265 (1932). Lachnella auct. p.p. non Fr. (1835).

Apotnecia shortly stipitate, rarely sessile, cupulate, with bright yellow, orange or reddish hymenium, externally covered by long flexuous white or brown hairs. Hairs cylindrical, obtuse, multiseptate, with firm granulate walls, hyaline or brown. Asci cylindrical, with rounded, amyloid or nonamyloid. Spores aseptate, globose, elliptical or filiform, often asymmetrical, hyaline. Paraphyses cylindrical, filled with orange drops, slightly longer than asci, obtuse.

Type species: Pithya suecica DeBary ex Fuck., Jb. Nass. V. Naturk. 29-30: 32 (1876) = Lachnellula chrysophthalma Karst., Soc. Fauna Fl. Fenn. 11: 138 (1884).

Some problems connected with the taxonomy and position of this genus were already discussed in the introduction of this study. The intergeneric taxonomy, is however, rather unclear too.

There seems to be two clear-cut groups of hyaline-haired and brown-haired species. Fig. 1 shows, however, that several large-spored hyaline-haired species are very closely linked to brown-haired species. In this reason I have proposed no subgenera or sections in this genus although they very probably exist. This problem should to be resolved after a profound monographic study of the genus with the aid of quantitative methods and character analysis.

Included species:

Lachnellula agassizii (Berk. et Curt.) Dennis

Persoonia 2: 183 (1962)1 /Lit.: Dharne, 1965: 126; Bingham and Ehrlich, 1943/.

Lachnellula arida (Phill.) Dennis, Persoonia 2: 183 (1962). /Lit.: Dharne, 1965: 136/.

Lachnellula calycina Sacc. Syll. Fung. 8: 391 (1889).

Lachnellula calyciformis (Fr.)Dharne, Phytopath. Zeitschr. 53(2): 124 (1965).

Lachnellula ciliata (Hahn) Dennis, Persoonia 2: 183 (1962).

Lachnellula gallica (Karst. et Har.)Dennis, Persoonia 2: 184 (1962). /Lit.: Dharne, 1965: 121/.

Lachnellula flavovirens (Bres.) Dennis, Persoonia 2: 184 (1962). /Lit.: Dharne, 1965: 137/.

Lachnellula fuckelii (Bres. in Rehm)Dharne, Phytopath. Zeitschr. 53(2): 131 (1965).

Lachnellula fuscosanguinea (Rehm)Dennis, Persoonia 2: 194 (1962) /Lit.: Dharne, 1965: 138/.

Lachnellula hyalina Dharne, Phytopath. Zeitschr. 53(2): 119 (1965).

LACHNELLULA KAMTSCHATICA Raitv. sp. nova.

Apothecia breviter stipitata, cupulata, extus alba, longe pilosa, hymenio aureo, 1-3 mm in diam. Pili cylindracei, hyalini, multicellulares, granulati. Asci cylindracei, 65-80x6.5-8μ. Sporae late ellipsoideae, hyalinae, unicellulares, 6-8x4-5μ. Paraphyses cylindraceae, ascos parum superantes.

Ad ramos emortuos Pini pumilae crescit.

Holotypus: U.R.P.S.S., Kamtschatka, Zhupanovo, ad ramos emortuos Pini pumilae, 12.IX 1960, E. Parmasto legit (TAA-12146).

Lachnellula laricis (Cooke) Dharne, Phytopath.

Zeitschr. (53)2: 132 (1965).

Lachnellula minuta Dharne, Phytopath. Zeitschr. 5(2): 122 (1965).

Lachnellula occidentalis (Hahn et Ayers) Dharne, Phytopath. Zeitschr. 53(2): 129 (1965).

Lachnellula pini (Brunch.) Dennis, Persoonia 2: 184 (1962).

Lachnellula pseudofarinacea (Crouan)Dennis, Persoonia 2: 184 (1962).

Lachnellula pseudotsugae (Hahn)Dennis, Persoonia 2: 184 (1962). /Lit.: Hahn, 1940: 118/.

Lachnellula resinaria (Cooke et Phill.)Rehm, in Rabenhorst Krypt. Fl. 1(3): 864 (1896)./Lit.: Dharne, 196: 123/.

Lachnellula subtilissima (Cooke) Dennis, Persoonia 2: 184 (1962). /Lit.: Dharne, 1965: 121./

Lachnellula suecica (DeBary ex Fuck.) Nannf., Fungi Exs. Suec. 41-42: 48 (1953). /Lit.: Dharne, 1965: 118/.

Lachnellula tuberculata Dharne, Phytopath. Zeitschr. 53(2): 134 (1965).

Lachnellula willkommii (Hartig)Dennis, Persoonia 2: 184 (1962). /Lit.: Dharne, 1965: 127/.

Excluded or dubious species: Lachnellula carpathica Svrček /=L. gallica/, L. oblongospora Hahn et Ayers, L. Phyllocladi (Dennis) Dennis /?= L. gallica/, L. pulveracea (Fr.) Dennis, L. tricolor (Fr.) Dennis .

KEY TO THE INCLUDED SPECIES

1. Ap. externally white 2
- Ap. externally brown 19

2. Sp. filiform, 73-97x1.5-2μ. Ap. 1-1.5 mm in diam., Asci 100-115x9-10.5μ. On dead wood of Pinus. Eu - L. pseudofarinacea (Crouan) Dennis

- Sp. globose to fusoid 3

3. Sp. globose 4
- Sp. fusoid, ovate or ellipsoid 5

4. Sp. 1.6-2.4μ in diam. Ap. 0.5-1 mm in diam. Asci 35-40x3μ. Parasitic on Pinus and Picea. Eu - L. calycina Sacc.

- Sp. 4.2-6.6μ in diam. Ap. 1-2 mm in diam. Asci 52-80x5-8.5μ. On dead coniferous branches. Eu, A, NAm - L. suecica (DeBary ex Fuckel) Nannf.

5. Asci up to 100μ long 6
- Asci over 100μ long 16

6. Sp. 1-4μ broad 17
- Sp. 4-6.5μ broad 13

7. Asci 30-40μ long 8
- Asci over 40μ long 9

8. Sp. ovate or ellipsoid, 2-3x1-2μ. Ap. 0.5-1.5 mm in diam. Asci 30-35x4-5μ. On living stems of Picea and Abies. Eu, A - L. resinaria (Cooke et Phill) Rehm

- Sp. narrowly fusoid, 4.5-7.5x1.5μ. Ap. very small. Asci 30-40x4-4.6μ. On dead branches of Larix. Eu - L. minuta Dharne

9. Sp. narrowly fusoid, 6-11x2-2.5μ. Ap. 1-2 mm diam. Asci 45-60x5-6μ. On dead coniferous stems and branches. Eu, A, NAm - L. subtilissima (Cooke) Dennis

- Sp. elliptic-fusoid or subglobose 10

10. Sp. subglobose, 4-7x2.6-3.5μ. Ap. 3-5 mm in diam. Asci 60-75x5-6.2μ. On dead branches of Pinus montana. Eu - L. hyalina Dharne

- Sp. elliptic-fusoid 11

11. Forming cankers on living branches of Pseudotsuga taxifolia. Ap. 1-3.5 mm in diam. Asci 50-60x4-5.4μ. Sp. ellipsoid or fusoid, 4-7x2-4μ. NAm - L. pseudotsugae (Hahn et Ayers) Dennis

- Saprobic on dead bark and branches 12

12. Ap. 0.5-2.5 mm in diam. Asci 43-54x4.5-5.5μ. Sp. elliptic-fusoid, 4.5-7x2-3μ. On dead coniferous branches. Eu, A, NAm - L. calyciformis (Fr.) Dharne

- Ap. 1-3 mm in diam. Asci 50-70x5-7μ. Sp. ellipsoid, elliptic-fusoid or fusoid-ovate, 5.5-8.5x2.5-3.5μ. On dead bark of Abies. Eu, A, NAm - L. agassizii (Berk. et Curt.) Dennis

13. Sp. with large central oil-drop, ellipsoid to ovate, 9-12.5x4-6.5μ. Ap. 0.5-1.5 mm in diam. asci 70-90x7-10μ. On dead coniferous branches. A, NAm - L. ciliata (Hahn) Dennis

- Sp. without oil-drops 14

14. Sp. broadly ellipsoid, 6-8x4-5μ. Ap. 1-3 mm in diam. Asci 65-80x6.5-8μ. On dead branches of Pinus pumila. EA - L. kamtschatica Raitv.

- Sp. over 8μ long 15

15. Ap. 1-2 mm in diam. Asci 70-100x6-8.5μ. Sp. ellipsoid, 8-10x4.5-6μ. On dead branches of Abies. Eu, A - L. gallica (Karst. et Har.) Dennis

- Ap. 1-2 mm in diam. Asci 88-95x7-7.5μ. Sp. ellipsoid, 10-15x4.6-6.2μ. On dead branches of Pinus and Picea. Eu -
L. fuckelii (Bres. in Rehm) Dharne

16. Par. monilioid. Ap. 1-3 mm in diam. Asci 100-140x9-15μ. Sp. ellipsoid, 14-20x4-8μ. On dead fallen branches of Larix. Eu, A, NAm -
L. occidentalis (Hahn et Ayers) Dharne

17. Hairs distinctly tuberculate. Asci 90-120x6.5-7.7μ. Sp. ellipsoid, 10-16x3-4μ. On dead branches of Larix. Eu -
L. tuberculata Dharne

- Hairs finely granulate 18

18. Ap. 2-3 mm in diam. Asci 100-130x6.5-7.7μ. Sp. ellipsoid, 12-16x6.5-7.7μ. On dead branches of Larix. Eu -
L. laricis (Cooke) Dharne

- Ap. 2-3 mm in diam. Asci 140-160x11-17μ. Sp. ellipsoid, 17-24x7-9μ. On living stems of Larix, associated with larch cancer. Eu, NAm, EA -
L. willkommii (Hartig) Dennis

19. Sp. up to 12μ long 20
- Sp. over 12μ long 21

20. Ect. exc. textura oblita. Ap. 1-4 mm in diam. externally brown, hymenium yellowish. Asci 60-80x7-8μ. Sp. ovate-ellipsoid or ovate-fusoid, 7-12x4.5μ. On dead coniferous branches. Eu, A -
L. flavovirens (Bres.) Dennis

- Ect. exc. textura prismatica. Sp. 2-5 mm in diam., externally olivaceous, hymenium yellowish. Asci 65-72x6-7μ. Sp. broadly ellipsoid, 6-9x4.5-6μ. On dead coniferous branches. Eu,

A, NAm -
L. arida (Phill.) Dennis

21. Sp. 12-16x4-6μ, ellipsoid or ovate-ellipsoid. Ap. externally rust-brown, hymenium rose-coloured or reddish, 2-4 mm in diam. Asci 70-90x9-12μ. Parasitic on Pinus. Eu, NAm -
L. fuscosanguinea (Rehm) Dennis

- Sp. 18-21x5-7μ, cylindric-ellipsoid. Ap. 2-5 mm in diam, externally brownish, hymenium orange. Asci 85-125x7-12μ. Parasitic on Pinus. Eu, A -
L. pini (Brunch.) Dennis

Genus **Dasyscyphella** Tranzsch., Trav. Soc. Imp. Nat. St.-Petersbourg 28: 296 (1897) emend. Raitv.

Apothecia stipitate, cup-shaped, white to yellowish, externally densely covered by long white hairs. Hairs hyaline, multiseptate, cylindrical, granulate but with slightly clavate and completely smooth tips of various length, sometimes incrusted by crystal masses or massive conglomerates of amorphous matter dissolving in KOH and usually not visible in light microscope mounts. Asci cylindric-clavate with amyloid pore. Spores ellipsoid, fusoid or filiform, aseptate. Paraphyses cylindrical to lanceolate, rarely exceeding the asci.

Type species: Dasyscyphella cassandrae Tranzsch. Trav. Soc. Imp. Nat. St.-Petersbourg 28: 296 (1897).

The genus has long been misinterpreted due to the inadequate original description which reveals no true character of the hairs and stresses on the long filiform spores. Examining the type collection of D. cassandrae I discovered that it has the hairs of the same type as D. niveus and related species. Since all these species form a distinct natural

group it seems to be reasonable to unite them into Dasyscyphella and keep the genus separate from Dasyscyphus.

The outstanding feature of the genus is the dimorphism of ascospores which is distinctly present at least in three species (Raitviir, 1970).

Included species:

Dasyscyphella cassandrae Tranzsch., Trav. Soc. Imp. Nat. St.-Petersbourg 28: 296 (1897).

DASYSCYPHELLA CRYSTALLINA (Fuckel) Raitv. comb. nova
Basionymum: Peziza crystallina Fuckel Symb. Myc. 306 (1869).

DASYSCYPHELLA DRYINA (Karst.) Raitv. comb. nova Basionym: Peziza dryina Karst., Not. Sällsk. Fauna Flora Fenn. 10: 183 (1869). Syn.: Dasyscyphus distinguendus (Karst.)Sacc. /Lit.: Dennis, 1949:48; Dennis, 1956: 186; LeGal, 1939: 50, sub. Dasyscypha lundellii/.

DASYSCYPHELLA NIVEA (Fr.)Raitv. comb. nova.
Basionymum: Peziza nivea Fr. Syst. Myc. 2: 90(1822). /Lit.: Dennis, 1949: 46/.

Key to the included species

1. Sp. filiform, 37-53/2μ. Ap. stipitate, 0.5 mm in diam., white. Hairs 150-180x2.5-3.5μ. Asci cylindrical, 80-90x7-8.5μ. Par. cylindrical with pointed tips, not exceeding the asci, 1.5-2μ in diam. On dead twigs of Chamaedaphne calyculata. Eu, A - D. cassandrae Transch.
- Sp. ellipsoid to fusoid 2

2. Asci 60-76/3.8-5.3μ, cylindrical. Ap. stipitate, 1-2 mm in diam., whitish to yellowish. Hairs 50-[illegible]x2.5-3.7μ. Sp. of two kind. 8.3-10.8x2-3μ

and 11-14x2-3μ. Par. cylindrical with pointed tips, not exceeding the asci, 1.5-2μ in diam. On dead wood. Eu, A -
D. dryina (Karst.) Raitv.
- Asci up to 56μ long 3

3. Sp. of two kinds, 5-7.5x1.7-2.7μ and 7.5-9.1 x 1.7-2.7μ, elliptic-fusoid. Ap. 0.5-1 mm in diam., stipitate, white to yellowish. Hairs 50-105/2-4μ. Asci cylindrical, 33-56x3-5.3μ. Par. cylindrical with pointed tips to narrowly lanceolate, slightly longer than asci, 1.7-2.2μ in diam. On dead wood. Eu, A - D. nivea (Fr.) Raitv.
- Sp. of two kinds, 6.5-9x1.6-2.8μ and 10-12.5x 1.6-2.8μ, elliptic-fusoid. Ap. 0.5-1μmm in diam., stipitate, white to yellowish. Hairs 66-90x2.5-4μ. Asci cylindrical, 41-53x3.7-5μ. Par. lanceolate, 10-30 longer than asci, 2.2-3μ in diam. On dead wood. Eu -
D. crystallina (Fuckel)Raitv.

Genus Uncinia Vel. Mon. Disc. Boh. 293 (1934).

Apothecia minute, cup-shaped to saucer-shaped, subsessile to shortly stipitate, white to pale yellowish, externally minutely downy by short hairs. Hairs cylindrical, tapering but obtuse, curved or hooked, hyaline, thin-walled, smooth, 1-3-septate near the basis. Ectal excipulum of thin-walled, hyaline prismatical cells Asci cylindric-clavate. Spores narrowly fusoid to clavate-fusoid. Paraphyses narrowly cylindrical, not exceeding the asci.

Type species (lectotype selected): Uncinia laricionis Vel. Mon. Disc. Boh. 295 (1934).

The genus Uncinia was introduced by Velenovsky for species characterized by thin-walled curved

hairs. The original description was followed by descriptions of 14 species, all of them new and no type species was designated. U. laricionis seems to be the original species of the genus recollected by other authors and more or less perfectly known at present. Although Nannfeldt and Dennis think this species belong to Hyaloscypha it deserves a genus of its own and because of it I have chosen it as the lectotype of Uncinia Vel. Moreover, it seems to be more closely related to Clavidisculum than to Hyaloscypha.

Included species:

Uncinia laricionis Vel. Mon. Disc. Boh. 295. (1934)./Lit.: Dennis, 1956: 183 s.n. Helotium acuum var. tenuissimum (Karst.)Karst./.

UNCINIA UNCIPILA (LeGal)Raitv. comb. nova.
Basionymum: Hyaloscypha uncipila LeGal, Bull. Soc. Myc. Fr. 70: 217 (1954).

Key to the included species

1. Ap. subsessile to shortly stalked, cupulate, 0.3-0.4 mm in diam., white. Hairs cylindrical to flask-shaped, tapering but obtuse, more or less strongly curved, up to 40x5μ, sometimes up to 3-septate. Asci cylindric-clavate, 23-30x 3-4.2μ. Sp. ellipsoid, with two small oil-drops, 3-7x1-1.5μ. Par. cylindrical, obtuse, very slender, not exceeding the asci. On dead needles, coniferous sticks and cone scales. Eu -
U. laricionis Vel.

- Ap. as in the previous species. Hairs cylindrical, tapering, curved, 15-50x1.5-2μ. Asci 30-46 x4-6.3μ. Sp. 6.2-10x1.5-2.4μ. On cones of Abies and Pinus. Eu -
U. uncipila (LeGal) Raitv.

Genus Clavidisculum Kirscht. in Ann. Myc. 36: 37 379 (1938).
Syn.: Cistella Quél. Enchir. Fung. 319 (1886) emend. Nannf., Nova Acta Reg. Sci. Ups. IV 8(2): 265 (1932). non Cistella Blume Bijdr. 293, tab. 55 (1825). Discocistella Svrček, Ceska Mykologie 16(1): 10 (1962).

Apothecia sessile to shortly stipitate, cupulate, light coloured, rarely brown, externally downy by short hairs. Hairs cylindrical to clavate, hyaline, rarely coloured, one-celled, rarely up to 4-celled, thin-walled with a smooth basis and granulate upper part which may be of various length. Asci cylindric clavate. Spores elliptical, cylindrical, fusoid or clavate, 0-3-septate. Paraphyses from cylindrical with acute tips and not exceeding the asci up to distinctly lanceolate and considerably longer than the asci.

Type species: Clavidisculum kriegerianum Kirscht. Ann. Myc. 36: 379(1938) (?=C. acuum).

This genus seems to be a valid home for a rather large number of species characterized by aseptate or rarely up to 2-septate hairs which are granulated only on the tip or have at least always a smooth base. In these features this group differs from Dasyscyphus and forms a parallel series of evolution to it.

On the other hand the intrageneric taxonomy is far from clear. There is very probably a lot of undescribed species or poorly described species placed in other genera. Some authors (Nannfeldt, 1932; Dennis, 1949) have placed in the genus Cistella several species with completely smooth hairs which are probably not Hyaloscyphaceous at all.

In the mathematical part of this study it was mentioned that the intrageneric connections are

surprisingly loose in this genus. It may be due to the errors in choosing input data or the genus may be really heterogenous. Herbicolous and lignicolous species seem to be rather different from each other but in the present state of investigation the subgeneric structure of Clavidisculum remains concealed.

Included species:

Clavidisculum acuum (Fr.)Kirscht., Ann. Myc. 36: :380 (1938). /Lit.: Dennis, 1949: 33, sub Dasyscypha/.

CLAVIDISCULUM CARICIS Raitv. sp. nova.
Apothecia cupulata vel discoidea, sessilia, 0.15 -0.2 mm in diam., alba vel hyalina, margine breviter pilosa. Pili cylindracei, clavati vel capitati, hyalini, tenuiter tunicati, unicellulares, apicibus subtiliter granulatis, 15-40x3-7μ. Asci clavati, 40-50x6-6.5μ. Sporae cylindraceo-ellipsoideae, unicellulares, 11.5-15x2-2.5μ. Paraphyses sparsae, anguste cylindraceae, ascos non superantes.
Ad folia sicca Caricis crescit.

Holotypus: U.R.P.S.S., R.P.S.S. Lithuanica, Schakiai, ad folia sicca Caricis sp., 17.VII 1966; A. Raitviir legit (TAA-44252).

Species ab aliis graminicolis et cypericolis sporis et ascis majoribus differt.

CLAVIDISCULUM CRASSIPILUM Raitv. sp. nova.
Apothecia cupulata, breviter stipitata, 0.3-1 mm in diam. pallide ochracea, extus breviter pilosa. Pili cylindracei, nonnumquam basaliter constricti, tenuiter tunicati, unicellulares, granulati, hyalini vel pallide brunnei, 50-70x6.5-10μ. Asci cylindraceo-clavati, 55-65x6.5-8μ. Sporae cylindraceae vel cylindraceo-ellipsoideae, nonnumquam subcurvatae, unicellulares, 2-4-guttulatae, 8.5-10.6x2.7-3.3μ. Paraphyses anguste cylindraceae, 1-1.5μ in

diam., ascos non superantes.
Ad caules emortuos Sambuci ebuli crescit.

Holotypus: U.R.P.S.S., R.P.S.S. Georgica, distr. Poti, ad calem Sambuci ebuli dejectum, 12. X 1963, E. Parmasto legit (TAA-16898).

C. phytolaccae similis, colore et ascis majoribus differt.

CLAVIDISCULUM DENTATUM (Fr.)Raitv. comb. nova.
Basionymum: Peziza dentata Fr. Syst. Myc. 2: 147 (1822). /Lit.: Nannfeldt, 1932. Dennis, 1949: 58/.

CLAVIDISCULUM FUGIENS (Bucknall)Raitv. comb. nova.
Basionymum: Peziza fugiens Bucknall, Proc. Bristol Nat. Soc. 3: 137 (1881). /Lit.: Dennis, 1949: 34/.

CLAVIDISCULUM GEELMUYDENII (Nannf.)Raitv. comb. nova.
Basionymum: Cistella geelmuydenii Nannf., Nova Acta Regiae Soc. Sci. Ups. IV 8(2): 270 (1932).

Clavidisculum graminicolum Raitv., Eesti NSV TA Toim. Biol. 18: 66 (1969).

CLAVIDISCULUM GRANULOSELLUM (Höhn.)Raitv. comb. nova.
Basionymum: Psilachnum granulosellum Höhn., Mitt. Bot. Lab. Techn. Hochsch. Wien 3: 74 (1926). /Lit.: Dennis, 1949: 30/.

CLAVIDISCULUM GREVILLEI (Berk.)Raitv. comb. nova
Basionymum: Peziza grevillei Berk. English Flora 5 (2): 198 (1837). /Lit.: Dennis, 1949: 31/.

CLAVIDISCULUM HUMULI (Phill.)Raitv. comb. nova
Basionymum: Lachnella tami var. humuli Phill. Brit. Discom. 270 (1887). /Lit.: Dennis, 1963: 369/.

CLAVIDISCULUM HUNGARICUM (Rehm)Raitv. comb. nova
Basionymum: Pezizella hungarica Rehm, Flora II. 30:

526 (1872). /Lit.: Rehm, 1896: 669/.

CLAVIDISCULUM IMPROVISUM (Karst.)Raitv. comb. nova.
Basionymum: Peziza improvisa Karst. Myc. Fenn. 1: 141 (1871). /Lit.: Dennis, 1956: 189/.

CLAVIDISCULUM INCRUSTATUM (Raitv.)Raitv. comb. nova.
Basionymum: Dasyscyphus incrustatus Raitv., Eesti NSV TA Toim. Biol. 17: 325 (1968).

CLAVIDISCULUM KARSTENII Raitv. nom. novum
Synonymum: Peziza granulosella Karst., Not. Sällsk. Fauna Flora Fennica 10: 180 (1869) (cf. C. granulosellum (Höhn.)Raitv.).

CLAVIDISCULUM LARICINUM Raitv. sp. nova.
Apothecia cupulata, sessilia, 0.1-0.2 mm in diam., alba, extus breviter pilosa. Pili clavati, hyalini, unicellulares, apicibus subtiliter granulatis, 10-15x3-5μ. Asci clavati, 40-50x6.5-7.5μ. Sporae ellipsoideae vel ovoideo-ellipsoidea, 9.5-10.5x2.5μ. Paraphyses cylindraceae, apicibus clavatis 4μ in diam.
Ad ramos emortuos Laricis crescit

Holotypus: U.R.P.S.S., Regio Sverdlocsk, distr. Severouralsk, ad ramos emortuos Laricis sp., 20. VII 1968, A. Sirko legit (TAA-60789).

Species ab aliis lignicolis sporis magnis et latis differt.

Cistella piceae var. laricinum (Vel.) Dennis (1968) may be the same species or European variety of this species differing in septate spores and longer asci. It has, however, an invalid name since Belonium piceae P. Hennings is a typical Dermataceous fungus and the taxonomic position of its var. laricinum Vel. is highly unclear too.

CLAVIDISCULUM MALI (Rehm)Raitv. comb. nova
Basionymum: Pezizella mali Rehm, Ber. Naturf. Ver. Augsburg 26: 112 (1881). /Lit.: Rehm, 1896: 658/.

CLAVIDISCULUM PHYTOLACCAE (Raitv.)Raitv. comb. nova.
Basionymum: Dasyscyphus phytolaccae Raitv., Biol. Journ. Armenii 21(8): 4 (1968).

CLAVIDISCULUM STEREICOLUM (Cooke)Raitv. comb. nova.
Basionymum: Peziza stereicola Cooke, Grevillea 1: 130 (1873). /Lit.: Dennis, 1949:60/.

CLAVIDISCULUM TENUICULUM (Karst.)Raitv.comb. nova.
Basionymum: Peziza tenuicula Karst., Not. Sällsk. Fauna Flora Fenn. 10: 178 (1869), /Lit.: Dennis, 1956: 193/.

CLAVIDISCULUM XYLITUM (Karst.)Raitv. comb. nova
Basionymum: Peziza xylita Karst., Not. Sällsk. Fauna Flora Fennica 10: 190 (1869).

Excluded or dubious species: Cistella aphanes (Rehm) Nannf., C. inconspicua (Rehm)Nannf., C. chlorosticta (E.P. Fr.)Nannf., C. perparvula (Karst.)Nannf., C. sauciella (Karst.)Nannf., C. tapesioides (Starb.) Nannf., C. coarctata (Ell. et Ev.)Dennis, Discocistella albidolutea (Feltg.)Svrček, D. micacea (Fr.) Svrček.

Key to the included species

1. On wood and herbaceous stems 2
- On fallen needles of Picea, Pinus and Abies. Ap. substipitate, 0.1-0.2 mm in diam., whitish, minutely downy. Hairs clavate, aseptate, hyaline, granulate in upper part 15-30x3-4μ Asci cylindric-clavate, 25-30x4-5μ. Sp. clavate-fusoid, 4-

5x1-1.5 μ. Par. cylindrical to narrowly lanceolate, slightly exceeding the asci, 1.5-2 μ in diam. Eu, NAm - C. acuum (Fr.)Kirscht.

2. On herbaceous stems 3
- On wood 12

3. On Dicotyledons 4
- On Monocotyledons 8

4. Hairs up to 5μ in diam. 5
- Hairs 6-10 μ in diam. 7

5. Sp. up to 12 μ long 6
- Sp. 16-20x3.5-5 μ, cylindrical, up to 3-septate. Ap. sessile, cupulate, 0.6-0.8 mm in diam. pale ochraceous, minutely downy. Hairs cylindrical, hyaline, up to 3-septate, with granulate tips, 50-80x3-3.5 μ. Asci cylindric-clavate, 70-85x7-10 μ. On dead herbaceous stems. Eu, MA - C. tenuiculum (Karst.)Raitv.

6. Ap. sessile, 0.15-0.5 mm in diam., whitish. Hairs cylindrical or cylindric-clavate, hyaline, granulate in upper part, 15-40x3-4 μ. Asci cylindric-clavate, 27-40x4-6 μ. Sp. cylindric-fusoid, 5.5-8x1.5-2 μ. Par. narrowly lanceolate or cylindrical, slightly exceeding the asci, 1.5-2.5 μ in diam. On dead herbaceous stems. Eu, MA - C. hungaricum (Rehm)Raitv.

- Ap. sessile, 0.3-1 mm in diam., whitish to pale ochraceous. Hairs cylindrical or cylindric-clavate, hyaline, granulate in upper part, 20-50x3-4μ. Asci cylindric-clavate, 37-58x4-6 μ. Sp. cylindric-fusoid, 7-12x1.5-2.5 μ. Par. narrowly lanceolate, 5-10 μ longer than asci, 2-3 μ in diam. On dead herbaceous stems. Eu, A - C. grevillei (Berk.)Raitv.

7. Ap. sessile, subglobose to cupulate, 0.2-0.3 mm

in diam., brownish with ochraceous margin. Hairs shortly cylindrical or cylindric-clavate, ochraceous, 30-40x6-8 μ, granulate. Asci clavate, 44-50x5-6.5 μ. Sp. cylindric-fusoid, 9-11.5x2-2.5 μ. Par. cylindrical, 1.5 μ in diam., not exceeding the asci. On dead herbaceous stems. A - C. phytolaccae (Raitv.)Raitv.

- Ap. substipitate, saucer-shaped, 0.3-1 mm in diam., pale ochraceous. Hairs cylindrical, hyaline to pale brownish, granulate, 50-70x6.5-10 μ. Sp. cylindrical, cylindric-ellipsoid, sometimes slightly curved, aseptate, 2-4-guttulate, 8.5-10.6x2.7-3.3 μ. Par. cylindrical, not exceeding the asci, 1-1.5 μ in diam. On dead herbaceous stems. A - C. crassipilum Raitv.

8. Par. and hairs not incrusted by amorphous matter 9
- Par. incrusted by hyaline amorphous matter, lanceolate, up to 15 μ longer than asci, 4-5 μ in diam. Ap. sessile, cupulate, 0.5 mm in diam., grayish-white. Hairs clavate or fusoid, hyaline, aseptate, granulate, incrusted by hyaline amorphous matter like par. Asci clavate, 70-80x7-8 μ. Sp. fusoid, sometimes curved, 13.8-17.8x2.4-3.1 μ. On dead culms and leaves of grasses. A - C. incrustatum (Raitv.)Raitv.

9. Par. cylindrical, not exceeding the asci . . .10
- Par. lanceolate, 10-15 μ longer than asci, 3-4 μ in diam. Ap. sessile, cupulate, 0.15-0.2 mm, white. Hairs clavate, hyaline, aseptate, with granulate tips, 20-30x2-6 μ. Asci cylindric-clavate, 30-35x3-4 μ. Sp. clavate-fusoid, 2-guttulate, 5-7x1.5-2 μ. On dead leaves of Carex and Scirpus silvaticus. Eu - C. granulosellum (Höhn.)Raitv.

10. Sp. up to 8μ long 11
- Sp. 11.5-15x2-2.5μ, cylindric-ellipsoid. Ap. sessile, 0.15-0.2 mm in diam., white or hyaline. Hairs cylindrical, clavate or capitate, hyaline, granulate in upper part, aseptate, 15-40x3-7μ. Asci clavate, 40-50x6-6.5μ. Par. sparse, very thin, cylindrical. On dead leaves of Carex. Eu - C. caricis Raitv.

11. Ap. sessile, 0.1-0.2 mm in diam., whitish. Hairs hyaline, clavate, granulate, aseptate, 8-14x3-3.5μ. Asci cylindric-clavate, 16-20x3.5--5μ. Sp. fusoid, 4.5-8x1-1.5μ. Par. cylindrical, 1μ in diam., not exceeding the asci. On dead stems of Juncus and Eriophorum. Eu - C. fugiens (Bucknall)Raitv.

- Ap. sessile, 0.2-0.3 mm in diam., white or hyaline. Hairs hyaline, cylindric-clavate, granulate in upper part, aseptate, granulate in upper part, aseptate, 25-33x6.5μ. Asci cylindric-clavate, 30-35x4.3-5μ. Sp. clavate-fusoid, 6.5-7.5x1.5μ. Par. narrowly lanceolate, 2-2.5μ in diam., not exceedin ; the asci. On dead culms of grasses. MA - C. graminicolom Raitv.

12. Sp. up to 6μ long 13
- Sp. over 6μ long 15

13. Sp. ellipsoid to ellipsoid-clavate, over 2μ long 2μ. 14
- Sp. fusoid-clavate, 5-6x1.5μ. Ap. cupulate, shortly stalked, 0.5 mm in diam., yellowish to brownish. Hairs hyaline, cylindrical to clavate up to 30x3-6μ. Asci clavate, 35x5μ. Par. cylindrical, pointed, slightly exceeding the asci 2μ in diam. On rotten coniferous wood. Eu - C. improvisum (Karst.)Raitv.

14. Ap. sessile, cupulate, 0.3-0.5 mm in diam., pale yellowish. Hairs clavate, 15x4μ. Asci cylindric-clavate, 22-28x3-4μ. Sp. broadly ellipsoid to ellipsoid-clavate, 5x2μ. Par. cylindrical, not exceeding the asci, 1 in diam. On the hymenium of Stereum sp. Eu - C. stereicolum (Cooke)Raitv.

- As. sessile, 0.1-0.3 mm in diam., white. Hairs clavate, 30x4μ. Asci 30x6μ. Sp. ellipsoid, 6x2.5μ. On dead wood. Eu - C. geelmuydeni (Nannf.)Raitv.

15. Ap. up to 0.5 mm in diam 16
- Ap. over 0.5 mm in diam. 19

16. Par. tips not clavate or swallen 17
- Par. tips clavate, up to 4μ in diam. Ap. sessile, cupulate, white, 0.1-0.2 mm in diam. Asci clavate, 40-50x6.5-7.5μ. Sp. ellipsoid or ovate-ellipsoid, aseptate, 9.5-10.5x2.5μ. Hairs clavate, hyaline 10-15x3-5μ. On dead Larix branches Eu?, A - C. laricinum Raitv.

17. Asci 32-37x5μ, clavate. Ap. subsessile, cupulate, whitish, 0.5 mm in diam. Hairs cylindrical, hyaline, up to 30x5μ. Sp. clavate, 6-10x 1.5μ. On dead stems of Humulus. Eu - C. humuli (Phill.)Raitv.
- Asci over 38μlong 18

18. As. sessile, 0.1-0.3 mm in diam., yellow-green. Hairs hyaline, clavate, 15x3μ. Asci 40-45x6-8μ. Sp. ellipsoid, 8-9x2.5-3μ. Par. cylindrical, not exceeding the asci. On dead wood. Eu - C. mali (Rehm)
- Ap. sessile, cupulate, 0.5 mm in diam., whitish Hairs hyaline, clavate,25x3-4μ. Asci cylindrical, 38-54x5-6μ. Sp. ellipsoid, 5-9.5x2-2.5μ. Par. cylindrical, not exceeding the asci. On

dead wood. Eu - C. karstenii Raitv.

19. Ap. sessile, 1-2 mm in diam., pale ochraceous. Hairs hyaline, clavate 30x4μ. Asci 80-90x8.10μ. Sp. ellipsoid, 12-13x3-4μ. On dead wood - C. dentatum (Fr.)Raitv.

- Ap. substipitate, 0.4-1.2 mm in diam., reddish. Hairs hyaline, clavate, 30x3.5μ. Asci cylindrical, 37-45x4.5-5.5μ. Sp. ellipsoid, 5-10x1.5-2.5μ. On dead wood. Eu - C. xylitum (Karst.)Raitv.

Genus Dasyscyphus S.F. Gray Nat. Arrang. Brit. Pl. 1: 670 (1821).

Apothecia stipitate to substipitate, rarely sessile, externally whitish to brownish, densely hairy. Hymenium whitish, grayish or yellowish to orange. Hairs cylindrical, sometimes with clavate or capitate apices, 2-to multiseptate, totally granulate, thin- or thick-walled, hyaline or coloured, sometimes bearing crystal heads. Asci cylindrical to cylindric-clavate, J+. Spores from fusoid to filiform. Paraphyses lanceolate to cylindrical with acute tips.

Type species: Dasyscyphus virgineus S. F. Gray Nat. Arrang. Brit. Pl. 1:671 (1821).

In the course of this study the author saw that he could not include the tropical species of the genus Dasyscyphus. It is a rather numerous group, quite different from North Temperate species and unfortunately very poorly known. Those few collections which I have seen from tropics had convinced me that tropical Dasyscyphas are a rather difficult and confused group. In this reason I confined myself to the preliminary study of North Temperate species of the genus. There are only some tropical species included in the reason that their area of distribution covers Soviet Far East too.

The genus is divided into two subgenera on the basis of the difference in hair characters and these two groups seem to be more or less natural.

Included North Temperate species:

Dasyscyphus albo-citrinus (Cooke) Sacc. Syll. Fung. 8: 446 (1889). /Lit.: Dennis, 1962: 321/.

Dasyscyphus albopileatus (Cooke)Sacc. Syll. Fung. 8: 445 (1889). /Lit.: Dennis, 1962: 322/.

Dasyscyphus aleurodes Cooke, Grevillea 21: 73 (1893). /Lit.: Dennis, 1963: 325/.

Dasyscyphus apalus (Berk. et Br.)Dennis, Commonw. Myc. Inst. Myc. Pap. 32: 25 (1949).

Dasyscyphus bambusae Rick, Broteria 25: 104 (1931).

Dasyscyphus brevipilus LeGal, Rev. Myc. 4: 26 (1939). /Lit.: Dennis, 1949: 11/.

Dasyscyphus callimorphus (Karst.) Sacc. Syll. Fung. 8: 451 (1889). /Lit.: Dennis, 1949: 18/.

Dasyscyphus caricis (Desm.)Sacc. Syll. Fung. 8: 450 (1889). /Lit.: Dennis, 1949: 16/.

Dasyscyphus carneolus (Sacc.)Sacc. Syll. Fung. 8: 447 (1889). /Lit.: Dennis, 1949: 20; Rehm, 1896: 881/.

Dasyscyphus ciliaris (Fr.)Sacc. Syll. Fung. 8: 443 (1889). /Lit.: Dennis, 1949: 27/.

Dasyscyphus clavigerus Svrček, Česka Myk. 21: 64 (1967). Syn.: Lachnum morthieri var. menthae

Rehm.

Dasyscyphus clavisporus Mout., Bull. Soc. Roy. Bot. Belg. 36: 18 (1897). /Lit.: Dennis, 1962: 326/.

Dasyscyphus concinnus (Kirscht.)Dennis, Kew Bull. 17: 339 (1963). /Lit.: Kirschtein, 1938: 384/.

DASYSCYPHUS CORNI (Cash)Raitv. comb. nova
Basionymum: Lachnum corni Cash, Journ. Washington Acad. Sci. 29(2): 48 (1939).

Dasyscyphus corticola (Massee)Dennis, Kew Bull. 15: 297 (1961).

Dasyscyphus diminutus (Rob.)Sacc. Syll. Fung. 8: 449 (1889). /Lit.: Dennis, 1949: 24/.

Dasyscyphus dumorum (Rob.)Massee Br. Fung. Fl. 4 (1895). /Lit.: Dennis, 1949: 33/.

Dasyscyphus eburneus (Kirscht.)Dennis, Kew Bull. 17: 342 (1963). /Lit.: Kirschtein, 1938: 385/.

Dasyscyphus eriophori (Quél.)Sacc. Syll. Fung. 8: 448 (1889). /Lit.: Dennis, 1949: 18; Rehm, 1896: 883/.

Dasyscyphus fascicularis (Vel.)LeGal, Rev. Myc. 4: 37 (1939). /Lit.: Dennis, 1949: 15/.

Dasyscyphus halesiae (Cash)Dennis, Kew Bull. 17: 347 (1963).

DASYSCYPHUS LATEBRICOLA(Rehm)Raitv. comb. nova.
Basionymum: Dasyscyphus calyculaeformis var. latebricola Rehm, Ber. Nat. Hist. Vereins. Augsburg. 26: 30 (1881).

Dasyscyphus millerii Dennis in Kew Bull. 17: 326 (1963). /Lit.: Cash, 1940: 301 sub Lachnum arundinariae/.

Dasyscyphus mughonicolus Svrček, Česka Myk. 21:

65 (1967).

DASYSCYPHUS NARYNICUS Raitv. sp. nova
Ap. cupulata vel discoidea, sessilia vel substipitata, 0.5-1 mm in diam., alba, extus pilosa. Pili cylindraceo-conici, subacuti vel subclavati, hyalini, multiseptati, tenuiter tunicati, granulati, 116-140 x1.7-3 μ. Asci cylindracei, 69-83x6-7.5 μ. Sporae fusoideae, 3-septatae, 25-31x2-2.5 μ. Paraphyses anguste lanceolatae, 8 ascos superantes, 3 μ in diam.

Ad caules emortuorum graminum crescit.

Holotypus: U.R.P.S.S., R.P.S.S. Kirghizica, - Tianschan interior, Montes Naryntay, Naryn, ad caulis emortuorum graminum, 2. VIII 1967, A. et T. Raitviir legit (TAA-44591).

Dasyscyphus nudipes (Fuckel)Sacc. Syll. Fung. 8: 442 (1889). /Lit.: Dennis, 1949: 15 /.

Dasyscyphus papyraceus (Karst.)Sacc. Syll. Fung. 8: 433 (1889). /Lit.: Dennis, 1949: 14/.

Dasyscyphus pollinarius (Cooke)Dennis, Kew Bull. 17: 357 (1963).

Dasyscyphus pulveraceus (Fr.)Höhn., Sitzb. Akad. Wiss. Math-nat. I 126: 338 (1917).

Dasyscyphus pteridis (Fr.)Massee Br. Fung. Fl. 4: 368 (1895). /Lit.: Dennis, 1949: 32/.

Dasyscyphus pudibundus (Quel.)Sacc. Syll. Fung. 8: 433 (1889)./Lit.: Dennis, 1949: 14; LeGal, 1939/.

Dasyscyphus pygmaeus (Fr.)Sacc. Syll. Fung. 8: 436 (1889). /Lit.: Dennis, 1949: 10/.

Dasyscyphus rehmii (Staritz)Sacc. Syll. Fung. 8: 466 (1889). /Lit.: Rehm, 1896: 908/.

Dasyscyphus rhododendri (Rehm)Dennis, Kew Bull.

17: 329 (1963).

Dasyscyphus rhodoleucus (Sacc.)Sacc. Syll. Fung. 8: 446 (1889). /Lit.: Dennis, 1949: 21. Rehm, 1896: 885/.

Dasyscyphus rhytismatis (Phill.)Sacc. Syll. Fung. 8: 543 (1889). /Lit.: Dennis, 1949: 27/.

Dasyscyphus roridus (Wallr.)Sacc. Syll. Fung. 8: 457 (1889). /Lit.: Dennis, 1949: 26/.

Dasyscyphus roseus Rehm, Ber. Nat. Hist. Ver. Augsburg 26: 41 (1881). /Lit.: Dennis, 1963: 362; Rehm, 1896: 882/.

Dasyscyphus salicariae Rehm, Rabenh. Krypt.-Fl. 1(3): 851 (1896).

Dasyscyphus subauratus (Ellis)Dennis, Kew Bull. 17: 323 (1962).

Dasyscyphus soppitii Massee Br. Fung. Fl. 4: 330 (1895). /Lit.: Dennis, 1949: 330/.

Dasyscyphus sydowii Dennis, Commonwealth Myc. Inst. Myc. Papers 32: 17 (1949).

Dasyscyphus tenuissimus (Quél.)Dennis, Kew. Bull 17: 370 (1963). /Lit.: Dennis, 1949: 19 sub D. pudicella (Quél.) Sacc./.

Dasyscyphus tricolor (Fr.)Massee Brit. Fung. Fl. 4: 364 (1895).

Dasyscyphus virginellus Sacc. Syll. Fung. 8: 444 (1889). /Lit.: Dennis, 1963: 375/.

Dasyscyphus virgineus (Fr.)Fuck. Symb. Myc. 305 (1869). /Lit.: Dennis, 1949: 12/.

Subgenus CAPITOTRICHA Raitv. subgen. nova.

Pili crasse tunicati, multiseptati hyalini vel

brunnei, plerumque ad apicem crystallis magnis conglomeratis incrustati.

Typus subgeneris: Peziza bicolor. Fr. Syst. Myc. 2: 92 (1822).

Included species:

Dasyscyphus bicolor (Fr.)Fuckel. Symb. Myc. 305 (1869). /Lit.: Dennis, 1949: 35/.
Var. bicolor
Var. rubi (Bres.) Dennis, Commonw. Myc. Inst. Myc. Papers. 32: 6 (1949).

Dasyscyphus calyculaeformis (Fr.) Rehm, Ascomyceten 111b (1882). /Lit.: Rehm, 1896: 897; Dennis, 1949: 43/.

Dasyscyphus capitatus (Peck)LeGal, Rev. Myc. 4: 29 (1939) /Lit.: Dennis, 1949: 36/.

Dasyscyphus clandestinus (Fr.)Fuckel Symb. Myc. 305 (1869). /Lit.: Dennis, 1949: 38; Rehm, 1896 : 898/.

Dasyscyphus foliicola (Keissler)Dennis, Kew Bull 17: 344 (1963).

Dasyscyphus fuscescens (Fr.) Rehm Ascom. 457 (1878). /Lit.: Dennis, 1949: 22; Rehm, 1896: 905 sub Lachnum patens (Fr.)Karst./.

Dasyscyphus patulus (Fr.)Sacc. Syll. Fung. 8 443 (1889). /Lit.: Dennis, 1949: 37; LeGal, 1939 32/.

Dasyscyphus scabro-villosus (Phill.)Sacc. Syl Fung 8: 458 (1889).

Syn.: Dasyscyphus bicolor (Fr.)Fuckel var. indi Müller et Dennis, Sydowia 13: 42 (1959).

Dasyscyphus sulphurellus (Peck)Sacc. Syll. Fu

8: 459 (1889). /Lit.: Dennis, 1949; 29 sub D. crucifera (Phill.) Sacc./.

DASYSCYPHUS TURKESTANIKUS Raitv. sp. nova.

Apothecia substipitata, subglobosa vel cupulata, 0.5-2 mm in diam., extus alba, longe pilosa, hymenio aurantiaco. Pili cylindracei, hyalini, crasse tunicati, multiseptati, granulati, ad apicem crystallis magnis conglomeratis incrustati, 250-300x2.5-3μ. Asci cylindraceo-clavati, 60-70x6.5μ. Sporae ellipsoideae vel ellipsoideo-fusoideae, aseptatae, 10-11.6x2.8-3.3μ. Paraphyses anguste lanceolatae, contento aurantiaco-luteo, 15-20μ ascos superantes, 3μ in diam.

Ad caules emortuos Caraganae turkestanicae crescit.

Holotypus: U.R.P.S.S., R.P.S.S. Kirghizica, Tianschan interior, Montes Moldotau apud vallem fluvii Karatal. 3000 m alt., ad caules emortuos Caraganae turkestanicae, 30. VII 1967, H. Remm legit (TAA-44985).

D. bicolori similis, sed sporis latis et ellipsoideis differt.

Key to the included North Temperate species

1. Hairs bearing large conspicuous crystal masses at their tips 2
- Hairs without crystal caps or bearing occasionally some small crystals or lumps of resinous matter 15

2. Growing on wood 3
- Growing on herbaceous stems and fallen leaves .7

3. Hairs hyaline 4
- Hairs brown, cylindrical, thick-walled, multiseptate, 150-180x4μ. Asci cylindrical, 45-50x

4μ. Sp. fusoid, 8-12x2μ. Par. lanceolate, up to 15μ longer than asci, 4-5μ in diam. Ap. 1-2 mm in diam., with short stalk, externally brown., hymenium yellowish. Eu -
D. calyculaeformis (Fr.)Rehm

4. Hymenium bright orange, hairs thick-walled . . 5
- Hymenium whitish, hairs thin- to firm-walled . 6

5. Sp. fusoid, 6-10x1-2μ. Ap. 1-1.5 mm in diam., with short stalk, externally white, hymenium bright yellowish-orange. Hairs multiseptate, 130-200x4-6μ. Asci cylindrical, 45-55x5μ. Par. lanceolate, up to 15μ longer than asci, 4-5μ in diam. On dead twigs of deciduous wood. Eu, A, NAm. - D. bicolor (Fr.)Fuckel

- Sp. ellipsoid to ellipsoid-fusoid, 10-11.6x2.8-3.3μ. Ap. substipitate, subglobose to cupulate, 0.5-2μ in diam., externally white, hymenium orange. Hairs multiseptate, 250-300x2.5-3μ. Asci cylindric-clavate, 60-70x6.5μ. Par. narrowly lanceolate, 15-20μ longer than asci, 3μ in diam., with orange-yellow content. On dead stems of Caragana turkestanika. MA -
D. turkestanikus Raitv.

6. Hairs closely multiseptate, with firm walls, very finely granulate, 50-80x4-5μ. Ap. 0.5 mm in diam., with long stalk, white. Asci cylindrical, 30-35x4μ. Sp. fusoid, 6-10x1-1.5μ. Par. lanceolate, up to 20μ longer than asci, 4μ in diam. On dead branches of Myrica. Eu, EA, NAm -
D. sulphurellus (Peck)Sacc.

- Hairs 1-2-septate, thin-walled, granulate, 50-60x4-5μ. Ap. 0.5-1 mm in diam., with very short stalk, whitish, turning reddish-brown on drying. Asci clavate, 40-50x5μ. Sp. fusoid, 7-10x2μ. Par. lanceolate, up to 25μ longer than asci,

4 μ in diam. On rotten deciduous wood. Eu -
D. roridus (Wallr.)Sacc.

7. Growing on fallen leaves 8
- Growing on herbaceous stems 12

8. Hairs hyaline 9
- Hairs brown, thick-walled, multiseptate, 80-105x 3-5 μ. Ap. 0.5-1 mm in diam., with short stalk, externally dark brown, hymenium dingy yellow. Asci cylindrical, 40-45x3-4 μ. Sp. 6-11x1.5-2.5 μ, fusoid. Par.lanceolate, 25-30 μ longer than asci. On fallen leaves. Eu, NAm -
D. fuscescens (Fr.)Rehm

9. Hairs very thick-walled 10
- Hairs thin-walled 11

10. Ap. pure white, 0.3 mm in diam., with short stalk. Hairs 60-84x6-7 μ, 2-3-septate. Asci cylindrical, 30-36x3-4 μ. Sp. fusoid or fusoid-clavate, 5-6x1 μ. Par. lanceolate, 18-30 μ longer than asci, 3-5 μ in diam. On fallen leaves of Quercus. Eu, NAm -
D. capitatus (Peck)LeGal

- Ap. externally white, hymenium yellow to orange, 0.5 mm in diam., with short stalk. Hairs multiseptate, 175-250x4-5 μ. Asci clavate, 32-40x 5-5.5 μ. Sp. fusoid-clavate, 6.5-9x2-2.5 μ. Par. lanceolate, 10 μ longer than asci, 4 μ in diam. On fallen leaves of Quercus. Eu -
D. patulus (Fr.)Sacc.

11. Sp. fusoid. 15-22x2-3 μ. Ap. 0.3-0.5 mm in diam., with long stalk, externally white, hymenium creame-coloured. Hairs 80-100x4 μ, 4-5-septate. Asci cylindric-clavate, 50-60x6 μ. Par. cylindric-lanceolate, not exceeding the asci, 1.5-2 μ in diam. On fallen leaves. Eu, A,

NAm -
D. ciliaris (Fr.)Sacc.

- Sp. clavate, 4-6x1 μ. Ap. 0.2 mm in diam., with long stalk, white. Hairs 1-3-septate, 50-65x 4-5 μ. Asci clavate, 23-30x3-5 μ. Par. lanceolate, 15-25 μ longer than asci, 4-5 μ in diam. On fallen leaves. Eu, A -
D. rhytismatis (Phill.)Sacc.

12. On Dicotyledons 13
- On dead grasses. Ap. 0.5-1 mm in diam., with short stalk, pale rose-coloured. Hairs multiseptate, 100-140x4.5-6 μ. Asci cylindric-clavate, 50-60x5 μ. Sp. 11.5-16.5x2 μ, narrowly fusoid. Par. lanceolate, up to 20 μ longer than asci, 4 μ in diam. Eu, A -
D. roseus Rehm

13. Hairs thick-walled 14
- Hairs thin-walled, septate, 70-110x3-4 μ. Ap. 0.5-1 mm in diam., shortly stipitate, cupulate, white. Asci cylindric-clavate, 37-50x4-4.5 μ. Sp. fusoid, 6-8x1.5 μ. Par. lanceolate, up to 30 μ longer than asci, 4-5.5 μ in diam. On dead herbaceous stems, particularly on Chamaenerion angustifolium. Eu, A -
D. clavigerus Svrček

14. Hairs hyaline. Sp. fusoid, 6-8x1-2 μ. In other respects similar to D. bicolor (cf. 5). On dead stems of Rubus. Eu, A, NAm -
D. bicolor var. rubi (Bres.) Dennis

- Hairs brown, moderately thick-walled, multiseptate, 80-100x3-5 μ. Ap. 0.5-1 mm in diam., stipitate, cupulate, externally brown, hymenium pale yellowish. Asci cylindrical, 45-50x4-5 μ. Sp. fusoid, 6-8x1.5 μ. Par lanceolate, up to 30 μ longer than asci, 3-5 μ in diam. On dead

stems of Rubus and various herbaceous stems. Eu, A, NAm - D. clandestinus (Fr.)Fuckel

15. Hairs thick-walled 16
- Hairs thin-walled 17

16. Sp. fusoid to clavate, 15-20x3-4 μ, 1-3-septate. Ap. white, 0.6-1 mm in diam., shortly stipitate, cupulate. Hairs up to 120x4 μ, multiseptate. Asci clavate-fusoid, 60-88x8-9 μ. Par. narrowly lanceolate, scarcely exceeding the asci 3-3.5 μ in diam. On dead stems of Rubus. NAm, India - D. scabro-villosus (Phill.) Sacc.

- Sp. cylindric-clavate, 7-8x1.5 μ. Ap. stipitate, cupulate, brownish, covered with white hairs. Hairs up to 85x3 μ, multiseptate. Asci cylindric-clavate, 40-47x5 μ. Par. lanceolate, up to 20 μ longer than asci, 5 μ in diam. On fallen leaves of Rhododendron. A - D. foliicola (Keissler)Dennis

17. Growing on Cryptogams 61
- Growing on Phanerogams 18

18. Growing on fallen leaves and needles 19
- Growing on herbaceous stems and wood 30

19. Growing on fallen needles 20
- Growing on fallen leaves 21

20. Sp. 4-5x1 μ, cylindric-clavate. Ap. subsessile, 0.5-1 mm in diam., bright yellow, margin tipped with red. Hairs with firm walls, up to 70x3-4 μ, containing pale yellow oil-drops and bearing irregular lump of resin in tip. Asci cylindrical, 30-40x3-4 μ. Par. narrowly lanceolate, 5-10 μ longer than asci, 2 μ in diam. On fallen needles of Pinus. Eu, NAm - D. pulverulentus (Lib.)Sacc.

- Sp. 8.5-11x2-3 μ, fusoid. Ap. 0.4-1 mm in diam. stipitate, cupulate, sulphur-yellow. Hairs hyaline to pale yellowish, abundantly incrusted by lemon-yellow resinous matter, 80-110x2-3.5 μ. Asci cylindrical, 50-60x4.5-5 μ. Par. cylindrical with pointed tips, scarcely exceeding the asci, 1.5-2.5 μ in diam. On fallen needles of Pinus. Eu, A - D. mughonicolus Svrček

21. Growing on palm petioles. Ap. stipitate, white with yeloow hymenium, 1 mm in diam., Hairs hyaline, 70x3-4 μ. Asci 50x4 μ. Sp. 8-11x1 μ, fusoid. Par. cylindrical, 1 μ in diam. India - D. aleurodes Cooke

- Growing on leaves of other plants 22

22. Growing on leaves of Vaccinium 23
- Growing on leaves of other genera 24

23. Sp. 7-9x1 μ, cylindric-clavate. Ap. stipitate, up to 1 mm in diam., white. Hairs up to 100x 2.5-4 μ. Asci 50x4 μ. Par. up to 30 μ longer than asci, 3-4 μ in diam., lanceolate. On leaves of Vaccinium. NAm - D. virginellus Sacc.

- Sp. 10-11x1-1.5 μ, clavate. Ap. substipitate, white with orange hymenium, 1 mm in diam. Hairs cylindrical with rather sharp pointed tip, up to 120x3.5 μ. Asci 50x4 μ. Par. lanceolate, up to 10 μ longer than asci, 4 μ in diam. On dead leaves of Vaccinium. NAm - D. albocitrinus (Cooke)Sacc.

24. Sp. up to 8 μ long 25
- Sp. over 8 μ long 28

25. Hairs brown 26
- Hairs hyaline 27

26. On leaves of Rubus. Ap. 0.4 mm in diam., ses-

sile, brownish. Hairs up to 55x3-4 μ, light brown. Asci 30-35x4 μ. Sp. cylindric-fusoid, 4-5x1-1.5 μ. Par. narrowly lanceolate, scarcely exceeding the asci, 2 μ in diam. Eu -
D. dumorum (Rob.)Massee

- On leaves of Cornus. Ap. stipitate, brown, 0.3-0.8 mm in diam. Hairs brown, paler at apex, 50-65 μ long. Asci 33-38x3-3.5 μ. Sp. 4-6x0.5-1 μ, fusoid. Par. lanceolate, up to 20 μ longer than asci, 3-3.5 μ in diam. NAm -
D. corni (Cash)Raitv.

27. Ap. stipitate, white, 1 mm in diam. Hairs 30-35x3-4.5 μ. Asci 30-35x4 μ. Sp. fusoid, 5x1 μ. Par. lanceolate, up to 20 μ longer than asci, 4-5 μ in diam. On leaves of Magnolia. NAm -
D. albopileatus (Cooke)Sacc.

- Ap. stipitate, white to pale buff, 0.5 mm in diam. Hairs 60-70x2.5-4 μ, often tipped by yellow resinous matter. Asci 40x4 μ. Sp. clavate, 6-8x1 μ. Par. up to 30 μ longer than asci, 5 μ in diam. On. leaves of Clethra. NAm -
D. subauratus (Ellis)Dennis

28. Ap. white 29
- Ap. reddish-brown, covered by white hairs, subsessile, 0.5 mm in diam. Hairs brownish below, hyaline at tips, 50x3-4 μ. Asci 30x5-6 μ. Sp. cylindric-clavate, 8-9x1.5 μ. Par. lanceolate, up to 10 μ longer than asci, 2.5-3 μ in diam. On leaves of Quercus. NAm -
D. pollinarius (Cooke)Dennis

29. Sp. 8-11.6x1.8 μ, fusoid, rarely 1-septate. Ap. 0.3-0.5 mm in diam., stipitate, white. Hairs slightly tapering, obtuse, 115-130x3.5 μ. Asci 48-56x5 μ. Par. cylindric-lanceolate, 5-6 μ longer than asci, 2.5 μ in diam. On fallen lea-

ves of Quercus. Eu -
D. soppitii Massee

- Sp. 13-14x2-2.5 μ, elliptic-fusoid. Ap. sessile, 0.5 mm in diam., white. Hairs up to 135x4 μ. Asci 55-60x8 μ. Par. narrowly lanceolate, scarcely exceeding the asci, 3-4 μ in diam. On leaves of Halesia. NAm -
D. halesiae (Cash)Dennis

30. Growing on wood 31
- Growing on herbaceous stems 43

31. Hairs hyaline or sometimes becoming partly pale brownish on drying 33
- Hairs distinctly coloured 32

32. Asci 32-45x3-4 μ. Ap. shortly stipitate, pale brownish with pale hymenium, 1-1.5 mm in diam. Hairs pale brown with hyaline tips, 45-65x4 μ. Sp. clavate-fusoid, 6.5-8x1.5 μ. Par. lanceolate, 10 μ longer than asci, 3-4 μ in diam. On dead wood. Eu - D. concinnus (Kirscht.)Dennis

- Asci 45-50x6 μ. Ap. shortly stipitate, pale brown, 1 mm in diam. Hairs up to 175x3-4 μ, reddish-brown with hyaline tips. Sp. clavate-fusoid, 6-7x2 μ. Par. lanceolate, up to 15 μ longer than asci, 3 μ in diam. On dead twigs of Rhododendron and Erica. Eu -
D. latebricola (Rehm)Raitv.

33. Sp. fusoid 34
34. Sp. filiform, flexuous, 48-60x1.5-2 μ. Ap. shortly stipitate, 1-2 mm in diam., whitish or pale ochraceous with yellowish hymenium. Hairs 105-135x3-3.5 μ, sometimes pale brownish. Asci 95-105x6-7.5 μ. Par. cylindrical, sharply pointed, up to 15 μ longer than asci, 2.5 μ in diam. On dead wood and bark. EA, also in tropics -
D. corticola (Massee)Dennis

34. Asci longer than 60 μ 35
- Asci up to 60 μ long 36

35. Ap. with long stalk, white with pale yellowish hymenium, 1-3 mm in diam. Hairs cylindrical with clavate tips, 20-40x4-5 μ, hyaline. Asci cylindrical, 60-70x5-6 μ. Sp. narrowly fusoid, 7-12x1.5-2.5 μ. Par. lanceolate, 25 μ longer than asci, 5 μ in diam. On dead wood, also on rhizomes of grasses. Eu, A, NAm -
D. pygmaeus (Fr.)Sacc.

- Ap. shortly stipitate, blue-gray with yellow hymenium, 1-2 mm in diam. Hairs hyaline, cylindrical with somewhat pointed tips, 75-125x2-3 μ. Asci cylindrical, 60-70x7-8 μ. Sp. fusoid, 11-15x2-2.5 μ. Par. cylindrical, pointed, up to 20 μ longer than asci, 1-1.5 μ in diam. On bark of trees. Eu - D. tricolor (Fr.)Massee

36. Hairs tipped with crystals (D. roridus) . . . 6
- Hairs without crystals 37

37. Par. up to 2.5 μ in diam. 38
- Par. 3-6 μ in diam. 41

38. Sp. 4-6 μ long 39
- Sp. over 6 μ long 40

39. Ap. with long stalk, cupulate, white with pale yellowish hymenium, 0.5-1 mm in diam. Hairs hyaline, 40-80x3 μ, 1-3-septate. Asci 35-45x 3-4 μ. Sp. narrowly fusoid, 4-6x1 μ. Par cylindrical-lanceolate, up to 10 μ longer than asci, 2 μ in diam. On dead wood. Eu -
D. papyraceus (Karst.)Sacc.

- Ap. subsessile, cupulate, yellowish, up to 1 mm in diam. Hairs hyaline, up to 110x3.5-5 μ, multiseptate. Asci 40-50x5-6 μ. Sp. elliptic-fusoid, 5-6x1-1.5 μ. Par. cylindrical with acute

tips, 10 μ longer than asci, 2 μ in diam. On fallen twigs of Rhododendron. Eu -
D. rhododendri (Rehm)Dennis

40. Ap. with long stalk, cupulate, white, 0.5-1 mm in diam. Hairs hyaline, cylindrical with clavate tips, 40-50x3-5 μ. Asci 45-50x4-5 μ. Sp. fusoid, 6-8x1.5-2.5 μ. Par. cylindrical to narrowly lanceolate, up to 8 μ longer than asci, 1.5-2.5 μ in diam. On dead wood. Eu, A -
D. brevipilus LeGal

41. Ap. always pure white, stipitate, cupulate, 0.5-1 mm in diam. Hairs cylindrical with sometimes slightly swollen tips, 80-120x4-5 μ. hyaline. Asci 45-55x4-5 μ. Sp. 6-10x1.5-2.5 μ, fusoid to clavate-fusoid. Par. lanceolate, up to 20 μ longer than asci, 3-5 μ in diam. On dead wood and decaying debris. Eu, A, NAm -
D. virgineus (Fr.)Fuckel

- Ap. becoming pale brownish with aging or drying 42

42. Par. filled with brown drops, often septate, lanceolate, 20-30 μ longer than asci, 4 μ in diam. Ap. stipitate, 1-2 mm in diam., whitish, rust-brown when dry. Hairs cylindrical with clavate tips, 25-60x2-4 μ, hyaline. Asci 45-50x 4-5 μ. Sp. cylindric-clavate, 5-8x1-1.5 μ. On dead wood. Eu - D. fascicularis (Vel.)LeGal

- Par. hyaline, lanceolate, aseptate, 20 μ longer than asci, 3-6 μ in diam. Ap. shortly stipitate 1-2 mm in diam, whitish, becoming reddish-brown Hairs hyaline, sometimes pale brownish, cylindrical with clavate tips, 45-60x4 μ. Asci 40-50x 5 μ. Sp. fusoid, 7-9x1.5-2.5 μ. On dead wood. Eu, A - D. pudibundus (Quél.)Sacc.

43. On Dicotyledons 44
- On Monocotyledons 46

44. Ap. stipitate 45
- Ap. sessile, white, 0.5 mm in diam. Hairs hyaline, cylindrical, multiseptate. Sp. 6-8x1.5 μ. Par. lanceolate, far exceeding the asci. On dead herbaceous stems. Eu -
D. eburneus (Kirscht.)Dennis

45. Par. cylindric-lanceolate, up to 5 μ longer than asci, 2 μ in diam. Ap. stipitate, pale yellowish, 0.5-1 mm in diam. Hairs cylindrical, hyaline, 35-55x3-4 μ. Asci 30-40x4 μ. Sp. fusoid, 6-11x1.5-2 μ. On dead herbaceous stems. Eu -
D. salicariae Rehm

- Ap. with long stalk, white with sometimes yellowish hymenium, 0.5-1.5 mm in diam. Hairs cylindrical with clavate tips, hyaline, sometimes bearing unnumerous small crystals, 50-80x3-4 μ. Asci 45-55x4-5 μ. Sp. fusoid, 10-12x1.5-2 μ. Par. lanceolate, up to 15 μ longer than asci, 3-5 μ in diam. Eu, A, NAm? -
D. nudipes (Fuckel)Sacc.

46. On bamboo stems. Ap. substipitate to stipitate, 0.5-1 mm in diam., white with golden yellow or orange hymenium. Hairs cylindrical, tapering, hyaline, 100-120x1.8-2.5 μ. Asci 50-66x4-6 μ. Sp. fusoid, aseptate, 13-21.5x1.5-2.5 μ. Par. lanceolate, 15-30 μ longer than asci, 4 in diam. EA, Brasil -
D. bambusae Rick

- On grasses and rushes 47

47. Sp. up to 15 μ long 48
- Sp. over 15 μ long 57

48. Hairs brown 49
- Hairs hyaline 50

49. Ap. with long stalk, yellowish-brown, 0.5-1 mm in diam. Hairs cylindrical, yellowish-brown, 50-70x3-5 μ. Asci 45-50x4 μ. Sp. fusoid, 7-14x 1.5-2 μ. Par. lanceolate, 15 μ longer than asci 4-5 μ in diam. On dead grasses. Eu -
D. palearum (Desm.)Massee

- Ap. substipitate, up to 1.5 mm in diam., brownish. Hairs brown, 60-80x4-5 μ. Sp. 10-15x2-2.5 μ. Par. lanceolate, far exceeding the asci, 5 μ in diam. On dead culms of Juncus. Eu -
D. rehmii (Staritz)Sacc.

50. Hairs with swollen capitate tips 51
- Hairs cylindrical, without swollen tips . . 53

51. Asci up to 35 μ long 52
- Asci 38-50x3-4 μ. Ap. stipitate, 0.3-0.5 mm in diam., whitish. Hairs hyaline, cylindrical with globose tips, 50-75x3-4 μ. Sp. 10-15x1.5 μ, fusoid. Par. lanceolate, 15-20 μ longer than asci 4-5 μ in diam. On dead grasses. Eu, A -
D. rhodoleucus Sacc.

52. Ap. sessile, 0.1-0.2 mm in diam., white. Hairs hyaline, cylindrical with sometimes swollen tips, 50-70x3 μ. Asci 27-33x3-3.5 μ. Sp. fusoid or clavate, 5-6.5x0.7-1 μ. Par. lanceolate, up to 20 μ longer than asci, 3-4 μ in diam. On dead Arundinaria tecta. NAm -
D. millerii Dennis

- Ap. with long stalk, whitish, 0.3-0.5 mm in diam. Hairs cylindrical with globose tips, hyaline, 40-65x3-4 μ. Asci 30-35x4 μ. Sp. fusoid, 6-8.5x1.5 μ. Par. lanceolate, 10-25 μ longer than asci, 3-5 μ in diam. On dead grasses. Eu, A -
D. tenuissimus (Quél.)Dennis

53. Sp. 5-8 μ long 54

- Sp. 7-15 μ long 55

54. Sp. 5-6x1 μ, cylindric-clavate. Ap. shortly stipitate, white with flesh-coloured or yellowish-orange hymenium, 0.5 mm in diam. Hairs 35-50x3-4 μ. Asci 35-45x5 μ. Par. lanceolate, 15 μ longer than asci, 5-6 μ in diam. On dead grasses. Eu - D. carneolus (Sacc.)Sacc.

- Sp. 6-8x1.5 μ, ellipsoid. Ap. shortly stipitate, whitish, 0.4-0.6 mm in diam. Hairs hyaline or sometimes pale brownish, 40-50x3.5-4 μ. Asci 35-45x4 μ. Par. lanceolate, up to 15 μ longer than asci, 3-4 μ in diam. On dead stems and leaves of Carex. Eu -
D. caricis (Desm.)Sacc.

55. On dead grasses. Ap. 0.5-1.5 mm in diam., shortly stipitate, whitish. Hairs cylindrical, sometimes tapering, 50-65x3-4 μ. Asci 40-50x3-4 μ. Sp. fusoid, 7-12x1.5 μ. Par. lanceolate, 25 μ longer than asci, 4-5 μ in diam. Eu, A -
D. controversus (Cooke)Rehm

- On dead culms of Cyperaceae and Juncaceae . .56

56. Asci 30-40x4 μ. Ap. shortly stipitate, white to flesh-coloured, 0.3 mm in diam. Hairs hyaline, 45-50x3-4 μ Sp. fusoid, 9-10x1.5-2 μ. Par. lanceolate, 25 μ longer than asci, 4 μ in diam. On dead leaves of Eriophorum. Eu -
D. sydowii Dennis

- Asci 40-55x5 μ. Ap. subsessile, 0.5 mm in diam. white with yellowish hymenium. Hairs hyaline or sometimes pale brownish, 30-40x3-4 μ. Sp. narrowly fusoid, 10-15x1.5-2 μ. Par. lanceolate, 15 μ longer than asci, 4-5 μ in diam. On dead culms of Juncus. Eu -
D. diminutus (Rob.)Sacc.

57. Sp. over 25 μ long 58
- Sp. up to 25 μ long 59

58. Sp. 25-31x2-2.5 μ, fusoid. Ap. sessile to substipitate, white, 0.5-1 mm in diam. Hairs cylindric-conical with subacute or clavate tips, hyaline, multiseptate, 116-140x1.7-3 μ. Asci 69-83x6-7.5 μ. Par. narrowly lanceolate, 8 μ longer than asci, 3 μ in diam. On dead grasses. MA -
D. narynicus Raitv.

- Sp. 35-45x1-1.5 μ, acicular. Ap. stipitate, whitish with reddish-brown hymenium, 0.5-1 mm in diam. Hairs cylindrical, tapering, obtuse, hyaline, 50-70x4 μ. Asci 55-65x6 μ. Par. lanceolate, 15 μ longer than asci, 4 μ in diam. On dead culms of Juncus. Eu -
D. apalus (Berk. et Br.)Dennis

59. Sp. fusoid 60
- Sp. clavate, 15-20x3-4 μ. Ap. shortly stipitate 0.5 mm in diam., yellowish. Hairs hyaline, cylindrical, sometimes pale brownish, 45-70x4-5 μ. Asci 75-100x9-10 μ. Par. narrowly lanceolate, not exceeding the asci, 1.5-2 μ in diam. On dead grasses and rushes. Eu -
D. clavisporus Mouton

60. Asci 35-45x5 μ. Ap. sessile to shortly stipitate, white with yellow or orange hymenium, 0.3-0.5 mm in diam. Hairs short, hyaline. Sp. cylindric-fusoid, 17-20x1.5-2 μ. Par. lanceolate, 3 μ in diam. On dead leaves of Carex. Eu -
D. callimorphus (Karst.)Sacc.

- Asci 60-70x6-8 μ. Ap. sessile to shortly stipitate, white to bright yellow, 0.5 mm in diam. Hairs hyaline, 60-80x3-4 μ. Sp. fusoid, 16-23x 2.5-3 μ. Par. lanceolate, 20-25 μ longer than

asci, 4-5 μ in diam. On dead leaves of Eriophorum. Eu - D. eriophori (Quél.)Sacc.

61. Ap. sessile, urceolate, 0.3-0.4 mm in diam., dark brown with dingy yellow hymenium. Hairs cylindrical, brown, 20-50x3-4 μ. Asci 35-40x 5-6 μ. Sp. cylindric-ellipsoid, 6-10x1.5-2.5 μ. Par. cylindrical, not exceeding the asci. On dead fronds of ferns. Eu, NAm -
D. pteridis (Fr.)Massee

- Ap. stipitate or white (herbicolous species occasionally growing on ferns) 43

Genus Psilachnum Höhn., Mitt. Bot. Inst. Techn Hohsch. Wien 3: 73 (1926).

Apothecia sessile to shortly stipitate, cupulate whitish, externally covered by short hairs. Hairs cylindrical, thin-walled, obtuse, smooth, 0-2-septate. Asci cylindric-clavate. Spores fusiform, aseptate. Paraphyses lanceolate, exceeding the asci.

Type species: Helotium lateritio-album Karst.

There is only a small number of well-known species of this genus and it is rather impossible to say whether the genus is a natural group or not. The genus Lachnaster Höhn. is probably synonymous and offers an earlier valid name for the genus, but I have not seen type species L. gracilis Höhn.

Included species:

Psilachnum asemum (Phill.)Dennis, Kew Bull. 17: 326 (1963).

PSILACHNUM CHRYSOSTIGMUM (Fr.)Raitv. comb. nova. Basionymum: Peziza chrysostigma Fr. Syst. Myc. 2:

128 (1822). /Lit.: Dennis, 1956: 59/.

Psilachnum crinellum (Ell. et Ev.)Dennis, Kew Bull. 17: 340 (1963).

Psilachnum inquilinum (Karst.)Dennis, Persoonia 2: 182 (1962).

Psilachnum lanceolato-paraphysatum (Rehm)Dennis, Persoonia 3: 48 (1964).

Psilachnum-lateritio-album (Karst.)Höhn., Mitt. Bot. Inst. Techn. Hohsch. Wien 3: 73 (1926).

Psilachnum micaceum (Fr.)Dennis, Persoonia 3: 69 (1964).

Excluded, dubious or imperfectly known species: Psilachnum acutum (Vel.) Raitv., P. granulosellum Höhn., P. suspectum (Rehm)Höhn., P. tami (Lamy)Dennis.

Key to the included species

1. Growing on Cryptogams 2
- Growing on Phanerogams 3

2. On fronds of ferns. Ap. substipitate, 0.3-0.6 mm in diam., whitish with yellowish hymenium. Hairs aseptate, 30-50x2.5-3 μ, sometimes agglutinated into marginal teeth. Asci clavate, 25-40x3-4 μ. Sp. fusoid to clavate-fusoid, 5-9x1 μ. Par cylindrical to cylindric-lanceolate, sometimes slightly exceeding the asci. Eu, A, NAm -
C. chrysostigmum (Fr.)Raitv.

- On stems of Equisetum. Ap. 0.5-0.7 mm in diam., whitish with pale yellowish hymenium, substipitate. Hairs 1-2-septate, 30-70x2.5 μ. Asci cylindric-clavate, 35-45x5-6 μ. Sp. cylindric-fusoid to clavate-fusoid, 6-9x1.5-2 μ Par. narrow-

ly lanceolate, up to 10 μ longer than asci, 2.5 in diam. Eu, A, NAm -
P. inquilinum (Karst.)Dennis

3. On Dicotyledons 44
- On Monocotyledons 5

4. Asci 40-60x5-8 μ Ap. subsessile, 0.5 mm in diam., yellow to orange. Hairs aseptate, up to 30x4 μ. Sp. cylindric-clavate, 6-8x1.5 μ. Par. cylindrical to narrowly lanceolate, slightly exceeding the asci, 1.5-3 μ in diam. On dead herbaceous stems. Eu - P. micaceum (Fr.)Dennis

- Asci 30x5 μ. Ap. sessile, cream-coloured, externally up to light brown, up to 0.8 mm in diam. Hairs 0-1-septate, up to 25x4 μ. Sp. clavate, 6-8x1 μ. Par.lanceolate, 10 μ longer than asci, 2-2.5 μ in diam. On dead stems of Spiraea. NAm -
P. lanceolato-paraphysatum (Rehm)Dennis

5. Asci over 40 μ long 6
- Asci 32-38x5 μ. Ap. substipitate, whitish, small. Hairs cylindrical, aseptate. Sp. 6-8 μ Par. lanceolate, 12-14 μ longer than asci. On dead leaves of Cyperaceae and Juncaceae. Eu -
P. lateritio-album (Karst.) Höhn.

6. Asci 50-55x8 μ. Ap. minute, subsessile, whitish, Hairs 1-3-septate, up to 50x3-4 μ. Sp. elliptic-cylindric, 10-15x3-4 μ. Par. lanceolate, up to 10 μ longer than asci, 4-5 μ in diam. On dead leaves of Carex. Eu -
P. asemum (Phill.)Dennis

- Asci 45-47x7 μ. Ap. stipitate, 0.2 mm in diam., whitish. Hairs 1-2-septate, up to 50x2.5-3 μ. Sp. cylindric-clavate, 7-11x2 μ. Par. lanceolate

up to 10 μ longer than asci, 4-5 μ in diam. NAm -
P. crinellum (Ell. et Ev.) Dennis

EXCLUDED OR DUBIOUS GENERA

Arachnopeziza Fuckel Symb. Myc. 303 (1869).

Arachnoscypha Boud., Bull. Soc. Myc. Fr. 1: 118 (1885). These two genera belong to the Helotiaceae or to an undescribed family.

Diplocarpa Massee Brit. Fung. Fl. 4: 307 (1895). This genus belongs to the Dermataceae.

Eriopeziza (Sacc.)Rehm in Rabenh. Krypt-Fl. 1(3): 695 (1896). This genus is removed from the family as well as the other genera of Arachnopezizeae.

Lachnaster Höhn., Ann. Myc. 15: 350 (1911). This genus has to be synonymous with some other genus of the family since marginal teeth formed from agglutinated hairs have no taxonomic significance.

Microscypha H. et P. Sydow, Ann. Myc. 17: 38 (1913) This genus seems to belong to the Dermataceae.

Mollisina Höhn., Mitt. Bot. Inst. Techn. Hochsch. Wien 3: 67 (1926). Probably a Helotiaceous genus.

Pezizellaster Höhn., Ann. Myc. 9: 349 (1911).

Pithyella Boud., Bull. Soc. Myc. Fr. 1: 118 (1885).

Trichodiscus Kirscht., Verh. Bot. Ver. Brandenburg 66: 25 (1924). It is a Dermataceous genus.

Unguiculariopsis Rehm, Ann. Myc. 7: 401 (1909).

Zoellneria Vel. Mon. Disc. Boh. 298 (1934). The genus seems to be similar to Rutstroemia s.l.

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INDEX TO SPECIES AND GENERA

A Correction

The following species has to be inserted into page 87:

Dasyscyphus palearum (Desm.)Massee Brit. Fung. Flora 4 (1895).

А. РАЙТВИЙР

КОНСПЕКТ СИСТЕМЫ ГИАЛОСЦИФОВЫХ ГРИБОВ

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