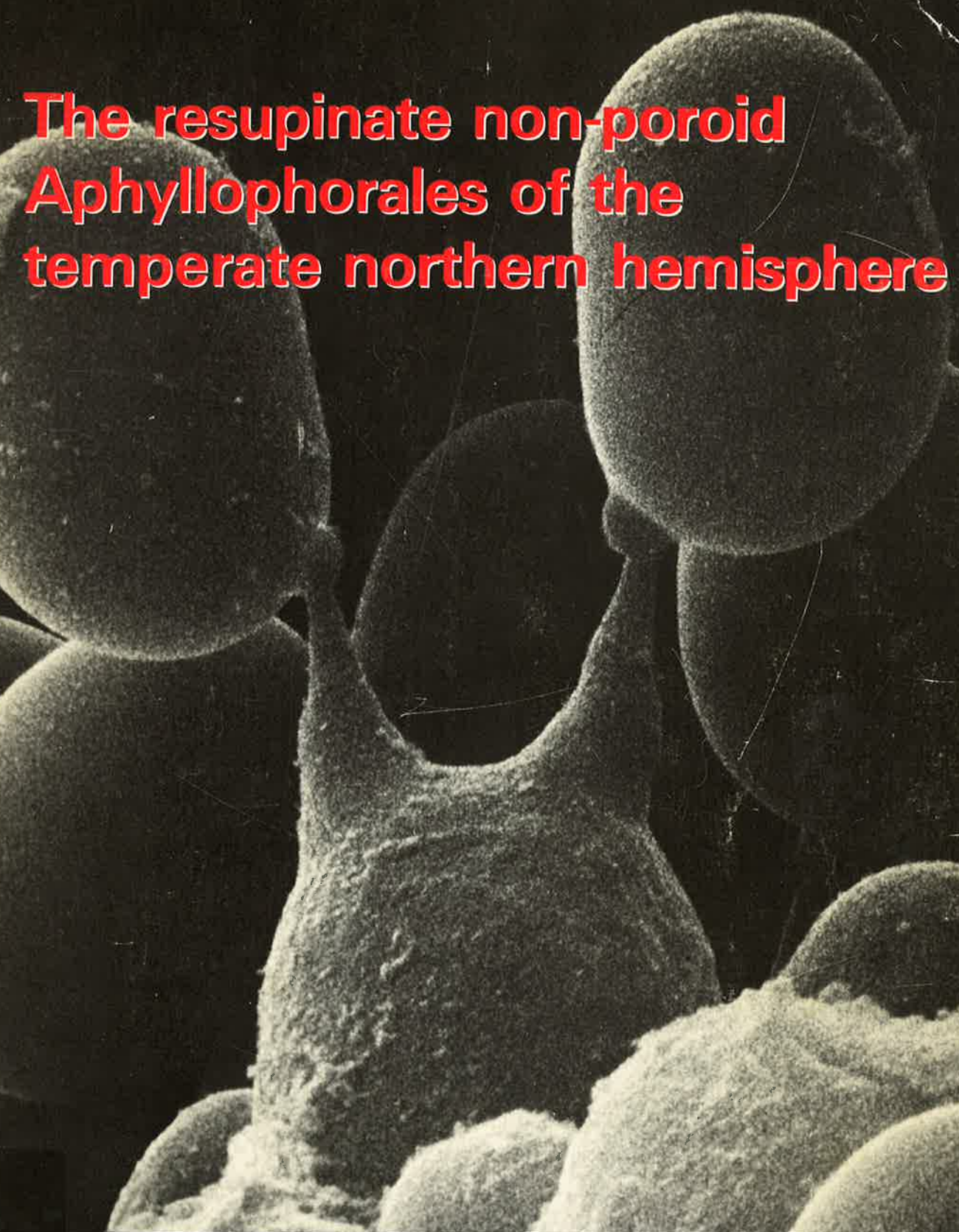
The resupinate non-poroid Aphyllophorales of the temperate northern hemisphere



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Introduction

In the last decennia the resupinate Aphyllophorales (mainly Corticiaceae) were the subject of increasing interest. As a consequence the knowledge of this group became greatly expanded and many species originally described from North America were found in Europe and vice versa. Unfortunately the information on many of these species was scattered and no comprehensive flora for larger areas was available. The need for a compendium thus became urgent.

In this book the resupinate non-poroid Aphyllophorales are treated in a broad sense to include groups traditionally considered to be Heterobasidiomycetes, for example *Ceratobasidium, Cerinomyces* and *Thanatephorus.* Most of the effused-reflexed species as well as those cyphelloid and poroid species belonging to typically resupinate genera are treated, with the exception of *Hymenochaete,* a genus well known in Europe but poorly known in North America.

The area concerned covers the non-tropical region of the northern hemisphere, viz. all parts of Europe, the USSR and North America (excluding Mexico, but including the southern states of the USA). We originally wished to give any useful information about distribution of taxa, but because of the very incomplete data available it seemed unjustifiable to include small areas, so we restricted ourselves to continents. For the same reason no information is given on the distribution in tropical areas.

The main purpose of the keys is to make identification as easy as possible. Therefore in the main entries characters are used which are easily recognized instead of characters which have great systematic importance but are often difficult to observe. As a consequence the key to the genera does not reflect systematic lines and frequent cross-references are made. To facilitate the use of the key to the genera a 'basic key' is offered, giving the principal characters used in the main key.

The genera are brought in alphabetical order to facilitate location without the help of a key or an index; any arrangement in families or groups of genera is bound to be artificial, leaving too many intermediate taxa. We hope this is clearly illustrated in the scheme.

All well accepted generic synonyms are given in the generic description. In some cases, however, the synonymy is not yet indubitable and the genera concerned are mentioned as 'inclusive'.

Information about the substrate is always given in general terms in the generic description. Most species grow on wood of angiosperms or

gymnosperms; this distinction is made where known with additional reference to substrates such as herbs or other material. In the species description the substrate is only given when of interest compared with related species or when it is very restricted.

With each description of an accepted genus the type species is given with its basionym. No type species are mentioned for generic synonyms.

The keys are principally dichotomous, except where the distinguishing characters are faint or intergrading (e.g. a small part of the key to the species of *Botryobasidium*).

Characters used in the main entries of the keys are not always repeated in the description, which is further reduced by only mentioning the important and distinguishing characters. Other characters, which apply to all species of a genus are only given in the generic description.

From the available references only those are selected which in our opinion are reliable and/or give good illustrations. In some cases, however, no good descriptions or figures were available and then no references are given.

In some cases we are not convinced that a certain species really belongs to the genus in which it is keyed out. It is listed under its basionym in the genus in which it is found most easily.

As far as the synonyms are concerned, we have tried to make the list given under the name of an accepted species as complete as possible. The synonyms are given with their basionyms at the species level; all varieties have been omitted as long as they have not been given specific rank.

Glossary to macro- and microstructures

Macrostructures

The basidia-producing fruitbody (**basidiocarp**) is generally **annual** (existing one season only) but sometimes **perennial** (persisting for several years). In the latter case there are several superimposed hymenial layers.

Resupinate basidiocarps consist of several layers:

a. Hymenial layer or **hymenium** with the basidia and eventually sterile elements (cystidia, hyphidia). This layer is exposed.
b. Subicular layer or **subiculum,** the sterile tissue between the hymenium and the substrate. When this layer is very compact it is sometimes called **trama** or **context.**
c. The abhymenial surface of the pileate parts of effused-reflexed basidiocarps typically consists of a layer of more or less parallel hyphae, which continues in the effused parts as a 'basal layer'.

The form of a resupinate basidiocarp may be **effused** (always following the substrate), or **effused-reflexed** (a small marginal part bends away from the substrate). When the pileate part of the basidiocarp is large in comparison with the effused part, but broadly attached (and often semicircular), it is called **dimidiate.** When the base is much narrower and the basidiocarp fan-shaped it is called **flabelliform** and from that it is a small step to **stipitate,** where the basidiocarp is distinctly stalked. Resupinate basidiocarps can also be **cyphelloid** (cup-shaped and centrally attached) or **discoid** (circular and nearly flat).

The margin of the effused parts is often indistinct, but sometimes there is a broad sterile zone or conspicuous white fans. **Hyphal strands** (fascicles consisting of only one type of hyphae) or **rhizomorphs** (fascicles of hyphae with a differentiated cortex and a central core) may be present, either radiating from the margin or growing in the substrate. Sometimes **bulbils** (small, soft, globose bodies consisting of thin-walled hyphae) or **sclerotia** (hard, more or less globose bodies with thick-walled hyphae and/or surrounded by encrusting material) are found.

The texture of the basidiocarp is very variable; the following terms are used in the descriptions:

arachnoid	– cobwebby, with loosely interwoven hyphae
byssoid	– soft, cottony
cartilaginous	– hard, tough, but breaking when bent

ceraceous	– waxy
coriaceous	– leathery
crustose	– hard, rather thin, forming a crust
farinose	– mealy, with a loose, powdery appearance
felty	– packed woolly, nearly glabrous
fleshy	– soft, putrescent
gelatinous	– jelly-like
hypochnoid	– loosely floccose to loosely felty
membranaceous	– thin, compact but pliant
pellicular	– with thin hymenial layer which is easily separable from the loose subiculum
pruinose	– finely powdered, frosty
pulverulent	– powdery, but relatively thick

The hymenial surface is often even, but can also be variously shaped. The following configurations can be distinguished:

even	– smooth
hydnoid	– with long, slender spines, typically longer than 0.5 mm (*Mycoacia, Sarcodontia*)
irpicoid	– with broad, flattened, concrescent projections (*Irpex*)
merulioid	– with anastomosing ridges, sometimes seeming irregularly poroid (*Serpula*)
odontioid	– (odontoid) with conical to cylindrical projections, often fimbriate at the apex, rarely longer than 0.5 mm (*Kneiffiella aspera*)
phlebioid	– with many ridges, irregular, but not anastomosing (*Phlebia radiata*)
poroid	– with distinct pores
raduloid	– with broad, flattened, separate tooth-like projections (*Basidioradulum*)
reticulate	– with shallow pores, resembling a network (*Tubulicrinis* spp.)
tuberculate	– (warted) with low, more or less hemispherical excrescences (*Trechispora farinacea*)

The abhymenial surface may be smooth, velvety (low and soft hairy), felty (compressed woolly), tomentose (densely woolly) or villose (shaggy).

Microstructures

Hyphae may be hyaline or yellowish to brownish, thin- to thick-walled, septate or not septate and the septa may have **clamps** (fig. 80), which occasionally are multiple (fig. 79). There are 3 basal types of hyphae. **Generative hyphae** are thin- to thick-walled, branched and provided with primary septa, which often have clamps. They may be somewhat irregular,

show **ampullate septa** (fig. 80) or may be filled with resinous or refractive material (**gloeoplerous hyphae**). **Skeletal hyphae** are thick-walled, not or rarely branched straight hyphae of unrestricted length without primary septa and thus without clamps. Secondary septa may be present. **Binding hyphae** are thick-walled, much-branched hyphae of restricted length without primary septa. Species with only generative hyphae are called **monomitic,** species with generative and skeletal hyphae **dimitic** and species with all three types **trimitic.**

Sterile structures in the hymenium and the subiculum are:

acanthohyphidium – more or less clavate element, at least apically provided with peg-like projections (fig. 68).

asterohyphidium – centrally branched, stellate, brown, thick-walled element (fig. 64).

cystidiole – thin-walled, not projecting hymenial cell, often acuminate, of the same size as the basidia.

cystidium – hyaline to brown, thin- to thick-walled sterile cell, originating in subiculum or subhymenium, but generally reaching the hymenial surface and often even projecting. They are very variable in shape and size. They can be clavate (fig. 67), capitate (fig. 54), fusoid or fusiform (fig. 56), cylindrical or flexuous-cylindrical, subulate, pyriform, conical (fig. 52), monilioid or moniliform (fig. 51), toruloid or may have several apical bulbs (fig. 46). Cystidia are sometimes encrusted with crystals or resinous material, covered with an apical cap of crystals (fig. 57), provided with a resinous halo (fig. 55) or ensheathed with dendritical hyphae (fig. 53). Rarely they are multi-rooted or multi-radicate (fig. 62).

dendrohyphidium – slender, much-branched hyphidium, often reaching the hymenial surface (fig. 69).

dichohyphidium – thin- to thick-walled, often yellowish, dextrinoid, dichotomously branched hyphidium, occurring in both subiculum and hymenium (fig. 65).

echinocyst – globose element covered with spines (fig. 49).

gloeocystidium – hymenial or subicular element with oily or refractive contents, sometimes yellowish. In case of a positive reaction with sulpho-aldehydes they are sometimes called sulpho-cystidia (fig. 70).

hyphidium – sterile hymenial or subicular element which has more or less retained its hyphal nature. Hyphidia can be unbranched, much-branched or provided with peg-like projections.

lagenocystidium – flask-shaped hymenial element with a long, often encrusted tubuliform apex (fig. 59).

lamprocystidium – conical, thick-walled encrusted element, projecting or embedded (fig. 52).

leptocystidium – thin-walled, hyaline element, typically projecting (fig. 67).

lyocystidium – thick-walled cystidium, walls swelling or wall-thickening disappearing in 10% KOH (fig. 62).

septocystidium – thin- to thick-walled, more or less cylindrical projecting element of which the projecting part is distinctly septate (often with clamps) (fig. 60).

seta – thick-walled, brown conical to subulate element (fig. 66).

skeletocystidium – cystidium originating from skeletal hypha.

stephanocyst – two-celled globose structure of which the lower cell is cup-shaped and surrounds the upper cell with a row of spines (fig. 50).

The **basidium** is a terminal or lateral (**pleurobasidium,** fig. 8, 9) cell, in which karyogamy is followed by meiosis. The haploid nuclei migrate into the (1-)4(-8) **sterigmata** on which the spores are produced. The basidial shape is generally clavate (fig. 3) to nearly cylindrical (fig. 5), but can also be subglobose, ovoid, urniform (fig. 2), suburniform (fig. 1) or barrel-shaped (fig. 4). Basidia are sometimes nearly stalked (**podobasidium,** fig. 41) or they originate from the base of an old basidium (**repetobasidium,** fig. 45). A **basidiole** is a young or aborted basidium.

The **basidiospore** is a meiospore which is attached to the sterigma of a basidium by a sometimes prominent **apiculus.** It germinates with a germ tube or more rarely with a secondary spore (**repetitive spore,** fig. 19). Basidiospores are hyaline to yellowish or brownish, thin- to thick-walled, smooth or ornamented and display a wide variety in shape. They can be globose or subglobose (fig. 35), ovoid (fig. 17), ellipsoid (fig. 15, 36), cylindrical (fig. 16), allantoid (fig. 20), pyriform (fig. 24), citriform or navicular (fig. 18), fusiform or fusoid (fig. 31), sigmoid (fig. 34), angular to pyramidical (fig. 22) or irregularly lobed (fig. 37).

The ornamentation of the basidiospores is also variable. The majority of the spores is smooth, but they may be roughened (fig. 32), warted (fig. 26), echinulate (fig. 37), aculeate (fig. 38) or have crests or ridges (fig. 39).

A **conidium** is a mitospore. Conidia occur only rarely in or close to the basidiocarp, but some of the following types are occasionally found:

arthroconidium – a hypha breaks up into fragments, which are capable of forming a new mycelium. These fragments may become somewhat thick-walled (fig. 76).

blastoconidia – the conidium is a newly formed structure and the conidial initial enlarges before a basal septum is formed (fig. 73). They are found for example in *Haplotrichum* (fig. 71) and *Sporotrichum* (fig. 74). Zygoconidia (fig. 77) consist of two fusing blastoconidia.

chlamydospores – thick-walled solitary resting spores (fig. 72).

Terms used in connection with colour reactions:

amyloid	– becoming blue in Melzer's reagent
cyanophilous	– becoming deep blue in cotton blue
dextrinoid	– becoming reddish brown in Melzer's reagent
sulpho-positive	– becoming blackish in sulpho-benzaldehyde
xanthochroic	– becoming dark brown in KOH 10%

Plates I–VI

Plate I. Basidia (Fig. 1–14).

1. *Hyphoderma amoenum.* – 2. *Sistotrema brinkmannii.* – 3. *Paullicorticium niveo-cremeum.* – 4. *Botryobasidium pruinatum.* – 5. *Dacryobolus karstenii.* – 6. *Phlebia nitidula.* – 7. *Phlebia cremeo-ochracea.* – 8. *Xenasma grisellum.* – 9. *Xenosperma ludibundum.* – 10. *Vuilleminia comedens.* – 11. *Cerocorticium confluens.* – 12. *Laeticorticium roseum.* – 13. *Clavulicium macounii.* – 14. *Oliveonia subviolacea.*

Plate II. Spores and basidia (Fig. 15–45).

15. *Phlebia cornea.* – 16. *Phlebia nitidula.* – 17. *Botryobasidium botryosum.* – 18. *Vararia investiens.* – 19. *Oliveonia subviolacea.* – 20. *Xenasmatella allantospora.* – 21. *Tylospora asterophora.* – 22. *Xenosperma ludibundum.* – 23. *Melzericium bourdotii.* – 24. *Cylindrobasidium evolvens.* – 25. *Galzinia geminispora.* – 26. *Trechispora vaga.* – 27. *Ramaricium albo-ochraceum.* – 28. *Digitatispora marina.* – 29. *Epithele typhae.* – 30. *Vuilleminia comedens.* – 31. *Jaapia argillacea.* – 32. *Hypochnicium analogum.* – 33. *Asterostroma ochroleucum.* – 34. *Tubulicium vermiferum.* – 35. *Cerocorticium hiemale.* – 36. *Hyphoderma capitatum.* – 37. *Tomentella fuscoferruginosa.* – 38. *Botryohypochnus isabellinus.* – 39. *Lindtneria trachyspora.* – 40. *Luellia lembospora.* – 41. *Athelopsis glaucina.* – 42. *Ceratobasidium cornigerum.* – 43. *Sistotremastrum suecicum.* – 44. *Paullicorticium ansatum.* – 45. *Galzinia incrustans.*

Plate III. Cystidia (Fig. 46–54).

46. *Crustomyces pini-canadensis.* – 47. *Basidioradulum radula.* – 48. *Kneiffiella alutaria.* – 49. *Hyphoderma echinocystis.* – 50. *Hyphoderma praetermissum.* – 51. *Aleurodiscus amorphus.* – 52. *Peniophora incarnata.* – 53. *Tubulicium spec.* – 54. *Tubulicrinis accedens.*

Plate IV. Cystidia (Fig. 55–63).

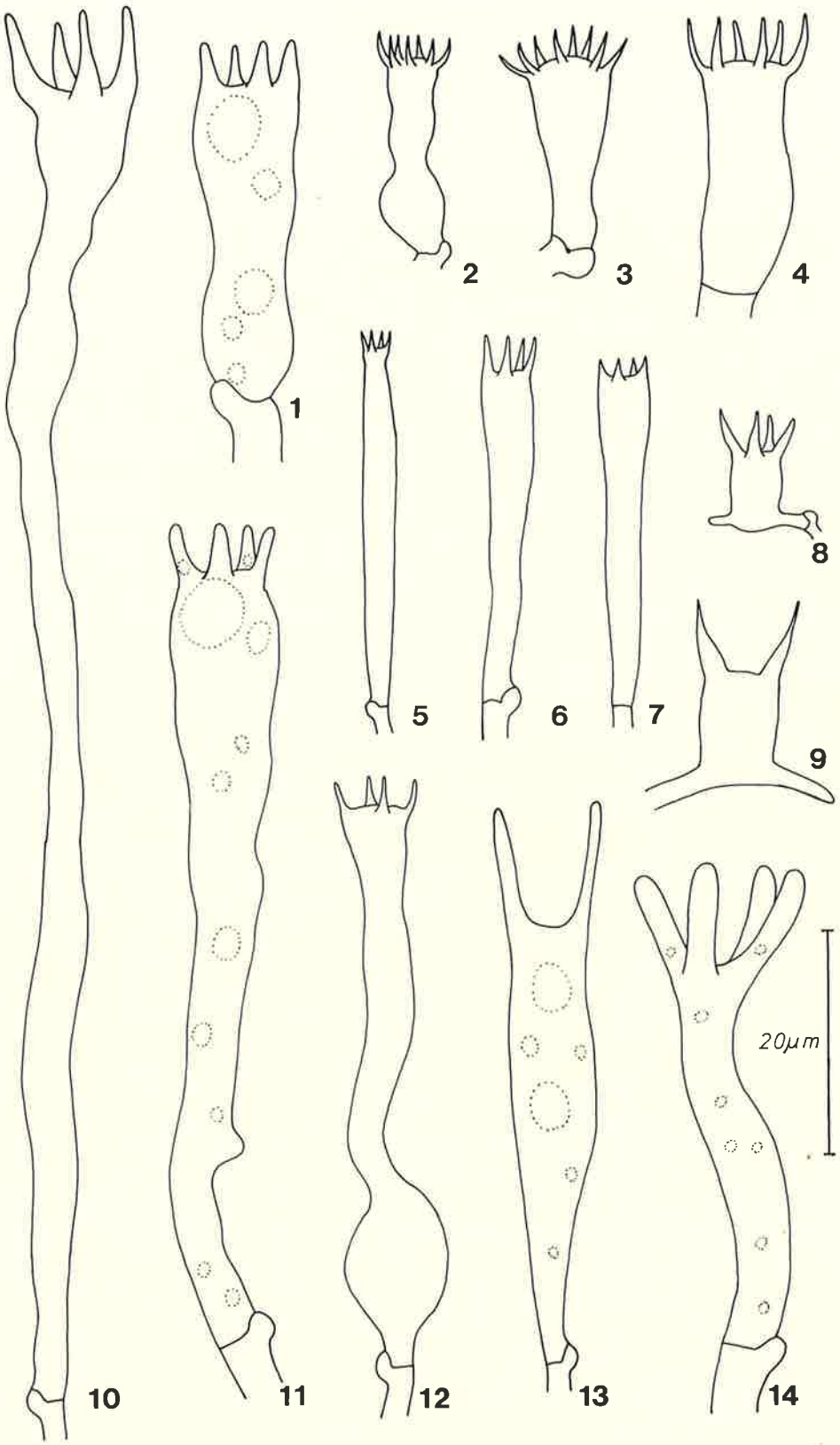
55. *Resinicium bicolor.* – 56. *Phlebia chrysocreas.* – 57. *Resinicium bicolor.* – 58. *Coronicium thymicola.* – 59. *Kneiffiella alutaria.* – 60. *Hyphoderma setigerum.* – 61. *Phlebia cornea.* – 62. *Tubulicrinis calothrix.* – 63. *Subulicystidium longisporum.*

Plate V. Cystidia (Fig. 64–70).

64. *Asterostroma ochroleucum.* – 65. *Vararia investiens.* – 66. *Hymenochaete tabacina.* – 67. *Phlebia rufa.* – 68. *Aleurodiscus fennicus.* – 69. *Peniophora lilacea.* – 70. *Laxitextum bicolor.*

Plate VI. Anamorphic structures and hyphae (Fig. 71–81).

71. *Haplotrichum capitatum (Botryobasidium candicans)* – 72. *Hypochnicium vellereum.* – 73. *Punctularia atropurpurascens.* – 74. *Sporotrichum pruinosum (Phanerochaete chrysosporium).* – 75. *Galzinia incrustans.* – 76. *Phlebia radiata.* – 77. *Christiansenia pallida.* – 78. *Conohypha albocremea.* – 79. *Coniophora puteana.* – 80. *Kavinia himantia.* – 81. *Peniophora quercina.*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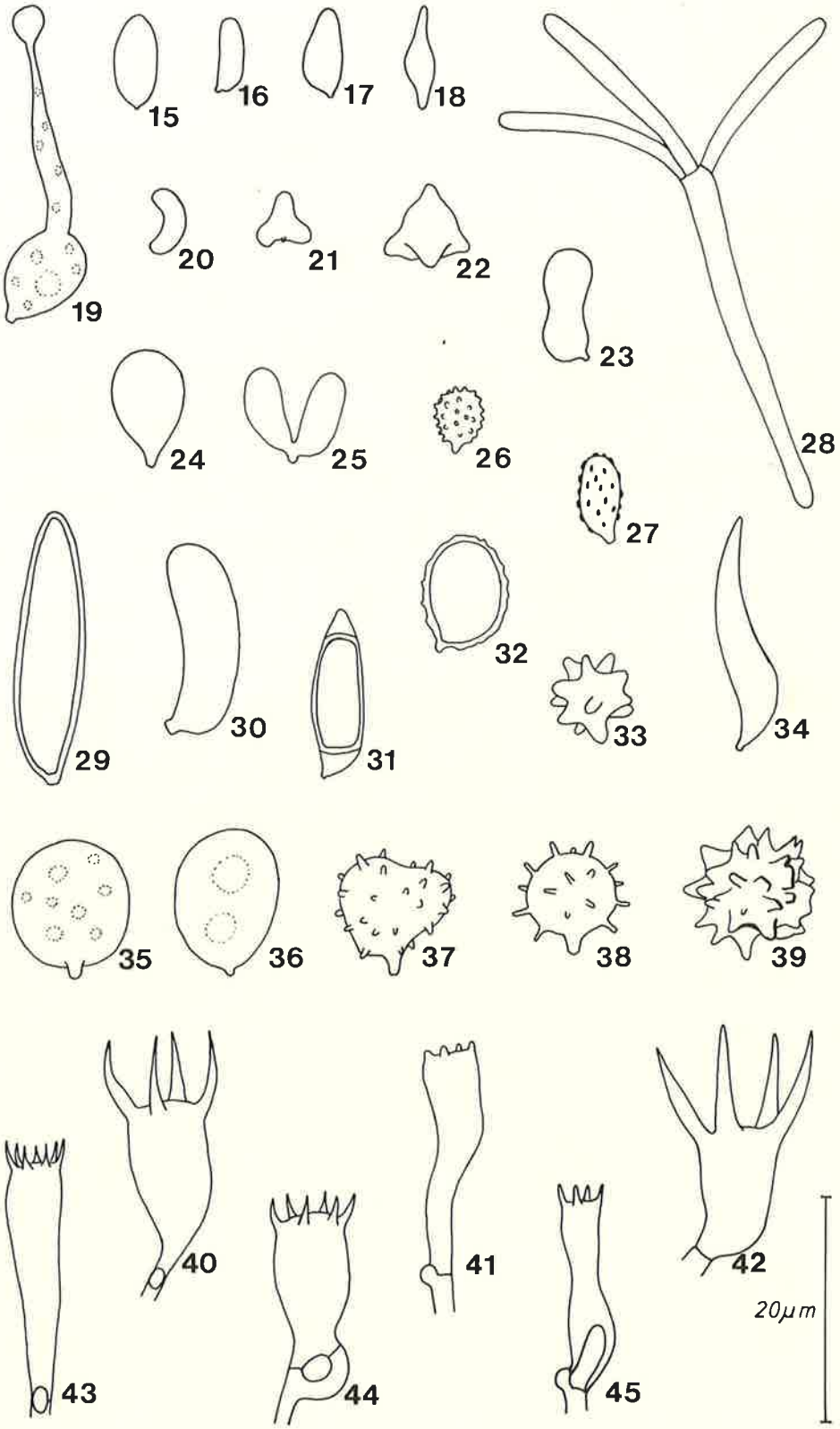
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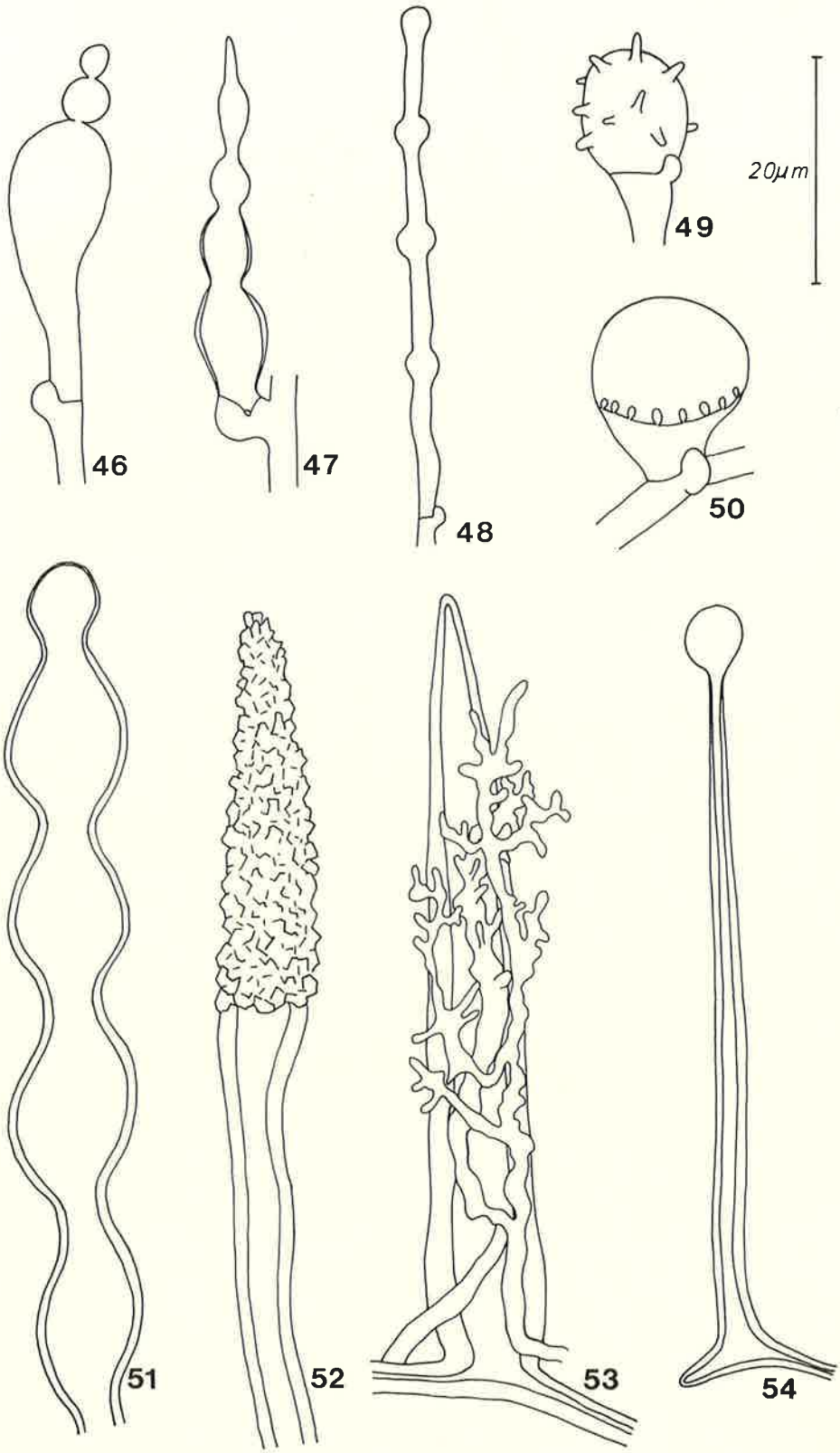
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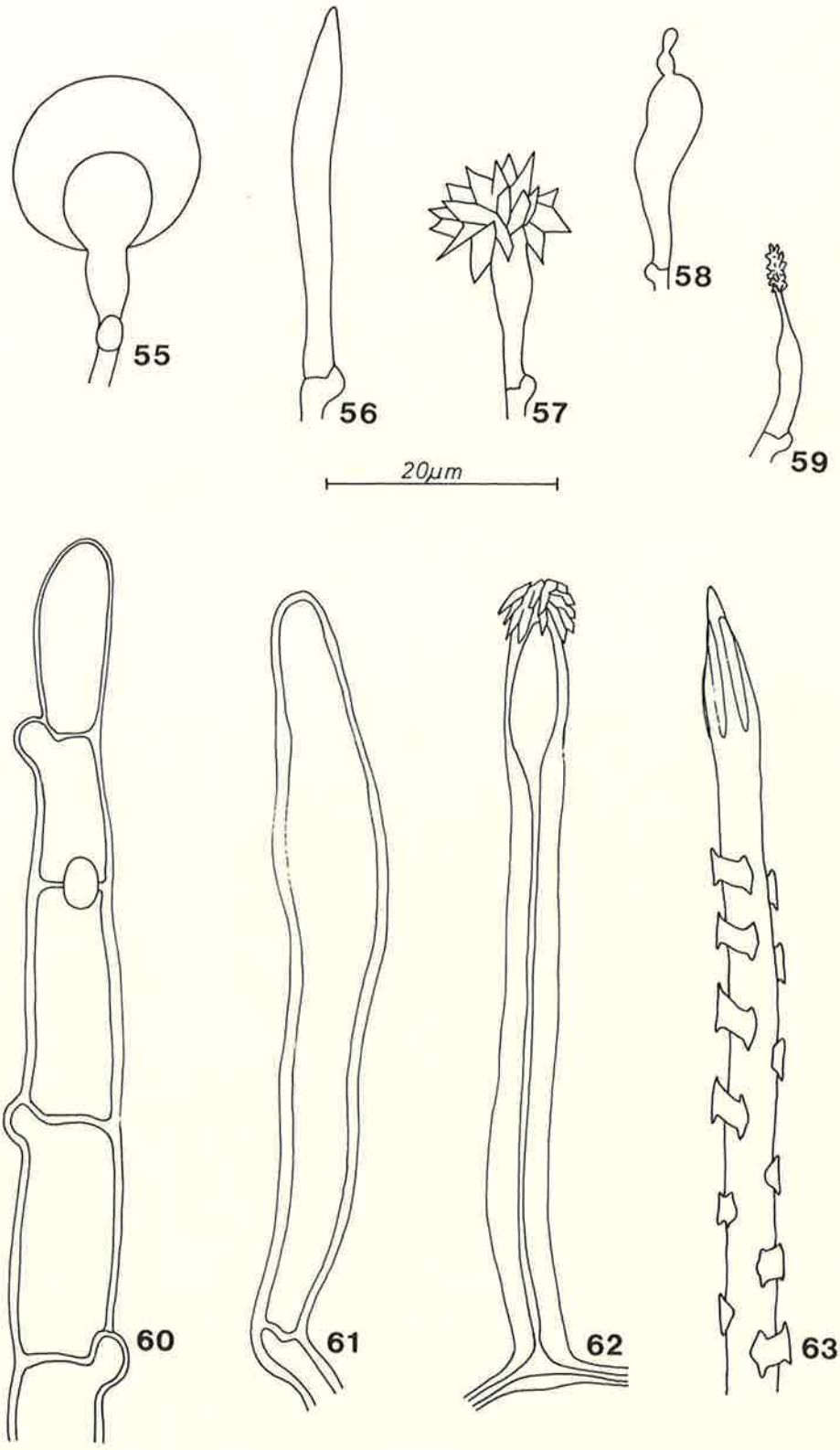
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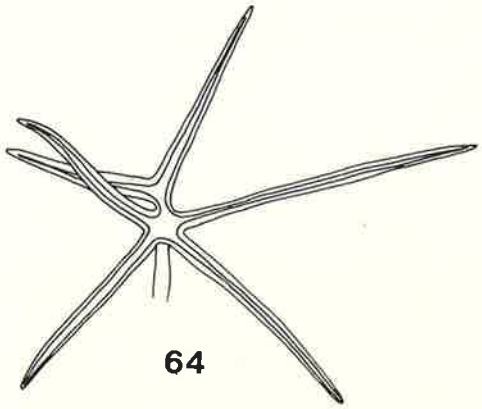

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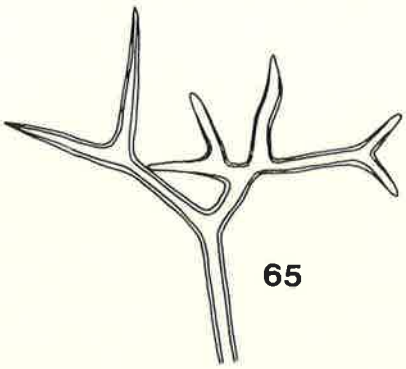

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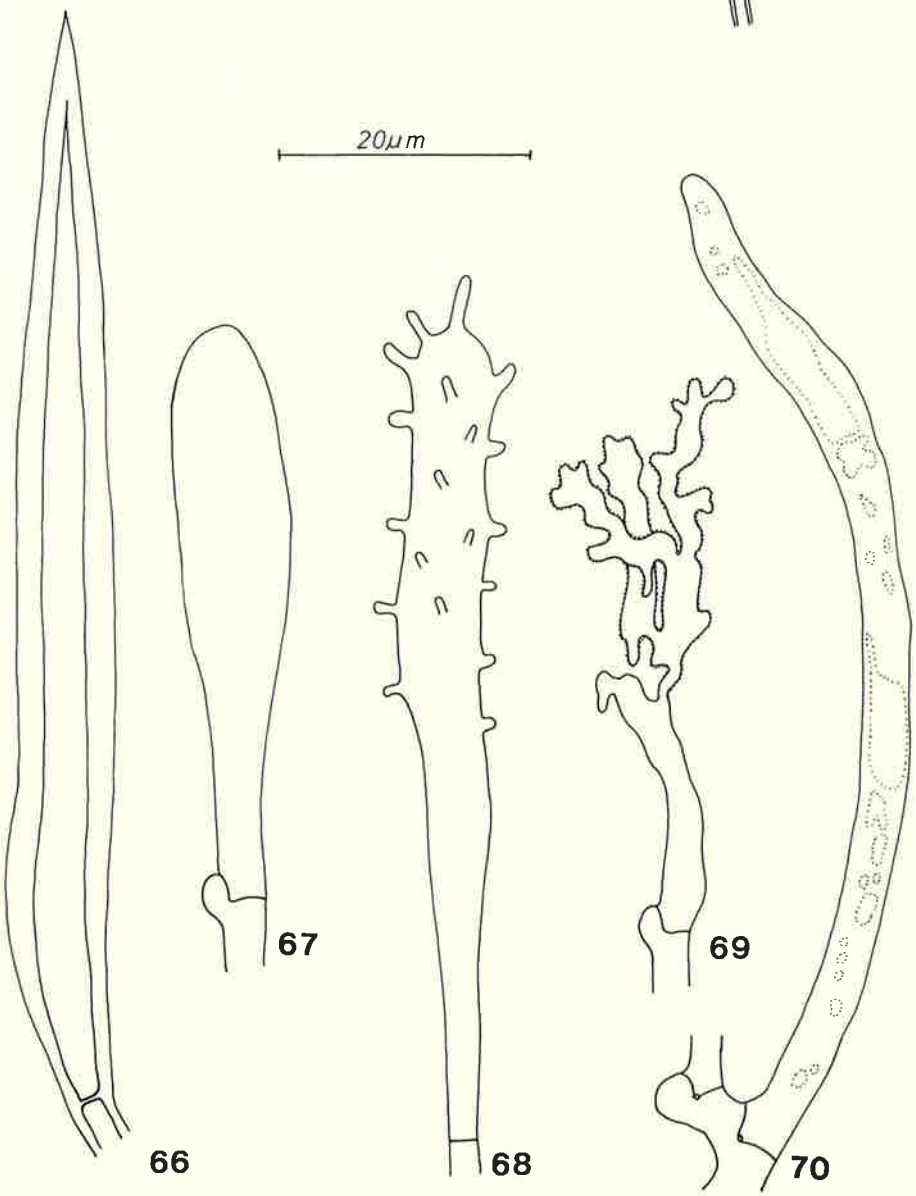

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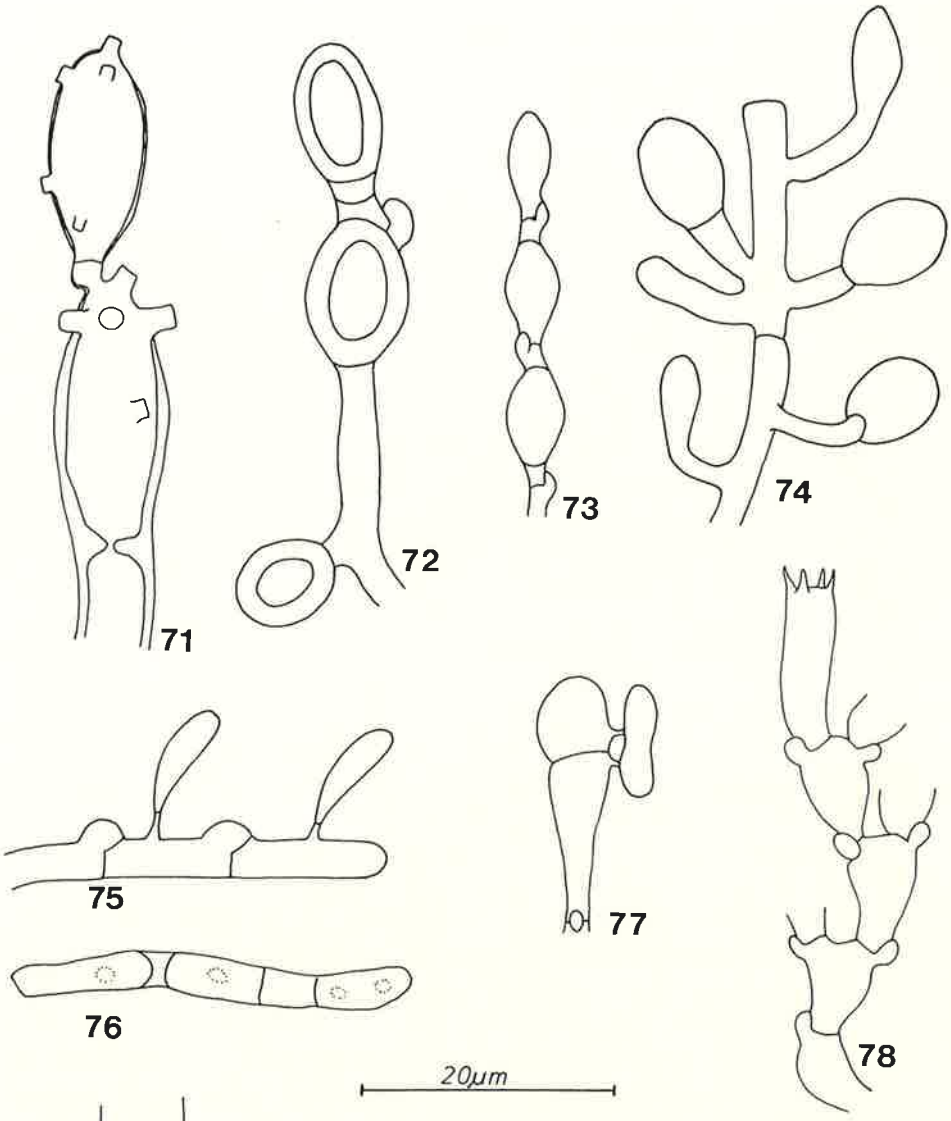
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Generic relationships

Several groups of genera can be recognized in the resupinate non-poroid Aphyllophorales, though these are not clearly delimited because several intermediate genera combine characters from two or three groups. Morphological, cytological and cultural features have been used to construct a scheme which shows presumable relationships between genera or groups of genera. We are still far away from a thorough understanding of the phylogeny of these fungi, and therefore no attempt has been made to assign a genus or a group of genera as the most primitive. The taxa in the centre of the scheme are not supposed to represent the base of the evolutionary progress. The scheme is necessarily two-dimensional; however, genera appearing at one extreme of the diagram can be related to genera at other extremes. The genus *Crustoderma*, for example, is placed in the vicinity of *Peniophora* but could as well be given in the surroundings of *Phlebia*. The distance between two names is not an indication of the suspected degree of relationship: it is mainly dependant on the number of taxa which had to be placed in their vicinity.

The scheme shows how difficult it is to separate families: the Corticiaceae, to which family most of the genera in the scheme belong, are connected with the Coniophoraceae via *Byssocorticium-Leucogyrophana* on the one side, and via *Phanerochaete* from the other side. Separation of the Corticiaceae from the Stereaceae is impossible, because some species of *Lopharia-Peniophora* and *Aleurodiscus* exhibit a close relationship to *Stereum-Xylobolus*, while also *Gloeocystidiellum* is close to *Stereum* on the one hand. On the other hand this genus is related to the Auriscalpiaceae (inclusive of the Hericiaceae), relating this family with the Corticiaceae. Several other possible lines to further families are indicated, e.g. to the Gomphaceae, Hymenochaetaceae, several groups of the Polyporaceae, Thelephoraceae and some genera of the Heterobasidiomycetes.

It is obvious from the scheme that the main groups with amyloid spores are more or less closely related: *Aleurodiscus, Gloeocystidiellum, Stereum* and the surrounding genera. However, we are convinced that the amyloid reaction evolved independently in some other, smaller, groups, viz. in *Leucogyrophana* which is related to *Serpula* and *Athelia*, and in *Amylocorticium-Irpicodon*, two small genera which find their place near *Ceraceomyces*, while the genus *Tyromyces* can also be mentioned here.

Aleurodiscus is quite closely connected to a rather large number of genera; a line to *Sistotrema* is established via *Vuilleminia* and *Galzinia*, to *Peniophora* via

Laeticorticium and to *Phlebia* via *Punctularia*. *Sistotrema* is connected to *Botryobasidium*, but also to *Athelia* via *Sistrotremastrum*. *Athelia* shows a relationship with *Phanerochaete* and via *Ceraceomyces* with the *Phlebia*-complex, but also a more distant connection with the genus-complex around *Hyphoderma* and *Kneiffiella*. Lines to distinctly poroid genera are given from *Phanerochaete* via *Meruliopsis* to *Ceriporia* and *Rigidoporus*, from *Phlebia* via *Merulius* to *Gloeoporus*, from *Steccherinum* to *Junghuhnia* and from *Kneiffiella* to *Trichaptum* on the one hand and to genera like *Chaetoporellus*, *Fibrodontia* and *Schizopora* (with a possible line to trametoid genera) on the other hand.

Information about microstructures, which is common in the resupinate Aphyllophorales, is limited in many other families and orders of the Basidiomycetes and a more detailed presentation of possible phylogenetic lines cannot be given at the present time. The scheme therefore mainly represents the lines within the resupinate Aphyllophorales, of which almost all genera present in the northern hemisphere have been included. The genera *Kavinia* and *Ramaricium*, both belonging to the Gomphaceae, have been excluded as they could not be allotted a plausible place within the scheme.

Basic key to the genera

Brown thick-walled setae, dichohyphidia and/or asterohyphidia present.	2
Spores amyloid.	6
Basidia normally with more than 4 sterigmata.	39
Dendrohyphidia or unbranched hyphidia present.	46
Marine. Sterigmata developing into apically branched diaspores.	62
Zygoconidia present and/or species parasitic on higher basidiomycetes.	63
Spores with distinctly thickened walls, smooth, often coloured.	65
Lyocystidia (dissolving or distorting in KOH) present, often bi- or multiradicate.	87
Spores ornamented, at least in Melzer's.	90
Sterigmata at least 10 μm long and/or spores repetitive.	106
Hyphal system dimitic or seemingly dimitic.	113
Basidia pleurobasidious and/or ovoid, pyriform or conical, but not constricted in the middle, sometimes repeating.	126
Many septa with distinct swellings (ampullate septa).	130
Thick-walled, conical, encrusted cystidia (lamprocystidia) present.	134
Cystidia projecting and projecting part septate (septocystidia).	141
Clamps absent or rare and then only at the basal hyphae.	147
Basidia with 1-2(-3) sterigmata.	167
Basidiocarp ceraceous to gelatinous.	170
Hymenial surface odontioid, raduloid or hydnoid.	186
Hymenial surface even to tuberculate or minutely reticulate.	192

Key to the genera

1a. Brown thick-walled setae, asterohyphidia and/or dichohyphidia present. 2

1b. Brown setae, asterohyphidia and dichohyphidia absent. 5

2a. Hymenial setae present. Basidiocarp xanthochroic. Gloeocystidia absent. Spores smooth, not amyloid. Hymenochaetaceae (not treated). When the "setae" are encrusted and/or apically obtuse and when the basidiocarp is not xanthochroic, cf. *Amylostereum, Columnocystis* and *Lopharia*.

2b. Hymenial setae absent. Basidiocarp typically not xanthochroic. Gloeocystidia typically present. Spores smooth or ornamented, amyloid or not amyloid. 3

3a. Asterosetae present. **Asterostroma**

3b. Asterosetae absent. 4

4a. Subiculum with numerous dichohyphidia. **Vararia**

4b. Subiculum composed of irregularly branched thick-walled dextrinoid hyphae. **Scytinostroma**

5a. Spores amyloid. 6

5b. Spores not amyloid. 38

6a. Hymenial surface distinctly odontioid to hydnoid. 7

6b. Hymenial surface even to warted. 12

7a. Gloeocystidia absent. **Irpicodon**

7b. Gloeocystidia present. 8

8a. Thick-walled encrusted cystidia present. **Gloeodontia**

8b. Thick-walled encrusted cystidia absent. 9

9a. Skeletal or skeletoid hyphae absent. **Dentipellis**

9b. Skeletal or skeletoid hyphae present. 10

10a. Basidiocarp consists of a dark brown tomentum surrounding ramifying processes, strands or veins. **Gloiodon**

10b. Basidiocarp different. 11

11a. Gloeoplerous hyphae present. Basidiocarp typically effused-reflexed. **Steccherícium**

11b. Gloeoplerous hyphae absent. Basidiocarp effused. **Scytinostroma**

12a. Acanthohyphidia or dendrohyphidia present. 13

12b. Hyphidia absent or not branched. 17

13a. Acanthohyphidia present. 14

13b. Acanthohyphidia absent. 16

14a. Skeletoid hyphae absent (but cf. *A. fruticetorum*). **Aleurodiscus**
14b. Skeletoid hyphae present. 15
15a. Acanthohyphidia thin-walled, with few aculei. **Stereum**
15b. At least some acanthohyphidia with thickened walls. **Xylobolus**
16a. Spores up to 10 μm long. **Dendrophysellum**
16b. Spores at least (11–)15 μm long (when spores 10–13 × 7–10 μm and faintly or irregularly amyloid, cf. *Dendrothele acerina*). **Aleurodiscus**
17a. Skeletoid hyphae present, sometimes only in hyphal strands. 18
17b. Skeletoid hyphae absent. 24
18a. Skeletoid hyphae dextrinoid. **Scytinostroma**
18b. Skeletoid hyphae not dextrinoid. 19
19a. Spores subglobose to ellipsoid, roughened to warted in Melzer's. 20
19b. Spores narrowly ellipsoid to cylindrical, smooth in Melzer's. 22
20a. Spores at least (11–)15μm long. **Aleurocystidiellum**
20b. Spores up to 8 μm long. 21
21a. Gloeocystidia present. **Scytinostromella**
21b. Gloeocystidia absent. **Laurilia**
22a. Spores ovoid to ellipsoid. Basidiocarp at least initially disciform to cyphelloid. **Aleurodiscus**
22b. Spores cylindrical, often slightly curved. Basidiocarp often effused-reflexed to pileate, never disciform or cyphelloid. 23
23a. Thick-walled brown encrusted cystidia present. **Amylostereum**
23b. Encrusted cystidia absent. **Stereum**
24a. Gloeocystidia present. 25
24b. Gloeocystidia absent. 30
25a. Spores globose to ellipsoid, at least (8–)10 μm broad. **Aleurodiscus**
25b. Spores narrower. 26
26a. Spores ornamented in Melzer's. 27
26b. Spores smooth in Melzer's. 29
27a. Gloeocystidia with cracked contents. Basidiocarp resupinate to effused-reflexed. Abhymenial surface brown. **Laxitextum**
27b. Gloeocystidia with homogeneous contents. Basidiocarp effused. 28
28a. Pleurobasidia present and dominant. Basidiocarp very thin. **Pseudoxenasma**
28b. Pleurobasidia absent. **Gloeocystidiellum**
29a. Gloeocystidia vesicular, sulpho-negative. Spores globose to subglobose. **Vesiculomyces**
29b. Gloeocystidia more or less tubular, often swollen at the base, sulpho-negative. Spores ellipsoid to cylindrical. **Gloeocystidiellum**
30a. Pleurobasidia present, dominant. Basidiocarp very thin. **Xenasma**
30b. Pleurobasidia absent or not predominant. 31
31a. Spores narrowly allantoid, up to 2.5 μm broad. 32
31b. Spores not allantoid or broader than 2.5 μm. 33
32a. Spores up to 4.5 μm long. Basidiocarp effused-reflexed to typically pileate. Hymenial surface merulioid to poroid when fresh (not treated). **Plicatura**

32b. Spores at least 4.5 μm long. Basidiocarp effused. Hymenial surface even. **Amylocorticium**

33a. Vesicles present in subiculum. **Vesiculomyces**

33b. Vesicles absent. 34

34a. Spores thin-walled, often somewhat constricted in the middle. **Melzericium**

34b. Spores with thickened walls, not constricted in the middle. 35

35a. Hyphidia present. Spores 8–12 μm long. Amyloid reaction distinct. **Aleurodiscus**

35b. Hyphidia absent. Spores up to 7.5 μm long. Amyloid reaction often faint. 36

36a. Hymenial surface white to pale ochraceous when fresh. Basidiocarp pellicular. **Leucogyrophana**

36b. Hymenial surface blue, green or violaceous when fresh. Basidiocarp hypochnoid. 37

37a. Clamps present. Hymenial surface blue to green. **Hypochnopsis**

37b. Clamps absent. Hymenial surface violaceous. **Hypochnella**

38a. Basidia normally with more than 4 sterigmata. 39

38b. Basidia with (1–)2–4 sterigmata. 45

39a. Basidia distinctly urniform. 40

39b. Basidia subglobose to cylindrical, not urniform. 41

40a. Spores aculeate, globose. **Echinotrema**

40b. Spores smooth, subglobose to cylindrical. **Sistotrema**

41a. Zygoconidia present. Parasitic on *Phanerochaete*. **Christiansenia**

41b. Zygoconidia absent. Saprophytic. 42

42a. Basidiocarp arachnoid, hypochnoid or pellicular. Basal hyphae wide, branching at right angles. **Botryobasidium**

42b. Basidiocarp ceraceous when fresh, often forming a thin film over the substratum when dry. Hyphae narrower, up to 5 μm wide. 43

43a. Pleurobasidia present. Cystidia present. **Xenasma**

43b. Basidia terminal. Cystidia absent. 44

44a. Basidia narrowly clavate, 15–20 × 4–5 μm. Basidiocarp distinct when dry. **Sistotremastrum**

44b. Basidia broadly clavate to broadly cylindrical, sometimes stalked, usually smaller, at least 5 μm wide. Basidiocarp subinvisible when dry. **Paullicorticium**

45a. Dendrohyphidia or unbranched hyphidia present. 46

45b. Hyphidia absent. 62

46a. Spores navicular to fusoid. 47

46b. Spores not navicular to fusoid. 48

47a. Spores fusoid, yellowish, at least 16 μm long. Sterile fascicles present, consisting of an aggregate of upright hyphae. **Epithele**

47b. Spores navicular, hyaline, up to 13(–15) μm long. Sterile fascicles absent. **Luellia**

48a. Hymenial surface brightly or dark coloured when fresh: pink, lilac, brown, blue, yellow or dark grey. 49

48b. Hymenial surface pale coloured when fresh or dry: whitish, cream-coloured, ochraceous or pale grey. 55
49a. Lamprocystidia and/or gloeocystidia present. 50
49b. Lamprocystidia and gloeocystidia absent. 51
50a. Lamprocystidia present or spores at least on average longer than 8 μm. Basidiocarp effused, rarely effused-reflexed. **Peniophora**
50b. Lamprocystidia absent. Spores up to 7.5(–8) μm long. Basidiocarp typically effused-reflexed. **Punctularia**
51a. Hymenial surface blue or bluish green. **Pulcherricium**
51b. Hymenial surface without bluish or greenish tinge. 52
52a. Basidia swollen at the base (originating from probasidia). Spores at least 4 μm broad. **Laeticorticium**
52b. Basidia not swollen at the base. Spores up to 4.5(–5) μm broad. 53
53a. Hyphidia simple or once or twice branched. **Cerocorticium**
53b. Dendrohyphidia present. 54
54a. Spores ellipsoid. Purplish conidia typically present. **Punctularia**
54b. Spores cylindrical, often slightly curved. Conidia absent. **Dentocorticium**
55a. Branched thick-walled skeletoid hyphae present. **Licrostroma**
55b. Branched thick-walled skeletoid hyphae absent. 56
56a. Thick-walled cystidia present, multi-radicate, covered with dendritically branched hyphae. **Tubulicium**
56b. Multi-radicate thick-walled cystidia absent. 57
57a. Basidia distinctly urniform. **Galzinia**
57b. Basidia not distinctly urniform. 58
58a. Basidia up to 20 μm long. 59
59b. Basidia at least 25 μm long. 60
59a. Dendrohyphidia richly branched. **Crustomyces**
59b. Hyphidia rare, simple or once or twice branched. **Pteridomyces**
60a. Basidiocarp develops under the bark, which rolls up. **Vuilleminia**
60b. Basidiocarp develops on the substratum. 61
61a. Dendrohyphidia richly branched. **Dendrothele**
61b. Hyphidia simple or rarely branched. **Cerocorticium**
62a. Marine. Sterigmata developing into apically branched diaspores. **Digitatispora**
62b. Terrestrial. Spores not apically branched. 63
63a. Zygoconidia present (*Syzygospora*) and/or species parasitic on higher basidiomycetes. **Christiansenia**
63b. Zygoconidia absent. Not parasitic on basidiomycetes. 64
64a. Spores with distinctly thickened walls, smooth, often coloured. 65
64b. Spores thin-walled or ornamented. 86
65a. Clamps absent or rare. 66
65b. Clamps present at nearly all primary septa. 73
66a. Spores up to 6(–6.5) μm long. 67
66b. Spores at least on average longer than 6.5 μm. 69
67a. Basidiocarp poroid or hymenial surface bluish, greenish or olivaceous. **Byssocorticium**

67b. Basidiocarp not poroid. Hymenial surface cream, yellowish or brown. 68
68a. Clamps completely absent. **Piloderma**
68b. Clamps present in hymenium and subhymenium. **Athelia**
69a. Cystidia septate, yellowish to brown, with thickened walls. 70
69b. Septate cystidia absent. 71
70a. Spores globose to subglobose. **Membranomyces**
70b. Spores ovoid to narrowly ellipsoid. **Coniophora**
71a. Hymenial surface yellowish to brown. **Coniophora**
71b. Hymenial surface reddish or violaceous when fresh. 72
72a. Spores at least 9 μm long. Hymenial surface reddish. **Erythricium**
72b. Spores 6–8 μm long. Hymenial surface violaceous. **Hypochnella**
73a. Thick-walled cystidia and bulbils (*Aegerita*) present. **Bulbillomyces**
73b. Thick-walled cystidia and bulbils absent. 74
74a. Spores fusoid, 12–25 μm long. **Jaapia**
74b. Spores globose to ellipsoid, smaller. 75
75a. Hymenial surface merulioid when dry. 76
75b. Hymenial surface even to hydnoid when dry, rarely slightly merulioid when fresh. 77
76a. Skeletoid hyphae present, but sometimes only in hyphal strands. Spores at least 8 μm long, on average longer. **Serpula**
76b. Skeletoid hyphae absent. Spores up to 8 μm long, on average shorter. **Leucogyrophana**
77a. Spores becoming violet in KOH. Hymenial surface with greenish tinge. **Hypochnopsis**
77b. Spores not violet in KOH. 78
78a. Basidia distinctly stalked. Spores often subangulate. **Intextomyces**
78b. Basidia not stalked. Spores not subangulate. 79
79a. Hymenial surface bluish, greenish or olivaceous or basidiocarp poroid. **Byssocorticium**
79b. Hymenial surface not bluish, greenish or olivaceous and basidiocarp not poroid. 80
80a. Spores subglobose to broadly ellipsoid, 2.8–3.5 × 2–2.5 μm. **Ceraceomyces**
80b. Spores larger. 81
81a. Septate cystidia absent. 82
81b. Septate cystidia present. 143
82a. Basidia up to 25 μm long. 83
82b. Basidia at least on average longer than 25 μm. 85
83a. Cystidia present. **Lagarobasidium**
83b. Cystidia absent, but cystidioles rarely present. 84
84a. Immature basidia with cyanophilous granulation. **Cristinia**
84b. Basidia never with cyanophilous granulation. **Leptosporomyces**
85a. Hymenial surface hydnoid. **Sarcodontia**
85b. Hymenial surface not hydnoid. 220

86a. Lyocystidia (dissolving or distorting in KOH) present, often bi- or multi-radicate. 87
86b. Lyocystidia absent. Cystidia, when present, rarely multi-radicate. 89
87a. Cystidial inner wall immediately dissolving in KOH. **Tubulicrinis**
87b. Cystidial wall swelling in KOH. 88
88a. Cystidia conical, multi-radicate, often ensheathed by simple or dendritic hyphae. **Tubulicium**
88b. Cystida cylindrical, not multi-radicate, not ensheathed. **Dacryobolus**
89a. Spores ornamented, at least in Melzer's. 90
89b. Spores smooth. 105
90a. Pleurobasidia present. Basidiocarp thin, gelatinous to ceraceous. 91
90b. Pleurobasidia absent. Basidiocarp hypochnoid to membranaceous. 92
91a. Basidia with 2 sterigmata. Spores angular-pyramidical. **Xenosperma**
91b. Basidia with (2–)4 sterigmata. Spores not angular. **Xenasma**
92a. Basidiocarp green with 10% $FeSO_4$. 93
92b. Basidiocarp not green with $FeSO_4$. 94
93a. Hymenial surface hydnoid. **Kavinia**
93b. Hymenial surface even to warted. **Ramaricium**
94a. Spores dichotomously warted. Basidia often sphaeropedunculate when immature. 95
94b. Spores not dichotomously warted. Immature basidia not sphaeropedunculate. 96
95a. Long brown septate cystidia present. **Tomentellina**
95b. Cystidia absent. **Pseudotomentella**
96a. Spores with crest-like ornamentation. **Lindtneria**
96b. Ornamentation regular, not crest-like. 97
97a. Clamps present at all primary septa or at least on the basidia and subhymenial hyphae. 98
97b. Clamps absent or scattered on subicular hyphae. 102
98a. Clamps lacking at many subicular hyphae. **Cyanobasidium**
98b. Clamps present at all primary septa. 99
99a. Hyphae with distinct swellings at a number of septa (ampullate). Basidia usually up to 20 μm (in some species up to 30 μm). Spores hyaline. **Trechispora**
99b. Septa not ampullate or basidia large and spores brownish. 100
100a. Hymenial surface coloured (yellowish, brownish, pink, green, blue, violaceous or blackish). Spores typically coloured. **Tomentella**
100b. Hymenial surface white to cream, rarely yellowish brown. Spores hyaline. 101
101a. Spores regular, subglobose to broadly ellipsoid. Basidia at least 25 μm long, on average longer. **Hypochnicium**
101b. Spores irregular, lobed or triangular. Basidia up to 25 μm long, on average shorter. **Tylospora**
102a. Spores up to 7(–7.5) μm long or in diam. 103
102b. Spores at least 7 μm in diam., on average more. 104

103a. Spores becoming blue in KOH. **Lazulinospora**
103b. Spores never blue in KOH. **Tomentellopsis**
104a. Subicular hyphae 8–12 μm wide. Hymenial surface whitish to ochraceous. **Botryohypochnus**
104b. Subicular hyphae up to 5(–8) μm wide. Hymenial surface with brown tinges. **Tomentella**
105a. Sterigmata at least 10 μm long and/or spores repetitive. 106
105b. Sterigmata up to 10 μm long. Spores not repetitive. 112
106a. Clamps present. 107
106b. Clamps absent. 109
107a. Basidia with 4 sterigmata. **Oliveonia**
107b. Basidia with (1–)2(–3) sterigmata. 108
108a. Basidia urniform. On grasses. **Galzinia**
108b. Basidia cylindrical. On wood. **Cerinomyces**
109a. Basidia more or less globose. Cystidia absent. **Ceratobasidium**
109b. Basidia clavate to cylindrical or ovoid, but then cystidia present. 110
110a. Basidia 50–100 μm long. **Laeticorticium**
110b. Basidia shorter. 111
111a. Cystidia present. **Oliveonia**
111b. Cystidia absent. **Thanatephorus**
112a. Hyphal system dimitic or seemingly dimitic. 113
112b. Skeletal or skeletoid hyphae absent. 125
113a. Hyphae with brown incrustations, turning green in KOH. **Boreostereum**
113b. Incrustation when present not green in KOH. 114
114a. Cystidia thick-walled, often encrusted. 115
114b. Cystidia absent or thin-walled, sometimes with cap of resinous material. 119
115a. Hymenial surface irpicoid to hydnoid. 116
115b. Hymenial surface even. 117
116a. Clamps present. **Steccherinum**
116b. Clamps absent. **Irpex**
117a. Cystidia with acute apex. On angiosperms. **Lopharia**
117b. Cystidia with obtuse apex. On gymnosperms. 118
118a. Spores at least 8.5 μm long. Cystidia brown. **Columnocystis**
118b. Spores up to 6.5 μm long. Cystidia hyaline. **Fibricium**
119a. Skeletal hyphae dextrinoid. **Scytinostroma**
119b. Skeletal hyphae not dextrinoid. 120
120a. Gloeocystidioid vesicles present. **Cystostereum**
120b. Gloeocystidioid vesicles absent. 121
121a. Hymenial surface even or merulioid. 122
121b. Hymenial surface warted, hydnoid, irpicoid or poroid. 123
122a. Cystidia present. Spores fusiform. **Merulicium**
122b. Cystidia absent. Spores ellipsoid. **Fibriciellum**
123a. Skeletoid hyphae mainly in the axis of the spines. Hymenial surface hydnoid, spines slender. **Mycoaciella**

123b. Skeletoid hyphae not confined to the axis of the teeth. Hymenial surface warted to irpicoid or poroid. 124

124a. Hymenial surface warted to odontioid. **Fibrodontia**

124b. Hymenial surface irpicoid to poroid (not treated). **Schizopora**

125a. Basidia pleurobasidious and/or ovoid, pyriform or conical, but not constricted in the middle, sometimes repeating. Basidiocarp thin, sub-invisible when dry. 126

125b. Pleurobasidia absent. Basidia urniform, clavate or cylindrical. 129

126a. Spores angular-pyramidical. Basidia with 2 sterigmata. **Xenosperma**

126b. Spores not angular. Basidia normally with 4 sterigmata. 127

127a. Basidia formed in linear succession; empty walls of preceeding basidia visible. **Repetobasidium**

127b. Basidia not repeating. 128

128a. Basidia subglobose, stalked, not pleurobasidious. Cystidia when present capitate, swollen at the base. **Sphaerobasidium**

128b. Basidia typically pleurobasidious. Cystidia when present not capitate (except *X. pulverulentum*). **Xenasma**

129a. Many septa with distinct swellings (ampullate septa). 130

129b. Hyphae not ampullate at the septa. 133

130a. Basidiocarp green with 10% $FeSO_4$. 131

130b. Basidiocarp not green in 10% $FeSO_4$. 132

131a. Hymenial surface hydnoid. **Kavinia**

131b. Hymenial surface even. **Ramaricium**

132a. Basidia urniform. **Sistotrema**

132b. Basidia cylindrical to suburniform. **Trechispora**

133a. Thick-walled, conical, encrusted cystidia (lamprocystidia) present. 134

133b. Lamprocystidia absent. 140

134a. Septate, thick-walled cystidia projecting from the apex of the teeth. **Scopuloides**

134b. Septate cystidia absent. 135

135a. Hymenial surface coloured, with pink, reddish, violaceous, greyish or brownish tinges. **Peniophora**

135b. Hymenial surface whitish or pale coloured. 136

136a. Clamps present at all or nearly all septa. 137

136b. Clamps absent or rare and confined to the basal hyphae. 139

137a. Bulbils present. **Bulbillomyces**

137b. Bulbils absent. 138

138a. Basidia cylindrical to narrowly clavate. Spores rarely exceeding 7.5 μm in length. **Phlebia**

138b. Basidia clavate to typically suburniform. Spores at least 7 μm long. (except *H. karstenii*). **Hyphoderma**

139a. Basidiocarp ceraceous, hymenium not separable from subiculum. **Phlebiopsis**

139b. Basidiocarp pellicular to membranaceous, when slightly ceraceous then hymenium separable from subiculum. (Cf. also *Phlebiopsis roumeguerii*) **Phanerochaete**

140a. Cystidia projecting and projecting part septate (septocystidia) (excl. apical hyphae in teeth). 141
140b. Septocystidia absent. 146
141a. Clamps absent. 142
141b. Clamps present. 143
142a. Basidiocarp hypochnoid to pellicular. Spores subcylindrical, 3–5 μm broad. **Candelabrochaete**
142b. Basidiocarp membranaceous. Spores allantoid, 1.5–2 μm broad. **Phanerochaete**
143a. Spores up to 6(–6.5) μm long. 144
143b. Spores at least 7 μm long. 145
144a. Hymenial surface even, yellowish. Yellow hyphal strands present, at least in the subiculum. **Amphinema**
144b. Hymenial surface even to odontioid. Hyphal strands absent. **Kneiffiella**
145a. Basidia clavate to suburniform. Spores ellipsoid to cylindrical. **Hyphoderma**
145b. Basidia barrel-shaped to ovoid. Spores fusoid. **Suillosporium**
146a. Clamps absent or rare and then only at the basal hyphae (when the distribution is different, the species is keyed out both ways). 147
146b. Clamps present at nearly all septa. 166
147a. Basidia with 2 sterigmata. 148
147b. Basidia with (2–)4 sterigmata. 150
148a. Spores navicular. **Luellia**
148b. Spores ellipsoid. 149
149a. Spores at least 20 μm long. **Laeticorticium**
149b. Spores up to 6 μm long. **Kneiffiella**
150a. Hymenial surface warted, odontioid or hydnoid. 151
150b. Hymenial surface even, merulioid or poroid. 154
151a. Basidia up to 20 μm long. **Odonticium**
151b. Basidia larger. 152
152a. Spores at least 7 μm long. **Hyphodermella**
152b. Spores up to 6 μm long. 153
153a. Spores subglobose to broadly ellipsoid. Hyphae up to 3.5 μm wide. **Radulodon**
153b. Spores narrowly ellipsoid, when broadly ellipsoid then subicular hyphae up to 8 μm wide. **Phanerochaete**
154a. Hymenial surface merulioid to poroid. **Meruliopsis**
154b. Hymenial surface even to slightly tuberculate. 155
155a. Cystidia present. 156
155b. Cystidia absent. 161
156a. Cystidia subulate, thick-walled. **Subulicium**
156b. Cystidia not subulate and thick-walled. 157
157a. Sterigmata about half as long as the basidia. **Oliveonia**

157b. Basidia at least four times as long as the sterigmata. 158
158a. Hymenium rather easily separable from subiculum. 159
158b. Hymenium not separable from subiculum. 160
159a. Basidiocarp pellicular. Basidia shorter than 25 μm. **Athelia**
159b. Basidiocarp membranaceous to subceraceous. Basidia often larger than 25 μm. **Phanerochaete**
160a. Basidiocarp ceraceous. Spores up to 5.5 μm long. **Phlebia**
160b. Basidiocarp membranaceous. Spores at least 8 μm long. **Hyphoderma**
161a. Basidia always with clamps at the base. Spores subfusiform. **Hyphodontiella**
161b. Basidia lacking clamps at the base; if rarely so, then spores broadly ellipsoid. 162
162a. Basidiocarp pellicular. **Athelia**
162b. Basidiocarp membranaceous. 163
163a. Basidia up to 25 μm long, narrowly clavate to cylindrical. (When basidia subglobose to pyriform or broadly clavate, cf. *Ceratobasidium*) **Athelidium**
163b. Basidia at least 25 μm long. 164
164a. On grasses, parasitic. Apart from basidiocarp also pink hyphal fascicles are formed, 1–10 mm long. **Laetisaria**
164b. On wood, saprophytic or rarely parasitic. Pink fascicles absent. 165
165a. Basal hyphae thick-walled. Spores thin-walled. **Phanerochaete**
165b. Basal hyphae thin-walled. Spores somewhat thick-walled. **Membranomyces**
166a. Basidia with 1–2(–3) sterigmata. 167
166b. Basidia normally with 4 sterigmata. 169
167a. Basidiocarp pellicular. **Athelia**
167b. Basidiocarp pruinose, membranaceous or ceraceous, sometimes hardly visible when dry. 168
168a. Basidia at least 35 μm long. Gloeocystidia present. **Clavulicium**
168b. Basidia up to 25 μm long, when longer gloeocystidia absent. **Sistotrema**
169a. Basidiocarp ceraceous to gelatinous. 170
169b. Basidiocarp not ceraceous or gelatinous. 185
170a. Hymenial surface merulioid to poroid. 171
170b. Hymenial surface even to tuberculate, odontioid, raduloid or hydnoid. 173
171a. Hymenial layer easily separable from subiculum. **Ceraceomyces**
171b. Hymenial layer not separable. 172
172a. Basidiocarp effused. **Phlebia**
172b. Basidiocarp typically effused-reflexed. **Merulius**
173a. Cystidia apically swollen, with large resinous bubble or halo. **Resinicium**
173b. Cystidia when present not with resinous halo. 174
174a. Hymenial surface odontioid to raduloid or hydnoid. 175

174b. Hymenial surface even to tuberculate. 178
175a. Spores at least 7.5 μm long. **Cerocorticium**
175b. Spores up to 7.5 μm long. 176
176a. Spores subglobose to broadly ellipsoid. **Radulodon**
176b. Spores narrowly ellipsoid to allantoid. 177
177a. Spines 1–3 mm long. **Mycoacia**
177b. Spines up to 0.5 mm long. **Dacryobolus**
178a. At least some cystidia with an apical bulb. **Coronicium**
178b. Cystidia never with an apical bulb. 179
179a. Hymenial layer easily separable from subiculum. **Ceraceomyces**
179b. Hymenial layer not easily separable. 180
180a. Hymenial surface deep purple. Basidiocarp often effused-reflexed. Vesicles present in subiculum. **Chondrostereum**
180b. Hymenial surface not purple. Basidiocarp effused. Vesicles absent. 181
181a. Basidia clavate to nearly cylindrical. 182
181b. Basidia subglobose or ovoid to urniform. 184
182a. Basidia broadly clavate to stalked-clavate, at least 6 μm wide. **Cerocorticium**
182b. Basidia narrowly clavate to nearly cylindrical, up to 6 μm wide. 183
183a. Cystidia thick-walled, cylindrical. Spores cylindrical to narrowly ellipsoid, up to 3.5 μm wide. **Crustoderma**
183b. Cystidia absent or thin-walled (when rarely with thickened walls, then spores at least 3.5 μm wide. **Phlebia**
184a. Basidia subglobose to ovoid. **Ceratobasidium**
184b. Basidia distinctly urniform. **Galzinia**
185a. Hymenial surface odontioid, raduloid or hydnoid. 186
185b. Hymenial surface even to tuberculate or minutely reticulate. 192
186a. Basidia up to 25 μm long and spores up to 8 μm long. 187
186b. Basidia at least 25 μm long or spores more than 8 μm long. 188
187a. Gloeocystidia present. **Parvobasidium**
187b. Gloeocystidia absent. **Kneiffiella**
188a. Spores narrowly allantoid, 5–6 × 1.5 μm. **Dacryobolus**
188b. Spores broader. 189
189a. Spores subglobose to broadly ellipsoid. **Radulodon**
189b. Spores narrowly ellipsoid, cylindrical or allantoid. 190
190a. Moniliform (toruloid) cystidia present. **Basidioradulum**
190b. Moniliform cystidia absent. 191
191a. Basidia suburniform. Spores up to 7.5 μm long. **Hyphoderma**
191b. Basidia stalked-clavate or clavate. Spores 9–11 μm long. **Cerocorticium**
192a. Cystidia subulate, with longitudinal rows of crystals, often bifurcate at the base. Basidia sometimes repeating. **Subulicystidium**
192b. Cystidia without longitudinal rows of crystals, not bifurcate. Basidia never repeating. 193
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193b. Spores not fusiform, navicular or biapiculate. 197
194a. Thick-walled cylindrical cystidia present. Basidia more than 50 μm long. **Chaetoderma**
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196a. Basidia broadly clavate to pyriform, 6–9 μm wide. Spores at least 7 μm long. **Luellia**
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197b. Clamps at all primary septa. 199
198a. Spores subfusiform. Basidia always with clamps at the base. **Hyphodontiella**
198b. Spores globose, ovoid, ellipsoid or cylindrical. Basidia rarely with clamps at the base, broadly clavate. Basidiocarp pellicular. (If basidia narrowly clavate and basidiocarp membranaceous-ceraceous, cf. *Phlebia*) **Athelia**
199a. Spores triangular. **Tylospora**
199b. Spores even in outline. 200
200a. Basidiocarp pellicular, hymenium easily separable from subiculum. 201
200b. Basidiocarp membranaceous to crustaceous. 206
201a. Basal hyphae cinnamon brown. **Confertobasidium**
201b. Basal hyphae hyaline to yellowish. 202
202a. Basidia 6–12 μm long. **Leptosporomyces**
202b. Basidia longer. 203
203a. Basidia broadly clavate or stalked. Subhymenial hyphae few. 204
203b. Basidia narrowly clavate to cylindrical. Subhymenial hyphae abundant. 205
204a. Basidia stalked (podobasidia). **Athelopsis**
204b. Basidia never stalked. **Athelia**
205a. Basidia up to 20 μm long. **Fibulomyces**
205b. Basidia longer than 20 μm, at least on average. **Ceraceomyces**
206a. Hymenial surface distinctly blue or blue-green. **Pulcherricium**
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207a. Basidiocarp consisting of minute globules. **Mycostigma**
207b. Basidiocarp not consisting of minute globules. 208
208a. Subhymenial cells short, conical. **Conohypha**
208b. Subhymenial cells cylindrical 209
209a. Basidia suburniform. 210
209b. Basidia clavate to cylindrical. 211
210a. Basidia up to 20 μm long. **Kneiffiella**
210b. Basidia 20–45 μm long (but cf. *Kneiffiella juniperi*). **Hyphoderma**
211a. At least some cystidia with an apical bulb. **Coronicium**
211b. Cystidia never with an apical bulb. 212

212a. Sulpho-positive gloeocystidia present. **Peniophora**
212b. Sulpho-positive gloeocystidia absent. 213
213a. Basidia up to 20 μm long. 214
213b. Basidia at least 20 μm long. 216
214a. Cystidia absent. Spores never allantoid. (If spores allantoid, cf. *Phlebia*). **Fibulomyces**
214b. Cystidia present. 215
215a. Basidia 8–12 μm long. **Parvobasidium**
215b. Basidia 15–20 μm long. **Phlebia**
216a. Thick-walled cystidia present. 217
216b. Thick-walled cystidia absent. 218
217a. Spores narrowly allantoid, up to 1.5 μm wide. Cystidia swelling in KOH. **Dacryobolus**
217b. Spores ellipsoid to subcylindrical, at least 2.5 μm wide. Cystidia not swelling in KOH. **Crustoderma**
218a. Spores pyriform. Basidia narrowly clavate to nearly subcylindrical, 5–6 μm wide. **Cylindrobasidium**
218b. Spores not pyriform. Basidia narrowly to broadly clavate. 219
219a. Basidia broadly clavate or stalked-clavate, at least 6.5 μm wide. Spores at least 5 μm wide. **Cerocorticium**
219b. Basidia narrowly clavate, up to 6.5(–7) μm wide. Spores up to 3.5(–4.5) μm wide. **Phlebia**
220a. Hymenium easily separable from subiculum. 221
220b. Hymenium not easily separable from subiculum. 222
221a. Spores ellipsoid and/or becoming grey in Melzer's. **Leucogyrophana**
221b. Spores globose to ovoid, not becoming grey in Melzer's. **Trechispora**
222a. Spores slightly yellowish. **Ramaricium**
222b. Spores hyaline. **Hypochnicium**

Description of genera and species

ALEUROCYSTIDIELLUM Lemke 1964

Basidiocarp annual or perennial, discoid or effused-reflexed, with thick margins. Hymenial surface even. Hyphal system dimitic with skeletal hyphae. Generative hyphae with clamps. Skeletal hyphae hyaline. Skeletocystidia present, originating from skeletal hyphae, encrusted. Basidia cylindrical to subclavate, large. Spores hyaline, ellipsoid or ovoid, minutely warted in Melzer's, large, with thick walls, amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Stereum subcruentatum* Berk. & Curt. 1858
Distribution: in the whole area.
References: 230.

Monotypic. Basidiocarp 0.2–1.6 mm thick. Abhymenial surface greyish brown, light-buff towards the margin, sometimes concentrically zoned. Hymenial surface cream-buff with greyish tinge. Generative hyphae 1.5–4 μm wide. Skeletal hyphae hyaline to yellowish in KOH, 2–6 μm wide. Skeletocystidia cylindrical, thick-walled, 3.5–6 μm wide, encrusted, the incrustation dissolving in KOH. Simple hyphidia scattered, thin-walled, 3–4 μm wide. Basidia flexuous-cylindrical to narrowly clavate, 55–90(–110) × 8–12 μm. Spores ovoid to broadly ellipsoid, (12–)15–18(–20) × (10–)11–15(–16) μm, the wall up to 2 μm thick.
Distr.: whole area. Ref.: 230.

A. subcruentatum (Berk. & Curt.) Lemke 1964

Syn.: *Aleurodiscus stereoides* Yasuda apud Lloyd 1921; *A. scutellatus* Litsch. 1926

ALEURODISCUS Rabenh. ex Schroet. apud Cohn 1888

Syn.: *Nodularia* Peck 1872, non ~ Link ex Lingbye 1819, nec ~ Mert. apud Jürg. ex Burnet & Flah. 1888 nom. cons.; *Gloeosoma* Bres. 1920; *Acanthophysium* (Pilát) G.H. Cunn. 1963; *Acanthobasidium* Oberw. 1965; *Acanthophysellum* Parm. 1967

Basidiocarp annual or perennial, resupinate, effused, discoid or cyphelloid, initially separate, later often confluent and effused, rarely effused-reflexed, pruinose, pulverulent or ceraceous. Margin adnate to reflexed. Hymenial

surface even, whitish, cream-coloured or buff, often with orange, reddish or greyish tinges. Hyphal system typically monomitic, rarely dimitic. Hyphae hyaline, with or without clamps, with thin or thickened walls. Acanthohyphidia, dendrohyphidia and gloeocystidia often present. Basidia typically large, single, with (2–)4 sterigmata. Spores hyaline, medium-sized to large, thin- to thick-walled, smooth or ornamented (ornamentation soluble in KOH), globose, ovoid, ellipsoid or allantoid, amyloid.

Substrate: saprophytic or parasitic on bark or undecayed wood of angiosperms and gymnosperms.
Type species: *Peziza amorpha* Pers. ex Purt. 1821
Distribution: in the whole area.
References: 113, 230.

Note: The genus is here treated in a rather broad sense. Some authors prefer to split it into several genera, the provisional limits of which are indicated in the key by placing the generic name between brackets.

1a. Acanthohyphidia present. 2
1b. Acanthohyphidia absent (*Aleurodiscus* s.str.). 24

2a. Spores smooth (*Acanthophysellum*). 3
2b. Spores ornamented, at least in Melzer's (*Gloeosoma*). 15

3a. Spores subglobose to broadly ovoid or broadly ellipsoid, length-width ratio <1.35 (cf. also the 2-spored *A. canadensis* under 8a). Acanthohyphidia faintly amyloid. Gloeocystidia sulpho-negative. 4
3b. Spores ovoid, ellipsoid or cylindrical, length-width ratio >1.5. Acanthohyphidia not amyloid. Gloeocystidia sulpho-positive (except sometimes *A. cerussatus*). 6

4a. Spores subglobose, (16–)18–20(–21) × (14–)16–18 μm.
Basidiocarp pulvinate with indeterminate adnate margins. Hymenial surface light orange buff. Hyphae thin- to thick-walled, 3.5–5 μm wide, without clamps. Acanthohyphidia cylindrical, thick-walled, 4–7 μm wide, sometimes the basal part inflated. Simple hyphidia present. Gloeocystidia subcylindrical to ampulliform with an apical bulb, (35–)75–85(–100) × (8–)13–20 μm. Basidia clavate, 75–100 × (15–)20–24 μm. On Abies and Tsuga.
Distr.: N. Am. Ref.: 230.
A. abietis H.S. Jacks. & Lemke apud Lemke 1964
4b. Spores ovoid to ellipsoid, up to 15 μm broad. 5

5a. Gloeocystidia subclavate to ampulliform with an apical bulb, 55–90 × (10–)13–16 μm. On Picea.
Basidiocarp orbicular to discoid, sometimes becoming confluent and effused. Hymenial surface ochraceous buff with pinkish or greyish tinges. Hyphae thin- to thick-walled, 3–4.5 μm wide, without clamps. Acanthohyphidia cylindrical to clavate, often thick-walled,

4–7 μm wide, often basally inflated. Simple hyphidia present. Basidia clavate, 70–90(–120) × 14–18 μm. Spores ovoid to broadly ellipsoid, (13.5–) 15–18(–20) × (10–)12–14(–15) μm.
Distr.: N. Am. Ref.: 230.
A. piceinus Lyon & Lemke apud Lemke 1964

5b. Gloeocystidia flexuous-cylindrical, without apical bulb, 100–220 × 10–15 μm. On Tsuga and Pseudotsuga.
Basidiocarp discoid, sometimes confluent. Hymenial surface pale buff. Hyphae thin- to usually thick-walled, 4.5–5.5(–7) μm wide, without clamps. Acanthohyphidia thick-walled, 4.5–8 μm wide, often basally swollen. Basidia clavate to subclavate, 75–90 × 14–20 μm. Spores ovoid, (15–)16–18(–19) × (11–)12–14(–15) μm.
Distr.: N. Am. Ref.: 230.
A. farlowii Burt 1918

6a. Spores at least longer than 12 μm on average. 7
6b. Spores up to 12 μm long, on average smaller. 11

7a. Spores at least 7 μm broad. 8
7b. Spores up to 7 μm broad. 10

8a. Clamps present. Basidia with (1–)2(–3) sterigmata.
Basidiocarp effused, pruinose to subceraceous. Hymenial surface white, becoming cream to ochraceous-buff. Hyphae thin- to thick-walled, 2–3.5 μm wide. Acanthohyphidia thick-walled, 6–10 μm wide, often basally inflated. Gloeocystidia cylindrical to subclavate, often apically monilioid, 40–100 × 5–10 μm. Basidia clavate, 45–60 × 10–13 μm. Spores ovoid to ellipsoid, (10–)12–18 × (7–)9–13 μm. On gymnosperms, mainly Picea.
Distr.: N. Am. Ref.: 230.
A. canadensis Skolko 1944

8b. Clamps absent. Basidia with (2–)4 sterigmata.

9a. On gymnosperms, mainly Picea. Spores ovoid to ellipsoid, (11–)12–15 (–16) × (7–)7.5–9(–10) μm.
Basidiocarp orbicular, often confluent, membranaceous to ceraceous. Hymenial surface grey to salmon-buff. Hyphae thin-walled, 2–3.5 μm wide. Acanthohyphidia thick-walled, 3–5 μm wide, basally often widened. Gloeocystidia cylindrical to clavate, 50–90 (–120) × (7–)9.5–12 μm. Basidia clavate, 55–90 × 10–13(–16) μm.
Distr.: Eur., N. Am. Ref.: 113, 230.
A. fennicus Laurila 1939
Syn.: *Aleurodiscus vleugelii* Litsch. 1944

9b. On angiosperms, mainly Ericaceae. Spores ellipsoid to subcylindrical, 14–16 × (6.5–)7–8(–9) μm.
Basidiocarp effused, pruinose to subfelty. Hymenial surface cream to ochraceous buff. Hyphae with thin to thickened walls, 2.5–4.5 μm

wide. Acanthohyphidia basally up to 15 μm wide, with aculeate thick-walled proliferations, 6–8 μm wide. Gloeocystidia clavate to ampulliform, 40–60(–70) × (9–)15–18(–23) μm. Basidia clavate, about 55 × 9.5 μm.
Distr.: N. Am. Ref.: 230.
A. macrocystidiatus Lemke 1964

10a. Aculeate parts of acanthohyphidia thick-walled to solid, yellowish in KOH, not amyloid.
Basidiocarp at first orbicular, becoming confluent and effused, subcoriaceous. Hymenial surface cream to pale yellowish or brownish grey. Hyphae with thin to thickened walls, 1.5–4.5 μm wide, with clamps scattered in the subhymenial hyphae. Gloeocystidia cylindrical to subclavate, apically sometimes monilioid and somewhat thick-walled, 80–100 × 6–9(–11) μm. Basidia subclavate, (40–)55–70× 7–9 μm. Spores ellipsoid to cylindrical and slightly curved, (10–)12–16(–18) × (4–)5–7 μm. On angiosperms, mainly Ericaceae.
Distr.: N. Am., USSR. Ref.: 230.
A. diffissus (Sacc.) Burt 1931
Syn.: *Stereum sajanensis* Murashk. ex Pilát 1931

10b. Aculeate parts of acanthohyphidia thin-walled, hyaline in KOH, slightly amyloid.
Basidiocarp orbicular to discoid, becoming confluent and effused, subceraceous to crustulose. Hymenial surface grey, cracked when dry. Hyphae with thin to thickened walls, 2–4.5(–5.5) μm wide, with clamps. Gloeocystidia thin-walled, cylindrical to subclavate, rarely with an apical bulb, 50–120 × 6.5–13.5 μm. Basidia subclavate, (40–)55–70 × 7–9 μm. Spores ellipsoid to cylindrical, (10–)12–14 (–15) × (5–)5.5–6.5(–7) μm. On angiosperms, mainly Ericaceae.
Distr.: N. Am. Ref.: 230.
A. succineus Bres. 1925

11a. Clamps absent or very rare. Skeletoid hyphae present.
Basidiocarp effused-reflexed, subceraceous. Hymenial surface orange buff. Abhymenial surface tomentose, greyish. Skeletoid hyphae 3–4 μm wide. Generative hyphae thin- to thick-walled, 2.5–4 μm wide, Acanthohyphidia thin-walled, aculei rather scattered. Simple hyphidia present. Gloeocystidia cylindrical to clavate, 70–80(–120) × 7–10 μm, often with several constrictions. Basidia clavate, 50–70 × 7–9(–11) μm. Spores ellipsoid to subcylindrical, 9.5–12(–13) × 5.5–7 μm. On angiosperms, mainly Ericaceae.
Distr.: N. Am. Ref.: 230.
A. fruticetorum W.B. Cooke 1943

11b. Clamps present at nearly all primary septa. Skeletoid hyphae absent. 12

12a. Spores at least in average longer than 8 μm. 13
12b. Spores up to 7.5(–8) μm long. 14

13a. Spores ellipsoid, (7–)8–10(–11) × (4.5–)5–6(–7) μm.
Basidiocarp effused, subcoriaceous to crustose. Hymenial surface white to yellowish or grey, ochraceous when dry. Hyphae with thin to thickened walls, 2–4 μm wide, with clamps. Acanthohyphidia thin- to apically thick-walled, apically 2.5–6 μm wide. Gloeocystidia subclavate to cylindrical, 30–65(–85) × 5.5–12(–14) μm, often with monilioid apex. Basidia subclavate, 30–50 × 6–8(–9) μm. On angiosperms, rarely on gymnosperms.
Distr.: whole area. Ref.: 113, 230.
A. cerussatus (Bres.) Höhn. & Litsch. 1907

13b. Spores ellipsoid, (8–)10–12(–13) × (5.5–)6–8(–8.5) μm.
Basidiocarp effused, pruinose to subcoriaceous. Hymenial surface greyish to drab or ochraceous buff. Hyphae with thin to thickened walls, 2–4.5(–6) μm wide, with clamps. Acanthohyphidia thin- to apically thick-walled, apically 3–5 μm wide. Simple hyphidia may be present. Gloeocystidia subclavate, 40–90 × 5–10(–12) μm, often monilioid at the apex. Basidia clavate, 40–70 × (8–)10–12 μm. On angiosperms.
Distr.: Eur., N. Am. Ref.: 113, 230.
A. lapponicus Litsch. 1944

14a. Spores subcylindrical, 5.5–7.5(–8) × 2.5–3.5(–4) μm. Hymenial surface with bluish tinges, becoming plumbeous to bluish black, but locally sometimes pallid or ochraceous with blue tinge.
Basidiocarp effused, membranaceous to subcoriaceous. Hyphae with thin to thickened walls, 2–3.5 μm wide, with clamps, often covered with blue granules. Acanthohyphidia thin-walled, 3–5 μm wide. Gloeocystidia cylindrical, 25–80 × (4.5–)6–12 μm, often with monilioid apex. Basidia subclavate, (15–)20–25(–30) × 4–5(–5.5) μm. On gymnosperms, rarely on angiosperms.
Distr.: whole area. Ref.: 113, 230.
A. lividocoeruleus (P. Karst.) Lemke 1964

14b. Spores D-shaped, (5.5–)6–7.5(–8) × (3–)3.5–4.5 μm, often adhering in groups of four. Hymenial surface cream to buff, rimose.
Basidiocarp effused, pruinose to subcoriaceous. Hyphae with thin to thickened walls, 3–4.5 μm wide, with clamps. Acanthohyphidia thick-walled in the aculeate part, up to 4 μm wide. Gloeocystidia cylindrical to ampulliform with an apical bulb, (30–)40–60(–80) × 7–12(–14) μm. Basidia clavate, about 40 × 6 μm. On angiosperms.
Distr.: N. Am. Ref.: 230.
A. bertii Lloyd 1924
Syn.: *Aleurodiscus cremeus* Burt 1918, non ~ Pat. 1915

15a. Spores up to 15 μm long. 16
15b. Spores at least 15 μm long. 21

16a. Acanthohyphidia delicately branched at their apices (botryose), branches with amyloid granulation.

Basidiocarp effused, pruinose to pulverulent. Hymenial surface white to pale buff, sometimes rimose. Hyphae thin-walled, 2–3.5 μm wide, without clamps. Gloeocystidia clavate to cylindrical or fusiform, 35–90 × 7–12 μm, sulpho-positive. Basidia clavate to subclavate, 38–68 × 10–12 μm. Spores ovoid, 12–15 × (7–)8–11 (–12) μm, often adhering in groups of two or four. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 230.

A. botryosus Burt 1918

16b. Acanthohyphidia not botryose, without amyloid granulation. 17

17a. Spores globose to subglobose. Gloeocystidia sulpho-positive. On gymnosperms. Distr.: N. Am. 18
17b. Spores ovoid to ellipsoid. Gloeocystidia (when present) sulpho-negative. On angiosperms. Distr.: Eur. 20

18a. Spores (10–)11.5–14(–16) × (9–)9.5–12(–13) μm.

Basidiocarp effused, pruinose to farinose-pulverulent. Hymenial surface whitish, becoming cream to buff when dry, rimose. Hyphae thin- to thick-walled, 1.5–5(–6) μm wide, with clamps. Acanthohyphidia (sub)clavate, thin-walled, some aculeate parts thick-walled. Gloeocystidia cylindrical to subclavate, 50–85 × 4–7 μm, often with an apical bulb, yellowish to brown in KOH. Basidia cylindrical to subclavate, 60–90 × 10–13 μm.

Distr.: N. Am. Ref.: 230.

A. spiniger D.P. Rogers & Lemke apud Lemke 1964

18b. Spores up to 10 μm long. 19

19a. Spores 8–10 × (7.5–)8–9 μm, warted to echinulate. Mainly on Abies and Picea.

Basidiocarp effused, pruinose to farinose-pulverulent. Hymenial surface whitish, becoming cream to buff when dry, rimose. Hyphae thin- to slightly thick-walled, 1.5–4 μm wide, with clamps. Acanthohyphidia with thin- to thickened walls, apically up to 7 μm wide. Gloeocysticia cylindrical to subclavate, 30–80(–100) × 5–7(–10) μm, often with an apical bulb, yellowish in KOH. Basidia 55–70 × 8–10 μm.

Distr.: N. Am. Ref.: 230.

A. laurentianus H.S. Jacks. & Lemke apud Lemke 1964

19b. Spores 5–7 × 5–6 μm, echinulate. Mainly on Tsuga and Pseudotsuga.

Basidiocarp effused, pruinose to farinose-pulverulent. Hymenial surface whitish when fresh, becoming cream to buff, rimose. Hyphae thin- to thick-walled, 1.5–4 μm wide, with clamps. Acanthohyphidia thin- to thick-walled, aculeate parts up to 6 μm wide. Gloeocystidia cylindrical, 55–80 × 5–6(–8) μm, rarely with an apical bulb, yellowish in KOH. Basidia 30–45 × 5–7 μm.
Distr.: N. Am. Ref.: 230.
A. weirii Burt 1918

20a. Basidia with 2 sterigmata, 30–40 × 8–10 μm, sometimes with lateral aculei.

Basidiocarp effused, soft. Hymenial surface whitish. Hyphae thin-walled, 2–4 μm wide, with clamps. Acanthohyphidia scarce, thin-walled, 5–8 μm wide, apically with few aculei. Gloeocystidia subclavate to cylindrical, 30–50 × 7–10 μm, often with apical constrictions, yellow in KOH. Spores ovoid to ellipsoid, 10–12 × 5–7 μm. On Calluna.
Distr.: Eur. Ref.: 113.
A. norvegicus J. Erikss. & Ryv. 1973

20b. Basidia with (2–)4 sterigmata, 20–40 × 10–15 μm, often with lateral aculei.

Basidiocarp effused. Hymenial surface whitish. Hyphae thin-walled, 1.5–3.5 μm wide, with clamps. Acanthohyphidia thin-walled, clavate, 8–15 μm wide. Gloeocystidia absent. Spores ellipsoid, 10–15 × 6–8 μm. On Cyperaceae.
Distr.: Eur. Ref.: 303.
A. delicatus Wakef. 1952

Note: The insufficiently known *Aleurodiscus apricans* Bourdot 1910 also keys out here. The species has gloecocystidia with apical constrictions. Bourdot & Galzin (32) mention collections on Calluna and Pteris.

21a. Acanthohyphidia cylindrical, covered with aculei over the entire length. Gloeocystidia sulpho-positive. Spores ellipsoid to D-shaped, biapiculate, (20–)24–28 × 14–16(–17) μm.

Basidiocarp at first discoid, becoming confluent and effused, pruinose-pulverulent to subcoriaceous, margin often reflexed. Hymenial surface cream to ochre, often with pinkish tinge, rimose to cracked when dry. Abhymenial surface tomentose, with acanthohyphidia. Hyphae thin- to thick-walled, 2–3.5(–5) μm, with clamps. Acanthohyphidia (4–)6–8 μm wide. Gloeocystidia cylindrical, 70–150 × 7–15 μm, yellowish in KOH, Basidia clavate, 80–160 × 16–24 μm, sterigmata up to 24 μm long. On angiosperms.
Distr.: N. Am. Ref.: 230.
A. mirabilis (Berk. & Curt.) Höhn. 1909
Syn.: *Corticium peradeniae* Berk. & Br. 1873; *Aleurodiscus javanicus* P. Henn. 1900; *A. usambarensis* P. Henn. 1904; *A. spinulosus* P. Henn. 1905; *A. apiculatus* Burt 1918; *A. japonicus* Yasuda 1919; *A. alboroseus* Bres. 1920; *A. peteloti*

Pat. 1924; *A. salmoneus* Pat. 1927; *A. sinensis* Teng & Ling 1933; *A. pallide-roseus* Litsch. 1937.

21b. Acanthohyphidia cylindrical to clavate, only the upper half covered with aculei. Gloeocystidia sulpho-negative. Spores globose to ovoid or ellipsoid, never D-shaped or biapiculate. 22

22a. Clamps present at all primary septa. Gloeocystidia containing a distinct globose particle. Basidia often with some aculei. On gymnosperms.

Basidiocarp effused, pruinose to farinose-pulverulent. Hymenial surface whitish to buff, rimose to cracked when dry. Hyphae thin-walled, 2–3.5 μm wide. Acanthohyphidia cylindrical to clavate, thin-walled, 5–20 μm wide, often with only few aculei. Gloeocystidia cylindrical to ampulliform, 35–75 × 9–12 μm, often with apical constrictions. Basidia clavate, 55–90 × 16–24 μm. Spores globose to ovoid, 15.5–20(–25) × (13–)14–19(–21) μm.

Distr.: N. Am. Ref.: 230.

A. penicillatus Burt 1918

22b. Clamps absent or present, but not at all primary septa. Gloeocystidia without globose particle. Basidia not aculeate. On angiosperms. 23

23a. Clamps absent or very rare. Subicular hyphae partly skeletoid. Gloeocystidia typically thick-walled, 4.5–6(–8) μm wide, cylindrical, often with monilioid apex.

Basidiocarp at first discoid to cyphelloid, later often confluent, subcoriaceous or pulverulent. Hymenial surface avellaneous to ochraceous-buff, often with greyish tinges. Abhymenial surface white when fresh, becoming pallid. Hyphae thin- to thick-walled, 2.5–4.5 μm wide. Acanthohyphidia cylindrical to subclavate, 4–6 μm wide. Basidia 75–120 × 12–15.5(–20) μm. Spores ovoid to ellipsoid, (16–)18–25(–27) × (10–)12–14(–17) μm.

Distr.: N. Am. Ref.: 22, 230.

A. oakesii (Berk. & Curt.) Höhn. & Litsch. 1907

23b. Clamps not rare, abundant in subhymenium, occasional in subiculum. Subicular hyphae thick-walled. Gloeocystidia typically thin-walled, 4–8.5 μm wide, cylindrical, often with monilioid apex.

Basidiocarp discoid, later often confluent, pulverulent to subcoriaceous. Hymenial surface isabelline, often with pinkish tinge, becoming avellaneous to buff. Hyphae thin- to thick-walled, 2.5–5.5 μm wide. Acanthohyphidia (sub)clavate, 4–7(–10.5) μm wide. Basidia (60–)100–160(–200) × 12.5–20 μm. Spores ovoid to ellipsoid, (17–)19.5–24(–29) × (12.5–)14–18(–20) μm.

Distr.: Eur. Ref.: 22.

A. wakefieldiae Boidin & Beller 1966

24a. Spores ornamented in Melzer's. 25

24b. Spores smooth in Melzer's. 29

25a. "Dendrohyphidia" densely branched in the upper part (botryose), with amyloid granulation. *A. botryosus*, see 16a.

25b. Dendrohyphidia, when present, not botryose and without amyloid granulation. 26

26a. Clamps present. 27

26b. Clamps absent. 28

27a. Basidiocarp discoid to effused-reflexed, subceraceous to coriaceous. Gloeocystidia sulpho-positive, 60–80 × 5–12 µm, typically with 2–8 monilioid apical swellings. On angiosperms, mainly Quercus.

Hymenial surface even to slightly warted, whitish to cream, often with greyish tinges, becoming buff. Hyphae thin- to thick-walled, 2.5–4.5 µm wide. Simple hyphidia may be present. Basidia 60–90 × 10–12(–14) µm. Spores subglobose to ovoid or ellipsoid, (13–)15–18(–20) × (8.5)–10–14(–16) µm.

Distr.: whole area. Ref.: 113, 230.

A. disciformis (DC. ex Fr.) Pat. 1894

Syn.: *Thelephora castaneae* Schleicher 1815

27b. Basidiocarp effused, pruinose to pulverulent, cracked when dry. Gloeocystidia sulpho-negative, 24–45 × 5.5–12 µm, typically with one apical bulb. On gymnosperms, mainly Tsuga.

Hymenial surface even, whitish to cream or buff. Hyphae thin-walled, 1.5–2.5 µm wide. Simple or scarcely branched hyphidia typically present. Basidia 55–75 × 16–18 µm. Spores ovoid to ellipsoid, (13–)15–22(–27) × 10–17(–20) µm.

Distr.: N. Am. Ref.: 230.

A. tsugae Yasuda apud Lloyd 1921

28a. Basidiocarp discoid, often confluent, farinose-pulverulent to subcoriaceous. Gloecystidia sulpho-negative, 125–215 × 5–10 µm, typically with 2–12 monilioid apical swellings. Spores subglobose to ellipsoid, 20–26 (–29) × 16–20(–23) µm. Dendrohyphidia absent. On gymnosperms, mainly Abies and Picea.

Hymenial surface orange buff to orange red, sometimes with greyish tinge, becoming ochraceous buff when dry. Abhymenial surface whitish. Hyphae thin- to thick-walled, 2–5 µm wide. Basidia 90–200 × (18–)20–28 µm.

Distr.: whole area. Ref.: 113, 230.

A. amorphus (Pers. ex Purt.) Schroet. 1888

Syn.: *Nodularia balsamicola* Peck 1872; *Aleurodiscus grantii* Lloyd 1920.

28b. Basidiocarp effused, pruinose, subceraceous. Gloeocystidia sulpho-positive, (30–)40–60 × 12–20 µm, typically with 1–3 apical constrictions. Spores subglobose to ovoid or ellipsoid, (14–)16–22 × (10–)12–15(–16) µm. Dendrohyphidia abundant. On angiosperms, mainly Rosaceae and Ericaceae, rarely on Taxus.

Hymenial surface orange buff to orange, sometimes with greyish tinge, becoming whitish to cream buff when dry, rimose. Hyphae thin-walled, 2–4 μm wide. Basidia (30–)50–70(–80) × 10–15 μm.
Distr.: whole area. Ref.: 113, 230.
A. aurantius (Pers. ex Fr.) Schroet. 1888
Syn.: *Thelephora rubi* Libert 1837; *Corticium marchandii* Pat. 1883; *C. angulatum* Britz. 1897.

29a. Spores subglobose to ellipsoid or D-shaped, 18–22(–24) × 14–19 μm. On angiosperms.
Basidiocarp effused, subceraceous to coriaceous. Hymenial surface whitish to cream, rimose. Hyphae thin-walled, 2–4(–5) μm wide, without clamps. Cystidia clavate, somewhat thick-walled, with short, flexuous, simple or branched projections, often thick-walled, 15–22 μm wide. Gloeocystidia subcylindrical to clavate, 50–80 × 5–10 μm, often with 1–3 monilioid apical bulbs. Basidia 65–100 × 16–22 μm.
Distr.: USSR. Ref.: 317.
A. ljubarskii Parm. 1967

29b. Spores ovoid to broadly ellipsoid, 9–13(–14) × 6–8.5 μm. On gymnosperms.
Basidiocarp effused, pellicular to soft membranaceous. Hymenial surface even, cream-coloured to yellowish-ochraceous. Hyphae thin- to slightly thick-walled, 2–3.5 μm wide, with clamps. Hyphidia often present, not or rarely branched. Cystidia and gloeocystidia absent. Basidia 25–45 × 6–8.5 μm.
Distr.: Eur., N. Am. Ref.: 230.
A. amylaceus (Bourd. & Galz.) D.P. Rogers & H.S. Jacks. 1943
Syn.: *Corticium ermineum* Burt 1926; *C. sociatum* Burt 1926

AMPHINEMA P. Karst. 1892

Syn.: *Diplonema* P. Karst. 1889, non ~ G. Don 1837

Basidiocarp annual, resupinate, effused, pellicular with a subiculum of loosely interwoven hyphae, rarely membranaceous and closely adnate; rhizomorphs present. Hymenial surface even, appearing hispid through a lens owing to the far projecting cystidia. Hyphal system monomitic. Hyphae yellowish, rarely hyaline, more or less thin-walled, with clamps, often covered with small granules. Cystidia yellowish, rarely hyaline, hyphoid, cylindrical, slightly thick-walled, with several clamped septa, densely covered with small granules. Basidia suburniform or clavate, with 4 sterigmata. Spores hyaline, small, thin- to slightly thick-walled, smooth, often guttulate, not amyloid.

Substrate: saprophytic on plant debris.
Type species: *Diplonema sordescens* P. Karst. 1889
Distribution: in the whole area.
References: 113.

Monotypic. Basidiocarp effused, soft-membranaceous or often pellicular, loosely adnate; yellowish (rarely white) rhizomorphs often present. Hymenial surface even, cream-coloured, rarely white, hispid. Hyphae yellowish, rarely hyaline, more or less thin-walled (0.2–0.3 μm), 2–4 μm wide, with clamps throughout, the surface often granulose. Basidia cylindrical, suburniform or clavate, mostly smooth, but sometimes covered with small granules, hyaline to yellowish, 20–25 × 4–5 μm, with 4 sterigmata 2–3 μm long. Spores hyaline, ellipsoid, thin- to very slightly thick-walled (c. 0.3 μm), 4–4.5 × 2–2.5 μm, often 1-guttulate, with small, lateral apiculus; not or only slightly cyanophilous.

Distr.: whole area. Ref.: 66, 113, 368.

Amphinema byssoides (Pers. ex Fr.) J. Erikss. 1958

Syn.: *Corticium lacunosum* Berk. & Br. 1873; *Hypochnus muscorum* Schroet. apud Cohn 1888; *H. setosus* Schroet. apud Cohn 1888; *Tomentella obducens* P. Karst. 1889; *Diplonema sordescens* P. Karst. 1889; *Zygodesmus pubidus* Ellis & Everh. 1900; *Kneiffia tomentella* Bres. 1903.

AMYLOCORTICIUM Pouzar 1959

Basidiocarp annual or perennial, resupinate, effused, pellicular, membranaceous or subcoriaceous, separable or adnate. Hymenial surface even to tuberculate, whitish, yellowish or reddish. Margin even or fimbriate. Hyphal system monomitic. Hyphae hyaline or coloured in the basal part, with thin to thickened walls, with clamps at all septa. Cystidia when present hyaline, thin-walled, hyphoid, sometimes with a median clamped septum. Basidia terminal, in small clusters, narrowly clavate, with (2–)4 sterigmata. Spores hyaline, with thin or slightly thickened walls, smooth, narrowly ellipsoid, cylindrical or allantoid, amyloid.

Substrate: saprophytic on wood of gymnosperms, rarely on angiosperms.
Type species: *Corticium subsulphureum* P. Karst. 1881
Distribution: in the whole area.
References: 113.

1a. Cystidia absent. 2
1b. Cystidia present. 3

2a. Hymenial surface even, white to cream; subiculum and margin white. No reaction with KOH. Basal hyphae hyaline, thin-walled, 3–4 μm wide.
Basidiocarp effused, pellicular to membranaceous. Hyphae hyaline, thin-walled, 3–4 μm wide. Basidia narrowly clavate, 20–30 × 4–6 μm. Spores cylindrical to allantoid, 6–7.5 × 1.8–2.5 μm. On gymnosperms, rarely angiosperms.
Distr.: whole area Ref.: 66, 113.
A. cebennense (Bourd.) Pouzar 1959

2b. Hymenial surface even, cream to reddish, subiculum and margin lemon yellow to sulphur yellow, purplish to blackish in KOH. Basal hyphae hyaline to brownish, with somewhat thickened walls, 3–5 μm wide.

Basidiocarp effused, soft-membranaceous. Subhymenial hyphae hyaline, thin-walled, 2–3 μm wide. Basidia narrowly clavate, 20–30 × 4–5 μm. Spores narrowly ellipsoid, cylindrical or slightly allantoid, (4.8–)5.5–7(–7.8) × (1.8–)2–2.3 μm. On gymnosperms.
Distr.: ? Eur., N. Am. Ref.: 250.
A. canadense (Burt) J. Erikss. & Weresub apud Weresub 1974
Syn.: *? Corticium sulphureo-marginatum* Litsch. 1933

Note: *A. rhodoleucum* (Bourd.) J. Erikss. & Ryv. 1976 (116) is a similar species without clamps.

3a. Spores cylindrical, slightly curved, 4.5–6.5(–7.5) × (1.5–)1.7–2 μm. Hymenial surface even, dark cream to greyish yellow, locally with ochraceous or reddish tinges, blackish brown with KOH.

Basidiocarp effused, subcoriaceous, thick (up to 700 μm), adnate. Hyphae hyaline, thin- to basally thick-walled, 2.5–4(–5) μm wide, often with yellowish material. Cystidia scarce, thin-walled, obtuse, 60–80 × 4–5 μm, sometimes with a median clamp, projecting up to 30 μm. Basidia clavate, 20–30 × 4–5 μm. On gymnosperms.
Distr.: USSR. Ref.: 318.
A. suaveolens Parm. 1968

3b. Spores narrowly ellipsoid to cylindrical, 2–2.5 μm broad. Hymenial surface even to tuberculate, yellow or reddish. Reaction with KOH unknown. 4

4a. Spores narrowly ellipsoid, with slightly thickened walls, 4.5–5 × 2–2.5 μm. Hymenial surface even to tuberculate, at first yellow, later reddish.

Basidiocarp membranaceous to subcoriaceous, thick (up to 400 μm), adnate. Hyphae hyaline, thin-walled, 3–4 μm wide. Cystidia thin-walled, hyphoid, sometimes with a median clamp, 50–70 × 4–5 μm, projecting up to 30 μm. Basidia narrowly clavate, about 20 × 4–5 μm.
Distr.: whole area. Ref.: 113, 368.
A. subincarnatum (Peck) Pouzar 1959

4b. Spores cylindrical with slightly thickened walls, 5–7 × 2–2.5 μm. Hymenial surface even, yellow, never reddish.

Basidiocarp membranaceous, effused, adnate. Hyphae hyaline, thin-walled, 3–4 μm wide. Basidia narrowly clavate, about 25 × 4–5 μm. Cystidia hyaline, thin-walled, hyphoid, sometimes with a clamped median septum, 60–90 × 4–6 μm, projecting up to 40 μm.
Distr.: whole area. Ref.: 113, 368.
A. subsulphureum (P. Karst.) Pouzar 1959

AMYLOSTEREUM Boidin 1958

Basidiocarp annual or perennial, resupinate or effused-reflexed, coriaceous to corky. Hymenial surface even to tuberculate. Hyphal system mono- or dimitic. Skeletal hyphae parallel, brown. Generative hyphae hyaline, with clamps. Cystidia originating from skeletal hyphae, rarely from generative hyphae, thick-walled, brownish, encrusted. Basidia subclavate. Spores hyaline, ellipsoid to cylindrical, thin-walled, smooth, amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Thelephora chailletii* Pers. 1822
Distribution: in the whole area.
References: 10, 113, 182.

1a. Basal parallel layer absent, basidiocarp always resupinate. Spores ellipsoid to cylindrical, 7–10 × 3–4 μm. On Juniperus, rarely Taxus or Cupressus.

Basidiocarp up to 1000 μm thick. Hymenial surface even, ochraceous to pale brown. Skeletal hyphae may be absent (no basal layer!). Generative hyphae 3–5 μm wide. Cystidia thick-walled, yellowish to brown, encrusted, 30–150 × 5–9 μm. Basidia subclavate, 25–35 × 3.5–5 μm.
Distr.: whole area. Ref.: 113, 182, 368.
A. laevigatum (Fr.) Boidin 1958
Syn.: *Xerocarpus juniperi* P. Karst. 1881

1b. Basal parallel layer present, basidiocarp resupinate or effused-reflexed. Spores ellipsoid to subcylindrical, 5–8.5 × 2.5–4 μm. On other gymnosperms. 2

2a. Basidiocarp up to 700 μm thick, resupinate or effused-reflexed. No dark dense thin layer between abhymenial layer and subiculum.

Abhymenial layer minutely tomentose or glabrous, brown to dark brown. Hymenial layer even to tuberculate, ochraceous to light brown, rarely with greyish tinge. Skeletal hyphae brownish, 2–4 μm wide. Generative hyphae hyaline, 2–4 μm wide. Cystidia yellowish brown, thick-walled, encrusted, 4–6 μm wide. Basidia subclavate, 20–25 × 3.5–5 μm. Mainly on Abies.
Distr.: whole area. Ref.: 113, 182, 234.
A. chailletii (Pers.) Boidin 1958
Syn.: *Xerocarpus ambiguus* P. Karst. 1881; *Peniophora atkinsonii* Ellis & Everh. 1894

2b. Basidiocarp up to 1500 μm thick, usually effused-reflexed. A dark dense thin layer present between subiculum and abhymenial layer.

Abhymenial layer distinctly tomentose, yellowish brown to dark brown. Hymenial layer even, ochraceous brown to greyish brown, somewhat violaceous when wet. Skeletal and generative hyphae as above. Cystidia yellowish brown, thick-walled, encrusted, 4–6 μm

wide. Basidia subclavate, 15–25 × 3.5–5 μm. Mainly on Picea.
Distr.: whole area. Ref.: 111, 182.
A. areolatum (Fr.) Boidin 1958

ASTEROSTROMA Massee 1889

Basidiocarp annual, rarely perennial, resupinate, effused, arachnoid, byssoid, soft-membranaceous or pulverulent to spongy-crustose. Hymenial surface even, whitish to brownish. Hyphal strands may be present. Hyphal system monomitic (dimitic in one species). Generative hyphae hyaline, with thin to slightly thickened walls, without clamps. Asterosetae present, with 3–8(–10) rays, brown, thick-walled. Rays simple or one or more times dichotomously branched; the rays pointing towards the hymenium sometimes considerably longer. When present in the hymenium and not typically developed (sometimes acanthohyphidium-like) they are occasionally called asterophyses (asterohyphidia). Gloeocystidia present, sometimes rare, clavate to fusiform, thin-walled. Basidia single or in small clusters, clavate to cylindrical, with (2–)4 sterigmata. Spores hyaline, with thin to somewhat thickened walls, smooth or ornamented, amyloid or not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Corticium apalum* Berk. & Br. 1875
Distribution: in the whole area.
References: 321, 399.

1a. Spores smooth. 2
1b. Spores ornamented. 5

2a. Spores not amyloid. 3
2b. Spores amyloid. 4

3a. Basidiocarp hydnoid. Hymenial setae and skeletal hyphae present. Spores ovoid to ellipsoid, 5–7 × 3.5–4.5 μm.
Asterodon ferruginosus Pat. (not treated here)

3b. Basidiocarp even. Hymenial setae and skeletal hyphae absent. Spores subcylindrical to navicular or subfusoid, 7–9(–10) × 2.5–3(–3.5) μm.
Basidiocarp arachnoid to soft-membranaceous. Hymenial surface yellowish ochraceous to pale brown. Hyphae 2.5–4.5 μm wide. Asterosetae with (2–)3–4(–5) rays, often bilaterally symmetrical. Rays 20–50(–80) × 3–5(–6) μm, often dichotomously branched. Asterohyphidia smaller and more irregular. Gloeocystidia clavate to fusiform, (20–)25–35 × 6–8 μm. Basidia clavate, 25–30 × 4–5.5 μm.
Distr.: USSR. Ref.: 321.
A. cremeo-fulvum Parm. 1970

4a. Rays of subicular asterosetae 30–150 × 3–8 μm, rarely dichotomously branched. Spores globose, 5–7 μm in diam.

Basidiocarp effused, arachnoid, byssoid or soft-membranaceous. Hymenial surface even, whitish to brown. Hyphal strands present. Hyphae 2–4 μm wide. Asterosetae with 3–6(–8) rays. Gloeocystidia clavate to fusiform, 25–55 × 4–10 μm. Basidia clavate to urniform, 30–37 × 4–7(–8) μm.

Distr.: N. Am. Ref.: 321, 399.

A. andinum Pat. 1893

Syn.: *Asterostroma bicolor* Ellis & Everh. 1894; *A. spiniferum* Burt 1924; *A. gracile* Burt 1924

4b. Rays of subicular asterosetae 20–35(–40) × 2–3 μm, regularly once or twice dichotomously branched. Spores globose, (6–)6.5–9 μm in diam.

Basidiocarp effused, byssoid to soft-membranaceous. Hymenial surface even to tuberculate, buff to yellowish brown, often with pinkish tint. Hyphal strands present. Hyphae 2–4.5 μm wide. Asterosetae with 2–4 rays, often bilaterally symmetrical. Gloeocystidia fusiform, 30–85 × (3.5–)5–10 μm. Basidia clavate to somewhat urniform, 20–50 × 6–9 μm.

Distr.: Eur., USSR. Ref.: 321, 399.

A. laxum Bres. apud Bourd. & Galz. 1920

5a. Spores regular, densely covered with blunt spines, up to 1.5 μm long. N. Am.

Basidiocarp arachnoid to spongy-crustose. Hymenial surface even, whitish to pale ochraceous. Hyphal strands present. Hyphae 2–4 μm wide. Asterosetae with 4–7(–9) rays. Rays 30–60 × 3–5(–6) μm. Gloeocystidia cylindrical to fusiform, often ventricose, up to 55 × 10 μm. Basidia clavate to somewhat urniform, 28–35 × 5–7 μm. Spores globose to subglobose, (5–)6–8 μm in diam.

Distr.: N. Am. Ref.: 321, 399.

A. muscicola (Berk. & Curt.) Massee 1889

Syn.: *? Corticium apalum* Berk. & Br. 1875; *? A. roseum* Bres. 1920

5b. Spores regular or irregular, with scattered and/or low ornamentation. 6

6a. Rays of subicular asterosetae normally simple, rarely dichotomously branched, 30–100 × (2–)3–6(–7) μm, spores globose to subglobose, sometimes irregular, with scarce hemispherical warts, 4.5–7 × 4.5–6 μm. N. Am.

Basidiocarp arachnoid to spongy-crustose. Hymenial surface even, whitish to ochraceous. Hyphal strands present. Hyphae 2–5 μm wide. Asterosetae with (3–)4–6(–7) rays. Gloeocystidia clavate to fusoid, often ventricose, (30–)40–80 × 7–15 μm, with thin to rarely thickened walls. Basidia clavate to somewhat urniform, 25–31 × 6–7 μm.

Distr.: N. Am. Ref.: 321, 399.

A. cervicolor (Berk. & Curt.) Massee 1889

6b. Rays of subicular asterosetae often dichotomously branched. Spore ornamentation conical to bluntly spinous. Eur., USSR. 7

7a. Spores irregular to angular, (4.5–)5–6(–7) × 4–5.5 μm, with blunt spines up to 1.5 μm long.

Basidiocarp hypochnoid to soft-membranaceous. Hymenial surface whitish to pale ochraceous or cinnamon. Hyphal strands present. Hyphae 1.5–4 μm wide. Asterosetae with 3–6(–8) rays. Rays 30–80 × 1.5–3.5(–4) μm. Gloeocystidia fusiform, (25–)30–60 × (8–)10–15(–20) μm. Basidia clavate, 15–26 × 4–6.5 μm.
Distr.: Eur., USSR. Ref.: 321.
A. medium Bres. 1920
Syn.: *? A. cellare* P. Henn. 1908.

7b. Spores globose to subglobose, regular, 5–7(–7.5) × 4–5.5(–7) μm, with blunt spines up to 1.5 μm long.

Basidiocarp hypochnoid to soft-membranaceous. Hymenial surface whitish to ochraceous. Hyphal strands present. Hyphae 1.5–4 μm wide. Asterosetae with 3–9 rays. Rays 35–75 × 2–3(–4) μm. Gloeocystidia fusiform, 25–70 × 7–10 μm. Basidia clavate, 14–30(–60) × 5–8 μm.
Distr.: Eur., USSR. Ref.: 321.
A. ochroleucum Bres. apud Torrend 1913

ATHELIA Pers. 1822

Basidiocarp annual, resupinate, effused, more or less pellicular, often easily separable. Hymenial surface even when dry, in some species slightly merulioid, grandinioid or finely reticulate when fresh, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled (0.1–1.0 μm), clamps present or absent, often loosely encrusted. Some species with thin-walled cystidia (leptocystidia), but no gloeocystidia. Basidia clustered, more or less clavate, hyaline, a basal clamp present or absent, with 2–4 sterigmata. Spores hyaline, smooth, thin-walled, not amyloid.

Substrate: saprophytic on debris of angiosperms and gymnosperms, also on soil. Some species are parasites of algae and lichens.
Type species: *Athelia epiphylla* Pers. 1822
Distribution: in the whole area.
References: 113, 186.

1a. Weakly parasitic on or symbiotic with filamentous Cyanophyceae.

Basidiocarp effused, only a few mm long, loosely adnate. Hymenial surface even to slightly grandinioid, whitish. Hyphae hyaline, thin-walled, 4–6.5 μm wide, with relatively small clamps at all septa. Cystidia lacking. Basidia 15–18 × 5.5–6.5 μm, with a basal clamp. Spores ovoid, basally widened, 5.5–6 × 4–4.4 μm.
Distr.: N. Am. Ref.: 200.
A. poeltii Jülich 1978

1b. Not on filamentous Cyanophyceae, but on wood, leaves, soil, other plant debris or on Lichens or Chlorococcales 2

2a. Basidia with 2 (rarely 4) sterigmata. 3
2b. Basidia with 4 (rarely 2) sterigmata. 4

3a. Clamps present at nearly all septa.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae somewhat thick-walled (up to 0.4 μm thick), 4–5 μm wide. Basidia clavate, with a clamp at the base, 17–22 × 6.5–8 μm. Spores broadly cylindrical to ellipsoid, thin-walled, 9.5–13.5 × 5–5.6 μm, with distinct apiculus.
Distr.: Eur., USSR. Ref.: 113, 186.
A. sibirica (Jülich) J. Erikss. & Ryv. 1973

3b. Clamps only occasionally present at the basal hyphae, lacking in other parts of the basidiocarp (particularly at the base of the basidia)
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, slightly thick-walled (up to 0.5 μm thick), 5–8(–10) μm wide. Basidia clavate, 24–33 × 6.5–8 μm. Spores thin-walled, 8–11(–12) × 4–5.5(–6) μm (only 3–3.5 μm wide in *A. arachnoidea* var. *leptospora* Jülich 1972).
Distr.: whole area. Ref.: 113, 186.
A. arachnoidea (Berk.) Jülich 1972
Syn.: *Hypochnus bisporus* Schroet. 1888

4a. Clamps completely lacking. 5
4b. Clamps present at all septa *or* present only at the base of the basidia *or* only on the basal hyphae. 8

5a. Spores broadly ellipsoid, 5–6.5 μm long. 6
5b. Spores pyriform (c. 7–10 μm long) *or* ovoid (c. 6–8 μm long). 7

6a. Cystidia lacking.
Basidiocarp thin, pellicular, even. Hymenial surface whitish. Hyphae thin-walled in the hymenial region, thick-walled (up to 1.0 μm) in the basal part, 4–5 μm wide. Basidia clavate, 10–14 × 5–6 μm. Spores thin-walled, 5–6.5 × 3–3.8 μm, with distinct apiculus. Mostly on coniferous wood.
Distr.: whole area. Ref.: 113, 186.
A. decipiens (Höhn. & Litsch.) J. Erikss. 1958
Syn.: *A. caucasica* Parm. 1968

6b. Leptocystidia present, scattered, ± cylindrical, 20–30 × 4–5 μm, projecting up to 15 μm.
Basidiocarp thin, pellicular. Hymenial surface at first even, later grandinioid, whitish. Hyphae thin-walled (up to 0.3 μm thick), 3–5.5 μm wide. Basidia clavate, 13–16 × 5–6 μm. Spores thin-walled, 5–6 × 3–4 μm, with small apiculus.
Distr.: whole area. Ref.: 186.
A. cystidiolophora Parm. 1967

7a. Spores pyriform, 7–9.5(–10.5) × 3.6–4.8–5.5 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin-walled, 5–7(–8) μm wide. Basidia clavate, 18–22 × 7–8 μm. Spores thin-walled, with broad apiculus.
Distr.: Eur. Ref.: 113, 186, 303.
A. pyriformis (M.P. Christ.) Jülich 1972

7b. Spores narrowly ovoid, the basal part broadened, 6–8 × 2.8–3 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish. Hyphae hyaline, basal hyphae with scattered clamps in some specimens, thin-walled (up to 0.4 μm thick), 5–7 μm wide. Basidia clavate, 12–15 × 4.5–5 μm. Spores thin-walled, with small but distinct apiculus.
Distr.: Eur. Ref.: 188.
A. subovata Jülich & Hjortstam apud Jülich 1973

8a. Clamps present at almost all septa. 9
8b. Clamps only present in the hymenial *or* in the basal part of the basidiocarp 13

9a. Spores globose to broadly ellipsoid. 10
9b. Spores narrowly cylindrical to ellipsoid (see also *Fibulomyces*). 11

10a. Leptocystidia lacking. Spores broadly ellipsoid, some specimens with a few globose spores.
Basidiocarp thin, pellicular to slightly membranaceous. Hymenial surface even, sometimes merulioid when fresh, whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.5 μm), 4–6 μm wide, the basal ones not always clamped. Basidia clavate, sometimes somewhat stalked, 20–25 × 7.5–9 μm. Spores thin- to slightly thick-walled (up to 0.3 μm), 6.5–8.5(–10) × 4.5–5.5(–7) μm, with distinct apiculus.
Distr.: whole area. Ref.: 113, 186.
A. neuhoffii (Bres.) Donk 1957
Syn.: *A. globularis* M.P. Christ. 1960; *Corticium arachnoideum* Berk. sensu Bres.

10b. Capitate leptocystidia present. Spores globose.
Basidiocarp thin, pellicular to slightly membranaceous, sometimes with a few narrow hyphal strands. Hymenial surface whitish to cream-coloured. Hyphae hyaline to slightly yellowish, thin-walled (up to 0.3 μm thick), 2–2.5(–3) μm wide. Basidia ± clavate, 18–33 × 6.5–8.5 μm. Leptocystidia capitate, thin-walled, smooth, 40–50 × 6–7 μm, the upper capitate part 7–8 μm wide, with a basal clamp, projecting up to 30 μm. Spores thin- to slightly thick-walled (up to 0.3 μm thick), (5.5–)6–6.5(–7) μm in diam., with distinct apiculus.
Distr.: N. Am. Ref.: 186.
A. laxa (Burt) Jülich 1972

11a. Spores up to 6 μm long, cylindrical to narrowly ellipsoid.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), 3–5 μm wide. Basidia cylindrical to narrowly clavate, 12.5–16 × 4–6.5 μm, sterigmata 5–6 × 1–1.3 μm. Spores thin-walled, 4.5–6 × 2.5–3(–3.5) μm, with distinct apiculus.
Distr.: whole area. Ref.: 113, 186.
A. bombacina (Pers.) Jülich 1972

11b. Spores longer than 6 μm, ellipsoid. 12

12a. Spores 7–11 × 3.5–4.5 μm.
Basidiocarp thin, pellicular to thin-membranaceous. Hymenial surface whitish to cream-coloured. Hyphae thin- to slightly thick-walled (up to 0.5 μm), 4–5 μm wide. Basidia clavate, 16–20 × 6–8 μm, sterigmata c. 4–6 × 1.2–1.5 μm. Spores thin-walled, with distinct apiculus.
Distr.: whole area. Ref.: 113, 186.
A. fibulata M.P. Christ. 1960

12b. Spores 8–14 × 5–6 μm.
Basidiocarp thin, pellicular. Hymenial surface slightly cream-coloured. Hyphae hyaline, thin-walled, 3–3.5 μm wide. Basidia clavate to stalked, 22–30(–40) × 7.5–8.5(–11) μm. Spores thin-walled, with distinct apiculus.
Distr.: USSR. Ref.: 186.
A. singularis Parm. 1967

13a. Clamps at almost all septa of the hymenial part, rare or lacking on the basal hyphae. 14

13b. Clamps always lacking in the hymenial part, rare or abundant in the basal part of the basidiocarp 16

14a. Spores with thickened walls (up to 0.5 μm), globose, guttulate. Basidia with oil drops in the cytoplasm. 15

14b. Spores thin- to slightly thick-walled (up to 0.3 μm), globose to usually broadly ellipsoid, non-guttulate. Basidia without oildrops. *Athelia neuhoffii*, see 10a.

15a. Hyphae 4–5 μm wide, clamps on the basal hyphae relatively rare. Spores 4–5(–6) μm in diam.
Basidiocarp thin, pellicular, with small rhizomorphs. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm). Basidia clavate, guttulate, 20–25 × 6–7.5 μm. Spores hyaline. On plant debris and dung.
Distr.: Eur., N. Am. Ref.: 113, 186.
A. coprophila (Wakef.) Jülich 1972
Note: This species has been placed in the genus *Byssocorticium* by J. Erikss. & Ryv. 1973.

15b. Hyphae 2.5–3 μm wide, clamps on the basal hyphae relatively abundant. Spores 3.5–4.5 μm in diam.

Basidiocarp pellicular, with small rhizomorphs. Hymenial surface cream-coloured. Hyphae hyaline, thin-walled. Basidia clavate, guttulate, 15–22 × 4.5–5 μm. Spores with thickened walls.
Distr.: Eur. Ref.: 113.
Byssocorticium lutescens J. Erikss. & Ryv. 1973

16a. Spores narrowly cylindrical to narrowly ellipsoid. 17
16b. Spores ellipsoid, pyriform or ovoid. 20

17a. Spores 5.5–8 μm long. 18
17b. Spores 8–12 μm long, up to 4–5 μm broad. 19

18a. Spores cylindrical, with rounded base, (5.5–)6–7.5(–8) × 2.8–3.2 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), (4–)5–7(–8) μm wide. Clamps scattered on the basal hyphae, otherwise lacking. Basidia clavate, 13–18 × 5–8 μm. Spores hyaline, thin-walled.
Distr.: whole area. Ref.: 113, 186.
A. epiphylla Pers. 1822

18b. Spores cylindrical, with tapering base, 5.5–7(–8) × 2.2–2.6 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), 3.5–4.5 μm wide, clamps scattered on the basal hyphae. Basidia clavate, 12–15 × 5–6 μm. Spores hyaline, thin-walled.
Distr.: Eur. Ref.: 113, 186.
A. acrospora Jülich 1972

19a. Spores cylindrical, with rounded base, 8–10(–12) × 3.5–4 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), 4–7 μm wide, clamps scattered on the basal hyphae. Basidia clavate, 16–18 × 6.5–7.5 μm. Spores hyaline, thin-walled.
Distr.: whole area. Ref.: 186.
A. tenuispora Jülich 1972

19b. Spores cylindrical, with tapering base, 9–11.5 × 3.5–4.8 μm.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), 3.5–4.5 μm wide. Basidia 18–24 × 6–7 μm. Spores hyaline, thin-walled.
Distr.: N. Am. Ref.: 186.
A. alutacea Jülich 1972

20a. Spores ellipsoid. 21
20b. Spores pyriform or ovoid. 24

21a. Spores 9–13.5 × 5–6 μm.

Basidiocarp thin, pellicular to membranaceous. Hymenial surface cream-coloured. Hyphae hyaline, thin-walled, but the basal ones thick-walled (up to 1.0 μm), 5–7 μm wide, clamps scattered on the basal hyphae. Basidia large, clavate, 20–36 × 8–10 μm (basidia 18–25 × 10–12 μm in *A. teutoburgensis* var. *tenuis* (Donk) Jülich). Spores hyaline, thin-walled, apiculus not always distinct.
Distr.: whole area. Ref.: 186, 188.
A. teutoburgensis (Brinkm.) Jülich 1973
Syn.: *A. macrospora* (Bourd. & Galz.) M.P. Christ. 1960.

21b. Spores up to 8(–9) μm long and up to 4.5 μm broad. 22

22a. Spores ellipsoid, up to 8(–9) × 4.5 μm. Hyphae relatively wide, mostly 5–8(–10) μm wide, clamps only scattered. 23

22b. Spores broadly ellipsoid to broad and short cylindrical, 4.3–5.2 μm broad. Hyphae relatively narrow, 2.5–4 μm wide, the basal ones with clamps at most septa.
Basidiocarp thin, pellicular. Hymenial surface whitish. Hyphae thin- to basally slightly thick-walled (up to 0.5 μm). Basidia clavate, 15–18 × 5.5–6.5 μm. Spores hyaline, thin-walled, the adaxial part flattened, 6.5–8(–9) × 4.3–5.2 μm, with distinct apiculus.
Distr.: Eur. Ref.: 186.
A. nivea Jülich 1972

23a. Basidia 10–16 μm long, the subbasidial hyphae relatively narrow. Basidiocarp pellicular. Common species.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.5 μm), (3–)5–8(–10) μm wide. Basidia clavate, 10–16 × 5.5–8 μm. Spores hyaline, thin-walled, (5.5–)6–7.5(–8) × 3.5–4.5 μm, with distinct apiculus.
Distr.: whole area. Ref.: 186.
A. salicum Pers. 1822
Syn.: *A. incrustata* M.P. Christ. 1960

23b. Basidia 15–25 μm long, the subbasidial hyphae relatively wide. Basidiocarp membranaceous. Rare species.
Basidiocarp membranaceous. Hymenial surface cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.4 μm), 5–8 μm wide. Basidia clavate, 15–25 × 5–8 μm. Spores hyaline, thin-walled, 6.5–8.5 × 3.6–4.4 μm, with distinct apiculus.
Distr.: Eur., N. Am. Ref.: 186.
A. alnicola (Bourd. & Galz.) Jülich 1972

24a. Spores ovoid, 8–9 μm long.
Basidiocarp thin, pellicular. Hymenial surface whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled (up to 0.5 μm), 4–5 μm wide. Basidia clavate, 16–18 × 5–7 μm. Spores

broadened at the base, hyaline, thin-walled, 8–9 × 3.8–4.2 μm, with distinct apiculus.
Distr.: Eur., USSR. Ref.: 186.
A. ovata Jülich 1972

Note: If spores 6–8 × 2.8–3 μm, see 6b, *A. subovata*.

24b. Spores pyriform, 4.5–6 μm long.
Basidiocarp thin, pellicular. Hymenial surface even to finely reticulate, whitish. Hyphae hyaline, thin-walled, the basal ones 5–10 μm wide, the subhymenial ones 3–4 μm wide. Basidia clavate, 10–16 × 4–5 μm. Spores hyaline, thin-walled, 4.5–6 × 2.5–3 μm.
Distr.: Eur. Ref.: 113.
A. binucleospora J. Erikss. & Ryv. 1973

ATHELIDIUM Oberw. 1965

Basidiocarp annual, resupinate, effused, adnate, membranaceous. Hymenial surface even. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, clamps lacking. No cystidia. Basidia cylindrical to narrowly clavate, a basal clamp lacking. Spores hyaline, thin-walled, smooth, subfusiform to navicular, not amyloid.

Substrate: saprophytic on decayed wood.
Type species: *Xenasma aurantiacum* M.P. Christ. 1960
Distribution: Europe.
References: 113, 186, 303.

Monotypic. Basidiocarp granular-membranaceous. Hymenial surface ochraceous to slightly orange. Hyphae 5–7 μm wide. Basidia irregularly cylindrical to narrowly clavate, mostly 4-spored, 15–20 × 6–7 μm. Spores subfusiform to navicular, 7–11 × 3.5–4.5 μm.
Distr.: Eur. Ref.: 113, 186, 303.
A. aurantiacum (M.P. Christ.) Oberw. 1965

ATHELOPSIS Oberw. ex Parm. 1968

Basidiocarp annual, resupinate, effused, pellicular or hypochnoid, separable. Hymenial surface even, with yellowish or greenish colour. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps, sometimes encrusted. Cystidia absent. Basidia single or usually in clusters, subclavate to cylindrical, stalked (podobasidia), with (2–)4 sterigmata. Spores hyaline, thin-walled, smooth, ellipsoid to narrowly cylindrical or allantoid, not amyloid.

Substrate: saprophytic on angiosperms and gymnosperms
Type species: *Corticium glaucinum* Bourd. & Galz. 1928
Distribution: in the whole area.
References: 113.

1a. Spores ellipsoid, 6–8(–8.5) × 3.8–4.5 μm.
Basidiocarp hypochnoid to pellicular, thin. Hymenial surface even, light yellowish, often with greenish tint. Hyphae 2–4 μm wide. Basidia 13–20(–25) × 4–7 μm.
Distr.: Eur., N. Am. Ref.: 113, 194.
A. subinconspicua (Litsch.) Jülich 1975
Syn.: *Athelopsis hypochnoidea* Jülich 1971.

1b. Spores cylindrical or allantoid, up to 3.5 μm broad. 2

2a. Spores allantoid, 5–7(–8) × 2–2.5(–3) μm.
Basidiocarp pellicular, thin. Hymenial surface even or somewhat reticulate, whitish to cream yellow. Hyphae (1–)1.5–2.5 μm wide. Basidia 14–20 × 5–6 μm.
Distr.: Eur. Ref.: 113.
A. lacerata (Litsch.) J. Erikss. & Ryv. 1973

2b. Spores cylindrical, straight. 3

3a. Spores cylindrical, often somewhat flexuous, (5.5–)6.5–7.5(–8) × 2 μm.
Basidiocarp farinose to pellicular, thin. Hymenial surface even, whitish to bright grey. Hyphae (1–)1.5–2.5 μm wide.
Basidia 13–20 × 4.5–5.5 μm.
Distr.: Eur. Ref.: 185.
A. baculifera (Bourd. & Galz.) Jülich 1971

3b. Spores cylindrical, (7–)8–11(–12.5) × (1.5–)2–3(–3.5) μm.
Basidiocarp pellicular, thin. Hymenial surface even, light yellow to pale ochraceous, sometimes with greenish tint. Hyphae 1–3 μm wide.
Basidia 8–20 × 4.5–6(–7.5) μm.
Distr.: Eur., USSR. Ref.: 113, 242, 303.
A. glaucina (Bourd. & Galz.) Oberw. ex Parm. 1968

BASIDIORADULUM Nobles 1967

Basidiocarp annual, resupinate, effused or effused-reflexed, membranaceous, sometimes with a ceraceous hymenial layer. Hymenial surface raduloid. Hyphal system monomitic. Hyphae hyaline, the basal ones more or less loosely arranged, in the hymenial layer compact, thin-walled, clamped. Cystidia and gloeocystidia lacking. Cystidioles may be present. Basidia when mature suburniform and constricted in the middle, the young stages broadly ellipsoid or pyriform, with clamps at the base. Spores hyaline, thin-walled, cylindrical, not amyloid.

Substate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Hydnum radula* Fr. ex Fr. 1821
Distribution: in the whole area.
References: 300.

Monotypic. Basidiocarp orbicular, later confluent, effused, up to several

decimeters long, thick-membranaceous, the hymenial layer often ceraceous; margin adnate or reflexed. Hymenial surface at first even, but soon covered with teeth of variable shape, from cylindrical or conical to plate-like, the tip in younger stages fertile, after rapid growth often sterile, scattered over the whole surface or slightly fasciculate; cream-coloured, the margin lighter. Hyphae hyaline, 2–5 μm wide, with clamps at all septa, the basal ones distinct and straight, the subhymenial ones often torulose and indistinct. Cystidioles sometimes present, moniliform, 35–60 × 5–7 μm. Basidia irregularly cylindrical to narrowly clavate, 22–30 × 4.6–6 μm. Spores hyaline, cylindrical, often slightly curved, smooth, 7–11 × 2.3–3 μm, with small apiculus.
Distr.: whole area. Ref.: 114, 300.

Basidioradulum radula (Fr. ex Fr.) Nobles 1967
Syn.: *Radulum orbiculare* Fr. ex Grev. 1827; *Radulum hydnans* Schw. 1834; *Radulum bennettii* Berk. & Curt. 1873; *Corticium colliculosum* Berk. & Curt. 1873; *R. corallinum* Berk. & Br. 1875; *R. epileucum* Berk. & Br. 1875

BOREOSTEREUM Parmasto 1968

Basidiocarp annual, resupinate or effused-reflexed, rarely flabelliform, coriaceous. Hymenial surface even or slightly plicate, ferrugineous. Abhymenial surface tomentose to nearly smooth, dark brown to blackish. Hyphal system dimitic (?). Thick-walled hyphae nearly unbranched in the basal part and then up to 6.5 μm wide, densely branched with right angles in the upper part. Incrustations brown, in KOH dark green. Leptocystidia present. Basidia subclavate. Spores hyaline, thin-walled, smooth, cylindrical, not amyloid.

Substrate: on wood of gymnosperms.
Type species: *Stereum radiatum* Peck 1873
Distribution: in the whole area.
References: 182, 318.

Monotypic. Basidiocarp typically narrowly reflexed, up to 800 μm thick (without tomentum). Hymenial surface even or plicate, ferrugineous to amber brown, rarely black. Abhymenial surface tomentose to nearly smooth, dark brown to black. Hyphae of tomentum often with verruculose protuberances, (2.5–)3.5–4.5 μm wide; "skeletal" hyphae thick-walled, in the upper part abundantly branched. Generative hyphae hyaline to yellowish, 2–3.5(–5) μm wide, without clamps. Brown incrustations present, turning green in KOH. Leptocystidia (hyphidia?) immersed or protruding up to 30 μm, thin-walled, encrusted, filiform, acute, 3–4 μm wide. Basidia subclavate, 30–35 × 5–7 μm. Spores cylindrical, 6–12 × (2.5–)3–4 μm.
Distr.: whole area. Ref.: 12, 182, 234.

B. radiatum (Peck) Parm. 1968

BOTRYOBASIDIUM Donk 1931

Basidiocarp annual, resupinate, effused, arachnoid, byssoid or hypochnoid, rarely pellicular, even, often minutely reticulate under a lens, often not continuous. Hyphal system monomitic. Hyphae rather wide, branching at right angles, usually without clamps. Basal hyphae hyaline to yellowish, long-celled, often with thickened walls. Subhymenial hyphae hyaline, short-celled, thin-walled, cyanophilous. Cystidia usually absent, when present hyaline, cylindrical or subfusiform, originating in hymenium. Basidia in clusters, typically subcylindrical, often constricted in the middle, with (4–)6(–8) sterigmata. Spores hyaline, smooth or rarely warted, usually navicular to fusoid, not amyloid, cyanophilous.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms and on humus.
Type species: *Corticium subcoronatum* Höhn. & Litsch. 1907
Anamorphs: *Haplotrichum* Link 1824 (syn.: *Acladium* Link ex Pers. 1822; *Oidium* Link ex Fr. 1829); *Allescheriella* P. Henn. 1897
Distribution: in the whole area.
References: 113, 169, 252.

1a. Clamps present, at least sub-basidial and at the basal hyphae. 2
1b. Clamps absent. 7

2a. Spores broadly navicular to fusiform. 3
2b. Spores subglobose, ellipsoid or cylindrical, sometimes curved. Cf. *Sistotrema*.

3a. Cystidia present. 4
3b. Cystidia absent. 5

4a. Cystidia hyaline, smooth, thin- to slightly thick-walled, cylindrical to subfusiform, 55–120 × 8–12.5 μm. Spores navicular to broadly fusiform, 8–9 × 4–5 μm.
Basidiocarp hypochnoid, continuous. Hymenial surface buff. Hyphae 7–15 μm wide, the basal ones with thickened walls (up to 2.5 μm). Basidia subcylindrical to suburniform, 17–29 × 8–10 μm, with (4–)6 sterigmata.
Distr.: N. Am. Ref.: 354.
B. ansosum (H.S. Jacks. & D.P. Rogers apud D.P. Rogers) Parm. 1968

4b. Cystidia hyaline, thin-walled, cylindrical or fusiform, smooth or minutely encrusted, 65–100 × 4–9 μm. Spores navicular, 5.5–6 × 2.5–3 μm.
Basidiocarp hypochnoid. Hymenial surface greyish white. Basal hyphae thin-walled, 6–7 μm wide. Subhymenial hyphae 3–5 μm wide. Basidia subcylindrical, constricted, 14–20 × 5–6 μm, usually with 6 sterigmata.
Distr.: USSR. Ref.: 107.
B. pilosellum J. Erikss. 1958

5a. Clamps present on basal hyphae and sub-basidial, not on subhymenial hyphae. Spores narrowly navicular to fusiform, 7–9 × 1.5–2.5 μm.

Basidiocarp hypochnoid to pellicular. Hymenial surface white to cream-coloured, pale ochraceous when old. Basal hyphae with thickened walls, 4–10 μm wide. Subhymenial hyphae 4–6 μm wide. Basidia subcylindrical, not or slightly constricted, 16–30 × 5–6.5 μm, usually with 6 sterigmata.

Distr.: whole area. Ref.: 5, 113.

B. intertextum (Schw.) comb. nov.

(Basionym: *Sporotrichum intertextum* Schw. 1831, Syn. Fung. America bor., p. 271 (nr. 2509).

Syn.: *Pellicularia angustispora* Boidin 1957

5b. Clamps present in all parts of the basidiocarp. Spores broader than 2.5 μm. 6

6a. Spores broadly navicular, 9–12(–13.5) × 5 –6(–7) μm. Anamorph usually present.

Basidiocarp hypochnoid. Hymenial surface greyish white to yellowish. Basal hyphae hyaline to yellowish, with thickened walls, 7–10(–15) μm wide. Subhymenial hyphae (4–)5–7.5 μm wide. Basidia subcylindrical, somewhat constricted in the middle, 10–22 × (5–)7–10 μm, with (4–)6 sterigmata.

Distr.: whole area. Ref.: 98, 113.

B. medium J. Erikss. 1958

Anamorph: Basal hyphae hyaline to pale yellowish, 6–7.5 μm wide, thick-walled, with clamps. Ascending hyphae and conidiophores hyaline, thin-walled, 3.5–7.5 μm wide, without or with rare clamps. Apical cells (1–3) of conidiophores conidiogenous. Conidia hyaline, narrowly ellipsoid to fusoid, thin-walled, smooth, terminated by a papilla, (12–)15–22(–28) × (4.5–)5.5–7(–8) μm, often in chains.

H. medium (Hol.-Jech.) Hol.-Jech. 1976

6b. Spores narrowly navicular, 6–10 × 2.5–4.5 μm. Anamorph unknown.

Basidiocarp arachnoid to hypochnoid, later continuous. Hymenial surface whitish to yellowish. Basal hyphae with thickened walls, 7–11 μm wide. Subhymenial hyphae 4–7 μm wide. Basidia subcylindrical, usually constricted, 12–25(–30) × 6–9 μm, with 6 sterigmata.

Distr.: whole area. Ref.: 113, 354.

B. subcoronatum (Höhn. & Litsch.) Donk 1931

7a. Basal hyphae very wide, some 15–20 μm wide, at least twice as wide as the subbasidial hyphae. 8

7b. Basal hyphae rarely up to 15 μm wide. 9

8a. All hyphae smooth.

Basidiocarp hypochnoid to floccose or continuous. Hymenial surface whitish to yellowish. Basal hyphae yellowish to yellowish

brown, thick-walled, 15–20 μm wide. Subhymenial hyphae 4.5–6 μm wide. Basidia subcylindrical, constricted, 17–27 × 7–9 μm. Spores ovoid to narrowly ellipsoid, 5–8 × 2.5–3.5 μm.
Distr.: whole area. Ref.: 113.
B. laeve (J. Erikss.) Parm. 1965

8b. At least the basal hyphae asperulate.
Basidiocarp hypochnoid to floccose or continuous. Hymenial surface whitish, greyish or yellowish. Basal hyphae yellowish to brownish, 15–20 μm wide. Subhymenial hyphae 4.5–6 μm wide. Basidia 15–25 × 7–10 μm, ovoid to subcylindrical, more or less constricted, with usually 6 sterigmata. Spores ovoid to ellipsoid, 5–8 × 2.5–3.5 μm.
Distr.: whole area. Ref.: 99, 113.
B. pruinatum (Bres.) J. Erikss. 1958
Syn.: *?Hypochnus coronatus* Schroet. apud Cohn 1888, non ~ Bon. 1876; *?H. schroeteri* Sacc. 1888; *Tomentella granulata* Bref. 1889; *?H. brefeldii* Sacc. 1891; *Corticium botryoideum* Overh. 1934

9a. Key to the teleomorphs. 10
9b. Key to the anamorphs (*Haplotrichum, Allescheriella*). 17

10a. Basidia at least 8 μm wide. 11
10b. Basidia narrower than 8 μm, at least on average 15

11a. Spores narrowly navicular to almost allantoid, three times as long as broad, (10–)12–14(–17) × 3–5 μm.
Basidiocarp hypochnoid to reticulate. Hymenial surface greyish white to yellowish. Basal hyphae thick-walled, 10–12 μm wide. Subhymenial hyphae 6–8 μm wide. Basidia ovoid to subcylindrical, 15–20 × 9–12 μm.
Anamorph: unknown.
Distr.: Eur., N. Am. Ref.: 107, 113.
B. danicum J. Erikss. & Hjortstam 1969

11b. Spores smaller, less than three times as long as broad. 12

12a. Spores at least 3.5 μm broad. 13
12b. Spores not more than 3.5 μm broad (at least on average). 16

13a. Basidia ovoid to pyriform, 12.5–17.5 × 8.5–12.5 μm, with 2–6 sterigmata. Spores narrowly ovoid, ellipsoid, navicular or subfusiform, (6–)7.5–12.5(–15) × 3.5–4.5(–6) μm.
Basidiocarp arachnoid to hypochnoid. Hymenial surface whitish to buff. Subicular hyphae with thin to somewhat thickened walls, hyaline to pale brown, 7.5–11 μm wide. Subhymenial hyphae up to 12.5 μm wide.
Anamorph: *Allescheriella crocea*, see 22a.
Distr.: N. Am. Ref.: 237.
B. croceum Lentz 1967

13b. Basidia ovoid to subcylindrical, 17–25 × 8–12 μm. 14

14a. Spores navicular, biapiculate, (7.5–)9–12 × 4.5–6 μm.
Basidiocarp reticulate to hypochnoid or subpellicular. Hymenial surface greyish white to yellowish. Basal hyphae hyaline to yellowish brown, with thickened walls, 8–10 μm wide. Subhymenial hyphae 6–8(–10) μm wide.
Anamorph: unknown.
Distr.: whole area. Ref.: 66, 113.
B. botryosum (Bres.) J. Erikss. 1958

14b. Spores obliquely and narrowly ovoid, apically obtuse, 7.5–12 × 3.5–5 μm.
Basidiocarp hypochnoid to continuous. Hymenial surface greyish white to ochraceous. Basal hyphae yellowish, with thickened walls, 7.5–10 μm wide. Subhymenial hyphae 5–6 μm wide. Basidia 17–25 × 8–10 μm.
Anamorph: unknown.
Distr.: Eur., USSR. Ref.: 113.
B. obtusisporum J. Erikss. 1958

15a. Spores citriform to navicular, distinctly biapiculate, (5.3–)6–8(–10) × 3–4 μm.
Basidiocarp minutely reticulate to hypochnoid. Hymenial surface whitish to greyish or yellowish. Basal hyphae 5–8(–10) μm wide, with thickened walls. Subhymenial hyphae 4–5 μm wide. Basidia ovoid to subcylindrical, 12–18 × 5–7 μm, usually with 6 sterigmata.
Anamorph: *H. capitatum*, see 20b
Distr.: whole area. Ref.: 113.
B. candicans J. Erikss. 1958

15b. Spores apically obtuse, not distinctly biapiculate. 16

Note.: The following species, together with *B. danicum, B. botryosum*, and *B. obtusisporum*, form the *B. vagum*-complex. They can be distinguished by their anamorphs only; the morphological differences of the teleomorphs are faint and intergrade. For this reason they are only enumerated.

16a. Basidiocarp hypochnoid to arachnoid. Hymenial surface whitish to greyish or yellowish. Basal hyphae 5–9 μm wide, with thickened walls. Subhymenial hyphae 4–5 μm wide. Basidia ovoid to subcylindrical, 12–18 × 7–10 μm, normally with 6 sterigmata. Spores narrowly ovoid to cylindrical, 6–9(–10) × 3–3.7(–4) μm.
Anamorph: *H. aureum*, see 20a
Distr.: whole area. Ref.: 113, 313.
B. aureum Parm. 1965

16b. Basidiocarp hypochnoid. Hymenial surface whitish. Basal hyphae 5–7 μm wide, more or less thin-walled. Subhymenial hyphae 4–5 μm wide. Basidia ovoid to subcylindrical, (11–)13–18 × (6.5–)7–9 μm. Spores navicular to cylindrical, 7–9(–10) × 2.5–3.5 μm.

Anamorph: *H. conspersum*, see 23a
Distr.: whole area. Ref.: 113.
B. conspersum J. Erikss. 1958

16c. Basidiocarp minutely reticulate to hypochnoid. Hymenial surface white to cream-coloured. Basal hyphae (6–)8–9(–11) μm wide, thick-walled. Subhymenial hyphae 3.5–5(–8) μm wide. Basidia subcylindrical, (12.5–)16–18 × (6–)7–8 μm, with (4–)6–8 sterigmata. Spores ellipsoid to fusiform, (7–)8–10(–11) × (3–)3.5–4(–4.5) μm.
Anamorph: *H. ellipsosporum*, see 23b
Distr.: Eur. Ref.: 169.
B. ellipsosporum Hol.-Jech. 1969

16d. Basidiocarp hypochnoid. Hymenial surface white to cream-coloured. Basal hyphae with thickened walls, 7.7–11 μm wide. Subhymenial hyphae 4.5–6 μm wide. Basidia ovoid to subcylindrical, 13.3–18(–20) × (7–)7.5–9(–10) μm, normally with 6 sterigmata. Spores ellipsoid to fusiform or navicular, (6–)6.5–7.7(–8.7) × 3.3–3.5 μm.
Anamorph: *H. rubiginosum*, see 21a
Distr.: whole area. Ref.: 341.
B. robustius Pouzar & Jech. 1967

16e. Basidiocarp reticulate to hypochnoid. Hymenial surface whitish to cream-coloured. Basal hyphae thick-walled, 6–10.2 μm wide. Subhymenial hyphae 4.5–7(–10) μm wide. Basidia ovoid to subcylindrical, 10–12.2 × 6.5–8.5 μm, with (4–)6–8 sterigmata. Spores fusiform, 8.8–10(–10.5) × 3–3.8(–4) μm.
Anamorph: *H. simile,* see 17a
Distr.: Eur., N. Am. Ref.: 342.
B. simile Pouzar & Hol.-Jech. 1969

16f. Basidiocarp arachnoid to hypochnoid. Hymenial surface whitish to pale buff. Spores narrow, almost allantoid, 8–9 × 2.5–3 μm (109) or subcylindrical to navicular, 9–10.5 × 3–4(–4.5) μm (354). The basidial state is insufficiently known.
Anamorph: *H. curtisii,* see 21b
Distr.: N. Am. Ref.: 109, 354.
B. vagum (Berk. & Curt.) D.P. Rogers 1935

17a. Conidiophores of two types: a) short, branched, thin-walled, more or less hyaline, up to 150(–290) × 7.5–11 μm, with inconspicuous conidiogenous vesicles and conidia in long chains, b) long, simple, thick-walled, pale to dark brown, up to 500(–680) × 4–7.5 μm with pyriform conidiogenous vesicles bearing 1–3 chains of conidia.
Colonies hypochnoid, powdery, yellowish, rusty or dark brown. Basal hyphae hyaline to rusty, 6.5–12 μm wide. Conidia yellowish brown to dark brown, subglobose to ellipsoid, (17.5–)20–25(–30) × (13.7–)15–18.5(–22) μm.
H. simile (Berk.) Hol.-Jech. 1976

17b. Conidiophores of one type 18

18a. Conidiophores with terminal or lateral conidiogenous vesicles, globose, clavate, pyriform or fusiform, usually branched in the (upper) conidiogenous part 19

18b. Conidiophores without conidiogenous vesicles, the conidiogenous part usually unbranched 22

19a. Conidia ellipsoid, lemon-shaped or fusiform. 20

19b. Conidia globose to subglobose. 21

20a. Conidia lemon-shaped to broadly fusiform, yellowish, 20–25.5 × 9–12.5(–14.5) μm. Colonies yellowish, ochraceous or orange-brown.
Colonies hypochnoid to powdery. Basal hyphae 4.5–7 μm wide, subhyaline. Conidiophores hyaline, the upper part yellowish, up to 200 × 7.5–9 μm.
H. aureum (Pers.) Hol.-Jech. 1976

20b. Conidia ellipsoid, hyaline to pale yellow, 14.5–18.5 × 8–10 μm. Colonies cream buff to cinnamon buff.
Colonies cottony to hypochnoid. Basal hyphae 5.5–9 μm wide, hyaline. Conidiophores up to 500 × 5.5–9 μm.
H. capitatum (Link ex Pers.) Link 1824

21a. Conidia dark brown, globose to subglobose, sometimes broadly ellipsoid, 13–17.5 × 10.5–15 μm, the inner wall ornamented with low ridges. Conidiophores much anastomosing, especially in the basal parts.
Colonies cottony to hypochnoid, tawny to rusty brown. Basal hyphae brownish, 6–9 μm wide. Conidiophores pale to dark brown, thick-walled, up to 700 × 6–10(–11.5) μm.
H. rubiginosum (Fr.) Hol.-Jech. 1976

21b. Conidia subhyaline to brownish, globose to subglobose, (9.3–)10–14.5(–15) × (8.5–)10–14.5 μm, the inner wall smooth or minutely ornamented. Conidiophores not or rarely anastomosing.
Colonies hypochnoid to tomentose, ochraceous to tawny or hazel. Basal hyphae hyaline, 5.4–9 μm wide. Conidiophores hyaline to brownish, up to 400 × 6.5–9(–11) μm.
H. curtisii (Berk.) Hol.-Jech. 1976

22a. Conidia yellow to reddish brown, becoming thick-walled except for the thin-walled basal septum, globose to pyriform, (14–)20–28(–31) × (9–)11–18(–21) μm, with striate inner wall.
Colonies cushion-like, later confluent, ochraceous to reddish brown or sienna. Basal hyphae thin- to thick-walled, hyaline to olive or brownish, (4–)7.5–9(–11) μm wide. Conidiophores hyaline, thin-walled, rarely branched, 3–5 μm wide, usually with one conidium per cell, developing right below a septum.
Allescheriella crocea (Mont.) Hughes apud Baker & Dale 1950

22b. Conidia with thin or uniformly thickened walls. Conidiophore with several conidia per cell. 23

23a. Conidia ovoid to ellipsoid, hyaline to yellowish, (12.5–)15–18(–20) × (8–)10–15(–19) μm, with minutely ornamented inner wall.
Colonies hypochnoid to tomentose, whitish, greyish, olivaceous or alutaceous. Basal hyphae 6–9 μm wide. Conidiophores (sub)hyaline, up to 360 × (3.6–)6–10.5 μm.
H. conspersum (Pers.) Hol.-Jech.

23b. Conidia hyaline to pale yellowish, ellipsoid, (17–)20–24(–25) × (9–)11–12.5(–13.7) μm, with minutely verrucose inner wall.
Colonies hypochnoid to cottony, white to yellowish or ochraceous. Basal hyphae hyaline, thick-walled, (6–)6.5–8.7(–11) μm wide. Conidiophores hyaline to yellowish, up to 230 × (7–)8–9(–10) μm.
H. ellipsosporum (Hol.-Jech.) Hol.-Jech. 1976

BOTRYOHYPOCHNUS Donk 1931

Basidiocarp annual, resupinate, hypochnoid. Hymenium not continuous. Hyphal system monomitic. Hyphae hyaline or yellowish with thin or somewhat thickened walls, rather wide, without clamps, branching at right angles. Basidia in candelabrum-like clusters, ovoid to subcylindrical, with 4 sterigmata. Spores hyaline to pale yellow, globose, ovoid, ellipsoid or biapiculate, with thin or thickened walls, ornamented, not amyloid, cyanophilous.

Substrate: saprophytic on bark and wood of angiosperms and gymnosperms.
Type species: *Hypochnus isabellinus* Fr. ex Schleicher 1821
Distribution: in the whole area.
References: 66, 113.

1a. Spores globose, yellowish, with thin or slightly thickened walls, echinulate to aculeate, (5.5–)7–10.5 μm in diam., cylindrical spines 1–3 μm long.
Basidiocarp hypochnoid. Hymenial surface whitish to yellowish, becoming ochraceous to brownish. Basal hyphae subhyaline to yellowish, with thickened walls, 9–12(–14) μm wide. Subhymenial hyphae hyaline, thin-walled, 6–8 μm wide. Basidia ovoid to subcylindrical, 15–22 × 8–10 μm, with 4 sterigmata up to 6 μm long.
Distr.: whole area. Ref.: 66, 113.
B. isabellinus (Fr. ex Schleicher) J. Erikss. 1958
Syn.: *Hypochnus argillaceus* P. Karst. 1881; *Zygodesmus rudis* Ellis 1882; *Z. marginatus* Cooke & Harkness 1884; *Odontia tenerrima* Wettstein 1888; *Tomentella flava* Bref. 1889; *Z. tubercularis* Ellis & Everh. 1891; *T. ochraceo-viridis* Pat. 1893; *Z. tenuissimus* Peck 1894.

1b. Spores ovoid to subpyriform, with thickened to thick walls (up to 2 μm), aculeate, (6.5–)7–8.5 × 6–7 μm, cylindrical or conical spines (2.5–) 3–4 μm long.
Basidiocarp hypochnoid. Hymenial surface farinaceous, greyish yellow. Basal hyphae yellowish, with thickened to thick walls, up to

12 μm wide. Subhymenial hyphae hyaline, thin-walled, 6–12 μm wide. Basidia ovoid to clavate or cylindrical, 25–40 × 9–12 μm, with 4 sterigmata up to 7 μm long.
Distr.: USSR. Ref.: 313.
B. bondarcevii Parm. 1965

BULBILLOMYCES Jülich 1974

Basidiocarp annual, resupinate, effused, adnate, membranaceous, the margin indistinct. Hymenial surface even, greyish to ochraceous. Hyphal system monomitic. Hyphae hyaline, distinct or soon collapsed, more or less thin-walled, with clamps, guttulate. Thick-walled, aseptate and heavily encrusted cystidia (lamprocystidia) present, clamped at the base. Basidia urniform or subur-niform, with 4 sterigmata and a clamp at the base. Spores hyaline, smooth, thin- to somewhat thick-walled, subglobose to ellipsoid, not amyloid.

Substrate: saprophytic on wood and bark of angiosperms, more rarely of gymnosperms.
Type species: *Kneiffia farinosa* Bres. 1903
Anamorph: *Aegerita* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 115, 191.

Monotypic. Basidiocarp effused, at first very thin, later soft-membranaceous. Hymenial surface even, under a lens hispid, light greyish to ochraceous. Hyphae hyaline, thin- to slightly thick-walled (0.3–0.4 μm), easily collapsed, 3–6 μm wide, with clamps. Lamprocystidia thick-walled (2–3 μm), cylindrical to conical, 50–100 × 8–10 μm, projecting up to 60 μm. Basidia 20–32 × 6–8 μm, with (2–)4 sterigmata. Spores hyaline, subglobose to broadly ellipsoid, slightly thick-walled (0.3–0.4 μm), 6–10 × 5–7 μm, with small apiculus.
Distr.: whole area. Ref.: 115, 191, 406.
B. farinosus (Bres.) Jülich 1974
Syn.: *Peniophora aegerita* Höhn. & Litsch. 1907; *P. candida* Lyman 1907
Anamorph: **Aegerita candida** Pers. ex Fr. 1821. Bulbils mostly ochraceous, sometimes pure white but becoming ochraceous in the herbarium, more or less ovoid (0.2 × 0.1 mm), composed of centrifugally arranged branching chains of progressively larger cells, with clamps at all septa and numerous anastomoses; the apical cells broadly clavate and often stalked (15–23 × 10–13 μm), at the apex with slightly thickened walls, otherwise thin-walled; the bulbils as a whole strongly dextrinoid.

BYSSOCORTICIUM Bond. & Sing. ex Sing. 1944

Incl.: *Byssoporia* M.J. Larsen & Zak 1978

Basidiocarp annual, resupinate, effused, thin, usually pellicular. Hymenial

surface even, bluish, greenish or olivaceous. Hyphal system monomitic. Hyphae in the hymenial part thin-walled and hyaline, in the basal part mostly slightly thick-walled and of faint bluish colour; clamps present or lacking, the basal hyphae more often without clamps. Cystidia and gloeocystidia lacking. Basidia hyaline, irregularly cylindrical to slightly clavate, usually with oil drops, clamps at the base present of lacking, 4-spored. Spores pale bluish to greenish, globose, subglobose or broadly ellipsoid, typically slightly thick-walled (0.4 μm), guttulate.

Substrate: saprophytic, occurring on decayed wood or bark of gymnosperms, angiosperms, and on other plant debris.
Type species: *Thelephora atrovirens* Fr. 1828
Distribution: in the whole area.
References: 113, 186.

1a. Hymenial surface even, bluish, greenish or olivaceous. 2
1b. Hymenial surface smooth or poroid, yellowish. 5

2a. Spores thin-walled, hyaline, cylindrical to ellipsoid, 5–7 × 2.5–3.5 μm, with small apiculus.
Basidiocarp greyish blue, thin, pellicular, smooth. Hyphae in the hymenial part hyaline, basally greyish blue, thin-walled, slightly thick-walled (c. 0.4 μm) at the base, without clamps. Basidia cylindrical to narrowly clavate, 14–20 × 4–5 μm, lacking clamps at the base, sterigmata 2–3 × 0.8–1.2 μm.
Distr.: N. Am. Ref.: 128, 188.
B. neomexicanum Gilberts. & Budington 1970
2b. Spores somewhat thick-walled (c. 0.4 μm), faint bluish or greenish, globose or broadly ellipsoid to pyriform. 3

3a. Spores globose to subglobose, 2.5–4(–4.5) μm in diam.
Basidiocarp bluish to greenish, thin, pellicular, smooth. Hyphae in the hymenial part hyaline, thin-walled and rarely with a few clamps, the basal ones bluish, slightly thick-walled and lacking clamps, 2–4 μm wide. Basidia cylindrical to narrowly clavate, 18–28 × 4–5(–5.5) μm, always some of these with clamps at the base, with oildrops, sterigmata c. 3 × 1 μm. Spores bluish with small apiculus, often guttulate..
Common species.
Distr.: whole area. Ref.: 113,186.
B. atrovirens (Fr.) Bond. & Sing. ex Sing. 1944
Syn.: *Sporotrichum aeruginosum* Schw. 1831, non ~ (Pers.) ex Pers. 1822
Note.: A form totally devoid of clamps has been described as *B. efibulatum* Hjortstam & Ryv. 1978 (163).
3b. Spores broadly ellipsoid or pyriform. 4

4a. Spores broadly ellipsoid, 3.5–4.2 × 2.5–3.2 μm, greenish, with distinct apiculus.

Basidiocarp greyish green, thin, pellicular, smooth. Hyphae slightly thick-walled (up to 0.5 μm), greenish, 2.5–3(–4) μm wide, lacking clamps at all septa. Basidia cylindrical to narrowly clavate, 12–15 × 3.5–4.5 μm, sterigmata c. 4–5 × 0.5–1 μm.

Distr.: N. Am. Ref.: 186.

B. californicum Jülich 1973

4b. Spores subglobose to pyriform, 4.5–6 × 4–5 μm, bluish, mostly guttulate.

Basidiocarp bluish or greenish, thin, pellicular, smooth. Hyphae hyaline, basal hyphae slightly bluish, thin- to somewhat thick-walled (up to 0.4 μm), 3–5 μm wide, clamps very rare on the basal hyphae, more abundant on the hymenial hyphae. Basidia irregularly cylindrical to slightly clavate, with oildrops, 26–35 × 6.5–7.5 μm, sterigmata 5–6 × 2 μm.

Distr.: whole area. Ref.: 113, 186.

B. pulchrum (Lundell) M.P. Christ. 1960

5a. Hymenial surface poroid, yellowish.

Basidiocarp up to 3 mm thick, resupinate, very soft and easily separable, 2–3 pores per mm. Hyphae thin-walled, 3–4 μm wide, with few clamps. Basidia narrowly clavate, 15–20 × 5 μm, with oildrops. Spores globose to subglobose, with thickened yellowish walls, guttulate, with small apiculus, 3.5–4.5 μm in diam. Rare species.

Distr.: Eur., N. Am. Ref.: 113, 227.

B. mollicula (Bourd.) Jülich 1975

Syn.: *Poria parksii* Murrill 1921; *P. sartoryi* Bourd. & L. Maire 1921; *P. mycorrhiza* Killerm. 1927; *P. terrestris* Bourd. & Galz. 1928

5b. Hymenial surface even. Cf. *Athelia* under 15.

CANDELABROCHAETE Boidin 1970

Basidiocarp annual, resupinate, effused, hypochnoid to pellicular, with brown projections. Hyphal system monomitic. Hyphae hyaline, with thin to thickened walls, short-celled, without clamps, not cyanophilous, branching at right angles. Cystidia cylindrical, septate, originating from basal parts of the basidiocarp. Basidia in candle-like clusters, cylindrical to subcylindrical, with 4 sterigmata. Spores hyaline, smooth, thin-walled, ellipsoid to subcylindrical, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Candelabrochaete africana* Boidin 1970
Distribution: North America.
References: 19.

Only one species in the area. Basidiocarp hypochnoid to minutely reticulate, brown-setulose. Hymenial surface whitish to cream-coloured Basal hyphae with thickened walls, up to 10–19 μm wide. Subhymenial hyphae thin-walled, (3.5–)6–8 μm wide. Cystidia cylindrical, 100–160 × 9–11 μm, septate, encrusted with orange-brown granular material, projecting. Basidia subcylindrical, 11–15 × 6–7 μm, with 4 sterigmata up to 6 μm long. Spores hyaline, subcylindrical, sometimes slightly curved, (5.5–)6–8 × 3–4.5(–5) μm. On angiosperms.
Distr.: N. Am. Ref.: 19, 354.
C. langloisii (Pat.) Boidin 1970

CEJPOMYCES Svrček & Pouzar 1970

Basidiocarp annual, resupinate, effused, hypochnoid to fleshy. Hymenial surface discontinuous to continuous, even, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin- to somewhat thick-walled, rather wide, without clamps, branching at right angles, dextrinoid, cyanophilous. Basidia in clusters, short cylindrical to subclavate, with 4 long sterigmata. Spores hyaline, thin-walled, smooth, narrowly ovoid to navicular, cyanophilous, not amyloid, sometimes slightly dextrinoid, occasionally becoming septate after detachment.

Substrate: saprophytic on soil, detritus and strongly decayed wood.
Type species: *Corticium terrigenum* Bres. 1903
Distribution: Europe.
References: 113, 378.

Monotypic. Basidiocarp at first hypochnoid, later almost fleshy, up to 160 μm thick. Hymenial surface even, pale ochraceous. Margin indistinct. Basal hyphae hyaline, with slightly thickened walls, 8–10.5 μm wide, without clamps; subhymenial hyphae thin-walled, 8–10 μm wide. Basidia in clusters, short cylindrical to subclavate, 12.5–35 × 7–12.5 μm, with (2–)4(–6) sterigmata 10–23(–29) μm long. Spores usually navicular, sometimes narrowly ovoid, 12–17.2(–21) × (5.5–)6–7.7(–8.3) μm.
Distr.: Eur. Ref.: 113, 378.
C. terrigenus (Bres.) Svrček & Pouzar 1970

CERACEOMYCES Jülich 1975

Basidiocarp annual, resupinate, effused, ceraceous-membranaceous, adnate, hyphal strands present or absent. Hymenial surface even or merulioid, mostly yellowish or ochraceous, in two species slightly violaceous. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, with clamps. Cystidia lacking in most species, thin-walled. Basidia narrowly clavate, mostly four-spored. Spores hyaline, smooth, thin- to slightly thick-walled, subglobose to ellipsoid or cylindrical, not amyloid.

Substrate: saprophytic on decayed wood or herbaceous plants.
Type species: *Corticium tessulatum* Cooke 1878
Distribution: in the whole area.
References: 113, 186.

1a. Basidiocarp, especially the cinnamon-brown encrusted basal hyphae, becoming violaceous in KOH. Spores ellipsoid, 5–6 × 3–3.5 μm. 2
1b. Basidiocarp without cinnamon-brown encrusted basal hyphae, not staining in KOH. Spores different. 3

2a. Cystidia lacking.
Basidiocarp membranaceous. Hymenial surface even, whitish to cream-coloured with a violaceous tinge. Hyphae hyaline in KOH, slightly thick-walled, 5–10 μm wide, with clamps. Basidia 20–36 × 5–6.5 μm. Spores thin-walled.
Distr.: whole area. Ref.: 113, 186.
C. violascens (Fr. ex Fr.) Jülich 1972
2b. Cystidia present, thin-walled, apically loosely covered with crystals, 30–50 × 5–6 μm, up to 30 μm projecting
Other characters as in *C. violascens*.
Distr.: Eur. Ref.: 113, 186.
C. cystidiatus (J. Erikss. & Hjortstam apud Jülich) Hjortstam 1973

3a. Spores small, subglobose to broadly ellipsoid, c. 3 μm in diam. or 2.8–3.5 × 2–2.5 μm.
Basidiocarp membranaceous. Hymenial surface cream-coloured. Hyphae hyaline, rather thin-walled, 3–4 μm wide, with clamps at most septa. Few hyphoid cystidia may be present.
Basidia 20–28 × 4–5 μm.
Distr.: whole area. Ref.: 113, 186.
C. sublaevis (Bres.) Jülich 1972
Note: This species is easily confused with *Trechispora cohaerens* which, however, has much shorter basidia.
3b. Spores longer, more or less cylindrical, ellipsoid or pyriform. 4

4a. Spores cylindrical to ellipsoid, about 3.5–5 × 1.5–3 μm. 5
4b. Spores 6–8(–10) μm long. 7

5a. Hymenial surface even, bright yellow.
Basidiocarp slightly ceraceous. Hyphae hyaline, thin- to slightly thick-walled, 2–8 μm wide, with clamps. Leptocystidia cylindrical, thin-walled, 60–90 × 7–10 μm, the upper part encrusted. Basidia 30–35 × 5–6 μm. Spores ellipsoid, 4.5–5.5 × 2.5–3 μm.
Distr.: whole area. Ref.: 111.
C. sulphurinus (P. Karst.) J. Erikss. & Ryv. 1978
5b. Hymenial surface merulioid. 6

6a. Hymenial surface yellowish to yellowish-brownish.

Basidiocarp effused to effused-reflexed, slightly ceraceous. Hyphae hyaline, thin-walled, 2–5 μm wide, with clamps. Basidia 14–20 × 4–6 μm. Spores cylindrical to narrowly ellipsoid, 3.5–4.5(–5) × 1.5–2(–2.5) μm.

Distr.: whole area. Ref.: 142.

Merulius aureus Fr. 1828

Syn.: *Xylomyzon croceum* Pers. 1825, *X. solare* Pers. 1825.

6b. Hymenial surface ochraceous to pale brownish.

Basidiocarp effused, membranaceous. Hyphae hyaline, thin-walled, 2–4.5(–6.5) μm wide, inflated at some septa, with clamps. Basidia 16–33 × 3.5–5 μm. Spores cylindrical to ellipsoid, 3.5–5 × 1.5–3 μm.

Distr.: whole area. Ref.: 113, 142.

C. serpens (Fr.) Ginns 1976

Syn.: *Merulius crispatus* Fr. 1821; *M. porinoides* Fr. 1821; *Xylomyzon crustosum* Pers. 1825; *M. ceracellus* Berk. & Curt. 1872; *Polyporus collabefactus* Berk. & Br. 1875; *M. farlowii* Burt 1917; *M. stratosus* Pilát 1936.

7a. Spores cylindrical to narrowly ovoid (the basal part of the spores somewhat broadened), 6–8 × 1.8–2 μm.

Basidiocarp at first pellicular and smooth, becoming ceraceous to membranaceous. Hymenial surface merulioid (at least in fresh condition), cream-coloured. Hyphal strands often present. Hyphae thin- to slightly thick-walled, the basal ones 4–7 μm wide, the subhymenial hyphae more narrow (2–3 μm wide), always with clamps. Basidia narrowly clavate, 16–22 × 4–5 μm. Spores thin-walled.

Distr.: Eur., USSR. Ref.: 113, 142.

C. borealis (Romell) J. Erikss. & Ryv. 1973

7b. Spores pyriform to broadly ellipsoid, 6–8(–10) × 3–4(–5) μm.

Basidiocarp ceraceous to membranaceous, with white subiculum and more or less white hyphal strands. Hymenial surface cream-coloured. Hyphae slightly thick-walled (c. 0.3–0.5 μm, in the hyphal strands up to 1.0 μm), 5–8 μm wide (in the hyphal strands up to 14 μm), nearly always with large and distinct clamps, only some septa of the large hyphae of the hyphal strands lacking clamps. Basidia cylindrical to slightly clavate, 26–36 × 5–7 μm. Spores thin-walled, with distinct apiculus.

Distr.: whole area. Ref.: 113, 186.

C. tessulatus (Cooke) Jülich 1972

Syn.: *Corticium apiculatum* Bres. 1925; *Corticium dovrense* Jørstad & Pilát 1936; *Corticium illaqueatum* Bourd. & Galz. 1911; *Corticium rhizophorum* Bourd. & Galz. 1911

CERATOBASIDIUM D.P. Rogers 1935

Syn.: *?Koleroga* Donk 1958

Basidiocarp annual, resupinate, effused, reticulate-pruinose, pellicular, ceraceous to subgelatinous. Hymenial surface discontinuous to continuous, even. Hyphal system monomitic. Hyphae hyaline, with thin to thickened walls, branching at right angles, without clamps. Hyphal walls sometimes layered. Sterile hymenial structures absent. Basidia terminal, single or in small clusters, typically subglobose to pyriform, abruptly narrowed at the base, about 2–3 times as wide as the supporting hyphae, with 2–4(–6) sterigmata. Spores hyaline, thin-walled, smooth, subglobose to cylindrical, repetitive, not amyloid, not cyanophilous. Sclerotia sometimes present. Hyphal cells binucleate.

Substrate: saprophytic on rotten wood, soil, organic debris or parasitic on angiosperms, gymnosperms or mosses.
Type species: *Ceratobasidium calosporum* D.P. Rogers 1935
Anamorph: *Rhizoctonia* DC. ex Fr. p.p.
Distribution: in the whole area.
References: 113, 353, 384.

1a. Parasitic on angiosperms, gymnosperms or mosses, forming web-blights. Sclerotia present or absent. 2

Note: This group of species, which may be regarded a separate genus (*Koleroga* Donk 1958), is insufficiently known, especially the (sub)tropical forms. Therefore only species from temperate regions are treated here.

1b. Saprophytic on rotten wood, soil or organic litter. Sclerotia absent. 4

2a. Basidia 15–20 × 8–10 μm, with 2(–3) sterigmata 12–18 μm long. On mosses.

Basidiocarp ceraceous. Hymenial surface even, whitish. Hyphae with thin to somewhat thickened walls, c. 5 μm wide. Spores narrowly ovoid to narrowly ellipsoid or subcylindrical, 13–16 × 6–8 μm.
Distr.: Eur. Ref.: 113.
C. bicorne J. Erikss. & Ryv. 1973

2b. Basidia typically with 4 or 5 sterigmata. On vascular plants. 3

3a. Sclerotia present. Spores ellipsoid to subcylindrical, 9–13 × 4.5–7.5 μm.

Basidiocarp pruinose to pellicular, very thin. Hymenial surface discontinuous or continuous, whitish or greyish. Hyphae thin-walled, 3.5–5.5 μm wide. Basidia subglobose to short cylindrical, sometimes pleurobasidious, 10–18 × 8–12 μm. Sclerotia at first whitish, brown when mature, deciduous.
Distr.: whole area. Ref.: 172, 284, 384.
C. anceps (Bres. & Sydow apud Sydow) H.S. Jacks. 1949

3b. Sclerotia absent. Spores ovoid, 5.2–10.5 × 3.5–7 μm.

Basidiocarp powdery or arachnoid. Hymenial surface discontinuous, whitish. Hyphae hyaline to slightly coloured, with thin to somewhat thickened walls, 5.2–7.8 μm wide. Basidia ovoid, 8–15.6 × 5.2–10.8 μm, with 4–5 sterigmata up to 15 μm long.

Distr.: N.Am. Ref.: 385.
C. ramicola Tu, Roberts & Kimbrough 1969

4a. Spores at least 2.5 times as long as wide, at least 8 μm long. 5
4b. Spores up to twice as long as wide, or not reaching 8 μm in length. 6

5a. Spores filiform-cylindrical, arcuate or subsigmoid, widest in the middle, 23–36 × 3–3.6 μm.
Basidiocarp pruinose to ceraceous, hardly visible when dry. Hymenial surface even, greyish. Hyphae hyaline, thin-walled, 3–4.5 μm wide. Basidia globose, 10.5–12(–14) × 9.5–11 μm, with 2–3(–4) sterigmata up to 18 μm long.
Distr.: N. Am. Ref.: 284, 353.
C. calosporum D.P. Rogers 1935
5b. Spores cylindrical, 8–12 × 3–4 μm.
Basidiocarp ceraceous, hardly visible when dry. Hymenial surface even, greyish. Hyphae hyaline, with thin to somewhat thickened walls, 4.5–7 μm wide. Basidia globose to ovoid, 14–16 × 8–10 μm, with 4 sterigmata up to 10 μm long.
Distr.: Eur. Ref.: 65, 113.
C. pseudocornigerum M.P. Christ. 1959

6a. Spores 13–16 μm long. Basidia with 2(–3) sterigmata. *C. bicorne*, see 2a.
6b. Spores up to 12 μm long. Basidia with (2–)4 sterigmata. 7

7a. Spores subglobose to broadly ellipsoid, less than 1.5 times as long as wide, 7.5–9.6 × 5–7 μm. Sterigmata up to 18(–20) μm long.
Basidiocarp ceraceous to gelatinous when fresh, hardly visible when dry. Hymenial surface even, greyish. Hyphae hyaline, with thin to thickened walls, 4.5–9 μm wide, sometimes inflated and up to 14 μm wide. Basidia 19–24 × 9–11 μm, with 4 sterigmata.
Distr.: N. Am. Ref.: 284, 353.
C. obscurum D.P. Rogers 1935
7b. Spores ellipsoid to subcylindrical, 1.5–2 times as long as wide. Sterigmata up to 12(–14) μm long. 8

8a. Spores ellipsoid to subcylindrical, 6–7.5 × 3–3.5 μm.
Basidiocarp very thin, almost invisible when dry. Hymenial surface even, whitish to greyish. Hyphae hyaline to yellowish, with thin to thickened walls, 3–4.5 μm wide, cyanophilous. Basidia subglobose to pyriform, 8–10 × 6–8 μm, with 4 sterigmata.
Distr.: Eur. Ref.: 113.
C. stridii J. Erikss. & Ryv. 1973
8b. Spores narrowly ellipsoid to subcylindrical, 6.5–11.5 × 3.5–6 μm.
Basidiocarp pruinose to ceraceous, almost invisible when dry. Hymenial surface even, yellowish or grey when fresh, greyish when dry. Hyphae hyaline to slightly coloured, with thin to somewhat thickened walls, (3–)4–7(–7.5) μm wide. Basidia subglobose to

ovoid, 11–16 × 6.5–10(–11) μm, with 4 sterigmata up to 12(–14) μm long.
Distr.: whole area. Ref.: 65, 113, 284, 353.
C. cornigerum (Bourd.) D.P. Rogers 1935

CERINOMYCES G.W. Martin 1949

Basidiocarp annual, resupinate, ceraceous when fresh, brittle when dry. Hymenial surface even to grandinioid, whitish or chrome to orange. Hyphal system monomitic. Hyphae hyaline, with thin to thickened walls, with clamps. Basidia cylindrical, forked, single, with 2(–3) long and broad sterigmata. Spores cylindrical to allantoid, hyaline, smooth, not septate (with one exception), not amyloid.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms.
Type species: *Cerinomyces pallidus* G.W. Martin 1949
Distribution: in the whole area.
References: 113, 284.

1a. Spores 6–12 × 2.5–4.5 μm. 2
1b. Spores 11–16 × 4.5–6 μm. 3

2a. Spores (6–)7–8(–9) × (3–)4–4.5 μm, cylindrical to allantoid. Basidia cylindrical, 11–13 × 3–4 μm, with 2 sterigmata up to 10 μm long. On angiosperms.
Basidiocarp ceraceous to arid-fleshy, effused. Hymenial surface whitish to buff or tawny olive, even to warted or odontioid. Hyphae hyaline, 2.5–4 μm wide.
Distr.: N. Am. Ref.: 283, 284.
C. pallidus G.W. Martin 1949

2b. Spores allantoid, 7–12 × 2.5–4 μm. Basidia cylindrical, 20–25 × 5–6 μm, with 2(–3) sterigmata up to 15 μm long. On gymnosperms.
Basidiocarp ceraceous, effused. Hymenial surface even, whitish to pale ochraceous. Hyphae hyaline, with thin to somewhat thickened walls, 2.5–4 μm wide.
Distr.: Eur., N. Am. Ref.: 113.
C. crustulinus (Bourd. & Galz.) G.W. Martin 1949

3a. Basidiocarp ceraceous, effused, up to 200 μm thick. Hymenial surface even, chrome to light orange. Spores never septate.
Hyphae hyaline, basally loose, not parallel to the substrate, 2–3.5 μm wide. Basidia 20–35 × 4–5.5 μm, with 2 sterigmata up to 25(–30) μm long. Spores cylindrical, often curved, 11–14(–15) × 4.5–5.5(–6) μm. On gymnosperms.
Distr.: N. Am., USSR. Ref.: 284, 311.
C. canadensis (H.S. Jacks. & G.W. Martin) G.W. Martin 1949

3b. Basidiocarp ceraceous, orbicular to cupulate, 350–700 μm thick. Hymenial surface even, whitish. Spores partly 1-septate.

Hyphae thin-walled, hyaline, basally parallel to the substrate, conglutinate, 1.5–3.5(–4.5) μm wide. Basidia 25–45 × 3.5–5 μm, with 2 sterigmata up to 25 μm long. Spores subhyaline, cylindrical, curved, 12–15(–16) × 4.5–5.5(–6) μm. On gymnosperms.
Distr.: USSR. Ref.: 311.
C. altaicus Parm. 1961.

CEROCORTICIUM P. Henn. apud O. Warburg 1899

Syn.: *Radulomyces* M.P. Christ. 1960; *Globulicium* Hjortstam 1973; *Flavophlebia* (Parm.) K.-H. Larsson & Hjortstam 1977; *Uncobasidium* Hjortstam & Ryv. 1978

Basidiocarp annual, resupinate, effused or slightly effused-reflexed, adnate, membranaceous or with somewhat ceraceous hymenial layer. Hymenial surface even or odontioid to hydnoid. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, with clamps. Hyphidia typically present, hyaline, mostly unbranched, flexuous-cylindrical. Cystidia rarely present, hyaline, thin-walled, cylindrical. Basidia typically stalked-clavate, sometimes pleurobasidioid, with 4 sterigmata, contents homogeneous or guttulate. Spores hyaline, rather thin-walled, smooth, globose, ellipsoid or cylindrical, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Cerocorticium bogoriense* P. Henn. 1899
Distribution: in the whole area.
References: 66, 191.

1a. Cystidia present, hyaline, thin-walled, cylindrical, 40–110 × 5.5–8 μm, originating in the subiculum.
Basidiocarp effused, membranaceous or slightly ceraceous. Hymenial surface even, yellowish to cream-coloured or ochraceous. Hyphae thin-walled, 1.5–3 μm wide, with clamps. Hyphidia simple or rarely branched, 2.5–3.5 μm wide. Basidia stalked-clavate, 25–40 × 7–8 μm. Spores subglobose to broadly ellipsoid, 5–8 × 5–6 μm.
Distr.: whole area. Ref.: 161.
C. sulfureo-isabellinum (Litsch. apud Pilát) comb. nov.
Bas.: *Corticium sulfureo-isabellinum* Litsch. apud Pilát. in Acta Mus. nat. Prag. 2B: 43. 1940

1b. Cystidia absent. 2

2a. Hymenial surface merulioid or odontioid to hydnoid. 3
2b. Hymenial surface even or slightly warted. 4

3a. Hymenial surface merulioid, pale orange brown to orange yellow.
Basidiocarp effused, membranaceous to ceraceous. Hyphae thin-walled, 2–3.5 μm wide, with clamps. Basidia stalked-clavate, 35–65 × 8–10 μm. Spores ellipsoid, 7.5–10 × 5.5–7 μm.

Distr.: N. Am. Ref.: 142.

C. fuscum (Lloyd) comb. nov.

Bas.: *Merulius fuscus* Lloyd in Mycol. Writ. 7: 1348. 1925

3b. Hymenial surface odontioid to hydnoid, cream-coloured to ochraceous. Basidiocarp effused, membranaceous. Teeth 1–2 mm long. Hyphae thin- to slightly thick-walled, 1.5–4 μm wide, with clamps. Basidia stalked-clavate, 35–46 × 6–8 μm. Spores ellipsoid to subcylindrical, 9–11 × 5.5–7 μm.

Distr.: Eur. Ref.: 66.

C. molare (Chaill. ex Fr.) comb. nov.

Bas.: *Radulum molare* Chaill. ex Fr. in Elench. 1: 151. 1828

Syn.: *Sistotrema rude* Pers. 1825

4a. Spores narrowly ellipsoid to cylindrical, length : width ≥ 2. 5

4b. Spores globose to ellipsoid, length : width ≤ 1.6. 7

5a. Spores narrowly ellipsoid to cylindrical, 15–18 × 5.9–7 μm. Hymenial surface even to warted, yellowish-orange.

Basidiocarp effused, ceraceous. Hyphae hyaline, thin- to slightly thick-walled, 2–4 μm wide, with clamps. Hyphidia 2–3 μm wide. Basidia clavate to stalked-clavate, 40–70 × 7–9 μm.

Distr.: N. Am. Ref.: 193.

C. molle (Berk. & Curt.) Jülich 1975

Syn.: *Corticium armeniacum* Sacc. 1888; *Cerocorticium bogoriense* P. Henn. apud O. Warburg 1899; *Ce. tjibodense* P. Henn. apud O. Warburg 1899

5b. Spores up to 15 μm long, on average shorter. Hymenial surface even. 6

6a. Spores cylindrical, often slightly curved, 9–12 × 4.3–5(–5.5) μm.

Basidiocarp effused, membranaceous to ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 1.5–3.5 μm wide, with clamps. Hyphidia 40–60 × 2.5–3.5 μm wide. Basidia clavate, 30–45 × 6.5–8(–10) μm.

Distr.: USSR. Ref.: 318.

C. submolare (Parm.) comb. nov.

Bas.: *Radulomyces submolaris* Parm. in Consp. Syst. Cort., p. 224. 1968.

6b. Spores narrowly ellipsoid to cylindrical, 10–15 × 5.5–6.5(–7) μm.

Basidiocarp effused, membranaceous to ceraceous. Hymenial surface even, pinkish red when fresh, cream-coloured when dry. Hyphae hyaline, thin-walled, 2.5–4(–5) μm wide, with clamps. Hyphidia up to 5 μm wide. Basidia clavate, 40–55 × 6.5–8(–9) μm.

Distr.: USSR. Ref.: 318.

C. roseolum (Parm.) comb. nov.

Bas.: *Radulomyces roseolus* Parm. in Consp. Syst. Cort., p. 222. 1968.

7a. Spores globose to subglobose, rarely broadly ellipsoid, 10–13 μm in diam. or 10–13 × 8–12 μm.

Basidiocarp effused, membranaceous to slightly ceraceous. Hymenial surface even, cream-coloured. Hyphae 1.5–3 μm wide, thin- to slightly thick-walled, with clamps. Hyphidia 2–3.5 μm wide. Basidia stalked-clavate, 50–75 × 10–16 μm. On gymnosperms.

Distr.: whole area. Ref.: 66, 114.

C. hiemale (Laurila) comb. nov.

Bas.: *Corticium hiemale* Laurila in Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo 10(4): 4. 1939.

Syn.: *Corticium obsoletum* Litsch. 1941; *Corticium probatum* H.S. Jacks. 1948

7b. Spores broadly ellipsoid to ellipsoid, rarely subglobose, up to 8.5 μm broad. 8

8a. Spores ellipsoid, 8–9 × 5–6 μm.

Basidiocarp effused, membranaceous. Hymenial surface even, cream-coloured to distinctly yellow. Hyphae (1.5–)2–4 μm wide, thin- to slightly thick-walled, with clamps. Hyphidia 1.5–2.5 μm wide, sometimes rare. Basidia stalked-clavate, 30–65 × 6.5–8 μm. On gymnosperms, rarely on angiosperms.

Distr.: Eur., N. Am. Ref.: 171.

C. notabile (H.S. Jacks.) comb. nov.

Bas.: *Corticium notabile* H.S. Jacks. in Can. J. Res. C, 26: 156. 1948.

Note: *Uncobasidium luteolum* Hjortstam & Ryv. 1978 is very close or perhaps identical.

8b. Spores broadly ellipsoid, 6–8.5 μm broad. 9

9a. Basidiocarp effused, 1–5 mm thick, crustaceous.

Hymenial surface even, greyish. Hyphae hyaline to somewhat brownish, 2–4 μm wide, with clamps. Basidia clavate, 40–60 × 6–9 μm. Spores broadly ellipsoid, 8–11 × 6–8.5 μm.

Distr.: Eur. Ref.: 12.

C. lusitanicum (Torrend) comb. nov.

Bas.: *Stereum repandum var. lusitanicum* Torrend in Broteria (Bot.) *11*: 76.1913; non *Stereum repandum* Fr. 1828.

9b. Basidiocarp effused, up to 1 mm thick, membranaceous to ceraceous.

Hymenial surface even to warted, greyish when fresh, cream-coloured to ochraceous when dry. Hyphae hyaline, thin- to slightly thick-walled, 2–4(–5) μm wide, with clamps. Hyphidia 1.5–3 μm wide. Basidia stalked-clavate, 30–75 × 7–11 μm. Spores broadly ellipsoid, 7–11 × 6–8.5 μm.

Distr.: whole area. Ref.: 66.

C. confluens (Fr. ex Fr.) comb. nov.

Bas.: *Thelephora confluens* Fr. ex Fr. in Syst. Mycol. 1: 447. 1821

Syn.: *Coniophora avellanea* Burt 1917; *Corticium rubellum* Burt 1926

Note: *Corticium rickii* Bres. apud Rick 1898 with subglobose spores (7–9 × 6–8 μm) is very similar or perhaps identical.

CHAETODERMA Parm. 1968

Basidiocarp perennial, resupinate, small-pulvinate, rather thick, mostly separated, sometimes confluent, with abrupt margin. Hymenial surface slightly rimose, pale coloured. Hyphal system monomitic. Hyphae hyaline, slightly thick-walled, with clamps. Cystidia of tramal origin, hyaline, cylindrical, thick-walled. Basidia hyaline, narrowly clavate, 4-spored, c. 100 μm long. Spores hyaline, cylindrical, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood.
Type species: *Peniophora luna* Romell ex D.P. Rogers & H.S. Jacks. 1943
Distribution: in the whole area.
References: 113, 318.

Monotypic. Basidiocarp pulvinate, 0.5–2 mm thick, mostly 1–2 cm in diam., sometimes larger. Hymenial surface somewhat rimose, under a lens finely fibrillose, whitish, pale greyish to pale ochraceous. Hyphae thin- to slightly thick-walled, the surface smooth or somewhat encrusted, 2–4 μm wide, with clamps, mostly vertically arranged, forming a dense context. Cystidia up to 300 × 9 μm, projecting 15–50 μm, smooth, slightly encrusted or apically with some crystals. Basidia narrowly clavate, 70–100 × 5–7 μm, smooth or slightly encrusted, with 4 sterigmata 6–8 μm long. Spores fusiform, somewhat curved, smooth, 12–16 × 4–6 μm. On wood of gymnosperms.
Distr.: whole area. Ref.: 113, 288, 406.
Chaetoderma luna (Romell ex D.P. Rogers & H.S. Jacks.) Parm. 1968

CHONDROSTEREUM Pouzar 1959

Basidiocarp annual or perennial, resupinate or effused-reflexed, soft-coriaceous when fresh, horny when dry. Abhymenial surface tomentose-villose, becoming glabrous. Hymenial layer ceraceous, hymenial surface even to somewhat merulioid, with purplish tinge. Hyphal system monomitic. Hyphae hyaline to brown, thin- to somewhat thick-walled, often somewhat gelatinous, with clamps. Thin-walled pyriform to subglobose vesicles present. Leptocystidia may be present. Basidia in clusters, cylindrical, with 4 sterigmata. Spores hyaline, ellipsoid to cylindrical, smooth, thin-walled, not amyloid.

Substrate: saprophytic or parasitic on wood of angiosperms, rarely on gymnosperms.
Type species: *Thelephora purpureum* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 113, 182.

Monotypic. Basidiocarp up to 1 mm thick. Abhymenial surface light buff to brownish, often becoming concentrically zoned with blackish lines. Hymenial surface even to slightly merulioid, at first light buff, later brownish with purplish, lilaceous or violaceous tinges which may become dominant. Margin paler. Hyphae hyaline to brownish, 3–6 μm wide, abhymenial ones often with thickened walls. Subhymenium and subiculum with hyaline to brownish, thin-walled vesicles, subglobose to pyriform, 13–30 × 10–15(–22) μm. Leptocystidia when present cylindrical to fusiform, 3–7.5 μm wide, projecting up to 30 μm. Basidia cylindrical, 25–50 × 4–6 μm. Spores ellipsoid to cylindrical, 5–8(–10) × (2–)3–4 μm.

Distr.: whole area. Ref.: 113, 182, 234.

C. purpureum (Pers. ex Fr.) Pouzar 1959

Syn.: *Stereum vorticosum* Fr. ex Fr. 1838; *S. micheneri* Berk. & Curt. apud Berk. 1873 sensu Massee 1890; *Corticium nyssae* Berk. & Curt. apud Berk. 1873; *S. rugosiusculum* Berk. & Curt. apud Berk. 1873; *C. siparium* Berk. & Curt. apud Berk. 1873

CHRISTIANSENIA Hauerslev 1969

Basidiocarp annual, resupinate, undulate or subcerebriform (or growing on cerebriform galls formed by the host), gelatinous when fresh, subinvisible when dry. Hymenial surface white to pallid or pale salmon. Hyphal system monomitic. Hyphae hyaline, thin-walled, with or without clamps. Basidia bladder-shaped when young, nearly cylindrical when mature, sometimes constricted, with 2–6 sterigmata. Spores hyaline, thin-walled, not amyloid, sometimes forming globose sprout-cells. Blastoconidia present, in some species formed at both sides of a septum and fusing to form one zygoconidium. Arthroconidia sometimes present.

Substrate: parasitic on Basidiomycetes or saprophytic on wood.
Type species: *Christiansenia pallida* Hauerslev 1969
Anamorph: *Syzygospora* G.W. Martin 1937
Distribution: Europe, North America.
References: 20, 145, 202, 281.

1a. Parasitic on Aphyllophorales (*Leucogyrophana, Phanerochaete*). Zygoconidia usually present. 2

1b. Parasitic on Agaricales (*Collybia*). Zygoconidia absent. 3

2a. Basidia with (4–)6 sterigmata. Zygoconidia cylindrical, often slightly curved, 6–11 × 2.8–4.5 μm.

Basidiocarp effused, gelatinous, somewhat granulose, up to 300 μm thick. Hymenial surface even, whitish. Hyphae 2–5 μm wide. Basidia 35–140 × 5.5–14 μm. Spores subglobose to ovoid, 7.5–11 × 5–9 μm. Conidiophores cylindrical to clavate, 10–20 × 2.5–5 μm, each septum with 1–2 conidia. Parasitic on *Phanerochaete sordida*.

Distr.: Eur. Ref.: 20, 113.

C. pallida Hauerslev 1969

2b. Basidia with (2–)4 sterigmata. Conidia ellipsoid, 5–7 × 2–3 μm.

Basidiocarp effused. Hymenial surface even to slightly warted, pale salmon. Hyphae 1.5–2 μm wide. Basidia 18–40 × 4.5–7 μm, sterigmata up to 10 μm long. Spores subglobose, 6.5–8 × 4.5–6.2 μm, forming globose sprout-cells, 1.5–2 μm in diam. Parasitic on *Leucogyrophana mollis*.

Distr.: Eur. Ref.: 113.

C. mycophaga (M.P. Christ.) Boidin 1969

Note: The species is imperfectly known.

3a. Spores ellipsoid to ovoid or lacrimoid, 6–8(–9) × 3–4 μm. Basidia clavate, 40–70 × (6–)8–13 μm, sterigmata up to 8 μm long, lacking refractive material in the tip.

Basidiocarp on the surface of cerebriform galls. Hymenial surface pallid to hyaline. Hyphae 2–4 μm wide, with clamps. Blastoconidia subglobose to broadly ellipsoid, 2–3.5 × 1.5–2 μm, originating apically or laterally on the conidiophores, often with a basal clamp. Arthroconidia rare, up to 13 × 2 μm.

Distr.: Eur. Ref.: 145.

C. tumefaciens Ginns & Sunhede 1978

Note: Although Ginns and Sunhede (145) call the conidiophores simple-septate, they draw a conidiophore with four clamp connections and not one septum without a clamp.

3b. Spores narrowly ellipsoid to cylindrical, (5.5–)6–8(–10) × 1.5–2.5 μm. Basidia narrowly clavate to cylindrical, sterigmata up to 7 μm long with refractive material in the tip. 4

4a. Clamps present at all septa, except those of the conidiophores. Basidia (40–)50–80 × 6–8 μm, with (3–)4 sterigmata.

Hyphae 2–3 μm wide. Blastoconidia subglobose to broadly ellipsoid, 2–4 × 1.5–2.5 μm, originating terminally and laterally on the conidiophores. Arthroconidia 7–13 × 2 μm.

Distr.: Eur., N.-Am. Ref.: 145.

C. mycetophila (Peck) Ginns & Sunhede 1978

4b. Clamps absent. Basidia (25–)35–55 × 5–7 μm, with 2(–3) sterigmata.

Hyphae 2–4 μm wide. Blastoconidia subglobose to broadly ellipsoid, 2–3.5 × 1.5–2 μm, originating terminally and laterally on the conidiophores. Arthroconidia up to 13 × 2 μm, originating by fragmentation of the conidiophore.

Distr.: Eur. Ref.: 145.

C. efibulata Ginns & Sunhede 1978

Note: Caryological studies are needed to prove that *C. efibulata* is not only the haploid phase of *C. mycetophila*

CLAVULICIUM Boidin 1957

Basidiocarp annual, resupinate, effused, membranaceous to somewhat ceraceous. Hymenial surface even, whitish to ochraceous. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Gloeocystidia present. Basidia clavate, guttulate, 2-spored. Spores hyaline, broadly ellipsoid, thin-walled, smooth, guttulate, not amyloid.

Substrate: saprophytic on decayed wood of gymnosperms.
Type species: *Corticium pilatii* Boidin 1954
Distribution: in the whole area.
References: 5.

Monotypic. Basidiocarp at first adnate, later often loosening at the margin, up to 300 μm thick. Margin at first white, fibrillose. Hymenial surface even, greyish to ochraceous. Hyphae hyaline, 2–4 μm wide, with clamps. Gloeocystidia flexuous-cylindrical, thin-walled, 80–120 × 3.5–5 μm. Basidia 35–50 × 6.8–8 μm, with (1–)2(–4) sterigmata, a basal clamp present. Spores hyaline, broadly ellipsoid, 9–13 × 6.5–8 μm, guttulate.
Distr.: whole area. Ref.: 4, 113.
C. macounii (Burt) J. Erikss. & Boidin ex Parm. 1968
Syn.: *Corticium pilatii* Boidin 1954

COLUMNOCYSTIS Pouzar 1959

Basidiocarp annual or perennial, resupinate or effused-reflexed, coriaceous. Hymenial surface even, with brownish, violaceous or greyish tinges, usually with a white pruinose bloom. Abhymenial surface typically with dark tomentum. Hyphal system dimitic. Skeletal hyphae brown, generative hyphae hyaline, with or without clamps. Cystidia cylindrical to clavate, of two types: a) very thick-walled, typically slightly pigmented, with encrustations, typically projecting, originating from skeletal hyphae; b) thick-walled (1–2 μm), strongly pigmented, smooth, embedded, originating from hymenium or trama. Basidia subclavate to cylindrical, hyaline to brownish, with thin to thickened walls. Spores hyaline to yellowish, thin- to slightly thick-walled, smooth, cylindrical, not amyloid.

Substrate: saprophytic on wood of gymnosperms, mainly Picea.
Type species: *Thelephora abietina* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 12, 113, 182, 337.

1a. Clamps present at nearly all septa. Hymenial surface violaceous, greyish or brownish. Spores cylindrical, 8.5–13 × 4–5 μm.
Basidiocarp resupinate or usually effused-reflexed, up to 2.5 mm thick. Abhymenial layer matted tomentose, dark red brown to fuscous, later often zoned with black lines; margin light brown.

Skeletal hyphae dark brown, 2.5–5(–6.5) μm wide, generative hyphae hyaline, 2–3.5 μm wide. Cystidia either a) very thick-walled (up to 5 μm), apically almost hyaline, 150–260 × 8–17 μm, delicately encrusted (incrustion dissolving in lactic acid and Melzer's), typically projecting, or b) thick-walled (up to 2 μm), strongly pigmented, often with several simple septa, smooth, 50–100 × 3–6 μm. Basidia subclavate to cylindrical, 50–100 × 5–7 μm.

Distr.: whole area. Ref.: 113, 182, 234.

C. abietina (Pers. ex Fr.) Pouzar 1959

Syn.: *Thelephora crispa* Pers. ex Fr. 1821; *T. conchata* Fr. 1821; *Stereum striatum* Schrad. ex Fr. 1838 non ~ (Fr.) 1838; *S. glaucescens* Fr. 1874; *Hymenochaete fimbriata* Ellis & Everh. 1885; *H. abnormis* Peck 1889; *?H. rugispora* Ellis & Everh. 1890; *S. pinicola* Vel. 1922

1b. Clamps absent. Hymenial surface dark ochraceous brown, greyish brown or umber, often with olivaceous tinge. Spores cylindrical to fusoid, 11–16(–17) × 3.5–4(–5) μm.

Basidiocarp resupinate or effused-reflexed, up to 3 mm thick. Abhymenial surface (layer) yellowish brown to umber. Skeletal hyphae dark brown, 2–4.5 μm wide, generative hyphae thin- to slightly thick-walled, hyaline to pale brown, 2–4 μm wide. Cystidia either very thick-walled (up to 6 μm), reddish brown, often with large crystals, 150–250 × 8–14 μm, or thick-walled (1–2 μm), reddish brown, often secondarily septate, 30–80 × 3–5 μm, smooth. Basidia subclavate to cylindrical, 70–120 × 5–8 μm. Rare.

Distr.: whole area. Ref.: 43, 182, 234.

C. ambigua (Peck) Pouzar 1959

Syn.: *Stereum carpaticum* Pilát 1930

CONFERTOBASIDIUM Jülich 1972

Basidiocarp annual, resupinate, effused, pellicular to ceraceous-membranaceous, separable. Hymenial surface even, whitish and distinctly contrasting with the cinnamon-brown subiculum. Hyphal system monomitic. Hyphae in the hymenial part hyaline, thin-walled and often irregularly deformed, the basal ones cinnamon-brown, straight, not discolouring in KOH, and somewhat thick-walled (0.5–1.0 μm), with clamps at nearly all septa, especially the basal hyphae often encrusted with small granules. Basidia clustered, hyaline, cylindrical, about 10–20 × 4–5 μm, with (2–)4 sterigmata. Spores hyaline, more or less thin-walled, smooth, ellipsoid to cylindrical, with small apiculus, not amyloid.

Substrate: saprophytic mainly on wood and bark of gymnosperms.
Type species: *Corticium olivaceo-album* Bourd. & Galz. 1911
Distribution: in the whole area.
Reference: 113, 186.

1a. Spores relatively small, cylindrical to ellipsoid, 3.5–4 × 1.8–2.3 μm. Basidia rather small, 9–15 × 3.5–4.5 μm. Common species.

Basidiocarp membranaceous to thin-ceraceous. Hymenial surface even, often cracked when dry, whitish when young, later cream-coloured. Hyphae hyaline and thin-walled in the subhymenium, brownish and thick-walled (0.5–1 μm) in the subiculum, 2.5–5 μm wide, with clamps at nearly all septa.

Distr.: whole area. Ref.: 113, 186.

C. olivaceo-album (Bourd. & Galz.) Jülich 1972

Syn.: *Corticium fuscostratum* Burt 1926; *C. ochroleucum* Bres. 1898, non ~ Fr. 1838

1b. Spores larger, more or less cylindrical, 5–6.5 × 2.3–2.6 μm. Basidia larger, 18–25 × 4–5 μm. Rare species.

Basidiocarp thin-membranaceous, loosely adnate. Hymenial surface even, cream-coloured. Hyphae as in *C. olivaceo-album*.

Distr.: N. Am., USSR. Ref.: 186.

C. montanum (Jülich) comb. nov.

Bas.: *Confertobasidium olivaceo-album* var. *montanum* Jülich 1972, Willdenowia, Beih. 7: 174.

CONIOPHORA DC. ex Mérat 1821

Syn.: *Coniophorella* P. Karst. 1889

Basidiocarp annual, effused, resupinate, arachnoid to fleshy, separable or adnate. Hymenial surface even to tuberculate, often granulose. Subiculum loose when well developed, white or dull-coloured. Rhizomorphs and/or hyphal strands often present. Hyphal system typically monomitic. Hyphae hyaline or yellowish, typically thin-walled, some very wide (up to 15 μm). Septa usually without clamps, but wider hyphae may show one or more (up to 6) clamps per septum. Cystidia absent or present, cylindrical and septate; leptocystidia or hyphidia may also appear to be present when the hymenium is thickening. Much-branched hyphae originating directly under the basidial septum are sometimes present. Basidia typically originating from a subglobose or pyriform cell, subclavate when mature, often somewhat flexuous, with 2–4 sterigmata. Spores yellowish, ovoid, ellipsoid, fusiform or navicular, rarely (sub)globose, typically rather large, smooth, thick-walled, typically dextrinoid and cyanophilous, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms, causing severe brown rot.

Type species: *Coniophora membranacea* DC. ex Mérat 1821.

Distribution: in the whole area.

References: 66, 127, 141, 235.

Note: The species concept within *Coniophora* is difficult due to the lack of stable combinations of characters. Thickness of the basidiocarp, state of development of the subiculum, presence of "hyphidia" are unreliable characters. Pure cultures demonstrate no significant differences within the species-complexes. The nuclear behaviour of the species suggests the possibilities of wide variation. For these reasons the *C. fusispora*-complex and the *C. puteana*-complex are introduced.

1a. Spores globose, faintly brownish, 6–8 μm in diam. Cf. *Ramaricium*.

1b. Spores not globose, at least 8 μm long 2

2a. Cystidia present, olivaceous to dark brown, with thickened walls, cylindrical or somewhat widened at the apex, 90–210(–300) μm, often with some encrustations, septate.

Basidiocarp floccose to membranaceous, rather thick. Hymenial surface even to slightly warted, olivaceous to umber. Margin similar or fibrillose and paler. Subiculum pale to dark brown. Rhizomorphs or hyphal strand often present, up to 50 μm wide. Hyphae hyaline to brown, with thin to thickened walls, (1–)2–7(–10) μm wide, clamps very rare. Basidia hyaline, 25–60 × 6–9 μm. Spores olivaceous, ovoid to narrowly ellipsoid, (8–)9–12(–13) × 4–5.5 μm.

Distr.: whole area. Ref.: 66, 127, 278.

C. olivacea (Fr.) P. Karst. 1882

Syn.: *Thelephora sistotremoides* Schw. 1882; *T. umbrina* Fr. 1828; *Corticium brunneolum* Berk. & Curt. 1873; *Cor. leucothrix* Berk. & Curt. 1873; *Hymenochaete ellisii* Berk. & Cooke 1876; *Coniophora atrocinerea* P. Karst. 1881; *Con. fumosa* P. Karst. 1881; *Con. furva* P. Karst. 1888; *Con. fulvo-olivacea* Massee 1889; *Con. karstenii* Massee 1889; *Con. sibirica* Burt 1931

2b. Septate cystidia absent. 3

3a. Spores ovoid to ellipsoid, rarely subfusiform or cylindrical, 8–15 μm long. 4

3b. Spores fusiform to navicular, 13–21 × 5–8.5 μm. *C. fusispora*-complex. Key to the form-species. 8

4a. Hyphal system dimitic.

Basidiocarp adnate, continuous, up to 400 μm thick. Margin cottony, fimbriate, white to cream, up to 3 mm wide. Hymenial surface even, pruinose to granulose, dull brown to grey brown; subiculum tan to brown. Hyphal strands absent. Skeletal hyphae 2.5–4 μm wide. Generative hyphae hyaline, (1.5–)3–5(–9.5) μm, some heavily granule-encrusted. Basidia about 8 μm wide. Spores pale yellow, broadly ellipsoid to ovoid, (8–)8.5–10.5 × 5.5–6.5(–7.5) μm. On angiosperms and gymnosperms.

Distr.: Eur. Ref.: 141.

C. hanoiensis Pat. 1907

4b. Hyphal system monomitic. 5

5a. Spores ovoid, subfusiform or cylindrical, (7.5–)8–11.5(–13.6) × 3.5–5.5 μm. Subiculum with pale olive tinge, dark grey next to the substratum. Hyphal strands present, up to 25 μm wide.

Basidiocarp membranaceous, separable, up to 600 μm thick, margin indistinct or mucedinous, deep olive buff or concolourous with hymenium. Hymenial surface even, pruinose to pulverulent, avellaneous, ochraceous to brown. Hyphae thin-walled, (2.5–)4–8(–20) μm wide, often with swellings, sometimes granule-encrusted. Basidia about 8 μm wide, projecting up to 20 μm.

Distr.: N. Am. Ref.: 141.

C. submembranacea (Berk. & Br.) Cooke ex Sacc. 1888

Syn.: *Coniophora inflata* Burt 1917

5b. Spores ovoid to broadly ellipsoid, 9–15 × 6–9.5 μm. Subiculum white to pallid, rarely darker. Rhizomorphs often present. *C. puteana*-complex. Key to the form-species 6

6a. Basidiocarp membranaceous to fleshy, separable, 330–1000 μm thick. Hymenial surface even to tuberculate, cream, ochraceous, olivaceous-brown and finally dark brown. Subhymenial layer thick, waxy.

Margin white to yellowish, granulose or composed of radiating hyphal strands. Hyphae hyaline, rarely tan, 2–6(–11) μm wide, often encrusted with granules. Basidia 55–75 × 6.5–9 μm. Spores 9.5–15 × (6–)6.5–9(–9.5) μm.

Distr.: whole area. Ref.: 66, 127, 141.

C. puteana (Schum. ex Fr.) P. Karst. 1868

Syn.: *Coniophora membranacea* DC. ex Mérat 1821; *Con. cerebella* Pers. 1822; *Thelephora laxa* Fr. 1828; *T. luteocincta* Berk. 1872; *Con. lurida* P. Karst. 1881; *Corticium kalmiae* Peck 1893

6b. Basidiocarp floccose to membranaceous, separable or not, up to 500 μm thick. Hymenial surface even, pale ochraceous, sulphureous, olivaceous to olive-brown or chocolate. Subhymenial layer thin. 7

7a. Hyphae 2.5–6 μm wide, smooth, rarely slightly encrusted with granules. Basidiocarp floccose to submembranaceous, adnate, up to 300 μm thick.

Hymenial surface floccose to continuous, even, pale ochraceous, sulphureous to olive-brown. Basidia 30–75 × 6.5–9 μm. Spores 9–14 × 6–9 μm.

Distr.: whole area. Ref.: 66, 141, 253.

C. arida (Fr.) P. Karst. 1882

Syn.: *Coniophora cookei* Massee 1889; *Con. subcinnamomea* P. Karst. 1889; *Con. eremophila* Lindsey & Gilberts. 1975

7b. Hyphae 3–6.5(–13) μm wide, often heavily encrusted with coarse crystals or granules. Basidiocarp pellicular to membranaceous, separable or adnate, up to 500 μm thick.

Hymenial surface ochraceous to olivaceous to umber. Basidia 35–75 × 6–10(–11) μm. Spores 10–13 × 6.5–9.5 μm.

Distr.: whole area. Ref.: 141.

C. suffocata (Peck) Massee 1889

Syn.: *Coniophora macra* P. Karst. 1882; *Con. berkeleyi* Massee 1889; *Con. betulae* P. Karst. 1896; *Hypochnus flavobrunneus* Dearness & Bisby apud Bisby et al. 1929

8a. Basidiocarp adnate, membranaceous, thick. Margin pale, fimbriate. Hyphae thin-walled, 3–10 μm wide, with inflations up to 15 μm wide, smooth or slightly encrusted. Spores fusiform to navicular, 13–21(–23) × (5.5–)6.5–8.5 (–9) μm.

Hymenial surface whitish to yellowish at first, becoming dark olive brown. Basidia 40–65 × (7–)9–12 μm.

Distr.: Eur. Ref.: 66.

C. bourdotii Bres. 1908

Note: *C. fuscata* Bres. & Torrend apud Torrend 1913 with yellowish pyriform or narrowly ovoid spores, 15–18 × 6–7 μm, may be identical.

8b. Basidiocarp separable, thin. Margin pale, mucedinous. Hyphae thin-walled, 4–5 μm wide, sometimes slightly encrusted with granules. Spores fusiform, curved at the base, 8–21 × 5–6 μm.

Hymenial surface tawny olive to snuff brown when dry, even, pulverulent. Hyphal strands present, up to 25 μm wide.

Distr.: N.-Am. Ref.: 54.

C. fusispora (Cooke & Ellis) Cooke apud Sacc. 1888

CONOHYPHA Jülich 1975

Basidiocarp annual, resupinate, effused, adnate, membranaceous Hymenial surface even, more or less cream-coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, with short and broad cells, with clamps. Cystidia lacking or present as leptocystidia. Basidia cylindrical, thin-walled, with a basal clamp. Spores hyaline, ellipsoid, smooth, thin-walled, not amyloid.

Substrate: on wood of gymnosperms and soil.
Type species: *Corticium albocremeum* Höhn. & Litsch. 1908
Distribution: Europe, North America.
References: 194.

1a. Leptocystidia lacking.

Basidiocarp effused, loosely adnate, c. 100 μm thick. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, the subhymenial cells inverse-conical, 8–19 × 5–11 μm, with clamps at all septa. Basidia 23–30 × 5.5–6 μm, slightly guttulate, 4-spored. Spores broadly ellipsoid, 6.6–8 × 4.6–5.2 μm, guttulate. On wood or bark of gymnosperms.

Distr.: Eur. Ref.: 194.

C. albocremea (Höhn. & Litsch.) Jülich 1975

1b. Leptocystidia present, thin-walled, subulate, 60–80 × 4–6 μm, projecting up to 50 μm.
Basidiocarp effused, 100–200 μm thick, closely adnate, membranaceous. Hymenial surface even, whitish. Hyphae hyaline, densely interwoven, 3–6 μm wide, encrusted. Spores ellipsoid 4–6 × 3–4 μm. On soil.
Distr.: N. Am. Ref.: 368.
C. terricola (Burt) Jülich 1976

CORONICIUM J. Erikss. & Ryv. 1975

Basidiocarp annual, resupinate, effused, adnate, membranaceous to somewhat ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphal system monomitic. Hyphae hyaline, indistinct, thin-walled, with clamps. Leptocystidia (cystidioles) present, hyaline, thin-walled, typically with apical outgrowths. Basidia hyaline, clavate to suburniform, often somewhat stalked, c. 20 μm long, with a basal clamp, mostly 4-spored. Spores hyaline, more or less ellipsoid to navicular, smooth, thin-walled, guttulate, not amyloid.
Substrate: on wood or bark of angiosperms and gymnosperms.
Type species: *Corticium gemmiferum* Bourd. & Galz. 1911.
Distribution: in the whole area.
References: 114, 194.

1a. Spores ellipsoid, 4.5–5.2 × 2.5–3.0 μm. Leptocystidia broadly clavate.
Basidiocarp effused, membranaceous, up to 50 μm thick. Hymenial surface even, cream-coloured or greyish. Hyphae hyaline, 1.5–2 μm wide, often torulose with clamps. Leptocystidia 15–25 × 6–12 μm. Basidia 14–18 × 4.2–4.6 μm.
Distr.: N. Am. Ref.: 175, 194.
C. proximum (H.S. Jacks.) Jülich 1975
1b. Spores 6–9 μm long. Leptocystidia narrowly clavate or fusiform. 2

2a. Spores narrowly navicular, 6.5–9 × 2.5–3 μm, guttulate.
Basidiocarp effused, membranaceous, 50–100 μm thick. Hymenial surface even, cream-coloured. Hyphae hyaline, 2–3 μm wide, mostly torulose with clamps. Leptocystidia irregularly cylindrical to somewhat subulate, 15–25 × 3–4 μm. Basidia 15–23 × 4–6 μm.
Distr.: whole area. Ref.: 115, 194, 241, 303.
C. alboglaucum (Bourd. & Galz.) Jülich 1975
2b. Spores ellipsoid or broadly navicular, 3–4.5 μm wide 3

3a. Spores ellipsoid, 6–8 × 3–4 μm. Hymenial surface appearing homogeneous when seen through a lens.
Basidiocarp effused, membranaceous, 50–130 μm thick. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, c. 1.5 μm wide, cylindrical to torulose, with clamps. Leptocystidia irregularly clavate, 15–20 × 4–6 μm. Basidia 18–20 × 4.5–5.2 μm.

Distr.: Eur. Ref.: 194, 241, 303.

C. thymicola (Bourd. & Galz.) Jülich 1975

3b. Spores broadly ellipsoid to navicular, 6–9 × 3.5–4.5 μm. Hymenial surface dotted with small, brownish particles when seen through a lens (50×).

Basidiocarp effused, firm-membranaceous, 50–80 μm thick. Hymenial surface even, ochraceous. Hyphae hyaline, 1–2.5 μm wide, more or less torulose with clamps. Leptocystidia fusiform, 25–35 × 4–5 μm. Basidia 15–25 × 4–6 μm.

Distr.: Eur. Ref.: 114, 242.

C. gemmiferum (Bourd. & Galz.) J. Erikss. & Ryv. 1975

CRISTINIA Parm. 1968

Basidiocarp annual, resupinate, hypochnoid, farinose or floccose. Hymenial surface even to warted, reticulate, raduloid or irpicoid, whitish to ochraceous or sulphureus, sometimes incarnate. Hyphal strands usually present. Hyphal system monomitic. Hyphae hyaline, thin-walled, typically short-celled, with clamps at all septa. Cystidia absent. Basidia in clusters, subclavate to cylindrical, with 4 sterigmata. Immature basidia typically with cyanophilous granules. Spores hyaline, thick-walled, smooth, globose to broadly ellipsoid, cyanophilous, not amyloid.

Substrate: saprophytic on wood of angiosperms or more rarely gymnosperms.
Type species: *Hydnum helveticum* Pers. 1825
Distribution: in the whole area.
References: 114, 318.

1a. Hymenial surface even.

Basidiocarp hypochnoid to farinaceous, thin. Hymenial surface whitish to greyish-cream, sometimes incarnate. Hyphal strands present, sometimes scarce. Hyphae hyaline, thin-walled, 4–8 μm wide. Basidia 15–23 μm × 5.5–6.5 μm. Spores subglobose to broadly ellipsoid, (3.5–)4–5 × 3.5–4.2(–4.5) μm, with distinct apiculus.

Distr.: USSR. Ref.: 318.

C. sasae Parm. 1968

Note: (cf. *Leptosporomyces ovoideus* without hyphal strands)

1b. Hymenial surface reticulate, warted, raduloid or irpicoid. 2

2a. Spores globose to ovoid, 3.5–4.5(–5) × 3–4 μm, with small apiculus. Basidia 15–25 × 5–7 μm. Hymenial surface typically warted, sometimes reticulate or minutely grandinioid, whitish to ochraceous.

Basidiocarp floccose to farinaceous. Hyphal strands abundant. Hyphae 2–7 μm wide.

Distr.: whole area. Ref.: 66, 114.

C. helvetica (Pers.) Parm. 1968

Note: *Cristina sonorae* Nakasone & Gilberts. 1978 seems to be closely related. It differs in the presence of cystidioles and in the ovoid to ellipsoid spores, 4.5–5.5 × 3.5–4 μm.

2b. Spores globose or subglobose, 5–7 μm in diam., distinctly apiculate. Basidia 24–35 × 6–8 μm. Hymenial surface raduloid to irpicoid, sulphureus when fresh, ochraceous when dry. Teeth 2–5 mm long, sometimes confluent.

Basidiocarp soft-membranaceous. Hyphal strands present. Hyphae 3–9 μm wide.

Distr.: Eur. Ref.: 114.

C. gallica (Pilát) Jülich 1975

Syn.: *Radulum mucidum* (Pers.) Bourd. & Galz. 1914 sensu Bourd. & Galz.

CRUSTODERMA Parm. 1968

Basidiocarp annual, resupinate, effused, ceraceous to crustaceous, closely adnate; the margin more or less abrupt. Hymenial surface even, yellowish to ochraceous to cinnamon. Hyphal system monomitic. Hyphae yellowish, indistinct, slightly thick-walled, with clamps, mainly vertically arranged, forming a rather dense context. Cystidia cylindrical and clamped at the base, thick-walled, the apical part smooth or somewhat encrusted. Basidia hyaline to slightly yellowish, cylindrical to narrowly clavate, thin- to slightly thick-walled, 4-spored, with a basal clamp. Spores hyaline to yellowish, cylindrical to narrowly ellipsoid, thin- to slightly thick-walled, smooth, not amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Corticium dryinum* Berk. & Curt. apud Berk. 1873
Distribution: in the whole area.
References: 114, 318.

Monotypic. Basidiocarp 100–200 μm thick, the margin mostly abrupt, sometimes somewhat thinning out. Hymenial surface even, under a lens finely velvety, pale ochraceous to yellowish. Hyphae 2–6 μm wide. Cystidia numerous, 80–135 × 5–9 μm, projecting 40–80 μm. Basidia 24–35 × 5–6 μm. Spores cylindrical to narrowly ellipsoid, 7–9 × 2.5–3.5 μm. On gymnosperms.

Distr.: whole area. Ref.: 114, 368.

C. dryinum (Berk. & Curt. apud Berk.) Parm. 1968

Note: When spores hyaline, thin-walled, ellipsoid, 7–11 × 3.5–5.5 μm, cf. *Phlebia cornea* and *Ph. longicystidia.*

CRUSTOMYCES Jülich 1978

Basidiocarp annual or perennial, resupinate, effused, membranaceous or crustaceous, hyphal strands lacking. Hymenial surface even or odontioid, light coloured. Hyphal system monomitic or dimitic with skeletal hyphae.

Generative hyphae hyaline, thin- to slightly thick-walled, with clamps. Skeletal hyphae hyaline. Dendrohyphidia present, hyaline, richly branched. Gloeocystidia present, hyaline, with resinous contents. Basidia narrowly clavate or suburniform, 4-spored. Spores hyaline, ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Odontia subabrupta* Bourd & Galz. 1928
Distribution: Europe, North America.
References: 199.

1a. Hymenial surface distinctly odontioid, pale ochraceous.
Basidiocarp effused. Generative hyphae and skeletal hyphae 2–3 μm wide. Dendrohyphidia few or abundant, hyaline, richly branched, c. 20 μm long. Gloeocystidia ellipsoid or clavate, rarely with a lateral appendix at the base or an apical outgrowth, 25–35 × 7–10 μm, thin-walled, smooth. Basidia 12–18 × 3–4 μm. Spores ellipsoid, 3.5–4.5 × 2–2.5 μm.
Distr.: Eur., N. Am. Ref.: 114, 374.
C. subabruptus (Bourd. & Galz.) Jülich 1978

1b. Hymenial surface even or somewhat tuberculate, cream-coloured.
Basidiocarp effused. Generative hyphae 1.5–4 μm wide. Skeletal hyphae not seen. Dendrohyphidia abundant, very difficult to see. Gloeocystidia clavate, often with moniliform outgrowth at the apex, 17–57 × 6–9 μm, thin- to slightly thick-walled, smooth. Basidia 13–16 × 4–5 μm. Spores ellipsoid, 4.5–5.5 × 1.8–2.2 μm.
Distr.: N. Am.
C. pini-canadensis (Schw.) Jülich 1978
Syn.: *Peniophora piceina* Overh. 1930

CYANOBASIDIUM Jülich 1979

Basidiocarp annual, resupinate, effused, hypochnoid to membranaceous. Hyphal system monomitic. Hyphae hyaline to yellowish, distinct, cylindrical, with or without clamps. Cystidia lacking. Basidia narrowly clavate or more or less cylindrical, with guttulate, cyanophilous contents, four-spored. Spores hyaline to pale yellowish, globose to subglobose, slightly thick-walled, finely warted, with cyanophilous walls.

Substrate: saprophytic on wood or bark of angiosperms.
Type species: *Pellicularia chordulata* D.P. Rogers 1943.
Distribution: North America.
References: 201.

Only one species in the area. Basidiocarp resupinate, effused, several cm large, hypochnoid to thin-membranaceous, hyphal strands only present in the subiculum. Hymenial surface even, ochraceous. Hyphae hyaline in the sub-

hymenium, often yellowish in the trama and there slightly thick-walled and 4–8 μm wide, clamps present in the subhymenium, absent in the trama. Basidia 12–23 × 6–8 μm, with a basal clamp. Spores hyaline to pale yellowish, slightly thick-walled, globose to subglobose, finely warted, 4–5 × 4–4.5 μm, cyanophilous.
Distr.: N. Am. Ref.: 201
C. chordulatum (D.P. Rogers) Jülich 1979

CYLINDROBASIDIUM Jülich 1974

Basidiocarp annual, resupinate or seldom effused-reflexed, membranaceous, with more or less fimbriate margin. Hymenial surface even, sometimes slightly tuberculate, cream-coloured to ochraceous. Hyphal system monomitic. Hyphae hyaline, the basal ones sometimes slightly yellowish, loosely interwoven, distinct, with clamps, thin- to slightly thick-walled. Gloeocystidia or cystidioles of about the same size as the basidia, but with fusiform apex. Basidia rather long, narrowly clavate, cylindrical when young, about 40–80 μm long, with clamps at the base, 4-spored. Spores hyaline, thin-walled, pyriform, smooth, not amyloid.

Substrate: saprophytic on bark and wood of angiosperms.
Type species: *Thelephora evolvens* Fr. ex Fr. 1821
Distribution: in the whole area.
References: 115, 191

1a. Spores 8–12 × 4.3–6 μm.
Basidiocarp at first forming rounded resupinate patches with white fimbriate margin, often with one wart in the middle, then confluent and widely effused; hyphal strands lacking. Subhymenial hyphae hyaline and thin-walled, the basal ones slightly yellowish, thick-walled (0.4–1 μm), 3–5 μm wide, guttulate. Basidia 40–80 × 5–6 μm, the sterigmata 4–6 μm long. Spores hyaline, pyriform, with large apiculus.
Distr.: whole area. Ref.: 66, 115, 191.
C. evolvens (Fr. ex Fr.) Jülich 1974
Syn.: *Thelephora laevis* (Pers.) ex Fr. 1821; *Th. fissilis* Pers. 1822; *Th. laxa* Pers. 1822, non ~ Fr. 1828; *Th. populina* Sommerf. 1826; *Th. flocculenta* Fr. 1828; *Th. sarcoides* Fr. 1828; *Cladoderris mimima* Berk. & Br. 1878; *Aleurodiscus sendaiensis* Yasuda apud Lloyd 1922; *Hyphoderma arizonicum* Lindsey & Gilberts. 1977

1b. Spores 4–6 × 2.5–3 μm.
Characters of basidiocarp similar.
Distr.: N. Am. Ref.: 115.
C. albulum (Atk. & Burt apud Burt) J. Erikss. & Hjortstam apud J. Erikss. & Ryv. 1976

CYSTOSTEREUM Pouzar 1959

Basidiocarp annual or perennial, resupinate to somewhat effused-reflexed, corky or hard. Hymenial surface even to tuberculate, pale coloured. Hyphal system dimitic with skeletal hyphae. Generative hyphae hyaline, thin-walled, with clamps. Skeletal hyphae subhyaline to brown. Gloeocystidioid vesicles present, hyaline, filled with resinous material or oildrops, sulpho-negative. Basidia in clusters, narrowly clavate, 4-spored. Spores hyaline, thin-walled, ellipsoid to subcylindrical, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Thelephora murraii* Berk. & Curt. 1868
Distribution: in the whole area.
References: 114, 182, 337.

Basidiocarp annual or typically perennial, corky hard and brittle. Abhymenial surface (where exposed) black and hard. Hymenial surface tuberculate to papillate, greyish white to pale brownish. Odeur aromatic (cocos). Generative hyphae 2–3.5 μm wide. Skeletal hyphae 1.5–3 μm wide. Gloeocystidia ovoid to ellipsoid, 20–45(–60) × 5–12(–15) μm. Spores ellipsoid to subcylindrical, 4.5–5.5 × 2–3 μm. Basidia 17–35 × 4–5 μm.
Distr.: whole area. Ref.: 114, 182.
C. murraii (Berk. & Curt.) Pouzar 1959
Syn.: *Stereum tuberculosum* Fr. 1874; *? Corticium globosum* Burt 1926; *S. pulverulentum* Peck 1900, non ~ (Lév.) Mont. 1847; *C. effusum* Overholts 1930.

DACRYOBOLUS Fr. 1849

Basidiocarp annual, resupinate, effused, adnate, membranaceous to coriaceous. Hymenial surface even to odontioid or tuberculate, pale-coloured. Hyphal system monomitic or dimitic. Hyphae hyaline to pale yellowish, thin- or slightly thick-walled, the generative hyphae with clamps. Cystidia of two types: a) of tramal origin, cylindrical, thick-walled; b) of hymenial origin, cylindrical, thin-walled. Basidia long and narrowly clavate, thin-walled, 4-spored, with a basal clamp. Spores hyaline, thin-walled, smooth, allantoid, not amyloid.

Substrate: saprophytic on gymnosperms.
Type species: *Hydnum sudans* Alb. & Schw. ex Fr. 1821
Distribution: in the whole area.
References: 114, 304.

1a. Hymenial surface tuberculate when fresh, even when dry. Hyphal system dimitic.

Basidiocarp at first orbicular or irregularly rounded, later confluent and becoming effused, closely adnate, membranaceous or coriaceous, 0.5–1 mm thick. Hymenial surface continuous or more or less cracked when dry, pale-coloured in younger specimens

(cream-coloured or yellowish ochraceous), in older ones darker. Hyphae hyaline, the generative ones thin-walled, with clamps, 2–3 μm wide, the skeletal hyphae thick-walled, 3–5 μm wide, with some secondary septa. Cystidia of two types: a) cylindrical, thick-walled, of tramal origin, up to 250 × 5–8 μm, projecting up to 75 μm, the apical part thin-walled, the wall swelling in KOH; b) cylindrical, thin-walled, of hymenial origin, 60–80 × 3–4 μm, with a basal clamp. Basidia 35–45 × 2–3.5 μm, slightly constricted at the apex. Spores allantoid, 4.5–6 × 1.2–1.5 μm.

Distr.: whole area. Ref.: 114, 304, 405, 406.

D. karstenii (Bres.) Oberw. ex Parm. 1968

1b. Hymenial surface odontioid. Hyphal system monomitic.

Basidiocarp mostly small, sometimes confluent and effused. Hymenial surface at first pale (whitish to ochraceous), later darker, distinctly odontioid, the teeth separated, conical, up to 0.5 mm long, at the top often excreting a drop of viscid liquid (which is not always preserved in dried specimens). Hyphae thin- to slightly thick-walled, the wall somewhat swelling in KOH, 2.5–3.5 μm wide, with clamps, distinct in the trama, rather indistinct in the subhymenial layer. Cystidia of two types: a) long, cylindrical, moderately thick-walled, mainly in the teeth and then projecting, with several secondary septa lacking clamps, but the basal septum always with a clamp connection, of tramal origin; b) thin-walled, cylindrical, of hymenial origin, 50–70 × 3–5 μm, projecting up to 30 μm. Basidia 25–30 × 2.5–3.5 μm. Spores allantoid, 5–6 × 1.5 μm.

District.: whole area. Ref.: 114, 304.

D. sudans (Fr.) Fr. 1849

DENDROPHYSELLUM Parm. 1968

Basidiocarp annual, resupinate, effused, ceraceous to somewhat crustaceous; margin mealy or indistinct. Hymenial surface even or grandinioid. Hyphal system monomitic. Hyphae thin-walled, with clamps. Dendrohyphidia present, encrusted. Basidia cylindrical to clavate, small. Spores hyaline, fusiform to navicular, thin-walled, smooth, amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Dendrophysellum amurense* Parm. 1968
Distribution: USSR.
References: 318.

Monotypic. Basidiocarp 150–250 μm thick. Hymenial surface even to somewhat grandinioid, with greyish and yellowish tinges. Hyphae 1.5–3 μm wide, with scattered clamps. Dendrohyphidia abundant, densely branched in the upper part, with yellowish encrustation. Basidia flexuous-cylindrical to clavate, 12–16 × 5–5.5 μm. Spores subcylindri-

cal-fusiform to narrowly navicular, smooth, 6.5–9(–10) × 3–4 μm.
Distr.: USSR. Ref.: 318.
D. amurense Parm. 1968

DENDROTHELE Höhn. & Litsch. 1907

Syn.: *Aleurocorticium* Lemke 1964

Basidiocarp annual, initially separate, discoid to effused, later often confluent, 50 to 3000 μm thick. Hymenial surface even, rarely with projections consisting of an aggregate of hyphae, white to ochraceous or yellow, sometimes with greyish tinges. Hyphal system monomitic, usually with abundant crystals. Hyphae hyaline, with or without clamps. Dendrohyphidia present, encrusted, delicately branched. Gloeocystidia may be present, sometimes darkening in sulphobenzaldehyde, often difficult to distinguish from immature basidia. Basidia not closely arranged, typically rather large, flexuous-cylindrical to clavate, with (2–)4 sterigmata. Spores hyaline, small to large, globose to allantoid, thin- or slightly thick-walled, smooth or roughened in Melzer's, not amyloid.

Substrate: saprophytic on bark and undecayed wood of angiosperms and gymnosperms.
Type species: *Dendrothele papillosa* Höhn. & Litsch. 1907
Distribution: in the whole area.
References: 114, 231.

1a. Spores narrowly ellipsoid to cylindrical or allantoid, smooth, at least twice as long as broad 2
1b. Spores globose to ellipsoid or angular, smooth or ornamented, less than twice as long as broad. 5

2a. Spores up to 7(–8) μm broad 3
2b. Spores at least (7.5–)8 μm broad 4

3a. Cystidia cylindrical, sometimes slightly capitate, more or less thick-walled, 60–120 × 6–10 μm, emerging 40–50 μm.
Basidiocarp ceraceous, rather thick, pruinose. Hymenial surface whitish. Hyphae thin- to slightly thick-walled, 1–3 μm wide, rarely with clamps. Basidia clavate, 30–90 × 5–10 μm. Spores cylindrical to allantoid, 10–21 × 4.5–7 μm. On angiosperms.
Distr.: Eur. Ref.: 115.
D. macrospora (Bres.) Lemke 1965
Note: *Vuilleminia cystidiata* Parm. 1965 (313) differs only in having fusoid cystidia. Spores 12–16 × 3.7–5(–5.5) μm.

3b. Cystidia absent, gloeocystidia may be present, not emerging.
Basidiocarp pruinose to pulverulent, 80–100 μm thick. Hymenial surface whitish to pallid. Hyphae thin-walled, 1.5–2 μm wide,

without clamps. Gloeocystidia present or absent, fusiform to clavate-ampulliform with an apical digitiform outgrowth, 20–40 × 6–14 μm, sulpho-negative. Basidia subclavate to suburniform, 30–60 × 6–9(–12) μm. Spores narrowly ellipsoid to cylindrical to sub-allantoid, (10–)11–15(–17) × (5–)6–7(–8) μm. On angiosperms.
Distr.: whole area. Ref.: 114, 231.
D. alliacea (Quél.) Lemke 1965
Syn.: *Aleurodiscus subacerinus* Höhn. & Litsch. 1907.

4a. Clamps present at all septa. Spores allantoid, 16–22 × 8–9(–11) μm. Basidiocarp pruinose to pulverulent, 75–150 μm thick. Hymenial surface white to pallid. Hyphae thin-walled, 1–2.5 μm wide. Gloeocystidia absent. Basidia flexuous-cylindrical to subclavate, (60–)100–120(–150) × 7–10 μm. On angiosperms, mainly Acer.
Distr.: whole area. Ref.: 231.
D. dryina (Pers.) Lemke 1965

4b. Clamps absent on rare. Spores allantoid, larger.
Basidiocarp gregarious to incompletely confluent, irregularly effused, hypochnoid to pruinose. Hymenial surface pallid to ivory. Hyphae thin-walled, 1.5–3 μm wide. Gloeocystidia sulpho-negative, flexuous-cylindrical to subclavate, 40–130 × 5–10 μm. Basidia flexuous-subclavate to clavate, 80–120 × 14–16 μm. Spores allantoid, (21.5–)23–28(–32) × (7.5–)8–10(–10.5) μm. On Corylus and Prunus.
Distr.: N. Am. Ref.: 231.
D. maculata (H.S. Jacks. & Lemke apud Lemke) Lemke 1965
Note: Parmasto (313) described a *Vuilleminia corticola* from Prunus padus in the USSR at nearly the same time. This species is probably synonymous, only differing in the absence of gloeocystidia, which are often difficult to find in this genus.

5a. Spores angular. 6
5b. Spores globose to ellipsoid, not angular. 7

6a. Spores rectangular, (17–)19–23(–29) × 11–16(–18) μm, with a few large spines, up to 4 μm long. Clamps present.
Basidiocarp pruinose to pulverulent, 100–200 μm thick. Hymenial surface white to ivory. Hyphae thin-walled, 2–3 μm wide. Gloeocystidia absent. Basidia flexuous-subclavate to clavate, 60–80 × (12–)15–18(–20) μm. On angiosperms, mainly Fraxinus.
Distr.: N. Am. Ref.: 231.
D. macrodens (Coker) Lemke 1965

6b. Spores triangular or rounded with 3 subcylindrical spines, more rarely with 2 or 4 spines, 10–13 × 7–10 μm. Clamps absent.
Basidiocarp pruinose to pulverulent. Hymenial surface whitish. Microscopical characters as in *D. acerina* (9a). On angiosperms.
Distr.: N. Am. Ref.: 231.
Aleurodiscus acerina fo. **tricornis** Bourd. & Galz. 1928

7a. Spores up to 13 μm long. 8
7b. Spores at least 13 μm long. 12

8a. Spores ellipsoid, larger than 10 μm when ovoid. 9
8b. Spores globose, subglobose or ovoid, up to 10 μm long. 10

9a. Clamps absent. Spores ovoid to broadly ellipsoid, (8–)10–13(–15) × (6–)7–10(–11) μm.
Basidiocarp pruinose to pulverulent, 80–150 μm thick. Hymenial surface white to pallid. Hyphae 1.5–2 μm wide. Gloeocystidia scattered to absent, sulpho-negative, fusiform to clavate-ampulliform with an apical digitate outgrowth, 20–40 × 6–14 μm. Basidia subclavate to suburniform, 30–60 × 6–9(–12) μm. Spores thin- to partially thick-walled, rarely faintly and irregularly amyloid. On angiosperms.
Distr.: whole area. Ref.: 114, 231.
D. acerina (Pers. ex Fr.) Lemke 1965

9b. Clamps present. Spores ellipsoid, (8.8–)10–12(–13) × (4–)5–6(–6.5) μm.
Basidiocarp pruinose to subceraceous, 80–100 μm thick. Hymenial surface whitish to greyish with brownish tinge. Hyphae 1.2–2.5 μm wide. Gloeocystidia absent. Basidia flexuous-subclavate to suburniform, 25–40 × 6.5–8 μm. On gymnosperms and angiosperms.
Distr.: N. Am. Ref.: 231.
D. pachysterigmata (H.S. Jacks. & Lemke apud Lemke) Lemke 1965
Note: *D. commixta* (Höhn. & Litsch.) J. Erikss. & Ryv. 1975 also keys out here. In this species the clamps are scattered, there are no gloeocystidia and the spores are 8–11 × 5–8 μm.

10a. Gloeocystidia sulpho-positive. Hymenial surface even to spinulose, greyish with ochraceous tinge to violaceous drab.
Basidiocarp pruinose to pulverulent, 50–130 μm thick, margin byssoid at first. Hyphae 1.5–2.5 μm wide, without clamps. Gloeocystidia (sub)clavate, 35–60 × 6.5–10 μm. Basidia flexuous-subclavate to suburniform, 20–35 × 7.4–9.5 μm. Spores subglobose to subovoid, 7.5–10.5(–11) × 6–8 μm. Spinulose projections consisting of dendrohyphidia. On angiosperms and gymnosperms.
Distr.: whole area. Ref.: 114, 231.
D. griseo-cana (Bres.) Bourd. & Galz. 1913
Syn.: *Dendrothele papillosa* Höhn. & Litsch. 1907

10b. Gloeocystidia sulpho-negative. Hymenial surface even, white to pallid. 11

11a. Spores globose to subglobose, 6–7.5(–8) × 5–6 (–7) μm. Clamps absent.
Basidiocarp pruinose to pulverulent, 60–100 μm thick. Hymenial surface white to pallid. Hyphae 1–2 μm wide. Gloeocystidia scattered, ovoid to clavate, 25–40 × 5.5–10 μm, rarely with an apical digitiform outgrowth. Basidia (sub)clavate, 25–45 × 6–8 μm. On angiosperms, rarely on gymnosperms.

Distr.: N. Am. Ref.: 231.

D. microspora (H.S. Jacks. & Lemke apud Lemke) Lemke 1965

Note: *Xenasma vassilievae* Parm. 1965 (spores 4–5(–5.5) × 2.4–3 μm) probably belongs here.

11b. Spores globose to subpyriform, 8–10 × 8–8.5(–9.5) μm. Clamps present, scattered.

Basidiocarp pruinose to subceraceous, 50–80 μm thick. Hymenial surface white to pallid. Hyphae 1.5–3 μm wide, walls sometimes thickened. Gloeocystidia absent. Basidia suburniform to clavate, 25–37 × 8–11 μm. On angiosperms and gymnosperms.

Distr.: N. Am. Ref.: 231.

D. incrustans (Lemke) Lemke 1965

12a. Spores on average at least 22 μm long. Tramal vesicles resembling spores present 13

12b. Spores on average shorter than 20 μm. Tramal vesicles absent. 14

13a. Clamps present, scattered. Gloeocystidia sulpho-negative, pyriform, 20–55 × 9.5–25 μm, sometimes with yellow granulation. Hymenial surface bright golden yellow.

Basidiocarp pruinose to mealy-pulverulent, 300–600 μm thick. Hyphae 2–3 μm wide. Basidia clavate, 52–75 × 20–30 μm. Spores globose to subglobose, thin- to slightly thick-walled, 22–24(–27) × 19–22(–23) μm. Tramal vesicles irregularly globose to ovoid, thin-walled, 17–23(–30) × 15–19(–26) μm, with granular contents. On angiosperms.

Distr.: N. Am. Ref.: 231.

D. strumosa (Fr.) Lemke 1965

Syn.: *Stereum mancinianum* Sacc. & Cuboni apud Sacc. 1888

13b. Clamps absent. Gloeocystidia absent. Hymenial surface whitish, later ochraceous-buff or olive-buff.

Basidiocarp pruinose to pulverulent, 300–600 μm thick. Hyphae 1.5–2.5 μm wide. Basidia clavate, 60–125 × 18–24 μm. Spores subglobose to ovoid, (18–)23–24(–25) × (16–)20–23 μm. Tramal vesicles irregularly globose, up to 30 μm in diam. On angiosperms.

Distr.: N. Am. Ref.: 231.

D. seriata (Berk. & Curt.) Lemke 1965

14a. Gloeocystidia sulpho-positive, ovoid, clavate or subcylindrical, 20–50 × 8–16 μm. On gymnosperms.

Basidiocarp forming ellipsoid to linear patches, pruinose to pulverulent, 80–330 μm thick. Hymenial surface white to pallid. Hyphae 1.5–3 μm wide, with scattered clamps. Sulphocystidia rarely with an apical bulb. Basidia flexuous-subclavate, 60–95(–150) × 12–18 μm. Spores subglobose to ovoid, smooth to finely echinulate in Melzer's, thin-walled, (14–)16–20 × 12–15 μm. Mainly on Juniperus.

Distr.: N. Am. Ref.: 231.

D. nivosa (Berk. ex Höhn. & Litsch.) Lemke 1965

14b. Gloeocystidia when present sulpho-negative. On angiosperms. 15

15a. Spores up to 12 μm broad. 16

15b. Spores broader. 17

16a. Clamps absent. Spores ovoid to broadly ellipsoid, smooth, (8–)10–13 (–15) × (6–)7–10(–11) μm. *D. acerina*, see 9a.

16b. Clamps present. Spores ovoid, ellipsoid or pip-shaped, smooth or roughened in Melzer's, 14–19(–22) × 8–11(–12) μm.

Basidiocarp discoid or confluent, pellicular to pulverulent, with or without sterile projections. Hymenial surface white to pale tan. Hyphae thin-walled, about 3.2 μm wide. Gloeocystidia present, often with forked or submoniliform apical outgrowth. Basidia clavate, 50–110 × 10–40 μm, projections consisting of interwoven dendrohyphidia.

Distr.: N. Am. Ref.: 231.

D. alba Viégas 1940

Syn.: *D. duthieae* Talbot 1956

Note: Lemke (231) suggests that the sterile *D. lepra* (Berk. & Br.) Lemke 1965 (syn.: *Aleurodiscus albidus* Massee apud Cooke 1889; *Aleurodiscus cremeus* Pat. 1915 non – Burt 1918 = *A. bertii* Lloyd 1924) is also a synonym.

17a. Clamps absent. Spores globose to ovoid, smooth to roughened in Melzer's, (13–)15–20(–22) × (11–)13–16(–20) μm.

Basidiocarp pruinose, pulverulent to crustulose, annual and 200–500 μm thick or perennial and up to 3000 μm thick; margin free to raised. Hymenial surface white. Abhymenial surface dark. Hyphae 2–3 μm wide. Gloeocystidia absent. Basidia flexuous-clavate, 45–70 × (11–)13.5–16 μm.

Distr.: N. Am. Ref.: 231.

D. candida (Schw.) Lemke 1965

Syn.: *Thelephora candidissima* Schw. 1832; *Aleurodiscus crassus* Lloyd 1920; *Aleurodiscus jacksonii* S. Ahmad 1962

17b. Clamps scattered, inconspicuous. Spores subglobose to subpyriform, smooth, (12–)14–17(–18) × (11.5–)13–15(–17) μm.

Basidiocarp pruinose to subceraceous, 70–100 μm thick; margin adnate. Hymenial surface white to pale ochraceous. Hyphae 1–2 μm wide. Gloeocystidia rare, flexuous-subclavate to clavate, 25–45 × (7–)11–13 μm. Basidia flexuous-subclavate to clavate, 55–70 × 12–16 μm.

Distr.: N. Am. Ref.: 231.

D. mexicana (Lemke) Lemke 1965

DENTIPELLIS Donk 1962

Basidiocarp annual, resupinate, effused, rarely effused-reflexed, separable, consisting of a membranaceous basal layer which is covered with fragile, slender spines. Hyphal system monomitic. Hyphae hyaline, with clamps. Gloeoplerous hyphae and gloeocystidia present. Basidia in small clusters, clavate, with (2–)4 sterigmata. Spores hyaline, thin- to firm-walled, subglobose to broadly ellipsoid, smooth or ornamented, amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Hydnum fragile* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 95.

1a. Spores subglobose to ovoid, 4.5–6 × 4–5 μm. Generative hyphae thin-to firm-walled, 2–4.5 wide. Teeth up to 1.5 mm long. Distr.: Eur., USSR.
Basidiocarp effused, membranaceous. Hymenial surface white to ochraceous. Gloeoplerous hyphae and gloeocystidia 4.5–9 μm wide, projecting up to 30 μm. Basidia 20–35 × 4.5–7.5 μm.
Ref.: 180.
D. fragilis (Pers. ex Fr.) Donk 1962
Syn.: *?Hydnum macrodon* Pers. ex Fr. 1821

1b. Spores broadly ellipsoid, 3.5–5 × 3–4 μm. Generative hyphae thin- to thick-walled, 2.5–4 μm wide, wall up to 2 μm thick. Teeth up to 1 mm long. Distr.: N. Am.
Basidiocarp effused, cottony membranaceous. Hymenial surface white to ochraceous. Gloeoplerous hyphae and gloeocystidia 7–10 μm wide. Basidia 16–24 × 7–10 μm.
Ref.: 120.
D. separans (Peck) Donk 1962
Note: Miller and Boyle (290) consider these species to be synonyms. Gilbertson (120) examined a specimen with ellipsoid spores (4–5 × 2–2.5 μm), which he considered to be conspecific with the (sterile) type specimen.

DENTOCORTICIUM (Parm.) M.J. Larsen & Gilberts. 1974

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even to warted or papillate, whitish, yellowish or brown to purple. Hyphal system monomitic or seemingly dimitic. Hyphae hyaline to coloured, thin- to thick-walled, with clamps. Dendrohyphidia present, cystidia or gloeocystidia absent. Basidia clavate, with 4 sterigmata. Spores hyaline, smooth, thin-walled, ellipsoid to allantoid, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Laeticorticium ussuricum* Parm. 1965
Distribution: North America, USSR.
References: 223, 224.

1a. Spores allantoid, 7–9.5 × 2.5–4 μm. Hymenial surface even to warted, yellow when fresh, becoming almost white when dry.

Basidiocarp not separable. Subicular hyphae 3–4 μm wide, thin- to thick-walled, sometimes sclerified. Dendrohyphidia abundant, 1–2 μm wide. Basidia 30–40 × 4–6 μm.

Distr.: N. Am. Ref.: 120, 224.

D. sulphurellum (Peck) M.J. Larsen & Gilberts. 1974

1b. Spores cylindrical to allantoid, 5–7 × 2–2.5 μm. Hymenial surface warted to papillate, violaceous fuscous to violet when fresh, dark ochraceous brown when dry.

Basidiocarp adherent. Subicular hyphae thin- to thick-walled, 2–4 μm wide. Dendrohyphidia abundant, often covered with resinous cinnamon material. Basidia 20–40 × 3–5 μm.

Distr.: USSR. Ref.: 224, 313.

D. ussuricum (Parm.) M.J. Larsen & Gilberts. 1974

DIGITATISPORA Doguet 1962

Basidiocarp annual, resupinate, becoming cushion-shaped. Hymenial surface even. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps at all primary septa. Basidia terminal, single or in small dusters, cylindrical to narrowly clavate, bearing 4 spores directly on their apices. Spores cylindrical with 3 apical appendages, hyaline, thin-walled smooth, not amyloid, not actively discharged.

Substrate: saprophytic on wood which is regularly or permanently in contact with sea-water.

Type species: *Digitatispora marina* Doguet 1962

Distribution: Europe.

Reference: 79a.

Monotypic. Basidiocarp small, cushion-shaped, up to 300 μm thick. Hymenial surface greyish. Hyphae 2–3 μm wide. Cystidia absent. Basidia cylindrical to narrowly clavate, up to 50 μm long, without sterigmata. Spores cylindrical, slightly tapering toward the base, 30–45 × 3–4 μm, apically with 3 cylindrical to filiform appendages up to 45 × 2–3 μm.

Distr.: Eur. Ref.: 79a.

D. marina Doguet 1962

ECHINOTREMA Parker-Rhodes 1955

Basidiocarp anual, resupinate, membranaceous, covered with vertically arranged plates. Hymenial surface whitish. Hyphal system monomitic. Hyphae hyaline, thin-walled, without clamps. Basidia in loose clusters, urniform, with 3–6 sterigmata. Spores hyaline, globose, ornamented, not amyloid.

Substrate: on soil in old rabbit-hole (humus?).
Type species: *Echinotrema clanculare* Parker-Rhodes 1955
Distribution: Europe.
References: 310.

Monotypic. Basidiocarp covered with parallel sinuous plates, up to 25 mm long, 5 mm high, and 1 mm thick. Hymenial surface whitish. Margin indistinct. Hyphae hyaline, thin-walled, 2–3 μm wide, without clamps. Basidia urniform, 15 × 5 μm in average. Spores hyaline, globose, aculeate, 4–5 μm in diam.
Distr.: Eur. Ref.: 310.
E. clanculare Parker-Rhodes 1955

EPITHELE (Pat.) Pat. 1900

Basidiocarp annual, resupinate, effused, soft-membranaceous. Hymenial surface odontioid (sterile hyphal fascicles), cream-coloured to pale ochraceous. Hyphal system monomitic. Hyphae hyaline, cylindrical to torulose, often rather indistinct, with clamps. Cystidia lacking. Basidia hyaline, stalked-clavate, rather large, thin-walled, with a basal clamp, 4-spored. Spores hyaline to slightly yellowish, large, ellipsoid to fusiform, smooth, finally thick-walled, not amyloid.

Substrate: saprophytic on angiosperms, mainly Carex.
Type species: *Athelia typhae* Pers. 1822
Distribution: Europe.
References: 66, 191.

Monotypic. Basidiocarp effused, membranaceous, 100–150 μm thick, adnate. Hymenial surface odontioid, the sterile hyphal fascicles 100–200 μm long, cream-coloured to pale ochraceous. Hyphae hyaline, rather indistinct, often torulose, thin-walled, 1–2 μm wide, with clamps at all septa. Basidia 55–70 × 8–11 μm, clamped, with four, rather large sterigmata. Spores thick-walled, slightly yellowish when fully mature, 16–28 × 5.5–8 μm. On Carex, Scirpus, Typha.
Distr.: Eur. Ref.: 66, 114, 191.
E. typhae (Pers.) Pat. 1900

ERYTHRICIUM J. Erikss. & Hjortstam 1970

Basidiocarp annual, resupinate, effused, soft-membranaceous to pellicular, separable. Hymenial surface even or wrinkled, pink when fresh, whitish to yellowish when dry. Subiculum and margin white. Hyphal system monomitic. Subicular hyphae wide and short-celled, the basal and marginal ones straight and somewhat thick-walled; subhymenial hyphae narrow. Clamps absent. Cystidia absent. Basidia clavate, often somewhat constricted, with 4 sterigmata. Spores hyaline, ovoid to ellipsoid, smooth, slightly thick-walled, cyanophilous, not amyloid.

Substrate: saprophytic on angiosperms and mosses.
Type species: *Hyphoderma laetum* P. Karst. 1889
Distribution: Europe.
References: 110, 114.

1a. Spores ovoid to ellipsoid, 11–13(–15) × 6–7.5 μm. On angiosperms.
Basidiocarp pellicular to soft-membranaceous. Hymenial surface even to wrinkled, pink, pale when dry. Basal and marginal hyphae straight, 4–9 μm wide, with thickened walls. Subicular hyphae short-celled, much-branched, up to 15 μm wide. Subhymenial hyphae 2.5–3 μm wide. Basidia 35–50 × 8–12 μm.
Distr.: Eur. Ref.: 110, 114.
E. laetum (P. Karst.) J. Erikss. & Hjortstam 1970

1b. Spores ovoid to ellipsoid, 9–11 × 4.5–6 μm. On mosses in gymnospermous woods.
Basidiocarp pellicular to membranaceous. Hymenial surface even, pink. Subicular hyphae up to 10 μm wide. Basidia 30–40 × 7–10 μm.
Distr.: Eur. Ref.: 110, 114.
E. hypnophilum (P. Karst.) J. Erikss. & Hjortstam 1970

FIBRICIELLUM J. Erikss. & Ryv. 1975

Basidiocarp annual, resupinate, effused, membranaceous, often with rhizomorphs. Hymenial surface even, pale coloured. Hyphal system dimitic, with skeletals. Generative hyphae hyaline, thin-walled, with clamps. Skeletal hyphae hyaline, cyanophilous. Cystidia lacking. Basidia hyaline, clavate, with 4 sterigmata. Spores hyaline, smooth, ellipsoid, thin-walled, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Fibriciellum silvae-ryae* J. Erikss. & Ryv. 1975
Distribution: Europe.
Reference: 114.

Monotypic. Basidiocarp 100–200 μm thick. Hymenial surface even to somewhat tuberculate, whitish to ochraceous. Generative hyphae 2–3 μm wide. Skeletal hyphae 1.5–2.5 μm wide. Cystidia lacking, but outgrowths of hyphae or basidia may be present. Basidia 10–12 × 4–5 μm. Spores ellipsoid, thin- to slightly thick-walled, 3–4 × 1.5–2 μm. On angiosperms.
Distr.: Eur. Ref.: 114.
F. silvae-ryae J. Erikss. & Ryv. 1975

FIBRICIUM J. Erikss. 1958

Basidiocarp annual, resupinate, effused, membranaceous, often with small hyphal strands. Hymenial surface even, pale coloured. Hyphal system dimitic, with skeletal hyphae. Generative hyphae hyaline, thin-walled, with clamps.

Skeletal hyphae hyaline, not cyanophilous. Cystidia present, not very thick-walled, encrusted or not. Basidia hyaline, clavate, with 4 sterigmata. Spores hyaline, smooth, thin-walled, ellipsoid, not amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Corticium rude* P. Karst. 1882
Distribution: in the whole area.
References: 105, 114.

1a. Cystidia heavily encrusted with crystals. Spores narrowly ellipsoid, 6–6.5 × 3–3.5 μm, guttulate.

Basidiocarp membranaceous, with small hyphal strands around the margin or in the substrate. Hymenial surface mostly even, cream-coloured to ochraceous. Generative hyphae 2.5–4 μm wide, with clamps. Skeletal hyphae 1.5–2.5 μm wide. Cystidia hyaline, conical, somewhat thick-walled, 40–70 × 7–11 μm, the upper half encrusted. Basidia 25–30(–45) × 5–6 μm.
Distr.: whole area. Ref.: 114.
F. lapponicum J. Erikss. 1958

1b. Cystidia smooth or covered with non-crystalline material. Spores narrowly ellipsoid, 4.5–5.5 × 1.2–2 μm.

Basidiocarp membranaceous, with small hyphal strands around the margin and in the substrate. Hymenial surface even, whitish or cream-coloured. Generative hyphae 2.5–3.5 μm wide, with clamps. Skeletal hyphae 1.5–2 μm wide. Cystidia hyaline, more or less cylindrical with the apical part narrower, somewhat thick-walled, 45–60 × 5–7 μm. Basidia 12–17 × 3–5 μm.
Distr.: Eur., N. Am. Ref.: 114.
F. rude (P. Karst.) Jülich 1974
Syn.: *Corticium greschikii* Bres. 1890; *Peniophora alba* Burt 1926

FIBRODONTIA Parm. 1968

Basidiocarp annual, resupinate, effused, membranaceous to thick-coriaceous. Hymenial surface odontioid, cream-coloured to ochraceous or isabelline. Hyphal system dimitic. Generative hyphae hyaline, thin- to thick-walled, with clamps. Cystidioles rare, often with resinous cap. Basidia suburniform, with 4 sterigmata. Spores hyaline, thin-walled, smooth, ovoid to ellipsoid, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Fibrodontia gossypina* Parm. 1968
Distribution: USSR.
References: 318

Monotypic. Basidiocarp effused, membranaceous to soft coriaceous, up to 350 μm thick. Hymenial surface odontioid, cream-coloured to

ochraceous, often with dark greyish tinges. Teeth fimbriate. Skeletal hyphae yellowish, 2–3.5(–4) μm wide. Generative hyphae hyaline, thin-to thick-walled, 2–4 μm wide. Cystidioles rare, clavate to capitate, often with a resinous cap. Basidia suburniform to urniform, 10–18 × 3.5–5.5 μm. Spores ovoid to broadly ellipsoid, (3–)3.5–4.2 × 2.5–3.7 μm.
Distr.: USSR. Ref.: 318.
F. gossypina Parm. 168

FIBULOMYCES Jülich 1972

Basidiocarp annual, resupinate, thin, membranaceous with mostly distinct subiculum, whitish to yellowish. Hymenial surface smooth to only slightly merulioid when fresh. Hyphal strands often present. Hyphal system monomitic. Hyphae hyaline, cylindrical, in the hymenial region sometimes irregularly shaped, with clamps. Cystidia and gloeocystidia lacking. Basidia more or less cylindrical, with (2–)4 sterigmata, clamped at the base. Spores hyaline, ellipsoid to narrowly cylindrical, thin-walled, smooth, not amyloid.

Substrate: saprophytic on angiosperms and gymnosperms.
Type species: *Corticium mutabile* Bres. 1892.
Distribution: in the whole area.
References: 114, 186.

1a. Spores ovoid, the basal part somewhat broadened. 2
1b. Spores tapering towards the base or cylindrical to ellipsoid. 3

2a. Spores 5–6 × 1.5–2 μm. Hyphal strands typically present.
Hymenial layer almost ceraceous, cracked when dry, loosely connected with a distinct whitish subiculum, separable. Hyphae thin- to slightly thick-walled (up to 0.4 μm), 5–8 μm wide. Basidia cylindrical to almost clavate, 14–21 × 4–7 μm, sterigmata 2–3.5 μm long. Spores with distinct, lateral apiculus.
Distr.: whole area. Ref.: 114, 186.
F. septentrionalis (J. Erikss.) Jülich 1972

2b. Spores 6.5–7.5 × 2–2.5 μm. Hyphal strands lacking.
Basidiocarp thin, membranaceous, with almost indistinct subiculum, separable in small pieces. Hyphae thin- to slightly thick-walled (up to 0.4 μm), 3–4 μm wide. Basidia cylindrical, 13–16 × 3.8–4.5 μm, sterigmata 3.5–4 μm long. Spores with distinct, lateral apiculus.
Distr.: N. Am. Ref.: 186.
F. canadensis Jülich 1972

3a. Spores cylindrical to ellipsoid, with rounded base and lateral apiculus, 3.5–5.5 × 1.8–2.8 μm.
Basidiocarp membranaceous to thin-ceraceous, with mostly distinct subiculum, separable in small pieces. Hyphal strands (in the substrate) present. Hyphae thin- to slightly thick-walled (up to 0.4 μm),

2–4 μm wide, often covered with crystals. Basidia almost cylindrical, 10–20(–25) × 4–5 μm, sterigmata (2–)4, c. 3 μm long (up to 6 μm long in 2-spored basidia). Common.
Distr.: whole area. Ref.: 114, 186.
F. mutabilis (Bres.) Jülich 1972

3b. Spores cylindrical, tapering towards the base, 7–8 × 2.3–2.6 μm.
Basidiocarp thin, membranaceous, without distinct subiculum, separable. Hyphal strands lacking. Hyphae with up to 0.4 μm thick walls, 3.5–4.5 μm wide. Basidia cylindrical, often with oildrops, 12.5–15.5 × 4.3–5.2 μm, with (2–)4 sterigmata, 3–5 μm long. Rare.
Distr.: whole area. Ref.: 114, 186.
F. fusoideus Jülich 1972

GALZINIA Bourd. 1922

Basidiocarp annual, resupinate, effused, ceraceous to gelatinous, subinvisible when dry. Hymenial surface even, often with greyish tinge. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, with or without clamps. Cystidia or gloeocystidia sometimes present. Basidia single or in clusters, at first ovoid or vesicular, then elongating and becoming narrowly urniform, with (2–)4 sterigmata. Basidial repetition common in some species. Pleurobasidia often present. Spores hyaline, thin-walled, smooth, ovoid, ellipsoid, cylindrical or allantoid, in one species furcate, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms or parasitic on grasses.
Type species: *Galzinia pedicellata* Bourd. 1922
Distribution: in the whole area.
References: 114, 355.

1a. Clamps present. Basidiocarp thin, typically up to 50 μm thick, ceraceous to gelatinous, pruinose when dry. Hyphidia absent. 2
1b. Clamps absent. Basidiocarp thicker, mucous-gelatinous. Hyphidia present. 5

2a. Spores ovoid to ellipsoid, 13–16 × 7–9.5 μm. On grasses.
Basidiocarp subinvisible, thin. Hymenial surface even, hyaline to pinkish. Hyphae 2–4 μm wide. Basidia urniform, 25–55 μm long, 3.5–4.5 μm in the middle, 7–9 μm wide at the inflations, with (1–)2(–3) sterigmata up to 12 μm long.
Distr.: Eur., N. Am. Ref.: 1, 308.
G. culmigena (Webster & D. Reid apud D. Reid) Johri & Bandoni apud Bandoni & Johri 1975
2b. Spores cylindrical to allantoid. On wood. 3

3a. Gloeocystidia thin-walled, clavate to subcylindrical, often ventricose, 55–125 × 6–12 μm.

2–4 μm wide, often covered with crystals. Basidia almost cylindrical, 10–20(–25) × 4–5 μm, sterigmata (2–)4, c. 3 μm long (up to 6 μm long in 2-spored basidia). Common.
Distr.: whole area. Ref.: 114, 186.
F. mutabilis (Bres.) Jülich 1972

3b. Spores cylindrical, tapering towards the base, 7–8 × 2.3–2.6 μm.
Basidiocarp thin, membranaceous, without distinct subiculum, separable. Hyphal strands lacking. Hyphae with up to 0.4 μm thick walls, 3.5–4.5 μm wide. Basidia cylindrical, often with oildrops, 12.5–15.5 × 4.3–5.2 μm, with (2–)4 sterigmata, 3–5 μm long. Rare.
Distr.: whole area. Ref.: 114, 186.
F. fusoideus Jülich 1972

GALZINIA Bourd. 1922

Basidiocarp annual, resupinate, effused, ceraceous to gelatinous, subinvisible when dry. Hymenial surface even, often with greyish tinge. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, with or without clamps. Cystidia or gloeocystidia sometimes present. Basidia single or in clusters, at first ovoid or vesicular, then elongating and becoming narrowly urniform, with (2–)4 sterigmata. Basidial repetition common in some species. Pleurobasidia often present. Spores hyaline, thin-walled, smooth, ovoid, ellipsoid, cylindrical or allantoid, in one species furcate, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms or parasitic on grasses.
Type species: *Galzinia pedicellata* Bourd. 1922
Distribution: in the whole area.
References: 114, 355.

1a. Clamps present. Basidiocarp thin, typically up to 50 μm thick, ceraceous to gelatinous, pruinose when dry. Hyphidia absent. 2
1b. Clamps absent. Basidiocarp thicker, mucous-gelatinous. Hyphidia present. 5

2a. Spores ovoid to ellipsoid, 13–16 × 7–9.5 μm. On grasses.
Basidiocarp subinvisible, thin. Hymenial surface even, hyaline to pinkish. Hyphae 2–4 μm wide. Basidia urniform, 25–55 μm long, 3.5–4.5 μm in the middle, 7–9 μm wide at the inflations, with (1–)2(–3) sterigmata up to 12 μm long.
Distr.: Eur., N. Am. Ref.: 1, 308.
G. culmigena (Webster & D. Reid apud D. Reid) Johri & Bandoni apud Bandoni & Johri 1975
2b. Spores cylindrical to allantoid. On wood. 3

3a. Gloeocystidia thin-walled, clavate to subcylindrical, often ventricose, 55–125 × 6–12 μm.

Basidiocarp ceraceous. Hymenial surface whitish. Hyphae 2–4 μm wide. Basidia urniform, 23–55(–100) μm long, 4.5–5 μm wide in the middle, 6–11.5 μm wide at the inflations, with 4 sterigmata. Spores cylindrical to allantoid, (9–)10–12.5 × 4.5–5(–6) μm.
Distr.: N. Am. Ref.: 355.
G. occidentalis D.P. Rogers 1944

3b. (Gloeo)cystidia absent. 4

4a. Spores allantoid, 4.5–6 × 1.5–2.5 μm. Hymenial surface even, greyish, often with pink or violaceous tinge.
Basidiocarp ceraceous. Hyphae with thin to thickened walls, 2.5–4 μm wide. Basidia urniform to suburniform, 15–20 × 4–5 μm. Basidial repetition rare.
Distr.: whole area. Ref.: 114.
G. incrustans (Höhn. & Litsch.) Parm. 1965

4b. Spores allantoid, 8–11 × 2–4(–4.5) μm. Hymenial surface even, subhyaline to greyish or bluish.
Basidiocarp ceraceous to gelatinous. Hyphae thin-walled, 2–4 μm wide. Basidia urniform, 15–80 μm long, 2.5–4 μm wide in the middle, 5–7 μm wide at the inflations, with 4 sterigmata. Basidial repetition and pleurobasidia often frequent.
Distr.: Eur., N. Am. Ref.: 114, 355.
G. pedicellata Bourd. 1922

5a. Spores forked, with twin branches, each part 7.2–10 × 2.5–3.7 μm.
Basidiocarp mucous-gelatinous, up to 125 μm thick. Hymenial surface even. Hyphae thin-walled, 1.5–7.7 μm wide. Hyphidia simple or branched, 1.5–3.7 μm wide. Basidia urniform to nearly cylindrical, 15–70 × (2.5–)3–6.5 μm, with (2–)4 sterigmata.
Distr.: N. Am. Ref.: 306.
G. geminispora Olive 1954

5b. Spores allantoid, 6.3–7.8 × 2.7–3.3(–4) μm.
Basidiocarp mucous-gelatinous, up to 150 μm thick. Hymenial surface even, sordid tan to plumbeous. Hyphae thin-walled, 1.5–5.5 (–7) μm wide. Hyphidia simple or sparingly branched, 2.5–4 μm wide. Basidia urniform, 15–50 × 4.5–6.8 μm, with 4 sterigmata.
Distr.: N. Am. Ref.: 306, 355.
G. cymosa D.P. Rogers 1944

GLOEOCYSTIDIELLUM Donk 1931

Basidiocarp annual, more rarely perennial, resupinate, effused, hypochnoid, membranaceous, ceraceous or coriaceous. Hymenial surface even to tuberculate, often strongly cracked when dry. Hyphal system monomitic. Hyphae hyaline, with thin or thickened walls, with or without clamps. Gloeocystidia present, typically darkening in sulphobenzaldehyde, thin-walled, with granular

or oily contents. Encrusted cystidia rarely found. Basidia in small clusters, clavate to sometimes urniform, with (2–)4 sterigmata. Spores hyaline, thin-walled, smooth or ornamented, globose to cylindrical, amyloid, ornamentation often soluble in KOH.

Substrate: saprophytic on angiosperms and gymnosperms.
Type species: *Corticium porosum* Berk. & Curt. apud Berk. & Br. 1879
Distribution: in the whole area.
References: 86, 114.

1a. Clamps absent. 2
1b. Clamps present. 9

2a. Spores ornamented in Melzer's. 3
2b. Spores smooth. 6

3a. Encrusted cystidia present, conical, 30–60 × 6–12(–15) μm, immersed or projecting up to 40 μm.
Basidiocarp effused, membranaceous to somewhat ceraceous. Hymenial surface typically strongly tuberculate, whitish to yellowish or pale ochraceous. Margin fibrillose, often with white hyphal strands. Hyphae thin- to somewhat thick-walled, 2–4(–5) μm wide. Gloeocystidia sulpho-positive, 50–120(–200) × 6–13(–15) μm. Basidia 20–30 × 4–6(–7) μm. Spores ellipsoid, warted, 4–6 × 2.5–3.5(–4) μm. On angiosperms and gymnosperms.
Distr.: whole area. Ref.: 114, 368.
G. convolvens (P. Karst.) Donk 1956
Syn.: *Peniophora lundellii* Litsch. apud Lundell & Nannf. 1938
3b. Encrusted cystidia absent. 4

4a. Spores ellipsoid to cylindrical, minutely warted, 6–7(–8) × 3.5–4.5 μm. On Populus tremula.
Basidiocarp effused, ceraceous to thick membranaceous, often layered. Hymenial surface even when young, deeply cracked when dry, pale ochraceous to isabelline. Hyphae thin- to somewhat thick-walled, 2–3(–4) μm wide. Cystidia sulpho-positive, cylindrical, 30–90 × 8–12 μm. Basidia clavate, 20–30 × 4–5 μm.
Distr.: Eur., USSR. Ref.: 114.
G. karstenii (Bourd. & Galz.) Donk 1956
4b. Spores globose to broadly ellipsoid, up to 6 μm long. On gymnosperms. 5

5a. Spores subglobose to broadly ellipsoid, 3.5–4 × 3–3.5 μm, warted.
Basidiocarp effused, soft-membranaceous. Hymenial surface even, later cracked, cream-coloured. Hyphae thin-walled. Gloeocystidia cylindrical to subclavate, often basally swollen, 50–90 × 6–8.5 μm. Basidia narrowly clavate to somewhat urniform, 20–25 × 4.5–5.5 μm.
Distr.: N. Am. Ref.: 176.
G. propinquum (H.S. Jacks. & Dearden) Parm. 1965

5b. Spores globose to broadly ellipsoid, 4.5–6 × 3.7–5 μm, warted.
Basidiocarp effused, at first farinaceous, later continuous. Hymenial surface even, later cracked, whitish to cream coloured. Margin arachnoid to fibrillose. Hyphae thin-walled, 2–3.5(–4) μm wide. Gloeocystidia clavate to subfusiform, (40–)50–100 × 7–16(–18) μm, rarely cylindrical, 80–130 × 6–8 μm. Basidia narrowly clavate, 18–25(–30) × 5–6.5 μm.
Distr.: USSR. Ref.: 313.
G. sibiricum Parm. 1965

6a. Spores globose to ovoid or broadly ellipsoid, at least 4 μm wide, on average broader. Simple hyphidia often present. 7
6b. Spores ellipsoid, up to 4 μm broad. Hyphidia absent. 8

7a. Gloeocystidia bladder-shaped to fusiform with inflated portions, sulpho-negative, with hyaline contents, 35–100(–150) μm long, 10–20 μm wide in the subiculum, 5–10(–14) μm in the hymenium. Cf. *Vesiculomyces citrinus*.
7b. Gloeocystidia narrowly cylindrical, sulpho-positive, with granular yellowish contents, (120–)150–250 × 4–10 μm.
Basidiocarp effused, ceraceous to fleshy. Hymenial surface even, cracked to furrowed when dry, at first whitish, later ochraceous or reddish yellow. Hyphae thin-walled, 1–2.5 μm wide. Hyphidia numerous, 1–2 μm wide. Basidia clavate, sometimes stalked, (20–)40–60 × 5–7 μm. Spores subglobose, ovoid or broadly ellipsoid, (5–)6–8 × 4–5(–6) μm. Mainly on angiosperms.
Distr.: whole area. Ref.: 66, 114.
G. lactescens (Berk.) Boidin 1951
Syn.: *?Corticium epigaeum* Ellis & Everh. 1885; *Gloeocystidiellum orientale* Parm. 1965
Note: *Gloeocystidiellum torrendii* (Bres.) Donk is probably very close or identical. The insufficiently known species differs in the subglobose to broadly ellipsoid spores, 7–10 × 6–8 μm and (?) absence of hyphidia, fide Bourdot & Galzin (32).

8a. Spores narrowly ovoid to ellipsoid, 3–5 × 2–3 μm. On angiosperms.
Basidiocarp effused, ceraceous, hard when dry, layered. Hymenial surface even, whitish to isabelline. Hyphae thin- to thick-walled, 2–4.5 μm wide. Gloeocystidia narrowly cylindrical, 30–70 × 4–6 μm, with yellowish contents. Basidia 15–35 × 3–5 μm.
Distr.: Eur., USSR. Ref.: 32.
G. insidiosum (Bourd. & Galz.) Donk 1956
8b. Spores narrowly ovoid to ellipsoid, 4.5–6 × 3–4 μm. On gymnosperms.
Basidiocarp effused, ceraceous to thick membranaceous, hard when dry, layered. Hymenial surface even to tuberculate, cracked when dry, cream-coloured to ochraceous or ochraceous brown. Hyphae thin- to thick-walled, 2–3.5 μm wide. Gloeocystidia cylindrical, sulpho-positive, with yellowish contents, (30–)40–70 × 4–6 μm.

Basidia subclavate, 20–30 × 4–5 μm. Spores narrowly ovoid to narrowly ellipsoid, 4.5–6 × 3–3.5 μm.
Distr.: Eur., USSR. Ref.: 114.
G. ochraceum (Fr. ex Fr.) Donk 1956
Syn.: *Gloeocystidium friesii* Lundell apud Lundell & Nannf. 1950

9a. Spores ornamented in Melzer's (sometimes difficult to see). 10
9b. Spores smooth. 13

10a. Spores globose to subglobose, echinulate, 5–7 μm wide.
Basidiocarp effused, arachnoid to granulose, later continuous. Hymenial surface even, farinaceous, whitish to cream or somewhat greyish. Hyphae thin-walled, sometimes ampullate, 1.5–3 μm wide. Gloeocystidia cylindrical, with yellowish contents, 30–70(–90) × 4–10 μm, sulpho-positive. Basidia clavate to distinctly urniform, 22–35 × 4–5.5(–6) μm.
Distr.: whole area. Ref.: 66, 114.
G. furfuraceum (Bres.) Donk 1956
10b. Spores ellipsoid to subcylindrical or reniform, minutely to distinctly warted. 11

11a. Spores reniform, warted, 3.5–4.5 × 2–2.5 μm.
Basidiocarp effused, membranaceous to subceraceous. Hymenial surface even, whitish to pale ochraceous or pinkish buff. Hyphae thin-walled, 1.5–2.5 μm wide. Gloeocystidia 20–30 × 3–5 μm, often with 1 or 2 apical bulbs, sulpho-positive. Basidia urniform to subcylindrical, 20–30 × 2.5–4 μm. On gymnosperms.
Distr.: whole area. Ref.: 114, 171.
G. subasperisporum (Litsch.) J. Erikss. & Ryv. 1975
Syn.: *Corticium electum* H.S. Jacks. 1948; *Xenasma amylosporum* Parm. 1968
11b. Spores broadly ellipsoid to subcylindrical. 12

12a. Spores broadly ellipsoid to ellipsoid, warted, 4.5–5.5(–6) × 3–3.8(–4) μm.
Basidiocarp farinaceous to thin membranaceous, separable. Hymenial surface even, white to cream-coloured. Hyphae thin-walled, (1–)1.5–2.5 μm wide, not all septa with clamps. Gloeocystidia subcylindrical or with basal swelling, 18–30 × 5.5–8.5 μm, often with apical bulb or digitiform outgrowth. Basidia urniform to clavate, 12–23 × 4–5.5 μm. On gymnosperms.
Distr.: USSR. Ref.: 318.
G. percuriosum Parm. 1968
12b. Spores ellipsoid to subcylindrical, warted, (3.5–)4.5–6(–8) × 2.5–3.5 (–4) μm. Basidiocarp membranaceous to ceraceous, adnate.
Hymenial surface even to tuberculate, whitish to pale ochraceous. Hyphae thin-walled, 2–3 μm wide. Gloeocystidia cylindrical to

fusoid, often swollen at the base, 50–150 × 8–15 μm, sulpho-positive. Basidia clavate, 12–25 × 3–5 μm. On angiosperms.
Distr.: whole area Ref.: 66, 114.
G. porosum (Berk. & Curt. apud Berk. & Br.) Donk 1931
Syn.: *?Xerocarpus letendrei* P. Karst. 1884; *Corticium stramineum* Bres. apud Brinkm. 1900; *C. vesiculosum* Burt 1926; *C. pruni* Overh. 1929

13a. Spores cylindrical to allantoid, (11–)12–20 × 4.5–7 μm.
Basidiocarp effused, ceraceous to fleshy, often strongly cracked when dry. Hymenial surface even to tuberculate, whitish to pale ochraceous, sometimes ochraceous brown. Hyphae thin-walled, rarely slightly thick-walled, 2–4 μm wide. Gloeocystidia cylindrical, often apically moniliform, with yellowish contents, (35–)70–150(–200) × 6–15(–18) μm, sulpho-positive. Hyphidia often present. Basidia clavate, 30–60 × 6–8(–9) μm. On angiosperms, mainly Alnus, Populus and Salix.
Distr.: whole area. Ref.: 66, 114.
G. leucoxanthum (Bres.) Boidin 1951

13b. Spores ellipsoid, 7–10(–12) × 4.5–5.5(–6) μm.
Basidiocarp effused, ceraceous to fleshy, often cracked when dry. Hymenial surface even to tuberculate, whitish or greyish-white to ochraceous or pale brown. Hyphae with thin or slightly thickened walls, 2–3.5 μm wide. Hyphidia often present. Gloeocystidia cylindrical, often apically moniliform, with yellowish contents, 50–150 × 6–14 μm, sulpho-positive. Basidia clavate, 40–60 × 5–7 μm. On angiosperms.
Distr.: whole area. Ref.: 66, 114.
G. luridum (Bres.) Boidin 1951

GLOEODONTIA Boidin 1966

Basidiocarp annual, resupinate, effused, membranaceous to crustaceous, covered with slender teeth. Hymenial surface pale yellow to greyish orange. Hyphal system monomitic or dimitic. Generative hyphae hyaline, with thin to thickened walls, with clamps. Skeletal-like hyphae pale yellow to brownish, sometimes branched, rarely septate; some may be encrusted. Gloeocystidia present in hymenium and subiculum (often rare), sulpho-positive. Cystidia thick-walled, originating in subiculum, heavily encrusted. Basidia subclavate to urniform, with 4 sterigmata. Spores hyaline to yellowish, with thin to slightly thickened walls, ornamented, ovoid to ellipsoid, amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Irpex discolor* Berk. & Curt. 1873
Distribution: North America.
References: 16, 49.

1a. Spores ovoid to ellipsoid, minutely warted, (3–)3.5–4.5(–5.5) × 2.5–3(–3.5) μm. Skeletal-like hyphae present.

Basidiocarp effused, membranaceous to crustaceous, covered with slender teeth. Teeth acute or somewhat flattened, pale yellow to greyish orange, up to 3 mm long. Margin almost white. Generative hyphae hyaline to yellowish, thin- to somewhat thick-walled, 1–4 μm wide, with clamps. Skeletal-like hyphae pale to strongly yellow, thick-walled, 1.8–4 μm wide, sometimes encrusted, rarely branched or septate. Gloeocystidia rare in subiculum, abundant in hymenium, thin-walled, cylindrical to clavate, often with an apical bulb, 25–70 × 5–10 μm, sulpho-positive. Cystidia thick-walled, heavily encrusted, 6–9 μm wide. Basidia subclavate to urniform, 12–20 × 3.5–4 μm.

Distr.: N. Am. Ref.: 16, 49.

G. discolor (Berk. & Curt.) Boidin 1966

Syn.: *Odontia eriozona* Bres. 1925

1b. Spores ovoid to ellipsoid, minutely warted, 5.5–6.5 × 3.5–4(–4.5) μm. Skeletal-like hyphae absent.

Basidiocarp effused, crustaceous, often cracked, covered with teeth. Teeth irregularly shaped, often concrescent at the base, sometimes branched, fimbriate at the apex, yellowish. Margin white. Generative hyphae hyaline to yellowish, thin- to thick-walled, 2–3 μm wide, occasionally encrusted. Gloeocystidia originating in subiculum or subhymenium, thin-walled, cylindrical, often with apical bulb, 25–60 × 5–10 μm, sulpho-positive. Cystidia heavily encrusted, 7–10 μm wide. Basidia cylindrical to urniform, 20–27 × 5–6 μm.

Distr.: N. Am. Ref.: 49.

G. columbiensis Burt ex Burdsall & Lombard 1976

GLOIODON P. Karst. 1879

Syn.: *Sclerodon* P. Karst. 1889; *Leaia* Banker 1906

Basidiocarp annual, occasionally perennial, effused, effused-reflexed or pileate (sessile), tough, consisting of a dark brown tomentum which may embed ramifying processes, strands or veins. Teeth slender, acute, dark brown, often with whitish bloom. Hyphal system monomitic or imperfectly dimitic. Generative hyphae hyaline, thin-walled, with clamps. Skeletal-like hyphae hyaline to brown, thick-walled to solid, occasionally branched and sometimes septate. Strands consisting of skeletal-like hyphae. Gloeocystidia present in subiculum and hymenium, sulpho-negative. Basidia clavate, with 4 sterigmata. Spores hyaline to pale brownish, thin-walled, subglobose to broadly ellipsoid, minutely ornamented, amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Hydnum strigosus* Swartz ex Fr. 1821

Distribution: in the whole area.
References: 273.

Only one species in the area. Basidiocarp consists of dark brown tomentum surrounding ramifying processes, strands or veins. Teeth arising from the lower strands, slender, acute, up to 3 × 0.2 mm, mummy brown to light grey. Margin fimbriate or tomentose. Abhymenial surface (when exposed) covered with long stiff hairs, consisting of bundles of agglutinated brown hyphae. Generative hyphae hyaline, thin- to thick-walled, 1.8–3.5(–5) μm wide, with clamps. Skeletal-like hyphae hyaline to brown, with sometimes irregularly thickened walls or solid, 2.5–5 μm wide. Gloeocystidia with oily contents, parallel with the central axis, then curving outward and becoming somewhat inflated, up to 18 μm wide. Basidia clavate, with a clamp at the base. Spores hyaline, thin-walled, roughened to warted, subglobose to ellipsoid, 4.5–5.8 × 3.5–4.5 μm, amyloid.
Distr.: whole area. Ref.: 273.
G. strigosus (Swartz ex Fr.) P. Karst. 1879
Syn.: *Hydnum stratosum* Berk. 1845; *Leaia piperata* Banker 1906

HYPHODERMA Wallr. 1833

Syn.: *Kneiffia* Fr. 1836; *Kneiffiella* Underw. 1897; *Kneiffiella* P. Henn. 1897; *Pycnodon* Underw. 1898; *Neokneiffia* Sacc. 1899; *Atheloderma* Parm. 1968; *Metulodontia* Parm. 1968; *Mutatoderma* (Parm.) Gómez apud Gómez & Loewenbaum 1976

Basidiocarp annual, resupinate, effused, membranaceous or somewhat ceraceous, in some species pellicular. Hymenial surface mostly even, in some species tuberculate, grandinioid or odontioid. Hyphal system monomitic. Hyphae hyaline, thin- to somewhat thick-walled, sometimes inflated, with clamps at all primary septa (lacking in one species). Cystidia present in most species, hyaline, thin- or thick-walled, with or without oily material in the contents, smooth or encrusted, some species with echinocysts or stephanocysts. Basidia in clusters, cylindrical to narrowly clavate when young, suburniform when mature, 20–45 μm long, often guttulate, with (2–)4 sterigmata. Spores hyaline, subglobose or ellipsoid to cylindrical, typically thin-walled and longer than 7 μm, with or without guttules, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms, on leaves and occasionally on soil.
Type species: *Hyphoderma spiculosum* Wallr. 1833
Distribution: in the whole area.
References: 114, 191.
Note: The difference between gloeo- and leptocystidia is not always distinct and therefore only the term leptocystidia is used in the key.

1a. Clamps lacking at all primary septa.

Basidiocarp membranaceous, thin (c. 50 μm). Hymenial surface even, whitish when fresh, often pale yellowish when dry. Hyphae thin-walled, 2–3 μm wide. Leptocystidia thin-walled, capitate, the basal part widened, 50–125 μm long, the apical head 6–8 μm wide, the basal part 8–12(–15) μm, basal clamp lacking, smooth or apically with some hyaline, amorphous material, projecting up to 50 μm. Basidia suburniform, the basal part somewhat stalk-like, 30–50 × 9–12 μm, guttulate. Spores subglobose to broadly ellipsoid, thin- to slightly thick-walled, 8–11(–13) × 7–9 μm, guttulate. On gymnosperms.

Distr.: Eur. Ref.: 114.

H. capitatum J. Erikss. & Strid 1975

1b. Clamps present at all primary septa. 2

2a. lamprocystidia or leptocystidia absent, but hyphidia sometimes present (cf. also *Cerocorticium*). 3

2b. Lamprocystidia and/or leptocystidia present. 9

3a. Basal hyphae very thick-walled.

Basidiocarp membranaceous, adnate. Hymenial surface even, cream-coloured. Hyphae hyaline or slightly yellowish, with 1–2 μm thick walls, 4–5 μm wide. Basidia 26–35 × 7–8 μm. Spores broadly ellipsoid, 6–7.5 × 4.5–5.5 μm. On burnt wood.

Distr.: Eur. Ref.: 32.

H. anthracophilum (Bourd. & Galz.) Jülich 1974

3b. Basal hyphae thin- or only slightly thick-walled 4

4a. Hymenial surface odontioid or raduloid. 5

4b. Hymenial surface even. 6

5a. Hymenial surface odontioid. Spores 5.5–7.2 × 3.2–4.8 μm. *H. pruni*, see 28a.

5b. Hymenial surface raduloid. Spores 9–11 × 3–3.5 μm. Cf. *Basidioradulum radula*

6a. Spores broadly ellipsoid. Hyphidia present.

Basidiocarp effused, membranaceous, thin (50–100 μm). Hymenial surface even, white when fresh, mostly cream-coloured when dry. Hyphae hyaline, thin-walled, 2–3 μm wide, with clamps. Hyphidia 2–3 μm wide, not projecting. Basidia 25–35(–40) × 5–7 μm, guttulate. Spores thin-walled, 7–9 × 4–5 μm, guttulate. On gymnosperms.

Distr.: Eur., USSR. Ref.: 114, 318.

H. sibiricum (Parm.) J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

6b. Spores cylindrical to narrowly ellipsoid. Hyphidia lacking. 7

7a. With echinocysts. *H. echinocystis*, see 30b.

7b. Without echinocysts. 8

8a. Spores ellipsoid, 10–14 × 5–6.5 μm.
Basidiocarp effused, membranaceous, c. 100 μm thick. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, thin-walled, 3–4 μm wide, with clamps, smooth or covered with crystals. Basidia 35–50 × 7–10 μm. Spores guttulate.
Distr.: Eur. Ref.: 114.
H. cremeoalbum (Höhn. & Litsch.) Jülich 1974

8b. Spores 7–9 × 3–4 μm.
Basidiocarp effused, ceraceous to crustaceous, thin, adnate. Hymenial surface even, cream-coloured. Hyphae distinct, thin-walled, 2–4 μm wide. Basidia 30–40 × 5.5–6.5 μm.
Distr.: Eur.
H. griseo-flavescens (Litsch. apud Pilát & Lindtner) Jülich 1974

9a. Septocystidia (i.e. with several septa and clamps) present. 10

9b. Septocystidia absent. 11

10a. Spores cylindrical, thin-walled.
Basidiocarp effused, adnate, thin (100 μm) to thick (up to 5 mm). Hymenial surface even or odontioid, often cracked when dry, young white, cream-coloured to ochraceous when old. Hyphae distinct, hyaline, thin- to slightly thick-walled, 3–4 μm wide, with clamps, smooth. Septocystidia hyaline, thick-walled, cylindrical, 70–200 × 8–12 μm, mostly with many clamped septa, often loosely encrusted, projecting up to 100 μm. Basidia 25–30 × 6–7 μm, guttulate. Spores 7–10 × 3–4.5 μm, guttulate.
Distr.: whole area. Ref.: 66, 114, 191, 368.
H. setigerum (Fr.) Donk 1957
Syn.: *Hydnum cristulatum* Fr. 1821; *Thelephora granulosa* Pers. ex Fr. 1821; *T. aspera* Pers. 1822; *H. spiculosum* Wallr. 1833; *Corticium myxosporum* P. Karst. 1882; *C. latitans* P. Karst. 1888; *C. berkeleyi* Cooke apud Massee 1890; *C. chusqueae* Pat. 1893; *Peniophora trachytricha* Ellis & Everh. 1895; *Odontia acerina* Peck 1900; *P. subtestacea* Litsch. 1928; *O. vesiculosa* Burt apud Povah 1929.

10b. Spores ellipsoid, somewhat thick-walled (c. 0.4 μm).
Basidiocarp effused, adnate, soft-membranaceous, 200–300 μm thick (incl. cystidia). Hymenial surface even, hairy, whitish to pale yellowish. Hyphae hyaline, thin-walled and 3–5 μm wide in the hymenial part, thick-walled and 6–10 μm wide near the substrate, with clamps, smooth. Septocystidia somewhat yellowish, thick-walled, cylindrical, 100–200 × 6–10 μm, with several clamped septa, encrusted with small crystals, projecting up to 150 μm. Basidia 17–35 × 4–5 μm. Spores 7–8 × 4–6 μm.

Distr.: whole area. Ref.: 66, 115.
H. polonense (Bres.) Donk 1957
Syn.: *Peniophora canadensis* Burt 1926

11a. Lamprocystidia (i.e. thick-walled and encrusted) present, more or less conical or clavate. 12
11b. Lamprocystidia absent, other cystidia thin-walled (if somewhat thick-walled, then apically blunt). 20

12a. Lamprocystidia and leptocystidia present. 13
12b. Only lamprocystidia present. 17

13a. Spores 7–11 μm long. 14
13b. Spores 10–16 μm long, on average exceeding 11 μm. 15

14a. On Typha.
Basidiocarp membranaceous. Hymenial surface even, pruinose, whitish. Hyphae indistinct, 2–3 μm wide. Lamprocystidia conical, 30–45 × 10–15 μm, enclosed. Leptocystidia irregularly cylindrical, 25–40 × 5–7 μm, immersed. Basidia 15–25 × 6–8 μm. Spores cylindrical and adaxially flattened, or slightly allantoid, 10–11 × × 3.5–4.5 μm.
Distr.: N. Am. Ref.: 368.
H. typhicola (Burt) Donk 1962
Note: Perhaps identical with *H. puberum*.

14b. On wood of angiosperms or gymnosperms.
Basidiocarp somewhat gelatinous to soft-membranaceous when fresh (resembling a *Phlebia*), ceraceous when dry, up to 300 μm thick. Hymenial surface even, whitish when young, becoming greyish-ochraceous; under a lens velutinous. Hyphae hyaline, thin-walled, 3–4 μm wide, with clamps. Lamprocystidia conical, 60–130 × 10–18 μm, heavily encrusted, immersed or projecting up to 70 μm. Leptocystidia few, irregular-cylindrical, 30–60 × 7–10 μm. Stephanocysts sometimes developed. Basidia 20–40 × 5–7 μm. Spores cylindrical to narrowly ellipsoid, 7–11 × 3.5–5 μm, granular or with small guttules.
Distr.: whole area. Ref.: 114, 368.
H. puberum (Fr.) Wallr. 1833
Syn.: *Peniophora puberula* Sacc. 1891; *Hypochnus subtilis* Schroet. 1888; *P. tenella* Burt 1926; *P. tenuissima* Peck 1912

15a. Section of basidiocarp white in colour. On angiosperms (incl. of Populus).

Basidiocarp effused, membranaceous, 100–300 μm thick. Hymenial surface even or rarely somewhat tuberculate, whitish to cream-coloured when fresh, ochraceous and cracked when dry. Hyphae thin- to somewhat thick-walled (up to 0.8 μm), 3–4 μm wide, with clamps. Lamprocystidia few, 30–70 × 7–12 μm, immersed.

Leptocystidia abundant, of very variable shape, cylindrical, moniliform, pyriform, clavate, or capitate, 30–120 × 5–10 μm, immersed or slightly projecting (10–20 μm). Basidia 30–45(–56) × 5–9 μm. Spores cylindrical to slightly allantoid, 12–16 × 3–4.5 μm, contents homogeneous.
Distr.: whole area. Ref.: 114, 289, 368.
H. mutatum (Peck) Donk 1957
Syn.: *Corticium allescheri* Bres. 1898

15b. Section of basidiocarp yellowish-brown, at least the hymenial part. 16

16a. On Populus. In section homogeneous brown.
Basidiocarp membranaceous. Hymenial surface even, strongly cracked when dry, ochraceous. Hyphae with somewhat thickened walls, 2–4 μm wide. Lamprocystidia cylindrical to conical, 30–50 × 5–7 μm, immersed. Leptocystidia few, irregularly cylindrical, 40–100 × 5–8 μm, immersed. Basidia 30–40 × 6–7 μm. Spores cylindrical or slightly allantoid, 10–14 × 3.5–4 μm.
Distr.: N. Am. Ref.: 289, 368.
H. populneum (Peck) Donk 1957

16b. On angiosperms, but not on Populus. In section two-layered, the hymenial part brown, the lower part white.
Basidiocarp membranaceous. Hymenial surface even or somewhat tuberculate, ochraceous. Hyphae thin-walled, 4–6 μm wide, the basal ones hyaline, in the subhymenium yellowish. Lamprocystidia often yellowish, clavate or conical, 25–60 × 7–11 μm, immersed or slightly projecting. Leptocystidia hyaline, except for the basal part which is often yellowish, irregularly cylindrical or clavate, 30–80 × 8–16 μm. Basidia 20–45 × 5–7 μm. Spores hyaline, cylindrical or slightly allantoid, 11–16 × 3.5–5 μm.
Distr.: Eur., N. Am. Ref.: 289, 368.
H. heterocystidium (Burt) Donk 1957
Syn.: *Peniophora kauffmanii* Burt 1925

17a. Spores 7–11 μm long. 18
17b. Spores 3–6 μm long. 19

18a. Cystidia thick-walled (1–2 μm). *H. puberum*, see 14b.
18b. Cystidia with thinner walls (0.4–1 μm). *H. guttuliferum*, see 37b.

19a. Spores ellipsoid, 4–6 × 2.5–3.5 μm.
Basidiocarp membranaceous. Hymenial surface even to somewhat tuberculate, cream-coloured to ochraceous. Hyphae hyaline, thin-walled, 2–4 μm wide. Lamprocystidia clavate, 20–100 × 5–12 μm, projecting up to 50 μm. Some subulate cystidioles, probably young stages of lamprocystidia, c. 20 × 6 μm, are sometimes present. Basidia 18–25 × 4–5 μm.
Distr.: Eur. Ref.: 115, 191, 368.
H. karstenii Jülich 1974

Syn.: *Kneiffia nivea* P. Karst. 1896, non *H. niveum* Fuckel 1869

Note: *Hyphoderma fouquieriae* Nakasone & Gilberts. 1978 also keys out here. It has straw yellow hyphal strands, mainly present under the basidiocarp and in the decayed wood. The spores are ellipsoid to subcylindrical, 5–6 × 3–4 μm.

19b. Spores ellipsoid to subcylindrical, slightly curved, 3.5–4.5(–5) × (1.8–)2–2.5 μm. Cf. *Phlebia cremeo-alutacea*

20a. Leptocystidia often constricted to somewhat monilioid. 21
20b. Leptocystidia not constricted. 23

21a. Hymenial surface even. 22
21b. Hymenial surface raduloid. *Cf. Basidioradulum radula*

22a. Spores cylindrical to allantoid, 12–16 × 3–4.5 μm. *H. mutatum*, see 15a.
22b. Spores cylindrical, 8–10(–12) × 3–4 μm.

Basidiocarp effused, soft-membranaceous, 100–300 μm thick. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled, 3–4 μm wide, with clamps. Leptocystidia thin-walled, cylindrical, but with several constrictions, some more or less monilioid, 50–120 × 5–7 μm. Basidia 20–25 × 5–6 μm. Spores guttulate.

Distr.: Eur., N. Am. Ref.: 114, 318.

H. litschaueri (Burt) J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

Syn.: *Corticium niveum* Bres. 1903, non *Hyphoderma niveum* Fuckel 1869; *Basidioradulum alienum* Parm. 1968; *Hyphoderma bresadolae* Jülich 1974

23a. Basal hyphae very large, up to 8–10 μm wide, slightly thick-walled, distinct, the cells rather short, with clamps.

Basidiocarp thin, ceraceous. Hymenial surface even, white to ochraceous. Hyphae of the subhymenium 3–4 μm wide. Leptocystidia thin- to slightly thick-walled, smooth or loosely encrusted, 45–60 × 8–12 μm, projecting up to 30 μm. Basidia 20–30 × 4.5–5.5 μm, guttulate. Spores cylindrical and adaxially flattened or ellipsoid, 4–6 × 2.5–3 μm.

Distr.: N. Am. Ref.: 170.

H. probatum (H.S. Jacks.) Jülich 1974

23b. Basal hyphae not conspicuous, distinct or indistinct, 2–6 μm wide (in some species the septal part of the hypha is inflated to up to 10 μm, the rest of the hypha remaining narrow). 24

24a. All leptocystidia distinctly capitate; encrusted hyphal tips also present in the hymenium.

Basidiocarp effused, ceraceous, thin (50 μm). Hymenial surface even, greyish. Hyphae thin-walled, 2–2.5 μm wide, with clamps. Leptocystidia 40–80 × 6–14 μm, widest at the base, the apical heads often surrounded by non-crystalline substances. Basidia 20–35 × 6–9 μm, guttulate. Spores broadly ellipsoid, 7–10 × 5–6 μm, guttulate.

Distr.: Eur. Ref.: 114.

H. orphanellum (Bourd. & Galz.) Donk 1957

24b. Leptocystidia not capitate, or if capitate, then occurring with other forms of cystidia. 25

25a. Leptocystidia (gloeocystidia) narrow, the basal part not wider than 3–5 μm. 26

25b. Leptocystidia (gloeocystidia) wider, the basal part 6–14 μm wide. 29

26a. Echinocysts present on the hyphae, consisting of a globose or subglobose cell 3.5–5.5 μm in diam., sessile or terminal on short branches, with spines (0.7–1.5 μm long) on the surface, and a basal clamp.

Basidiocarp subpellicular to soft-membranaceous, 80–150 μm thick. Hymenial surface even, cream-coloured, not cracked when dry. Hyphae hyaline, thin-walled and 2.5–3.5 μm wide in the subhymenium, thick-walled (0.5–1.0 μm) and 3.5–5.0 μm wide in the trama, with clamps. Leptocystidia hyaline, thin-walled or slightly thick-walled near the base, subulate, 30–45 × 3–4.5 μm, projecting up to 20 μm. Basidia 14–26 × 5.5–8 μm. Spores ellipsoid, 6–8 × 4–5 μm, guttulate. On gymnosperms.

Distr.: N. Am. Ref.: 170.

H. comptum (H.S. Jacks.) Jülich 1976

26b. Echinocysts absent. 27

27a. Spores 11–14 μm long. *H. definitum*, see 49a.

27b. Spores not exceeding 8 μm in length. 28

28a. Hymenial surface odontioid, white to mostly cream-coloured. Spores ellipsoid, 5.5–7.2 × 3.2–4.8 μm, guttulate.

Basidiocarp effused, soft when fresh, somewhat crustaceous when dry. Hymenial surface white to cream-coloured. Hyphae hyaline, thin- to slightly thick-walled, 2–3 μm wide, with clamps. Leptocystidia thin-walled, irregularly cylindrical or somewhat capitate, 20–44 × 4–5 μm, smooth, not or only slightly projecting. Basidia 24–32 × 4–5.5 μm. On angiosperms.

Distr.: Eur. Ref.: 115.

H. pruni (Lasch apud Rabenh.) Jülich 1974

Syn.: *Odontia bugellensis* Ces. apud Rabenh. 1855

28b. Hymenial surface even, mostly chalky white. Spores broadly ellipsoid, 4.5–6 × 3.5–4.5 μm, guttulate.

Basidiocarp effused, soft-membranaceous when fresh, somewhat crustaceous when dry, 100–300 μm thick. Hymenial surface in old collections often ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 2.5–4 μm wide, with clamps. Leptocystidia hyaline, thin-walled, subulate or capitate, 20–50 × 3.5–5 μm, immersed or slightly projecting. Basidia 20–30 × 4–5.5 μm. Mainly on Sambucus.

Distr.: whole area. Ref.: 66, 115, 368.

H. sambuci (Pers. ex Pers.) Jülich 1974

Syn.: *Thelephora sera* Pers. ex Pers. 1822; *Corticium cretaceum* (Fr. ex Sacc.) Cooke 1891; *C. chrysanthemi* Plowr. 1905; *C. harioti* Bres. 1920; *Peniophora irregularis* Burt 1926; *P. thujae* Burt 1926

29a. Echinocysts present. 30

29b. Echinocysts absent. 31

30a. Hymenial surface even. Leptocystidia fusiform, 50–60(–90) μm long, distinctly projecting; capitate cystidia in the trama, apically surrounded with reddish brown material. Spores cylindrical, 7–9(–10) × 2.5–3.5(–4) μm. *H. pallidum*, see 41a.

30b. Hymenial surface odontioid. Leptocystidia cylindrical, 30–50 × 5–10 μm, not or only slightly projecting; no capitate cystidia in the trama. Spores slightly allantoid, 9–11 × 2.5–3 μm, guttulate.

Basidiocarp effused, membranaceous. Hymenial surface odontioid, the teeth 1–2 μm long, cream-coloured to ochraceous. Hyphae hyaline, thin-walled, 3–4 μm wide, with clamps. Echinocysts laterally on subhymenial and tramal hyphae, subglobose, c. 10 μm in diam., with 1–2 μm long warts on the surface, contents dense, with brownish material. Basidia 25–30 × 6–7 μm. On angiosperms.

Distr.: Eur. Ref.: 114.

H. echinocystis J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

31a. Spores up to 10 μm long *and* up to 3 μm wide. 32

31b. Spores 10–13–15 μm long *or* broader than 3 μm. 35

32a. Basidiocarp pellicular to thin-membranaceous, with narrow hyphal strands.

Hymenial surface even, whitish. Hyphae hyaline, thin-walled, 3–4 μm wide, with clamps. Leptocystidia more or less cylindrical, the basal part slightly thick-walled, 40–80 × 6–8 μm, 20–30 μm projecting. Basidia 24–30 × 5.5–6.5 μm. Spores cylindrical, 6.5–8.5 × 2.5–3 μm, guttulate.

Distr.: USSR. Ref.: 186, 318.

H. orientale (Parm.) Jülich 1974

32b. Basidiocarp membranaceous, hyphal strands lacking. 33

33a. Leptocystidia somewhat thick-walled, the basal part often furcate. *H. deserticola*, see 37a.

33b. Leptocystidia thin-walled, the basal part not furcate. 34

34a. Spores cylindrical, 7–9(–10) × 2.5–3.5(–4) μm. Leptocystidia 50–60(–90) × 6–8 μm. *H. pallidum*, see 41a.

34b. Spores somewhat allantoid, 6–8 × (1.5–)2–2.5 μm, guttulate. Leptocystidia 60–120 × 6–8(–10) μm, projecting up to 80 μm.

Basidiocarp effused, soft-membranaceous, c. 100 μm thick. Hymenial surface even, young whitish, ochraceous when mature. Hyphae 3–4 μm wide. Sometimes small capitate cystidioles present in the hymenium. Basidia 16–27 × 4–5(–6) μm.
Distr.: Eur. Ref.: 114.
H. macedonicum (Litsch.) Donk 1957

35a. Leptocystidia distinctly clavate *or* somewhat thick-walled. 36
35b. Leptocystidia thin-walled or only the basal part somewhat thick-walled, cylindrical or basally widened to fusiform. 38

36a. Leptocystidia somewhat thick-walled. 37
36b. Leptocystidia clavate, thin-walled, 40–120 × 10–16 μm, smooth, but apically often covered with brownish, amorphous material.
Basidiocarp effused, membranaceous. Hymenial surface even or rarely somewhat tuberculate, white to cream-coloured. Hyphae hyaline, 3–4 μm wide, with clamps. Basidia 25–35 × 6–8 μm. Spores cylindrical, 8–12 × 4.2–4.8 μm, guttulate.
Distr.: Eur., N. Am. Ref.: 114, 368.
H. clavigerum (Bres.) Donk 1957

37a. Leptocystidia fusiform, the basal part may be furcate, 40–100 × 4.5–12 μm, with a basal clamp, smooth, projecting up to 60 μm.
Basidiocarp membranaceous. Hymenial surface even, pinkish cinnamon. Hyphae hyaline, the basal ones thick-walled (0.7–1(–2) μm), 4–5(–9) μm wide. Basidia 20–24 × 4.7–6 μm. Spores narrowly ellipsoid, 5–7 × 2.5–3.8 μm, some guttulate. On gymnosperms (Juniperus).
Distr.: Eur., N. Am. Ref.: 114, 133.
H. deserticola Gilberts. & Lindsey 1975
Syn.: *H. luridum* (Bourd. & Galz.) J. Erikss. & Hjortstam apud J. Erikss. & Ryv. 1976.
Note: When spores and basidia larger, cf. *H. amoenum* under 39a.
37b. Leptocystidia cylindrical, the basal part not furcate, 60–80 × 10–20 μm, with a basal clamp, the apical part densely covered with crystals, projecting up to 40 μm.
Basidiocarp effused, membranaceous. Hymenial surface even, whitish to ochraceous. Hyphae hyaline, thin-walled, 3–4(–5) μm wide, with clamps. Basidia 20–30 × 5–6 μm. Spores cylindrical to slightly allantoid, 9–12 × 3–4 μm, guttulate.
Distr.: Eur., N. Am. Ref.: 114, 368.
H. guttuliferum (P. Karst.) Donk 1962

38a. Leptocystidia fusiform, or the basal part distinctly widened. 39
38b. Leptocystidia more or less cylindrical. 44

39a. Spores cylindrical, 11–16 × 4.5–6.5 μm, with small apiculus.

Basidiocarp membranaceous. Hymenial surface even, yellowish-ochraceous. Hyphae thin- to slightly thick-walled, 3–4(–5) μm wide, with clamps. Leptocystidia fusiform, the basal part often rather wide, 70–110 × 6–12 μm. Basidia 28–45 × 8–10 μm, guttulate.
Distr.: N. Am. Ref.: 249, 368.
H. amoenum (Burt) Donk 1957
Syn.: *Peniophora investiens* Burt 1926; *P. montana* Burt 1926; *Corticium subalbum* Burt 1926; *C. pilosum* Burt 1926

39b. Spores up to 11 μm long. 40

40a. Spores up to 4 μm broad. 41
40b. Spores 4–5 μm broad. 42

41a. Leptocystidia more or less fusiform, 50–60(–90) × 6–8 μm. Echinocysts sometimes present.
Basidiocarp effused, soft-membranaceous when fresh, firm-membranaceous when dry, thin (up to 100 μm). Hymenial surface even, at first whitish, later ochraceous, under higher magnification dotted with some reddish-brown material. Hyphae hyaline, thin-walled, 3–4 μm wide. Small, capitate cystidioles present in the trama, apically always with excreted masses of reddish-brown material. Echinocysts rare, on short side branches of the hyphae, c. 10 × 5 μm, with a basal clamp. Basidia 22–25(–30) × 5–6 μm. Spores cylindrical, 7–9(–10) × 2.5–3.5(–4) μm, guttulate.
Distr.: whole area. Ref.: 66, 114, 127.
H. pallidum (Bres.) Donk 1957
Syn.: *Corticium ochrofarctum* Burt 1926; *Peniophora gilva* Bourd. & Galz. 1928

41b. Leptocystidia cylindrical or somewhat fusiform, the apical part sometimes broadened, the basal part somewhat thick-walled, 80–160 × 10–13 μm, projecting up to 100 μm.
Basidiocarp effused, firm-membranaceous, 100–200 μm thick. Hymenial surface even, whitish to pale ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 3–4 μm wide, with clamps. Basidia 23–32 × 5–6.5 μm, guttulate. Spores cylindrical to narrowly ellipsoid, 5.5–7 × 3–3.5 μm, guttulate.
Distr.: Eur. Ref.: 115.
H. deviatum (Lundell) Parm. 1968

42a. Leptocystidia very wide at the base, the apical part more or less cylindrical, 100–200 × 10–20 μm, thin-walled, projecting up to 120 μm.
Basidiocarp effused, membranaceous, 100–200 μm thick. Hymenial surface even, whitish, greyish or ochraceous, pilose under a lens. Hyphae hyaline, thin-walled, 2.5–3.5 μm wide. Basidia 25–30 × 5–6 μm, some guttulate. Spores ellipsoid, 6–9 × 4–5 μm, some guttulate.
Distr.: whole area. Ref.: 66, 114, 127, 368.
H. argillaceum (Bres.) Donk 1957

Syn.: *Kneiffia carneola* Bres. 1903; *Peniophora fusca* Burt 1926; *P. reticulata* Wakef. 1952

42b. Leptocystidia 50–100 μm long. 43

43a. Leptocystidia of two kinds, one fusiform (50–80 × 6–9 μm), the other capitate (30–50 × 5–8 μm), the latter always with a large cap of brown, resinous, amorphous material.

Basidiocarp effused, membranaceous, 50–100 μm thick. Hymenial surface even, whitish to pale ochraceous. Hyphae hyaline, 3–4 μm wide, with relatively small clamps. Basidia 25–35 × 6–7 μm, guttulate. Spores ellipsoid, 8–10 × 4–5 μm, guttulate. On gymnosperms.

Distr.: Eur., N. Am. Ref.: 114.

H. tsugae (Burt) J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

43b. Leptocystidia of two or three kinds, but not as above.

Basidiocarp effused, ceraceous, 100–200 μm thick. Hymenial surface even, whitish to ochraceous. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia thin-walled: a) cylindrical to slightly fusiform, enclosed, 50–100 × 8–12 μm; b) capitate, the apical part sometimes with crystals, projecting, 10–90 × 6–10 μm; c) stephanocysts mostly very rare, ellipsoid to pyriform, 10–12 μm in diam. Basidia 22–28 × 6–7 μm. Spores narrowly ellipsoid, 8–11 × 4–5 μm, guttulate.

Distr.: whole area. Ref.: 2, 42, 66, 114.

H. praetermissum (P. Karst.) J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

Syn.: *Corticium tenue* Pat. 1885 sensu auct.; *C. pertenue* P. Karst. 1890; *C. flavicans* Bres. 1920; *Sebacina africana* Burt 1926; *Peniophora albugo* Burt 1926; *P. taxodii* Burt 1926; *Gloeocystidium calicifera* Litsch. 1928

44a. Spores broadly ellipsoid. 45

44b. Spores allantoid to cylindrical or narrowly ellipsoid. 47

45a. Spores with somewhat thickened walls, broadly ellipsoid, 6–9 × 4–5 μm.

Basidiocarp effused, soft-membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 2–4 μm wide. Leptocystidia somewhat thick-walled over the whole length, the apical part somewhat monilioid, 60–90 × 6–10 μm, projecting up to 50 μm. Basidia 20–35 × 5–7 μm.

Distr.: N. Am. Ref.: 127, 368, 406.

H. pilosum (Burt) Gilberts. & Budington 1970

45b. Spores thin-walled. 46

46a. On gymnosperms

Basidiocarp effused, ceraceous, up to 100 μm thick. Hymenial surface even, whitish, greyish or cream-coloured. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia broadly cylindrical to

slightly clavate, 50–70(–90) × 8–10(–15) μm. Basidia 30–35 × 6–8 μm. Spores broadly ellipsoid, 8–10 × 5–6.5 μm.
Distr.: Eur., USSR. Ref.: 105, 114.
H. obtusum J. Erikss. 1958
Note: Very similar to *H. lapponicum*, which has slightly larger spores.

46b. On angiosperms.
Basidiocarp effused, ceraceous, up to 100 μm thick. Hymenial surface even, yellowish grey to ochraceous. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia more or less cylindrical, 30–80 × 5–12 μm. Basidia 20–25 × 6–7 μm. Spores broadly ellipsoid, 8–12 × 6–7 μm.
Distr.: Eur. Ref.: 114, 358.
H. lapponicum (Litsch.) Ryv. 1971

47a. Spores broadly cylindrical to ellipsoid, 7–8.5 × 3–3.7 μm. Hyphal strands thin, white.
Basidiocarp effused, pellicular to slightly ceraceous, thin. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia more or less cylindrical, thin-walled, except for the up to 0.5 μm thick basal part, 40–90 × 5.5–6.5 μm, projecting up to 40 μm. Basidia 22–30 × 5.5–6.5 μm.
Distr.: USSR. Ref.: 115, 186.
H. mirabile (Parm.) Jülich 1974

47b. Spores at least 9 μm long. 48

48a. Spores 3–4 μm broad. 49
48b. Spores 4–5.5(–7) μm broad. 50

49a. Basidiocarp thin (c. 50 μm). Leptocystidia cylindrical, 50–75 × 6–7 μm.
Basidiocarp effused, membranaceous. Hymenial surface even, greyish white. Hyphae hyaline, thin-walled, 2–3(–4) μm wide. Basidia 25–30(–40) × 6–8 μm, guttulate. Spores cylindrical to somewhat allantoid, 11–14 × 3–3.5(–4) μm, guttulate. On gymnosperms.
Distr.: Eur., N. Am. Ref.: 114, 127, 170.
H. definitum (H.S. Jacks.) Donk 1957

49b. Basidiocarp thicker (c. 100 μm). Leptocystidia cylindrical, 50–130 × 6–8 μm.
Basidiocarp effused, ceraceous. Hymenial surface even, cream-coloured to ochraceous, often with rose-coloured patches. Hyphae hyaline, thin-walled, 3–5 μm wide. Basidia 25–35 × 6–8 μm, guttulate. Spores cylindrical to slightly allantoid, 9–12 × 3–4 μm, guttulate.
Distr.: Eur., USSR. Ref.: 114.
H. roseocremeum (Bres.) Donk 1957

50a. Leptocystidia 80–150 μm long 51
50b. Leptocystidia up to 80 μm long. 53

51a. Leptocystidia 60–100 μm long. 52

51b. Leptocysticia more or less cylindrical, the basal part somewhat thick-walled, 90–150 × 10–12 μm, projecting up to 60 μm.

Basidiocarp effused, membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, thin-walled, 2.5–3.5 μm wide. Leptocystidia as above or also some immersed, clavate, 50–80 × 4–6 μm. Basidia 25–40 × 5–6 μm, guttulate. Spores cylindrical, 10–14 × 4.5–5 μm, guttulate.

Distr.: Eur. Ref.: 162.

H. subclavigerum K.-H. Larsson & Hjortstam 1978

Note: Perhaps identical with *H. medioburiense*.

52a. Spores narrowly ellipsoid, 8–11 × 4–5 μm. *H. praetermissum*, see 43b.

52b. Spores cylindrical to slightly allantoid, 10–17 × 4–5.5 μm, guttulate.

Basidiocarp effused, membranaceous. Hymenial surface even, yellowish ochraceous. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia thin-walled, cylindrical, 60–100 × 7–10 μm. Basidia 30–40 × 7–8 μm, guttulate with (2–)4 sterigmata.

Distr.: Eur., N. Am. Ref.: 114, 368.

H. medioburiense (Burt) Donk 1957

Syn.: *Gloeocystidium subargillaceum* Litsch. 1938

53a. Spores narrowly ellipsoid, 10–14 × 5–7 μm, guttulate.

Basidiocarp effused, membranaceous, c. 100 μm thick. Hymenial surface even, white to cream-coloured. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia thin-walled, cylindrical, 50–80 × 8–12 μm, projecting up to 50 μm. Basidia 30–40 × 8–9 μm, guttulate.

Distr.: Eur. Ref.: 114.

H. obtusiforme J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

53b. Spores slightly allantoid to cylindrical or narrowly ellipsoid, 13–15 × 4.5–5.5 μm.

Basidiocarp effused, membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, thin-walled, 3–4 μm wide. Leptocystidia irregularly cylindrical or slightly capitate, 55–80 × 6–11 μm. Basidia 38–54 × 7–8.5 μm.

Distr.: Eur., N. Am. Ref.: 177.

H. assimile (H.S. Jacks. & Dearden) Donk 1957

Syn.: *?H. subdefinitum* J. Erikss. & Strid apud J. Erikss. & Ryv. 1975

HYPHODERMELLA J. Erikss. & Ryv. 1976

Basidiocarp annual, resupinate, effused, crustaceous, rhizomorphs lacking. Hymenial surface odontioid, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, without clamps. Cystidia lacking, but teeth with encrusted hyphal fascicles present. Basidia suburniform, 4-spored. Spores hyaline, ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Grandinia corrugata* Fr. 1874
Distribution: Europe.
References: 115.

Monotypic. Basidiocarp effused, at first orbicular, later confluent, ceraceous-crustaceous. Hymenial surface odontioid, cream-coloured. Hyphae thin-walled, 2–4 μm wide. Fimbriate apices of teeth with strongly encrusted, cylindrical, projecting hyphae. Basidia suburniform, 35–50 × 6–7 μm. Spores ellipsoid, 7–10(–12) × 4–6(–7.5) μm.
Distr.: Eur. Ref.: 115.
H. corrugata (Fr.) J. Erikss. & Ryv. 1976

HYPHODONTIELLA Strid 1975

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even, pale-coloured. Hyphal system monomitic. Hyphae hyaline, thin- to somewhat thick-walled, with clamps and numerous secondary septa. Cystidia lacking. Basidia narrowly clavate, 4-spored. Spores hyaline, thin-walled, smooth, ovoid to subfusiform, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Hyphodontiella multiseptata* Strid 1975
Distribution: Europe.
References: 115.

Monotypic. Basidiocarp effused, at first orbicular, later confluent. Hymenial surface even, whitish to pale yellowish. Hyphae hyaline, distinct, slightly thick-walled in the subiculum, 2–3 μm wide, with scattered clamps and numerous secondary septa lacking clamps. Cystidia absent. Basidia narrowly clavate, 12–15(–20) × 4.5–6 μm. Spores ovoid to subfusiform, 5.5–6.5 × 3–3.5 μm.
Distr.: Eur. Ref.: 115, 373.
H. multiseptata Strid 1975

HYPOCHNELLA J. Schroet. apud Cohn 1888

Basidiocarp annual, resupinate, hypochnoid, separable. Hymenial surface even to discontinuous. Hyphal system monomitic. Hyphae hyaline to brownish, thin- to slightly thick-walled, branching at right angles, without clamps. Cystidia absent. Basidia in candelabrum-like clusters, short-cylindrical to subclavate, often somewhat sinuous, more rarely somewhat constricted, with 4 sterigmata. Spores violaceous when fresh, yellowish brown when dry, ellipsoid to subcylindrical, smooth, with thickened walls. Reaction with Melzer's indistinct.

Substrate: saprophytic on wood of angiosperms.

Type species: *Hypochnella violacea* (Auersw.) ex J. Schroet. 1888
Distribution: Europe, North America.
References: 115.

Monotypic. Basidiocarp hypochnoid, separable. Hymenial surface even, sometimes discontinuous, violaceous when fresh, yellowish brown when dry. Subiculum whitish, loose. Subicular hyphae thin- to slightly thick-walled, hyaline, 4–8(–9) μm wide, often with small crystals, branching at right angles. Subhymenial hyphae 4–6 μm wide. Basidia subclavate to short cylindrical, 17–25(–35) × 5–7.5 μm, sterigmata up to 7 μm long. Spores violaceous when fresh, yellowish brown when dry, ellipsoid to cylindrical, 6–8 × 3–4.5(–5) μm, not reacting with KOH.
Distr.: Eur., N. Am. Ref.: 115.
H. violacea (Auersw.) ex J. Schroet. 1888

HYPOCHNICIUM J. Erikss. 1958

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even, warted or odontioid, pale-coloured. Hyphal system monomitic. Hyphae hyaline, thin- to somewhat thick-walled, with clamps. Leptocystidia or gloeocystidia often present. Basidia narrowly clavate, with a basal clamp and 4 sterigmata. Spores hyaline, globose to ellipsoid or pyriform, with smooth or warted thickened walls, not amyloid, cyanophilous.

Substrate: saprophytic on wood of angiosperms or gymnosperms, rarely on soil.
Type species: *Thelephora bombycina* Sommerf. ex Fr. 1828
Distribution: in the whole area.
References: 66, 115.

1a. Cystidia absent. 2
1b. Cystidia present. 4

2a. Spores globose, roughened, 7–8 μm in diam.
Basidiocarp effused, membranaceous. Hymenial surface even, cream-coloured to pale ochraceous, often with a salmon tinge. Hyphae thin- to somewhat thick-walled, 3–5 μm wide. Basidia narrowly clavate, 40–60 × 5–6 μm. Chlamydospores usually present in the basidiocarp, broadly ellipsoid, thick-walled, smooth, 7–10 × 6–8 μm.
Distr.: Eur., N. Am. Ref.: 66, 115, 301.
H. vellereum (Ellis & Cragin) Parm. 1968
2b. Spores ellipsoid. 3

3a. Spores broadly ellipsoid, smooth, 6–7 × 5–5.5 μm.
Basidiocarp effused, membranaceous. Hymenial surface even or tuberculate to reticulate, whitish to cream-coloured. Hyphae thin- to slightly thick-walled, 3–5 μm wide. Basidia narrowly clavate, 25–35 × 5–7 μm.

Distr.: Eur., N. Am. Ref.: 66, 115.
H. lundellii (Bourd.) J. Erikss. 1958

3b. Spores broadly ellipsoid to somewhat pyriform, smooth, 8–11 × 6–8 μm. Basidiocarp effused, membranaceous, sometimes thick (up to 2.5 mm). Hymenial surface even to tuberculate, whitish to cream-coloured. Hyphae thin- to thick-walled, 3–6 μm wide. Basidia narrowly clavate, 30–65 × 6–8.5 μm.
Distr.: Eur. Ref.: 66, 115.
H. bombycinum (Sommerf. ex Fr.) J. Erikss. 1958

4a. Spores smooth. 5
4b. Spores roughened or warted. 8

5a. Spores globose to subglobose, 5–7.5 × 4–6 μm.
Basidiocarp effused, membranaceous to subceraceous. Hymenial surface even or tuberculate, whitish to cream-coloured. Hyphae thin-walled, 3–4 μm wide. Cystidia thin-walled, smooth, cylindrical to somewhat fusiform, 50–200 × 6–12 μm. Basidia suburniform to subclavate, 25–35 × 6–8 μm.
Distr.: Eur. Ref.: 66, 115.
H. sphaerosporum (Höhn. & Litsch.) J. Erikss. 1958
5b. Spores ellipsoid. 6

6a. Cystidia at least apically with several constrictions, thin-walled, 60–85 × 5–10 μm, smooth or slightly encrusted.
Basidiocarp effused, membranaceous. Hymenial surface even to tuberculate, whitish to cream-coloured or pale ochraceous. Hyphae thin-walled, 2.5–4 μm wide. Basidia clavate, 40–45 × 8–11 μm. Spores broadly ellipsoid, 9–12 × 5.5–8.5 μm.
Distr.: N. Am. Ref.: 132.
H. prosopidis Burdsall apud Gilberts. Burdsall & Canfield 1976
6b. Cystidia without bead-like constrictions. 7

7a. Spores ellipsoid, 6–7.5(–9) × 4–4.5(–5) μm.
Basidiocarp effused, membranaceous to subceraceous. Hymenial surface even to tuberculate, whitish to cream-coloured. Hyphae thin- to somewhat thick-walled, 3–5 μm wide. Cystidia thin-walled, cylindrical, smooth, 80–125 × 6–8 μm. Basidia narrowly clavate, 20–30 × 5–6 μm.
Distr.: Eur., N. Am. Ref.: 66, 115.
H. geogenium (Bres.) J. Erikss. 1958
Syn.: *Gloeocystidium inaequale* Höhn. & Litsch. 1907; *Peniophora albostraminea* Bres. 1925
7b. Spores broadly ellipsoid, 8–10(–12) × 6–7(–9) μm. *H. eichleri*, see 9b.

8a. Gloeocystidia numerous, sulpho-positive, fusiform, c. 200 × 10 μm.
Basidiocarp effused, membranaceous to subceraceous. Hymenial surface even or tuberculate, whitish to pale ochraceous. Hyphae

thin-walled, 2–4 μm wide. Basidia narrowly clavate, 50–75 × 6–9 μm. Spores subglobose to broadly ellipsoid, warted, 7.5–10 × 7–8 μm.

Distr.: whole area. Ref.: 66, 115.

H. analogum (Bourd. & Galz.) J. Erikss. 1958

8b. Sulpho-positive gloeocystidia absent, but leptocystidia present. 9

9a. Spores broadly ellipsoid, warted, (5–)5.5–7(–7.5) × 4.5–5 μm. Basidiocarp effused, membranaceous. Hymenial surface even to tuberculate, whitish to cream-coloured. Hyphae thin- to sometimes thick-walled, 3–5 μm wide. Cystidia thin-walled, fusiform, smooth, 70–150 × 7–10 μm. Basidia narrowly clavate, 30–40 × 6–7 μm. Mainly on gymnosperms, but also on angiosperms.

Distr.: Eur., N. Am. Ref.: 66, 115.

H. punctulatum (Cooke) J. Erikss. 1958

Syn.: *Hypochnus cremicolor* Bres. 1903; *Corticium wakefieldii* Bres. 1920; *?Hypochnicium caucasicum* Parm. 1967

9b. Spores broadly ellipsoid, warted, 8–10(–12) × 6–7(–9) μm. Basidiocarp effused, membranaceous. Hymenial surface even to slightly tuberculate, whitish to cream-coloured. Hyphae thin- to somewhat thick-walled, 3–5 μm wide. Cystidia with thin to somewhat thickened walls, fusiform, smooth, 100–150 × 7–10 μm. Basidia narrowly clavate, 25–40 × 6–8 μm. Mainly on angiosperms, but also on gymnosperms.

Distr.: Eur. Ref.: 115.

H. eichleri (Bres.) J. Erikss. & Ryv. 1976

Syn.: *Hypochnus albostramineus* Bres. 1903

HYPOCHNOPSIS P. Karst. 1889

Basidiocarp annual, effused, hypochnoid, separable. Hymenial surface discontinuous to continuous, even to granular to finely papillose. Subiculum loose. Hyphal system monomitic. Hyphae hyaline, thin-walled, with large clamps. Basidia single or in small clusters, clavate, the basal part usually abruptly narrowed (podobasidia), the upper part often constricted. Spores yellowish, thick-walled, smooth, subglobose to ellipsoid, amyloid, violet in KOH.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Hypochnus mustialaensis* P. Karst. 1871
Distribution: Europe, North America.
References: 127.

Monotypic. Basidiocarp effused, hypochnoid, separable. Hymenial surface even to granular or finely papillose, sulphur yellow, yellowish green to olivaceous; margin narrow, white. Subiculum white, loose. Hyphae hyaline, thin-walled, (2–)2.5–4.5(–5.5) μm wide, with large

clamps. Cystidia absent, but protruding immature basidia might be mistaken for them. Basidia 20–35(–40) × 5–7 μm, the basal part 2.5–3.5 μm wide, with 2–4 sterigmata. Spores yellow, thick-walled, subglobose to ovoid or ellipsoid, flattened at one side, rarely minutely reniform, (4.5–)5–6.3(–7) × 3.5–4.5(–5) μm, amyloid (but not all spores), violet in KOH. On angiosperms (mainly Betula) and gymnosperms.
Distr.: Eur., N. Am. Ref.: 41, 127, 387.
H. mustialaensis (P. Karst.) P. Karst. 1889

INTEXTOMYCES J. Erikss. & Ryv. 1976

Basidiocarp annual or perennial, resupinate, effused, ceraceous. Hymenial surface even, warted or odontioid, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, densely interwoven, with clamps. Cystidia absent. Basidia stalked, suburniform, with 4 sterigmata. Spores hyaline, thick-walled, smooth, ellipsoid to ovoid, sometimes subangulate, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Corticium contiguum* P. Karst. 1881
Distribution: in the whole area.
References: 115.

Monotypic. Basidiocarp effused, ceraceous when fresh, becoming hard when dry. Hymenial surface even when young, often becoming warted or odontioid, white to greyish, often with pinkish tinge. Hyphae thin-walled, 1–3 μm wide, some irregular with swellings, others more or less gelatinized. Basidia typically stalked, suburniform, 10–20 × 4–6(–8) μm (without stalk). Spores thick-walled, ellipsoid to ovoid, often subangulate, 4.5–5(–6) × 3.5–4 μm.
Distr.: whole area. Ref.: 115.
I. contiguus (P. Karst.) J. Erikss. & Ryv. 1976

IRPEX Fr. 1825

Basidiocarp annual, effused, effused-reflexed or pileate, coriaceous. Abhymenial surface velutinous to hirsute, pale coloured. Hymenial surface poroid, irpicoid or hydnoid, pale coloured. Hyphal system dimitic. Generative hyphae hyaline, thin- to thick-walled, without clamps. Cystidia thick-walled, encrusted, typicallly cylindrical to fusiform, originating from skeletal or generative hyphae. Basidia in small clusters, clavate to subcylindrical, with 4 sterigmata. Spores hyaline, thin-walled, smooth, ellipsoid to cylindrical or allantoid, not amyloid.

Substrate: saprophytic on wood of angiosperms or gymnosperms.
Type species: *Hydnum lacteum* Fr. ex Fr. 1821
Distribution: in the whole area.
References: 276.

1a. Spores ellipsoid to cylindrical, sometimes slightly curved, (4.9–)5.5–6.5 × (2.2–)2.5–3 μm.

Basidiocarp effused to pileate, sometimes even flabellate. Abhymenial surface velutinous to hirsute, whitish to ochraceous. Hymenial surface irpicoid, hydnoid or poroid, coriaceous to subceraceous, whitish to ochraceous. Ridges or spines up to 5 mm long. Generative hyphae 3–5.5 μm wide, thin- to thick-walled. Skeletal hyphae 3.5–7.2 μm wide. Cystidia thick-walled, encrusted, cylindrical to fusiform, 4–7.5 μm wide. Basidia clavate to subcylindrical, 18–25 × 3–6 μm. On angiosperms, rarely on gymnosperms.

Distr.: whole area. Ref.: 276.

Irpex lacteus (Fr. ex Fr.) Fr. 1825

Syn.: *?Hydnum occarium* Batsch ex Fr. 1821; *?H. pectinatum* Fr. 1821; *H. orbiculatum* Pers. ex Fr. 1821; *Boletus tulipiferae* Schw. 1822; *Irpex sinuosus* Fr. 1828; *I. canescens* Fr. 1828; *H. subresupinatum* Schw. 1832; *I. pallescens* Fr. 1838; *I. hirsutus* Kalchbr. 1879; *I. bresadolae* Schulzer 1885; *I. rimosus* Peck 1890; *I. raduloides* Pilát 1937

1b. Spores ellipsoid, 2.5–4 × 2–3 μm. Cf. *Steccherinum subcrinale*

IRPICODON Pouzar 1966

Basidiocarp annual, effused to effused-reflexed or dimidiate, ceraceous to fleshy. Hymenial surface warted to irpicoid, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Sterile hymenial structures absent. Basidia in clusters, clavate, with 4 sterigmata. Spores hyaline, thin-walled, subcylindrical, smooth, amyloid.

Substrate: parasitic on wood of gymnosperms.
Type species: *Hydnum pendulum* (Alb. & Schw.) ex Fr. 1821
Distribution: Europe, USSR.
References: 115.

Monotypic. Basidiocarp resupinate to dimidiate, rarely more or less stipitate, thin. Abhymenial surface rugose, often zonate, later glabrous, white to yellowish. Hymenial surface warted to irpicoid with flat or lamellate teeth, white to yellowish or pale ochraceous; margin fimbriate. Hyphae 2.5–3.5 μm wide. Basidia clavate, 12–15 × 3–4 μm. Spores subcylindrical, 4.5–5 × 2–2.5 μm.

Distr.: Eur., USSR. Ref.: 115.

I. pendulus (Alb. & Schw. ex Fr.) Pouzar 1966

JAAPIA Bres. 1911

Syn.: *Coniobotrys* Pouzar 1958

Basidiocarp annual, resupinate, effused, floccose or hypochnoid. Hymenial surface even, whitish to yellowish. Hyphal system monomitic. Hyphae hyaline,

thin-walled, with clamps at all septa. Cystidia hyaline, cylindrical or subfusiform, smooth, aseptate, with thin or thickened walls. Basidia in clusters, clavate to cylindrical, somewhat constricted in the middle. Spores hyaline to yellowish, smooth, fusoid to navicular, thin- to thick-walled, cyanophilous, not amyloid, contents sometimes contracting, leaving the ends of the spore empty.

Substrate: saprophytic on wood of angiosperms and especially gymnosperms.
Type species: *Jaapia argillacea* Bres. 1911
Distribution: Europe, North America.
References: 115, 292, 336.

1a. Spores narrowly fusoid, hyaline to yellowish, with thickened walls when mature (ripening process continues after detachment), contents often contracted, leaving the ends of the spore empty, 16–25 × 5–7 μm. Cystidia thin-walled, 60–120 × 5–8 μm.
Basidiocarp hypochnoid to floccose, loosely adnate. Hymenial surface even, whitish to pale ochraceous. Hyphae 2.5–5 μm wide. Basidia 30–65 × 6–8 μm.
Distr.: Eur., N. Am. Ref.: 66, 115, 292.
J. argillacea Bres. 1911

1b. Spores fusoid, hyaline to yellowish, thick-walled, contents never contracted, (9.5–)12–18 × 4–6(–8) μm. Cystidia at least basally with thickened walls, 95–360 × 6–12 μm.
Basidiocarp hypochnoid to floccose, separable. Hymenial surface even, whitish to isabelline. Hyphae 3–6(–12) μm wide. Basidia 18––48 × 5–10 μm.
Distr.: Eur., N. Am. Ref.: 115, 292.
J. ochroleuca (Bres. apud Brinkmann) Nannf. & J. Erikss. 1953

KAVINIA Pilát 1938

Incl.: *Hydnocristella* Petersen 1971.

Basidiocarp annual, resupinate, effused, byssoid to pellicular, green in 10% $FeSO_4$. Hymenial surface typically hydnoid. Hyphal strands usually present. Hyphal system monomitic. Hyphae hyaline, with thin to somewhat thickened walls, often distinctly swollen at the septa, with clamps, smooth or encrusted, often cyanophilous. Cystidia absent. Basidia single or in small clusters, clavate to subcylindrical, with 4 sterigmata. Spores hyaline to greenish, smooth or warted, with thin or somewhat thickened walls, narrowly ellipsoid, ovoid or cylindrical, cyanophilous, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Caldesiella sajanensis* Pilát 1936
Distribution: in the whole area.
References: 115, 325.

1a. Spores narrowly ovoid to narrowly ellipsoid, warted, ochraceous to greenish, 6–10 × 3–4 μm. Basal hyphae typically smooth. Teeth olive green on white subiculum.

Basidiocarp byssoid, loosely adnate, with teeth up to 1.5(–3) mm long. Margin with white hyphal strands. Hyphae hyaline, up to 9 μm wide at the swellings. Basidia 20–25 × 5–7 μm.

Distr.: whole area. Ref.: 115, 127.

K. alboviridis (Morgan) Gilberts. & Budington 1970

Syn.: *Clavaria bourdotii* Bres. 1908; *Caldesiella sajanensis* Pilát 1936

1b. Spores hyaline, cylindrical, smooth, 8–12 × 3–5 μm. Basal hyphae with cyanophilous warts. Teeth ochraceous on whitish subiculum, darker when old.

Basidiocarp soft-membranaceous, with teeth up to 2 mm long. Margin with abundant white hyphal strands. Hyphae hyaline, up to 9 μm wide at the swellings. Basidia 30–40(–55) × 7–10 μm.

Distr.: whole area. Ref.: 115, 325.

K. himantia (Schw.) J. Eriksson. 1958

Syn.: *Hydnum subfuscum* Peck 1887; *Clavaria byssacea* Roth ex Pers. 1822; *Hydnum serpens* Lasch apud Klotzsch 1850

KNEIFFIELLA P. Karst. 1889 = Granulivira

Syn.: *Hyphodontia* J. Eriksson. 1958

Basidiocarp annual, resupinate, effused, adnate, membranaceous, rhizomorphs lacking. Hymenial surface even, tuberculate, grandinioid or odontioid, rarely irpicoid, whitish to pale ochraceous. Hyphal system monomitic. Hyphae hyaline, slightly thick-walled in the subiculum, in almost all species with clamps. Cystidia present, very variable in shape. Basidia suburniform, up to 20 μm long in most species, (2–)4-spored. Spores hyaline, allantoid, cylindrical, ellipsoid or subglobose, thin-walled, smooth, often guttulate, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Hydnum barba-jovis* Bull. ex Fr. 1821
Distribution: in the whole area.
References: 115.

Note: There is no holotype available for the type species and a neotype should be selected. According to Eriksson & Ryvarden (1976, p. 621) this is not difficult: "The tradition is unanimous and Fries's description matches our species rather well, why there should be no problem in choosing a neotype."

1a. Clamps lacking. Basidia 2-spored, 8–15 × 3.5–4.5 μm.

Basidiocarp effused. Hymenial surface variable, from nearly even to odontioid or raduloid, cream-coloured to pale ochraceous. Hyphae 2–3 μm wide, with cyanophilous walls. Cystidia long-cylindrical,

150 × 6 μm, thick-walled, smooth. Spores narrowly ellipsoid, 5–5.5 × 2–2.5 μm.
Distr.: Eur. Ref.: 108, 115.
K. efibulata (J. Erikss. & Hjortstam apud J. Erikss. & Ryv.) comb. nov.
Bas.: *Hyphodontia efibulata* J. Erikss. & Hjortstam apud J. Erikss. & Ryv. 1976, The Corticiaceae of North Europe Vol. 4, p. 637.

1b. Clamps present. Basidia 4-spored. 2

2a. Lagenocystidia present. 3
2b. Lagenocystidia absent. 5

3a. Hymenial surface even or slightly tuberculate. 4
3b. Hymenial surface odontioid.
Basidiocarp effused. Hymenial surface whitish, cream-coloured to ochraceous. Hyphae 2–3 μm wide. Cystidia of two types: a) lagenocystidia abundant, 30–50 × 2–3 μm; b) leptocystidia abundant, capitate, 40–75 × 5–7 μm. Basidia 15–18 × 3.5–5 μm. Spores broadly ellipsoid, 4.5–6 × 3.5–4 μm.
Distr.: Eur., N. Am. Ref.: 115.
H. arguta (Fr.) comb. nov.
Bas.: *Hydnum argutum* Fr. 1821, Syst. mycol. Vol. I, p. 424

4a. Lagenocystidia rare. Spores 4–4.5 μm long. *K. pallidula*, see 14b.
4b. Lagenocystidia abundant. Spores ellipsoid, 4.5–5 × 3–3.5 μm.
Basidiocarp effused. Hymenial surface tuberculate, pale ochraceous. Hyphae 2–3 μm wide. Cystidia of two types: a) lagenocystidia abundant, 25–40 × 2 μm; b) leptocystidia abundant, cylindrical with apical and intercalar, globose inflations, 50–80 × 5–7 μm. Basidia 15–17 × 4–5 μm.
Distr.: whole area. Ref.: 115.
K. alutaria (Burt) comb. nov.
Bas.: *Peniophora alutaria* Burt 1926 in Ann. Mo. bot. Gdn 12: 332.

5a. Cystidia long-cylindrical, thick-walled. 6
5b. Cystidia different. 12

6a. Spores narrowly ellipsoid to subglobose. 7
6b. Spores allantoid. 10

7a. Spores subglobose, 4.5–5.5(–6) × 3.5–4.5 μm.
Basidiocarp effused. Hymenial surface odontioid, ochraceous. Hyphae 2–3 μm wide. Cystidia long-cylindrical, 80–300 × 6–8 μm, thick-walled, smooth. Basidia 14–20 × 4–5 μm.
Distr.: Eur. Ref.: 115.
K. barba-jovis (Bull. ex Fr.) P. Karst. 1889
Syn.: *?Peniophora prominens* H.S. Jacks. & Dearden 1951

7b. Spores narrowly ellipsoid. 8

8a. Hymenial surface odontioid. 9

8b. Hymenial surface even, cream-coloured to ochraceous.
Basidiocarp effused. Hyphae 3–4 μm wide. Cystidia long-cylindrical, 60–100 × 5–6 μm, thick-walled, smooth or loosely encrusted. Basidia 16–20(–25) × 4.5–5.5 μm. Spores ellipsoid, 4.5–5.5 × 3–3.5 μm.
Distr.: Eur., N. Am. Ref.: 115.
K. alienata (Lund. apud Lund. & Nannf.) comb. nov.
Bas.: *Peniophora alienata* Lund. apud Lund. & Nannf. 1941 in Fung. exsicc. suec. 21–22: 28.

9a. Spores ellipsoid, 2.5–3.5 × 1.5–1.8 μm.
Basidiocarp effused. Hymenial surface odontioid, pale ochraceous. Hyphae 2–3 μm wide. Cystidia long-cylindrical, 120–200 × 6–8 μm, thick-walled, smooth. Basidia 8–12 × 3–4 μm.
Distr.: Eur. Ref.: 115.
K. microspora (J. Erikss. & Hjortstam apud J. Erikss. & Ryv.) comb. nov.
Bas.: *Hyphodontia microspora* J. Erikss. & Hjortstam apud J. Erikss. & Ryv. 1976, The Corticiaceae of North Europe, Vol. 4, p. 651.

9b. Spores ellipsoid, 5–6 × 3–3.5 μm.
Basidiocarp effused. Hymenial surface odontioid, cream-coloured to ochraceous. Hyphae 2.5–3 μm wide. Cystidia long-cylindrical, 100–150 × 5–9 μm, thick-walled, smooth. Basidia 16–20 × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 115.
K. abieticola (Bourd. & Galz.) comb. nov.
Bas.: *Odontia barba-jovis* subsp. *abieticola* Bourd. & Galz. 1928, Hyménomycètes de France, p. 426.

10a. Hymenial surface even. 11

10b. Hymenial surface odontioid, cream-coloured to ochraceous.
Basidiocarp effused. Hyphae 2–3 μm wide. Cystidia long-cylindrical, 120–200 × 6–7 μm, thick-walled, smooth. Basidia 12–20 × 3.5–5 μm. Spores slightly allantoid, 5.5–7 × 1.5–1.8 μm.
Distr.: Eur., N. Am. Ref.: 115.
K. floccosa (Bourd. & Galz.) comb. nov.
Bas.: *Odontia alutacea* subsp. *floccosa* Bourd. & Galz. 1928, Hyménomycètes de France, p. 423.

11a. Spores slightly allantoid, 5.5–6.5(–7) × 2–2.5(–3) μm.
Basidiocarp effused. Hymenial surface even, whitish to pale greyish. Hyphae 2–3 μm wide. Cystidia long-cylindrical, 80–140 × 6–7 μm. Basidia 14–20 × 4–5 μm.
Distr.: Eur. Ref.: 115.
K. cineracea (Bourd. & Galz.) comb. nov.

Bas.: *Peniophora glebulosa* subsp. *cineracea* Bourd. & Galz. 1913 in Bull. Soc. mycol. France 28: 387.

Note: *Hyphodontia altaica* Parm. 1968 differs only in having a slightly thicker basidiocarp.

11b. Spores allantoid, 6–8 × 1.5–2 μm.

Basidiocarp effused. Hymenial surface even or slightly tuberculate, cream-coloured to ochraceous. Hyphae 2–3 μm wide. Cystidia long-cylindrical, 80–200 × 5–7 μm, thick-walled, smooth. Basidia 12–20 × 3–4 μm.

Distr.: whole area. Ref.: 115.

K. subalutacea (P. Karst.) comb. nov.

Bas.: *Corticium subalutaceum* P. Karst. 1882 in Medd. Soc. F. Fl. Fenn. 9: 65.

12a. Spores ellipsoid to subglobose. 13

12b. Spores cylindrical to allantoid. 21

13a. Hymenial surface even. 14

13b. Hymenial surface odontioid. 16

14a. Leptocystidia subulate or slightly fusiform. 15

14b. Leptocystidia moniliform, 80–120 × 4–6 μm.

Basidiocarp effused. Hymenial surface even, ochraceous. Hyphae 2–3 μm wide. Basidia 10–18 × 3–4.5 μm. Spores ellipsoid to subglobose, 3.5–4.5(–5.5) × 2–2.5(–3) μm.

Distr.: Eur. Ref.: 115.

K. pallidula (Bres.) comb. nov.

Bas.: *Gonatobotrys pallidula* Bres. 1903 in Annls mycol. 1: 127.

Syn.: *Gloeocystidium oleosum* Höhn. & Litsch. 1907

15a. Leptocystidia fusiform, 40–50 × 4 μm.

Basidiocarp effused. Hymenial surface even, whitish. Hyphae 2–3 μm wide. Basidia 15–25 × 3–6 μm. Spores ellipsoid, 4.5–5.5 × 3–3.5 μm.

Distr.: Eur. Ref.: 32.

K. juniperi (Bourd. & Galz.) comb. nov.

Bas.: *Corticium serum* var. *juniperi* Bourd. & Galz. 1911 in Bull. Soc. mycol. France 27: 246.

Note: See also *Hyphoderma sambuci*.

15b. Leptocystidia wider, slightly fusiform, 60–70 × 7–12 μm.

Basidiocarp effused. Hymenial surface even, whitish. Hyphae 2–3 μm wide. Basidia 10–15(–18) × 4–5 μm. Spores ellipsoid, 4.5–6 × 3–4 μm.

Distr.: Eur., N. Am. Ref.: 164, 177.

K. involuta (H.S. Jacks. & Dearden) comb. nov.

Bas.: *Peniophora involuta* H.S. Jacks. & Dearden 1951 in Mycologia 43: 54.

16a. With large, projecting, capitate leptocystidia, 50–80 × 7–10 μm, thin-walled, smooth.

Basidiocarp effused. Hymenial surface odontioid, cream-coloured. Hyphae 2.5–3.5 μm wide. Basidia 18–22 × 4–5 μm. Spores broadly ellipsoid, 5–6.5 × 3–3.5(–4) μm.

Distr.: Eur. Ref.: 115.

K. pilaecystidiata (Lundell apud Lundell & Nannf.) comb. nov.

Bas.: *Odontia pilaecystidiata* Lundell apud Lundell & Nannf. 1953 in Fung. exs. suec. 43–44: 24.

16b. Cystidia different, but sometimes narrow, capitate hyphal ends present. 17

17a. Sterile apices of teeth with subulate leptocystidia, often encrusted. Cf. *Hyphoderma pruni*.

17b. Sterile apices of teeth mainly with obtuse or capitate cystidia. 18

18a. Teeth not densely crowded, resupinate part well visible.

Basidiocarp effused. Hymenial surface cream-coloured. Hyphae 2–3 μm wide. Leptocystidia capitate, 30–40 × 3–3.5 μm, thin-walled, smooth. Basidia 18–20 × 4–5 μm. Spores broadly ellipsoid, 5–6 × 3.5–4.5 μm

Distr.: Eur. Ref.: 115.

K. aspera (Fr.) comb. nov.

Bas.: *Grandinia aspera* Fr. 1874, Hym. europ., p. 627.

18b. Teeth densely crowded, resupinate part scarcely visible. 19

19a. Teeth 1–2 mm long.

Basidiocarp effused. Hymenial surface odontioid to raduloid, cream-coloured to ochraceous. Hyphae 2–3.5 μm wide. Cystidia of two types: a) leptocystidia capitate, abundant, 25–50 × 3–3.5 μm, thin-walled, smooth, the apex covered with resinous material; b) leptocystidia fusiform to somewhat moniliform, rare, 20–35 × 3.5–5 μm, thin-walled, smooth. Basidia 12–20 × 4–5 μm. Spores broadly ellipsoid, 4.5–5.5 × 3.5–4 μm.

Distr.: whole area. Ref.: 115.

K. spathulata (Schrad. ex Fr.) comb. nov.

Bas.: *Hydnum spathulatum* Schrad. ex Fr. 1821, Syst. mycol. Vol. I, p. 423.

Syn.: *?Hydnum rimosissimum* Peck 1896

19b. Teeth less than 1 mm long. 20

20a. Hymenial surface whitish. Moniliform leptocystidia present.

Basidiocarp effused. Hymenial surface odontioid. Hyphae 2.5–3.5 μm wide. Cystidia of two types: a) leptocystidia moniliform, abundant, 40–60 × 4–5 μm, thin-walled, smooth; b) leptocystidia capitate, abundant, 30–40 × 3–4 μm, thin-walled, smooth or apically covered with resinous material. Basidia 14–18 × 3–5 μm. Spores ellipsoid, 4–5 × 3–3.5 μm.

Distr.: Eur. Ref.: 115.

K. breviseta (P. Karst.) comb. nov.

Bas.: *Kneiffia breviseta* P. Karst. 1886 in Hedwigia 25: 232.

20b. Hymenial surface ochraceous to reddish. Moniliform leptocystidia absent.

Basidiocarp effused. Hymenial surface tuberculate to odontioid. Hyphae 2–3 μm wide. Leptocystidia capitate, 30–50 × 2–3 μm, thin-walled, apically with resinous material. Basidia 15–25 × 3.5–4.5 μm. Spores broadly ellipsoid, 5–6 × 3.5–4 μm.

Distr.: Eur. Ref.: 115.

K. verruculosa (J. Erikss. & Hjortstam apud J. Erikss. & Ryv.) comb. nov.

Bas.: *Hyphodontia verruculosa* J. Erikss. & Hjortstam apud J. Erikss. & Ryv. 1976, The Corticiaceae of North Europe, Vol. 4, p. 681.

21a. Hymenial surface even. 22

21b. Hymenial surface odontioid. 23

22a. Leptocystidia subulate and moniliform.

Basidiocarp effused. Hymenial surface even or tuberculate, cream-coloured. Hyphae 2–3 μm wide. Cystidia of two types: a) leptocystidia moniliform, few, 40–50 × 3–5 μm, thin-walled, smooth; b) leptocystidia subulate, 30–40 × 4–5 μm, thin-walled, smooth or apically covered with resinous material. Basidia 14–22 × 4–5 μm. Spores narrowly ellipsoid, 5–6 × 2–2.5 μm.

Distr.: Eur. Ref.: 115.

K. hastata (Litsch.) comb. nov.

Bas.: *Peniophora hastata* Litsch. 1928 in Österr. bot. Z. 77: 130.

22b. Leptocystidia capitate and moniliform.

Basidiocarp effused. Hymenial surface even or tuberculate, cream-coloured. Hyphae 2–3 μm wide. Cystidia of two types: a) leptocystidia moniliform, abundant, 50–100 × 4–5 μm, thin-walled, smooth; b) leptocystidia capitate, 30–60 × 4–5 μm, thin-walled, apically covered with resinous material. Basidia 12–15 × 4–5 μm. Spores cylindrical, 4.5–5.5 × 2 μm.

Distr.: Eur., USSR. Ref.: 115.

K. halonata (J. Erikss. & Hjortstam) comb. nov.

Bas.: *Hyphodontia halonata* J. Erikss. & Hjortstam 1969 in Svensk bot. Tidskr. 63: 227–228.

23a. Spores cylindrical, 2–3 μm broad. 24

23b. Spores allantoid, 1–1.5 μm broad. 26

24a. Spores cylindrical, 4–6.5 × 2–2.5 μm.

Basidiocarp effused. Hymenial surface odontioid, cream-coloured. Hyphae 2–3 μm wide. Cystidia of two types: a) leptocystidia

cylindrical, only at apex of teeth, 50–80 × 4.5 –5.5 μm, thin-walled, smooth or loosely encrusted; b) leptocystidia capitate, 40–60 × 3–4 μm, thin-walled, smooth or loosely encrusted. Basidia 12–25 × 4–4.5 μm.
Distr.: Eur., USSR. Ref.: 115.
K. nespori (Bres.) comb. nov.
Bas.: *Odontia nespori* Bres. 1920 in Annls mycol. 18:43.

24b. Spores 2.5–3 μm broad. 25

25a. Spores cylindrical, 5–6.5 × 2.5–3 μm. Teeth less than 1 mm long. Basidiocarp effused. Hymenial surface odontioid, cream-coloured. Hyphae 2–3 μm wide. Leptocystidia subulate, 20–40 × 2–3 μm, thin-walled, smooth. Basidia 20–30 × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 115.
K. crustosa (Pers. ex Fr.) comb. nov.
Bas.: *Hydnum crustosum* Pers. ex Fr. 1821, Syst. mycol. Vol. I, p. 419.
Syn.: *?Grandinia burtii* Peck 1900.

25b. Spores cylindrical, 6–7.5 × 2.5–3 μm. Teeth 1–3 mm long. Basidiocarp effused. Hymenial surface odontioid to hydnoid, cream-coloured. Hyphae 2–3 μm wide. Leptocystidia variable, moniliform, fusiform or capitate, 20–35 × 3–5 μm, thin-walled, capitate cystidia apically covered with resinous material. Basidia 25–35 × 4.5–5.5 μm.
Distr.: Eur., N. Am. Ref.: 115.
K. quercina (Fr.) comb. nov.
Bas.: *Hydnum quercinum* Fr. 1821, Syst. mycol. Vol. I, p. 423.
Syn.: *Hydnum fallax* (Fr.) ex Fr. 1821.

26a. Spores allantoid, 6–8 × 1.5(–2) μm. Basidiocarp effused. Hymenial surface odontioid, ochraceous. Hyphae 2–3 μm wide. Leptocystidia cylindrical to moniliform, 50–75 × 4–7 μm, thin-walled, smooth. Basidia 10–16 × 4–5 μm.
Distr.: whole area. Ref.: 115.
K. alutacea (Fr.) comb. nov.
Bas.: *Hydnum alutaceum* Fr. 1821, Syst. mycol. Vol. I, p. 417.
Syn.: *Kneiffia stenospora* P. Karst. 1886; *Hyphodontia alutacea* var. *mamillicrinis* J. Erikss. & Hjortst. 1969.

26b. Spores strongly curved, 4–5 × 1–1.5 μm. Basidiocarp effused. Hymenial surface odontioid, cream-coloured to ochraceous. Hyphae 2.5–3.5 μm wide. Leptocystidia cylindrical to slightly fusiform, 35–50(–70) × 4–7 μm, thin-walled, smooth. Basidia 10–12(–15) × 4–5 μm.
Distr.: Eur. Ref.: 108, 115.
K. curvispora (J. Erikss. & Hjortstam) comb. nov.
Bas.: *Hyphodontia curvispora* J. Erikss. & Hjortstam 1969 in Svensk bot. Tidsskr. 63: 224.

LAETICORTICIUM Donk 1956

Syn.: *Dendrocorticium* M.J. Larssen & Gilberts. 1974

Basidiocarp annual or biennial, resupinate, effused to rarely effused-reflexed. Hymenial surface even to granulose, generally vividly coloured when fresh, paler when dry. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, typically with clamps. Cystidia and gloeocystidia typically absent. Dendrohyphidia present. Basidia single or in small clusters, often originating from a vesicular probasidium, urniform to narrowly clavate, with (1–2–)4 sterigmata. Spores hyaline, thin- or rarely thick-walled, smooth, globose to ellipsoid or subcylindrical, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Thelephora rosea* (Pers.) ex Fr. 1821
Anamorph: *Hyphelia* Fr. 1825
Distribution: in the whole area.
References: 115, 224.

1a. Basidia with 1–2 sterigmata. 2
1b. Basidia with 4 sterigmata. 3

2a. Clamps present. Basidia predominantly with 1 sterigma. Spores globose, thin- to thick-walled, 9–11 μm in diam.
Basidiocarp effused. Hymenial surface even to tuberculate, pinkish buff to reddish purple. Hyphae thin- to thick-walled, 2.5–5.5 μm wide. Dendrohyphidia 1.5–2.5 μm wide. Basidia up to 150 μm long, thick-walled and 8–15 μm wide at the probasidial bladder, thin-walled and 4.5–6 μm wide at the upper part.
Distr.: N. Am. Ref.: 255, 256.
L. simplicibasidium Lindsey & Gilberts. 1977

2b. Clamps absent. Basidia with 2 sterigmata. Spores ellipsoid, 20–30 × 12–15 μm.
Basidiocarp orbicular, gelatinous, small. Hymenial surface reddish. Hyphae 2.5–5 μm wide, thin- to slightly thick-walled. Dendrohyphidia absent or rare, 1.5–2 μm wide. Basidia urniform, 50–100 μm long, 3–4 μm wide in the middle, 6–10 μm wide at the inflations. On or around fruitbodies of *Colpoma* (Taphrinales) on Quercus.
Distr.: Eur. Ref.: 115.
L. quercinum J. Erikss. & Ryv. 1976

3a. Spores longer than 12 μm on average. 4
3b. Spores less than 12 μm long on average. 9

4a. On angiosperms. 5
4b. On gymnosperms. 7

5a. Spores ellipsoid to subcylindrical, 12–24 × 8–12 μm.

Basidiocarp 100–500 μm thick. Hymenial surface pinkish buff to reddish, paler when dry. Hyphae (2–)2.5–4.5(–5) μm wide. Basidia 40–100 × 7–12 μm. Mainly on Populus and Salix, but also on other angiosperms.
Distr.: whole area. Ref.: 115, 227.
L. roseum (Pers. ex Fr.) Donk 1956
Syn.: *Corticium roseolum* Massee 1890

Note: Larsen & Gilbertson (1977) describe *L. roseum* with very large spores (17–24 × 8–12 μm), while when european authors distinguish a small-spored and a large-spored form, they give 12–20 × 8–11 μm for the latter. Lentz (in Larsen & Gilbertson, 1974) gives a description of *L. mississippiense*, which is indiscernable from the concept here adopted for *L. roseum*.

5b. Spores narrower than 8 μm on average. 6

6a. Dendrohyphidia with capitate cystidioid branches, swellings becoming up to 7 μm wide.
Basidiocarp up to 250 μm thick. Hymenial surface pale yellow to greyish yellow when dry (pinkish when fresh?). Hyphae 2–4 μm wide. Basidia 70–125 × 10–12 μm, probasidia 12–18 μm wide. Spores ovoid to ellipsoid, 12–15(–18) × 7–8 μm.
Distr.: N. Am. Ref.: 45, 227.
L. appalachiensis Burdsall & M.J. Larsen apud Burdsall 1976

6b. Dendrohyphidia with narrow branches, never cystidioid.
Basidiocarp up to 250 μm thick. Hymenial surface pinkish buff. Hyphae 2.5–4 μm wide. Basidia 90–120 × 8–9 μm, probasidia up to 15 μm wide. Spores ovoid to ellipsoid, 13–15 × 6–8.5 μm.
Distr.: N. Am. Ref.: 222, 227.
L. canfieldiae M.J. Larsen & Gilberts. 1974

7a. Spores subglobose to broadly ellipsoid, 12–16 × 8.5–11 μm. Sclerotial state (*Minnsia*) often present.
Basidiocarp effused to somewhat cup-shaped, small, pinkish buff to pale flesh colour, paler when dry. Hyphae 2–5 μm wide. Basidia 80–130 × 8–10 μm. *Minnsia*-form cup-shaped, 500–900 μm in diam., containing one globose sclerotium, 300–500 μm in diam. Hyphae of cup 2–8 μm wide, cells of sclerotial body thick-walled, up to 16 μm in diam. Mainly on Tsuga, but also on Pseudotsuga and Pinus.
Distr.: N. Am. Ref.: 173, 227.
L. minnsiae (H.S. Jacks.) Donk 1956

7b. Spores ellipsoid to cylindrical, (16–)19–24 μm long. 8

8a. Hymenial surface greyish white. Spores narrowly ellipsoid to cylindrical, 19–23 × 8–10 μm. On Pseudotsuga.
Basidiocarp up to 200 μm thick. Hyphae 1.5–2(–2.5) μm wide. Basidia 65–80(–100) × 10–12 μm.
Distr.: N. Am. Ref.: 227.
L. griseo-effusum M.J. Larsen & Gilberts. 1974

8b. Hymenial surface pale pinkish buff. Spores ellipsoid, (16–)19–24 × (8–)10–12 μm. On Pinus, mainly on cone epiphyls.
Basidiocarp up to 400 μm thick. Hyphae 2.5–4 μm wide. Basidia 40–50(–70) × 10–12 μm.
Distr.: N. Am. Ref.: 222, 227.
L. durangense M.J. Larsen & Gilberts. 1974

9a. Hyphal strands present, whitish to pink. Spores ellipsoid to ovoid or subcylindrical, 6–10 × 3.5–5 μm.
Basidiocarp up to 500 μm thick, at first consisting of a net of hyphal strands, later becoming continuous, even to somewhat tuberculate. Hymenial surface pink, fading to pale ochraceous. Hyphae 2–4 μm wide. Basidia 30–60 × 4–6 μm. On wood and debris.
Distr.: whole area. Ref.: 115, 227.
L. lundellii J. Erikss. 1958

9b. Hyphal strands absent. Spores different. 10

10a. Spores smaller than 8 μm on average. 11

10b. Spores at least 8 μm long. 13

11a. Spores subglobose to broadly ovoid, 4–6.5 × 3–5 μm.
Basidiocarp effused, sometimes reflexed, up to 300 μm thick. Hymenial surface pale lilac brown. Hyphae 1.5–3.5(–4) μm wide. Basidia 30–45 × 4–6 μm, sometimes with median swelling. On angiosperms, mainly Fraxinus.
Distr.: N. Am. Ref.: 227.
L. violaceum (H.S. Jacks. apud M.J. Larsen & Gilberts.) comb. nov.
Bas.: *Dendrocorticium violaceum* H.S. Jacks. apud M.J. Larsen & Gilberts. in Norw. J. Bot. 24: 116. 1977.

11b. Spores larger. 12

12a. Some subicular hyphae amyloid, 1–2 μm wide. On gymnosperms. Distr.: N. Am.
Basidiocarp up to 800 μm thick. Hymenial surface pale buff to pale yellowish buff. Hyphae 1–4 μm wide. Basidia 45–55 × 7–8 μm. Spores subglobose to broadly ellipsoid, 7.5–8 × 5–6 μm.
Ref.: 227.
L. piceinum (Lemke apud M.J. Larsen & Gilberts.) comb. nov.
Bas.: *Dendrocorticium piceinum* Lemke apud M.J. Larsen & Gilberts. in Norw. J. Bot. 24: 113. 1977.

12b. Subicular hyphae not amyloid. On angiosperms. Distr.: Eur., USSR.
Basidiocarp up to 1 mm thick. Hymenial surface violaceous to brownish or dark buff, sometimes becoming whitish. Hyphae 2–4.5 μm wide. Basidia 35–80 × 4–7(–8.5) μm. Spores ovoid to ellipsoid, 6–9 × 4–6 μm.
Ref.: 115, 227.
L. polygonioides (P. Karst.) Donk 1956

13a. On Pinus strobus.
Basidiocarp up to 200 μm thick. Hymenial surface pinkish buff to pale buff. Hyphae 2–4(–5.5) μm wide. Basidia 65–100 × (5–)6–9 μm.
Distr.: N. Am. Ref.: 173, 227.
L. pini (H.S. Jacks.) Donk 1956

13b. On angiosperms. 14

14a. Spores up to 6 μm broad, ellipsoid to subcylindrical. 15

14b. Spores at least 6 μm broad, ovoid to ellipsoid. 16

15a. Hymenial surface pink when fresh, *Hyphelia*-anamorph often present. Distr.: Eur.
Basidiocarp orbicular. Hymenial surface at first even, becoming tuberculate. Hyphae 2–5 μm wide. Basidia 30–50 × 5–7 μm. Spores ellipsoid to subcylindrical, 8–11 × 4–5 μm. *Hyphelia*-anamorph orbicular, developing many sclerotioid bodies up to 100 μm in diam. which function as diaspores. Mainly on *Populus*.
Ref.: 115.
L. pulverulentum J. Erikss. & Ryv. 1977
Anamorph: *Hyphelia rosea* Fr. 1825.

15b. Hymenial surface violaceous when fresh. Anamorph absent. Distr.: N. Am., USSR.
Basidiocarp effused to effused-reflexed, up to 1500 μm thick. Hymenial surface even, purplish brown to vinaceous when fresh, becoming cinnamon to fawn when dry. Hyphae 2–3.5(–4) μm wide. Basidia 45–60 × 7–9 μm. Spores 8–12 × 4–6 μm.
Ref.: 8, 227, 234.
L. roseocarneum (Schw.) Boidin 1958
Syn.: *Corticium lilacino-fuscum* Berk. & Curt. 1873; *C. subrepandum* Berk. & Cooke 1878; *Stereum sendaiense* Lloyd 1917

16a. Hymenial surface pink or rosy when fresh. Probasidia hibernating. Sporeprint pink.
Basidiocarp effused to effused-reflexed. Hyphae thin- to thick-walled, 2–4 μm wide. Basidia 50–70 × 9–11 μm. Spores 9–12 × 5.5–7.5 μm.
Distr.: ?Eur., N. Am. Ref.: 225, 256.
L. lombardiae M.J. Larsen & Gilberts. 1978
Note: *Laeticorticium roseum* B as distinguished by Boidin et al. (1968) is morphologically indistinguishable, but intersterile.

16b. Hymenial surface violaceous to lilaceous when fresh. Probasidia not hibernating. Sporeprint white.
Basidiocarp effused to effused-reflexed, up to 300 μm thick. Hymenial surface becoming buff when dry. Hyphae 2–3.5 μm wide, some gelatinizing in KOH. Basidia 60–90(–110) × 5–8 μm.

Distr.: Eur., USSR. Ref.: 227.
L. ionides (Bres. apud Brinkm.) Donk 1956

LAETISARIA Burdsall 1979

Basidiocarp annual, resupinate, effused, adnate, membranaceous to pellicular. Hymenial surface even, pinkish when fresh, ochraceous to pale orange when dry. Sterile fascicles often present, clavarioid, ceraceous, pinkish to orange, up to 10 mm long. Hyphal system monomitic. Hyphae hyaline, with thin to thickened walls, without clamps. Simple hyphidia may be present. Basidia more or less urniform, often originating from probasidia, with 4 sterigmata. Spores hyaline, thin-walled, smooth, ellipsoid to ovoid, not amyloid.

Substrate: parasitic on grasses.
Type species: *Hypochnus fuciformis* McAlpine 1906
Distribution: Europe.
References: 45a.

Monotypic. Basidiocarp effused, membranaceous to pellicular, up to 100 μm thick. Hymenial surface even, pinkish when fresh, pale ochraceous to pale orange when dry. Clavarioid fascicles often present, ceraceous, pinkish to orange, 2–10 μm long. Hyphae hyaline, thin- to thick-walled, 5–8(–10) μm wide, with multi-nucleate cells. Hyphidia sometimes rare, hyphoid, 15–25 × 3–4 μm. Basidia urniform, 35–50 × 6–8 μm. Spores ovoid to ellipsoid, 9–12 × 5–6.5 μm. On grasses, mainly Lolium and Festuca.
Distr.: Eur. Ref.: 45a, 196.
L. fuciformis (McAlpine) Burdsall 1979

LAGAROBASIDIUM Jülich 1974

Basidiocarp annual, resupinate, effused, membranaceous to slightly ceraceous. Hymenial surface even, grandinioid or odontioid, more or less cream-coloured. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, with clamps. Cystidia hyaline, thin- to somewhat thick-walled, smooth. Basidia hyaline, suburniform to narrowly clavate, 10–20 μm long, with a basal clamp. Spores hyaline, ellipsoid, smooth, thick-walled, not amyloid.

Substrate: on plant debris.
Type species: *Odontia pruinosa* Bres. apud Bourd. & Galz. 1914
Distribution: in the whole area.
References: 191.

1a. Hymenial surface even, whitish. Cystidia subulate, 40–80 × 4–6 μm. Basidiocarp effused, often very thin and rather inconspicuous. Hyphae in the basal part somewhat thick-walled, 3–7.5 μm wide. Basidia 10–15 × 4–6 μm, 4-spored. Spores subglobose, thick-

walled, c. 5 × 4 μm, guttulate, cyanophilous. On gymnosperms.
Distr.: Eur., N. Am. Ref.: 161.
L. cymosum (D.P. Rogers & H.S. Jacks. apud H.S. Jacks.) Jülich 1974

1b. Hymenial surface even to odontioid, ochraceous. Cystidia narrowly clavate, 80–110 × 8–12 μm. 2

2a. Spores ellipsoid, 5–6 × 4–5 μm, guttulate.
Basidiocarp effused, thin-membranaceous, somewhat pruinose. Hyphae slightly thick-walled in the basal part (up to 0.6 μm), 2–4 μm wide. Cystidia narrowly clavate, 80–110 × 8–10 μm, projecting up to 50 μm. Basidia 14–20 × 4.5–6 μm, 4-spored.
Distr.: Eur. Ref.: 115, 191.
L. detriticum (Bourd. & Galz.) Jülich 1979
Syn.: *Odontia pruinosa* Bres. apud Bourd. & Galz. 1914

2b. Spores ellipsoid, 4.5–5.7(–6.2) × 3–4.2 μm, guttulate.
Basidiocarp effused, soft-membranaceous, adnate. Hyphae 2–4.5 (–5) μm wide. Cystidia narrowly clavate to cylindrical, 60–100 × 7–12 μm, projecting up to 50 μm. Basidia 12–20 × 4–5 μm, (2–)4-spored.
Distr.: USSR. Ref.: 318.
L. nikolajevae (Parm.) Jülich 1974
Note: This species may be identical with *L. detriticum*.

LAURILIA Pouzar 1959

Basidiocarp perennial, resupinate or effused-reflexed, corky. Hymenial surface typically even. Hyphal system seemingly dimitic. Generative hyphae with clamps. Cystidia hyaline to yellowish, thick-walled, encrusted, at various levels in the basidiocarp, sometimes minutely emerging. Basidia clavate, with 4 sterigmata. Spores hyaline, globose to subglobose, thin-walled, smooth or ornamented, amyloid.

Substrate: on wood of gymnosperms.
Type species: *Stereum sulcatum* Burt apud Peck 1901
Anamorph: *Spiniger* Stalpers 1974 p.p.
Distribution: in the whole area.
References: 115, 147, 182, 337.

1a. Frequently branched hyphae without or with a narrow lumen present. Hymenial surface pale ochraceous with pinkish tinge. Subicular hyphae irregularly arranged. Tomentum consisting of clamped hyphae.
Basidiocarp up to 3 mm thick. Abhymenial surface tomentose, dark brown, later glabrous and blackish. Skeletoid hyphae yellowish, 3–5 μm wide. Generative hyphae hyaline to brown, thin- to thick-walled, 2–4 μm wide. Cystidia hyaline to yellowish, conical to fusiform, 35–65 × 6–12 μm. Basidia clavate, 20–35 × 4–6 μm. Spores

globose to subglobose, smooth or minutely echinulate, 5–6.5 × 4.5–6 μm. On Pinaceae.
Anamorph: *Spiniger* sp.
Distr.: whole area. Ref.: 115, 147, 182.
L. sulcata (Burt apud Peck) Pouzar 1959

1b. Frequently branched thick-walled hyphae absent. Hymenial surface light buff to pale ochraceous with greyish tinge. Subicular hyphae semi-parallel. Tomentum consisting of skeletoid hyphae.
Basidiocarp up to 4 mm thick. Abhymenial surface velutinous to tomentose, dark brown. Skeletoid hyphae yellowish to brown, 4–7(–8.5) μm wide. Generative hyphae hyaline, thin- to somewhat thick-walled, 2.5–5.5 μm wide. Cystidia hyaline to brownish, conical to fusiform, 40–80 × 6–14 μm. Basidia clavate, 25–40 × 5–7 μm (147) or 50–75 × 8 μm (79). Spores globose to subglobose, smooth or minutely echinulate, 5.5–8.5 × 5–7 μm. On Cupressaceae and Taxodiaceae.
Distr.: N. Am. Ref.: 79, 147.
L. taxodii (Lentz & McKay) Parm. 1968

LAXITEXTUM Lentz 1955

Basidiocarp annual, resupinate, effused or typically effused-reflexed, soft-coriaceous, fragile when dry. Hymenial surface even, whitish. Hyphal system monomitic. Hyphae hyaline to brown, thin- to somewhat thick-walled, with clamps. Gloeocystidia abundant, slender, with refractive, hyaline contents. Basidia subcylindrical, with 4 sterigmata. Spores hyaline, thin-walled, smooth or slightly ornamented in Melzer's, ovoid to ellipsoid, amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Thelephora bicolor* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 115, 182.

Monotypic. Basidiocarp 800–1500 μm thick. Abhymenial surface wrinkled-membranaceous to appressed-strigose, often concentrically sulcate, dark brown. Hymenial surface white when fresh, buff when dry. Hyphae hyaline to brown, thin- to somewhat thick-walled, often encrusted, (1–)2–3.5(–4.5) μm wide. Gloeocystidia immersed or slightly protruding, narrowly fusoid to somewhat conical, 50–110 × 4–8.5 μm. Basidia subcylindrical, 16–24 × 3–5 μm. Spores ovoid to ellipsoid, (3.5–)4–6 × (2–)2.5–3.5 μm.
Distr.: whole area. Ref.: 115, 182.
L. bicolor (Pers. ex Fr.) Lentz 1955
Syn.: *Stereum fuscum* (Schrad.) ex P. Karst. 1885; *S. coffeatum* Berk. & Curt. apud Berk. 1873; *S. pannosum* Cooke & Massee apud Cooke 1892 non ~ Cooke 1879; *S. laxum* Lloyd 1915.

LAZULINOSPORA Burdsall & M. J. Larsen 1974

Basidiocarp annual, resupinate, effused, arachnoid to byssoid, adherent or loosely attached, thin. Hymenial surface discontinuous to continuous, blue to greenish blue, margin similar. Hyphal system monomitic. Hyphae hyaline to pale yellow, with thin to thickened walls, smooth or slightly encrusted. Clamps absent. Sterile hymenial structures absent. Basidia clavate to cylindrical, somewhat constricted just below the apex, with 4 sterigmata. Basidiospores subglobose to ovoid, irregular, thin-walled, warted to sparsely echinulate, hyaline to subhyaline in H_2O, blue in KOH.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Lazulinospora wakefieldii* Burdsall & M.J. Larsen 1974
Distribution: Europe, North America.
References: 48.

Note: The only character distinguishing this genus from *Tomentella* (incl. *Tomentellastrum*) is the blue reaction in KOH. This may be insufficient reason for separation.

1a. Spores irregularly ovoid, warted to sparsely echinulate, 5–7 × 2.5–4 μm. Subicular hyphae thin-walled.

Basidiocarp arachnoid to byssoid, very thin. Hymenial surface deep dull violaceous blue to glaucous green when fresh, greyish yellow when dry. Subicular hyphae smooth or slightly encrusted, (2–)2.5–4 (–5) μm wide. Basidia 25–35(–40) × 4.5–6 μm, sterigmata 4–6 μm long.

Distr.: Eur. Ref.: 48.

L. cyanea (Wakef.) Burdsall & M.J. Larsen 1974

1b. Spores irregularly subglobose, rarely ovoid, strongly warted, 5–5.5 × 3.5–5 μm. Subicular hyphae with thickened walls.

Basidiocarp mucedinoid, thin. Hymenial surface somewhat discontinuous, pale turquoise to light green. Subicular hyphae smooth, (2.5–)4–5(–6) μm wide. Basidia (15–)20–30 × 4–6.5 μm, sterigmata 3–4 μm long.

Distr.: N. Am. Ref.: 48, 390.

L. wakefieldii Burdsall & M.J. Larsen 1974

LEPTOSPOROMYCES Jülich 1974

Basidiocarp annual, resupinate, effused, thin, pellicular, with or without hyphal strands. Hymenial surface even, pale coloured. Hyphal system monomitic. Hyphae hyaline, cylindrical to somewhat torulose, thin- to slightly thick-walled, with clamps. Cystidia present in one species, hyaline, slightly thick-walled. Basidia hyaline, narrowly clavate, up to 14 μm long, with a basal clamp, mostly 4-spored. Spores hyaline, smooth, thin-walled, ellipsoid to cylindrical, small, not amyloid.

Substrate: on plant debris or soil.

Type species: *Corticium galzinii* Bourd. 1910
Distribution: in the whole area.
References: 115, 186.

1a. Spores broadly ellipsoid, somewhat thick-walled, 4–5 × 3–3.5 μm.
Basidiocarp pellicular, loosely adnate, hyphal strands lacking. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, somewhat thick-walled in the subiculum, 3–5 μm wide, with clamps. Basidia 10–14 × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 115, 186.
L. ovoideus Jülich 1972

1b. Spores cylindrical or ellipsoid, thin-walled. 2

2a. Spores broadly ellipsoid to pyriform, with relatively large, prominent apiculus, 3–4 × 1.8–2.3 μm. Leptocystidia present.
Basidiocarp thin-membranaceous, loosely adnate, hyphal strands lacking. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, somewhat thick-walled in the subiculum, 1.5–3 μm wide, with clamps. Cystidia present, sometimes few, hyaline, slightly thick-walled, cylindrical, 30–40 × 3–4 μm, with a basal clamp, smooth, projecting up to 30 μm. Basidia 6.5–10 × 3.5–4 μm.
Distr.: N. Am. Ref.: 186.
L. mundus (H.S. Jacks. & Dearden) Jülich 1972

2b. Spores cylindrical to ellipsoid, with small, inconspicuous apiculus. Cystidia lacking. 3

3a. Spores narrowly cylindrical, 4.2–5.5 × 1.5–1.8(–2) μm.
Basidiocarp pellicular, loosely adnate, hyphal strands lacking. Hymenial surface even, whitish to pale greyish. Hyphae hyaline, slightly thick-walled in the subiculum, 2.5–5.5 μm wide, with clamps. Basidia 7–10 × 3.5–4.5 μm, with (2–)4 sterigmata.
Distr.: whole area. Ref.: 115, 186.
L. raunkiaerii (M.P. Christ.) Jülich 1972

3b. Spores ellipsoid, somewhat shorter. 4

4a. Spores narrowly ellipsoid, 3–4.2 × 1.8–2.2(–2.4) μm. Hyphal strands lacking.
Basidiocarp pellicular, loosely adnate. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, slightly thick-walled in the subiculum, 2–3 μm wide, with clamps. Basidia 8–13 × 3–4 μm.
Distr.: whole area. Ref.: 115, 186, 293.
L. galzinii (Bourd.) Jülich 1972

4b. Spores broadly ellipsoid to ovoid, 3.5–4.5 × 2–2.5 μm. Thin hyphal strands present.
Basidiocarp pellicular, loosely adnate. Hymenial surface even, pale rose or whitish. Hyphae hyaline, slightly thick-walled in the

subiculum, 2.5–3.5 μm wide, with clamps. Basidia 9–11 × 3–3.5 μm.
Distr.: Eur. Ref.: 115, 186.
L. roseus Jülich 1972

LEUCOGYROPHANA Pouzar 1958

Basidiocarp annual, resupinate, effused, pellicular, membranaceous or fleshy, hymenium easily separable from subiculum. Hymenial surface even to merulioid, rarely irpicoid, white to yellow, orange, olive or brown. Hyphal strands typically present, sclerotia sometimes present. Hyphal system monomitic. Hyphae hyaline or pale yellow, with thin- or somewhat thickened walls, sometimes inflated or ampullate at the septa. Clamps always present. Cystidia typically absent. Basidia in small clusters, clavate. Spores hyaline to yellowish, smooth, thick-walled when mature, ovoid to ellipsoid, rarely subglobose, typically cyanophilous, dextrinoid, amyloid or unchanged in Melzer's.

Substrate: saprophytic on gymnosperms, but also occurring on angiosperms.
Type species: *Merulius molluscus* Fr. 1821
Distribution: in the whole area.
References: 115, 190.

1a. Hymenial surface even, rarely merulioid when fresh, white to pale ochraceous. 2
1b. Hymenial surface folded or merulioid to hydnoid, ochraceous, orange, olive or brown. 7

2a. Spores grey in Melzer's. 3
2b. Spores not grey in Melzer's. 4

3a. Cystidia rare, cylindrical to clavate, 50–150 × 5.5–9 μm, with thin to thickened walls. Spores ellipsoid to subcylindrical, (4.5–)5.5–7(–7.5) × 2.5–3.5(–4) μm, not cyanophilous when mature.
Basidiocarp pellicular. Hymenial surface merulioid when fresh, even when dry, whitish to pale ochraceous. Hyphal strands often present. Hyphae hyaline, thin- to thick-walled, 4–7 μm wide. Basidia clavate, 12–22 × 3.5–4.5 μm. On gymnosperms.
Distr.: whole area. Ref.: 115.
L. mollis (Bres.) Parm. 1967

3b. Cystidia absent. Spores ovoid to ellipsoid, 3–5 × 2–3.5(–4) μm, cyanophilous.
Basidiocarp pellicular. Hymenial surface even, cream to pale ochraceous. Hyphal strands often present. Hyphae hyaline, thin-walled, 2–5 μm wide, often ampullate at the septa and then up to 7 μm wide. Basidia clavate, 14–25(–40) × 3.5–5(–6) μm. On gymnosperms.
Distr.: Eur. Ref.: 115.
L. subillaqueatum (Litsch.) Jülich 1974

4a. Spores subglobose to ellipsoid, 2.8–3.5 × 2–2.5 μm. Cf. *Ceraceomyces sublaevis.*

4b. Spores at least 4 μm long. 5

5a. Spores dextrinoid. Hymenial surface even, but becoming tuberculate, orange yellow and often with an olivaceous tinge. *L. olivascens*, see 10a.

5b. Spores not dextrinoid. Hymenial surface even, white to pale ochraceous or pale isabelline. 6

6a. Basidia 10–14 × 4–5 μm. Spores ellipsoid, 4–5 × 2.5–3.5 μm. On angiosperms. Cf. *Leptosporomyces ovoideus.*

6b. Basidia 15–28 × 5–6 μm. Spores ellipsoid, (4–)5–7 × (2.5–)3–4 μm. On gymnosperms.

Basidiocarp pellicular to membranaceous. Hymenial surface even, cream to pale ochraceous or pale isabelline. Hyphal strands typically present. Hyphae hyaline, thin- to thick-walled, 2–5(–8) μm wide.
Distr.: Eur., USSR. Ref.: 115.
L. cremeo-isabellina (Litsch.) Parm. 1967
Syn.: *Athelia subtessulata* Parm. 1967

7a. Spores up to 3(–3.2) μm broad. 8

7b. Spores at least 3 μm broad, on average broader. 9

8a. Spores ellipsoid, (3–)3.3–4(–4.5) × (2–)2.3–2.6 μm. Hymenial surface lilac to dark brownish when dry.

Basidiocarp ceraceous. Hymenial surface folded or merulioid to raduloid. Hyphal strands present. Hyphae thin-walled, often encrusted with yellowish resinous material, 2–5(–6) μm wide. Basidia 20–30 × 4–5 μm. On gymnosperms.
Distr.: N. Am. Ref.: 143.
L. montana (Burt) Domań. 1975

8b. Spores ellipsoid, 3.8–4.5(–5.5) × 2.4–3(–3.2) μm. Hymenial surface pale orange to pale ochraceous when dry.

Basidiocarp ceraceous. Hymenial surface folded to merulioid. Hyphal strands sometimes present. Hyphae thin-walled, rarely encrusted, 2–6(–10) μm wide. Basidia 15–24 × 4–6.5 μm. On gymnosperms.
Distr.: Eur., N. Am. Ref.: 143.
L. sororia (Burt) Ginns 1976

9a. Basidiocarp up to 400 μm thick, athelioid. Hymenial surface even to tuberculate or with low ridges but not merulioid, often pale coloured. 10

9b. Basidiocarp up to 1000 μm or more thick, ceraceous. Hymenial surface becoming merulioid or spiny, often brightly coloured 11

10a. Hymenial surface becoming minutely tuberculate, yellow to olive-yellow or olive-green.

Hyphal strands present. Hyphae hyaline to yellowish, thin- to thick-

walled, sometimes inflated, sometimes encrusted, 2–7(–10) μm wide. Hyphoid thin-walled cystidioles occasionally present, projecting up to 50 μm. Basidia 20–27(–40) × 5.5–6.5(–7) μm. Spores ovoid to ellipsoid, 4.5–6(–7.6) × (3–)3.5–4.5(–6) μm. On angiosperms and gymnosperms.

Distr.: Eur., N. Am. Ref.: 143, 146.

L. olivascens (Berk. & Curt. apud Berk.) Ginns & Weresub 1976

Syn.: *Corticium prasinum* Berk. & Curt. apud Berk. 1873; *C. chlorinum* Berk. & Curt. apud Berk. 1873; *Coniophora subochracea* Peck 1897

10b. Hymenial surface with branched ridges, pale yellow to ochraceous, sometimes becoming ochraceous-brown or orange-yellow.

Hyphal strands present, sometimes rare. Hyphae hyaline, thin-walled, sometimes encrusted, 2.5–5(–6.5) μm wide. Cystidioles rare or absent. Basidia (17–)20–28 × 5–7(–8) μm. Spores ovoid to ellipsoid, 4.4–6.0 × 3.2–4.4 μm. On gymnosperms or rarely angiosperms.

Distr.: whole area. Ref.: 143.

L. romellii Ginns 1978

11a. Hymenial surface at first covered with low ridges which form a reticulum, finally covered with conical spines. Sclerotia often present in the decayed wood.

Basidiocarp ceraceous, up to 1(–2) mm thick. Hymenial surface yellowish to olive-yellow or brownish, darker when dry. Hyphal strands present. Hyphae hyaline, thin-walled, 3–8(–12) μm wide. Cystidioles present, projecting up to 10 μm. Basidia 18–38 × (4–)5–7.5(–9) μm. Spores ovoid to ellipsoid, rarely subglobose, (4.5–)5–7 × 3.5–4.5(–5.5) μm. On gymnosperms, rarely on angiosperms.

Distr.: whole area. Ref.: 143, 146.

L. pinastri (Fr.) Ginns & Weresub 1976

Syn.: *Hydnum sordidum* Weinm. 1836; *?Merulius giganteus* Sauter 1877; *M. candicans* Roum. 1886; *M. irpicinus* Peck 1894; *M. hydnoides* P. Henn. 1903; *M. sclerotiorum* Falck apud Möller 1907; *M. byssoideus* Burt 1917; *M. atrovirens* Burt 1917

11b. Hymenial surface merulioid, never reticulate or with spines. Sclerotia absent (except in *L. mollusca*). 12

12a. Spores with an apical germ pore. Distr.: N. Am.

Basidiocarp ceraceous. Hymenial surface pinkish or ochraceous-orange, becoming brownish. Hyphal strands rare. Hyphae hyaline to pale brown, thin-walled, sometimes inflated. Hyphoid cystidioles may be present. Basidia 34–40 × 8–9 μm. Spores ovoid to ellipsoid, 5.6–7.2 × 3.8–4.8 μm. On gymnosperms.

Ref.: 143.

L. arizonica Ginns 1978

12b. Spores without an apical germ pore. Distr.: whole area 13

13a. Spores not dextrinoid, distinctly yellow, ovoid to ellipsoid, (4.5–)5–6.8 (–8) × 3–4.5(–5) μm. Basidiocarp (1–)2–6.5 mm thick. Hymenial surface merulioid to pitted, brown. Sclerotia absent.

Hyphal strands present. Hyphae hyaline, thin-walled, 2–7(–18) μm wide. Cystidioles rare or absent. Basidia 20–52 × 6–8 μm. On gymnosperms, rarely on angiosperms.

Distr.: whole area. Ref.: 143.

L. pulverulenta (Fr.) Ginns 1978

Syn.: *Merulius minor* Falck apud Möller 1912; *M. tignicola* Harmsen 1952

13b. Spores typically dextrinoid, subhyaline to pale yellow, ovoid to ellipsoid, 5.5–7.5 × (3.8–)4–4.8(–5.2) μm. Basidiocarp up to 1(–2) mm thick. Hymenial surface merulioid, orange-yellow to orange-brown, more rarely yellowish brown. Sclerotia often present in decayed wood.

Hyphal strands present. Hyphae hyaline, thin- to somewhat thick-walled, (2.5–)3–7.5(–10) μm wide, sometimes encrusted. Cystidioles often present. Basidia (20–)25–35(–45) × 6–9(–10) μm. On gymnosperms, more rarely on angiosperms.

Distr.: whole area. Ref.: 143, 146.

L. mollusca (Fr.) Pouzar 1958

Syn.: *Xylomyzon paucirugum* Pers. 1825. *Merulius laeticolor* Berk. & Br. 1878; *M. subaurantiacus* Peck 1885; *M. pseudomolluscus* Parm. 1962; *?Leucogyrophana pouzarii* Parm. 1967

LICROSTROMA Lemke 1964

Basidiocarp annual, resupinate, effused or effused-reflexed, confluent, membranaceous; margin adnate to reflexed. Hymenial surface even, pale coloured. Hyphal system seemingly dimitic with binding hyphae. Hyphae thin- to thick-walled, clamps absent. Hyphidia and gloeocystidia present. Basidia scattered, cylindrical, large. Spores hyaline, (sub)globose, thick-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Corticium subgiganteum* Berk. 1873
Anamorph: *Michenera* Berk. & Curt. 1868
Distribution: North America.
References: 231.

Monotypic. Basidiocarp up to 1 mm thick, membranaceous to toughly ceraceous. Hymenial surface even, cream to ochraceous-buff, later often alutaceous. Abhymenial surface even, concolorous or lighter. Trama

layered when well developed. Skeletoid hyphae branching at right angles, 2–3 μm wide; generative hyphae thin- to partially thick-walled, 2.5–4 μm wide. Cystidia sulphopositive, of tramal origin, flexuous-cylindrical to subclavate, 100–250 × (8–)12–18(–23) μm, becoming secondarily septate and thick-walled. Hyphidia simple or branched, 3–5 μm wide. Basidia cylindrical, 70–100 × 13–18 μm. Spores hyaline, globose to subglobose, smooth, with thickened walls, 16–19 × 14–16 μm.
Distr.: N. Am. Ref.: 231.
L. subgiganteum (Berk.) Lemke 1964
Syn.: *Aleurodiscus orientalis* Lloyd 1920
Anamorph: *Michenera artocreas* Berk. & Curt. 1868

LINDTNERIA Pilát 1938

Basidiocarp resupinate, effused, soft-membranaceous. Hymenial surface even, irpicoid or irregularly poroid. Hyphal system monomitic. Hyphae hyaline, thin-walled, with or without clamps, often inflated near the septa. Cystidia lacking. Basidia hyaline, clavate to suburniform, with strongly cyanophilous globules or guttules in the cytoplasma, 4-spored. Spores hyaline to often pale brown, somewhat thick-walled, globose to broadly ellipsoid, with an ornamentation of spines or wing-like crests, spore-wall ornamentation strongly cyanophilous, not amyloid.

Substrate: saprophytic on plant debris and wood of gymnosperms and angiosperms.
Type species: *Poria trachyspora* Bourd. & Galz. 1925
Distribution: in the whole area.
References: 115, 198.

1a. Spores globose, 6–8 μm in diam.
Basidiocarp effused, soft-membranaceous. Hymenial surface poroid, ochraceous. Hyphae hyaline, 3–5 μm wide, with clamps at some septa. Basidia 25–35 × 9–12 μm.
Distr.: Eur., N. Am. Ref.: 66, 115, 151.
L. trachyspora (Bourd. & Galz.) Pilát 1938

1b. Spores ellipsoid. 2

2a. Clamps present at all septa.
Basidiocarp effused, soft-membranaceous. Hymenial surface even, cream-coloured to ochraceous. Basidia 35–55 × 6–12 μm. Spores ellipsoid, 7–9 × 5.5–6.5 μm.
Distr.: Eur. Ref.: 251.
L. leucobryophila (P. Henn.) Jülich 1977

2b. Clamps absent from many septa.
Basidiocarp effused. Hymenial surface uneven to poroid, yellowish-ochraceous. Hyphae 3–5 μm wide. Basidia 25–40 × 8–11 μm. Spores ellipsoid, 6–9 × 5–6 μm.

Distr.: Eur., USSR Ref.: 318.
L. flava Parm. 1968

LOPHARIA Kalchbr. & MacOwan apud Kalchbr. 1881

Syn.: *Thwaitesiella* Massee 1892; *Lloydella* Bres. apud Lloyd 1901; *Porostereum* Pilát 1936; *Licentia* Pilát 1940

Basidiocarp annual or perennial, resupinate to effused-reflexed, membranaceous to coriaceous when fresh. Hymenial surface even, sometimes irpicoid or poroid. Abhymenial surface tomentose to hirsute. Hyphal system dimitic with skeletal hyphae. Generative hyphae with or without clamps. Skeletal hyphae wide, (3–)4–6(–10) μm. Cystidia hyaline to brown, thick-walled, often encrusted, originating from skeletal as well as from generative hyphae. Basidia in clusters, clavate to cylindrical, with 4 sterigmata. Spores hyaline, thin-walled, smooth, ovoid, ellipsoid or subcylindrical, not amyloid.

Substrate: on wood of angiosperms.
Type species: *Lopharia lirellosa* Kalchbr. & MacOwan apud Kalchbr. 1881
Distribution: in the whole area, but mainly tropical.
References: 12, 18, 383, 404.

1a. Clamps present at all septa. 2
1b. Clamps absent or rare. *L. crassa*-complex. 4

2a. Spores ovoid, ellipsoid or subcylindrical, 8–14(–15.5) × (4–)4.5–8(–10) μm. Basidia 35–65(–80) × (6–)9–11 μm.
Basidiocarp coriaceous. Hymenial surface even, warted, with ridges or slightly irpicoid to poroid, greyish brown to avellaneous. Abhymenial surface tomentose to hirsute, buff to grey. Cuticle well developed. Generative hyphae hyaline, 1.5–4 μm wide. Skeletal hyphae (3–)4–6 μm wide. Cystidia hyaline to dark brown, thick-walled, conical to fusoid, 65–175 × 10–26(–34) μm.
Distr.: ?Eur., N. Am. Ref.: 234, 382, 404.
L. cinerascens (Schw.) G.H. Cunn. 1956
Syn.: *Corticium aschistum* Berk. & Curt. 1858; *Radulum mirabilis* Berk. & Br. 1873; *Stereum dissitum* Berk. 1873; *C. ephebium* Berk. & Curt. apud Berk. 1873; *Peniophora berkeleyi* Cooke 1879; *S. neglectum* Peck 1880; *Lopharia lirellosa* Kalchbr. & MacOwan apud Kalchbr. 1881; *P. deglubens* Berk. 1881; *P. schweinitzii* Massee 1889; *S. caperatum* Lloyd 1916 non ~ (Berk. & Mont.) Massee 1881; *P. occidentalis* Ellis & Everh. 1897; *L. javanica* P. Henn. & Nym. apud P. Henn. 1889; *S. purpurascens* Lloyd 1914; *S. turgidum* Lloyd 1916; *Licentia yao-chanica* Pilát 1940
Note: When spores up to 4 μm wide, cf. *Peniophora*.

2b. Spores up to 8.5(–9) μm long. Basidia rarely reaching 40 μm in length, never 9 μm in width. 3

3a. Cuticle present, consisting of interwoven skeletal hyphae. N. Am.
Basidiocarp spongy-brittle. Hymenial surface even, buff to ochraceous. Abhymenial surface glabrous to tomentose, brown to grey. Generative hyphae 2–5 μm wide. Skeletal hyphae 2–5 μm wide. Cystidia narrow, sometimes monilioid. Basidia 38–42 × 4–5 μm. Spores subcylindrical to cylindrical, 5–8.5 × 2–4 μm.
Distr.: N. Am. Ref.: 404.
L. sharpiana Welden 1970

3b. Cuticle absent. Eur., USSR.
Basidiocarp membranaceous to coriaceous, effused to effused-reflexed. Hymenial surface even to warted, rarely with ridges or pores, greyish brown to olive brown. Abhymenial surface brown to greyish brown, tomentose. Generative hyphae 2–4.5(–6.5) μm wide. Skeletal hyphae 4–7 μm wide. Cystidia originating from generative and skeletal hyphae, cylindrical to narrowly clavate, 15–90 × 4.5–11 μm. Basidia 20–40(–54) × 4–6 μm. Spores 4.5–8.5(–9) × 3–6 μm.
Distr.: Eur., USSR. Ref.: 115, 182, 404.
L. spadicea (Pers. ex Fr.) Boidin 1959
Syn.: *Stereum sponheimeri* Pilát 1937; *S. retirugum* Cooke 1882; *S. venosum* Quél. 1883
Note: *L. phellodendri* (Pilát) Boidin differs only in the shallowly poroid hymenial surface (when fresh). There is no agreement on the spore dimensions of the type specimen. Pilát (328) and Boidin (12) give 8–9 × 4–5 μm, Welden (404) gives 4.5–6.5 × 3.5 μm.

4a. Tramal layer poorly developed. All skeletal hyphae form cystidia. Temperate region and tropical highlands. Cystidia 75–250 × 7–13.5 μm.
Basidiocarp effused to effused-reflexed, membranaceous to coriaceous. Hymenial surface even, umber to purplish brown. Abhymenial surface tomentose, buff to vinaceous lilac to snuff brown. Generative hyphae 3–6 μm wide. Skeletal hyphae 4–6(–9) μm wide. Cystidia yellowish brown, obtuse or acute. Basidia subclavate, 18–33 × 4–6 μm. Spores ellipsoid to subcylindrical, 5.5–7.5(–8.5) × 3–4 μm.
Distr.: N. Am. Ref.: 12, 234, 404.
L. crassa (Lév.) Boidin 1959
Syn.: *Corticium vinosum* Berk. 1845; *Stereum umbrinum* Berk. & Curt. apud Berk. 1873: *Hymenochaete multispinulosa* Peck 1882; *H. scabriseta* Cooke apud Ravenel 1882; *H. purpurea* Cooke & Morgan apud Cooke 1883; *Peniophora intermedia* Massee 1890; *H. kalchbrenneri* Massee 1890; *H. agathicola* P. Henn. 1894; *H. kwangensis* P. Henn. 1907

4b. Tramal layer well developed. Some skeletal hyphae form cystidia, which

also originate from generative hyphae. Cystidia ventricose, 30–75 × 8–20(–25) μm. (Sub)tropical lowlands.

Basidiocarp effused to effused-reflexed, thin-coriaceous. Hymenial surface even or with ridges, snuff brown. Abhymenial surface tomentose, grey to brownish. Generative hyphae 3–5 μm wide. Skeletal hyphae 4–6 μm wide. Basidia 28–34 × 5–6 μm. Spores ellipsoid to subcylindrical, 6–8 × 3–4 μm.

Distr.: N. Am. Ref.: 404.

L. papyrina (Mont. apud de la Sagra) Boidin 1959

Note: *L. crassa* and *L. papyrina* may be conspecific. A species such as *Stereum earlei* Burt may represent an intermediate taxon.

LUELLIA K.-H. Larsson & Hjortstam 1974

Basidiocarp anual, resupinate, effused, hypochnoid, pellicular or membranaceous, adnate. Hymenial surface even, ochraceous or brown. Hyphal system monomitic. Hyphae hyaline or yellowish brown in KOH, slightly thick-walled in the trama and smooth or encrusted with yellowish material. Cystidia absent, but simple hyphidia present in the hymenium. Basidia broadly clavate, rather abruptly narrowed towards the base, with 2–4 sterigmata, clamps present or absent. Spores hyaline, navicular, smooth, thin-walled, not amyloid.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms.
Type species: *Corticium reconditum* H.S. Jacks. 1948
Distribution: in the whole area.
References: 115, 228.

1a. Clamps absent. Basidia with 2 sterigmata.

Basidiocarp hypochnoid to pellicular. Hymenial surface brownish. Hyphae of subiculum yellowish to brownish, 2–3 μm wide, somewhat thick-walled and encrusted. Hyphidia abundant. Basidia clavate with narrow base, 20–30 × 7–8 μm. Spores navicular, 10–13(–15) × 4–5.5 μm.

Distr.: Eur. Ref.: 115, 228, 242.

L. furcata K.-H. Larsson & Hjortstam 1974

1b. Clamps present. Basidia with 4 sterigmata 2

2a. Basal hyphae yellowish-brownish, encrusted with yellowish material.

Basidiocarp membranaceous. Hymenial surface ochraceous to pale brownish. Hyphae thin- to somewhat thick-walled, 2–4.5 μm wide. Hyphidia often numerous. Basidia broadly clavate with narrow base, 15–20 × 7–9 μm. Spores navicular, 7–9(–11) × 4–5(–5.5) μm.

Distr.: whole area. Ref.: 115, 228.

L. recondita (H.S. Jacks.) K.-H. Larsson & Hjortstam 1974

2b. Basal hyphae hyaline, not encrusted.

Basidiocarp membranaceous. Hymenial surface cream-coloured to ochraceous. Hyphae thin- to slightly thick-walled, 1.5–4 μm wide.

Hyphidia absent. Basidia broadly clavate with narrow base, 13–23 × 5–9 μm. Spores navicular, 7–10 × 3–4 μm.
Distr.: Eur., N. Am. Ref.: 242, 303.
L. lembospora (Bourd.) Jülich 1975

MELZERICIUM Hauerslev 1974

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, sometimes inflated, with clamps. Sterile hymenial structures absent. Basidia in small clusters, terminal, some with a pleural appendix at the base, clavate, often more or less stalked, with (2–)4 sterigmata and a basal clamp. Spores hyaline, smooth, thin-walled, ellipsoid to cylindrical, more or less constricted in the middle, amyloid.

Substrate: saprophytic on decayed wood of angiosperms.
Type species: *Corticium udicola* Bourd. 1910
Distribution: Europe.
References: 115, 155.

1a. Spores cylindrical to narrowly ellipsoid, 8–10 × 3–4 μm.
Basidiocarp small, 50–150 μm thick, membranaceous. Hymenial surface cream-coloured. Hyphae hyaline, cylindrical to torulose, 2–4 μm wide, inflated up to 6 μm, thin- to slightly thick-walled, with clamps. Basidia clavate, often stalked, 20–25 × 6.5–7 μm.
Distr.: Eur. Ref.: 115, 155, 195.
M. udicola (Bourd.) Hauerslev 1975

1b. Spores ellipsoid, distinctly constricted in the middle part, 8–10.5 × 4–5 μm.
Basidiocarp small, 50–150 μm thick, membranaceous. Hymenial surface cream-coloured. Hyphae hyaline, cylindrical to torulose, 2–4 μm wide, inflated up to 8 μm. Basidia clavate, often stalked, 15–20 × 5–6 μm, with a basal clamp.
Distr.: Eur. Ref.: 195.
M. bourdotii Jülich 1976

MEMBRANOMYCES Jülich 1975

Basidiocarp annual, resupinate, effused, adnate, membranaceous to subceraceous, the margin thinning out. Hymenial surface even, yellowish, ochraceous or pale brown. Hyphal system monomitic. Hyphae hyaline to slightly yellowish, cylindrical, thin- to slightly thick-walled, clamps lacking. Cystidia and gloeocystidia absent. Basidia large, hyaline or slightly yellowish with age, flexuous-cylindrical to narrowly clavate, guttulate, 4-spored. Spores hyaline to pale yellowish, smooth, becoming slightly thick-walled, subglobose to ellipsoid, guttulate, not amyloid.

Substrate: on decayed wood.
Type species: *Corticium spurium* Bourd. 1922
Distribution: Europe, North America.
References: 194.

Monotypic. Hymenial surface pale yellowish, ochraceous or pale brown. Basidiocarp membranaceous to submembranaceous. Hyphae hyaline to slightly yellowish in the subiculum, 3–4 μm wide. Basidia flexuous-cylindrical to narrowly clavate, 35–75 × 6.5–9.5 μm, guttulate, with 4 rather large sterigmata. Spores hyaline to slightly yellowish, subglobose to broadly ellipsoid, 7.5–9.5 × 6–7.5 μm, guttulate.
Distr.: Eur., N. Am. Ref.: 113, 194, 242, 303.
M. spurius (Bourd.) Jülich 1975

Note: *Corticium delectabile* H.S. Jacks. 1948 is probably identical; the only difference is its lemon-yellow hymenial surface.

MERULICIUM J. Erikss. & Ryv. 1976

Basidiocarp annual, resupinate, effused, pellicular. Hymenial surface merulioid when fresh, even when dry. Hyphal system dimitic with skeletal hyphae. Generative hyphae hyaline, thin-walled, with clamps. Skeletal hyphae hyaline, very narrow, dextrinoid. Cystidia present. Basidia narrowly clavate, four-spored. Spores hyaline, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood or herbaceous plants.
Type species: *Merulius fusisporus* Romell 1911.
Distribution: Europe.
References: 115.

Monotypic. Basidiocarp effused, loosely adnate, pellicular, rhizomorphs present. Hymenial surface whitish to pale ochraceous. Generative hyphae hyaline, thin-walled, 1–3 μm wide, with clamps. Skeletal hyphae hyaline, 1–2 μm wide, dextrinoid. Cystidia hyaline, thin-walled, subulate, 30–50 × 6–8(–10) μm, smooth. Basidia 20–25 × 5–6 μm. Spores fusiform, 8–10 × 3–4(–4.5) μm.
Distr.: Eur. Ref.: 115.
M. fusisporum (Romell) J. Erikss. & Ryv. 1976

MERULIOPSIS Bond. apud Parm. 1959

Syn.: *Byssomerulius* Parm. 1967; *Ceraceomerulius* (Parm.) J. Erikss. & Ryv. 1973

Basidiocarp annual, resupinate, effused to effused-reflexed or slightly pileate, membranaceous. Hymenial surface at first even, then merulioid, more or less ochraceous. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, without clamps. Cystidia sometimes present. Basidia narrowly clavate,

four-spored. Spores hyaline, more or less cylindrical, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Xylomyzon taxicola* Pers. 1825
Distribution: in the whole area.
References: 142.

1a. Spores up to 2 μm broad. 2
1b. Spores 2–3.5 μm broad. 3

2a. Spores curved-cylindrical to allantoid, 3–5 × 1–1.5 μm.
Basidiocarp effused, sometimes with raised margins, membranaceous to slightly ceraceous. Hymenial surface merulioid to poroid, yellowish-brown to purplish-black. Hyphae hyaline, thin- to slightly thick-walled, 2–7 μm wide. Basidia 13–20 × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 142, 150.
M. taxicola (Pers.) Bond. apud Parm. 1959
Syn.: *Xylomyzon pulchrum* Pers. 1825; *Merulius ravenelii* Berk. 1872

2b. Spores cylindrical, slightly curved, 4.5–6 × 1.5–2 μm.
Basidiocarp effused, membranaceous. Hymenial surface even to merulioid, bright orange to red when fresh, paler when dry. Hyphae hyaline, thin- to slightly thick-walled, 2.5–5 μm wide. Cystidia hyaline, cylindrical, 25–50 × 4–7 μm, thin-walled, smooth. Basidia 18–25 × 4–5.5 μm.
Distr.: whole area. Ref.: 113, 372.
M. albostramineus (Torrend) comb. nov.
Bas.: *Merulius albostramineus* Torrend, Brotéria (Bot.) 11: 70. 1913.
Syn.: *Merulius armeniacus* Bres. 1925; *M. rubicundus* Litsch. in Pilát 1934; *M. atropurpureus* W.B. Cooke 1971

3a. Hymenial surface dark blackish-purple, merulioid.
Basidiocarp sometimes effused, mostly effused-reflexed, membranaceous to slightly ceraceous. Hyphae hyaline, thin- to slightly thick-walled, 2–6.5 μm wide. Cystidia absent. Basidia 17–30 × 4–5.5 μm. Spores cylindrical to narrowly ellipsoid, 5–8 × 2–3 μm.
Distr.: whole area. Ref.: 142.
M. ambiguus (Berk.) Ginns 1976
Syn.: *Merulius succineus* Lloyd 1924

3b. Hymenial surface pale ochraceous. 4

4a. Basidiocarp effused, membranaceous.
Hymenial surface yellowish ochraceous, merulioid. Hyphae hyaline, thin- to slightly thick-walled, 2–8 μm wide. Cystidia cylindrical, 30–60 × 3.5–5 μm, thin-walled, smooth. Basidia 15–24 × 4–6 μm. Spores ellipsoid, 4–5.5 × 2–2.5(–3) μm.

Distr.: whole area. Ref.: 127, 142.

M. hirtellus (Burt) Ginns 1976

Syn.: *Merulius macedonicus* Pilát & Lindtner 1938; *Byssomerulius armeniacus* Parm. 1967

4b. Basidiocarp often effused-reflexed, membranaceous.

Hymenial surface young whitish, later greyish-ochraceous to pale brownish, merulioid. Hyphae hyaline, thin- to somewhat thick-walled, 2.5–6 μm wide. Cystidia absent. Basidia 25–35 × 5–6 μm. Spores cylindrical to narrowly ellipsoid, 5–7 × 2.5–3.5 μm.

Distr.: whole area. Ref.: 113, 127, 142.

M. corium (Fr.) Ginns 1976

Syn.: *Merulius confluens* Schw. 1822; *M. pallens* Schw. 1832; *M. aurantiacus* Klotzsch apud Berk. in J.E. Smith 1836; *M. haedinus* Berk. & Curt. apud Berk. 1872; *M. ulmi* Peck 1906; *M. hirsutus* Burt 1917

MERULIUS Fr. 1821

Basidiocarp annual, effused to effused-reflexed or sometimes dimidiate, often imbricate, fleshy to ceraceous or cartilagineous, hard when dry. Hymenial surface merulioid to poroid, often brightly coloured. Abhymenial surface typically tomentose, whitish or sometimes more brightly coloured. Hyphal system monomitic. Generative hyphae hyaline, thin- to thick-walled, sometimes gelatinized; most septa with clamps. Cystidioles sometimes present. Basidia in clusters, clavate. Spores hyaline, smooth, thin-walled, subcylindrical to allantoid, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Merulius tremellosus* Fr. 1821
Distribution: in the whole area.
References: 115, 142.

1a. Spores cylindrical to allantoid, 3.5–4.5 × 1–1.5(–2) μm.

Basidiocarp effused to effused-reflexed, up to 5 mm thick. Hymenial surface ceraceous, merulioid to poroid, yellowish to orange yellow, sometimes becoming red. Abhymenial surface whitish to greyish. Abhymenial hyphae thin- to thick-walled, 2–5.5 μm, often with granular encrustations. Cystidioles when present hyaline, thin-walled, cylindrical to slightly capitate, 30–65 × 4–7.5 μm, sometimes encrusted. Basidia clavate, 17–28 × 3–5 μm. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 115, 127, 142.

M. tremellosus Fr. 1821

Syn.: *M. imbricatus* Balfour-Browne 1955

1b. Spores subcylindrical, sometimes slightly curved, 4–5(–6) × 2–2.5 μm.

Basidiocarp effused-reflexed to dimidiate, about 5 mm thick. Hymenial surface ceraceous, pale pink when fresh, pink to dark red when dry. Abhymenial surface pink when fresh. Abhymenial hyphae with thin to slightly thickened walls, 2.5–5.5(–6.5) μm wide. Subhymenial hyphae thin-walled, 2–4.5(–6) μm wide, often gelatinized or with granules. Cystidioles absent. Basidia clavate, 17–35 × 3–5 μm. On angiosperms, rarely on gymnosperms.
Distr.: N. Am. Ref.: 127, 142.
M. incarnatus Schw. 1822
Syn.: *M. rubellus* Peck 1882

MYCOACIA Donk 1931

Basidiocarp annual, resupinate, effused, ceraceous, hydnoid. Spines conical to cylindrical, acute, single or sometimes concrescent, sometimes branched, often fimbriate at the apex. Hymenial surface bright or dark coloured, covering spines and resupinate part. Margin even or fimbriate. Coloured parts may become purplish or brownish black in KOH. Hyphal system monomitic. Hymenial and subhymenial hyphae hyaline, thin-walled, nearly all septa with clamps. Basal and axial hyphae hyaline, with thin to thick walls, clamps rare or absent. Hyphae often encrusted. Cystidioles often present. Basidia narrowly clavate, in small clusters, usually with 4 sterigmata. Spores hyaline, thin-walled, smooth, ellipsoid, cylindrical or suballantoid, not amyloid.

Substrate: saprophytic on wood of angiosperms, rarely of gymnosperms.
Type species: *Hydnum fuscoatrum* Fr. ex Fr. 1821
Distribution: in the whole area.
References: 66, 115.

1a. Spores subcylindrical to typically suballantoid, 3.5–5(–6) × 1.5–2(–2.5) μm. Colour not changing in KOH.
Basidiocarp effused, ceraceous, densely covered with slender spines. Spines single or confluent at the base, often fimbriate at the apex, up to 2.5(–3) mm long. Hymenial surface whitish to cream when young, ochraceous to brownish when mature. Margin fimbriate. Hyphae in central fascicles hyaline, with thickened walls, 2.5–3 μm wide, with or without clamps. Subhymenial hyphae thin-walled, 1.5–2.5 μm wide, with clamps. Cystidioles when present thin-walled, obtuse, sometimes encrusted, 15–25 × 3–4 μm. Basidia clavate, 11–20 × 3.5–5 μm.
Distr.: whole area. Ref.: 66, 115.
M. aurea (Fr.) J. Erikss. & Ryv. 1976
Syn.: *Hydnum stenodon* Pers. 1825; *H. mucidum* Velen. 1922; *Mycoleptodon mycophilus* Pilát 1936; *M. microcystidius* M.P. Christ. 1953; *Sarcodontia bulliardii* Nikolajeva 1961

1b. Spores ellipsoid to subcylindrical, on average wider than 2 μm. Colour often changing in KOH. 2

2a. Spores subcylindrical, (4–)4.5–6 × 1.7–2.5 μm. Hymenial surface yellowish to ochraceous when young, brown to blackish brown when mature. Cystidioles either abruptly narrowed at the apical part and forming a thread-like appendix (4–10 × 0.7–1.2 μm) or gradually tapering to the acute tip. Apical part of the spines consists of strongly encrusted protuding hyphae, resembling cystidia.

Basidiocarp effused, ceraceous. Spines single or confluent at the base, 1–3 mm long. Yellow parts of hymenial surface become red to purple in KOH, ochraceous or greyish brown parts sometimes dark brown or blackish. Margin often fimbriate. Hyphae in central fascicle of spines thin- to thick-walled, 2–4.5 μm wide, often encrusted. Subhymenial hyphae 2–3 μm wide. Basidia 10–22 × 3.5–5 (–5.5) μm.

Distr.: whole area. Ref.: 66, 115.

M. fuscoatra (Fr. ex Fr.) Donk 1931

Syn.: *Hydnum carbonarium* Peck 1887; *Mycoleptodon corneum* Pilát 1934

2b. Spores narrowly ellipsoid, 4.5–6 × 2–3(–3.2) μm. Hymenial surface lemon yellow to mustard yellow, becoming ochraceous to tawny. Cystidioles subfusoid, sometimes apically encrusted with resinous material. Hyphae in apical part of spines generally not encrusted, not cystidioid.

Basidiocarp effused, ceraceous. Spines conical to cylindrical, sometimes confluent, 1–2 mm long. Yellow parts becoming red in KOH. Margin pruinose to fimbriate. Hyphae in central fascicle of spines thin- to thick-walled, 2–4.5 μm wide, often encrusted or with crystalline material between the hyphae. Subhymenial hyphae 2–3 μm wide. Basidia 10–22 × 3–4.5(–5) μm.

Distr.: whole area. Ref.: 66, 115.

M. uda (Fr.) Donk 1931

Syn.: *?Acia flava* Čejp 1928

Note: *Mycoacia kurilensis* Parm. 1967 and *M. austro-occidentalis* Canfield apud Gilberts. et al. 1976 may represent a small-spored form of *M. uda*.

MYCOACIELLA J. Erikss. & Ryv. 1978

Basidiocarp annual, resupinate, effused, ceraceous. Hymenial surface hydnoid, yellowish to ochraceous or brownish. Hyphal system seemingly dimitic. Generative hyphae hyaline, thin-walled, with clamps. Skeletoid hyphae hyaline, thick-walled, lumen often not visible, only present in the axis of the spines. Cystidia hyaline, thin-walled, obtuse to capitate, rarely fusiform, typically with a large yellowish oil-cap. Basidia narrowly clavate, with 2–4 sterigmata. Spores hyaline, thin-walled, smooth, narrowly ellipsoid to subcylindrical, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Resinicium bisporum* Stalpers 1976
Distribution: Europe.
References: 111.

Monotypic. Basidiocarp effused, ceraceous, hard when dry. Hymenial surface densely hydnoid, yellowish to ochraceous, becoming brownish when dry. Spines single, rarely concrescent, slender, acute, up to 2 mm long. Skeletoid hyphae 2.5–4.5(–5) μm wide. Generative hyphae often irregular, 2–3.5(–7) μm wide. Cystidia obtuse to capitate, rarely fusiform, 16–30 × 2.5–4 μm, typically with a large yellowish oil-cap up to 9 μm in diam. Crystalline material often present. Basidia narrowly clavate, 11–20 × 3–4.5 μm, with (1–)2–4 sterigmata. Spores narrowly ellipsoid to subcylindrical, 4.5–5.5(–6) × 2.2–2.8(–3) μm.
Distr.: Eur. Ref.: 111, 371.
M. bispora (Stalpers) J. Erikss. & Ryv. 1978

MYCOSTIGMA Jülich 1976

Basidiocarp annual, consisting of minute globules, separated or aggregated, but never confluent, connected by a few hyaline hyphae. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Cystidia lacking. Basidia hyaline, clavate, with a basal clamp. Spores hyaline, smooth, thin-walled, globose to subglobose, not amyloid.

Substrate: on plant debris.
Type species: *Corticium aegeritoides* Bourd. & Galz. 1911
Distribution: Europe.
References: 196.

Monotypic. Basidiocarp more or less globose, 20–100 μm in diam., connected by very few delicate, hyaline hyphae. Hymenial surface even. Hyphae hyaline, rather indistinct, easily collapsed, flexuous-cylindrical, 2–3 μm wide, probably with clamps. Basidia ellipsoid to mostly clavate, 11–18 × 4.5–6 μm, 4-spored. Spores globose to subglobose, 4–4.5 μm in diam., with prominent apiculus. On decaying petioles of ferns.
Distr.: Eur. Ref.: 196.
M. aegeritoides (Bourd. & Galz.) Jülich 1976

ODONTICIUM Parm. 1968

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface tuberculate or odontioid, the teeth up to 1 mm long, more or less cream-coloured. Hyphal system monomitic. Hyphae hyaline, cylindrical, thin- to thick-walled, lacking clamps. Cystidia hyaline, cylindrical, somewhat thick-walled, smooth or encrusted. Basidia hyaline, cylindrical, narrowly clavate or

suburniform, up to 20 μm long, 4-spored. Spores hyaline, thin-walled, smooth, ellipsoid, cylindrical or slightly allantoid, often guttulate, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Odontia romellii* Lundell apud J. Erikss. 1958
Distribution: in the whole area.
References: 111, 318.

1a. Spores cylindrical to slightly allantoid, 4–5 × 1–1.5 μm.
Basidiocarp membranaceous. Hymenial surface cream-coloured, odontioid, the teeth up to 1 mm long, with fimbriate apices. Hyphae slightly thick-walled, 3–5 μm wide. Cystidia in tufts at apices of teeth, thick-walled at the base, gradually thinning out towards the apex, 4–5 μm wide, smooth. Basidia 15–20 × 4–5 μm. On gymnosperms.
Distr.: whole area. Ref. 111.
O. romellii (Lundell apud J. Erikss.) Parm. 1968

1b. Spores ellipsoid, 3–3.5 × 1.7–2.3 μm.
Basidiocarp thin-membranaceous. Hymenial surface whitish to pinkish buff, odontioid, the teeth subulate or cylindrical. Hyphae thin- to somewhat thick-walled, 4–7 μm wide, smooth or encrusted. Cystidia cylindrical, somewhat thick-walled, 40–75 × 5–10 μm, encrusted. Basidia 8–12 × 3–4 μm. On angiosperms.
Distr.: N. Am. Ref.: 363.
O. laxa (Miller) Ryv. 1978

OLIVEONIA Donk 1958

Syn.: *Heteromyces* Olive 1957, non ~ Müll.-Arg. 1889; *Hydrabasidium* Parker-Rhodes ex J. Erikss. & Ryv. apud J. Erikss., Hjortstam & Ryv. 1978

Basidiocarp annual, resupinate, effused, pruinose to ceraceous. Hymenial surface even. Hyphal system monomitic. Hyphae hyaline, fuscous in one species, with or without clamps. Cystidia (gloeocystidia) present or absent, often emerging. Basidia in small clusters, ellipsoid, ovoid to broadly clavate or cylindrical, with (2–)4 large sterigmata. Spores hyaline, ovoid to ellipsoid to (sub)cylindrical, smooth, thin-walled, not amyloid, not cyanophilous, capable of forming secondary spores.

Substrate: saprophytic on ferns and rotten wood of gymnosperms and angiosperms.
Type species: *Sebacina fibrillosa* Burt 1926
Distribution: in the whole area.
References: 384.

1a. Cystidia (gloeocystidia) absent. Hyphae and basidia becoming brown.

Basidiocarp fleshy to ceraceous, sometimes layered. Hymenial surface even, greyish olive to violaceous or blackish, becoming paler when dry. Hyphae hyaline to fuscous, 2–5(–6) μm wide, with clamps. Basidia ovoid to short-cylindrical to subclavate or cylindrical, hyaline to yellowish fuscous, 20–40 × 6–10 μm, with four 10–15 μm long sterigmata. Spores hyaline to brownish, 6–10.5 × 4–8 μm, globose to ovoid, thin-walled.

Distr.: whole area. Ref.: 111, 284, 387.

O. subviolacea (Peck) M.J. Larsen 1974

Syn.: *Corticium atratum* Bres. 1896; *Tulasnella metallica* Rick 1934; *Ceratobasidium plumbeum* G.W. Martin 1939

Note: This seems to be a species-complex.

1b. Cystidia (gloeocystidia) present. Hyphae and basidia always hyaline. 2

2a. Clamps present. Yellowish submerged gloeocystidia present, 30–45 × 7–12 μm. Emerging (gloeo)cystidia cylindrical, 30–105 × 6–10 μm, apically often with densely staining contents.

Basidiocarp fibrillose-hypochnoid to ceraceous, 30–400 μm thick. Hymenial surface even, whitish. Basidia ovoid to short-clavate, 15–20(–27) × 9–11 μm, with 4 sterigmata up to 7.5 μm long. Spores ellipsoid to cylindrical, 7–12 × 3–5.5 μm. (Sub)tropical distribution.

Distr.: N. Am., USSR. Ref.: 307.

O. fibrillosa (Burt) Donk 1958

Syn.: *Peniophora heterobasidioides* D.P. Rogers 1935

2b. Clamps absent. No yellowish submerged gloeocystidia. Emerging (gloeo)cystidia cylindrical, 25–50 × 5–8 μm, sometimes inflated at the base.

Basidiocarp pruinose to granular, thin. Hymenial surface white. Hyphae with irregular cells. Basidia ovoid to broadly clavate or nearly cylindrical, sometimes pleurobasidious, 13–20 × 6–7.5 μm, with (3–)4 sterigmata. Spores ellipsoid to cylindrical, sometimes curved, 7–12 × 3–4.5(–5) μm. Northern distribution.

Distr.: Eur., N. Am. Ref.: 111, 175, 307.

O. pauxilla (H.S. Jacks.) Donk 1958

PARVOBASIDIUM Jülich 1975

Syn.: *Physodontia* Ryv. & Solheim 1977

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even to odontioid, whitish to cream-coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Gloeocystidia present, hyaline, thin-walled, with granular or guttulate contents. Cystidia absent or present, hyaline, subulate, thin-walled. Basidia small, narrowly clavate, up to 15 μm long, 4-spored. Spores hyaline, ellipsoid, smooth, thin-walled, not amyloid.

Substrate: saprophytic on wood of gymnosperms or on ferns.
Type species: *Gloeocystidium cretatum* Bourd. & Galz. 1913
Distribution: Europe.
References: 191.

1a. Hymenial surface even, whitish to pale cream-coloured.
Basidiocarp effused, membranaceous, 50–250 μm thick. Hyphae cylindrical to somewhat torulose, 1.5–2 μm wide. Gloeocystidia clavate or the basal part widened, 17–32 × 5.2–8.9 μm. Basidia clavate, 8.5–12 × 3.5–4 μm. Spores ellipsoid, 4–4.5 × 1.8–2.1 μm. On putrescent petioles of ferns.
Distr.: Eur. Ref.: 191, 242.
P. cretatum (Bourd. & Galz.) Jülich 1975

1b. Hymenial surface odontioid, whitish to pale cream-coloured, with up to 300 μm long teeth.
Basidiocarp effused, membranaceous. Hyphae cylindrical, 2–4 μm wide. Gloeocystidia ellipsoid or clavate, 12–20 × 6–12 μm, with yellowish, granular or guttulate contents. Cystidia hyaline, thin-walled, subulate, 20–40 × 3–5 μm. Basidia clavate, 8–15 × 4–5.5 μm. Spores ellipsoid, 3–3.5 × 2–2.5 μm. On gymnosperms.
Distr.: Eur. Ref.: 364.
P. lundellii (Ryv. & Solheim) Jülich 1979

PAULLICORTICIUM J. Erikss. 1958

Basidiocarp annual, resupinate, effused, thin, indistinct, forming a pruinose film over the substratum. Hymenial surface even or minutely reticulate. Hyphal system monomitic. Hyphae hyaline, thin-walled, with or without clamps. Sterile structures in hymenium absent. Basidia single or in clusters, subglobose, ovoid or subcylindrical, with (4–)5–7(–8) sterigmata. Spores hyaline, smooth, thin-walled, ellipsoid to cylindrical, allantoid or navicular, not amyloid.

Substrate: saprophytic on wood of gymnosperms, more rarely on angiosperms.
Type species: *Corticium pearsonii* Bourd. 1921
Distribution: in the whole area.
References: 111, 243, 303.

1a. Hyphae without clamps (but large open ones may be present under the basidia only). 2
1b. Hyphae with clamps at nearly all septa. 3

2a. Large ansiform clamps present at the basidial septa. Spores ellipsoid to subnavicular, 4.5–6.5 × (2–)2.5–3.5(–4) μm, never forming 'micro-conidia'.
Basidiocarp ceraceous when fresh, fibrillose-encrusting when dry, up to 40 μm thick. Hymenial surface even to minutely reticulate, pruinose, whitish to grey. Hyphae hyaline, distinct, 1.5–3.5 μm

wide. Basidia subglobose to ovoid, 7–18 × 5–9 μm, with 6–8 sterigmata.
Distr.: Eur., N. Am. Ref.: 111, 243, 303.
P. ansatum Liberta 1962

2b. Basidial septa without clamps. Spores narrowly navicular to subfusiform, (4.5–)6–7.5 × 2–3 μm, sometimes forming small globose to broadly ellipsoid 'microconidia' 0.5–1.5 μm across.
Basidiocarp ceraceous when fresh, encrusting when dry, up to 50 μm thick. Hymenial surface even, granular or minutely reticulate, pruinose, whitish to grey. Hyphae hyaline, 1.5–4 μm wide. Basidia subglobose to ovoid or subcylindrical, 7–15 × (4–)5–7 μm, with (4–)5–7 sterigmata.
Distr.: Eur., N. Am. Ref.: 111, 243, 303.
P. pearsonii (Bourd.) J. Erikss. 1958
Syn.: *Corticium subinvisibile* D.P. Rogers 1935

3a. Basidia subglobose to ovoid, 5–10 × (4–)5–8 μm, usually solitary. 4
3b. Basidia ovoid to subcylindrical, 12–20 × 5–8 μm, usually in clusters. 5

4a. Spores narrowly ellipsoid to subcylindrical, rarely ovoid, often curved, 2.5–4.5 × 1.5–2.5 μm.
Basidiocarp subinvisible, up to 30 μm thick. Hymenial surface even to minutely reticulate, pruinose, hyaline to whitish or pale yellowish. Hyphae 1–3.5 μm wide, with clamps. Hyphal strands may be present in subiculum. Basidia single, subglobose to ovoid, 6–10 × (4–)5–7 μm, with 5–7 sterigmata.
Distr.: Eur., N. Am. Ref.: 111, 243, 303.
P. delicatissimum (H.S. Jacks.) Liberta 1962

4b. Spores allantoid, (4–)4.5–6.5(–7) × 1.5–2.5 μm.
Basidiocarp subinvisible. Hymenial surface even, hyaline, pruinose. Hyphae 0.5–1.5 μm wide, with clamps. Basidia single, subglobose to ovoid, 5–10 × 5–8 μm, with (4–)6 sterigmata.
Distr.: Eur. Ref.: 303.
P. globosum Oberw. 1962

5a. Spores narrowly ellipsoid to cylindrical, 6–9 × 3–4 μm. Mainly on angiosperms.
Basidiocarp ceraceous to crustaceous. Hymenial surface even to minutely reticulate, pruinose, whitish to greyish-ochraceous. Hyphae 2–5 μm wide, sometimes ampullate, with clamps. Basidia in loose clusters, ovoid to usually subcylindrical, 12–21 × 5–8 μm, with (4–)6(–8) sterigmata.
Distr.: whole area. Ref.: 111, 243, 303.
P. niveo-cremeum (Höhn. & Litsch.) Oberw. 1962
Syn.: *?Paullicorticium jacksonii* Liberta 1962

5b. Spores allantoid, 5.5–7 × 2–2.5 μm. On gymnosperms.

Basidiocarp subinvisible, up to 45 μm thick. Hymenial surface even to minutely reticulate, pruinose, hyaline to whitish or greyish. Hyphae 1.5–3.5 μm wide, with clamps, rarely with swellings. Basidia in loose clusters, ovoid to subcylindrical, 13–20 × 5–8 μm, with 5–8 sterigmata.
Distr.: Eur. Ref.: 111, 243, 303.
P. allantosporum J. Erikss. 1958

PENIOPHORA Cooke

Syn.: *Cryptochaete* P. Karst. 1889; *Sterellum* P. Karst. 1889; *Gloeopeniophora* Höhn. & Litsch. 1907; *Duportella* Pat. 1915

Basidiocarp annual or perennial, resupinate, effused or effused-reflexed, membranaceous or somewhat ceraceous, thin- to rather thick, in section stratified or not. Margin indistinct or distinct, adnate or free from the substrate. Hymenial surface even to papillate or (in one species) raduloid, reddish, orange, pink, violaceous, greyish, ochraceous or brown. Hyphal system monomitic or rarely seemingly dimitic. Hyphae hyaline, yellowish or brown, thin- to thick-walled, typically with clamps, the walls gelatinized or not. Dendrohyphidia, gloeocystidia (sulpho-positive), or lamprocystidia (and their thin-walled, young states) present. Basidia narrowly clavate, thin- to slightly thick-walled, with (2–)4 sterigmata. Spores hyaline, ellipsoid, cylindrical or allantoid, thin-walled, smooth, not amyloid, spore print mostly pink.

Substrate: saprophytic on wood or bark of angiosperms or gymnosperms.
Type species: *Thelephora quercina* Pers. ex Fr. 1821
Distribution: in the whole area.
References: 15, 103, 111.

1a. Dendrohyphidia present. 2
1b. Dendrophydia absent. 12

2a. Lamprocystidia absent. 3
2b. Lamprocystidia present. 5

3a. Spores rather broad, ellipsoid, 11–14 × 7–9 μm.
Basidiocarp effused, thin, up to 200 μm thick, adnate, margin indeterminate. Hymenial surface even, pruinose, cream-coloured or greyish alutaceous, with a pinkish tinge when fresh. Hyphae hyaline in the subhymenium, pale yellowish brown in the basal part, 2–3 μm wide, with clamps, forming a 50–60 μm thick basal horizontal layer. Dendrohyphidia hyaline, brittle, slightly thick-walled, somewhat encrusted, not easily seen. Gloeocystidia flexuous fusiform, 50–100 × 11–18 μm. Basidia 45–60 × 8.5–12 μm. On angiosperms, mainly Fraxinus and Ulmus.
Distr.: Eur., USSR. Ref.: 8, 111.
P. lilacea Bourd. & Galz. 1913

3b. Spores narrower, cylindrical, slightly curved. 4

4a. Mainly on Tamarix, sometimes on Acacia and Pistacia. Dendrohyphidia in all parts of the basidiocarp.

Basidiocarp effused, rather thin (50–200 μm), adnate. Margin pale, irregular or indistinct. Hymenial surface even, at first pinkish-cream, later brownish, cracked when dry. Hyphae hyaline in the subhymenium, slightly yellowish and thick-walled in the basal part, with clamps, 4–5 μm wide. Dendrohyphidia hyaline, covered with small crystals (especially the appendages). Gloeocystidia clavate or fusiform, 30–70 × 8–12 μm. Basidia 35–50 × 6–8 μm. Spores cylindrical, slightly curved, 8–12 × 3.7–5.2 μm.

Distr.: Eur., N. Am. Ref.: 14, 15, 130.

P. tamaricicola Boidin & Malenç. apud Boidin 1961

4b. On other angiosperms, mainly Populus (tremula). Dendrohyphidia mainly in the hymenial layer.

Basidiocarp effused, adnate, often composed of scattered rounded patches, rarely confluent. Hymenial surface even to warted, orange to reddish. Hyphae hyaline, with clamps, 3–8 μm wide, a basal horizontal layer present or lacking. Dendrohyphidia hyaline, covered with small crystals. Gloeocystidia sulpho-positive, mostly ellipsoid to pyriform, 50–100 × 15–25 μm. Basidia 30–45 × 4.5–5.5 μm. Spores cylindrical, slightly curved, 9–12 × 2.5–4 μm.

Distr.: Eur., N. Am. Ref.: 8, 111.

P. polygonia (Pers. ex Fr.) Bourd. & Galz. 1928

Syn.: *Thelephora maculaeformis* Fr. ex Fr. 1821; *?Th. leproides* Pers. 1822; *Th. colliculosa* Hoffmann ex Wallr. 1833

5a. Dendrohyphidia brown (*P. versiformis*-group). 6

5b. Dendrohyphidia hyaline to slightly yellowish (*P. lycii*-group). 9

6a. Spores at least 8 μm long, on average longer. 7

6b. Spores up to 7.2 μm long. 8

7a. Distr.: N. Am.

Basidiocarp effused, 250–400 μm thick, with free margin. Hymenial surface even, slightly velvety, brownish, somewhat cracked when dry. Hyphae light to dark brown, with clamps. Gloeocystidia subulate, 4–5.5 μm wide. Lamprocystidia conical, encrusted, 30–55 × 8–14 μm. Basidia 28–38 × 5–6 μm. Spores narrowly ellipsoid to cylindrical, 8–11 × 2–4.3 μm. On angiosperms.

Ref.: 8, 14, 234.

P. albobadia (Schw. ex Fr.) Boidin 1961

Syn.: *Thelephora albomarginata* Schw. ex Berk. 1847; *Stereum cof-fearum* Berk. & Curt. 1868; *Hymenochaete paupercula* Berk. & Curt. 1868; *S. bizonatum* Berk. & Curt. apud Berk. 1873; *S. fragile* Pat. 1900; *S. heterosporum* Burt 1920

7b. Distr.: Eur.

Basidiocarp effused, 200–500 μm thick, often with reflexed margin. Hymenial surface even, brownish. Hyphae hyaline to yellowish brown, 2–3 μm wide, with clamps, sometimes skeletoid. Gloeocystidia subulate, 50–60 × 5.5–6.5 μm. Lamprocystidia brownish, conical, smooth or encrusted, 50–100 × 6.5–10 μm. Basidia 40–50 × 5.5–6 μm. Spores cylindrical, slightly curved, 8–10(–13) × 3–4 μm. On angiosperms.

Ref.: 26.

P. malenconii Boidin & Lanquetin 1977

8a. Basidiocarp at first discoid with elevated black margin, later confluent. Spores cylindrical, slightly curved, 6.5–7.2 × 2–2.5 μm.

Basidiocarp 200–400 μm thick. Hymenial surface even, greyish to brownish. Hyphae pale brown, 3.5–5 μm wide, often thick-walled, with clamps, a basal horizontal layer developed. Lamprocystidia conical, encrusted, 30–80 × 5–25 μm. Basidia 4.5–5 μm wide. On angiosperms.

Distr.: N. Am. Ref.: 8, 234.

P. erumpens (Burt) Boidin 1959

8b. Basidiocarp effused, totally adnate or only narrowly reflexed. Spores cylindrical to slightly curved, 5–7 × 1.7–2.2 μm.

Basidiocarp 75–150 μm thick. Hymenial surface even, pruinose, light to dark brown with violaceous tinge. Hyphae subhyaline to brown, 3–5 μm wide, with clamps, the basal horizontal layer 20–80 μm thick. Gloeocystidia rare to numerous, clavate to fusiform, 30–50 × 5–7 μm. Lamprocystidia conical, encrusted, 20–80 × 7–25 μm. Basidia 4.5–5 μm wide. Mainly on angiosperms.

Distr.: whole area. Ref.: 8, 234.

P. versiformis (Berk. & Curt.) Bourd. & Galz. 1928

Syn.: *Corticium carbonicola* Pat. 1885; *Peniophora ellisii* Massee 1889

9a. Growing (like *Vuilleminia comedens*) under bark which finally disrupts. Basidiocarp effused, 50–120 μm thick, adnate. Hymenial surface even, greyish orange. Hyphae hyaline, indistinct, with clamps, 3.5–5 μm wide, a basal horizontal layer developed. Lamprocystidia broadly ellipsoid to pyriform, 22–42 × 14–25 μm. Basidia 30–35 × 4.5–5.5 μm. Spores cylindrical, slightly curved, 8.5–11 × 2.5–3 μm. On angiosperms.

Distr.: N. Am. Ref.: 8, 14, 103.

P. decorticans Burt 1926

9b. Growing on the surface of wood or bark. 10

10a. Spores allantoid, 9–12 × 3.5–4.5 μm.

Basidiocarp effused, 40–80 μm thick, totally adnate, margin

inconspicuous. Hymenial surface even or papillate, pruinose, greyish or violaceous. Hyphae brown, 3–5 μm wide, with clamps, a horizontal layer not or only slightly developed. Dendrohyphidia hyaline, richly branched. Gloeocystidia lacking or present, 30–60 × 4–14 μm. Lamprocystidia ellipsoid to pyriform, encrusted, 25–35 × 10–25 μm. Basidia 25–40 × 4–7 μm. Mainly on angiosperms, rarely on gymnosperms.

Distr.: Eur., N. Am. Ref.: 8, 103, 111.

P. lycii (Pers.) Höhn. & Litsch. 1907

Syn.: *Corticium bupleuri* Roum. 1882; *?C. rimosissimum* Passerini & Beltrand 1882; *C. friesii* Grognard 1863; *?C. passerinii* Sacc. 1888; *C. caesium* Bres. 1892

10b. Spores smaller, up to 9 μm long. 11

11a. Spores ellipsoid, 6.2–7.2 × 3.2–3.8 μm.

Basidiocarp effused, 70–130 μm thick, totally adnate. Hymenial surface even, cream-coloured, slightly pinkish. Hyphae not arranged in a horizontal layer. Gloeocystidia lacking. Lamprocystidia conical, encrusted, 20–40 × 7–8(–10) μm. On Pistacia.

Distr.: Eur. Ref.: 348

P. boidinii D. Reid 1965

11b. Spores cylindrical, slightly curved, 6.8–8.8 × 2.4–3.2 μm.

Basidiocarp effused, 150–200 μm thick, totally adnate. Hymenial surface even or slightly papillate, cream-coloured or brownish. Hyphae hyaline to brown, with clamps, 3–5 μm wide, no horizontal basal layer. Gloeocystidia lacking. Lamprocystidia conical, encrusted, 35–55 × 8–20 μm. Basidia 25–45 × 4.2–5.5 μm. On Quercus.

Distr.: Eur. Ref.: 8.

P. meridionalis Boidin 1959

12a. Basidiocarp mostly bright coloured, spore ratio length : width = 1.5–2.5:1. 13

12b. Basidiocarp mostly dull coloured, spore ratio length : width = 2.5–3:1. 23

13a. Gloeocystidia lacking. 14

13b. Gloeocystidia present. 16

14a. On Buxus.

Basidiocarp effused, at first adnate, later with free margins. Hymenial surface even or papillate, reddish. Hyphae hyaline, 2–4 μm wide, with clamps. Lamprocystidia conical, encrusted, 25–35 × 5–7 μm. Basidia up to 50 × 10 μm. Spores ellipsoid, (8–)9–11 × 6–7 μm.

Distr.: Eur. Ref.: 15, 103.

P. proxima Bres. apud Bourd. & Galz. 1913

Syn.: *Peniophora hilitzeri* Pilát 1937

14b. On other angiosperms or on gymnosperms. 15

15a. Spores cylindrical to narrowly ellipsoid, 7.5–11 × 4.5–5.5 μm.
Basidiocarp effused, adnate, c. 100 μm thick. Hymenial surface even, pinkish grey or brown. Hyphae hyaline to light brown, 3–5 μm wide, with clamps. Lamprocystidia conical, encrusted, 15–25 × 5–7 μm.
Distr.: Eur. Ref.: 15.
P. versicolor (Bres.) Sacc. & Syd. 1902

15b. Spores ellipsoid, 6.2–7.2 × 3.2–3.8 μm. *P. boidinii*, see 11a.
Note: When spores smaller, cf. *Phlebia*.

16a. Spores ellipsoid, broader than 6 μm. 17

16b. Spores cylindrical to ellipsoid, narrower than 6 μm. 18

17a. Clamps present.
Basidiocarp effused, adnate. Hymenial surface even, orange. Hyphae hyaline, 3–6 μm wide. Gloeocystidia flexuous-cylindrical, 60–100 × 10–15 μm. Lamprocystidia rare, conical, encrusted, 40–70 × 8–12 μm. Basidia 40–90 × 8–14 μm. Spores ellipsoid, 14–18 × 7–10 μm. On Alnus, in Europe mainly on A. viridis.
Distr.: Eur., N. Am. Ref.: 111, 368.
P. aurantiaca (Bres.) Höhn. & Litsch. 1906
Syn.: *Peniophora lepida* Bres. 1925

17b. Clamps lacking.
Basidiocarp effused, adnate. Hymenial surface even or papillate, orange. Hyphae hyaline, 2–6 μm wide. Gloeocystidia flexuous-cylindrical, 100–200 × 7.5–18 μm. Lamprocystidia hyaline, thin- or slightly thick-walled, encrusted, 40–70 × 7–14 μm. Basidia 60–100 × 12–15 μm. Spores ellipsoid, 14–20 × 10–13 μm. On Alnus, in Europe mainly on A. glutinosa and A. incana.
Distr.: Eur., N. Am. Ref.: 111, 368.
P. erikssonii Boidin 1957

18a. Growing (like *Vuilleminia comedens*) under bark which finally disrupts.
Basidiocarp c. 300 μm thick. Hymenial surface even, papillate or somewhat raduloid, bright orange when fresh, cream-coloured when dry. Hyphae hyaline, 2–4 μm wide, with clamps. Gloeocystidia cylindrical, clavate or fusiform, 40–100 × 8–12 μm. Lamprocystidia conical, encrusted, 40–60 × 12–15 μm. Basidia 30–40 × 5–7 μm. Spores cylindrical, 9–12 × 3.5–4.5 μm. On Carpinus.
Distr.: Eur. Ref.: 66, 111.
P. laeta (Fr.) Donk 1957
Syn.: *Thelephora hydnoidea* (Pers.) ex Fr. 1821; *Sistotrema glossoides* Pers. 1825; *?Hydnum thelephoroideum* Duby 1830

18b. Growing on the surface of bark or wood. 19

19a. Clamps lacking.
Basidiocarp effused, loosely adnate. Hymenial surface tuberculate or merulioid when fresh, almost even when dry, orange. Hyphae hyaline, 3–5 μm wide. Gloeocystidia cylindrical, 70–150 × 8–12 μm. Lamprocystidia conical, encrusted, 40–60 × 10–15 μm. Basidia 50–60 × 6–8 μm. Spores cylindrical, 9–12 × 4–5 μm. On Betula, Populus, Salix.
Distr.: Eur. Ref.: 103, 111.
P. laurentii Lundell apud Lundell & Nannf. 1946
Syn.: *Merulius lepidus* Romell 1911

19b. Clamps present. 20

20a. On Atriplex halimus (Chenopodiaceae).
Basidiocarp effused, adnate or with free margins, c. 200 μm thick. Hymenial surface even, pinkish grey to brownish. Hyphae rather thin-walled, hyaline, 2–3 μm wide, with clamps. Gloeocystidia subulate, 55–70 × 5–10 μm. Lamprocystidia cylindrical to conical, yellowish to brown, 45–52 × 6–6.5 μm. Spores broadly ellipsoid, 5.5–7 × 4–4.8 μm.
Distr.: Eur. Ref.: 25.
P. halimi Boidin & Lanquetin 1974

20b. On trees. 21

21a. Spores narrowly ellipsoid to cylindrical, 5.5–6.5 × 2.5–3 μm.
Basidiocarp effused, 120–200 μm thick. Hymenial surface even to papillate, pale pinkish ochraceous when fresh, ochraceous when dry. Hyphae hyaline to brownish, with clamps. Gloeocystidia cylindrical, 45–55 × 8.5–10 μm. Lamprocystidia conical to subcylindrical, 40–60 × 7.5–12 μm. Basidia 25–35 × 3.5–4.5 μm.
Distr.: N. Am. Ref.: 177.
P. exima H.S. Jacks. & Dearden 1951

21b. Spores larger. 22

22a. Spores cylindrical to slightly allantoid, 6.5–9(–10) × 3–3.5(–4) μm, uninucleate. Basal horizontal layer often developed.
Basidiocarp effused, 50–350 μm thick. Hymenial surface even to papillate, pinkish to orange, becoming reddish brown. Hyphae hyaline, 2.5–5 μm wide, with clamps. Gloeocystidia cylindrical or clavate, 27–85 × 8–15 μm. Lamprocystidia conical to subcylindrical, 30–50 × 6–9 μm. Basidia 30–45 × 5–6 μm. On angiosperms.
Distr.: Eur. Ref.: 15.
P. pseudoversicolor Boidin 1965

22b. Spores cylindrical to slightly allantoid, 8–12 × 3.5–5 μm, binucleate. Basal horizontal layer lacking.
Basidiocarp effused, up to 300 μm thick. Hymenial surface even to

papillate, pink to orange, fading when dry. Hyphae hyaline, 3–5 μm wide, with clamps. Gloeocystidia cylindrical, 50–200 × 8–15 μm. Lamprocystidia conical to subcylindrical, 30–60 × 7–15 μm. Basidia 30–40 × 5–6 μm. On angiosperms, rarely on gymnosperms.
Distr.: whole area. Ref.: 103, 111, 368.
P. incarnata (Pers. ex Fr.) P. Karst. 1889
Syn.: *Thelephora fallax* Pers. ex Fr. 1821; *Th. lateritia* Chaillet apud Pers. 1822; *?Corticium rubrofulvum* Mont. 1837; *Peniophora aemulans* P. Karst. 1889

23a. Gloeocystidia lacking. 24
23b. Gloeocystidia present. 34

24a. On angiosperms. 25
24b. On gymnosperms. 31

25a. No basal horizontal layer developed. Margin adnate. 26
25b. With a basal horizontal layer. Margin in some species free from the substrate. 27

26a. Hymenial surface greyish, often with a violaceous tinge. Clamps present. Lamprocystidia conical, 15–30 × 7–10 μm, encrusted.
Basidiocarp effused, 50–100 μm thick. Hymenial surface even or papillate. Hyphae hyaline to brown, 2–4 μm wide. Basidia 20–35 × 5–6 μm. Spores cylindrical, curved, 7–10 × 2–3.5 μm. On angiosperms.
Distr.: whole area. Ref.: 103, 111.
P. cinerea (Pers. ex Fr.) Cooke 1879
Syn.: *Thelephora tiliae* Pers. 1822; *Th. obscura* Pers. 1822; *?Th. lilacina* Schw. 1832; *Corticium fumigatum* Thüm. 1876
26b. Hymenial surface brown. Clamps absent. Lamprocystidia 20–50 × 12–17 μm.
Basidiocarp effused, 75–280 μm thick. Hymenial surface even. Hyphae brown, 3–7 μm wide. Spores cylindrical, curved, 7–8.5 × 2.5–3 μm. On angiosperms.
Distr.: N. Am. Ref.: 249.
P. seymouriana Burt 1926

27a. Basidiocarp stratified in section, the basal part rather dark. Hyphae not gelatinized. 28
27b. Basidiocarp not stratified, the basal part at first hyaline or yellowish, gradually becoming dark brown. Hyphae gelatinized or not. 29

28a. On Oleaceae (Fraxinus, Ligustrum, Syringa). Hymenial surface rather dark coloured, brownish violaceous or greyish brown. Subhymenial hyphae thin-walled.
Basidiocarp effused, at first adnate, later with free margins, 100–500 μm thick. Hymenial surface even or papillate. Hyphae of trama

thick-walled, brown, 3–5 μm wide, with clamps. Lamprocystidia conical, encrusted, 30–70 × 8–15 μm. Basidia 40–55 × 6–8 μm. Spores allantoid, 7–12 × 2.5–3.5 μm.
Distr.: Eur., USSR. Ref.: 103, 111.
P. limitata (Chaillet ex Fr.) Cooke 1879
Syn.: *Thelephora fraxinea* Pers. 1822

28b. Mainly (or exclusively?) on other angiosperms. Hymenial surface rather light coloured, pinkish brown or pinkish grey. Subhymenial hyphae rather thin-walled.
Basidiocarp effused, at first adnate, later with free margins, up to 500 μm thick. Hymenial surface even. Hyphae hyaline to dark brown, 2–3 μm wide, clamps present. Lamprocystidia conical, encrusted, up to 52 × 8–12 μm. Basidia up to 7.5 μm wide. Spores cylindrical, curved, 5.7–9.7 × 2.2–3.2 μm.
Distr.: Eur. Ref.: 15, 348.
P. pilatiana Pouzar & Svrček 1953
Note: A very similar but (according to interfertility tests) distinct species is *P. simulans* D. Reid 1968. It differs in having broader spores (8.7–10.7(–11.2) × 3.2–3.7(–4) μm). Macroscopically it strongly resembles *P. quercina*. Known only from Corsica. Ref.: 349.

29a. Mainly (or exclusively?) on Tilia .
Basidiocarp effused, 100–400 μm thick, at first adnate, soon with loosening margins, showing the dark coloured basal part. Hymenial surface irregularly tuberculate, pinkish grey or pinkish brown. Hyphae brown, 3–5 μm wide, thick-walled, with clamps. Lamprocystidia conical, encrusted, 30–60 × 10–20 μm. Spores cylindrical to allantoid, 7.5–10 × 2.5–3.5 μm.
Distr.: Eur. Ref.: 103, 111, 346.
P. rufomarginata (Pers.) Litsch. apud Keissler 1923

29b. On other angiosperms, often on Quercus. 30

30a. Margin adnate. Hymenial surface light to medium brown.
Basidiocarp effused, 200–300 μm thick. Hymenial surface even. Hyphae hyaline to yellowish-brown, 2.5–4.5 μm wide, with clamps. Lamprocystidia conical, 40–70 × 7–20 μm. Basidia 25–35 × 5–6.5 μm. Spores cylindrical, curved, 6–11 × 2.5–3.5 μm (cf. also *P. pithya* under 34a).
Distr.: Eur. Ref.: 103, 111.
P. suecica Litsch. 1941

30b. Margin free from the substrate and rolling up. Hymenial surface sometimes with pinkish tint.
Basidiocarp effused, 200–500 μm thick. Hymenial surface even or often irregularly tuberculate, violaceous, old specimens brownish. Hyphae hyaline to brown, 3–4 μm wide, with clamps, a basal horizontal layer developed. Lamprocystidia conical, encrusted,

40–60 × 10–15 μm. Basidia 30–45 × 5–7 μm. Spores cylindrical, curved, 7–12 × 2.8–4 μm.
Distr.: whole area. Ref.: 66, 103, 111.
P. quercina (Pers. ex Fr.) Cooke 1879
Syn.: *Thelephora corticalis* (Bull.) ex St.-Amans 1821; *Th. ciliata* Fr. 1828; *Th. carnea* (Willd.) ex Wallr. 1833; *Peniophora pezizoides* Massee 1889; *Stereum tuberculosum* Velen. 1922

31a. On Juniperus.
Basidiocarp effused, 100–200 μm thick, margin becoming free. Hymenial surface even, greyish violaceous or greyish red. Hyphae in the basal part brown, context dense and often stratified, hyphae 3–4 μm wide, with clamps. Lamprocystidia conical, encrusted, 30–80 × 7–12 μm. Basidia 35–50 × 6–7 μm. Spores cylindrical, slightly curved, 8–11 × 2.5–3.5 μm.
Distr.: Eur. Ref.: 103, 111.
P. junipericola J. Erikss. 1950

31b. On other genera (Abies, Picea etc.), very rarely on Juniperus or Salix. 32

32a. Spores rather small, cylindrical, slightly curved, 5.5–7.5 × 2–3 μm.
Basidiocarp effused, adnate, 50–150 μm thick. Hymenial surface even, greyish blue to blue-black when fresh, reddish grey when dry, old specimens more or less brown. Hyphae brown, thick-walled, 3–5 μm wide, with clamps, the context often with a basal horizontal layer. Gloeocystidia subulate, 50–70 × 8–10 μm. Lamprocystidia conical, encrusted, 35–65 × 12–15 μm. Basidia 20–35 × 4–6 μm.
Distr.: whole area. Ref.: 66, 111, 368.
P. pithya (Pers.) J. Erikss. 1950
Syn.: *Corticium plumbeum* Fr. 1874

32b. Spores larger 33

33a. Distr.: Eur., N. Am. In Europe on Abies, in North America also on other gymnosperms.
Basidiocarp effused, 100–300 μm thick, margins free. Hymenial surface even or tuberculate, greyish lilaceous to greyish brown. Hyphae brown, 3–4 μm wide, with clamps, thick-walled, the context often with a basal horizontal layer. Lamprocystidia conical, encrusted, 20–35 × 5–15 μm. Basidia 30–40 × 5–7 μm. Spores cylindrical, slightly curved, 6–9.5 × 1.7–2.7 μm.
Ref.: 103, 111.
P. piceae (Pers.) J. Erikss. 1950
Syn.: *Peniophora separans* Burt 1926

33b. Distr.: Eur. On Picea.
Basidiocarp adnate, margins becoming free, 100–400 μm thick. Hymenial surface even or tuberculate, pinkish-grey or brown. Hyphae hyaline to brown, thick-walled, 3–5 μm wide, with clamps,

the context with a well developed horizontal basal layer. Gloeocystidia 60–120 × 7–10 μm. Lamprocystidia conical, encrusted, 30–50 × 7–12 μm. Basidia 20–40 × 4–6 μm. Spores cylindrical, slightly curved, 6–8 × 2–2.5 μm.
Ref.: 103, 111, 298.
P. septentrionalis Laurila 1939

34a. Margin adnate. Hyphae not gelatinized. 35
34b. Margin free from the substrate. Hyphae gelatinized. 37

35a. Spores rather small, 5.5–7.5 × 2–3 μm. *P. pithya*, see 32a.
35b. Spores larger, 7.5–9 × 2.5–3 μm. 36

36a. Gloeocystidia clavate to fusiform, 50–75 × 7–15 μm.
Basidiocarp effused, adnate, 50–200 μm thick. Hymenial surface even or papillate, bluish- to greyish-violaceous. Hyphae hyaline to brown, 3–5 μm wide, thin- to thick-walled, with clamps, a basal horizontal layer lacking or thin. Lamprocystidia conical, encrusted, 15–30 × 5–9 μm. Basidia 30–40 × 5–6 μm. Spores cylindrical to allantoid, 7.5–9 × 2.5–3 μm. On angiosperms.
Distr.: whole area. Ref.: 103, 111, 368.
P. cinctula (Quél.) Bourd. & Galz. 1913
Syn.: *Thelephora violaceo-livida* Sommerf. 1826 (non *Peniophora violaceo-livida* Massee 1889); *P. syringae* P. Karst. 1889

36b. Gloeocystidia ellipsoid to cylindrical, 30–60 × 8–20 μm. Basidiocarp effused, adnate. Hymenial surface even or tuberculate, greyish red to greyish brown. Hyphae brown, thick-walled, 3–4 μm wide, with clamps. Lamprocystidia conical, encrusted, 15–40 × 5.8–12 μm. Basidia 25–40 × 5–7 μm. Spores cylindrical, curved, 7.5–11 × 2.5–3.5 μm. On angiosperms.
Distr.: whole area. Ref.: 66, 103, 111.
P. nuda (Fr.) Bres. 1897

37a. On angiosperms, mainly Populus.
Basidiocarp cushion-shaped, c. 1 mm thick, adnate. Hymenial surface even or plicate, pale reddish, pruinose. Hyphae 4–5 μm wide, thick-walled, brown, with clamps. Gloeocystidia rather large, with gelatinized walls, 100–200 × 15–25 μm. Lamprocystidia thick-walled, narrowly conical, with gelatinized walls, encrusted, 30–35 × 5–7 μm. Basidia 30–45 × 4.5–6 μm. Spores cylindrical, curved, 6–9 × 2–3 μm.
Distr.: Eur., N. Am. Ref.: 103, 111, 234, 288.
P. rufa (Fr.) Boidin 1959
Syn.: *Tubercularia pezizoidea* Schw. 1832; *Hypocrea richardsonii* Berk. & Mont. apud Berk. 1875

37b. On gymnosperms, mainly Pinus. 38

38a. Gloeocystidia mostly elongated, very rarely vesicular. Individual brown hyphae lacking in the hyaline areas of the basidiocarp.

Basidiocarp at first appearing as rounded patches, later more elongate and somewhat confluent. Margin adnate in young specimens, later somewhat free from the substrate. Hymenial surface even, pruinose, cream-coloured. Hyphae hyaline, 3.5–5.5(–7) μm wide, thick-walled, with clamps, the walls gelatinized, with a 25–100 μm thick basal horizontal layer. Gloeocystidia 13–70(–100) × 5.5–20 μm. Lamprocystidia encrusted, 35–50 × 5–10 μm. Basidia 4.5–7 μm wide. Spores cylindrical, curved, 5.5–9 × 2.2–3.2 μm. On Pinus.

Distr.: N. Am. Ref.: 368, 408.

P. duplex Burt 1926

Syn.: *Corticium overholtsii* Burt 1926

38b. Gloeocystidia mostly vesicular, rarely elongated. Individual brown hyphae (branched or not) growing through the hyaline parts of the basidiocarp. 39

39a. Distr.: Eur., USSR.

Basidiocarp at first orbicular, later somewhat confluent, 100–400 μm thick, the margin adnate or somewhat free. Hymenial surface even, tuberculate or folded, pruinose, reddish when fresh, becoming greyish or brownish when old. Hyphae 4–11 μm wide, with clamps, thin- to thick-walled, the walls gelatinized. Gloeocystidia clavate, cylindrical or ellipsoid, 30–60 × 10–20 μm. Lamprocystidia conical, 20–35 × 5–7 μm. Basidia 30–40 × 5–6 μm. Spores cylindrical, curved, 7–9 × 2.5–3 μm. On Pinus and other gymnosperms.

Ref.: 103, 111, 408.

P. pini (Schleicher ex Fr.) Boidin 1956

39b. Distr.: N. Am.

Basidiocarp at first orbicular, later somewhat confluent, margin mostly free from the substrate. Hymenial surface even, pruinose, cream-coloured, brown or reddish. Hyphae 3.5–7(–9.5) μm wide, thick-walled, with clamps, the walls gelatinized. Gloeocystidia ellipsoid to clavate, 20–50 × 10–20 μm. Lamprocystidia conical, 40–60 × 10–15 μm. Basidia 4.5–5.4 μm wide. Spores cylindrical, slightly curved, 6–7.5 × (1.7)–2.2–2.5 μm. On Pinus.

Ref.: 408.

P. pseudopini Weresub & Gibson 1960

Syn.: *Phlebia cervina* Overh. 1930 (non *Peniophora cervina* (Thüm.) Höhn. & Litsch.)

PHANEROCHAETE P. Karst 1889

Syn.: *Grandiniella* P. Karst. 1895

Basidiocarp annual, resupinate, effused, membranaceous, ceraceous or crustaceous. Hymenial surface even to sometimes odontioid, hydnoid, or tuberculate. Hyphal strands present or absent. Hyphal system monomitic. Hyphae hyaline or yellowish-brown, cylindrical, clamps absent from most septa, occasionally present on tramal hyphae as single or multiple clamps (up to 6 per septum). Cystidia lacking or present as lepto- or lamprocystidia, in one species as septocystidia, hyaline, cylindrical, subulate or fusiform, thin- to thick-walled, smooth or encrusted. Basidia hyaline, narrowly clavate, thin-walled, normally with 4 sterigmata. Spores hyaline, ellipsoid, cylindrical or allantoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic or rarely parasitic on angiosperms or gymnosperms, occasionally on soil.
Type species: *Stereum alneum* (Fr.) Fr. sensu P. Karst. 1889
Anamorphs: *Sporotrichum* Link ex Fr. 1821; *Necator* Massee 1898
Distribution: in the whole area.
References: 111.

1a. Hymenial surface distinctly hydnoid, orange-yellow.
Basidiocarp effused, thin-membranaceous, fragile, with yellow-orange hyphal strands. Teeth subulate, up to 2 mm long. Hyphae thin- to somewhat thick-walled, 2–8 μm wide, smooth or densely encrusted. Leptocystidia rare, slightly fusiform, 30–40 × 3–4 μm. Basidia 20–30 × 5.5–7 μm. Spores broadly ellipsoid, 5–6 × 4–4.5 μm. On angiosperms.
Distr.: N. Am. Ref.: 50, 122, 253.
Ph. chrysorhizon (Torrey) Budington & Gilberts. 1973
Syn.: *Hydnum fragilissimum* Berk. & Curt. 1873

1b. Hymenial surface even or tuberculate to raduloid. 2

2a. Cystidia absent. 3
2b. Cystidia present. 6

3a. Parasitic on angiosperms, causing the "pink disease". Pantropical species, also known from the southern states of N. Am.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even, orange pink when fresh, in dry condition soon whitish to cream-coloured. Hyphae thin- to thick-walled, 2–10 μm wide, lacking clamps. Basidia 35–50 × 6–8 μm. Spores broadly ellipsoid, 10–13 × 6–8 μm. On angiosperms.
Distr.: N. Am. Ref.: 194.
Ph. salmonicolor (Berk. & Br.) Jülich 1975
Anamorph: *Necator decretus* Massee 1898

3b. Saprophytic or on soil. Species of northern temperate areas. 4

4a. Spores cylindrical to narrowly ellipsoid, 7–8(–11) × 2.5–3.2 μm.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even or slightly tuberculate, cream-coloured. Hyphae thin- to thick-walled, 2–4.5 μm wide. Cystidia lacking. Basidia 25–40 × 4.5–6 μm. On angiosperms.
Distr.: Eur., USSR. Ref.: 348, 352.
Ph. jose-ferreirae (Reid) Reid 1975
Syn.: *?Ph. pallida* Parm. 1967

4b. Spores shorter, 4.5–6.5 μm long. 5

5a. Spores ellipsoid, 5–6.5 × 3–4 μm.
Basidiocarp membranaceous, sometimes with whitish hyphal strands. Hymenial surface tuberculate when fresh, even when dry, cream-coloured. Hyphae thin- to slightly thick-walled, 2–5 μm wide. Cystidia lacking. Basidia 25–35 × 4–5 μm. On angiosperms or more rarely on gymnosperms.
Distr.: Eur. Ref.: 111.
Ph. tuberculata (P. Karst.) Parm. 1968

5b. Spores cylindrical to narrowly ellipsoid, 4.5–5.5 × 2–2.5 μm.
Basidiocarp soft-membranaceous, often with white hyphal strands. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to somewhat thick-walled, 2–8 μm wide. Cystidia lacking or cylindrical, thin-walled, 30–60 μm long, heavily encrusted, projecting. Basidia 25–30 × 4–5 μm. On angiosperms and gymnosperms.
Distr.: Eur. Ref.: 111.
Ph. galactites (Bourd. & Galz.) J. Erikss. & Ryv. 1978

6a. Cystidia with 3–7 clampless septa, 70–170 × 10–13 μm, encrusted.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even, ochraceous. Hyphae thin- to thick-walled, 2–8 μm wide. Basidia 15–25 × 4–5 μm. Spores allantoid, 4–5 × 1.5–2 μm. On wood of angiosperms.
Distr.: whole area. Ref.: 111.
Ph. septocystidiata (Burt) J. Erikss. & Ryv. 1978
Syn.: *Odonticium raitviirii* Parm. 1968

6b. Cystidia not septate. 7

7a. Spores longer than 7 μm. 8
7b. Spores up to 7 μm long. 13

8a. Spores allantoid. 9
8b. Spores cylindrical to ellipsoid. 10

9a. Spores allantoid, 9–13 × 3–4.5 μm.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial

surface even, chocolate brown. Hyphae thin- to thick-walled, 3–9 μm wide, covered with brown material. Cystidia rare, thin-walled, subulate, 50–60 × 5–7 μm, projecting. Basidia 25–35 × 6–9 μm. On gymnosperms.
Distr.: Eur. Ref.: 32, 111.
Ph. cacaina (Bourd. & Galz.) Burdsall & Gilberts. 1974

9b. Spores allantoid, 9–14 × 2.5–3.5 μm.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even, yellowish white to greyish orange. Hyphae thin- to somewhat thick-walled, 2.5–5 μm wide, covered with pale yellow material. Cystidia abundant, thin-walled, cylindrical, 50–130 × 5.5–8 μm, projecting. Basidia 25–35 × 6–8 μm. On angiosperms.
Distr.: N. Am. Ref.: 47.
Ph. allantospora Burdsall & Gilberts. 1974

10a. Subiculum bright orange-yellow.
Basidiocarp membranaceous, the margin bright orange and fibrillose, hyphal strands lacking. Hymenial surface even, pale greyish to cream-coloured or greyish orange. Hyphae thin- to slightly thick-walled, 2–6 μm wide. Cystidia often rare, thin-walled, cylindrical, 50–90 × 7–10 μm, projecting. Basidia 25–40 × 6–9 μm. Spores ellipsoid, 8–10.5 × 4–6 μm. On gymnosperms and angiosperms.
Distr.: N. Am. Ref.: 368.
Ph. viticola (Schw.) Parm. 1968

10b. Subiculum whitish to cream-coloured. 11

11a. Spores broadly ellipsoid, 7–10 × 4–5 μm.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even, cream-coloured to pale ochraceous. Hyphae thin- to slightly thick-walled, 2.5–7 μm wide. Cystidia often rare, thin-walled, subulate, 50–75 × 6–9 μm, projecting. Basidia 30–50 × 6–8 μm. On angiosperms.
Distr.: Eur. Ref.: 111.
Ph. martelliana (Bres.) J. Erikss. & Ryv. 1978
Syn.: *Peniophora macrospora* Bres. apud Bourd. & Galz. 1913

11b. Spores cylindrical to narrowly ellipsoid, 3–4 μm wide. 12

12a. Cystidia rare, thin-walled, subulate, 40–60 × 3–5 μm.
Basidiocarp slightly ceraceous to membranaceous, hyphal strands lacking. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to slightly thick-walled, 2–6 μm wide. Basidia 24–36 × 3–5 μm. Spores cylindrical to narrowly ellipsoid, 4.5–8 × 3–4 μm. On angiosperms.
Distr.: Eur. Ref.: 32.
Ph. ericina (Bourd.) J. Erikss. & Ryv. 1978

12b. Cystidia abundant, thin-walled, cylindrical, 60–150 × 7–10 μm.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to somewhat thick-walled, 2.5–7 μm wide. Basidia 20–35 × 6–8 μm. Spores cylindrical to narrowly ellipsoid, 6–9 × 3–4 μm. On angiosperms.
Distr.: N. Am. Ref.: 46.
Ph. chrysosporium Burdsall 1974
Anamorph: *Sporotrichum pruinosum* Gilman & Abott 1927

13a. Substrate (wood) staining reddish.
Basidiocarp membranaceous, often with red hyphal strands. Hymenial surface even, whitish to cream-coloured or more or less reddish. Hyphae thin- to somewhat thick-walled, 2–8 μm wide. Cystidia few or abundant, thin-walled, subulate, 50–80 × 5–6 μm, projecting. Basidia 25–40 × 5–6 μm. Spores cylindrical to narrowly ellipsoid, 4.5–6 × 2.5–3 μm. On gymnosperms, less common on angiosperms.
Distr.: whole area. Ref.: 111, 127.
Ph. sanguinea (Fr.) Pouzar 1973

13b. Substrate (wood) remaining whitish. 14

14a. Lamprocystidia present, always heavily encrusted. 15

14b. Leptocystidia present, smooth or somewhat encrusted (slightly thick-walled in *Ph. sordida*). 19

15a. Hymenial surface turning purplish in KOH.
Basidiocarp membranaceous, with whitish to yellowish hyphal strands. Hymenial surface even, ochraceous. Hyphae thin- to somewhat thick-walled, 2–5 μm wide. Lamprocystidia narrowly conical, 50–80 × 5–8 μm, projecting. Basidia 25–30 × 4–5 μm. Spores ellipsoid, 4–5 × 2–3 μm. On angiosperms, more rarely on gymnosperms.
Distr.: Eur., N. Am. Ref.: 111.
Ph. filamentosa (Berk. & Curt.) Burdsall 1976

15b. Hymenial surface not purplish in KOH. 16

16a. With conspicuous whitish, up to 1 mm wide hyphal strands. Basidiocarp about 1 mm thick.
Basidiocarp membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to thick-walled, 2–7 μm wide. Lamprocystidia abundant, conical, 40–90 × 8–14 μm, projecting. Basidia 18–30 × 4–5 μm. Spores ellipsoid, 4.5–6 × 2–4 μm. On angiosperms and on soil.
Distr.: Eur. Ref.: 32.
Ph. leprosa (Bourd. & Galz.) Jülich 1979

16b. Hyphal strands absent or thinner. Basidiocarp thinner. 17

17a. Basal hyphae thin- to slightly thick-walled. Basidiocarp almost athelioid. All cystidia projecting. *Ph. galactites*, see 5b.

17b. Basal hyphae distinctly thick-walled. Basidiocarp membranaceous to ceraceous. Cystidia enclosed and projecting. 18

18a. Lamprocystidia cylindrical to subulate, 40–120 × 8–15 μm.
Basidiocarp more or less ceraceous, often with whitish hyphal strands. Hymenial surface even, whitish or with a reddish tinge. Hyphae thin- to thick-walled, 2–8 μm wide. Basidia 30–35 × 4–6 μm. Spores ellipsoid, 5–7 × 2.5–3 μm. On angiosperms, more rarely on gymnosperms.
Distr.: whole area. Ref.: 111.
Ph. velutina (DC. ex Pers.) P. Karst. 1898
Syn.: *Corticium decolorans* P. Karst. 1882; *Stereum alneum* (Fr.) Fr. sensu P. Karst. 1889

18b. Lamprocystidia narrowly conical, 40–70 × 5–7 μm.
Basidiocarp membranaceous, seldom with white hyphal strands. Hymenial surface even, sometimes tuberculate when fresh, ochraceous or with an orange tinge. Hyphae thin- to somewhat thick-walled, 2–5 μm wide. Basidia 25–35 × 4–5 μm. Spores ellipsoid, 4.5–6 × 2.3–2.6 μm. On gymnosperms and angiosperms.
Distr.: whole area. Ref.: 111.
Ph. affinis (Burt) Parm. 1968
Syn.: *Ph. laevis* (Fr.) sensu J. Erikss. & Ryv. 1978

19a. Hyphal strands yellow. 20

19b. Hyphal strands white or absent. 21

20a. Hyphal strands and subiculum yellowish, becoming reddish in KOH.
Basidiocarp membranaceous. Hymenial surface even, yellowish orange. Hyphae thin- to somewhat thick-walled, 2.5–7 μm wide, encrusted with yellowish granules which dissolve in KOH turning the solution red. Cystidia subulate, thin-walled, 35–50 × 5–8 μm, projecting. Basidia 20–30 × 4.5–5 μm. Spores narrowly ellipsoid, 4.5–6 × 2.5–3 μm. On angiosperms.
Distr.: N. Am. Ref.: 47.
Ph. salmoneolutea Burdsall & Gilberts. 1974

20b. No such colour reaction with KOH.
Basidiocarp membranaceous, with yellow hyphal strands. Hymenial surface even, yellowish. Hyphae thin- to somewhat thick-walled, 2–8 μm wide. Cystidia subulate, thin-walled, 30–50 × 3–5 μm, projecting. Basidia 20–30 × 4.5–6 μm. Spores cylindrical to narrowly ellipsoid, 4–5 × 2–2.5 μm.
Distr.: N. Am. Ref.: 41, 368.
Ph. burtii (Romell ex Burt) Parm. 1967

21a. Basidiocarp becoming more or less raduloid. Subicular hyphae often strongly branched, resembling binding hyphae.

Basidiocarp ceraceous, sometimes with hyphal strands. Hymenial surface yellowish to reddish orange. Hyphae thin- to thick-walled, 1.5–3.6 μm wide. Cystidia often rare, thin-walled, cylindrical, 60–90 × 8–12 μm, projecting. Basidia 25–35 × 4–5 μm. Spores narrowly ellipsoid, 4.5–5.5 × 2.3–2.6 μm. On angiosperms.
Distr.: Eur., USSR. Ref.: 111.
Ph. raduloides J. Erikss. & Ryv. 1978

21b. Basidiocarp even at least when dry. Subicular hyphae straight. 22

22a. Margin and subiculum dark brown.

Basidiocarp crustaceous to membranaceous, hyphal strands lacking. Hymenial surface even, pale violaceous grey. Hyphae thin- to somewhat thick-walled, 2–6 μm wide. Cystidia rare, thin-walled, cylindrical, 4–8 μm wide, projecting. Basidia 18–24 × 5–6 μm. Spores narrowly ellipsoid, 5–7 × 3–4 μm. On angiosperms.
Distr.: N. Am. Ref.: 132, 249
Ph. fuscomarginata (Burt) Gilberts. apud Gilberts., Canfield & Cummins 1972

22b. Margin and subiculum not dark brown. 23

23a. Hyphal strands present, white. 24
23b. Hyphal strands absent. 25

24a. Cystidia encrusted. *Ph. galactites,* see 5b.
24b. Cystidia smooth.

Basidiocarp membranaceous, with white hyphal strands. Hymenial surface even, whitish to pale ochraceous. Hyphae thin- to somewhat thick-walled, 2–8 μm wide. Cystidia subulate, thin-walled, projecting, 40–70 × 5–7 μm. Basidia 25–30 × 4–5 μm. Spores cylindrical to narrowly ellipsoid, 4.5–5.5 × 2–2.5 μm. On angiosperms, more rarely on gymnosperms.
Distr.: Eur. Ref.: 111.
Ph. calotricha (P. Karst.) J. Erikss. & Ryv. 1978
Syn.: *Peniophora limonia* Burt 1926

25a. Spores narrowly ellipsoid, 4–5 × 2–2.5 μm.

Basidiocarp membranaceous, 200–800 μm thick, hyphal strands lacking. Hymenial surface even, yellow. Hyphae thin- to slightly thick-walled, 2–8 μm wide. Cystidia abundant, thin-walled, cylindrical, 45–60 × 3–5 μm, projecting. Basidia 25–45 × 4.5–6 μm. On gymnosperms, more rarely on angiosperms.
Distr.: N. Am. Ref.: 127, 368.
Ph. carnosa (Burt) Parm. 1967

Note: When basidiocarp 100–200 μm thick and hymenial surface cream-coloured, cf. *Ph. galactites* under 5b.

25b. Spores 2.5–3 or 3–4 μm wide. 26

26a. Cystidia 3–6 μm wide. 27
26b. Cystidia 6–10 μm wide. 28

27a. Cystidia cylindrical, 50–80 × 4–6 μm, projecting.
Basidiocarp membranaceous, hyphal strands lacking. Hymenial surface even or slightly tuberculate, cream-coloured to ochraceous. Hyphae thin- to thick-walled, 2–7 μm wide. Basidia 25–35 × 5.5–7.5 μm. Spores narrowly ellipsoid, 5–7 × 2.5–3.5 μm. On angiosperms.
Distr.: N. Am. Ref.: 47.
Ph. arizonica Burdsall & Gilberts. 1974

27. Cystidia fusoid, 40–60 × 3–5 μm. *Ph. ericina*, see 12a.

28a. Spores narrowly ellipsoid to short cylindrical, 5–7 × 2.5–3 μm. *Sporotrichum*-anamorph absent.
Basidiocarp ceraceous to membranaceous, hyphal strands lacking. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to thick-walled, 2–7 μm wide. Cystidia cylindrical-fusiform, 60–80 (–130) × 6–10 μm, basally somewhat thick-walled, projecting. Basidia 25–30 × 4–5 μm. Spores narrowly ellipsoid or short cylindrical, 5–7 × 2.5–3 μm. Mainly on angiosperms, rarely on gymnosperms.
Distr.: whole area. Ref.: 111.
Ph. sordidia (P. Karst.) J. Erikss. & Ryv. 1978
Syn.: *Grandiniella livescens* P. Karst. 1895; *Corticium cremeum* Bres. 1898; *C. eichlerianum* Bres. 1903; *Peniophora arachnoidea* Burt 1926

28b. Spores narrowly ellipsoid to cylindrical, 6–9 × 3–4 μm. *Sporotrichum*-anamorph typically present. *Ph. chrysosporium*, see 12b.

PHLEBIA Fr. 1821

Basidiocarp annual, resupinate, effused or somewhat effused-reflexed, adnate, ceraceous to sometimes membranaceous, sometimes with hyphal strands. Hymenial surface even, phlebioid or merulioid, rarely poroid or odontioid, light or dark coloured. Hyphal system monomitic. Hyphae hyaline, cylindrical or torulose, thin- to thick-walled, with or without clamps. Cystidia lacking or present, hyaline, thin- to thick-walled, subulate, cylindrical, clavate or conical, smooth or encrusted, enclosed or projecting. Basidia hyaline, narrowly clavate, with 4 sterigmata. Spores hyaline, thin-walled, smooth, subglobose, ellipsoid, cylindrical or allantoid, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms, occasionally on soil.
Type species: *Phlebia radiata* Fr. 1821
Distribution: in the whole area.
References: 66.

1a. Thick-walled cystidia present. 2
1b. Thick-walled cystidia absent. 10

2a. Basidiocarp reddish in KOH. 3
2b. Basidiocarp not reddish in KOH. 4

3a. Cystidia thin-walled, partly or totally encrusted, 3–5 μm wide, the incrustation consisting of amorphous material. *Ph. chrysocreas*, see 14a.
3b. Cystidia thick-walled, encrusted, 40–80 × 6–16 μm, the incrustation consisting of small, hyaline crystals.

Basidiocarp effused, ceraceous to membranaceous, the margin fimbriate and yellowish orange. Hymenial surface even or slightly granular, yellowish orange when fresh, orange-brown when dry. Hyphae 2–3.5 μm wide, covered with brownish, amorphous material, with clamps. Basidia 22–32 × 4–5 μm. Spores ellipsoid to cylindrical, 4.4–6.8 × 2.8–3.5 μm. On angiosperms.
Distr.: whole area. Ref.: 317, 368.
Ph. martiana (Berk. & Curt.) Parm. 1967
Syn.: *Peniophora egelandii* Bres. 1911; *Ph. pulcherrima* Parm. 1967

4a. Hymenial surface odontioid, cream-coloured to ochraceous.

Basidiocarp effused, closely adnate, ceraceous to membranaceous, the margin thinning out. Hyphae thin- to somewhat thick-walled, 2.5–3.5 μm wide, with clamps. Lamprocystidia hyaline, conical, 30–80 × 6–12 μm, thick-walled, encrusted. Basidia 15–25 × 4.5–5.5 μm. Spores ellipsoid, 5–6 × 3–3.5 μm. On gymnosperms.
Distr.: Eur. Ref.: 66.
Ph. queletii (Bourd. & Galz.) M.P. Christ. 1960

4b. Hymenial surface even to merulioid. 5

5a. Spores up to 5 μm long. 6
5b. Spores at least 6 μm long. 8

6a. Two types of cystidia present, viz. heavily encrusted concical and smooth clavate cystidia.

Basidiocarp effused, adnate, ceraceous, with indistinct margin. Hymenial surface merulioid when fresh, almost even when dry, greyish. Hyphae thin- to thick-walled, 3–6 μm wide, with clamps. Lamprocystidia hyaline, conical, thick-walled, 40–60 × 8–10 μm, encrusted, projecting. Leptocystidia rare, hyaline, cylindrical to capitate, 40–50 × 7–8 μm, thin- to slightly thick-walled, smooth, somewhat projecting. Basidia 20–25 × 4–5 μm. Spores ellipsoid, 4–5.5 × 2–2.8(–3) μm.
Distr.: Eur., USSR. Ref.: 372.
Ph. lindtneri (Pilát) Parm. ex Strid 1975
Syn.: *Phlebia merulioidea* Parm. 1962

6b. Cystidia conical, thick-walled, smooth or encrusted. 7

7a. Spores cylindrical, sometimes curved, 5.5–7 × 2.2–2.5 μm. Cystidia smooth, conical, thick-walled, 50–70 × 5–7 μm.

Basidiocarp effused, adnate, ceraceous. Hymenial surface even, greyish to cream-coloured or ochraceous. Hyphae thin-walled, 1–3 μm wide, with clamps. Basidia 12–20 × 4–5 μm. On gymnosperms.

Distr.: Eur., USSR. Ref.: 368, 406.

Ph. segregata (Bourd. & Galz.) Parm. 1967

Syn.: *Peniophora livida* Burt 1926

7b. Spores ellipsoid, 3.5–4.5(–5) × 2–2.5 μm. Cystidia heavily encrusted, conical, thick-walled, 40–100 × (7–)10–18(–20) μm, projecting up to 60 μm.

Basidiocarp effused, adnate, ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin-walled, 2–3(–3.5) μm wide, with clamps. Basidia 15–22(–25) × 4–5(–5.5) μm. On gymnosperms.

Distr.: Eur., USSR. Ref.: 161, 318.

Ph. cremeo-alutacea (Parm.) K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1977

Note: Cf. also *Hyphoderma karstenii* and *H. fouquieriae*.

8a. Cystidia heavily encrusted. Cf. *Hyphoderma pubera*

8b. Cystidia more or less smooth. 9

9a. Cystidia cylindrical, subulate or conical, 60–80 × 9–11 μm, thick-walled, smooth. Cystidioles absent.

Basidiocarp effused, ceraceous, closely adnate, the margin adnate or slightly rolled up when dry. Hymenial surface even, greyish brown or reddish brown. Subicular hyphae thick-walled, up to 8 μm wide. Subhymenial hyphae thin-walled, 3–5 μm wide, with clamps. Basidia 30–45 × 5–6 μm. Spores ellipsoid, 7–10.5 × 3.5–5.5 μm. On gymnosperms.

Distr.: whole area. Ref.: 32.

Ph. cornea (Bourd. & Galz.) Parm. 1967

9b. Cystidia cylindrical, 90–150(–200) × 10–12 μm, somewhat thick-walled, smooth. Thick-walled cystidioles or basidioles sometimes present.

Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, greyish. Hyphae 3.5–4.5 μm wide, thin- to somewhat thick-walled, with clamps. Basidia 20–30 × 5–6 μm. Spores ellipsoid, 7–8 × 4–5 μm. On gymnosperms.

Distr.: Eur. Ref.: 164, 406.

Ph. longicystidia (Litsch.) Hjortstam & Ryv. 1979

Note: When spores slightly narrower, cf *Crustoderma dryina*.

10a. Hymenial surface fresh or dry distinctly folded, merulioid or somewhat poroid. 11

10b. Hymenial surface even, tuberculate or grandinioid, not or – when fresh – only slightly folded-merulioid. 12

11a. Hymenial surface folded, pinkish to orange, sometimes with violaceous tinges.

Basidiocarp effused or slightly effused-reflexed, gelatinous when fresh, ceraceous when dry, adnate. Subhymenial hyphae thin- to slightly thick-walled, 2–5 μm wide, with clamps. Subicular hyphae thick-walled, up to 10 μm wide. Cystidia rare or absent, thin-walled, clavate, 40–100 × 6–12 μm, smooth. Basidia 23–35 × 3.5–5.5 μm. Spores cylindrical, curved, 4.5–6 × 1.5–2 μm. On angiosperms, rarely on gymnosperms.

Distr.: whole area. Ref.: 142.

Ph. radiata Fr. 1821

Syn.: *Phlebia contorta* Fr. 1821; *Ph. merismoides* (Fr.) ex Fr. 1821; *Thelephora bolaris* Pers. 1822; *Merulius fulvus* Lasch 1829; *Ph. cinnabarina* (Schw. ex Fr.) Schw. 1832; *Th. aurantiaca* (Sow.) ex Berk. 1836; *Ph. kriegeriana* P. Henn. 1902; *Ph. donkii* Bourd. apud Donk 1930. *Ph. cystidiata* H.S. Jacks. ex W.B. Cooke 1956

Note: When spores larger (7–9 × 2.5–3 μm), cf. *Ph. centrifuga* under 37a.

11b. Hymenial surface merulioid to poroid, orange when young, becoming ochraceous or brownish.

Basidiocarp effused or slightly reflexed, ceraceous, adnate. Hyphae thin- to somewhat thick-walled, 2–6 μm wide, with clamps. Cystidia rare or abundant, thin-walled, cylindrical to clavate, 30–120 × 6–14 μm, mostly enclosed. Basidia 20–30 × 3.5–5 μm. Spores narrowly ellipsoid to cylindrical, slightly curved, 4.5–5.5 × 2–2.5 μm. On angiosperms, rarely on gymnosperms.

Distr.: whole area. Ref.: 142.

Ph. rufa (Fr.) M.P. Christ. 1960

Syn.: *Xylomyzon isoporum* Pers. 1825; *Merulius pallens* Berk. 1841; *Phlebia acerina* Peck 1889; *M. pruni* Peck 1906; *Ph. merulioidea* Lloyd 1915; *Ph. castanea* Lloyd 1922; *M. pilosus* Burt apud Zeller 1922; *M. lividus* Bourd. & Galz. 1923; *M. phlebioides* Bourd. & Galz. 1923; *M. interruptus* Bres. 1925; *Ph. vassilkovii* Parm. 1962; *Ph. sublivida* Parm. 1967

12a. Leptocystidia present. 13

12b. Leptocystidia absent. 25

13a. Cystidia 9–12 μm wide. 9

13b. Cystidia narrower. 14

14a. Subiculum reddish in KOH.

Basidiocarp effused, up to 1 mm thick, adnate, ceraceous to membranaceous. Hymenial surface even or slightly warted, yellowish ochraceous to slightly brown. Hyphae thin- to slightly thick-walled, 2–5.5 μm wide, with clamps. Cystidia subulate, 15–30 × 3–5 μm. Basidia 15–22 × 4–5 μm. Spores narrowly ellipsoid to cylindrical, 4–5.5(–6) × 2–2.5 μm. On angiosperms.

Distr.: Eur., N. Am. Ref.: 268.

Ph. chrysocreas (Berk. & Curt. apud Berk.) Burdsall apud Lombard, Burdsall & Gilberts. 1975

Syn.: *Kneiffia chromoplumbea* Berk. & Br. 1875; *Corticium flavocroceum* Bres. apud Bourd. & Galz. 1911

14b. Subiculum not reddish in KOH. 15

15a. Spores narrowly cylindrical to allantoid. 16

15b. Spores ellipsoid. 21

16a. Cystidia covered with a thick layer of yellowish amorphous material, cylindrical, 28–55 × 3–4 μm.

Basidiocarp effused, adnate, ceraceous. Hymenial surface even, brick-red when fresh, ochraceous to yellowish brown when dry. Hyphae thin-walled, 1.5–4 μm wide, with clamps. Basidia 14–28 × 3.5–4.5 μm. Spores cylindrical to slightly allantoid, 5–6 × 1.2–1.5 μm. On gymnosperms.

Distr.: whole area. Ref.: 263, 368.

Ph. flavoferruginea (P. Karst.) Parm. 1967

16b. Cystidia smooth. 17

17a. Cystidia small, subulate, with small, capitate apex, 20–40 × 3–6 μm. 18

17b. Cystidia larger, cylindrical or subulate, not capitate, 30–70(–100) μm long. 19

18a. Spores narrowly cylindrical to allantoid, 6–7 × 1.5–1.8 μm.

Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, whitish. Hyphae thin- to slightly thick-walled, 1.5–3 μm wide, with clamps. Cystidia thin-walled, subulate, apically capitate, 20–25 × 3–3.5 μm. Basidia 15–20 × 4–5 μm. On gymnosperms.

Distr.: Eur. Ref.: 265.

Ph. romellii (Litsch. apud Bourd. & Galz.) Parm. 1967

Syn.: *Corticium cretaceum* Romell apud Litsch. 1941

18b. Spores allantoid, 4.5–5.5 × 1.8–2.2 μm.

Basidiocarp effused, adnate, ceraceous, with few hyphal strands. Hymenial surface even, whitish to cream-coloured. Hyphae thin-walled, 1.5–3 μm wide, with clamps. Cystidia thin-walled, subulate, apically capitate, 25–40 × 3–6 μm. Basidia 13–20 × 4.5–5 μm. On angiosperms.

Distr.: USSR. Ref.: 317.

Ph. georgica Parm. 1967

19a. Cystidia cylindrical, thin- to somewhat thick-walled, the basal part slightly widened, 50–100 × 6.5–9 μm, smooth.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin-walled, 1–3.5 μm wide, with clamps. Basidia 20–28 × 4.5–5 μm. Spores cylindrical to slightly allantoid, 4.5–7 × 1.5–2 μm. On gymnosperms.
Distr.: Eur.
Ph. tristis (Litsch. & Lundell apud Litsch.) Parm. 1967

19b. Cystidia subulate. 20

20a. Spores curved-cylindrical to allantoid, 5–7 × 1.8–2.4 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, ochraceous. Hyphae thin- to somewhat thick-walled, 2.5–4 μm wide, with clamps. Cystidia thin-walled, subulate, 30–70 × 2.8–4 μm. Basidia 20–30 × 3.5–4 μm. On gymnosperms.
Distr.: Eur., N. Am. Ref.: 66.
Ph. subserialis (Bourd. & Galz.) Donk 1957

20b. Spores narrowly ellipsoid to cylindrical, 4.5–5.5 × 2–2.5 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface somewhat merulioid when fresh, even when dry, cream-coloured to ochraceous. Hyphae thin- to somewhat thick-walled, 2–4 μm wide, with clamps. Cystidia thin-walled, subulate, 25–35 × 3–4.5 μm. Basidia 12–20 × 3.5–4.5 μm. On gymnosperms.
Distr.: N. Am. Ref.: 176, 368.
Ph. phlebioides (H.S. Jacks. & Dearden) Donk 1957

21a. Hymenial surface grandinioid, brownish.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hyphae thin- to somewhat thick-walled, 2–6 μm wide, with clamps. Cystidia sometimes rare, thin-walled, subulate, 40–60 × 4–5 μm. Basidia 30–40 × 4–5 μm. Spores ellipsoid, 4.5–5.5 × 2.5–3 μm. On angiosperms.
Distr.: Eur., N. Am. Ref.: 66.
Ph. subochracea (Bres.) J. Erikss. & Ryv. 1976
Syn.: *Peniophora ludoviciana* Burt 1925; *Ph. danica* M.P. Christ. 1956

21b. Hymenial surface even to slightly tuberculate. 22

22a. Clamps absent.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, cream-coloured to ochraceous or brownish. Hyphae thin- to slightly thick-walled, 2–4 μm wide. Cystidia often rare, thin-walled, cylindrical, 50–70 × 4–6 μm. Basidia 28–40 × 4–5 μm. Spores ellipsoid, 3.5–4.8 × 2.2–3 μm. On angiosperms.
Distr.: Eur. Ref.: 66.
Ph. umbrata (Bourd. & Galz.) Parm. 1967
Syn.: *Phlebia lilacea* M.P. Christ. 1960

22b. Clamps present. 23

23a. Cystidia cylindrical to narrowly clavate, thin-walled, 60–80 × 5–8 μm. Basidiocarp effused, adnate, ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin-walled, 2–3.5 μm wide, with clamps. Basidia 12–45 × 3–7 μm. Spores ellipsoid, 5–8 × 2.5–3 μm. On angiosperms.
Distr.: Eur. Ref.: 32.
Ph. expallens (Bres.) Parm. 1967

23b. Cystidia subulate or fusiform. 24

24a. Cystidia subulate, thin-walled (except for the slightly thick-walled basal part), 40–60 × 5–6 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even to slightly tuberculate, pinkish ochraceous when fresh, brownish when dry. Hyphae thin- to somewhat thick-walled, 3–5 μm wide, with clamps. Basidia 22–30 × 3.5–5 μm. Spores ellipsoid, 5.5–8 × 3.2–4 μm. On angiosperms.
Distr.: Eur., N. Am. Ref.: 66.
Ph. ochraceofulva (Bourd. & Galz.) Donk 1957

24b. Cystidia fusiform, thin-walled, 65–130 × 4.5–6 μm.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, ochraceous. Hyphae thin-walled, 2–3 μm wide, with clamps. Basidia 45–50 × 5.5–6.5 μm. Spores ellipsoid, 7–8 × 3.5–4.5 μm. On gymnosperms.
Distr.: N. Am. Ref.: 368.
Ph. separata (H.S. Jacks. & Dearden) Parm. 1967

25a. Clamps absent. 26

25b. Clamps present. 28

26a. Basal hyphae thick-walled, 3–6.5 μm wide.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even to slightly grandinioid, greyish. Subhymenial hyphae thin-walled, 3–4 μm wide. Basidia 28–44 × 3.8–4.4 μm. Spores ellipsoid, 3.8–4.8 × 2.8–3.5 μm.
Distr.: Eur. Ref.: 358.
Ph. deflectens (P. Karst.) Ryv. 1971

26b. Basal hyphae thin-walled. 27

27a. Spores broadly ellipsoid, 3.5–5 × 2.4–2.8 μm.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, light greyish to cream-coloured. Hyphae thin-walled, 1.5–3 μm wide, without clamps. Basidia 22–32 × 3.5–5 μm. On angiosperms.
Distr.: Eur. Ref.: 32.
Ph. griseo-livens (Bourd. & Galz.) Parm. 1967

27b. Spores narrowly ellipsoid, 5–7 × 2.5–3.5 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin-walled, 2.5–4 μm wide, without clamps. Basidia 28–35 × 4–5 μm. On angiosperms.
Distr.: Eur. Ref.: 161.
Ph. cremeo-ochracea (Bourd. & Galz.) Parm. 1967

28a. Spores curved-cylindrical or allantoid. 29
28b. Spores ellipsoid. 33

29a. Basal hyphae thick-walled, 2–5 μm wide.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even or slightly warted to tuberculate, bluish grey to brownish. Subhymenial hyphae thin-walled, 2.5–4 μm wide, with clamps. Basidia 20–35 × 4–5 μm. Spores allantoid, 4–6 × 1.5–2.5 μm.
Distr.: whole area. Ref.: 268.
Ph. livida (Pers. ex Fr.) Bres. 1897
29b. Basal hyphae thin-walled. 30

30a. Spores allantoid, 1.2–1.8 μm broad. 31
30b. Spores cylindrical, often curved, 1.8–2.5 μm broad. 32

31a. Basidia irregularly clavate, 14–18 × 3.7–4.4 μm.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, cream-coloured to yellowish. Hyphae thin-walled, 1–2 μm wide, with clamps. Spores allantoid, 5–6.5 × 1.2–1.5 μm. On gymnosperms.
Distr.: Eur. Ref.: 66.
Ph. subcretacea (Litsch.) M.P. Christ. 1960
31b. Basidia narrowly clavate, 18–24 × 4–5 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, bluish grey to pale brownish. Hyphae thin-walled, 2–3 μm wide, with clamps. Spores curved-cylindrical to allantoid, 6–7 × 1.2–1.8 μm.
Distr.: Eur., USSR. Ref.: 270 (nr 1840).
Ph. aerugineo-livida (Romell ex Lundell) Donk 1957

32a. Spores cylindrical, slightly curved, 7–9 × 1.8–2 μm. Subiculum without colonies of green algae.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin-walled, 1–2.5 μm wide, with clamps. Basidia 20–25(–30) × 5–7.5 μm. On gymnosperms.
Distr.: Eur. Ref.: 317.
Ph. argentea Parm. 1967
32b. Spores cylindrical, slightly curved, 5–7 × 1.8–2.5 μm. Subiculum (?always) with colonies of green algae (Chlorococcus).
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, light greyish or with a bluish tinge. Hyphae thin-walled, 1–2.5(–4) μm wide, with clamps. Basidia 18–25 × 4–6 μm. On gymnosperms.

Distr.: USSR. Ref.: 317.
Ph. lichenoides Parm. 1967

33a. Spores up to 5 μm long. 34
33b. Spores longer than 5 μm. 35

34a. Spores ellipsoid, 3.5–5 × 2.5–3 μm.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, cream-coloured or greyish. Hyphae thin-walled, 2–4 μm wide, with clamps. Basidia 24–30 × 4–4.5 μm.
Distr.: Eur. Ref.: 66.
Ph. lacteola (Bourd.) M.P. Christ. 1960

34b. Spores ellipsoid, 3.8–4.5 × 2.2–2.5 μm.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae thin- to slightly thick-walled, 1.5–4 μm wide, with clamps. Basidia 38–45 × 3.8–4.5 μm.
Distr.: Eur. Ref.: 32.
Ph. serialis (Fr.) Donk 1957
Syn.: *?Corticium pallido-incarnatum* Litsch. 1941

35a. Hymenial surface blackish or bluish grey. 36
35b. Hymenial surface cream-coloured, ochraceous or brown. 37

36a. Spores ellipsoid, 5.5–6.5 × 3–3.5 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, blackish or dark bluish grey. Hyphae thin- to somewhat thick-walled, 3–4 μm wide, with clamps. Basidia 20–35 × 4.5–5.5 μm.
Distr.: USSR. Ref.: 317.
Ph. ardesiaca Parm. 1967

36b. Spores ellipsoid, 6.5–8 × 3.2–4 μm.
Basidiocarp effused, adnate, ceraceous. Hymenial surface even, dark grey. Hyphae thin- to thick-walled, 2–5 μm wide, with clamps. Basidia 35–45 × 4.8–5.2 μm.
Distr.: USSR. Ref.: 317.
Ph. plumbea Parm. 1967

37a. Spores ellipsoid, 7–9 × 3–3.5 μm. Hymenial surface cream-coloured, even.
Basidiocarp effused, adnate, ceraceous to membranaceous. Hyphae thin- to thick-walled, 2.5–4.5 μm wide, with clamps. Basidia 20–30 × 5–7 μm. On angiosperms.
Distr.: Eur. Ref.: 265.
Ph. pallido-cremea (Litsch.) Parm. 1967

37b. Spores up to 3 μm broad. Hymenial surface brownish. 38

38a. Spores narrowly ellipsoid to cylindrical, 7–9 × 2.5–3 μm. Margin distinct, strigose, up to 5 mm wide. Hymenial surface papillose and wrinkled when fresh, even or papillose when dry.

Basidiocarp effused, adnate, ceraceous. Hymenial surface at first greyish white, becoming pale ochraceous to brown. Hyphae thin- to slightly thick-walled, 1.5–4 μm wide, with clamps. Basidia 25–35 × 5–6 μm.

Distr.: Eur., N. Am.

Ph. centrifuga P. Karst. 1881

Syn.: *?Phlebia albida* Post ex Fr. 1863; *Ph. macra* Litsch. apud Pilát 1934

38b. Spores narrowly ellipsoid to cylindrical, 5.5–7.5(–8) × 2.3–2.8 μm. Margin indistinct or slightly fimbriate. Hymenial surface even.

Basidiocarp effused, adnate, ceraceous. Hymenial surface ochraceous to brown. Hyphae thin- to somewhat thick-walled, 2–4.5 μm wide, with clamps. Basidia 28–35 × 4–5.5 μm. On angiosperms.

Distr.: Eur. Ref.: 358.

Ph. nitidula (P. Karst.) Ryv. 1971

Syn.: *?Phlebia pallidolivens* (Bourd. & Galz.) Parm. 1967

PHLEBIOPSIS Jülich 1978

Basidiocarp annual, resupinate, effused, ceraceous, adnate. Hymenial surface even to slightly tuberculate, whitish, greyish, cream-coloured or ochraceous. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, clamps rare or absent. Lamprocystidia present, hyaline, thick-walled, encrusted. Basidia hyaline, narrowly clavate, 4-spored. Spores hyaline, ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Thelephora gigantea* Fr. 1821
Distribution: in the whole area.
References: 199.

1a. On gymnosperms.

Basidiocarp effused, up to 1 m long, thick-gelatinous when fresh, ceraceous when dry, adnate. Hymenial surface even or slightly tuberculate, whitish to light greyish or pinkish-ochraceous. Margin fimbriate. Hyphae densely interwoven, cylindrical to torulose, thin- to somewhat thick-walled and 2–4 μm wide in the subhymenium, very thick-walled and up to 8 μm wide in the subiculum, clamps absent or rare. Lamprocystidia hyaline, conical, thick-walled, 60–100 × 12–20 μm, the upper half heavily encrusted, projecting. Basidia 18–30 × 4–5 μm. Spores ellipsoid, 5–7 × 2.5–3 μm.

Distr.: whole area. Ref.: 66, 368.

Ph. gigantea (Fr.) Jülich 1968

1b. On angiosperms.

Basidiocarp effused, ceraceous-membranaceous, adnate. Hymenial surface even, pilose when seen through a lens, cream-coloured to ochraceous. Margin thinning out. Hyphae densely interwoven, cylindrical, thin- to somewhat thick-walled, 2–5 μm wide, clamps absent. Lamprocystidia hyaline, conical, thick-walled, 60–120 × 10–20 μm, the greater part heavily encrusted, projecting. Basidia 15–25 × 3.5–4.5 μm. Spores ellipsoid, 4.5–6.5 × 2.5–3.5 μm.

Distr.: whole area. Ref.: 66, 368.

Ph. roumeguerii (Bres.) comb. nov.

Bas.: *Corticium roumeguerii* Bres. 1892, Fung. trident. Vol. 2, p. 36, pl. 144, fig. 1.

PILODERMA Jülich 1969

Basidiocarp annual, resupinate, effused, pellicular to membranaceous, with or without hyphal strands. Hymenial surface even, mostly pale coloured. Hyphal system monomitic. Hyphae hyaline to pale yellowish, thin- to somewhat thick-walled, cylindrical, without clamps, the surface smooth or loosely covered with crystals. Cystidia lacking. Basidia hyaline, clavate, with (2–)4(–6) sterigmata. Spores yellowish, somewhat thick-walled, smooth, subglobose to ellipsoid, often guttulate, not amyloid.

Substrate: saprophytic on wood of angiosperms, plant debris, soil or stones.
Type species: *Corticium bicolor* Peck 1874
Distribution: in the whole area.
References: 186, 314.

1a. Basidia large, broadly clavate, 10–31 × 5.7–12 μm, with (2–)4(–6) sterigmata.

Basidiocarp effused, pellicular, loosely adnate, without hyphal strands. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline to pale yellowish, 2.5–4 μm wide. Spores ellipsoid, 3.5–6 × 2.8–4.2 μm. On wood, ferns and stones.

Distr.: Eur., USSR. Ref.: 186.

P. lapillicola Jülich 1969

1b. Basidia smaller, narrowly clavate. 2

2a. Hyphal strands lacking. Subiculum not very distinct. 3

2b. Hyphal strands present. Subiculum usually well developed. 4

3a. Basidiocarp thin-pellicular. Basidia rigid, after dispersal of the spores not easily collapsed, 16–20 × 3.5–4(–4.5) μm.

Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, thin-walled, 2.5–3 μm wide. Spores subglobose to broadly ellipsoid, 3–4(–4.5) × 2.8–3(–3.4) μm.

Distr.: Eur., N. Am. Ref.: 186.
P. sphaerosporum Jülich 1972

3b. Basidiocarp crumbly-granular, adnate. Basidia soft, easily collapsed after dispersal of the spores, 11–15 × 3.6–5 μm.
Hymenial surface even, cream-coloured. Hyphae hyaline to pale yellowish, thin-walled, 2–3 μm wide. Spores broadly ellipsoid, 2.9–3.8 × 2.1–2.9 μm.
Distr.: Eur. Ref.: 186.
P. reticulatum Jülich 1972

4a. Hyphal strands and subiculum orange-yellow. Hymenial surface typically yellowish to orange-yellow, rarely brown, white or olive.
Basidiocarp pellicular, loosely adnate. Hyphae pale yellowish, slightly thick-walled, 2–4 μm wide. Basidia 12–20 × 4–5.5 μm. Spores broadly ellipsoid, 2.5–4.5 × 2–3 μm.
Distr.: whole area. Ref.: 66, 127, 186.
P. bicolor (Peck) Jülich 1972

4b. Hyphal strands and subiculum pure white, sometimes scarcely developed. Hymenial surface white or pale yellowish.
Basidiocarp pellicular to soft membranaceous. Hyphae pale yellowish, slightly thick-walled, 2–4 μm wide. Basidia 11–18 × 4–5.5 μm, with 2–4 sterigmata. Spores ellipsoid, 2–5.5 × 2–3.8 μm.
Distr.: whole area. Ref.: 127, 186.
P. byssinum (P. Karst.) Jülich 1972

PSEUDOTOMENTELLA Svrček 1958

Basidiocarp annual, resupinate, effused, arachnoid, byssoid, tomentose or pellicular. Hymenial surface continuous when mature, even, pale or dark coloured. Hyphal system mono- or dimitic. Hyphal strands typically present. Skeletal hyphae yellowish, 1–2.5 μm wide. Generative subicular hyphae typically with thickened walls, brownish, without clamps or rarely with scattered or abundant clamps. Sterile hymenial structures absent. Basidia sphaeropedunculate when immature, pedunculate-clavate when mature, sometimes with median septum, with (2–)4 sterigmata which may become septate. Spores subhyaline to pale yellowish, rarely brown, globose to lobed, typically warted and warts becoming bifurcate, rarely echinulate to aculeate, with thickened walls, 5–12 μm in diam.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Hypochnus mucidula* P. Karst. 1882
Distribution: in the whole area.
References: 217, 376.

1a. Spores becoming deep blue in KOH, yellowish in H_2O.

Basidiocarp effused, pellicular, separable, margin indistinct. Hymenial surface pulverulent, deep blue when fresh, pale yellow green when dry. Hyphal system monomitic. Subicular hyphae hyaline to yellowish, 1–4 μm wide. Basidia 35–40 × 8–10 μm, sterigmata up to 5 μm long. Clamps present, abundant in subhymenium, rare in subiculum. Spores irregularly globose to irregular, coarsely warted, 7–9 × 7 μm.

Distr.: Eur., N. Am. Ref.: 48, 218, 387.

P. atrocyanea (Wakef.) Burdsall & M.J. Larsen 1974

1b. Spores not deep blue in KOH. 2

2a. Nearly all septa of subicular hyphae with clamps. 3

2b. Clamps on subicular hyphae rare or absent. 5

3a. Spores warted to echinulate, walls brownish to umbrinous. Hymenial surface typically warted to toothed. Cf. *Tomentella crinalis*.

3b. Spores warted, walls hyaline to pale yellowish. Hymenial surface even. 4

4a. Spores irregularly globose, strongly warted, 8–11(–12) μm in diam. Subicular hyphae 3.5–5.5(–6.5) μm wide. Chlamydospores typically present in hyphal strands, up to 35 μm in diam.

Basidiocarp effused, separable, pellicular, up to 0.4 mm thick. Hymenial surface even, often cracking, dark green. Margin fimbriate, darker. Hyphal strands present, up to 45 μm wide, dark greyish blue in H_2O, dull purplish brown, greenish or yellowish in KOH (subicular hyphae also). Basidia 60–80 × 9–11(–13) μm, sterigmata up to 8 μm long. On gymnosperms.

Distr.: N. Am. Ref.: 208, 211, 217.

P. vepallidospora M.J. Larsen 1967

4b. Spores irregularly globose, warted, (5.5–)6–8(–9) μm in diam. Subicular hyphae 3–4.5(–6) μm wide. Chlamydospores absent.

Basidiocarp effused, separable in small pieces, pellicular to crustose. Hymenial surface even, greenish. Margin indistinct. Hyphal strands present, up to 200 μm wide, yellowish to brownish in H_2O and KOH (subicular hyphae also). Basidia 50–70 × 8–10.5(–11) μm, sterigmata up to 9 μm long. On gymnosperms.

Distr.: Eur., N. Am. Ref.: 217.

P. humicola M.J. Larsen 1968

5a. Spore walls pale brown to umbrinous in KOH. 6

5b. Spore walls hyaline to pale yellow in KOH. 7

6a. Spores irregularly globose to lobed, warted, some may be greenish in KOH, 5.5–6.5(–7) μm in diam. Hyphal system dimitic.

Basidiocarp effused, arachnoid to pellicular, separable. Hymenial surface even, blackish brown. Margin fimbriate to arachnoid, paler. Subiculum much paler than hymenium. Hyphal strands dull brown,

up to 30 μm wide. Skeletal hyphae 1.5–2 μm wide, generative subicular hyphae 2–2.5 μm wide, hyaline to brownish, some encrusting material purple in KOH. Basidia 40–60 × 6–8 μm, encrusting material and contents greenish in KOH, sterigmata up to 7 μm long. On angiosperms and gymnosperms.

Distr.: Eur., N. Am. Ref.: 216, 217.

P. atrofusca M.J. Larsen 1971

6b. Spores globose to subglobose or irregular, warted, rarely echinulate, pale brown to umbrinous in KOH, 7–10(–11) μm in diam. Hyphal system monomitic.

Basidiocarp effused, separable, pellicular to crustose, up to 2 mm thick. Hymenial surface even to slightly folded, ferrugineous to brown to bluish black. Subiculum ferrugineous. Margin fibrillose, concolorous or paler. Hyphal strands absent. Subicular hyphae brown, 2.5–3.5(–6) μm wide, encrusting material often greenish in KOH. Basidia 40–60(–80) × 8–12 μm, often with greenish contents, sterigmata up to 10 μm long. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 208, 211, 217, 376.

P. tristis (P. Karst.) M.J. Larsen 1972

Syn.: *Thelephora umbrina* auctt., non ~ Fr. 1828; *Th. biennis* Fr. 1874, non ~ 1821; *Hypochnopsis fuscata* P. Karst. 1889; *Hypochnus sitnensis* Bres. 1897; *H. rhacodium* Berk. & Curt. apud Burt 1926

7a. Hymenium tan to brown to brownish black. 8

7b. Hymenium with greenish tinges or pale grey to greyish blue. 10

8a. Hymenium blackish brown. Spores 5.5–6.5(–7) μm in diam. *P. atrofusca*, see 6a

8b. Hymenium tan to pale brown. Spores 7–12 μm in diam. 9

9a. Subiculum dark blue or violaceous black. Basidiocarp effused, becoming pellicular, up to 1.5 μm thick. Basidia 60–80(–110) × 8–12 μm. Hyphal strands up to 150 μm wide.

Hymenial surface even, tan to pale brown. Hyphal system dimitic. Generative subicular hyphae blue to bluish grey in H_2O and yellowish brown in KOH, thick-walled, often minutely spinulose, 2–3(–4) μm wide. Spores globose to irregular, warted, 8–12 μm in diam.

Distr.: Eur., N. Am. Ref.: 211, 217, 376.

P. nigra (Höhn. & Litsch.) Svrček 1960

9b. Subiculum pale tan to pale brown. Basidiocarp effused, tomentose, rarely pellicular, up to 0.5 mm thick. Basidia 35–45(–50) × 7–9 μm. Hyphal strands up to 20 μm wide.

Hymenial surface even, tan to pale brown. Hyphal system dimitic. Generative subicular hyphae pale brown, with thickened walls,

smooth, 2–3 μm wide. Spores globose, sometimes irregular, warted or more rarely echinulate, 7–11 μm in diam.
Distr.: whole area. Ref.: 211, 217, 376.
P. mucidula (P. Karst.) Svrček 1958
Syn.: *Corticium epimyces* Bres. 1901; *Hypochnus roseogriseus* Wakef. & Pearson 1919; *H. lavandulaceus* Pearson 1920; *Tomentella verrucispora* Bourd. & Galz. 1924; *T. gilbertii* Bourd. & Galz. 1928

10a. Subiculum ferrugineous brown. Hyphal sytem monomitic; subicular hyphae 3–4.5(–6) μm wide. Sterigmata up to 18 μm long. Spores 8–10(–12) μm in diam.
Basidiocarp effused, separable, pellicular, up to 1.5 mm thick. Hymenial surface even, greyish green; margin ferrugineous brown. Hyphal strands obscure, up to 150 μm wide. Basidia 50–80(–100) × (8–)10–15 μm. Spores globose to irregular, strongly warted.
Distr.: N. Am. Ref.: 208, 211, 217.
P. longisterigmata M.J. Larsen 1967

10b. Subiculum with some shade of grey, green or blue. Hyphal system dimitic. Subicular hyphae 2–3.5(–4) μm wide. Sterigmata up to 7 μm long. Spores 5–8(–10) μm in diam. 11

11a. Hymenial surface dull green to greyish green, even. Spores irregularly globose to lobed, strongly warted, 6.5–8(–10) μm in diam.
Basidiocarp effused, separable, membranaceous to pellicular, up to 0.5 mm thick. Margin arachnoid to fibrillose, paler than hymenial surface. Hyphal strands up to 40 μm wide, composed of skeletal and/or generative hyphae. Generative subicular hyphae 2–3(–3.5) μm wide, sometimes greenish in KOH. Subhymenial hyphae may be faintly purple in KOH. Basidia 60–80(–90) × 5–6(–7) μm.
Distr.: Eur., N. Am. Ref.: 211, 217, 376.
P. flavovirens (Höhn. & Litsch.) Svrček 1958

11b. Hymenial surface greyish blue or greyish blue-green. Spores globose to lobed, warted, 5–7(–8) μm in diam. 12

12a. Fertile area pale grey to greyish blue. Subiculum grey, but darker than the hymenium. Basidiocarp usually drying parchment-like.
Basidiocarp effused, separable, arachnoid to byssoid, later pellicular, up to 0.2 mm thick. Hyphal strands up to 150 μm wide with generative hyphae, or up to 50 μm wide with skeletal hyphae. Generative subicular hyphae pale brown to dull yellowish brown, with thickened walls, 2–3.5(–4) μm wide. Basidia 45–60(–70) × 6–7(–8.5) μm. Spores globose to irregular, 5–7(–8) μm in diam.
Distr.: N. Am. Ref.: 216, 217.
P. griseopergamacea M.J. Larsen 1971

12b. Fertile area greyish blue to normally greyish blue-green, sometimes with

purplish tinge. Subiculum dull honey-yellow brown. Basidiocarp not drying parchment-like.

Basidiocarp effused, separable, arachnoid to byssoid, sometimes pellicular, up to 200 μm thick. Hyphal strands up to 30 μm wide, with generative hyphae. Generative subicular hyphae subhyaline to yellowish brown, thin-walled, 2.5–3.5 μm wide. Basidia 50–70 (–80) × 6–7.5 μm. Spores irregularly globose to symmetrically lobed, 5.5–6.5(–7) μm in diam.

Distr.: N. Am. Ref.: 218.

P. griseoveneta M.J. Larsen 1974

PSEUDOXENASMA K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1976

Basidiocarp annual, resupinate, effused, thin-ceraceous. Hymenial surface even, whitish to grey. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Gloeocystidia sulpho-positive, often with 1–4 apical bulbs, sometimes bi-rooted. Basidia single, often pleurobasia, clavate, with 4 sterigmata. Spores hyaline, thick-walled, ornamented, subglobose to broadly ellipsoid, amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Pseudoxenasma verrucisporum* K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1976
Distribution: Europe.
References: 160.

Monotypic. Basidiocarp effused, thin-ceraceous. Hymenial surface even, pruinose, whitish to grey. Hyphae indistinct, thin-walled, 1.5–2.5 μm wide. Cystidia sulpho-positive, clavate, 20–40 × 4–9.5 μm, often with 1–4 apical bulbs. Basidia clavate to suburniform, 20–35 × 6–9 μm, typically pleurobasidiate. Spores subglobose to broadly ellipsoid, warted, 8–10 × 7–8 μm, amyloid. Ornamentation quickly dissolving in KOH. Mainly on Picea.

Distr.: Eur. Ref.: 160.

Pseudoxenasma verrucisporum K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1976

PTERIDOMYCES Jülich 1979

Basidiocarp annual, resupinate, effused, membranaceous, adnate. Hymenial surface minutely hydnoid, cream-coloured. Hyphal system monomitic. Hyphal pegs present, sterile, consisting of parallely arranged hyphae. Hyphae hyaline, cylindrical, thin-walled, with clamps. Cystidia lacking. Basidia hyaline, clavate, 4-spored. Spores hyaline, ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on ferns.

Type species: *Epithele galzinii* Bres. apud Bourd & Galz. 1911
Distribution: Europe.
References: 201.

Monotypic. Basidiocarp effused, c. 50 μm thick, membranaceous. Hymenial surface minutely hydnoid due to sterile hyphal pegs, cream-coloured. Hyphae hyaline, thin-walled, 2–3 μm wide, with clamps. Basidia clavate, 9–15 × 4–5 μm . Spores ellipsoid, 5–8 × 3–4 μm. On old fronds of ferns.
Distr.: Eur. Ref.: 114.
P. galzinii (Bres. apud Bourd. & Galz.) Jülich 1979

PULCHERRICIUM Parm. 1968

Basidiocarp annual, resupinate, effused or effused-reflexed, membranaceous. Hymenial surface even, at first blue, later bluish-greenish. Hyphal system monomitic . Hyphae bluish, distinct, somewhat thick-walled, with clamps. Cystidia and gloeocystidia lacking. Dendrohyphidia present, the appendages covered with dark blue granules, at least some of the dendrohyphidia capable of growing out to form basidia. Basidia clavate, hyaline or slightly bluish, with clamps at the base and 4 sterigmata; basidia may have lateral appendages. Spores hyaline to slightly bluish, more or less thin-walled, smooth, ellipsoid, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Thelephora caerulea* Lamarck ex St.-Amans 1821
Distribution: in the whole area.
References: 191, 318.

Monotypic. Basidiocarp effused, sometimes slightly reflexed, membranaceous with fimbriate and lighter coloured margin. Hymenial surface even, deep blue when immature, later becoming dirty bluish-greenish. Hyphae mostly bluish or greenish, the basal ones slightly brownish, 4–6 μm wide, somewhat thick-walled (0.4–0.8 μm), with clamps. Hyphae smooth or encrusted with a dark blue substance or with hyaline cystals. Dendrohyphidia 20–40 × 4–8 μm, appendages of various shape and length, often covered with dark blue granules. Basidia hyaline to slightly blue, thin- or slightly thick-walled, clavate, 30–60 × 5.5–8 μm, sometimes with small lateral appendages like those of the dendrohyphidia. Spores hyaline to slightly bluish, ellipsoid, more or less thin-walled, 8–13 × 5–7 μm.
Distr.: whole area. Ref.: 66, 191.
P. caeruleum (Lamarck ex St.-Amans) Parm. 1968
Syn.: *Thelephora indigo* Schw. 1822; *Sporotrichum azureum* Link ex Steudel 1824; *Th. atrocoerulea* Trog 1832

PUNCTULARIA Pat. apud Pat. & Lagerh. 1895

Syn.: *Phaeophlebia* W.B. Cooke 1956

Basidiocarp annual, resupinate, effused or effused-reflexed, ceraceous. Hymenial surface even or tuberculate to phlebioid, medium to dark coloured. Hyphal system monomitic. Hyphae hyaline in the subhymenium, brown in the trama, cylindrical, thin- to thick-walled, clamps present. Dendrohyphidia present, yellowish to brown, scarcely or strongly branched. Gloeocystidia present in one species. Basidia long and narrowly clavate, 4-spored. Spores hyaline to pale yellowish, ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Corticium tuberculosum* Pat. apud Pat. & Lagerh. 1892
Anamorph: *Ptychogaster* Corda p.p.
Distribution: Europe, North America.
References: 70, 379, 383.

1a. Gloeocystidia present, 20–35 × 3.5–5 μm, with yellowish contents.
Basidiocarp mostly effused-reflexed, up to 1 mm thick, ceraceous, the upper surface of pileus brown, zonate. Hymenial surface even, tuberculate or phlebioid, dark brown. Margin yellow-brown when fresh. Hyphae 3–5 μm wide. Dendrohyphidia yellowish, the upper part branched, 20–35 × 1–2 μm, smooth. Basidia narrowly clavate, 15–20 × 3–4 μm. Spores ellipsoid, 6.5–7.5(–8) × 3–4 μm.
Distr.: whole area. Ref.: 70, 383.
P. strigoso-zonata (Schw.) Talbot 1958
Syn.: *Auricularia persistens* Sow. 1803; *Phlebia orbicularis* Berk. & Cooke 1849; *Ph. zonata* Berk. & Curt. 1872; *Ph. rubiginosa* Berk. & Rav. 1872; *Ph. anomala* Berk. & Rav. 1873; *Corticium hepaticum* Berk. & Cooke 1873; *Ph. pileata* Peck 1878; *Ph. spilomea* Berk. & Cooke ex Cooke 1891

1b. Gloeocystidia absent.
Basidiocarp effused, rarely slightly effused-reflexed, pulvinate, about 500 μm thick. Hymenial surface even, medium to dark brown (the margin including). Hyphae 2–4.5 μm wide. Dendrohyphidia with a hyaline stem and brown branches, the branched part up to 30 × 5.5 μm, smooth. Basidia narrowly clavate, 27–50 × 4–7 μm. Spores ellipsoid, 5.5–7(–8) × 3–4(–5) μm.
Distr.: Eur., N. Am. Ref.: 383.
P. atropurpurascens (Berk. & Br.) Petch 1916
Syn.: *Corticium tuberculosum* Pat. apud Pat. & Lagerh. 1892; *C. conigenum* Shear & Davidson 1944
Anamorph: Pulvinate, loose, floccose, several mm thick, reddish brown to violaceous blue. Conidia purplish brown in mass, thick-walled, globose to ellipsoid, 4–4.5(–6) μm in diam, or 4.5–7(–10) × (3–)3.5–4.5 μm.
Ptychogaster rubescens Boud. 1887

RADULODON Ryvarden 1972

Basidiocarp annual, resupinate, effused, ceraceous, becoming cartilagineous when dry, covered with spines, adherent. Spines single or concrescent, often fimbriate at the apex. Hymenial surface ochraceous to pale brown, sometimes greyish. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, with or without clamps. Cystidia when present hyaline, thin-walled. Basidia single or in small clusters, clavate to suburniform, often with 1–2 constrictions, gradually or abruptly narrowing towards the base. Spores hyaline, thin-walled, smooth, globose to subglobose, not amyloid.

Substrate: saprophytic or parasitic on angiosperms.
Type species: *Radulodon americanus* Ryv. 1972
Distribution: in the whole area.
References: 360, 362.

1a. Clamps absent. Some subicular hyphae thick-walled, much-branched, 1.5–2 μm wide.
Basidiocarp up to 1.5 mm thick. Spines crowded, often concrescent, up to 8 × 0.5 mm. Hymenial surface greyish to buff when dry. Besides narrow, thick-walled hyphae also thin-walled hyphae present, 2–3.5 μm wide, sometimes encrusted. Cystidia absent. Basidia 5–5.5 μm wide. Spores subglobose, 5–6 × 4–4.5 μm. On angiosperms. Distr.: N. Am. Ref.: 360.
R. casearium (Morgan) Ryv. 1972

1b. Clamps present. Narrow thick-walled much-branched subicular hyphae absent. 2

2a. Cystidia present, cylindrical to clavate, 35–70 × 6–13 μm, apex acute or obtuse. Distr.: Eur., USSR.
Basidiocarp up to 0.3 mm thick. Spines cylindrical to somewhat flattened, 1–3 mm long. Hymenial surface ochraceous to buff. Hyphae 1.5–5 μm wide. Basidia 20–40 × 5–10 μm. Spores globose to subglobose, 4–6 μm in diam. On Populus.
Ref.: 360.
R. erikssonii Ryv. 1972

2b. Cystidia absent. Distr.: N. Am.
Basidiocarp up to 2 mm thick. Spines 1–5 mm long, often fused at the base. Hymenial surface ochraceous to pale buff. Hyphae 1.5–4.5 μm wide. Basidia 20–40 × 5–10 μm. Spores globose to subglobose, 4–6.5 μm in diam. On Populus.
Ref.: 360.
R. americanus Ryv. 1972

RAMARICIUM J. Erikss. 1954

Syn.: *Phlyctibasidium* Jülich 1974

Basidiocarp annual, resupinate, effused, membranaceous, with distinct subiculum. Hymenial surface even or tuberculate, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin- to somewhat thick-walled, with clamps, smooth or covered with warts. Cystidia lacking, hyphidia may be present. Basidia clavate, often distinctly stalked, with a basal clamp, (2–)4-spored. Spores hyaline or yellowish, thin- to slightly thick-walled, smooth or warted, subglobose to ellipsoid or cylindrical, cyanophilous, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms and on mosses.
Type species: *Ramaricium occultum* J. Erikss. 1954
Distribution: in the whole area.
References: 104, 144.

1a. Spores smooth, hyaline, thin-walled, cylindrical, 10–16.5 × 4.5–4.8 μm. Basidiocarp effused, up to 1 mm thick, membranaceous, with short hyphal strands. Hymenial surface even, ochraceous. Hyphae hyaline, thin- to somewhat thick-walled, smooth or covered with acyanophilous warts, 2–4 μm wide, locally inflated up to 7.5 μm. Hyphidia hyaline, cylindrical, sometimes branched, 2–4 μm wide. Basidia stalked, clavate, 60–100 × 8–10 μm.
Distr.: N. Am. Ref.: 144.
R. flavomarginatum (Burt) Ginns 1979

1b. Spores nearly smooth (and then subglobose) or distinctly warted, yellowish. 2

2a. Spores subglobose, nearly smooth, 6–7 μm in diam., yellowish. Basidiocarp effused, soft-membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, thin- to slightly thick-walled, smooth or warted, 1.5–4 μm wide. Hyphidia torulose, branched, 1–3 μm wide. Basidia stalked, clavate, 40–70 × 8–10 μm.
Distr.: N. Am. Ref.: 144.
R. alboflavescens (Ell. & Everh.) Ginns 1979
Syn.: *Coniophora corticola* Overh. 1938; *Serpula illudens* Overh. ex W.B. Cooke 1957; *S. imperfectus* Overh. ex W.B. Cooke 1957

2b. Spores ellipsoid, distinctly warted. 3

3a. Hyphae with cyanophilous warts. Basidiocarp effused, c. 300 μm thick, membranaceous. Hymenial surface even, yellowish-ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 2–5.5 μm wide. Basidia 28–40 × 6.5–8 μm. Spores ellipsoid, pale yellow, 7–9.2 × 5–6 μm (incl. warts), slightly thick-walled.

Distr.: N. Am. Ref.: 144, 189.

R. polyporoideum (Berk. & Curt.) Ginns 1979

3b. Hyphae smooth.

Basidiocarp effused, soft-membranaceous, with hyphal strands. Hymenial surface even, ochraceous. Hyphae hyaline, thin- to slightly thick-walled, 1–3 μm wide. Basidia clavate, stalked, 17–40 × 5–8 μm. Spores ellipsoid, pale yellow, slightly thick-walled, 5–9 × 3.5–4.5 μm.

Distr.: Eur. Ref.: 198, 251.

R. albo-ochraceum (Bres.) Jülich 1977

Note: A very similar and probably identical species is *R. occultum* J. Erikss. 1954 which differs by growing on dead mosses.

REPETOBASIDIUM J. Erikss. 1958

Basidiocarp annual, resupinate, effused, adnate, pruinose, membranaceous or ceraceous, thin. Hymenial surface even to minutely reticulate, whitish to greyish or ochraceous. Hyphal system monomitic. Hyphae hyaline, thin-walled, distinct or indistinct, with clamps. Cystidia hyaline, thin-walled, conical, capitate, or cylindrical, smooth or with an apical oily excretion, often with a clamped median septum. Basidia (repetobasidia) single, globose or ovoid to subcylindrical, 4-spored. Spores hyaline, smooth, thin-walled, subglobose to ellipsoid or allantoid, not amyloid.

Substrate: saprophytic on decayed wood of gymnosperms and angiosperms.
Type species: *Peniophora vilis* Bourd. & Galz. 1928
Distribution: Europe, USSR.
References: 105, 303.

1a. Spores subglobose to broadly ellipsoid, 5–7 × 4.5–5.5 μm.

Basidiocarp pruinose, adnate. Hymenial surface even, whitish to pale ochraceous. Hyphae 1.5–3(–4) μm wide, with clamps. Cystidia conical, often with an apical bulb, which may be surrounded by a ring and may be covered with oily excretions, 30–50 × 5–10 μm. Basidia 7–13 × (5–)6–8 μm.

Distr.: Eur., USSR. Ref.: 303.

R. mirificum J. Erikss. 1958

1b. Spores ellipsoid to allantoid. 2

2a. Spores narrowly ellipsoid to allantoid, 6–10 × 2–4(–5) μm. Cystidia conical, often with median septum, 25–40 × 5–10 μm.

Basidiocarp pruinose to membranaceous-ceraceous, adnate. Hymenial surface even, whitish to greyish ochraceous. Hyphae (1–)1.5–3 μm wide, with clamps. Basidia 6–15 × 5–7 μm.

Distr.: Eur. Ref.: 303.

R. vile (Bourd. & Galz.) J. Erikss. 1958

2b. Spores ellipsoid, (4–)4.5–6 × 2.5–3 μm. Cystidia cylindrical, usually with one or two clamped septa, 20–50 × 3.5–5 μm.
Basidiocarp adnate. Hymenial surface even, whitish to greyish ochraceous. Hyphae 1.5–3 μm wide, with clamps. Basidia 6–10 × 5–7 μm.
Distr.: Eur. Ref.: 303.
R. erikssonii Oberw. 1965

RESINICIUM Parm. 1968

Basidiocarp annual, resupinate, effused, membranaceous to ceraceous, closely adnate. Hymenial surface even, grandinioid or hydnoid, pale coloured. Hyphal system monomitic. Hyphae rather indistinct, often agglutinated, hyaline, cylindrical to torulose, thin- to slightly thick-walled, with clamps. Cystidia hyaline, thin-walled, apically swollen and covered with a halo of oily material or with crystals, with a basal clamp. Basidia narrowly clavate, hyaline, with a basal clamp. Spores hyaline, cylindrical, allantoid or ellipsoid, smooth, thin-walled, not amyloid.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms.
Type species: *Hydnum bicolor* Alb. & Schw. ex Fr. 1821
Distribution: in the whole area.
References: 127, 318.

1a. Hymenial surface even.
Basidiocarp thin, adnate, ceraceous, often cracked when dry. Hymenial surface cream-coloured. Hyphae rather indistinct, thin-walled, 2–3 μm wide. Cystidia apically swollen, 2–4 μm in diam., the halo up to 6 μm wide. Basidia clavate, 11–13 × 4–5 μm. Spores ellipsoid, 4–5 × 2–3 μm.
Distr.: whole area. Ref.: 127, 245.
R. furfuraceum (Bres.) Parm. 1968

1b. Hymenial surface grandinioid or minutely to distinctly hydnoid. 2

2a. Hymenial surface grandinioid or minutely hydnoid; two types of cystidia present.
Basidiocarp thin-ceraceous. Hymenial surface pale cream-coloured. Hyphae rather indistinct, agglutinated, cylindrical to torulose, 1.5–3 μm wide, thin- to slightly thick-walled. Cystidia of two types: a) cylindrical to clavate, apically swollen, 10–18 × 8–10 μm, with a large, 12–20 μm wide halo; b) irregularly cylindrical, 10–15 × 2–5 μm, apically with a stellate mass of crystals; both types with clamps at the base. Basidia cylindrical to narrowly clavate, 16–22 × 4–5 μm. Spores cylindrical, 4–6 × 2.5–3 μm.
Distr.: whole area. Ref.: 66, 81, 127, 297.
R. bicolor (Alb. & Schw. ex Fr.) Parm. 1968

2b. Hymenial surface strongly hydnoid; one type of cystidium present.
Basidiocarp membranaceous to ceraceous. Hymenial surface usually strongly hydnoid, with numerous brittle, conical teeth, 0.5–1 mm long, cream-coloured to bright yellowish. Hyphae hyaline, 3–5 μm wide, rather thin-walled, with clamps. Cystidia abundant at apices of teeth, irregularly cylindrical, apically swollen, 3–5 μm in diam., the halo up to 9 μm wide, never covered with crystals. Basidia 4–5 μm wide. Spores allantoid, 4–7 × 1.5–2 μm.
Distr.: N. Am. Ref.: 127, 128.
R. chiricahuaensis Gilberts. & Budington 1970

SARCODONTIA S. Schulzer 1866

Syn.: *Oxydontia* L.W. Miller 1933

Basidiocarp resupinate, effused, adnate, ceraceous, the margin thinning out, reddish or purplish in KOH. Hymenial surface hydnoid, the teeth up to 1.5 cm long, conical or flattened, acuminate, at base free or concrescent, ochraceous or brownish. Hyphal system monomitic. Hyphae of teeth hyaline, thin-walled, cylindrical, 2–4 μm wide, with clamps. Cystidia lacking. Basidia hyaline, long and narrowly clavate, thin-walled, clamped at base, 4-spored. Spores hyaline, subglobose to broadly ellipsoid, smooth, thick-walled (c. 0.4 μm), not amyloid.

Substrate: parasitic on angiosperms.
Type species: *Hydnum setosum* Pers. 1825
Distribution: in the whole area.

Monotypic. Basidiocarp ceraceous, with sulphur yellow hyphae at the base and especially in the substrate. Hymenial surface hydnoid, teeth slender, up to 1.5 cm long. Hyphae 3–4 μm wide, guttulate, thin-walled in the teeth, often thick-walled (1–2 μm) in the substrate, always with clamps. Basidia 40–45 × 4–5 μm. Spores subglobose to broadly ellipsoid, thick-walled, 4.5–5 × 3.7–4 μm, guttulate. Parasitic on rosaceous trees (mainly Malus) and ?Fraxinus.
Distr.: whole area. Ref.: 183, 290.
S. setosa (Pers.) Donk 1952
Syn.: *Sistotrema croceum* Schw. 1822 sensu Kotlaba 1953; *Hydnum luteocarneum* Secr. 1833; *Sarcodontia mali* S. Schulzer 1866; *H. schiedermayri* Heufler 1870; *H. amplissimum* Berk. & Curt. apud Berk. 1873; *H. subvelutinum* Berk. & Curt. apud Berk. 1873; *H. earleanum* Sumstine 1904; *H. foetidum* Velen. 1922

SCOPULOIDES (Massee) Höhn. & Litsch. 1908

Basidiocarp annual, resupinate, effused, ceraceous, adnate. Hymenial surface odontioid, greyish. Hyphal system monomitic. Hyphae hyaline, thin- to slightly

thick-walled, without clamps. Cystidia of two types: a) lamprocystidia in the resupinate part, hyaline, aseptate, conical, thick-walled, encrusted; b) septocystidia in the teeth, hyaline, septate, cylindrical, thick-walled, encrusted. Basidia hyaline, narrowly clavate. Spores hyaline, cylindrical to ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Peniophora hydnoides* Cooke & Massee apud Cooke 1888
Distribution: in the whole area.

> Monotypic. Basidiocarp effused, firm-gelatinous when fresh, ceraceous when dry, adnate. Hymenial surface odontioid, light greyish to pale bluish-grey. Margin indistinct. Hyphae densely interwoven, cylindrical to slightly torulose, thin- to somewhat thick-walled, 3–4 μm wide. Cystidia of two types: a) lamprocystidia present in the resupinate part, hyaline, not septate, conical, thick-walled, 50–70 × 8–10 μm, the upper part heavily encrusted, projecting; b) septocystidia present in the teeth, hyaline, with several thick septa, cylindrical to slightly fusiform, thick-walled, 60–120 × 6–15 μm, encrusted, projecting. Basidia 8–12 × 3–5 μm. Spores cylindrical to narrowly ellipsoid, 3.5–4 × 2–2.4 μm. On angiosperms.
> Distr.: whole area. Ref.: 66, 164.
> **S. hydnoides** (Cooke & Massee apud Cooke) Hjortstam & Ryv. 1979

SCYTINOSTROMA Donk 1956

Basidiocarp annual or perennial, resupinate, effused, membranaceous to coriaceous. Hymenial surface even or tuberculate, rarely hydnoid, whitish, yellowish or brownish. Margin distinct or not, rarely rhizomorphic. Hyphal system dimitic. Skeletal hyphae subhyaline to yellowish, dextrinoid, present in subiculum and hymenium, often once or twice branched in terminal region, dichohyphidium-like. Generative hyphae hyaline, thin-walled, with or without clamps. Gloeocystidia or cystidia present or absent. Basidia single or in small clusters, cylindrical to clavate, often somewhat constricted in the middle, with (2–)4 sterigmata. Spores hyaline, globose to cylindrical, smooth or minutely echinulate, thin-walled, amyloid or not.

Substrate: saprophytic or parasitic on wood of angiosperms and gymnosperms.
Type species: *Corticium portentosum* Berk. & Curt. apud Berk. 1873
Distribution: in the whole area.
References: 321.

1a. Spores amyloid, globose to broadly ellipsoid. 2
1b. Spores not amyloid or only the supra-hilar plage, ellipsoid to clavate. 5

2a. Spores ornamented. Clamps present. Mainly on gymnosperms. 3
2b. Spores smooth. Clamps absent. On angiosperms. 4

3a. Spores with ridges, (5.5–)6–8 × 5.5–7 μm. Cf. *Vararia effuscata.*

3b. Spores globose to broadly ellipsoid, minutely echinulate, 3.5–4.5 × 2.5–3.5 μm.

Basidiocarp effused, soft-membranaceous, separable. Hymenial surface even to tuberculate, rarely hydnoid, cream to pale ochraceous. Skeletal hyphae 1.5–2.5 μm wide. Generative hyphae thin-walled, 2–2.5 μm wide. Gloeocystidia cylindrical to clavate, 60–120 × 5.5–8 μm, projecting up to 70 μm. Basidia 35–45 × 5–5.5 μm. On gymnosperms.

Distr.: N. Am. Ref.: 120, 172, 321.

S. arachnoideum (Peck) Gilberts. 1962

Syn.: *Corticium quaesitum* H.S. Jacks. & Dearden 1949

4a. Ultimate part of skeletal hyphae simple or rarely once branched, branches then very long, not dendroid, almost forming a layer, parallel to and above the hymenium.

Basidiocarp effused, adnate, membranaceous. Hymenial surface even, cream-coloured to pale ochraceous. Skeletal hyphae 1.5–2.5 μm wide, generative hyphae 1.2–3 μm wide. Gloeocystidia scarce or absent, 30–70 × 3–5 μm. Basidia 30–55(–65) × (4–)4.5–6(–7) μm. Spores globose to broadly ellipsoid, 4.5–6 × 4.5–5.5 μm.

Distr.: whole area. Ref.: 321, 343.

S. portentosum (Berk. & Curt. apud Berk.) Donk 1956

Syn.: *Corticium diminuens* Berk. & Curt. apud Berk. 1873; *C. penetrans* Cooke & Massee 1891; *C. grammicum* P. Henn. 1905; *C. aluta* Bres. 1908

4b. Ultimate part of skeletal hyphae 2–3 times branched, dichohyphidium-like, parallel with basidia.

Basidiocarp effused, adnate, membranaceous to coriaceous. Hymenial surface even, cream-coloured to pale ochraceous. Skeletal hyphae 0.8–1.5 μm wide, generative hyphae 1.5–3.5 μm wide. Gloeocystidia scarce or absent, cylindrical, 30–70 × 3–5 μm. Basidia 50–55 × (4–)5–5.5(–6) μm. Spores globose to broadly ellipsoid, 5.5–7 × 5–5.8 μm.

Distr.: Eur., USSR, ?N. Am. Ref.: 321, 339, 343.

S. hemidichophyticum Pouzar 1966

5a. Clamps present. Spores 1.5–3.2 μm wide. 6

5b. Clamps absent. Spores 3.5–6 μm wide. 7

6a. Spores subclavate, slightly curved, 11–14 × 2.5–3.2 μm. Basidiocarp thin, up to 50 μm, felty. Gloeocystidia absent (but see note).

Hymenial surface even, white to cream-coloured. Skeletal hyphae 0.8–2.5 μm wide. Basidia 25–30 × 5–6 μm. On angiosperms and on ferns. Northern distribution.

Distr.: N. Am. Ref.: 171, 343.

S. praestans (H.S. Jacks.) Donk 1956

Note: Parmasto (321) reports the species from the USSR, but this may be a distinct species. The basidiocarp is up to 700 μm thick, gloeocystidia are present (25–45 × 3–5 μm) and it grows on gymnosperms.

6b. Spores ellipsoid, 3.5–5.5(–7) × (2–)2.3–3(–3.2) μm. Basidiocarp up to 700 μm thick, coriaceous. Gloeocystidia abundant, cylindrical to fusoid, 30–120 × 3–6.5 μm.

Hymenial surface even, white to pale ochraceous. Skeletal hyphae 1.5–3.5 μm wide. Basidia (15–)25–40 × (2–)3–5 μm. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 321, 343, 409.

S. galactinum (Fr.) Donk 1956

Syn.: *?Thelephora alnea* Fr. 1821; *?Th. suaveolens* Fr. 1828

7a. Spores ellipsoid to broadly navicular, 6.5–9 × 3.5–5 μm. Basidia 20–50 × 3.5–5.5(–6) μm.

Basidiocarp coriaceous, adnate. Hymenial surface even, white to pale ochraceous. Skeletal hyphae 1–3.5 μm wide. Gloeocystidia cylindrical to fusoid, 40–100 × 3–8(–10) μm. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 321, 409.

S. odoratum (Fr.) Donk 1956

7b. Spores ellipsoid, (8–)10–13(–15) × 4.5–6.5(–8) μm. Basidia 30–70 × 6–11 μm.

Basidiocarp coriaceous, adnate. Hymenial surface even, pale ochraceous to cinnamon buff. Skeletal hyphae 2–3 μm wide. Gloeocystidia clavate to fusoid, 50–110(–130) × (4–)5–11(–13) μm. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 321, 343, 387.

S. ochroleucum (Bres. & Torrend apud Torrend) Donk 1956

Syn.: *Corticium abeuns* Burt 1926; *C. lentum* Wakef. 1952

SCYTINOSTROMELLA Parm. 1968

Basidiocarp annual, resupinate, effused, pellicular, membranaceous to crustaceous. Hymenial surface even, pale coloured. Margin often fimbriate or with hyphal strands. Hyphal system dimitic. Skeletal hyphae sometimes only in the hyphal strands, not dextrinoid. Generative hyphae hyaline, thin-walled, with clamps. Thick-walled encrusted cystidia absent or present, originating from skeletal hyphae. Gloeocystidia clavate, cylindrical, fusiform or subulate, hyaline, thin-walled, often with an apical bulb. Basidia clavate, often somewhat constricted in the middle, with (2–) 4 sterigmata. Spores hyaline, subglobose to ellipsoid, ornamented, thin-walled, amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Peniophora heterogenea* Bourd. & Galz. 1913
Distribution: in the whole area.
References: 318.

1a. Cystidia thick-walled, encrusted, narrowly clavate, 45–100 × 5–9(–13) μm, projecting up to 40 μm, originating from skeletal hyphae.
Basidiocarp effused, separable, pellicular. Hymenial surface even, whitish to pale ochraceous. Margin rhizomorphic. Skeletal hyphae 1.5–3 μm wide. Generative hyphae 2–4 μm wide. Gloeocystidia subhyaline to pale yellowish, thin-walled, 45–90 × 6–8.5 μm, immersed, guttulate. Basidia 15–20 × 4–6 μm. Spores subglobose to ellipsoid, minutely echinulate, (3.5–)4–5 × 2.5–4 μm.
Distr.: whole area. Ref.: 119, 127, 368.
S. heterogenea (Bourd. & Galz.) Parm. 1968

1b. Thick-walled encrusted cystidia absent. 2

2a. Gloeocystidia subulate, thin-walled, 35–60 × 3.5–5 μm.
Basidiocarp effused, membranaceous, with hyphal strands. Hymenial surface even, whitish to ochraceous. Skeletal hyphae only in the hyphal strands, 2–5.5 μm wide. Generative hyphae 2–5.5 μm wide, with clamps. Basidia 15–25 × 2.5–4 μm. Spores subglobose to broadly ellipsoid, 3–4 × 2–3 μm, warty.
Distr.: N. Am. Ref.: 119, 249.
S. humifaciens (Burt) Freeman & Petersen 1979

2b. Gloeocystidia clavate to broadly cylindrical, thin-walled, 25–50 × 5–7 (–10) μm, often with apical bulbs.
Basidiocarp at first arachnoid, then hypochnoid to membranaceous. Hymenial surface even, whitish to pale ochraceous. Margin rhizomorphic. Skeletal hyphae 0.5–1.5 μm wide. Generative hyphae 1.5–2.5 μm wide. Basidia 20–25 × 4–5 μm. Spores ovoid to ellipsoid, warty, 4.5–5.5 × 2.5–3.5 μm.
Distr.: Eur., N. Am. Ref.: 105, 119.
S. nannfeldtii (J. Erikss.) Freeman & Petersen 1979

SERPULA Pers. ex S.F. Gray 1821

Syn.: *Xylomyzon* Pers. 1825; *Gyrophana* Pat. 1897; *Xylophagus* Link ex Murrill 1903; *Meruliporia* Murrill 1942

Basidiocarp annual, rarely perennial, resupinate, effused to effused-reflexed, fleshy to ceraceous. Hymenial surface merulioid, poroid or hydnoid, honey yellow to orange brown or dark brown. Subhymenial gelatinous layer often present. Hyphal strands present, consisting of a central core of wide hyphae, surrounded by a sheath of generative and skeletal hyphae. Hyphal system dimitic, skeletal hyphae present in hyphal strands and sometimes in the basal layer. Generative hyphae hyaline to pale brown, thin- to thick-walled, with clamps. Cystidia and sclerotia absent. Basidia single or in small clusters, clavate. Spores yellow to brown, thick-walled, smooth, ovoid to ellipsoid, not amyloid.

Substrate: saprophytic on wood of gymnosperms, rarely on angiosperms.
Type species: *Serpula destruens* (Pers.) ex S.F. Gray 1821
Distribution: in the whole area.
References: 71.

1a. Hymenial surface distinctly poroid, 1–3 pores per mm. Distr.: N.-Am. Basidiocarp effused, up to 10 mm thick, separable. Hymenial surface buff to ochraceous or brownish, becoming dark brown to blackish when dry. Margin white, soft, sometimes with rhizomorphs. Basal hyphae parallel, thin-walled, 3–7(–12) μm. Basidia 20–35 × 7–9 μm. Spores ovoid to ellipsoid, (8–)9–13(–16) × (4–)5–7.5(–8.5) μm. On gymnosperms, often on timber.
Ref.: 139, 269.
S. incrassata (Berk. & Curt. apud Berk.) Donk 1948
Syn.: *Polyporus pineus* Peck 1888; *Poria atrosporia* Ames 1913

1b. Hymenial surface typically merulioid, rarely irregularly poroid or hydnoid. Distr.: whole area. 2

2a. Basidiocarp 2–10 mm thick, with thickened margin. Development of surface mycelium between the hyphal strands vigorous. Gelatinous subhymenial layer typically thick, sharply delimited from the basal layer, filling up the folds completely. Skeletoid hyphae in hyphal strands in average 4.1 μm wide.
Hymenial surface merulioid to irregularly poroid or sometimes irpicoid, honey yellow to dark brown; margin white to yellowish. Basal layer consisting of parallel hyphae which often are skeletoid. Hyphae 2–9 μm wide. Basidia 30–40 × 7–10 μm. Spores ovoid to ellipsoid, (8–)9–12(–12.5) × 4.5–7(–8) μm. Mainly on timber, but also in forests.
Distr.: whole area. Ref.: 71, 153.
S. lacrimans (Wulf. apud Jacq. ex Fr.) Schroet. 1888
Syn.: *Serpula destruens* (Pers.) ex S.F. Gray 1821; *Merulius vastator* Tode ex Fr. 1821; *M. guillemontii* Boud. 1894; *M. domesticus* Falck apud Möller 1912; *M. terrestris* (Peck) Burt 1917

2b. Basidiocarp up to 2 mm thick with thin margin. Development of surface mycelium between the hyphal strands scanty or absent. Gelatinous subhymenial layer typically poorly developed, not filling up the folds completely. Skeletoid hyphae in hyphal strands in average 2.6 μm wide.
Hymenial surface merulioid to poroid, greyish yellow to orange, cinnamon, olive or dark brown; margin whitish. Basal layer typically without skeletoid hyphae. Hyphae 2–8 μm wide. Basidia 25–45 × 6–9 μm. Spores ovoid to ellipsoid, (7–)8–12 × 4.5–7(–8) μm. On gymnosperms.
Distr.: whole area. Ref.: 71, 153.
S. himantioides (Fr.) P. Karst. 1889
Syn.: *?Merulius brassicaefolius* Schw. 1822; *Xylomyzon versicolor*

Pers. 1825; *M. papyrinus* Fr. 1828; *M. squalidus* Fr. 1828; *M. umbrinus* Fr. 1828; *M. tenuis* Peck 1894; *M. silvester* Falck apud Möller 1912; *M. americanus* Burt 1917; *M. gelatinosus* Lloyd 1922

SISTOTREMA Fr. 1821

Syn.: *Hydnotrema* Link 1833; *Heptasporium* Bref. 1908; *Urnobasidium* Parm. 1968
Incl.: *Galziniella* Parm. 1968

Basidiocarp annual, resupinate, effused, rarely pileate, arachnoid, pellicular, submembranaceous or ceraceous, separable. Hymenial surface even, grandinioid or poroid, whitish to cream-colour or greyish. Hyphal system monomitic. Hyphae hyaline or rarely basally brownish, thin- to slightly thick-walled, often ampullate at the septa, typically with clamps. Cystidia or gloeocystidia sometimes present. Basidia in clusters, urniform with 2–4–8 sterigmata. Spores hyaline, thin-walled, smooth, subglobose to ellipsoid or cylindrical, not amyloid.

Substrate: saprophytic on humus or bark and wood of angiosperms and gymnosperms.
Type species: *Sistotrema confluens* (Pers.) ex Fr. 1821
Distribution: in the whole area.
References: 66.

1a. Basidia with 2–4 sterigmata. 2
1b. Basidia with (5–)6–8 sterigmata. 6

2a. Cystidia or gloeocystidia present. 3
2b. Cystidia and gloeocystidia absent. 4

3a. Spores narrowly ellipsoid to cylindrical, 5.5–7 × 2.4–3 μm. Gloeocystidia subcylindrical to slightly fusoid, with yellow refractive contents, 50–100 × 5–7 μm, emerging.
Basidiocarp effused, hypochnoid to thin membranaceous. Hymenial surface white to cream-coloured. Hyphae 3–6 μm wide, sometimes inflated. Basidia narrowly urniform, 17–24 × 3.5–5 μm, with (2–)4 sterigmata.
Distr.: Eur., USSR. Ref.: 66.
S. sernanderi (Litsch.) Donk 1956

3b. Spores cylindrical, 7–10 × 2.5–3.5 μm. Cystidia flexuous cylindrical, thin-walled, 30–75 × 4.5–6.5 μm.
Basidiocarp effused, thin-ceraceous, up to 175 μm thick. Hymenial surface even, whitish to slightly greyish. Hyphae 2.5–5 μm wide. Basidia utriform to urniform, 10–15(–25) × 3–5 μm, with 1–2(–4) sterigmata up to 9 μm long.
Distr.: USSR. Ref.: 318.
Galziniella pereximia Parm. 1968

4a. Spores cylindrical, curved, often somewhat constricted in the middle, 6–9(–11) × 2–4 μm. Basidia with (2–)4 sterigmata.
Basidiocarp effused, hypochnoid. Hymenial surface white to cream-coloured or greyish, with faint lilaceous tinge when fresh, somewhat mealy. Hyphae 2.5–5 μm wide. Basidia urniform, 13–25 × 4–6(–6.5) μm.
Distr.: Eur.
S. hirschii (Donk) Donk 1956

4b. Spores ellipsoid. Basidia with 2(–4) sterigmata. 5

5a. Spores ellipsoid, 8–10.5 × 5.5–6 μm.
Basidiocarp pruinose to ceraceous, up to 70 μm thick. Hymenial surface even to minutely reticulate, white. Hyphae 3.5–4.5 μm wide. Basidia urniform, 20–25 × 7–8.5 μm, 5.5 μm wide in the middle part, with 2(–4) sterigmata up to 8.5 μm long.
Distr.: N. Am. Ref.: 171.
S. exima (H.S. Jacks.) Ryv. & Solheim 1977

5b. Spores ellipsoid, 10–14(–16) × 5.5–8 μm.
Basidiocarp pruinose to arachnoid, up to 100 μm thick. Hymenial surface minutely reticulate, white. Hyphae 3.5–6 μm wide. Basidia urniform, 30–50 × 5–7 μm, with 2 sterigmata up to 7 μm long. On angiosperms.
Distr.: Eur. Ref.: 364.
S. autumnalis Ryv. & Solheim 1977

6a. Spores tetrahedral, triangular in outline, 4.5–5 × 3–4 μm.
Basidiocarp pruinose, ceraceous when fresh, thin. Hymenial surface even, greyish white to white. Hyphae irregular, 3–5(–8) μm wide, with clamps. Basidia 12–18 × 4–6 μm, typically with 6 sterigmata. On angiosperms.
Distr.: Eur., N.Am. Ref.: 353, 355.
S. subtrigonospermum D.P. Rogers 1935

6b. Spores subglobose to cylindrical, even or nearly even in outline. 7

7a. Spores subglobose, ovoid or broadly ellipsoid. 8
7b. Spores ellipsoid, narrowly pyriform or cylindrical. 12

8a. Hymenial surface even. 9
8b. Hymenial surface hydnoid or poroid. 11

9a. Cystidia hyaline, capitate, thin-walled, 25–60 × 2–4 μm, apex 4.5–6 μm wide.
Basidiocarp pruinose, ceraceous. Hymenial surface even, whitish. Hyphae slightly ampullate, 1–3.5 μm wide, with clamps. Basidia urniform, 17–25 × 5–8 μm, usually with 6 sterigmata. Spores subglobose to subangular, 4–5 μm in diam.
Distr.: Eur. Ref.: 155.
S. pistilliferum Hauerslev 1975

9b. Cystidia absent. 10

10a. Clamps absent.

Basidiocarp adnate, thin-ceraceous. Hymenial surface even, yellow. Hyphae 2–3 μm wide. Basidia urniform, 20–25 × 5 μm, with 6(–8) sterigmata. Spores subglobose to subangular, 4–5 μm in diam. or 5–6 × 3.5–4 μm.

Distr.: Eur.. Ref.: 161.

S. subangulisporum K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1977

10b. Clamps present.

Basidiocarp adnate, pruinose to ceraceous, horny when dry. Hymenial surface even, whitish to greyish yellow. Hyphae 1.5–5.5 μm wide. Basidia urniform, 9–28(–31) × 4.5–8(–9) μm, with 6–8 sterigmata. Spores subglobose, ovoid or broadly ellipsoid, 3–5 (–6) × 2–4(–5) μm.

Distr.: whole area. Ref.: 66, 355.

S. diademiferum (Bourd. & Galz.) Donk 1956

11a. Spores subglobose to broadly ovoid, 3–4.5(–5.5) × 2.3–3.5 μm. Hymenial surface hydnoid to poroid, white to cream, finally becoming yellowish to ochraceous.

Basidiocarp pellicular to membranaceous. Hyphae 2–4.5 μm wide, often inflated (up to 10 μm). Basidia urniform, 14–24 × 4–6(–8) μm, with (4–)5–7(–8) sterigmata.

Distr.: whole area. Ref.: 66, 355.

S. muscicola (Pers.) Lundell apud Lundell & Nannf. 1947

Syn.: *Poria albo-pallescens* Bourd. & Galz. 1925

11b. Spores globose to subglobose, 4.5–7 × 4–6 μm. Hymenial surface poroid, at first whitish to cream, becoming sulphur yellow to golden yellow.

Basidiocarp soft membranaceous. Hyphae with thin or slightly thickened walls, 2–6.5 μm wide, often inflated at the septa. Basidia urniform, 14–22 × 6–9(–10) μm.

Distr.: Eur.

S. eluctor Donk 1967

Syn.: *Trechispora onusta* sensu Bres., non ~ P. Karst. 1890; *?Poria albo-lutea* Bourd. & Galz. 1925

12a. Gloeocystidia subcylindrical to fusoid, usually flexuous, with yellowish contents, 20–100 × 4.5–9.5 μm. Spores narrowly ellipsoid to subcylindrical, 4.5–6.5 × 1.8–3 μm, often slightly curved.

Basidiocarp thin, granulose to membranaceous. Hymenial surface even, white. Hyphae 2–5 μm wide, often ampullate and up to 9.5 μm wide, sometimes filled with yellowish resinous material, with clamps. Basidia urniform, 10–28 × 4–7 μm, with 6–8 sterigmata.

Distr.: whole area. Ref.: 66, 355.

S. coroniferum (Höhn. & Litsch.) Donk 1956

12b. Gloeocystidia or cystidia absent. 13

13a. Spores at least 6.5 μm long. 14
13b. Spores up to 6.5 μm long. 17

14a. Clamps absent. Spores pyriform to cylindrical, 9–13(–16) × 4–6.5 μm. Basidiocarp soft-membranaceous. Hymenial surface even to poroid-reticulate, greyish. Hyphae 2–6.5 μm wide, some with thickened walls; yellowish material often present in the basidiocarp. Basidia urniform, 20–38 × 4–7.5 μm.
Distr.: Eur. Ref.: 155.
S. pyrosporum Hauerslev 1975
14b. Clamps present. Spores up to 8.5 μm long. 15

15a. Hymenial surface raduloid to hydnoid, cream-coloured to buff, spines sometimes darker.
Basidiocarp byssoid to membranaceous. Hyphae 2.5–5 μm wide, often inflated and up to 7.5 μm wide, thin- or slightly thick-walled, sometimes with yellowish granular contents. Basidia urniform, 12.5–27.5 × 5–8 μm, with (6–)8 sterigmata. Spores subcylindrical to fusoid, (6–)6.5–8.5 × 2.5–3.5 μm, with slightly thickened walls.
Distr.: whole area. Ref.: 355.
S. raduloides (P. Karst.) Donk 1956
Syn.: *Hydnum populinum* Peck 1900
15b. Hymenial surface even. 16

16a. Branched thin hyphal strands present in subiculum. Spores narrowly pyriform to subcylindrical, 6.5–8 × 3–4.2 μm.
Basidiocarp adnate, membranaceous to ceraceous. Hymenial surface even, white. Hyphae 3–5 μm wide, with clamps. Basidia urniform, 15–18 × 7–9 μm.
Distr.: Eur. Ref.: 66.
S. subpyriforme M.P. Christ. 1960
16b. Hyphal strands absent. Spores subcylindrical, 5.5–7.5 × (2.5–)2.7–3.2 μm.
Basidiocarp hypochnoid-pruinose. Hymenial surface even, farinaceous, whitish to greyish. Hyphae 3.5–6 μm wide, ampullate, with clamps. Basidia urniform, 10–16 × 6–8 μm, typically with 6 sterigmata.
Distr.: USSR. Ref.: 315.
S. estonicum Parm. 1965

17a. Subicular hyphae hyaline or brownish, 5–7(–10) μm wide, not inflated, slightly thick-walled, with or without clamps. Spores narrowly ovoid to narrowly ellipsoid, 4–6 × 2–3.2 μm. 18
17b. Subicular hyphae hyaline, often with inflations, thin-walled, with clamps. Spores ellipsoid to cylindrical. 19

18a. Subicular hyphae brownish, 8–10 μm wide, with clamps.
Basidiocarp loosely hypochnoid. Hymenial surface even, whitish. Subhymenial hyphae hyaline, thin-walled, 4–6 μm wide, not inflated. Basidia suburniform, 18–24 × 5–7 μm. Spores narrowly ellipsoid, 5–6 × 2–3 μm.
Distr.: Eur. Ref.: 107.
S. heteronemum (J. Erikss.) Strid 1975

18b. Subicular hyphae hyaline, up to 7 μm wide, with or without clamps.
Basidiocarp arachnoid to membranaceous. Hymenial surface even or somewhat tuberculate, whitish. Hyphal strands sometimes present, inconspicuous. Subhymenial hyphae hyaline, 3–5 μm wide. Basida urniform, 18–25(–30) × 5–7 μm. Spores narrowly ovoid, obliquely tapering toward the base, 4–6 × 2–3.2 μm.
Distr.: Eur. Ref.: 66, 102.
S. commune J. Erikss. 1949
Syn.: *Corticium muscicola* Bres. 1903, non *Sistotrema muscicola* (Pers.) Lundell 1947
Note: The typical form has clamps at all septa. Eriksson (1949), however, distinguished a fo. *efibulatum*, which is devoid of clamps and has slightly larger spores (4.5–6 × 2.5–3.2 vs 4–5.5 × 2–2.5 μm).

19a. Spores at least 5.5 μm long. Hymenial surface even. 20

19b. Spores up to 5.5 μm long . Hymenial surface even, grandinioid or poroid. 21

20a. Spores subcylindrical, 5.5–7.5 × (2.5–)2.7–3.5 μm. Hymenial surface even, whitish to greyish. *S. estonicum*, see 16b.

20b. Spores narrowly ellipsoid to subcylindrical, 5.5–6.5(–7) × 1.8–2.5 μm. Hymenial surface even, yellowish grey.
Basidiocarp hypochnoid, pulverulent. Hyphae 3.5–6.5(–7) μm wide, often ampullate, with clamps. Basidia urniform, 15–20 × 5.5–7 μm, usually with 6 sterigmata.
Distr.: USSR. Ref.: 313.
S. camshadalicum Parm. 1965

21a. Spores subcylindrical to cylindrical, often curved, 4.5–5.5 × 1.5–1.8 μm. Basidia urniform, 12–15 × 4–5 μm, with 6–8 sterigmata.
Basidiocarp pruinose to ceraceous. Hymenial surface even to somewhat reticulate, greyish white. Hyphae 2.5–4 μm wide, with clamps.
Distr.: Eur. Ref.: 66.
S. oblongisporum M.P. Christ. & Hauerslev apud M.P. Christ. 1960

21b. Spores at least 2 μm broad. Basidia 5–7.5 μm wide. 22

22a. Spores narrowly ellipsoid to subcylindrical, often somewhat curved, 3.5–5.5 × 2–2.5 μm. Basidiocarp effused, submembranaceous to ceraceous.
Hymenial surface even to warted, whitish, greyish or slightly yellowish. Hyphae 4–7 μm wide, often ampullate, with clamps.

Basidia urniform, 10–24 × 5–7(–8) μm, with 6–8 sterigmata.
Distr.: whole area. Ref.: 66, 355.
S. brinkmannii (Bres.) J. Erikss. 1948
Anamorph: *?Phymatotrichum omnivorum* (Shear) Duggar 1916
Syn.: *Corticium coronilla* Höhn. apud Höhn. & Litsch. 1906; *C. octosporum* Schroet. ex Höhn. & Litsch. 1906: *?Heptasporium gracile* Bref. 1912; *C. varians* Kniep 1915; *C. catonii* Burgeff 1936; *C. masculi* Sprau 1937

22b. Spores ellipsoid, 4–4.5 × 2–2.5 μm. Basidiocarp more or less excentrically stalked, membranaceous to ceraceous; pilei rarely circular, usually flabellate and coalescent.
Hymenial surface grandinioid to poroid, whitish to yellowish. Hyphae 2–5 μm wide, often inflated up to 10 μm, with clamps. Basidia urniform, 12–22 × (4.5–)6–7.5 μm, with (2–)4–6(–8) sterigmata.
Distr.: Eur., USSR. Ref.: 271.
S. confluens Pers. ex Fr. 1821
Syn.: *Hydnum sublamellosum* Bull. ex St. Amans 1821; *Sistotrema membranaceum* Oudemans 1879; *Irpex anomalus* Wettstein 1887

SISTOTREMASTRUM J. Erikss. 1958

Basidiocarp annual, resupinate, effused, membranaceous to ceraceous. Hymenial surface even to reticulate. Hyphal system monomitic. Hyphae hyaline, thin-walled, typically distinct, with clamps. Basidia in clusters, narrowly clavate, with 6–8 sterigmata. Spores hyaline, thin-walled, smooth, narrowly ellipsoid to cylindrical, not amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Sistotremastrum suecicum* Litsch. ex J. Erikss. 1958
Distribution: in the whole area.
References: 105.

Monotypic. Basidiocarp effused, closely adnate, membranaceous to ceraceous. Hymenial surface even to minutely reticulate, cream to whitish; margin concolourous. Hyphae hyaline, thin-walled, 2–5 μm wide, with clamps. Basidia subclavate to cylindrical, 14–20 × 4–5 μm. Spores hyaline, narrowly ellipsoid to short-cylindrical, sometimes slightly curved, 4.5–6.5 × (1.5–)2–3 μm.
Distr.: whole area. Ref.: 66, 303.
S. suecicum Litsch. ex J. Erikss. 1958

SPHAEROBASIDIUM Oberw. 1965

Basidiocarp annual, resupinate, effused, very thin, pruinose. Hymenial surface

even, whitish to greyish. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Cystidia when present hyaline, capitate, thin-walled. Basidia single, globose to subglobose or ovoid, with 4 sterigmata. Spores hyaline, ellipsoid, subcylindrical or navicular, smooth, thin-walled, not amyloid.

Substrate: saprophytic, mainly on gymnosperms.
Type species: *Xenasma minutum* J. Erikss. 1958
Distribution: Europe, North America.
References: 303.

1a. Cystidia present, terminal or directly on basal hyphae, 20–25(–35) × 4–5 μm, capitate, basally swollen. Spores ellipsoid, 3.5–5.5 × 2.5–3.5 μm.
Basidiocarp subinvisible, one layer of horizontal hyphae. Hymenial surface even, whitish to greyish. Hyphae 1–2 μm wide. Basidia globose to subglobose, 7–8 × 5–7 μm.
Distr.: Eur., N. Am. Ref.: 244, 303.
S. minutum (J. Erikss.) Oberw. 1965

1b. Cystidia absent. Spores subcylindrical to navicular, 5.5–6.5(–7) × 2.5–3 μm.
Basidiocarp subinvisible, up to 30 μm thick. Hymenial surface even, whitish. Hyphae 2–4 μm wide. Basidia globose to ovoid, 7–8.5 × 4.5–6.5(–7) μm.
Distr.: N.Am. Ref.: 248.
S. subinvisibile Liberta 1966

STECCHERICIUM D. Reid 1963

Basidiocarp annual, effused to effused-reflexed, becoming flabelliform, coriaceous. Abhymenial surface velutinous to fibrillose, becoming zoned. Hymenial surface hydnoid. Hyphal system seemingly dimitic. Generative hyphae hyaline, thin- to thick-walled, with clamps. Gloeoplerous hyphae thick-walled, with oily contents. Gloeocystidia sulpho-positive, often originating from subiculum. Basidia in small clusters, clavate, with 4 sterigmata. Spores hyaline, thin- to firm-walled, ornamented, ellipsoid, amyloid.

Substrate: saprophytic on wood of angiosperms.
Type species: *Steccherinum fistulatum* G.H. Cunn. 1958
Distribution: North America (mainly subtropical).
References: 229.

Basidiocarps often gregarious, coriaceous. Abhymenial surface velutinous to fibrillose, becoming wrinkled, zoned or shiny, pale ochraceous to fawn coloured. Hymenial surface hydnoid, spines subulate, up to 2.5 mm long. Hyphae 2.5–5.5 μm wide, thin- to thick-walled, sometimes nearly solid. Gloeoplerous hyphae 3.5–5.5 μm wide, thin- to thick-walled. Gloeocystidia 3.5–8 μm wide. Basidia 18–30 ×

4–4.5 μm. Spores thin- to firm-walled, finely warted, ellipsoid, 2.5–3.5 × 1.8–2.5 μm.
Distr.: N. Am. Ref.: 229.
S. seriatum (Lloyd) Maas G. 1966
Syn.: *Steccherinum westii* Murr. 1940; *S. fistulatum* G.H. Cunn. 1958

STECCHERINUM S.F. Gray 1821

Syn.: *Odontia* Fr. 1835; *Leptodon* Quél. 1886; *Odontina* Pat. 1887; *Mycoleptodon* Pat. 1897; *Etheirodon* Banker 1902

Basidiocarp annual, effused, effused-reflexed or pileate. Abhymenial surface tomentose to velutinous, sometimes becoming glabrous, whitish to brown. Hymenial surface covered with spines, cream-coloured to pinkish, reddish or brownish. Hyphal system dimitic. Generative hyphae hyaline, in most species with clamps. Skeletal hyphae hyaline, thick-walled. Cystidia thick-walled, usually encrusted, originating from subiculum or hymenium. Gloeocystidia sometimes present. Basidia in small clusters, clavate to cylindrical, 4-spored. Spores globose to ellipsoid, hyaline, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Distribution: in the whole area.
Type species: *Hydnum ochraceum* Pers. apud Gmelin ex Fr. 1821
References: 276.

1a. Clamps present. 2
1b. Clamps absent.
Basidiocarp effused, margin fimbriate, hyphal strands often present. Hymenial surface pinkish buff to cinnamon, with up to 1 mm long teeth. Generative hyphae 2–4(–6) μm wide. Skeletal hyphae 2–5 μm wide. Cystidia 8–10 μm wide, encrusted. Basidia 15–20 × 5–8 μm. Spores ellipsoid, 2.5–4 × 2–3 μm. On gymnosperms and angiosperms.
Distr.: Eur., N.Am. Ref.: 363.
S. subcrinale (Peck) Ryv. 1978
Syn.: *Mycoleptodon kavinae* Pilát 1936

2a. Spores at least on average longer than 4.5 μm, narrowly ellipsoid to (sub)-cylindrical (length : width ≥ 2). 3
2b. Spores up to 4.5 μm long, often smaller, ovoid to narrowly ellipsoid (length : width ≤ 2). 5

3a. Hymenial surface salmon to reddish when fresh, becoming ochraceous when dry, rarely irpicoid-poroid at the margin.
Basidiocarp effused, sometimes effused-reflexed. Margin fimbriate, white. Spines up to 3.5 mm long. Generative hyphae 2.5–4(–5.5) μm wide. Skeletal hyphae 3.5–7.2 μm wide. Cystidia 4–14(–18) μm

wide, encrusted. Basidia 15–20 × 4.5–6.5 μm. Spores 4–6.5 × 2–3 μm. On angiosperms.
Distr.: whole area. Ref.: 276.
S. laeticolor (Berk. & Curt. apud Berk.) Banker 1912
Syn.: *Hydnum setulosum* Berk. & Curt. apud Berk. 1873; *Hydnum parasitans* Berk. & Curt. apud Berk. 1873; *H. floridanum* Berk. & Cooke apud Cooke 1878; *Mycoleptodon robustior* J. Erikss. & Lundell apud Lundell & Nannf. 1953.

3b. Hymenial surface white to cream-coloured, typically poroid at the margin. 4

4a. Spores 6–8 × 3–4 μm. Basidiocarp effused-reflexed to pileate. Margin not fimbriate.
Generative hyphae 3–5 μm wide. Skeletal hyphae 3–6 μm wide. Cystidia 8–10 μm wide, encrusted. Basidia 20–25 × 5–7 μm. On Populus tremulus.
Distr.: N. Am. Ref.: 254.
S. oreophilum Gilberts. 1977

4b. Spores ellipsoid to cylindrical, 4.5–5.5 × 1.8–2.7 μm. Basidiocarp effused. Margin fimbriate, sometimes forming strands.
Generative hyphae 1.8–5.5 μm wide. Skeletal hyphae 2.7–5.5 μm wide. Cystidia obtuse or acute, 3.5–8 μm wide. Basidia 18–22 × 4–6 μm. On angiosperms and gymnosperms.
Distr.: whole area. Ref.: 124, 276.
S. ciliolatum (Berk. & Curt.) Gilberts. & Budington 1970
Syn.: *Mycoleptodon litschaueri* Bourd. & Galz. 1928

5a. Basidiocarp effused 6
5b. Basidiocarp effused-reflexed to pileate 8

6a. Margin fimbriate, forming strands. Spines up to 0.5 mm long, often wart-like. Hymenial surface yellowish to pinkish grey, often locally purplish or violaceous.
Generative hyphae 2.5–4.5 μm wide. Skeletal hyphae 3.5–5.5 μm wide. Cystidia 3–9 μm wide, most abundant near apex of spines. Spores ovoid to ellipsoid, 3.3–4 × 2.5–3 μm. On angiosperms and gymnosperms.
Distr.: whole area. Ref.: 276.
S. fimbriatum (Pers. ex Fr.) J. Erikss. 1958

6b. Margin even to somewhat fimbriate, never with strands. Spines at least 0.5 mm long. Hymenial surface never purplish or violaceous. 7

7a. Margin indistinct to evanescent.
Basidiocarp inseparable, very thin. Hymenial surface yellowish to pale ochraceous. Generative hyphae 2.7–4 μm wide. Skeletal hyphae 2.7–4.5 μm wide. Cystidia 2.5–8 μm wide, encrusted. Basidia 14.5–17 × 4–5 μm. Spores ellipsoid, 3.8–4(–4.5) × 2.7–3 μm. On angiosperms.

Distr.: USSR. Ref.: 276.

S. narymicum (Pilát) Parm. 1968

7b. Margin distinct, velutinous. *S. ochraceum*, see 10b

8a. Spores subglobose to ovoid, 3.5–4.5 × 3–3.5 μm.

Basidiocarp pileate, flabelliform. Spines up to 0.5 mm long, subulate to flattened. Hymenial surface yellowish to flesh colour. Generative hyphae 3.5–4.6 μm wide. Skeletal hyphae 3.5–8 μm wide. Cystidia 4.5–7.5 μm wide, encrusted. Basidia 15–20 × 4.5–5.5 μm.

Distr.: N. Am. Ref.: 276.

S. basi-badium Banker 1912

8b. Spores narrowly ovoid to ellipsoid, up to 3 μm broad. 9

9a. Abhymenial surface white to ochraceous, near the base covered with concentrically arranged orange-brown pustules. Two types of cystidia.

Basidiocarp effused-reflexed to flabelliform. Spines up to 7 mm long. Hymenial surface pale ochraceous to brownish flesh-colour. Generative hyphae 2.7–3.6 μm wide. Skeletal hyphae 2.7–6.3 μm wide. Tramal cystidia 2.5–5 μm wide, thick-walled, encrusted. Subhymenial cystidia 18–40 × 2.4–7 μm, typically thin-walled, smooth, variously shaped. Basidia 11–16 × 4.5–5.5 μm. Spores 3–3.5 × 1.8–2 μm. On angiosperms.

Distr.: N. Am. Ref.: 276.

S. subrawakense Murrill 1940

9b. Abhymenial surface without orange-brown pustules. Cystidia of one kind. 10

10a. Spines 4–5 mm long, reddish brown to dark brown.

Basidiocarp effused-reflexed to flabelliform. Abhymenial surface with hispid concentrical zones. Generative hyphae 1.8–3.6 μm wide. Skeletal hyphae 2.7–6.3 μm wide. Cystidia up to 5 μm wide, sometimes encrusted. Basidia 12–15 × 3.6 μm. Spores 3–3.6 × 1.8 μm. On angiosperms and gymnosperms.

Distr.: USSR. Ref.: 276.

S. murashkinskyi (Burt) Maas G. 1962

10b. Spines up to 3 mm long, cream to ochraceous, sometimes pale orange.

Basidiocarp effused, effused-reflexed or pileate, often flabelliform. Abhymenial surface generally velutinous to tomentose, sometimes becoming glabrous or concentrically zoned. Generative hyphae 1.8–4.5 μm wide. Skeletal hyphae 1.8–9 μm wide. Cystidia 4–10 μm wide, encrusted, abundant to scarce. Spores (3–)3.5–4.5(–4.7) × (1.6–)1.8–2.5(–2.7) μm. On angiosperms and gymnosperms.

Distr.: whole area. Ref.: 276.

S. ochraceum (Pers. apud Gmelin ex Fr.) S.F. Gray 1821

Syn.: *Hydnum microdon* Pers. ex Fr. 1821; *H. rhois* Schw. 1822; *H. denticulatum* Pers. 1825; *H. dichroum* Pers. 1825; *H.*

pudorinum Fr. 1828; *H. flabelliforme* Berk. 1845; *H. decurrens* Berk. & Curt. 1868; *H. plumarium* Berk. & Curt. apud Berk. 1873; *H. alnicola* Velen. 1922; *H. reflexum* Burt 1931; *Mycoleptodon gracilis* Pilát 1938; *Steccherinum resupinatum* G.H. Cunn. 1958

Note: *S. peckii* Banker 1912 is recognized as a distinct species by Maas Geesteranus (232), mainly differing by the presence of numerous concentric dark brown lines on the abhymenial surface.

STEREUM Pers. ex S.F. Gray 1821

Syn.: *Auricularia* Fr. 1825; *Haematostereum* Pouzar 1959

Basidiocarp annual or perennial, resupinate, effused-reflexed or flabelliform, coriaceous to corky. Hymenial surface even, sometimes tuberculate or undulate, sometimes bleeding when damaged. Hyphal system typically dimitic. Hyphae thin- to thick-walled, without clamps. Cystidia usually present, originating from skeletal (or skeletoid) hyphae, with thickened to thick walls, sometimes with yellowish, reddish or brownish contents (conducting hyphae), not projecting. Cystidioles and acanthohyphidia often present, not emerging. Basidia subclavate to cylindrical. Spores hyaline, thin-walled, smooth, narrowly ellipsoid to cylindrical, amyloid.

Substrate: saprophytic or parasitic on wood of angiosperms or gymnosperms.
Type species: *Thelephora hirsuta* Willd. ex Fr. 1821
Distribution: in the whole area.
References: 10, 182, 403.

Note: The species concept within *Stereum* is difficult by the lack of stable combinations of characters. The shape of the basidiocarp, the type of the tomentum, the presence of acanthohyphidia and conducting hyphae are all variable. The homothallism and nuclear behaviour of the species also suggest possible wide variation. For these reasons Welden (403) recognizes only *S. rugosum, S. sanguinolentum, S. striatum*-complex, *S. hirsutum*-complex and *S. ostrea*-complex.

1a. Tomentum of reflexed part composed of long white hairs, appressed or not. Basidiocarp cup-shaped to effused-reflexed, up to 400 μm thick, exclusive of tomentum. Conducting hyphae and acanthohyphidia absent. *H. striatum*-complex. 2

1b. Reflexed part absent or tomentum not composed of long white hairs. Basidiocarp usually thicker. Conducting hyphae and acanthohyphidia may be present. 3

2a. Hairs adnate, radiating; reflexed part shiny, lineate-striate. On Carpinus. Basidiocarp with central umbo or effused-reflexed. Abhymenial layer buff to smoke grey. Hymenial surface light buff to ochraceous buff, rarely wood-brown. Skeletal hyphae 4–7 μm wide, generative hyphae 1.5–4 μm wide. Basidia 4.5–7.5 μm wide. Spores cylindrical, 6–8.5 × 2–3.5 μm.

Distr.: N. Am. Ref.: 234.

S. striatum (Fr.) Fr. 1838 non *S. striatum* (Schrad.) ex Fr. 1838.

Syn.: *Thelephora sericeum* Schw. 1822

2b. Hairs loose, silky-hirsute, predominantly pointing toward the margin. On various woods of angiosperms.

Basidiocarp cup-shaped or effused-reflexed. Abhymenial layer whitish to grey, more rarely with ochraceous or brownish tinge. Hymenial surface cream-buff to pale orange-yellow. Skeletal hyphae 4–7 μm wide, generative hyphae 1.5–4 μm wide. Basidia approximately 27 × 4.5–5 μm. Spores cylindrical, 5.5–9 × 1.5–2.5(–3) μm.

Distr.: whole area. Ref.: 182, 234.

S. ochraceo-flavum (Schw.) Ellis 1878

Syn.: *Thelephora ramealis* (Pers. ex Fr.) Schw. 1822 (= *Stereum rameale* (Pers. ex Fr.) Burt 1920 non ~ (Berk.) Massee 1890); *Stereum sulphuratum* Berk. & Rav. apud Berk. & Curt. 1868; *S. ochroleucum* Bres. 1903

3a. Spores on average larger than 8 × 3 μm. Conducting hyphae always present; hymenium usually bleeding when damaged. 4

3b. Spores at least on average smaller than 8 × 3 μm. Conducting hyphae usually absent. 6

4a. On wood of gymnosperms.

Basidiocarp effused or effused-reflexed, up to 600 μm thick. Abhymenial surface felty to strigose-hirsute, cinnamon buff to greyish brown. Hymenial surface even or tuberculate, pale brown to brown, often with greyish violaceous tinge, abundantly bleeding when damaged. Skeletal hyphae 3–6 μm wide, generative hyphae 2–3.5 μm wide. Acanthohyphidia present or not. Basidia 20–45 × 4–8.5 μm. Spores (6–)8–14 × (2–)2.5–3.5(–5) μm. Sometimes wound-parasite.

Distr.: whole area. Ref.: 182, 234, 367.

S. sanguinolentum (Alb. & Schw. ex Fr.) Fr. 1838

Syn.: *S. balsameum* Peck 1875; *S. rigens* (P. Karst.) Massee 1882; *S. crispum* Quél. 1891

Note: Acanthohyphidia are mentioned in descriptions of American specimens, never in those of European ones.

4b. On angiospermous wood, very rarely on gymnosperms. 5

5a. Basidiocarp effused, rarely with glabrous or short-felty, brown to dark brown corky-woody effused parts. Often perennial.

Basidiocarp up to 3.5 mm thick. Hymenial surface even, tuberculate or undulate, yellowish to ochraceous, sometimes greyish. Up to 20 hymenium layers may be present. Skeletal hyphae 4.5–7 μm wide, generative hyphae 2–5 μm wide. Acanthohyphidia sometimes present. Basidia 20–50 × 3–6 μm. Spores cylindrical, (6–)7–12 × (2.7–)3–4.5 μm.

Distr.: Eur., USSR, ?N. Am. Ref.: 182, 367.

S. rugosum (Pers. ex Fr.) Fr. 1838

Syn.: *S. avellanum* Fr. 1838; *Corticium boltoni* Fr. 1838; *Thelephora juniperina* Weinmann 1836; *Th. laurocerasi* Berk. 1836

5b. Basidiocarp effused-reflexed, reflexed part felty, yellowish brown to rust brown, coriaceous. Hymenium even, brownish, never yellowish. *S. gausapatum*, see 11a.

6a. On gymnospermous wood, bleeding when damaged. Spores 5–8.5 × 2–3.5 μm. Small-spored form of *S. sanguinolentum*, see 4a.

6b. On angiospermous wood, rarely on gymnospermous wood and then not bleeding. 7

7a. Acanthohyphidia absent. *S. hirsutum*-complex. Key to the form-species. 8

7b. Acanthohyphidia present. *S. ostrea*-complex. Key to the form-species. 13

8a. Hymenium bleeding yellow when damaged. 9

8b. Hymenium not bleeding yellow, or when it does, the colour changing rapidly to red. 10

9a. Basidiocarp effused or slightly reflexed, up to 800 μm thick. Distr.: N. Am.

Abhymnial surface pinkish buff to cinnamon brown when dry. Hymenial surface even, pruinose, pinkish buff. Conducting hyphae pale, 3–3.5 μm wide. Cystidia absent. Spores cylindrical, slightly curved, 5–8 × 2.5–3 μm.

Ref.: 58.

S. styracifluum (Schw.) Fr. 1838

9b. Basidiocarp effused-reflexed to stipitate, 200–600 μm thick, more when perennial. Distr.: Eur.

Abhymenial surface ochraceous to bright rusty brown, later paler. Hymenial surface yellowish to pinkish buff, often with greyish tinge. Cystidia and conducting hyphae present. Spores cylindrical, 5.5–7 × 2.2–3 μm.

Ref.: 182, 338.

S. subtomentosum Pouzar 1964

10a. Basidiocarp rather thick, 500–1500 μm, sometimes more. 11

10b. Basidiocarp thinner, 300–500(–850) μm. 12

11a. Hymenium bleeding when damaged, never with yellowish tinge.

Basidiocarp effused-reflexed, more or less radially plicate. Abhymenial surface pubescent to hirsute, sometimes strigose, yellowish brown to brown. Hymenium even, pinkish buff to brown. Conducting hyphae thin-walled, abundant. Spores narrowly ellipsoid to cylindrical, 6–10 × 3.5–4.5 or 5–7.5(–8.5) × 2–3 μm.

Distr.: whole area. Ref.: 182, 234, 367.

S. gausapatum (Fr.) Fr. 1874

Syn.: *Auricularia tabacina* Pers. 1822; *Thelephora spadicea* Fr. 1828, non ~ Pers. ex Fr. 1821, nec ~ Bres. apud Höhn. 1907; *S. cristulatum* Quél. 1875; *?S. aurantiacum* (P. Karst.) Britz. 1896, non ~ (Berk.) Fr. 1849, nec ~ (Pers. apud Gaud.) Lloyd 1913; *S. plicatum* (Peck) Lloyd 1922; *S. quercinum* M.C. Potter 1902; *S. occidentale* Lloyd 1919; *S. lacunosum* Velen. 1922

Note: The dimensions of the spores as given by European authors are always larger than those given by American authors.

11b. Hymenium very rarely bleeding when damaged, at least at the margin with yellowish tinge.

Basidiocarp typically effused-reflexed, rarely effused, margin often radiately plicate. Abhymenial surface hirsute to strigose, yellowish brown to rust brown, margin often orange-yellow. Hymenial surface even, yellowish to orange-yellow to cinnamon-buff, often with greyish tinge. Conducting hyphae sometimes present. Spores cylindrical, 5–8 × 2–3.5 μm.

Distr.: whole area. Ref.: 182, 234, 367.

S. hirsutum (Willd. ex Fr.) S.F. Gray 1821

Syn.: *Thelephora concentrica* Alb. & Schw. ex Fr. 1821; *T. ochracea* Schw. 1822, non ~ Fr. 1821; *T. subzonata* Fr. 1828; *T. rhicnopilus* Lév. 1846; *S. amoenum* Kalchbr. & McOwan 1881, non ~ (Lév.) Sacc. 1888; *S. kalchbrenneri* Sacc. 1888; *S. persoonianum* Britz. 1897; *S. variicolor* Lloyd 1914; *S. reflexum* Sacc. 1916; *Corticium reisneri* Velen. 1922; *S. neuwirthi* Velen. 1922; *S. azonum* Velen. 1922; *S. cinericium* Lloyd 1922; *S. ochroleucum* Velen. 1922, non ~ (Fr.) Fr. 1863, nec ~ Bres. 1903; *S. ochraceum* Lloyd 1923

12a. Conducting hyphae absent. 2

12b. Conducting hyphae present.

Basidiocarp effused-reflexed to flabelliform, reflexed part radiately plicate. Abhymenial surface strigose or appressed silky-strigose, cinnamon-buff to hazel, sometimes greyish. Hymenial surface even, cream-buff to cinnamon-buff to orange. Spores cylindrical, often slightly curved, 5–6.5 × 2–2.5 μm.

Distr.: N. Am. Ref.: 234.

S. complicatum (Fr.) Fr. 1838

Syn.: *Thelephora lobata* Bertoloni 1856, non ~ Kuntze ex Fr. 1830; *S. bertolonii* Sacc. 1895

13a. Tomentum formed of repent radiating fibrils, hirsute. Hymenium pale orange-brown to ochraceous brown with salmon tinge. Acanthohyphidia thin- to somewhat thick-walled.

Basidiocarp effused or with reflexed margin, approximately 370 μm thick. Abhymenial surface grey to ochraceous-buff. Hymenium

tuberculate, cracked into minute areolae. Skeletal hyphae 3–5 μm wide, generative hyphae 2.5–4 μm wide. Thick-walled cystidia and conducting hyphae present. Spores narrowly ellipsoid to cylindrical, 4.5–7 × (2.2–)2.5(–3) μm.

Distr.: Eur., rare. Ref.: 182, 350.

S. reflexulum D. Reid 1968

13b. Tomentum tomentose-felty. Hymenial surface even, light ochraceous buff, pinkish buff to light brown or drab to greyish. Acanthohyphidia thin-walled.

Basidiocarp effused-reflexed to flabelliform or stipitate, 300–800 (–1000) μm thick. Abhymenial surface light buff to rusty brown, or drab to greyish. Hymenial surface even, often undulate. Hymenium when damaged bleeding or not, "blood" may be red or yellow turning red. Skeletal hyphae 4–6 μm wide, generative hyphae 2–3 μm wide. Thick-walled cystidia always, conducting hyphae sometimes present. Spores narrowly ellipsoid to cylindrical, 4–7(–8) × 2–3 (–3.5) μm.

Distr.: whole area. Ref.: 182, 234, 350, 381.

S. ostrea (Blume & Nees) Fr. 1838

Syn.: *Thelephora fasciata* Schw. 1822; *T. lobata* Kunze ex Fr. 1830; *T. boryana* Fr. 1830; *T. concolor* Jungh. 1838; *S. luteobadium* Fr. 1838; *S. perlatum* Berk. 1842; *T. leichkardtianum* Lév. 1846; *T. mollis* Lév. 1846; *S. galeottii* Berk. 1851; *S. sprucei* Berk. apud Berk. & Br. 1869; *S. insignitum* Quél. 1889; *S. pictum* Berk. ex Massee 1890; *S. australe* Lloyd 1913; *S. tenebrosum* Lloyd 1918; *S. traplianum* Velen. 1920; *S. transvaalium* Bijl 1929

SUBULICIUM Hjortstam & Ryv. 1979

Basidiocarp annual, resupinate, effused, thin, pruinose to membranaceous, adnate. Hymenial surface even, pilose under a lens, whitish to cream-coloured. Hyphal system monomitic. Hyphae hyaline, thin- to slightly thick-walled, smooth or encrusted, without clamps. Cystidia terminally or laterally on hyphae, hyaline, subulate, somewhat thick-walled, smooth or somewhat encrusted. Basidia hyaline, narrowly clavate, 4-spored. Spores hyaline, globose, subglobose to broadly ellipsoid, thin-walled, smooth, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Peniophora lauta* H.S. Jacks. 1948
Distribution: Europe, North America.
References: 164.

1a. Cystidia mostly smooth, originating laterally on hyphae, 90–120 × 4–5 μm.

Basidiocarp effused, pruinose to thin-membranaceous. Hymenial

surface even, pilose, whitish to light cream-coloured. Hyphae thin-to slightly thick-walled, 3–3.5(–4) μm wide, smooth. Basidia 25–30 × 6 μm, guttulate. Spores globose to subglobose (6–7 μm in diam.) or broadly ellipsoid and 6–8 × 4.5–7 μm, guttulate. On angiosperms and gymnosperms.
Distr.: Eur., N. Am. Ref.: 164, 170.
S. lautum (H.S. Jacks.) Hjortstam & Ryv. 1979

1b. Cystidia somewhat encrusted, terminal, 60–75 × 4–5.5 μm.
Basidiocarp effused, pruinose. Hymenial surface even, pilose, whitish. Hyphae thin-walled, 3.5–4 μm wide, encrusted. Basidia 16–20 × 4–5 μm. Spores globose, 5–6 μm in diam. On angiosperms and gymnosperms.
Distr.: Eur., N. Am. Ref.: 164, 170.
S. rallum (H.S. Jacks.) comb.nov.
Basionym: *Peniophora ralla* H.S. Jacks. 1948 in Can. J. Res., C, 26:136.

SUBULICYSTIDIUM Parm. 1968

Basidiocarp annual, resupinate, effused, soft-membranaceous, often very thin. Hymenial surface even, under a lens hispid. Hyphal system monomitic. Hyphae hyaline to slightly yellowish, thin- to somewhat thick-walled, always with clamps. Cystidia acuminate-cylindrical, thick-walled, with bifurcate base, covered with crystals which in polarized light seem to be short-bacilliform and arranged in 3–4 longitudinal rows, but examined with the scanning electron microscope they are flattened bodies arranged in two rows only. Basidia more or less clavate, sometimes exhibiting repetition, clamped at the base, with (2–)4 sterigmata. Spores hyaline, thin-walled, long-cylindrical or long-ellipsoid, not amyloid.

Substrate: saprophytic on wood or bark of angiosperms and gymnosperms.
Type species: *Hypochnus longisporus* Pat. 1894
Distribution: in the whole area.
References: 184, 191, 192, 318.

Only one species in the area. Basidiocarp effused, adnate, hypochnoid or membranaceous, easily separable. Hymenial surface even, whitish or light greyish-brownish (in older specimens). Hyphae hyaline, thin- to slightly thick-walled (up to 0.8 μm), 2.5–4 μm wide, with clamps. Cystidia abundant, cylindrical, acuminate, brittle, with thickened walls (c. 1–1.5 μm) bearing flat bodies normally arranged in two rows, 40–80 × 4–5 μm, up to 50 μm projecting, the base mostly bifurcate. Basidia cylindrical to narrowly clavate, somewhat flexuose, 18–25 × 4–6 μm, with 4 subulate sterigmata 2–3 μm long; in well developed specimens the basal half of most of the basidia is loosely surrounded by a wall of the previous basidium (basidial repetition). Spores hyaline, more or less

cylindrical, straight or somewhat curved, slightly narrowed at both ends, thin-walled, 10–16 × 1.5–3 μm, often with several guttules, apiculus not distinctive.
Distr.: whole area. Ref.: 184, 191, 192.
S. longisporum (Pat.) Parm. 1968
Syn.: *Peniophora asperipilata* Burt 1926

SUILLOSPORIUM Pouzar 1958

Basidiocarp annual, resupinate, effused, thin, hypochnoid. Hymenial surface even, whitish to pale coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, short-celled, with small clamps. Cystidia hyaline, cylindrical, thin-walled, with clamped septa. Basidia barrel-shaped to ovoid, with 4 sterigmata. Spores hyaline, thin-walled, smooth, fusiform, not amyloid.

Substrate: saprophytic on wood of gymnosperms.
Type species: *Pellicularia cystidiata* D.P. Rogers 1943
Distribution: Europe, North America.
References: 336.

Monotypic. Basidiocarp hypochnoid, thin, adnate. Hymenial surface even, whitish to pale yellowish. Hyphae hyaline, thin-walled, short-celled, 4.5–10.5 μm wide, with minute clamps at all septa. Cystidia hyaline, thin-walled, cylindrical, with 2–6 clamped septa, often encrusted with some plate-like mineral bodies, (50–)70–110 × 6–10 μm. Basidia barrel-shaped to ovoid, 13–15 × 9–11 μm. Spores fusoid, (8–)11–13 (–16) × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 354.
S. cystidiatum (D. P. Rogers) Pouzar 1958

THANATEPHORUS Donk 1956

Incl.: *Uthatobasidium* Donk 1956; *Ypsilonidium* Donk 1972.

Basidiocarp annual, resupinate, effused, arachnoid, floccose, pellicular, hypochnoid or membranaceous. Hymenial surface typically discontinuous. Hyphal system monomitic. Basal hyphae hyaline or brownish, thin- or thick-walled, branching at right angles, often wide (up to 17 μm), without clamps. Subhymenial hyphae typically hyaline, rather short-celled, thin-walled. Hyphal cells bi- to pluri-nucleate. Sterile hymenial structures absent. Basidia hyaline, thin-walled, barrel-shaped to subcylindrical or broadly clavate, about the same width as the supporting hyphae, with (1–)2–4(–7) sterigmata, arranged in clusters. Spores hyaline to yellowish, thin-walled, smooth, subglobose, ellipsoid, cylindrical or citriform, repetitive, not amyloid, sometimes cyanophilous. Sclerotia may be present.

Substrate: parasitic on herbaceous plants or saprophytic on decaying wood, humus or soil.
Type species: *Hypochnus solani* Prillieux & Delacroix 1891
Anamorph: *Rhizoctonia* DC. ex Fr. p.p.
Distribution: in the whole area.
References: 65, 354, 384, 385.

1a. Spores citriform to fusoid. 2
1b. Spores subglobose, ovoid, ellipsoid or cylindrical. 3

2a. Spores 4.5–5.5 × 4–4.5 μm. Hyphae 2–3.5 μm wide.
Basidiocarp hypochnoid to membranaceous. Hymenial surface even, dark clay yellow to ochraceous. Basidia ovoid to subcylindrical or broadly clavate, 11–15 × 5–6 μm, with 2–4 sterigmata up to 7 μm long.
Distr.: Eur. Ref.: 65.
Uthatobasidium citriforme M.P. Christ. 1959

2b. Spores 8–18(–21) × 5–8 μm. Hyphae 5–10(–12) μm wide.
Basidiocarp arachnoid, floccose or membranaceous. Hymenial surface even, whitish to yellowish, sometimes with olivaceous tinge. Basidia broadly clavate to subcylindrical, 15–27 × 8.5–12 μm, with (1–)2–4 sterigmata, up to 15 μm long.
Distr.: whole area. Ref.: 65, 384.
Hypochnus fusisporus Schroet. 1888
Syn.: *?Hypochnus flavescens* Bon. 1851; *Coniophora vaga* Burt 1917; *Corticium fenestratum* Overholts 1934

3a. Spores narrowly ellipsoid to cylindrical, at least twice as long as wide. 4
3b. Spores subglobose, ovoid or ellipsoid. 5

4a. Spores cylindrical, often curved, 12–17 × 4.5–6 μm. Sterigmata up to 30 μm long.
Basidiocarp arachnoid, floccose or membranaceous. Hymenial surface whitish. Hyphae hyaline, thin-walled, 3–9(–12) μm wide. Basidia cylindrical to subclavate, 15–26 × 8–11 μm, with 2 sterigmata.
Distr.: Eur., N. Am. Ref.: 284.
T. sterigmaticus (Bourd.) Talbot 1965

4b. Spores narrowly ellipsoid to subcylindrical, 13–16 × 6–8 μm. Sterigmata up to 18 μm long. Cf. *Ceratobasidium bicorne*

5a. Hyphae up to 5.5 μm wide. 6
5b. Hyphae at least 6 μm wide. 7

6a. Basidia cylindrical to subclavate, 15–28 × 6–9 μm, with 2 sterigmata up to 25 μm long. Sclerotia absent.
Basidiocarp membranaceous, up to 160 μm thick. Hymenial surface pale fawn. Hyphae pale to dark brown, especially in the sub-

hymenium, thin-walled, 3.5–5 μm wide. Spores ovoid, pyriform or ellipsoid, (7.5–)8.7–13(–15) × (3.5–)5.7–7.5 μm.
Distr.: Eur. Ref.: 351.
T. langlei-regis D. Reid 1969

6b. Basidia subglobose to short-cylindrical, 10–18 × 8–12 μm, typically with 4 sterigmata up to 16 μm long. Sclerotia often present. Cf. *Ceratobasidium anceps.*

7a. Spores pale brownish, subglobose to ovoid or pyriform, 9–12 × 7–9.5 μm.
Basidiocarp arachnoid to floccose. Hymenial surface discontinuous, whitish to pale brownish. Basal hyphae brown, with thickened walls, up to 17 μm wide. Subhymenial hyphae hyaline, thin-walled, 8.5–10 μm wide. Basidia short-cylindrical, (13–)16–21 × 9–11 μm, with 4 sterigmata up to 12 μm long. On Orchidaceae.
Distr.: Eur. Ref.: 394.
T. orchidicola Warcup & Talbot 1966

7b. Spores up to 7 μm wide. 8

8a. Basal and subhymenial hyphae hyaline, with thin to somewhat thickened walls, 6–8 μm wide. On decaying wood.
Basidiocarp hypochnoid to membranaceous. Hymenial surface even, ochraceous. Basidia short-cylindrical or broadly clavate, 14–20 × 8–10 μm, with 4 sterigmata up to 14 μm long. Spores subglobose, ovoid or broadly ellipsoid, 8–10 × 5–6.5 μm.
Distr.: whole area. Ref.: 65, 384.
Uthatobasidium ochraceum (Massee) Donk 1958
Syn.: *?Hypochnus flavescens* Bon. 1851; *Corticium frustulosum* Bres. 1903

8b. Basal hyphae brownish, with thick walls (up to 2–3 μm thick); subhymenial hyphae hyaline, thin-walled; hyphae (4.5–)9–12(–17) μm wide. Typically parasitic on plant parts in or near the soil.
Basidiocarp arachnoid, hypochnoid or membranaceous. Hymenial surface even, whitish to cream-coloured. Basidia (9–)12–16(–25) × (5–)7–10(–12) μm, short-cylindrical, with (2–)4(–7) sterigmata. Spores hyaline, thin-walled, ovoid to ellipsoid, (5–)7–11(–12) × × (4–)4.5–7(–8) μm.
Distr.: whole area. Ref.: 65, 322, 354.
T. cucumeris (Frank) Donk 1956
Syn.: *Hypochnus filamentosus* Pat. apud Pat. & Lagerheim 1891; *H. solani* Prillieux & Delacroix 1891; *H. sasakii* Shirai 1906; *Corticium praticola* Kotila 1929; *C. areolatum* Stahel 1940, non ~ Bres. 1925
Anamorph: *Rhizoctonia solani* Kühn 1858

TOMENTELLA Pat. 1887 nom. cons.

Syn.: *Alytosporium* Link ex Steudel 1824; *Caldesiella* Sacc. 1877; *Amaurodon* Schroet. 1889; *Tomentellastrum* Svrček 1958

Basidiocarp annual, resupinate, effused, arachnoid, hypochnoid, byssoid, tomentose, pellicular or submembranaceous, separable or not. Hymenial surface discontinuous when young, later often continuous, even, granular, warted or hydnoid with yellowish, pinkish, reddish, brownish, greenish, purplish or blackish tinges, often bluish, greenish or blackish with KOH. Hyphal strands present or absent. Hyphal system monomitic or rarely dimitic. Subicular hyphae subhyaline to brown, thin- to thick-walled, smooth or encrusted, sometimes of two types. Subhymenial hyphae hyaline to brownish, typically thin-walled. Clamps present on nearly all septa or completely absent. Cystidia or cystidioles sometimes present. Basidia clavate, with 2–4 sterigmata, often septate in the middle or at the base of the sterigmata. Spores subhyaline to brown, globose to ellipsoid, regular, sinuous or angular in outline, ornamented, typically with somewhat thickened walls, not amyloid, sometimes changing colour in KOH.

Substrate: saprophytic on wood of angiosperms and gymnosperms or on humus.
Type species: *Thelephora ferruginea* Pers. ex Pers. 1822
Distribution: in the whole area.
References: 211, 219, 376.

Note: The genus *Tomentella* contains the resupinate forms/species of *Thelephora* Ehrh. ex Fr., of which the type species, *Thelephora terrestris* Ehrh. ex Fr., fits equally well in both genera!

1a. Clamps absent (*Tomentellastrum* Svrček 1958). 2
1b. Clamps present at most septa (*Tomentella* s. str.). 5

2a. Spores brown, globose to irregular, echinulate to usually aculeate, 7–12 μm in diam.

Basidiocarp arachnoid, byssoid or felty. Hymenial surface even or discontinuous, dark brown to olive brown to violaceous; margin and subiculum darker. Hyphal strands absent or obscure, up to 40 μm wide, individual hyphae 2.5–4 μm wide. Subicular hyphae with thickened to thick walls, dull brown, 3–7 μm wide. Subhymenial hyphae hyaline to yellowish brown, 3.5–5(–6) μm wide. Basidia 40–75 × 7–9(–11) μm, often with bluish or greenish contents.
Distr.: whole area. Ref.: 66, 210, 211, 376.
Syn.: *Thelephora floridana* Ellis & Everh. 1886; *Tomentella atro-violacea* Litsch. 1933; *Tom. fimbriata* M.P. Christ. 1960; *Tom. macrospora* auctt.
T. badia (Link ex S.F. Gray) Stalpers 1975

2b. Spores subglobose to ellipsoid, rarely globose, regular, warted to echinulate. 3

3a. Subicular hyphae 2–3.5(–4.5) μm wide.

Basidiocarp soft fleshy to crustose. Hymenial surface even, purplish brown to dark brown; margin paler to almost white. Subiculum dark brown. Hyphal strands up to 25 μm wide, individual hyphae 2–4 μm wide. Subhymenial hyphae thin- to slightly thick-walled, yellowish brown, 3–5 μm wide. Basidia 40–60 × 8–12 μm. Spores brown with slightly greenish contents, globose to broadly ellipsoid, warted to echinulate, 7.5–9.5 × 6–8 μm.

Distr.: N. Am. Ref.: 208, 211.

T. brunneofirma M.J. Larsen 1967

3b. Subicular hyphae 2–5.5(–8) μm wide. 4

4a. Hyphal strands present, up to 30 μm wide; individual hyphae 2–3.5 μm wide. Sterigmata up to 5 μm long. Basidiocarp arachnoid, byssoid or tomentose, loose.

Hymenial surface bluish grey to greyish brown, even; margin paler than hymenium. Subiculum dull brown. Subicular hyphae with thickened to thick walls, 2–5.5(–6) μm wide. Subhymenial hyphae thin- to moderately thick-walled, hyaline to brown, 3–6 μm wide. Basidia 35–60 × 7–10 μm, partly bluish in KOH. Spores pale yellow to brown, subglobose to ellipsoid, warted to echinulate, 8–10 × 6–8(–9) μm.

Distr.: Eur. Ref.: 211, 376.

T. caesiocinerea (Svrček) M.J. Larsen 1968

4b. Hyphal strands absent. Sterigmata up to 10 μm long. Basidiocarp tomentose to crustose.

Hymenial surface even, light brown, grey, dark brown, violaceous brown to violet; margin concolourous or paler. Subiculum darker. Subicular hyphae with thickened to thick walls, dark brown, 3.5–6 (–8) μm wide. Subhymenial hyphae hyaline to pale brown, thin- to slightly thick-walled, 3–5(–7) μm wide. Basidia 40–70 × 8–13(–16) μm. Spores yellowish brown to brown, subglobose to ellipsoid, warted to echinulate, 7.5–12(–14) × 6–9(–10) μm.

Distr.: whole area. Ref.: 211, 390.

Syn.: *?Thelephora biennis* Fr. 1821; *Hypochnus alutaceo-umbrinus* Bres. 1903; *Tomentella macrospora* Höhn. & Litsch. 1906; *?Tomentella phylacteris* Bull. ex Bourd. & L. Maire 1920; *Tomentella montanensis* M.J. Larsen 1967.

T. fusco-cinerea (Pers.) Donk 1933

Note: *Tomentella biennis* (Fr.) A.M. Rogers is often considered as synonymous. If this is accepted, *T. biennis* is the correct name. Larsen (211) distinguished *T. montanensis* from *T. macrospora* by the darker hymenium and the smaller spores of the former. However, the hymenium of *T. macrospora* was originally described as "schwarzbraun" and the dimensions of the spores of *T. montanensis* fall within the limits of those of *T. macrospora* as given by Larsen himself.

5a. Cystidia or cystidioles present. 6
5b. Cystidia or cystidioles absent. 16

6a. Hyphal strands present. 7
6b. Hyphal strands absent. 11

7a. Cystidia up to 5(–6.5) μm wide at the base and up to 3.5(–4.5) μm at the apex. 8
7b. Cystidia especially at the apex much wider. 9

8a. Basidia 25–55 × 5–8 μm. Subiculum paler than hymenium.
Basidiocarp granulose to submembranaceous. Hymenial surface pinkish buff to greyish buff to reddish brown, sometimes with olivaceous tinge, even, mealy or granulose; margin arachnoid, pale. Hyphal strands up to 15 μm wide, individual hyphae 2–3 μm wide. Subicular hyphae hyaline to pale tan, 2.5–4.5(–5.5) μm wide, with thickened walls. Subicular hyphae hyaline, thin-walled, 2.5–4.5(–5) μm wide. Cystidia cylindrical, sometimes slightly widened at the base and apex, hyaline, 35–60 × 2.5–5(–6.5) μm, often septate, sometimes encrusted at the apex. Spores yellowish to brown, irregularly globose to lobed, warted to echinulate, 7–9(–10) × 6–8 μm.
Distr.: whole area. Ref.: 219, 376.
T. subtestacea (Bourd. & Galz.) Svrček 1958
Syn.: *?Tomentella roana* (Bourd. & Galz.) Svrček 1958

8b. Basidia 40–50(–60) × 8–12 μm. Subiculum somewhat darker than hymenium.
Basidiocarp arachnoid to byssoid to submembranaceous, separable. Hymenial surface even to colliculose, tan brown to olivaceous; margin arachnoid to fimbriate, paler. Hyphal strands up to 50 μm wide, individual hyphae 2–4 μm wide. Subicular hyphae olive brown to yellowish brown, thick-walled, 2.5–5(–7) μm wide, often encrusted. Subhymenial hyphae 3–5(–7) μm wide. Cystidia hyphoid, up to 70 × 2–4(–5) μm, often septate, smooth. Spores yellowish to dark brown, irregularly globose to lobed, echinulate to aculeate, 7–9(–10) × 7–8 μm.
Distr.: USSR. Ref.: 219, 295.
T. atro-arenicolor Nikolajeva 1970

9a. Cystidia brown, often basally with thickened walls, originating in subiculum, expanded (up to 12 μm) and often encrusted at the apex, embedded or projecting up to 80 μm.
Basidiocarp byssoid to membranaceous, separable. Hymenial surface even to granulose, yellowish brown to tobacco brown or olivaceous brown; margin paler. Subiculum concolourous or darker. Subicular hyphae yellowish brown, thick-walled, 2.5–5.5(–8) μm wide. Hyphal strands up to 200 μm wide; individual hyphae 2–3(–4) μm wide. Subhymenial hyphae 3–4 μm wide. Basidia 35–60 × 6–10

μm. Spores yellowish to golden brown, irregular, echinulate to aculeate, 6–8(–9) × 5–7 μm.
Distr.: whole area. Ref.: 211, 219, 390.
T. pilosa (Burt) Bourd. & Galz. 1924

9b. Cystidia hyaline, thin-walled, originating in subhymenium, smooth. 10

10a. Cystidia clavate, 35–120 μm long, 3–4(–6) μm wide at the base, 6–8(–9) μm at the apex, usually septate, emerging.
Basidiocarp arachnoid to byssoid, separable. Hymenial surface even to granulose, drab to wood brown to buff; margin similar. Subiculum pale tan to medium brown. Hyphal strands 15–80 μm wide; individual hyphae 2–3.5 μm wide. Subicular hyphae yellowish to brown, with thickened walls, 3.5–6 μm, often encrusted and spinulose. Subhymenial hyphae 3–4.5 μm (or 5–7(–10) μm) wide. Basidia 25–40 × 7–9 μm. Spores brownish, echinulate to aculeate, globose to subglobose to irregular, 7–9(–10) μm in diam. or 7–9 × 5–6 μm.
Distr.: N. Am. Ref.: 211, 219, 388.
T. muricata (Ellis & Everh.) Wakef. 1960

10b. Cystidia clavate-cylindrical, up to 90 × 15 μm, aseptate, filled with ochre to reddish ochre material, not emerging.
Basidiocarp arachnoid to byssoid, separable. Hymenial surface even, dull buff to wood brown; margin paler. Subiculum concolourous or darker. Hyphal strands 10–40 μm wide; individual hyphae 2.5–4 μm wide. Subicular hyphae pale yellow to tan, with thickened walls, (3.5–)5–7 μm wide. Subhymenial hyphae 3–5 μm wide. Basidia (40–)50–65 × 7–10(–11) μm. Spores hyaline to pale yellow, irregular to lobed, echinulate to aculeate, 7.5–11 μm in diam.
Distr.: N. Am. Ref.: 211, 219.
T. pirolae (Ellis & Halsted) M.J. Larsen 1968

11a. Cystidia acuminate. 12
11b. Cystidia clavate to capitate, rarely cylindrical. 13

12a. Hymenial surface ferrugineous brown to reddish orange, even. Cystidia (paraphysoid hyphae) hyaline, 2.5–3.5(–4) μm wide, projecting 5–10 μm. Spored globose to subglobose, 7–11 × 7–9 μm or 7–11(–12) μm in diam. *T. bryophila*, see under 98a.

12b. Hymenial surface granulose to pulverulent, rarely smooth, dull green to olive brown. Cystidia up to 85 × 4–9 μm, hyaline to pale tan, projecting up to 40 μm. Spores pale brown, irregular to lobed, echinulate to aculeate, 6–8.5 μm in diam.
Basidiocarp adherent. Margin and subiculum concolourous or paler than hymenium. Subicular hyphae pale brown, thick-walled, 2.5–3.5 μm wide. Subhymenial hyphae 3.5–5(–6) μm wide. Basidia 30–45 × 6–8 μm.
Distr.: Eur., N. Am. Ref.: 211, 219.
T. galzinii Bourd. 1924

13a. Hymenial surface even to punctate or granulose, greyish green to olive brown. Cystidia hyaline, clavate to capitulate, 2–5 μm wide at the base, up to 7 μm wide at the apex, 50–90 μm long, often thick-walled at the base.

Basidiocarp floccose, adherent. Subiculum concolourous with hymenium, margin paler to whitish. Subicular hyphae hyaline to yellowish or olive-brown, 2–4 μm wide. Subhymenial hyphae 2.5–5 (–6) μm wide. Basidia 35–45(–50) × 5–7 μm. Spores yellowish brown to hazel, irregular to lobed, rarely subglobose, echinulate, 6–8(–9) × 6–7(–8) μm.

Distr.: whole area. Ref.: 211, 219, 390.

T. viridula (Bourd. & Galz.) Svrček 1958

13b. Hymenial surface without greenish tints. Cystidia thin-walled over the whole length. 14

14a. Cystidia up to 60 μm long, widest at the base, apex up to 4.5 μm wide, often finely encrusted. *T. subtestacea,* see under 8a.

14b. Cystidia up to 100(–160) μm long, widest at the apex (5–10(–12) μm). 15

15a. Spores subhyaline to pale brown, globose to broadly ellipsoid, rarely slightly irregular, echinulate, 6.5–7.5(–8.5) μm in diam. or 6–9 × 6–7 μm.

Basidiocarp arachnoid to tomentose, adherent. Hymenial surface even to granulose or discontinuous, buff to wood brown or greyish brown. Margin and subiculum paler. Subicular hyphae subhyaline or pale yellowish brown, thin- or rarely thick-walled, 3–5(–5.5) μm wide. Subhymenial hyphae 4–5(–8) μm wide. Cystidia originating in subiculum or subhymenium, clavate, up to 160 μm long, 2.5–5 μm wide at the base and 6–12 μm at the apex, projecting up to 80 μm. Basidia 25–35 × 6–8.5(–9.5) μm.

Distr.: Eur., N. Am. Ref.: 211, 219, 376, 390.

T. subclavigera Litsch. 1933

15b. Spores yellowish brown, irregular to lobed, usually elongated along one axis, echinulate, 7.5–8(–9) μm in diam.

Basidiocarp adherent. Hymenial surface even, dull pinkish buff to dull brown; margin paler. Subiculum concolourous or darker. Subicular hyphae hyaline to pale yellow, thin-walled, 2.5–4 μm wide. Subhymenial hyphae 3–5 μm wide. Cystidia originating in subhymenium, narrowly clavate to capitate, up to 100 μm long, 3–5 μm wide at the base and 5–10 μm at the apex, sometimes finely encrusted. Basidia 45–55 × 8–9 μm.

Distr.: Eur., N. Am. Ref.: 219, 376.

T. clavigera Litsch. apud Svrček 1960

16a. Hyphal strands present. 17

16b. Hyphal strands absent. 73

17a. Spores 4–6 μm in diam., ± globose, usually warted. 18
17b. Spores at least on average more than 6 μm in diam. 25

18a. Hyphal system dimitic. Skeletal hyphae 1–2 μm wide. 19
18b. Hyphal system monomitic. All hyphae at least 2 μm wide. 21

19a. Spores globose, warted to echinulate, pale yellowish brown, 4–6 μm in diam. Hymenial surface even to minutely granulose.
Basidiocarp arachnoid to byssoid, separable. Hymenial surface ferrugineous brown to ochraceous brown; margin concolourous or darker, subiculum darker. Hyphal strands up to 80 μm wide, consisting of generative hyphae and sometimes also skeletal hyphae. Skeletal hyphae pale yellow to citrine, 1–2 μm wide. Subicular hyphae yellowish brown, thin- to somewhat thick-walled, 2–4 μm wide. Subhymenial hyphae 2–3 μm wide. Basidia 25–40 × 5–7 μm.
Distr.: N. Am. Ref.: 219.
T. brunneorufa M.J. Larsen 1974
19b. Spores warted, pale brown to umbre. Hymenial surface granulose to distinctly toothed. 20

20a. Spores globose to subglobose, (4–)5–6 μm in diam. or 5–6 × 4–5 μm. Basidia 30–40 × (5–)6–7(–8) μm, sterigmata up to 6 μm long.
Basidiocarp byssoid, separable. Hymenial surface granulose to toothed (teeth up to 2 mm long), dull ferrugineous brown; margin paler. Subiculum dark ferrugineous brown. Hyphal strands up to 40 μm wide, consisting of generative hyphae, 2–3.5 μm wide. Skeletal hyphae yellow to citrine, 1–2 μm wide. Subicular hyphae 2–5 μm wide, subhyaline to yellowish brown, thin- to thick-walled, often encrusted, sometimes spinulose. Subhymenial hyphae 2–3.5 μm wide.
Distr.: whole area. Ref.: 211, 219.
T. calcicola (Bourd. & Galz.) M.J. Larsen 1967
20b. Spores globose, 3–3.5(–4) μm in diam. Basidia (15–)20–25 × 4–5(–6) μm, sterigmata up to 4 μm long.
Basidiocarp tomentose to byssoid, separable. Hymenial surface granular to toothed (teeth up to 1 mm long), ferrugineous brown; margin concolourous or paler. Subiculum concolourous. Hyphal strands up to 20 μm wide, consisting of skeletal and/or generative hyphae 1–3.5 μm wide. Skeletal hyphae yellow to citrine, 1–2 μm wide. Subicular hyphae 2.5–5 μm wide, yellowish to brown, thin- to thick-walled, often encrusted. Subhymenial hyphae 2–2.5(–3) μm wide.
Distr.: N. Am. Ref.: 219.
T. duemmeri (Wakef.) M.J. Larsen 1974
Syn.: *Tomentella subcalcicola* M.J. Larsen 1967

21a. Hymenial surface smooth to warted or toothed, dull green to yellowish green to olivaceous. Spores usually purple in KOH.

Basidiocarp arachnoid to tomentose, separable. Margin paler than hymenial surface, fibrillose. Subiculum paler. Hyphal strands up to 30 μm wide, individual hyphae 2–3 μm wide. Subicular hyphae hyaline to citrine, thin- to somewhat thick-walled, 2.5–4.5(–6) μm wide. Subhymenial hyphae 2.5–4.5 μm wide. Basidia 20–35 × 5–7 μm. Spores globose to subglobose, pale citrine to yellow, warted, 4.5–6 μm in diam.

Distr.: whole area. Ref.: 211, 219.

T. chlorina (Massee) G.H. Cunn. 1953

Syn.: *Hydnum viride* Alb. & Schw. ex Fr. 1821, non *Tomentella viridis* (Berk.) G.H. Cunn. 1963: *Thelephora viridis* Berk. apud Hooker 1860 non ~ Preuss 1851.

21b. Hymenial surface smooth to granulose or papillose, never with green tinges. Spores not purple in KOH. 22

22a. Subiculum much paler than hymenial surface, pale tan to whitish. Hymenial surface grey or buff to drab brown. 23

22b. Subiculum concolourous or darker than hymenial surface, dark brown or greyish blue. Hymenial surface brownish or dull grey blue. 24

23a. Some subhymenial hyphae intricately branched, often associated with vesicle-like structures. Hymenial surface granulose, buff brown to drab brown.

Basidiocarp byssoid to arachnoid, separable. Subiculum and margin pale tan to whitish. Hyphal strands up to 30 μm wide, individual hyphae 2–3.5 μm wide. Subicular hyphae hyaline to pale tan, thin-walled or rarely with thickened walls and then swelling in 10% KOH. Subhymenial hyphae 3–4 μm wide. Basidia 25–35 × 6–7 μm. Spores hazel to dull brown, irregular, elongated along one axis, warted to echinulate, 5–6.5 μm in diam.

Distr.: Eur., N. Am. Ref.: 219.

T. subcinerascens Litsch. 1939

23b. No intricately branched subhymenial hyphae. Hymenial surface papillose or warted, rarely smooth, grey to dull buff.

Basidiocarp arachnoid, tomentose or submembranaceous, separable. Subiculum and margin whitish. Hyphal strands up to 90 μm wide, individual hyphae 1.5–3 μm wide. Subicular hyphae hyaline to pale brown, thin- or slightly thick-walled, 2.5–4(–5) μm wide. Subhymenial hyphae 2.5–4 μm wide, sometimes green in KOH. Basidia 30–45 × 4–7(–8) μm. Spores hazel to dull brown, globose to subglobose, sometimes irregular, warted to echinulate, 5–6 μm in diam. or 5–6 × 5 μm.

Distr.: whole area. Ref.: 211, 219, 376.

T. cinerascens (P. Karst.) Höhn. & Litsch. 1906

Syn.: *Hypochnus capnoides* Bres. 1896; *Tomentella asterigma* R. Maire 1906; *T. subcervina* Litsch. 1933

24a. Hymenial surface even to minutely granulose. Basidia 35–45(–50) × 7.5–9.5 μm, often greenish in KOH.

Basidiocarp arachnoid, tomentose or submembranaceous, separable. Hymenial surface grey, greyish brown or blackish brown, some places with bluish or violaceous tints; margin paler, byssoid. Subiculum concolourous or darker. Hyphal strands up to 80 μm wide, individual hyphae 2.5–4.5 μm wide. Subicular hyphae yellowish to dull brown, thin- to thick-walled, 2.5–4.5(–7) μm wide, often with spinulose incrustations. Subhymenial hyphae 2.5–4 μm wide, sometimes encrusted. Hyphae sometimes purplish in KOH. Spores irregularly globose to lobed, brown, echinulate, 5.5–7.5(–8) μm in diam.

Distr.: Eur., N. Am. Ref.: 219.

T. griseoviolacea Litsch. 1939

24b. Hymenial surface granulose to warted, rarely even. Basidia 20–35 × 5.5–7.5 μm.

Basidiocarp arachnoid or floccose to submembranaceous. Hymenial surface dark brown to dull greyish blue. Subiculum concolourous, margin concolourous or paler. Hyphal strands sometimes rare, up to 35 μm wide, individual hyphae 2–4.5 μm wide. Subicular hyphae dull brown, thick-walled, 2–5(–6.5) μm wide, encrusted and often spinulose. Subhymenial hyphae 3–4.5 μm wide, sometimes encrusted, sometimes with bluish or greenish diffusate in KOH. Spores globose to subglobose, rarely irregular, warted to echinulate, rarely aculeate, 5–6.5(–7.5) μm in diam.

Distr.: whole area. Ref.: 212, 219.

T. neobourdotii M.J. Larsen 1968

25a. Hyphal system dimitic. Skeletal hyphae 1–2.5(–3) μm wide. 26

25b. Hyphal system monomitic. 30

26a. Spores 7–10 μm in diam. 27

26b. Spores 5–8 μm in diam. 28

27a. Spores irregularly globose to irregular, warted to more rarely echinulate, warts often bifurcate, 7–10 μm in diam. Hymenial surface ferrugineous to dull brown, hydnoid when well developed.

Basidiocarp tomentose to membranaceous. Subiculum concolourous, margin concolourous or paler than hymenial surface. Hyphal strands up to 25 μm wide, consisting of skeletal and/or generative hyphae, 1–3 μm wide. Skeletal hyphae 1–2.5 μm wide. Subicular hyphae yellowish to pale brown, thick-walled, 2.5–4.5 μm wide. Subhymenial hyphae 2.5–4 μm wide. Basidia 40–65 × 7–9 μm.

Distr.: whole area. Ref.: 211, 219, 376.

T. crinalis (Fr.) M.J. Larsen 1967

Syn.: *Hydnum ferruginosum* Pers. ex Fr. 1821

27b. Spores irregular, globose to subglobose, aculeate or sometimes echinulate, 8–9(–9.5) μm in diam. Hymenial surface even, dark brown to umber.

Basidiocarp submembranaceous. Subiculum chocolate brown. Hyphal strands rare, up to 35 μm wide, individual hyphae encrusted, 1.5–3 μm wide. Subicular hyphae 1.5–4.5(–5) μm wide, brownish, often encrusted and spinulose. Subhymenial hyphae 5–6.5 μm wide. Basidia 35–50 × 8.5–11(–12) μm.

Distr.: Eur., N. Am. Ref.: 214, 219.

T. brevispina (Bourd. & Galz.) M.J. Larsen 1970

28a. Hymenial surface green, olive to olivaceous black or dull brown. Subicular hyphae smooth. Spores pale brown.

Basidiocarp arachnoid to submembranaceous. Hymenial surface even to warted. Subiculum yellowish brown to ferrugineous, margin paler or concolourous. Hyphal strands up to 90 μm wide, consisting of skeletal or generative hyphae, 2–3 μm wide. Skeletal hyphae 2–2.5(–3) μm wide. Subicular hyphae yellowish to pale brown, 3–6(–7) μm wide, with thickened to thick walls. Subhymenial hyphae 2–3.5(–4) μm wide. Basidia 30–45 × 6–8 μm, often greenish in KOH. Spores lobed to irregular, echinulate, (6–)7–8 μm in diam.

Distr.: whole area. Ref.: 211, 319, 376.

T. ferruginea (Pers. ex Pers.) Pat. 1887

Syn.: *Grandinia coriaria* Peck 1873; *G. rudis* Peck 1878; *Tomentella suberis* Pat. 1897; *Hypochnus fulvocinctus* Bres. 1897.

28b. Hymenial surface reddish brown, chestnut brown, dark brown or greyish blue. Subicular hyphae often encrusted and spinulose. Spores pale brown to umbrinous. 29

29a. Hymenial surface granulose to warted, reddish brown to chestnut brown. Subicular hyphae up to 3(–3.5) μm wide. Basidia 30– 40(–50) × 6–7(–8) μm, not greenish in KOH.

Basidiocarp arachnoid to submembranaceous. Subiculum yellowish brown, margin concolourous. Hyphal strands up to 20 μm wide, consisting of skeletal or generative hyphae, 1.5–3.5 μm wide. Skeletal hyphae 1.5–2.5 μm wide. Subicular hyphae yellowish brown, thin- to thick-walled, 2.5–3(–3.5) μm wide, often encrusted and spinulose. Subhymenial hyphae 3–4(–5) μm wide. Spores irregular, rarely globose, subglobose or lobed, echinulate, 6–8 μm in diam.

Distr.: Eur., N. Am. Ref.: 211, 219.

T. umbrinospora M.J. Larsen 1968

29b. Hymenial surface granulose to warted, dark brown to dull greyish blue. Subicular hyphae up to 5(–6) μm wide. Basidia 20–35 × 5.5–7.5 μm, sometimes bluish or greenish in KOH. *T. neobourdotii* see 24b.

30a. Subiculum distinctly paler than hymenial surface. 31
30b. Subiculum concolourous or darker than hymenial surface. 49

31a. Subicular hyphae thin-walled or walls only minutely thickened (individual hyphae of hyphal strands may be thick-walled). 32
31b. At least some subicular hyphae with distinctly thickened walls. 35

32a. Some subicular hyphae ampullate, constricted at the septa, often irregular and swollen. Hymenial surface even. Sometimes irregular and contorted hyphae present in hymenium. Margin sometimes distinctly yellow. 33
32b. Subicular hyphae regular, not constricted at the septa. Hymenial surface granulose-warted. Hymenium without contorted hyphae. Margin whitish, pale yellow or pale brown. 34

33a. Hymenial surface even, brown vinaceous to purplish brown to dark brown, rarely avellaneous to buff. Margin distinct, fimbriate, pale to sulphur yellow. Basidia 30–40 × 7–9 μm, often greenish in KOH. Spores globose to irregularly subglobose, 7–8.5(–9) μm in diam., warted to echinulate.

Basidiocarp submembranaceous to membranaceous. Subiculum pale yellow or sulphureous to tan. Hyphal strands up to 80 μm wide, individual hyphae 2–4 μm wide. Subicular hyphae pale brown to yellowish, walls slightly or sometimes distinctly thickened, (2.5–) 3–5(–7) μm wide, often ampullate and swollen. Subhymenial hyphae 3.5–6(–7) μm wide.

Distr.: whole area. Ref.: 211, 219, 376.

T. ellisii (Sacc.) comb.nov.

Bas. *Zygodesmus ellisii* Sacc. in Syll. Fungi 4:808. 1886

Syn.: *Zygodesmus ochraceus* Sacc. 1882, non ~ Corda 1837; *Z. nigrescens* P. Karst. 1889; *Hypochnus microsporus* P. Karst. 1896; *H. sparsus* Burt 1916; *Tomentella porphyrea* Petch 1924; *T. bilthoveniensis* Bourd. apud Donk 1933; *T. livida* Litsch. 1932; *T. hydrophila* (Bourd. & Galz.) Litsch. 1939; *T. luteo-marginata* M.P. Christ. 1960.

33b. Hymenial surface even, avellaneous to pale brown. Margin indistinct, probably paler. Basidia 35–50 × 7–10 μm, not greenish in KOH. Spores globose to subglobose to irregular, warted to echinulate, 8–10(–11) μm in diam.

Basidiocarp encrusting, submembranaceous. Subiculum pale brown. Hyphal strands rare, up to 30 μm wide, individual hyphae 2–3.5 μm wide. Subicular hyphae pale brown, thin-walled, often swollen and constricted at the septa, without clamps, 2.5–4.3(–5) μm wide. Subhymenial hyphae 2.5–4 μm wide, some irregular and contorted and protruding in hymenium.

Distr.: Eur. Ref.: 219.

T. mairei Bourd. 1918

34a. Spores irregular to lobed, 5–8(–8.5) μm in diam., warted to echinulate. Hymenial surface granulose to warted, buff to pale ochraceous brown.

Basidiocarp tomentose to membranaceous. Subiculum and margin paler than hymenial surface. Hyphal strands rare, individual hyphae 2.5–3.5 μm wide. Subicular hyphae pale brown, 2.5–3.5(–4.5) μm wide. Subhymenial hyphae 3–3.5(–4) μm wide. Basidia 35–50 × 6–9(–9.5) μm, sometimes with reddish contents.

Distr.: Eur. Ref.: 219, 390.

T. puberula Bourd. & Galz. 1924

34b. Spores globose to subglobose, 7–10(–10.5) μm in diam., warted to echinulate. Hymenial surface brownish olive to cinnamon drab, granulose to warted.

Basidiocarp floccose to tomentose to membranaceous. Subiculum and margin paler, often whitish or pale yellow. Hyphal strands up to 80 μm wide, individual hyphae 2.5–3.5 μm wide, rarely 6–8 μm and tortuous. Subicular hyphae nearly hyaline, 2.5–3.5 μm wide. Subhymenial hyphae 2.5–4 μm wide. Basidia 40–55(–65) × 8–10 (–12) μm.

Distr.: Eur., N. Am. Ref.: 215, 219.

T. asperula (Karst.) Höhn. & Litsch. 1906

Syn.: *Tomentella gibbosa* Litsch. 1933; *T. griseocinnamomea* Wakef. 1966

35a. At least part of the spores lobed. 36

35b. Spores regular to irregular, but not lobed. 42

36a. Hymenial surface bluish black, brownish black or fuscous purple. 37

36b. Hymenial surface with brighter colours. 38

37a. Spores brown, echinulate to aculeate, lobed to irregular, (5–)6–7(–8.5) μm in diam. Basidia 35–50(–70) × 7–8(–9) μm, with bluish or greenish diffusate in KOH.

Basidiocarp arachnoid to tomentose to submembranaceous. Hymenial surface granulose to warted, bluish black to brownish black, sometimes with olivaceous tinges; margin and subiculum paler, brownish. Hyphal strands up to 40 μm wide, individual hyphae 2–4 μm wide. Subicular hyphae yellowish to dark brown, with thickened walls, 3–5.5(–7) μm wide, often encrusted or slightly spinulose. Subhymenial hyphae 2–4.5 μm wide, bluish or greenish in KOH.

Distr.: Eur., N. Am. Ref.: 211, 219.

T. botryoides (Schw.) Bourd. & Galz. 1924

37b. Spores umber, echinulate to aculeate, 7–10 × 5–7(–8) μm. Basidia 30–75 × 7–11 μm, colourless in KOH.

Basidiocarp floccose-membranaceous. Hymenial surface even to rugulose, fuscous purple. Subiculum and margin paler. Hyphal strands present. Hyphae 3–7.5(–15) μm wide, often with thickened walls, no reaction with KOH.

Distr.: whole area. Ref.: 75.
Thelephora penicillata Fr. 1821

38a. Subhymenial hyphae hyaline to pale yellowish, 5–9 μm wide, often inflated at the septa. In hymenium numerous articulate, clavate, yellowish to brownish cells, 8–10 μm in diam.

Basidiocarp submembranaceous. Hymenial surface even, yellowish-brown to castaneous. Subiculum paler, margin yellowish to white. Subicular hyphae yellowish brown, thin- to somewhat thick-walled, 4–7 μm wide. Basidia 50–60 × 8–10 μm. Hyphal strands present, distinct. Spores brown, irregular to lobed, warted to echinulate, 7–9 × 5.5–8 μm.

Distr.: Eur. Ref.: 376.
T. litschaueri Svrček 1958

Note: Larsen (211) described the spores as globose to subglobose, yellowish brown, 9–12 × 6–7 μm and the subicular hyphae as pale tan. He compared it with *T. brunneofirma*.

38b. Subhymenial hyphae 2.5–5 μm wide, not inflated. Hymenium composed of basidia only. 39

39a. Hymenial surface vinaceous brown to cinnamon brown. Basidiocarp normally adherent. 40

39b. Hymenial surface dull reddish purple to ferrugineous, olive or greenish. Basidiocarp normally separable. 41

40a. Subhymenial hyphae 2.5–4 μm wide, with red granular material in water, ochraceous to brownish in KOH. Vesicles hyaline, thin- to thick-walled, 12–20 μm in diam., rare in subiculum and subhymenium. Basidia 40–50 (–80) × 5–7 μm.

Basidiocarp hypochnoid to submembranaceous. Hymenial surface even to granulose, vinaceous brown. Subiculum and margin paler. Hyphal strands up to 15 μm wide, rare; individual hyphae 2–3 μm wide. Subicular hyphae 2–6(–7) μm wide, with thickened walls, sometimes torulose. Spores pale brown, irregular to lobed, echinulate, (5.5–)6–8(–9.5) μm in diam.

Distr.: N. Am. Ref.: 211, 219.
T. subvinosa (Burt) Bourd. & Galz. 1924

40b. Subhymenial hyphae 3.5–4 μm wide, hyaline. Vesicles absent. Basidia 30–45 × 8–11 μm.

Basidiocarp submembranaceous. Hymenial surface even, vinaceous brown to dull cinnamon brown. Subiculum and fibrillose margin paler. Hyphal strands up to 25 μm wide, individual hyphae 2.5–4.5 μm. Subicular hyphae 3–7 μm wide, the widest without clamps. Spores pale brown, irregular to lobed, aculeolate to echinulate, 7.5–9(–10) μm in diam.

Distr.; Eur., USSR. Ref.: 219.
T. radiosa (P. Karst.) Rick 1934

41a. Hymenial surface granulose to warted, dull reddish purple. Basidia 35–40(–70) × 6–8 μm, in water often with red granular contents, ochraceous to brownish in KOH.

Basidiocarp arachnoid to submembranaceous. Subiculum and fibrillose margin dull honey yellow. Hyphal strands up to 50 μm wide; individual hyphae 3–6 μm wide. Subicular hyphae hyaline to brown, thin- to thick-walled, 3–6.5(–7.5) μm wide, often greyish green in KOH (fading rapidly). Subhymenial hyphae 3.5–5 μm wide. Spores lobed to irregular, sometimes subglobose, echinulate, 6–8(–9) μm in diam., somewhat reddish in water, hyaline to pale tan in KOH.

Distr.: N. Am. Ref.: 219.

T. atrorubra (Peck) Bourd. & Galz. 1924

41b. Hymenial surface granulose to warted, yellowish ferrugineous to dark ferruginous, sometimes olivaceous to greenish. Basidia 35–60 × (6–) 7–9(–10) μm, often with adhering granular material becoming green in KOH.

Basidiocarp arachnoid to tomentose to submembranaceous. Subiculum and margin yellowish brown. Hyphal strands up to 70 μm wide, individual hyphae 2–3.5 μm wide. Subicular hyphae brown, somewhat thick-walled, 2–5.5 μm wide, sometimes encrusted to spinulose. Subhymenial hyphae 3–4 μm wide. Spores yellowish, irregular to lobed, echinulate to aculeate, (6–)6.5–8.5(–9) μm in diam.

Distr.: whole area. Ref.: 211, 219.

T. rubiginosa (Bres.) R. Maire 1906

Syn.: *Hypochnus atrovirens* Bres. 1897; *Tomentella subrubiginosa* Litsch. 1939

42a. Hymenial surface even, dark brown to bistre. 43

42b. Hymenial surface even to warted, paler. 45

43a. Spores brown to bistre, irregular to irregularly globose, echinulate, 8–12 × 7.5–9 μm or 8–11(–11.5) μm in diam. Margin fimbriate, whitish.

Basidiocarp spongy-fibrous to membranaceous, encrusting. Hymenial surface medium to dull brown, bistre drab or blackish. Subiculum paler. Hyphal strands up to 30 μm wide, individual hyphae 2–4.5 μm wide. Subicular hyphae yellowish brown, with thickened walls, 4–5.5(–6) μm wide. Subhymenial hyphae 3–5 μm wide. Basidia 55–65(–70) × 9–11(–12)|μm.

Distr.: Eur. Ref.: 219.

T. schmoranzeri (Bres.) M.J. Larsen 1974

Note: Some resupinate species of *Thelephora* also key out here, viz. *T. atra* Weinm. 1836 and *T. spiculosa* Fr. 1838. The differences between these species and *T. schmoranzeri* are faint their independency is uncertain.

43b. Spores pale tan to medium brown, warted to echinulate, up to 8.5(–9) μm in diam. Margin yellowish or brownish. 44

44a. Basidia 60–90 × 9–14 μm, the basal part often swollen, up to 20 μm in diam. Hymenial surface even, dark brown to bistre, often with vinaceous tinge; subiculum and margin somewhat paler. Hyphal strands dark brown.

Basidiocarp submembranaceous, adnate. Hyphal strands up to 50 μm wide, individual hyphae 2–4.5 μm wide. Subicular hyphae yellowish brown, 2.5–4(–5) μm wide, with thickened walls. Subhymenial hyphae 3–5 μm wide. Spores pale tan to yellowish brown, irregularly globose to subglobose, warted to echinulate, 6–7(–8.5) μm in diam.

Distr.: whole area. Ref.: 211, 219.

T. terrestris (Berk. & Br.) M.J. Larsen 1974

Syn.: *Tomentella umbrinella* Bourd. & Galz. 1924; *T. badiofusca* Bourd. & Galz. 1924

44b. Basidia 30–40 × 7–9 μm. Hymenial surface brown vinaceous to dull purplish brown or much paler. Subiculum pale tan, yellowish or hyaline. Margin yellow. Hyphal strands hyaline to pale tan. *T. ellisii*, see 33a.

45a. Hymenial surface ferrugineous, olivaceous or greenish. 46

45b. Hymenial surface tan, buff to dull brown or purplish. 47

46a. Basidiocarp adnate. Hymenial surface even to granulose, yellowish ferrugineous to ferrugineous. Basidia 40–60 × 8–11 μm, hyaline in KOH. Spores regular, globose to subglobose, echinulate to aculeate, 6–8.5 μm in diam.

Subiculum and margin paler than hymenial surface. Hyphal strands to 30 μm wide, individual hyphae 2–4 μm wide. Subicular hyphae brownish, with thickened walls, 2–4(–5) μm wide. Subhymenial hyphae 2–4 μm wide.

Distr.: Eur., N. Am. Ref.: 211, 219.

T. ferruginella (Bourd. & Galz.) Svrček 1958

46b. Basidiocarp usually separable. Hymenial surface granulose to warted, yellowish ferrugineous to dark ferrugineous, sometimes olivaceous or greenish. Basidia 35–60 × (6–)7–9(–10) μm, often with adhering granular material becoming green in KOH. Spores irregular to lobed, echinulate to aculeate, (6–)6.5–8.5(–9) μm in diam., *T. rubiginosa*, see 41b.

47a. Basidia 30–40 × 7–9 μm. Spores aculeolate to echinulate, 7–8.5(–9) μm in diam. Margin pale to sulphur yellow. *T. ellisii*, see 33a.

47b. Basidia at least in average broader. Spores echinulate to aculeate, 7–10(–11.5) μm in diam. Margin not distinctly yellow. 48

48a. Hymenial surface medium to dull brown, bistre drab, blackish, even.

Spores dull brown to bistre, irregular to irregularly globose, echinulate, 8–11(–11.5) μm in diam. or 8–12 × 7.5–9 μm. See *T. schmoranzeri* under 43a.

48b. Hymenial surface pale tan to buff to yellowish brown, even. Spores pale tan to medium brown, subglobose to irregular, echinulate to aculeate, 7–10(–11) μm in diam.

Basidiocarp submembranaceous. Subiculum and margin paler or concolourous with hymenial surface. Hyphal strands up to 40 μm wide, individual hyphae 2.5–4.5 μm wide. Subicular hyphae pale tan to pale brown, with thickened walls, 2.5–6.5 μm wide. Subhymenial hyphae 4–5.5 μm wide. Basidia 40–60 × 7–13(–14) μm.

Distr.: Eur., USSR. Ref.: 219, 376.

T. rhodophaea Höhn. & Litsch. 1907

Syn.: *?T. testaceogilva* Bourd. & Galz. 1924

49a. Hymenial surface pale buff, avellaneous, wood brown, cream-coloured, yellowish or pale green. 50

49b. Hymenial surface darker, brown, greyish, purplish or dark green. 58

50a. Hymenial surface even to colliculose, pale yellow, some parts pale bluish green; margin fibrillose, darker, pale yellowish brown to reddish brown. Spores irregular to lobed, echinulate, 6–7 μm in diam.

Basidiocarp membranaceous, separable. Subiculum yellowish brown. Hyphal strands up to 25 μm wide, individual hyphae 2.5–3.5 μm wide. Subicular hyphae 3–4 μm wide, with thin to thickened walls, often with greyish green encrusting material. Subhymenial hyphae 3–5 μm wide. Basidia 35–45 × 5–7 μm, sometimes pale green in KOH.

Distr.: N. Am. Ref.: 211, 219.

T. bicolor (Atk. & Burt) Bourd. & Galz. 1924

50b. Hymenial surface without bluish green parts. Margin concolourous or paler. Spores at least larger than 7 μm on average. 51

51a. At least some of the spores lobed. 52

51b. Spores never lobed. 55

52a. Spores irregularly globose, irregular, more rarely lobed, warted to echinulate, 5–8(–8.5) μm in diam, not elongated along one axis. Hymenial surface granulose to warted. *T. puberula*, see 34a.

52b. Spores usually elongated along one axis, larger on average. Hymenial surface usually even. 53

53a. Spores warted, irregular to lobed, pale to medium brown or pale purplish, 7–8.5(–9) μm in diam. Hyphae sometimes ampullate or swollen or torulose.

Basidiocarp submembranaceous. Hymenial surface lilac or purplish brown when fresh, paler to dull buff when dry. Subiculum darker.

Margin paler to whitish. Hyphal strands up to 50 μm wide, individual hyphae 3–4(–5) μm wide. Subicular hyphae brown, thick-walled, 3–6(–7) μm wide. Subhymenial hyphae 3–4(–6) μm wide. Basidia 30–45(–55) × 7–10(–11) μm.

Distr.: N. Am. Ref.: 219, 388.

T. purpurea Wakef. 1966

53b. Spores echinulate to aculeate, 8–11 μm in diam. Hyphae regular. 54

54a. Spores irregular to lobed, pale yellow, echinulate to usually aculeate, 8–11 μm in diam. Basidia 35–45 × 7–9 μm.

Basidiocarp tomentose to membranaceous, adnate. Hymenial surface even, pale buff to wood brown. Subiculum darker, margin concolourous. Hyphal strands up to 20 μm wide, individual hyphae 2–3.5 μm wide. Subicular hyphae yellowish brown, with thickened walls, 2–4(–6) μm wide. Subhymenial hyphae 3–5 μm wide.

Distr.: N. Am. Ref.: 219.

T. kentuckiensis M.J. Larsen 1974

54b. Spores irregularly subglobose to lobed, yellowish brown, echinulate, 8–10 μm in diam. or 8–10 × 5–7 μm. Basidia 50–70 × 8–14 μm.

Basidiocarp densely tomentose, adnate or separable. Hymenial surface buff, avellaneous or wood brown, even. Subiculum darker, margin paler. Hyphal strands up to 75 μm wide, individual hyphae 3–3.5 μm wide. Subicular hyphae pale yellowish brown, with thickened walls, 3.5–6(–7) μm wide. Subhymenial hyphae 3.5–5(–6) μm.

Distr.: Eur., N. Am. Ref.: 211, 219, 390.

T. avellanea (Burt) Bourd. & Galz. 1924

Syn.: *Tomentella corticioides* Wakef. 1960

55a. Spores not elongated along one taxis, 6.5–9.5 μm in diam. 56

55b. Spores usually elongated along one axis, 7–10(–11) μm in diam. 57

56a. Basidia 35–50 × 6–9(–9.5) μm. Spores warted to echinulate, 5–8(–8.5) μm across. Hymenial surface granulose to warted. *T. puberula,* see 34a.

56b. Basidia 35–45(–55) × 9–12 μm. Spores echinulate, 7–9.5 μm in diam., globose to irregularly globose, rarely subglobose. Hymenial surface even, pale yellowish brown.

Basidiocarp adnate. Subiculum concolourous or darker than hymenial surface, margin indeterminable. Hyphal strands up to 30 μm wide, individual hyphae 2.5–3.5 μm wide. Subicular hyphae pale yellowish brown, sometimes thick-walled, 2–3.5(–4.5) μm wide. Subhymenial hyphae 3–5.5 μm wide.

Distr.: Eur. Ref.: 219.

T. fragilis (Bourd. & Galz.) M.J. Larsen 1974

57a. Some hyphae slightly swollen, ampullate at the septa. Irregular and contorted hyphae present in hymenium and subhymenium. *T. mairei*, see 33b.

57b. All hyphae regular. Hymenium only consisting of basidia. *T. rhodophaea*, see 48b.

58a. At least some subicular hyphae encrusted, often spinulose. 59
58b. Subicular hyphae never encrusted or spinulose. 64

59a. Subicular hyphae 2–5(–6.5) μm wide. 60
59b. Subicular hyphae 4–7(–10) μm wide. 61

60a. Spores 8–9(–9.5) μm across, warted, rarely echinulate. *T. brevispina*, see 27b.
60b. Spores 5.5–7.5(–8) μm across, warted to echinulate. 24

61a. Spores irregularly globose to subglobose or irregular, brownish to pale tan, warted to echinulate, ornamentation often bifurcate, 7–8(–10) μm in diam. Hyphal strands abundant, up to 80 μm wide, individual hyphae 2.5–4.5 μm wide.

Basidiocarp hypochnoid to tomentose, separable. Hymenial surface even, rarely warted, sepia or medium to dark brown. Subiculum and margin concolourous or slightly darker. Subicular hyphae pale to dark brown, often thick-walled, 4–7 μm wide, often encrusted with granular material. Subhymenial hyphae 3–4(–6) μm wide. Basidia 40–55 × 6.5–8 μm.

Distr.: Eur. Ref.: 211, 219.

T. italica (Sacc.) M.J. Larsen 1967

61b. Spores aculeate, rarely echinulate, ornamentation never bifurcate. Hyphal strands rare. 62

62a. Some subhymenial hyphae, basidia and spores green to bluish green in KOH due to the reaction of adhering material. Subicular hyphae only rarely encrusted, never spinulose.

Basidiocarp hypochnoid to byssoid. Hymenial surface even, rarely warted, fuligineous to fuscous. Subiculum darker, margin concolourous. Hyphal strands rare, up to 30 μm wide. Subicular hyphae pale to dark brown, often thick-walled, (3.5–)4–7(–10) μm wide. Subhymenial hyphae 4–6(–8) μm wide. Basidia 27–50 × 7–10 μm. Spores tan to dark brown, globose, irregularly globose or subglobose, 7–8.5(–9) μm in diam, aculeate.

Distr.: whole area. Ref.: 211, 219, 388.

T. ramosissima (Berk. & Curt.) Wakef. 1960

Syn.: *Hypochnus fuligineus* Burt 1916

62b. No greenish reaction with KOH. Encrusted subicular hyphae usually numerous, often spinulose.

Basidiocarp tomentose to felty. Hymenial surface even, rarely warted, sepia, greyish brown or umbrinous. Subiculum darker, margin concolourous or darker. Hyphal strands rare, up to 30 μm wide, individual hyphae 3–6 μm wide. Subicular hyphae yellowish brown to golden brown, usually thick-walled, 5–8(–9) μm wide. Sub-

hymenial hyphae 3.5–5(–6) μm wide. Basidia 30–40 × 7–8.5 μm. Spores yellowish brown to brown, aculeate, more rarely echinulate, globose to subglobose, 6.5–8.5(–9) μm in diam.

Distr.: whole area. Ref.: 211, 219.

T. violaceofusca (Sacc.) M.J. Larsen 1974

Syn.: *Zygodesmus trachychaetes* Ellis & Everh. 1888; *Hypochnus spiniferus* Burt 1916; *Tomentella pseudofusca* Skovsted 1950.

Note: The independency of *T. neobourdotii, T. bryophila, T. ramosissima* and *T. violaceofusca*, especially that of the last three, is doubtful. The separating characters are intergrading. Christiansen (66), for example, described a *Tomentella spinifera* (Burt) M.P. Christ. with numerous densely encrusted hyphae and a greenish reaction with KOH.

63a. At least some of the spores distinctly lobed. 64

63b. Spores never lobed. 68

64a. Subhymenial hyphae 4–7(–12) μm wide. 65

64b. Subhymenial hyphae 2.5–4(–5) μm wide. 66

65a. Hymenium with articulate, clavate, yellowish to brownish cells, 8–10 μm in diam. Subhymenial hyphae often inflated at the septa. *T. litschaueri*, see 38a.

65b. No such cells in hymenium. Subhymenial hyphae regular, 3–6(–10) μm wide.

Basidiocarp membranaceous. Hymenial surface even, sometimes warted, isabelline to chocolate brown, sometimes with pinkish tinge. Subiculum concolourous or darker, margin paler to white. Hyphal strands present. Subicular hyphae yellowish to brown, often with thickened walls, 3–10(–12) μm wide. Basidia 40–90 × 8–12 μm. Spores yellowish brown to fuscous, irregular to lobed, warted to echinulate, 6.5–10 × 4–9 μm.

Distr.: whole area. Ref.: 66, 75.

Thelephora terrestris Ehr. ex Fr. 1821

66a. Some subhymenial hyphae in water with reddish granular contents, ochraceous in KOH. Spores echinulate. 67

66b. Subhymenial hyphae not reddish in water. Spores warted, irregular to lobed, pale to medium brown, 7–9 × 5.5–8 μm. *T. purpurea*, see 53a.

67a. Some subicular hyphae torulose, 3.5–6(–7) μm wide. Subiculum and subhymenium with rare vesicle, 12–20 μm in diam. *T. subvinosa*, see 40a.

67b. Subicular hyphae regular, 3–4(–4.5) μm wide. Vesicles absent.

Basidiocarp parchment-like, membranaceous, separable or adnate. Hymenial surface even to warted, sepia to dull brown, sometimes olivaceous or with pink tinges. Subiculum concolourous, margin concolourous or paler. Hyphal strands up to 35 μm wide, individual hyphae 1.5–3 μm wide. Subhymenial hyphae 2.5–4 μm wide. Basidia 30–45(–50) × 7–9(–10) μm. Spores irregular to lobed, echinulate, yellowish brown to brown, 6–8(–10) × 6–7(–8) μm.

Distr.: whole area. Ref.: 211, 219.

T. punicea (Alb. & Schw. ex Pers.) Schroet. apud Cohn 1889

Syn.: *Hydnum epiphyllum* Schw. 1832; *Hypochnus elaeodes* Bres. 1897; *Zygodesmus granulosus* Peck 1881; *Zygodesmus chlorochaetes*|Ellis 1881; *Tomentella liasicola* Bourd. & Galz. 1924.

68a. Subicular hyphae rarely exceeding 4.5 μm in width. 69

68b. Subicular hyphae wider than 4.5 μm on average. 70

69a. Spores warted to echinulate, 6–7(–8.5) μm in diam. Basidia 60–90 × 9–14(–20) μm. Subhymenial hyphae 3–5 μm wide. *T. terrestris*, see 44a.

69b. Spores aculeate, sometimes echinulate, 8–9(–9.5) μm across. Basidia 35–50 × 8.5–11(–12) μm. Subhymenial hyphae 5–6.5 μm wide. *T. brevispina*, see 27b.

70a. Basidia (6.5–)7–10 μm wide. Spores aculeate, more rarely echinulate; with bifurcate ornamentation if warted. Subicular hyphae often encrusted. 71

70b. Basidia narrower or wider. Spores warted to echinulate, ornamentation not bifurcate. Subicular hyphae smooth. 72

71a. Hymenial surface ferrugineous brown to reddish orange. *T. bryophila*, see 98a.

71b. Hymenial surface dull brown or sepia. 61

72a. Basidia 40–60 × 10–12 μm. Subhymenial hyphae 4–6 μm wide. Hymenial surface even, dark brown to umber.

Basidiocarp densely tomentose to submembranaceous. Subiculum darker, margin paler than hymenial surface. Hyphal strands up to 25 μm wide, individual hyphae 2.5–4 μm wide. Subicular hyphae brownish, sometimes swollen and irregular, 4–6(–7.5) μm, with thickened walls. Spores irregular to rarely globose, warted to echinulate, 7–9.5 μm in diam., brownish.

Distr.: Eur. Ref.: 214, 219.

T. albomarginata (Bourd. & Galz.) M.J. Larsen 1970

72b. Basidia 25–35 × 5–7 μm. Subhymenial hyphae 3–4 μm wide. Hymenial surface even to papillate, dull brown to dull greyish brown.

Basidiocarp tomentose to submembranaceous. Subiculum concolourous to darker, margin concolourous or paler than hymenial surface. Hyphal strands up to 30 μm wide, individual hyphae 3–4 μm wide. Subicular hyphae brown, regular, 4–6(–6.5) μm wide, with thickened walls. Spores globose to subglobose, warted to echinulate, 6–8(–9.5) μm in diam., dark brown.

Distr.: Eur., USSR. Ref.: 219.

T. pilatii Litsch. 1933

73a Spores globose to subglobose, 4–4.5 μm in diam. 74

73b. Spores larger. 76

74a. Basidia and subhymenial hyphae partly bluish black in KOH. Subicular hyphae with thin to slightly thickened walls, smooth, 2.5–4 μm wide.

Basidiocarp arachnoid to mealy-floccose. Hymenial surface even to warted, pinkish buff to brownish yellow or dark olive when dry. Subiculum and margin paler. Subhymenial hyphae 3–5 μm wide. Basidia 25–40 × 6–8 μm. Spores globose, subglobose or irregular, warted to echinulate, 4.5–6.5(–7.5) μm in diam.

Distr.: Eur., N. Am. Ref.: 215, 219.

T. molybdaea Bourd. & Galz. 1924

74b. Basidia and subhymenial hyphae hyaline to pale brown in KOH. Subicular hyphae with distinctly thickened walls. 75

75a. Basidia 12–15(–20) × 5–6 μm. Hymenial surface dull brown to brownish buff, even. Subicular hyphae brown to dull brown, with thickened walls, 2.5–4(–5) μm wide, smooth.

Basidiocarp tomentose to submembranaceous. Subiculum concolourous to darker than hymenial surface, margin darker to paler when old. Subhymenial hyphae 2–3(–4) μm wide. Spores globose to subglobose, brownish, warted to echinulate, 4–5 μm in diam.

Distr.: Eur., N. Am. Ref.: 219, 376.

T. griseo-umbrina Litsch. apud Lundell & Nannf. 1936

75b. Basidia 25–35 × 5–6 μm. Hymenial surface ferrugineous, even. Subicular hyphae pale yellowish brown, with thickened walls, 2–3.5(–4.5) μm wide, sometimes encrusted.

Basidiocarp tomentose to membranaceous. Subiculum paler to concolourous with hymenial surface, margin paler, arachnoid to farinaceous. Subhymenial hyphae 2–3.5 μm wide. Spores globose to subglobose, pale to medium brown, warted, 4.5–5.5 μm in diam.

Distr.: N. Am. Ref.: 219.

T. subalpina M.J. Larsen 1972

76a. Subhymenial hyphae and basidia often with red granular contents in water, becoming ochraceous in KOH. 77

76b. Subhymenial hyphae and basidia never with red granular contents. 79

77a. Hymenial surface granulose to papillose, pinkish buff to buff. Vesicles absent.

Basidiocarp floccose to submembranaceous. Subiculum and margin paler than hymenial surface. Subicular hyphae pale to dull brown, with thickened walls, 2.5–3(–4) μm wide. Subhymenial hyphae (2–)2.5–3(–4) μm wide, adhering crystalline material green in KOH. Spores subglobose to irregularly globose or lobed, echinulate, pale brown, (6–)7–8(–8.5) μm in diam.

Distr.: whole area. Ref.: 211, 219.

T. coerulea (Bres.) Höhn. & Litsch. 1907

Syn.: *Tomentella papillata* Höhn. & Litsch. 1908; *Hypochnus cervinus* Burt 1916; *Tomentella sordida* Wakef. 1969

77b. Hymenial surface even to warted, reddish to vinaceous brown. Vesicles often present in subiculum or subhymenium. 78

78a. Spores pale brown to hazel, globose to irregularly globose, rarely lobed, echinulate, 7–8(–9.5) μm in diam. Hymenial surface granulose to warted, bright to dull reddish cinnamon.

Basidiocarp pulverulent. Subiculum and margin paler than hymenial surface. Subicular hyphae hyaline to subhyaline, often with thickened walls, 2–4(–5) μm wide, some torulose. Subhymenial hyphae 2.5–4(–5) μm wide. Vesicles often present in subiculum and subhymenium, hyaline, up to 20 μm in diam. Basidia 45–60 × 6.5–7.5 μm, in water often with red granular material.

Distr.: whole area. Ref.: 211, 219.

T. lateritia Pat. 1894

Syn.: *Tomentella punicea* auctt.

78b. Spores pale brown, irregular to usually lobed, echinulate, (5.5–)6–8 (–9.5) μm in diam. Hymenial surface even to granulose, vinaceous brown. *T. subvinosa*, see 40a.

79a. At least some of the spores distinctly lobed. 80

79b. Spores never lobed. 89

80a. Hymenial surface even to warted, bright green to olive brown.

Basidiocarp hypochnoid to tomentose. Margin paler than hymenial surface, subiculum brownish. Subicular hyphae brownish, often with greenish tint, thick-walled, 4–5 μm wide, often with torulose ampullate and/or swollen cells. Subhymenial hyphae 3.5–4 μm wide. Basidia 35–40 × 7–9 μm. Spores irregularly globose to lobed, echinulate to usually aculeate, pale yellow to hyaline, 7–8.5(–9) μm in diam.

Distr.: N. Am. Ref.: 211, 219.

T. olivascens (Berk. & Curt.) Bourd. & Galz. 1924

80b. Hymenial surface without greenish tints. (When faintly olivaceous then spores 6–7 μm in diam.) 81

81a. Subicular hyphae at least on average narrower than 4 μm, but swellings may be present. Hymenial surface usually with buffy or ochraceous tints. 82

81b. Subicular hyphae at least 4 μm wide. Hymenial surface ferrugineous to dark brown or vinaceous brown, sometimes wood-brown. 86

82a. Subicular hyphae with distinctly thickened walls. 83

82b. Subicular hyphae with thin or slightly thickened (0.3 μm) walls. 85

83a. Subiculum paler than hymenial surface. Subhymenial hyphae always regular. *T. coerulea*, see 77a.

83b. Subiculum darker than or concolourous with hymenial surface. Some subhymenial hyphae torulose. 84

84a. Subicular hyphae with constrictions and swellings, yellowish to pale brown, with thickened walls, (2–)2.5–4.5(–9) μm wide. Hymenial surface even, grey to greyish buff. Spores echinulate, irregularly globose to irregular, rarely lobed, (5–)7–9 μm in diam.

Basidiocarp hypochnoid to tomentose. Subiculum concolourous with or darker than hymenial surface, margin concolourous to white. Subhymenial hyphae 3–4(–5) μm wide, often torulose. Basidia 30–45(–65) × 7–9(–10) μm.

Distr.: N. Am. Ref.: 211, 219.

T. epigaea (Burt) M.J. Larsen 1965

84b. Subiculae hyphae regular, with thickened walls, 2–4(–6) μm wide. Hymenial surface even, very pale buff to wood brown. Spores echinulate to normally aculeate, irregular to lobed, 8–11 μm in diam. *T. kentuckiensis*, see 54a.

85a. Hymenial surface even to minutely granulose, dull grey with a faint olivaceous tinge.

Basidiocarp hypochnoid to tomentose. Subicular hyphae pale yellowish brown, thin-walled, 2–3 μm wide. Subhymenial hyphae 2.5–3.5 μm wide. Basidia 30–35 × 6–7 μm. Spores angular to lobed, warted to echinulate, 6–7 μm in diam.

Distr.: N. Am. Ref.: 221.

T. angulospora M.J. Larsen 1975

85b. Hymenial surface warted to granulose, buff to pale ochraceous brown. *T. puberula*, see 34a.

86a. Subicular hyphae often swollen and ampullate, torulose, dark brown to pale brown, becoming thick-walled, 4–6.5(–8) μm wide. Subhymenial hyphae 4–7(–11) μm wide, often torulose, some with thickened to thick walls.

Basidiocarp floccose to tomentose or submembranaceous. Hymenial surface even, wood brown to vinaceous brown. Subiculum concolourous or darker, margin paler. Basidia 50–65 × 7–12 μm. Spores irregular to lobed, echinulate, brown, 7.5–10(–11) μm in diam.

Distr.: whole area. Ref.: 211, 219, 388.

T. sublilacina (Ellis & Holway apud Arthur & al.) Wakef. 1960

Syn.: *Tomentella castanea* (Bourd. & Galz.) Donk 1933; *T. pseudopannosa* Wakef. 1969

86b. Subicular and subhymenial hyphae regular. 87

87a. Spores irregular to lobed, usually elongated along one axis, warted to echinulate, 6.5–10 × 4–9 μm. *Thelephora terrestris*, see 65b.

87b. Spores irregularly globose to lobed, rarely elongated along one axis, echinulate to aculeate, (7–)8.5–10.5(–12) μm in diam. 88

88a. Spores irregularly globose to lobed, echinulate to typically aculeate, yellow to yellowish brown, (7–)8–10(–12) μm in diam. Hymenial surface even to warted, yellowish brown or ferrugineous to dark brown, subiculum darker, margin concolourous.

Basidiocarp floccose to membranaceous. Subicular hyphae yellowish brown to brown, with thickened to thick walls, 4–6.5(–9) μm wide. Subhymenial hyphae 4–6 μm wide. Basidia 30–45(–70) × 8–11 μm.
Distr.: Eur., N. Am. Ref.: 215, 219.
T. fuscoferruginosa (Bres.) Litsch. 1941

88b. Spores irregular to lobed, echinulate, brown, 8.5–10.5 μm in diam. Hymenial surface even, dull buff brown, subiculum paler, margin nearly white.

Basidiocarp hypochnoid to tomentose. Subicular hyphae hyaline, thick-walled, 4.5–6.5 μm wide. Subhymenial hyphae 3–4.5 μm wide. Basidia 40–60 × 7–10 μm.
Distr.: N. Am. Ref.: 221.
T. carbonaria M.J. Larsen 1975

89a. Hymenial surface whitish, buff, avellaneous, ochraceous, yellowish, wood brown or pale ochraceous brown. 90

89b. Hymenial surface darker, brown, green, ferrugineous, fuligineous, olivaceous, violaceous or bistre. 97

90a. Basidia at least 10 μm wide. 91

90b. Basidia up to 10 μm wide. 93

91a. Spores globose, aculeate, pale brown, (9–)10–12(–14) μm in diam., aculei up to 3 μm long.

Basidiocarp hypochnoid to floccose to membranaceous. Hymenial surface pale brown to dark reddish brown. Subiculum and margin concolourous to darker. Subicular hyphae tan to yellowish brown, (3.5–)4.5–8 μm wide, with thickened walls. Subhymenial hyphae 4–6 μm wide. Basidia 40–70 × (8.5–)10–12(–14) μm.
Distr.: whole area. Ref.: 213, 219.
T. bresadolae (Brinkmann apud Bres.) Bourd. & Galz. 1924

91b. Spores elongated along one axis or irregular, rarely globose, warted to echinulate. 92

92a. Hymenial surface dark yellowish brown to bistre. Subiculum darker. Basidia 40–50 × (8–)10–14 μm, not swollen in the basal part.

Basidiocarp floccose to membranaceous. Subicular hyphae brownish, 3–6(–7) μm, with thickened walls. Subhymenial hyphae 3.5–5.5 μm wide. Spores globose to subglobose to irregular, warted to echinulate, brown (8.5–)9.5–11.5(–12.5) μm in diam.
Distr.: Eur. Ref.: 219, 366.
T. atramentaria Rostrup 1894

92b. Hymenial surface pale yellowish brown. Subiculum and margin paler. Basidia 60–80 × 10–15 μm, basal part up to 20 μm wide.
Basidiocarp tomentose to mealy-velvety. Subicular hyphae 3–4.5 (–6) μm wide, brownish, with thickened walls. Subhymenial hyphae 3–5 μm wide. Spores irregularly globose to irregular, warted to echinulate, brown, 6–10(–11) μm in diam.
Distr.: Eur., N. Am. Ref.: 211, 219.
T. nitellina Bourd. & Galz. 1924

93a. Spores at least 8 μm in diam. 94
93b. Spores up to 8(–8.5) μm in diam., smaller on average. 95

94a. Some subicular hyphae with swellings and constrictions. Some subhymenial hyphae irregular and contorted, protruding into the hymenium. Hymenial surface even, avellaneous to pale brown. Basidia colourless in KOH. Spores 8–10(–11) μm in diam. *T. mairei*, see 33b.
94b. Subicular hyphae regular, brownish, 2–3.5 μm wide, with thin to thickened walls. Subhymenial hyphae regular or torulose, but not protruding in hymenium, 3.5–6.5 μm wide, some green in KOH. Basidia 35–45 × 7–8(–9) μm, partly green in KOH. Spores subglobose to broadly ellipsoid, warted to echinulate, brownish, 7.5–9 × 5–7 μm or 8.5–9(–9.5) μm in diam.
Basidiocarp floccose to membranaceous. Hymenial surface even to granulose, buffy brown to castaneous. Subiculum darker, margin paler.
Distr.: Eur. Ref.: 219, 390.
T. cladii Wakef. 1969

95a. Hymenial surface even, white to greyish to pale greyish yellow.
Basidiocarp floccose to membranaceous. Subiculum and margin concolourous with hymenial surface. Subicular hyphae thin-walled, hyaline, 3.5–5 μm wide. Basidia 40–50 × 8–10 μm. Spores subglobose to irregular, echinulate, (5.5–)7–8 × 5–7 μm in diam.
Distr.: Eur. Ref.: 376.
T. fatrensis Svrček 1958
95b. Hymenial surface even to warted, buff to pinkish buff to pale ochraceous brown. 96

96a. Spores 4.5–6.5(–7.5) μm in diam. Basidia and subhymenial hyphae partly black in KOH. Hymenial surface pinkish buff to brownish yellow or dark olive. *T. molybdaea*, see 74a.
96b. Spores 5–8(–8.5) μm in diam. Basidia and subhymenial hyphae not reacting with KOH. Hymenial surface buff to pale ochraceous brown. *T. puberula*, see 34a.

97a. Hymenial surface ferrugineous to orange brown. 98
97b. Hymenial surface not ferrugineous or orange brown. 99

98a. Subicular hyphae brownish, 4–7(–8.5) µm wide, thin- to thick-walled. Subhymenial hyphae 4–6 µm wide, sometimes with yellow encrusting material. Spores globose to subglobose, rarely irregular, echinulate to aculeate, (7–)8–11(–12) µm in diam. Subiculum darker than hymenial surface.

Basidiocarp floccose to tomentose. Hymenial surface ferrugineous to reddish orange. Basidia 40–60 × 7–11(–12) µm, sometimes with yellow encrusting material.

Distr.: whole area. Ref.: 211, 219, 376, 388.

T. bryophila (Pers.) M.J. Larsen 1974

Syn.: *Zygodesmus fulvus* Sacc. 1880; *Hypochnus obscuratus* P. Karst. 1896; *Z. pallidofulvus* Peck 1906; *Tomentella subferrugineus* Burt 1916; *T. pseudoferruginea* Skovsted 1950.

98b. Subicular hyphae brownish, 2–4(–5) µm wide. Subhymenial hyphae 2–4 µm wide, smooth. Spores globose to subglobose, echinulate to aculeate, 6–8.5 µm in diam. Subiculum paler than hymenial surface. *T. ferruginella*, see 46a.

99a. Hymenial surface with greenish, citrin or olivaceous tinges. 100

99b. Hymenial surface with brownish or violaceous tinges. 102

100a. Spores globose to subglobose, warted to echinulate, yellowish, 8–12 µm in diam. Subiculum and margin darker than hymenial surface.

Basidiocarp tomentose to membranaceous. Hymenial surface olive brown to dull citrine. Subicular hyphae olive brown, 2.5–4.5(–6) µm wide, with thickened walls. Subhymenial hyphae 3.5–5 µm wide. Basidia (45–)50–60 × 7.5–11(–15) µm, contents often ochraceous in KOH.

Distr.: Eur., N. Am. Ref.: 219.

T. viridescens (Bres. & Torrend apud Torrend) Bourd. & Galz. 1928

100b. Spores globose to subglobose, echinulate to aculeate, up to 8.5(–9) µm in diam. Subiculum and margin paler than hymenial surface. 101

101a. Spores globose, rarely irregularly globose, 5.5–6.5(–7.5) µm in diam. Subicular hyphae thin-walled, hyaline, 2.5–3 µm wide. Subhymenial hyphae regular, 2–3.5 µm wide.

Basidiocarp membranaceous. Hymenial surface granulose, greyish or dull brown with olivaceous tinge. Subiculum and margin paler or concolourous. Basidia 30–45 × 6–7(–8) µm.

Distr.: Eur. Ref.: 219.

T. donkii Litsch. 1941

101b. Spores irregularly globose to lobed, 7–8.5(–9) µm in diam. Subicular hyphae thick-walled, 4–5 µm wide, often with ampullate and swollen cells, torulose. Subhymenial hyphae 3.5–4 µm wide. *T. olivascens*, see 80a.

102a. Subicular hyphae brown, (2.5–)3–6(–8) µm wide, often wavy, becoming thick-walled, walls swelling in KOH (immediately in 10%, gradually in 2% KOH).

Basidiocarp hypochnoid to tomentose or submembranaceous. Hymenial surface even, dark brown to purplish brown. Subiculum and margin concolourous or darker. Subhymenial hyphae 4–6(–8) μm wide. Basidia 35–60 × 8–11(–13) μm. Spores globose to subglobose, echinulate to usually aculeate, brownish, (7–)8–9.5(–11.5) μm in diam.

Distr.: whole area. Ref.: 213, 219.

T. ruttneri Litsch. 1933

102b. Subicular hyphae not swelling in KOH. 103

103a. Subicular hyphae at least more than 4.5 μm on average. 104

103b. Subicular hyphae rarely exceeding 4.5 μm in width, on average narrower than 4 μm. 115

104a. Spores globose, aculeate, rarely echinulate. 105

104b. Spores subglobose, ellipsoid or irregular, rarely globose, warted to echinulate. 109

105a. Spores at least on average larger than 8.5 μm. 106

105b. Spores up to 8.5 μm in diam. 108

106a. Basidia 40–60 × 6–7(–8) μm.

Basidiocarp hypochnoid to tomentose. Hymenial surface even, dull greyish brown. Subiculum concolourous. Subicular hyphae yellowish brown, thick-walled, 4–7 μm wide, often torulose and then up to 9 μm wide. Subhymenial hyphae 3–5 μm wide. Spores globose to rarely irregularly globose, echinulate, pale brown, 8–11 μm in diam.

Distr.: N. Am; Ref.: 221.

T. kootenaiensis M.J. Larsen 1975

106b. Basidia at least 8.5 μm wide. 107

107a. Spores (9–)10–12(–14) μm in diam. *T. bresadolae*, see 91a.

107b. Spores 8–9(–9.5) μm in diam. *T. brevispina*, see 27b.

108a. Spores 5–6.5(–7.5) μm in diam. *T. neobourdotii*, see 24b.

108b. Spores 6.5–8.5(–9) μm in diam. 62

109a. Basidia 5–7.5 μm wide. 110

109b. Basidia more than 8 μm wide, at least on average. 111

110a. Most subicular hyphae encrusted, spinulose. Spores 5–6.5(–7.5) μm in diam. *T. neobourdotii*, see 24b.

110b. Subicular hyphae smooth. Spores 6–8(–9.5) μm in diam. *T. pilatii*, see 72b.

111a. Subicular hyphae thin-walled, pale brown, 4–6 μm wide. Spores subglobose to ellipsoid, sometimes reniform or minutely irregular, warted, 8–11.5 × 6.5–8.5 μm, pale brown to brown. Basidia 40–50 × 8–10 μm. No reactions with KOH.

Basidiocarp tomentose to membranaceous. Hymenial surface even, dark violaceous to castaneous. Margin and subiculum paler. Subhymenial hyphae 4–7 μm wide.
Distr.: Eur. Ref.: 376.
T. juncicola Svrček 1958

111b. Subicular hyphae with thickened walls. Spores usually irregular. Basidia often wider. 112

112a. Subiculum paler than hymenial surface. *T. carbonaria*, see 88b.
Note: When hyphal strands are not observed in *T. schmoranzeri* (see 43a), this species is indistinguishable from *T. carbonaria*.

112b. Subiculum concolourous with or darker than hymenial surface. 113

113a. Hymenial surface even to warted, isabelline to chocolate brown, often with pinkish tint. Subicular hyphae 3–10(–12) μm wide. *Thelephora terrestris*, see 65b.

113b. Hymenial surface even, dark brown to bistre, rarely dark yellowish brown. Subicular hyphae 3–6(–7.5) μm wide. 114

114a. Spores 7–9.5 μm in diam. Hymenial surface dark brown to umber. *T. albomarginata*, see 72a.

114b. Spores (8.5–)9.5–11.5(–12.5) μm in diam. Hymenial surface dark yellowish brown to bistre. *T. atramentaria*, see 92a.

115a. Basidia at least 8.5 μm wide. 69

115b. Basidia up to 8(–9) μm wide. 116

116a. Spores subglobose to ellipsoid, 7.5–9 × 5–7 μm or 8.5–9(–9.5) μm in diam. Subicular hyphae smooth. Subhymenial hyphae 3.5–6.5 μm wide, some green in KOH. *T. cladii*, see 94b.

116b. Spores globose to subglobose, rarely irregular, 5–6.5(–7.5) μm in diam. Subicular hyphae smooth or encrusted. Subhymenial hyphae 2–4.5 μm wide. 117

117a. Subicular hyphae typically encrusted or spinulose, 2–5(–6.5) μm wide. *T. neobourdotii*, see 24b.

117b. Subicular hyphae smooth. 118

118a. Subicular hyphae thin-walled. Hymenial surface dull brown with an olivaceous tinge. *T. donkii*, see 101a.

118b. Subicular hyphae with thickened walls, 2.5–3.5(–4) μm. Hymenial surface buff brown to dark brown.
Basidiocarp hypochnoid to tomentose. Margin paler than hymenial surface. Subhymenial hyphae 2.5–3.5(–4) μm wide. Basidia 40–60 × 6–7.5 μm. Spores globose to subglobose, echinulate, brown, 5–6.5(–7) μm in diam.
Distr.: N. Am. Ref.: 221.
T. fraseri M.J. Larsen 1975

TOMENTELLINA Höhn. & Litsch. 1906

Basidiocarp annual, resupinate, effused, arachnoid, tomentose or hypochnoid, separable. Hymenial surface even, hispid, brownish, darkening in KOH. Hyphal strands present. Hyphal system dimitic. Skeletal hyphae yellowish, intertwining. Subicular hyphae brown, with thickened walls; clamps rare or absent. Subhymenial hyphae thin-walled, hyaline to brownish, without clamps. Cystidia originating from subiculum or subhymenium, brown, thick-walled, septate, single or in fascicles, projecting. Basidia in clusters, often sphaeropedunculate when young, clavate, often with median septum, sometimes with yellowish contents, with (2–)4 sterigmata. Spores brownish, thick-walled, warted and warts often dichotomously branched, irregularly globose to lobed, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Tomentellina ferruginosa* Höhn. & Litsch. 1906
Distribution: in the whole area.
References: 127, 211.

Monotypic. Basidiocarp tomentose to hypochnoid, separable. Hymenial surface even, hispid, sometimes hydnoid, ferrugineous to dark brown. Subiculum concolourous or darker, margin paler. Hyphal strands present. Skeletal hyphae yellowish, 1.5–2 μm wide. Subicular generative hyphae brown, thick-walled, 3.5–6(–7.5) μm wide. Subhymenial hyphae hyaline to yellowish, thin-walled, 2.5–4(–6.5) μm wide. Clamps only found on subicular hyphae, sometimes completely absent. Cystidia brown, thick-walled, septate, 100–200 × 4–7(–10) μm, single or in fascicles. Basidia (25–)35–50(–60) × 5–8(–9) μm. Spores irregularly globose to lobed, (6–)7–11 μm wide, warted and warts often dichotomously branched.
Distr.: whole area. Ref.: 66, 127, 211, 376.
T. fibrosa (Berk. & Curt.) M.J. Larsen 1974
Syn.: *Kneiffiella bombycina* P. Karst. 1895; *Tomentellina ferruginosa* Höhn. & Litsch. 1906; *Hypochnus canadensis* Burt 1916

TOMENTELLOPSIS Hjortstam 1970

Syn.: *Byssocristella* M.P. Christ. & Bregnhøj Larsen 1970.

Basidiocarp annual, resupinate, effused, hypochnoid, pellicular or submembranaceous, separable. Hymenial surface discontinuous to continuous, often pulverulent, even, cream-coloured, yellowish, green or brownish. Subiculum loose, arachnoid. Hyphal strands may be present. Hyphal system typically monomitic. Hyphae thin-walled, hyaline to brownish, 1–5 μm wide, branching at right angles, without clamps or with a few at the basal hyphae. Sterile hymenial elements absent. Basidia clavate to subcylindrical, often somewhat

constricted, with 4 sterigmata. Spores globose to ellipsoid, hyaline to pale brown, warted to aculeate, thin-walled, not amyloid.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms, rarely on soil.
Type species: *Corticium echinosporum* Ellis 1881
Distribution: in the whole area.
References: 157, 159.

1a. Hymenium with distinct yellowish or greenish tinge. 2
1b. Hymenium with cream, pinkish or brownish tinge. 3

2a. Spores globose to subglobose, echinulate to aculeate, 4–6.5(–7) μm in diam., spines 0.5–1 μm long.
Basidiocarp arachnoid to pellicular, sometimes submembranaceous. Hymenial surface cream-coloured to sulphur yellow to greenish yellow. Hyphae 2.5–5 μm wide. Hyphal strands rare.
Basidia 20–30 × 6–9 μm.
Distr.: whole area. Ref.: 66, 157, 211, 376.
T. echinospora (Ellis) Hjortstam 1970
Syn.: *Tomentella incarnata* P. Henn. 1898; *Hypochnus pennsylvanicus* Overh. 1929

2b. Spores ellipsoid, warted to aculeate, (5.7–)6–7(–7.2) × (3.5–)4–5 μm, warts up to 0.5 μm long.
Basidiocarp arachnoid to pellicular. Hymenial surface pale lemon yellow to greenish. Hyphae 3–6 μm wide. Basidia 20–30 × 5–7 μm.
Distr.: Eur. Ref.: 167, 185.
T. bresadoliana (Sacc. & Trotter) comb. nov.
Bas.: *Corticium bresadolianum* Sacc. & Trotter in Syll. Fung. 21: 866. 1912.
Syn.: *Corticium viride* Bres. apud Höhn. & Litsch. 1907 non ~ Berk. apud Hooker 1855; *Athelia viridis* Parm. 1967; *Byssocristella pallido-citrina* M.P. Christ. 1970

3a. Spores hyaline to subhyaline, globose to subglobose, echinulate, 4–5 μm in diam., spines c. 0.5 μm long.
Basidiocarp effused, hypochnoid to pellicular. Hymenial surface light brown. Basal hyphae hyaline to subhyaline, c. 5 μm wide.
Basidia 20–35(–50) × 5–6 μm.
Distr.: Eur. Ref.: 159.
T. pusilla Hjortstam 1974

3b. Spores larger. 4

4a. Spores echinulate to aculeate, spines 1–2(–2.5) μm long. Subiculum and margin brown.
Basidiocarp pellicular to submembranaceous. Hymenial surface cream-coloured to brownish. Hyphae yellowish to pale brown, 3–6

μm wide. Basidia 25–45 × 6–9 μm. Spores hyaline to pale yellow, subglobose to broadly ellipsoid, (4–)5–7.5 × 4.5–6 μm.
Distr.: Eur., N. Am. Ref.: 66, 159, 376, 390.
T. zygodesmoides (Ellis) Hjortstam 1974
Syn.: *Hypochnus tabacina* Bres. apud Brinkmann 1908.

4b. Spores aculeate to echinulate, spines 0.5–1 μm long. Subiculum and margin whitish.
Basidiocarp pellicular to membranaceous. Hymenial surface cream-coloured to pinkish and often red-spotted. Hyphae hyaline, 3–5 μm wide. Basidia 30–40 × 5–7 μm. Spores hyaline or somewhat pinkish, globose to broadly ellipsoid, 5.5–7 μm in diam.
Distr.: Eur. Ref.: 376, 390.
T. submollis (Svrček) Hjortstam 1974
Note: Hjortstam (159) describes *T. submollis* as having a light brown basidiocarp and pale brown subicular hyphae. Spores subglobose to rarely globose (figured ellipsoid), 5–7 × 4–5 μm.

TRECHISPORA P. Karst. 1890

Syn.: *Tomentella* P. Karst. 1889, non ~ Pat. 1887; *Cristella* auctt. non ~ Pat. 1887; *Phlebiella* P. Karst. 1890
Incl.: *Brevicellicium* K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1978

Basidiocarp annual, resupinate or rarely substipitate, arachnoid, byssoid or membranaceous, loosely adnate. Hymenial surface even, odontioid or reticulate, typically whitish or pale yellowish. Hyphal strands sometimes present. Hyphal system typically monomitic. Hyphae hyaline, often ampullate at the septa, up to 4(–8) μm wide. Clamps present. Conidia, cystidia and spinulose hyphal cells sometimes present. Basidia short-cylindrical to clavate, rarely podo- or pleurobasidia, with 2–4 sterigmata. Spores hyaline, rarely yellowish or pale ochraceous, globose, ellipsoid or reniform, rarely irregular, typically thin-walled, smooth or ornamented, not amyloid.

Substrate: saprophytic on leaves and decayed wood or bark of angiosperms and gymnosperms.
Type species: *Trechispora onusta* P. Karst. 1890
Distribution: in the whole area.
References: 251.

1a. Spores smooth, thin-walled (subgenus *Laevispora*). 2
1b. Spores irregular or ornamented (subgenus *Trechispora*). 6

2a. Spores globose to subglobose, 3.5–4.5(–5) × 3–4(–4.5) μm.
Basidiocarp effused, waxy pruinose to waxy membranaceous, up to 100 μm thick. Hymenial surface typically warted to odontioid, with up to 200 μm long teeth, cream-coloured, pale yellowish to ochraceous or fulvous. Hyphae 2–4 μm wide, inflated up to 8.5 μm.

Basidia 11.5–17(–23) × 5–7(–7.5) μm.
Distr.: whole area. Ref.: 66, 162, 251.
T. mutabilis (Pers.) Liberta 1966
Syn.: *Odontia olivascens* Bres. 1892; *Corticium sulphurellum* Höhn. & Litsch. 1908; *Grandinia abrotani* Velen. 1922

Note: *Athelopsis viridula* Parm. 1968 is microscopically identical with *T. mutabilis* (fide Hjortstam & Larsson 1978), but the colour is a brighter yellow. We do not think that this is sufficient reason to separate *A. viridula* from the above species.

2b. Spores not globose to subglobose. 3

3a. Spores tear-shaped, ovoid or ovoid-ellipsoid, 3–5 × 2–4 μm.
Basidiocarp effused, pruinose to arachnoid, pellicular or membranaceous, up to 200 μm thick. Hymenial surface whitish to buff, cracked. Margin pruinose to fimbriate. Hyphae (1–)1.5–3.5 μm wide, with thin to thickened walls; swellings up to 7.5 μm wide. Basidia 8.5–18 × 3.5–6 μm.
Distr.: whole area. Ref.: 66, 251.
T. cohaerens (Schw.) comb.nov.
Basionym: *Sporotrichum cohaerens* Schw. 1832, Trans. Amer. phil. Soc., n.s., vol. 4: 272.
Syn.: *Corticium confine* Bourd. & Galz. 1911; *C. submicrosporum* Litsch. 1927

Note: *Corticium exile* H.S. Jacks. 1950 is very close. Basidiocarp effused, membranaceous. Hymenial surface even, whitish to cream-coloured. Hyphae 2–3 μm wide, locally up to 8 μm wide. Basidia 10–15 × 5–6 μm. Spores 4–6 × 3.5–4 μm. Distr.: Eur., N. Am.

3b. Spores narrowly ellipsoid, subcylindrical or allantoid. 4

4a. Spores allantoid, 3–3.5 × 1.4–1.6 μm.
Basidiocarp effused, thin, membranaceous. Hymenial surface even to slightly grandinioid, cream-coloured. Hyphae hyaline, 2–3 μm wide, swellings up to 5 μm wide. Basidia 8–13 × 3–4 μm.
Distr.: Eur.
T. lunata (Romell apud Bourd. & Galz.) Jülich 1975

4b. Spores at least 1.8 μm wide. 5

5a. Spores narrowly ellipsoid to suballantoid, 3.5–6(–7) × 2–3(–4.5) μm. Basidia 14–20 × 4–4.5 μm.
Basidiocarp effused, membranaceous to subpellicular, adnate, up to 175 μm thick. Hymenial surface pale yellowish, cracked. Margin sometimes with hyphal strands. Hyphae 1.5–3 μm wide, swellings up to 9.5 μm wide.
Distr.: whole area. Ref.: 127, 251.
T. amianthina (Bourd. & Galz.) Liberta 1966
Syn.: *Corticium crustulinum* Burt 1920

5b. Spores narrowly ellipsoid to subcylindrical, 3–4 × 1.8–2.2 μm. Basidia 8–13 × 3–4.5 μm.

Basidiocarp effused, arachnoid to pellicular, separable, up to 75 μm thick. Hymenial surface white. Margin with hyphal strands. Hyphae 1–4 μm wide, swelling up to 7.5 μm wide.
Distr.: Eur. Ref.: 251.
T. byssinella (Bourd.) Liberta 1966

6a. Hymenial surface poroid. 7
6b. Hymenial surface not poroid, at most slightly reticulate. 8

7a. Cystidia numerous, cylindrical, encrusted, with thin to thickened walls, 31–68 × 4–8 μm.
Basidiocarp effused, soft, white to cream-coloured, up to 1 mm thick. Pores rounded to angular, up to 1 mm deep, 4–5 per mm, edges somewhat fimbriate. Margin arachnoid, sometimes with hyphal strands. Hyphae 1.5–3.5 μm wide, often encrusted with large crystals; swellings up to 8 μm wide. Basidia 10–13(–15.5) × 4–6 μm. Spores subglobose to narrowly ovoid, thin-walled, echinulate, 2.5–4 × 2–3.5 μm.
Distr.: N. Am. Ref.: 251.
T. regularis (Murrill) Liberta 1973
Syn.: *Poria submollusca* Murrill 1920; *P. arachnoidea* Murrill 1920; *P. tenuissima* Speg. 1923; *P. velata* Rick 1937; *P. subvulgaris* Rick 1937

7b. Cystidia absent.
Basidiocarp effused, fragile, white to cream-coloured, up to 2 mm thick. Pores rounded, angular or sinuate, (2–)3–4(–5) per mm, edges fimbriate or splitting. Margin arachnoid, often with hyphal strands. Hyphae 2–4 μm wide, often encrusted; swellings up to 8 μm wide. Basidia 8.5–16.5(–18) × 4–6 μm; spores subglobose to ovoid, thin-walled, echinulate, 2.5–4 × 2.5–3 μm.
Distr.: whole area. Ref.: 251.
T. mollusca (Pers. ex Fr.) Liberta 1973
Syn.: *?Polyporus subtilis* (Schrad.) ex Fr. 1821; *P. candidissimus* Schw. 1832; *P. gordoniensis* Berk. & Br. 1865; *P. hymenocystis* Berk. & Br. 1879; *Trechispora onusta* P. Karst. 1890; *Physisporus fragillimus* P. Karst. 1903

8a. Arthroconidia, aleuriospores or chlamydospores present. 9
8b. No vegetative propagules. 11

9a. Irrgularly shaped arthroconidia present, 4–8 × 2.5–4.5 μm. *T. farinacea*, see 14b.
9b. Arthroconidia absent. 10

10a. Aleurio(chlamydo-)spores subglobose, ovoid or ellipsoid, smooth, thin- to thick-walled (1 μm), somewhat truncate, 4.5–7 × 3–4.5 μm. Spores ovoid to broadly ellipsoid, thin-walled, echinulate, 2.5–3.5 × 2–3 μm.

Basidiocarp effused, membranaceous, separable, up to 200 μm thick. Hymenial surface warted to grandinioid, buff to pale yellowish. Margin fimbriate or with hyphal strands. Hyphae 1–4 μm wide, swellings up to 5.5 μm wide. Conidia terminal on hyphoid conidiophores. Basidia 8–23 × 4–5.5 μm. On angiosperms.
Distr.: whole area. Ref.: 251.
T. alnicola (Bourd. & Galz.) Liberta 1966

10b. Aleurio(chlamydo-)spores globose to subglobose, thick-walled (0.8–1.5 μm), rugose, 5–7 μm in diam. Spores broadly ellipsoid to subreniform, thin-walled, echinulate, 3.5–4.5 × 2–3 μm.
Basidiocarp effused, pruinose to submembranaceous, separable. Hymenial surface even, white. Margin fibrillose or with hyphal strands. Hyphae 2–3 μm wide, swellings up to 7 μm wide. Conidia terminal on hyphoid conidiophores. Basidia 8.5–12 × 4–5 μm.
Distr.: N. Am. Ref.: 155, 251.
T. invisitata (H.S. Jacks.) Liberta 1966

11a. Spores up to 4 μm long. 12
11b. Spores at least 4 μm long. 15

12a. Spores turbinate (triangular), thin-walled, slightly warted at the apex, 3–3.5(–4) × 2–3 μm.
Basidiocarp effused, farinose, pellicular or membranaceous, adnate, up to 200 μm thick. Hymenial surface even to minutely reticulate, cream-coloured to pale yellowish. Margin fibrillose or with hyphal strands. Hyphae (1–)1.5–3 μm wide, swellings up to 8 μm wide. Basidia (8–)9.5–14 × (3–)3.5–5 μm.
Distr.: Eur., N. Am. Ref.: 66, 251.
T. subsphaerospora (Litsch.) Liberta 1973
Syn.: *Cristella trigonospora* M.P. Christ. 1960
12b. Spores not turbinate. 13

13a. Globose to ovoid cells 2–4 × 2–3.5 μm, with delicate spines, 4–13 × 0.5 μm, laterally or terminally on some hyphae. Spores globose to subglobose, stellate, 2.5–4 × 2.5–3.5 μm, warts ± 0.5 μm long.
Basidiocarp effused, farinose to granulose, adnate, up to 100 μm thick. Hymenial surface even to slightly reticulate, cream-coloured to buff. Margin pruinose. Hyphae 1–3 μm wide, swellings up to 8.5 μm wide. Basidia 8–12 × 3.5–4.5 μm.
Distr.: Eur., N. Am. Ref.: 251.
T. stellulata (Bourd. & Galz.) Liberta 1966
13b. Spinulose cells absent. Spores echinulate or irregularly warted, ovoid, ellipsoid or subcylindrical. 14

14a. Spores irregularly ovoid to subcylindrical, 3–3.5 × 2–2.5 μm, with irregularly scattered obtuse warts. Hymenial surface even to farinose-reticulate, white, cream-coloured or honey-yellow.

Basidiocarp effused, arachnoid to submembranaceous, up to 150 μm thick. Margin fibrillose to fan-shaped. Hyphae (1.5–)2–3(–3.5) μm wide, swellings up to 7 μm wide. Basidia (7–)8–12 × 4–5 μm.
Distr.: whole area. Ref.: 251.
T. microspora (P. Karst.) Liberta 1966
Syn.: *Corticium subnullum* Burt 1926; *Hypochnus sphaerosporus* Maire sensu M.P. Christ. 1960

14b. Spores ovoid to ellipsoid, echinulate, 3–4(–4.5) × 2.5–3(–3.5) μm. Hymenial surface pruinose, even to hydnoid, white, cream, buff or pale grey.

Basidiocarp effused, arachnoid, pellicular or submembranaceous, up to 200 μm thick. Teeth cylindrical to subulate, sometimes fused at the base, up to 1.6 mm long. Margin fibrillose or with hyphal strands. Hyphae (1.5–)2–4 μm wide, with thin to thickened (0.5 μm) walls; swellings up to 8 μm wide. Basidia (7.5–)8.5–17 × 3.5–5(–6) μm.
Distr.: whole area. Ref.: 66, 127, 251.
T. farinacea (Pers. ex. Fr.) Liberta 1966
Syn.: *?Hydnum niveum* (Pers.) ex Fr. 1821; *Hydnum stevensonii* Berk. & Br. 1875; *Hypochnus sphaerosporus* Maire 1905; *Corticium submutabile* Höhn. & Litsch. 1907; *Tomentella araneosa* Höhn. & Litsch. 1907; *Cristella caucasica* Parm. 1965

15a. Basidiocarp at first arachnoid, byssoid or tomentose, soon overrun by branching, anatomosing fertile strands. Often wine-red with KOH. 16

15b. Basidiocarp not overrun by branching fertile strands. No reaction with KOH. 17

16a. Basidiocarp wine-red with KOH. Spores hyaline to slightly yellowish, ovoid to broadly ellipsoid, echinulate to asperulate, 4–6(–7) × 3–4(–4.5) μm. Hymenium varying in colour from buff or honey to hazel or umber.

Basidiocarp up to 250(–500) μm thick. Margin fibrillose, fan-shaped or with hyphal strands. Hyphae subhyaline to light brown, 2–5 μm wide, swellings up to 8.5 μm wide. Basidia 12–23 × 5–7 μm. Common.
Distr.: whole area. Ref.: 66, 127, 251.
T. vaga (Fr.) Liberta 1966
Syn.: *Thelephora sulphurea* (Pers.) ex Fr. 1821; *Athelia sericea* Pers. 1822; *?Thelephora fumosa* Fr. ex Pers. 1822; *Odontia fusca* Cooke & Ellis 1881; *?Tomentella menieri* Pat. 1886; *O. tenuis* Peck 1891; *Hypochnus filamentosus* Burt 1926 non ~ Pat. 1891; *T. lurida* Skovsted 1950; *Cristella donkii* Parm. 1965; *?Xenasmatella sanguinescens* Svrček 1973

16b. No reaction with KOH. Spores hyaline, ellipsoid to narrowly ovoid, echinulate to asperulate, 4.5–7 × 2.5–3.5 μm. Hymenial surface white to buff or honey-yellow.

Basidiocarp up to 150 μm thick. Margin fimbriate or with hyphal

strands. Hyphae hyaline to slightly yellowish, (1.5–)2–3.5 μm wide, often encrusted, swellings rare, up to 8 μm wide. Basidia 10–18 (–22.5) × 4–7 μm. Rare.
Distr.: whole area. Ref.: 251.
T. christiansenii (Parm.) Liberta 1966

17a. Spores hyaline, globose to subglobose, echinulate, 4–6(–6.5) × 3.5–5(–6) μm. Hyphal system dimitic.
Basidiocarp effused, farinose, up to 150 μm thick. Hymenial surface even to grandinioid, pale buff to light pinkish cinnamon. Subiculum and margin orange-brown. Hyphal strands present, up to 400 μm wide. Skeletal hyphae hyaline to slightly yellowish, 2–2.5 μm wide, especially in the hyphal strands. Generative hyphae hyaline, thin-walled, sometimes encrusted, 2–5 μm wide; swellings rare. Cystidioles thin-walled, hyphoid, 2–4 μm wide, projecting up to 65 μm. Basidia 25–36 × 5–5.5 μm.
Distr.: N. Am. Ref.: 127, 128, 251.
T. pallido-aurantiaca Gilberts. & Budington 1970
Note: The correct place of this species is probably in or close to *Tomentella*.

17b. Spores ovoid to broadly ellipsoid, echinulate to asperulate. Hyphal system monomitic. 18

18a. Basidiocarp membranaceous, up to 400 μm thick, often with variously formed marginal extensions free from the substratum. Needle-like crystals absent. Spores hyaline to slightly yellowish, ovoid to ovoid-ellipsoid, asperulate, (4–)4.5–7.5 × 3–4.5 μm.
Hymenial surface even or slightly warted, white to pale yellowish. Margin byssoid to fibrillose. Hyphae (1–)1.5–3 μm wide, swellings up to 8.5 μm wide. Basidia 14–31 × 4.5–6(–7) μm.
Distr.: whole area. Ref.: 66, 251.
T. fastidiosa (Pers. ex Fr.) Liberta 1966
Syn.: *Thelephora foetida* (Pers.) Ehrenb. ex Becker 1828; *Hydnum alliaceum* Weinman 1832; *Grandinia membranacea* Peck & Clinton 1879

18b. Basidiocarp arachnoid, farinose-reticulate or thin-membranaceous, with hyphal strands, no marginal extensions, up to 100 μm thick. Needle-like crystals present on hyphae. Spores hyaline, ovoid to ovoid-ellipsoid, strongly echinulate (spines 0.5 μm long), 4–5 × 2.5–3 μm.
Hymenial surface even, white. Margin arachnoid or with hyphal strands. Hyphae 1–2.5 μm wide; swellings up to 7 μm wide. Basidia 11–17 × 4.5–6 μm.
Distr.: whole area. Ref.: 66, 127, 251.
T. praefocata (Bourd. & Galz.) Liberta 1966
Syn.: *Corticium suffocatum* Bourd. & Galz. 1911 non ~ Peck 1878

TUBULICIUM Oberw. 1965

Syn.: *Tubulixenasma* Parm. 1965
Incl.: *Litschauerella* Oberw. 1965

Basidiocarp annual, resupinate, effused, ceraceous. Hymenial surface even, hispid under a lens, pale coloured. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Cystidia conical, multi-radicate, with thick multi-layered walls, the inner wall slowly dissolving in KOH, the surface ensheathed with cylindric or dendritic hyphae. Basidia terminal or pleurobasidioid, clavate to subcylindrical, with a basal clamp, 4-spored. Spores hyaline, thin-walled, smooth or warted, globose, cylindrical to sigmoid, not amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms and on ferns.
Type species: *Peniophora vermifera* Bourd. 1910
Distribution: in the whole area.
References: 303.

1a. Spores cylindrical to sigmoid. Cystidia smooth, ensheathed with simple or dendritic hyphae. 2

1b. Spores globose. Cystidia encrusted with crystalline material, not or only slightly ensheathed with normal hyphae.

Basidiocarp effused, closely adnate, somewhat ceraceous. Hymenial surface even, whitish. Hyphae hyaline, c. 2 μm wide, thin-walled, with clamps. Cystidia conical, at the base with many roots, 80–125 × 10–20 μm, thick-walled, encrusted. Basidia terminal or pleurobasidioid, cylindrical to clavate, 12–20 × 4–8 μm. Spores hyaline, globose or subglobose, 4.5–15 μm in diam.
Distr.: whole area. Ref.: 7, 115, 117, 303, 406.
T. clematidis (Bourd. & Galz.) Oberw. 1965
Syn.: *Peniophora abietis* (Bourd. & Galz.) Sartory & Maire 1921; *Hypochnus albus* Burt 1926

2a. Spores sigmoid, 16–24 × 3.5–4.5 μm, smooth.

Basidiocarp effused, adnate, thin ceraceous. Hymenial surface even, whitish to pale cream-coloured. Hyphae hyaline, 1.5–3(–4) μm wide, with clamps. Cystidia conical, at the base with many roots, 80–150 × 10–15 μm, thick-walled, smooth, ensheathed with dendritic hyphae. Basidia 20–40 × 7–11 μm.
Distr.: whole area. Ref.: 303, 405, 406.
T. vermifera (Bourd.) Oberw. 1965

2b. Spores cylindrical, 11–13 × 3–5 μm, smooth.

Basidiocarp effused, ceraceous. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline, with clamps. Cystidia conical, at the base with many roots, thick-walled, ensheathed with cylindrical hyphae, 1.5–2 μm wide. Basidia cylindrical, 16–25 × 5–8 μm.

Distr.: N. Am. Ref.: 30.
Epithele capitata D.P. Rogers & Boquiren 1971

TUBULICRINIS Donk 1956

Basidiocarp annual, resupinate, effused, adnate, pruinose, ceraceous or membranaceous, rarely crustaceous. Hymenial surface even to minutely reticulate or hispid. Margin pruinose. Hyphal system monomitic. Hyphae hyaline, thin- to thick-walled, with clamps, sometimes amyloid; wall thickenings soluble in KOH. Lyocystidia present, thick-walled, usually multi-radicate, projecting, acute, obtuse or with an apical bulb, sometimes amyloid. Wall layered, material between inner and outer layer soluble in KOH. Lumen narrow, abruptly expanding at the apex (except in *T. chaetophorus*, apex thin-walled. Basidia hyaline, thin- or basally thick-walled, clavate to cylindrical or suburniform, single or in small clusters, rarely amyloid, with (2–)4 sterigmata. Spores hyaline, smooth, thin-walled, globose to ellipsoid or narrowly cylindrical to allantoid, not amyloid.

Substrate: saprophytic on decaying wood.
Type species: *Corticium glebulosum* Bres. 1898
Distribution: in the whole area.
References: 304.

1a. Cystidia with apical umbrella-shaped cap, which is up to 10 μm in diam., has 9–18 prongs and is not soluble in KOH.
Basidiocarp effused, subpelliculose. Hymenial surface even to reticulate, white to cream-coloured, hispid. Hyphae thin-walled, 2–4(–5) μm wide. Cystidia subulate, inflated at the base, in two categories: 15–30 × 3–6 μm and 40–70(–80) × 7–15 μm. Basidia clavate, 10–20(–30) × 5–8(–8.5) μm. Spores broadly ellipsoid, 5–7(–8) × 3–5(–5.5) μm.
Distr.: Eur., N. Am. Ref.: 304, 406.
T. hamatus (H.S. Jacks.) Donk 1956
Syn.: *?Peniophora umbracula* G.H. Cunn. 1955

1b. Cystidia without umbrella-shaped cap. 2

2a. Cystidia acute. 3
2b. Cystidia obtuse or capitate. 7

3a. Spores ovoid to subcylindrical, 2.5–3.5(–4) μm wide, up to 2(–2.5) times as long as wide. 4
3b. Spores narrowly cylindrical, 1.5–2.5 μm wide, about 3 times as long as wide. 6

4a. Most cystidia apically covered with an acute conical cap, which is not soluble in KOH. Spores ovoid to ellipsoid, 4.2–5.5(–6) × (2.5–)3–3.5 μm.

Basidiocarp effused, even to minutely reticulate. Hymenial surface white to cream-coloured. Hyphae with thin to somewhat thickened walls, 2–3.5 μm wide. Cystidia conical, 50–80 × 4–7 μm, not amyloid. Basidia 10–15 × (3.5–)4–5 μm.
Distr.: Eur., N. Am. Ref.: 304, 406.
T. inornatus (H.S. Jacks.) Donk 1956

4b. Cystidia without apical cap. Spores ellipsoid to subcylindrical, larger. 5

5a. Cystidia (60–)120–200 × (6–)7.5–12 μm, typically amyloid; lumen capillary all over its length.
Basidiocarp effused, membranaceous, sometimes cracked, up to 250 μm thick. Hymenial surface reticulate, white to cream-coloured or yellowish, sometimes with greenish tinge. Hyphae with thin to thickened walls, 1.7–3(–4) μm wide. Basidia 10–20(–25) × (3.5–)4–5.5 μm. Spores ellipsoid to subcylindrical, (4–)5.5–7(–7.5) × (2.2–)2.5–3.5(–4) μm. On gymnosperms.
Distr.: whole area. Ref.: 304, 405, 406.
T. chaetophorus (Höhn.) Donk 1956
Syn.: *Peniophora abnormis* Bourd. & Galz. 1928; *P. dissoluta* Overholts 1934

5b. Cystidia (40–)50–90(–110) × (3–)4–6 μm, not amyloid; lumen somewhat expanded in the upper part.
Basidiocarp effused, membranaceous. Hymenial surface reticulate, white to cream-coloured. Hyphae thin- to thick-walled, 2–3(–5) μm wide. Basidia 10–22 × 4–5 μm. Spores ellipsoid to subcylindrical, often somewhat curved, 5–7(–7.5) × 2.5–3.5 μm. On angiosperms.
Distr.: Eur., USSR. Ref.: 304, 406.
T. effugiens (Bourd. & Galz.) Oberw. 1965

6a. Cystidia 50–150 × 7–15 μm, conical, not or weakly amyloid. Spores cylindrical, slightly curved, 6–7.5(–9) × 1.5–2.5 μm.
Basidiocarp effused, submembranaceous. Hymenial surface hispid, white to cream-coloured. Hyphae thin- to somewhat thick-walled, 2–4 μm wide. Cystidia with capillary lumen which expands abruptly at the apex. Basidia 12–20 × (3–)4–5 μm, often with thickened walls.
Distr.: whole area. Ref.: 304, 406.
T. subulatus (Bourd. & Galz.) Donk 1956

6b. Cystidia 40–75(–90) × (3–)4–6.5(–7) μm, cylindrical, acute, not amyloid. Spores cylindrical, slightly curved, 6–9 × 2–2.5(–2.8) μm.
Basidiocarp effused, very thin. Hymenial surface hispid, white to pale ochraceous. Hyphae thin- to slightly thick-walled, 2–4(–5) μm wide. Cystidia with capillary lumen which expands abruptly at the apex. Basidia 8–20 × 4–5.5(–5.8) μm, with slightly thickened walls.
Distr.: Eur., N. Am. Ref.: 304, 406.
T. hirtellus (Bourd. & Galz.) J. Erikss. 1958

7a. Spores globose or ellipsoid to subcylindrical, up to twice as long as wide. 8
7b. Spores narrowly cylindrical, often curved, at least (2.5–)3 times as long as wide. 13

8a. Cystidia with distinct apical bulb, not or very weakly amyloid. 9
8b. Cystidia without apical bulb, but lumen widened toward the apex; distinctly amyloid. 12

9a. Spores at least 5 μm long. 10
9b. Spores up to 5 μm long. 11

10a. Cystidia directly under bulb 0.5–1.5(–2) μm wide. Spores subglobose to ellipsoid, 5–6.5 × 3–4.5 μm.

Basidiocarp effused, pruinose, very thin. Hymenial surface even to minutely reticulate, hispid, hyaline, whitish or greyish. Hyphae with thin to thickened walls, 1.5–3(–3.8) μm wide. Cystidia 35–65 (–70) × (1.5–)2–3.5 μm, apical bulb up to 7 μm wide, not or very weakly amyloid. Basidia clavate or stalked, 8–18 × 4–6 μm.

Distr.: Eur., N. Am. Ref.: 304, 405, 406.

T. sceptriferus (H.S. Jacks. & Weresub apud Weresub) Donk 1956

10b. Cystidia directly under bulb 3.5–7 μm wide. Spores ellipsoid, 7–9 × 4–5.5 μm.

Basidiocarp effused, crustaceous, very thin. Hymenial surface even, hispid, whitish. Hyphae with thin to thickened walls, 2–4.3 μm wide. Cystidia 90–150 × (5.5–)7–9(–10) μm, apical bulb up to 14(–16) μm wide, not amyloid. Cystidia occasionally without apical bulb, 90–150 × 7–9 μm. Basidia clavate to cylindrical, 18–22 × 6–7.5 μm.

Distr.: N. Am. Ref.: 304.

T. regificus (H.S. Jacks. & Dearden) Donk 1956

11a. Spores ellipsoid, (3–)3.5–5(–5.5) × 2–3.5(–3.8) μm.

Basidiocarp effused, submembranaceous, very thin. Hymenial surface even to minutely reticulate, hispid, whitish to greyish or cream-coloured. Hyphae with thin or slightly thickened walls, 2–3 μm wide. Cystidia 40–80 × (3–)3.5–5.5 μm, apical bulb up to 10 μm wide. Basidia clavate, 7–12 × 3.5–5 μm.

Distr.: whole area. Ref.: 405, 406.

T. accedens (Bourd. & Galz.) Donk 1956

11b. Spores globose to broadly ovoid, 3.2–4.3 μm in diam. or 4–5 × 3.5–4.5 μm.

Basidiocarp effused, submembranaceous, very thin. Hymenial surface reticulate, white to yellowish, hispid. Hyphae thin-walled, 2–3 μm wide. Cystidia 40–65 × 3–5 μm, apical bulb up to 8 μm wide. Basidia clavate or stalked, 6–10 × 4–5 μm.

Distr.: Eur. Ref.: 304, 406.

T. thermometrus (G.H. Cunn.) M.P. Christ. 1960

12a. Spores globose to subglobose, 4–5 μm wide.

Basidiocarp effused, thin. Hymenial surface even, hispid, whitish to light greyish. Hyphae thin-walled, 2.5–4 μm wide. Cystidia cylindrical, bi-rooted, upper part not expanded, 90–120 × 5–7 μm, distinctly amyloid. Basidia narrowly clavate, 13–15 × 5–7 μm. On gymnosperms.

Distr.: Eur., N. Am. Ref.: 162.

T. globisporus K.-H. Larsson & Hjortstam apud Hjortstam & K.-H. Larsson 1978

12b. Spores ellipsoid to subcylindrical, often curved, (4–)5–6(–7) × 2–2.5 μm.

Basidiocarp effused, very thin. Hymenial surface even, hispid, whitish to greyish or pale ochraceous. Hyphae with thin to thickened walls, 2–3(–4) μm wide. Cystidia cylindrical, 50–80 × (4–)5–8(–10) μm, thick-walled, apically thin-walled but hardly widened, distinctly amyloid. Basidia clavate, often basally somewhat thick-walled, 10–15 × 4–6 μm.

Distr.: Eur., USSR. Ref.: 304, 406.

T. borealis J. Erikss. 1958

13a. Cystidial wall apically asymmetrically thickened.

Basidiocarp effused, thin, soft membranaceous. Hymenial surface even to somewhat reticulate, white to pale ochraceous, hispid. Hyphae with thin to thickened walls, 2–4(–5) μm wide. Cystidia cylindrical, 45–100(–150) × (4.5–)5–8(–8.5) μm, amyloid, often somewhat encrusted. Basidia clavate, somewhat thick-walled, 8–18 × (3–)4–5(–5.5) μm, amyloid, in clusters. Spores cylindrical, curved, (4.5–)5.5–7.5 × (1.5–)2–2.5(–3) μm.

Distr.: whole area. Ref.: 304, 405, 406.

T. calothrix (Pat.) Donk 1956

Syn.: *?Peniophora pirina* (Bourd. & Galz.) Bourd. & Galz. 1928; *?P. delectans* Overholts 1934.

13b. Cystidial thickenings symmetrical. 14

14a. Spores ellipsoid to subcylindrical, often curved, (4–)5–6(–7) × 2–2.5 μm. *T. borealis*, see 12b.

14b. Spores cylindrical, up to 2 μm wide, usually larger. 15

15a. Cystidia with apical bulb up to 11 μm wide.

Basidiocarp effused, pruinose to membranaceous. Hymenial surface even, hispid, white to cream-coloured or greyish. Hyphae with thin to slightly thickened walls, 2–3 μm wide. Cystidia 50–100 × (3.5–)5–8(–9) μm, weakly amyloid. Basidia clavate to cylindrical, sometimes with thickened walls, 7–15(–18) × 3.5–5 μm. Spores (4–)5–7(–8.5) × (1–)1.5–2 μm, narrowly cylindrical, curved.

Distr.: whole area. Ref.: 304, 405, 406.

T. juniperinus (Bourd. & Galz.) Donk 1956

Syn.: *Tubulicrinis sororius* (Bourd. & Galz.) Oberw. 1965

15b. Cystidia without apical bulb. 16

16a. Spores cylindrical, often curved, (7–)8–10(–11) × 1.5–2(–2.2) μm. Cystidia cylindrical, 50–100(–135) × 3–6 μm, faintly amyloid.
Basidiocarp effused, ceraceous, waxy pruinose. Hymenial surface even to reticulate, hispid, whitish to greyish. Hyphae with thin to thickened walls, 2–3 μm wide. Basidia subclavate, 9–17(–25) × (3.5–)4–5 μm.
Distr.: Eur., N. Am. Ref.: 304, 406.
T. angustus (D.P. Rogers & Weresub apud Weresub) Donk 1956

16b. Spores narrowly cylindrical, often curved, (5–)6–8.5(–9) × (1–)1.5–2 (–2.2) μm. Cystidia 5–12 μm wide.
Basidiocarp effused, thin, ceraceous to membranaceous. Hymenial surface even to reticulate, hispid, white to cream-coloured or pale ochraceous. Hyphae thin- to thick-walled, 2–3.5(–4) μm wide. Basidia subclavate, often with thickened walls, (7–)10–20(–25) × 3–5 μm, often amyloid. *T. glebulosus* complex. 17

17a. Cystidial lument gradually expanding toward the apex. Cystidia 50–100 × 5–9 μm, amyloid.
Distr.: whole area. Ref.: 304, 406.
T. medius (Bourd. & Galz.) Oberw. 1965
Syn.: *?Tubulicrinis orientalis* Parm. 1967

17b. Cystidial lumen abruptly expanding toward the apex. 18

18a. Expanded part of lumen more or less globose, about as long as wide. Cystidia 60–120 × 5.5–12 μm, amyloid.
Distr.: Eur., N. Am. Ref.: 406.
T. propinquus (Bourd. & Galz.) Donk 1956

18b. Expanded part of lumen cylindrical. Cystidia 60–170 × 6–12 μm, faintly or distinctly amyloid.
Distr.: whole area. Ref.: 304, 406.
T. glebulosus (Bres.) Donk 1956
Syn.: *Peniophora gracillima* Ellis & Everh. ex D.P. Rogers & H.S. Jacks. 1943

TYLOSPORA Donk 1960

Syn.: *Tylosperma* Donk 1957, non ~ Botsch. 1952

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even, pale coloured. Hyphal system monomitic. Hyphae hyaline to pale yellowish, thin- to somewhat thick-walled, cylindrical, with clamps. Cystidia lacking. Basidia hyaline, narrowly clavate, with a basal clamp, (2–)4-spored.

Spores hyaline, triangular of irregularly shaped, smooth or covered with warts, thin-walled, not amyloid.

Substrate: on wood of angiosperms and gymnosperms, plant debris and soil.
Type species: *Corticium trigonospermum* Bres. 1905
Distribution: in the whole area.
References: 66, 186.

1a. Spores of triangular shape, the surface smooth, 4–5.5 × 4–5 μm.
Basidiocarp soft membranaceous. Hymenial surface even, whitish to cream-coloured. Hyphae pale yellowish, somewhat thick-walled, 3.5–4.5 μm wide, with clamps, loosely covered with small granules. Basidia 20–25 × 4–6 μm.
Distr.: whole area. Ref.: 66, 186.
T. asterophora (Bon.) Donk 1960
Syn.: *Corticium trigonospermum* Bres. 1905

1b. Spores of irregular shape, the surface with warts, 6–7 × 5–6 μm.
Basidiocarp soft membranaceous. Hymenial surface even, whitish to cream-coloured. Hyphae hyaline to pale yellowish, somewhat thick-walled, 3.5–5 μm wide, with clamps, the surface often granular. Basidia 20–25 × 5–6 μm.
Distr.: Eur., N. Am. Ref.: 66, 186.
T. fibrillosa (Burt) Donk 1960

VARARIA P. Karst. 1903

Syn.: *Asterostromella* Höhn. & Litsch. 1907
Incl.: *Dichostereum* Pilát 1926

Basidiocarp annual or perennial, resupinate, effused, tomentose. Hymenial surface even, tuberculate or rarely poroid, often farinaceous; margin distinct or not, sometimes rhizomorphic. Hyphal system monomitic. Generative hyphae hyaline, thin-walled, with or without clamps. Dichohyphidia in hymenium and subiculum, hyaline to yellowish brown, thick-walled, dextrinoid. Gloeocystidia often present, sometimes sulpho-positive. Basidia not forming a continuous hymenium, utriform to cylindrical, with (2–)4 sterigmata. Spores hyaline, thin- to somewhat thick-walled, smooth or ornamented with warts or ridges, globose to navicular or fusoid, amyloid or not.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Radulum investiens* Schw. 1832
References: 123, 321, 398.
Distribution: in the whole area.

1a. Spores globose to ellipsoid, up to twice as long as broad. 2
1b. Spores cylindrical, navicular or fusoid, at least twice as long as broad. 7

2a. Spores ornamented, amyloid. Gloeocystidia sulpho-positive. 3

2b. Spores smooth, not amyloid. Gloeocystidia sulpho-negative or absent. (When spores smooth and amyloid, cf. *Scytinostroma*.) 5

3a. Spores ellipsoid in side view, (4.5–)5–5.5(–6) × 3–4 μm, with small warts and ridges.

Basidiocarp annual or perennial. Hymenial surface even to papillose or grandinioid, cream to ochraceous. Hyphae 2–2.5 μm wide. Dichohyphidia abundant, branches up to 4 μm wide. Gloeocystidia cylindrical to fusoid, 15–35(–60) × 4–6 μm. Basidia 15–30 × 3.5–5 μm.

Distr.: whole area. Ref.: 123, 321, 398.

V. granulosa (Fr.) Laurila 1939

3b. Spores globose to subglobose, typically larger. 4

4a. Gloeocystidia 60–140 × 5–12 μm. Dichohyphidia often rare in hymenium.

Basidiocarp effused. Hymenial surface even, pale buff to cinnamon buff. Hyphae 2–3 μm wide. Branches of dichohyphidia up to 2 μm wide. Basidia 25–45 × 5–6 μm. Spores globose to subglobose, with ridges, (5.5–)6–8 × 5.5–7 μm.

Distr.: Eur., N. Am. Ref.: 123, 321, 398.

V. effuscata (Cooke & Ellis) D.P. Rogers & H.S. Jacks. 1943

4b. Gloeocystidia smaller, 2–6(–7) μm wide. Dichohyphidia abundant in hymenium.

Basidiocarp effused, up to 1 mm thick. Hymenial surface even to slightly warted, honey-yellow. Margin and subiculum darker. Hyphae 2–3 μm wide. Dichohyphidial branches up to 2 μm wide. Basidia up to 60 × 3.5–6 μm. Spores globose to subglobose, with distinct warts or ridges, (5.5–)6–7.5 × 5.5–6.5 μm.

Distr.: N. Am. Ref.: 123, 398.

V. pallescens (Schw.) D.P. Rogers & H.S. Jacks. 1943

Syn.: *?Thelephora insinuans* Schw. 1832; *?Corticium sordulentum* Cooke & Massee 1888; *?Corticium thelephoroides* Ellis & Everh. 1885

Note: The insufficiently known *Asterostromella dura* Bourd. & Galz. differs mainly in the minutely ornamented spores (and lack of gloeocystidia?). Distr.: Eur., ? N. Am.

5a. Spores globose, 7–7.5 μm in diam. Basidia 40–45 × 6–7.5 μm.

Basidiocarp effused. Hymenial surface even, cream-coloured to pale ochraceous; margin similar or sometimes rhizomorphic. Branches of dichohyphidia up to 4 μm wide. Gloeocystidia 3–5 μm wide.

Distr.: N. Am. Ref.: 123.

V. sphaericospora Gilberts. 1965

5b. Spores subglobose to ovoid, up to 5 μm long. Basidia up to 30 × 5 μm. 6

6a. Clamps absent. Spores subglobose to ovoid, 2.7–3.7 × 2.2–2.7 μm. Gloeocystidia 20–70 × 6–18 μm.

Basidiocarp effused. Hymenial surface even, cream-coloured to pale ochraceous. Hyphae 1–3 μm wide. Branches of dichohyphidia 3–5(–8) × 2–3 μm. Basidia 10–20 × 3–4.5 μm.
Distr.: Eur., USSR. Ref.: 321.
V. ochroleuca (Bourd. & Galz.) Donk 1930

6b. Clamps present. Spores broadly ellipsoid to ovoid, 4–5 × (2.8–)3–3.7 μm. Gloeocystidia 15–20 × 4–6 μm, or absent.
Basidiocarp effused. Hymenial surface even, whitish to yellowish. Hyphae 1.5–3 μm wide. Branches of dichohyphidia 4–10 × 1.5–3 μm. Basidia 20–30 × 3.5–5 μm.
Distr.: USSR. Ref.: 321.
V. vassilievae Parm. 1965

7a. Spores up to 11 μm long. 8
7b. Spores at least 11 μm long. 10

8a. Clamps present. Spores fusiform, widest in the middle, acute or rarely filiform at the ends, 8–11(–12) × 2.7–4.5 μm, with amyloid supra-hilar plage.
Basidiocarp effused. Hymenial surface even to warted, cream-coloured to pale ochraceous or bright yellow. Hyphae 2–2.5 μm wide. Gloeocystidia subcylindrical to fusoid, 40–80 × 4–8 μm. Basidia 24–55 × 3.5–6.5 μm.
Distr.: whole area. Ref.: 123, 321, 398.
V. investitiens (Schw.) P. Karst. 1898
Syn.: *Corticium alutarium* Berk. & Curt. 1873; *Thelephora subochracea* Peck 1893
Note: The description is after European material. American authors give deviating spore dimensions; Gilbertson (123): 7–8.5 × 3–3.5 μm, and Welden (398): 13–14(–21) × 3.5–4.5 μm.
8b. Clamps absent. Spores cylindrical to fusiform, not amyloid. 9

9a. Spores cylindrical, (5–)6–8 × 2–3 μm. Ultimate dichohyphidial branches short. Gloeocystidia with thickened walls. N. Am.
Basidiocarp effused. Hymenial surface even, cream-coloured to pale ochraceous. Hyphae 2–3 μm wide. Gloeocystidia broadly cylindrical, often swollen in the middle, mucronate, up to 10 μm wide. Basidia 25–30 × 3.5–4 μm.
Distr.: N. Am. Ref.: 123, 321.
V. racemosa (Burt) D.P. Rogers & H.S. Jacks. 1943
9b. Spores narrowly ovoid to fusoid, 8–11 × 3.2–4.5 μm. Ultimate dichohyphidial branches relatively long. Gloeocystidia thin-walled. Eur.
Basidiocarp effused. Hymenial surface whitish to cream-coloured. Hyphae 2–3 μm wide. Gloeocystidia 19–28 × 4–5.3 μm. Basidia 18–32 × 4–7.5 μm.
Distr.: Eur. Ref.: 321.
V. gallica (Bourd. & Galz.) Bond. 1953

10a. Clamps absent. Spores 16–22 × 2.5–3.5 μm, narrowly fusoid.
Basidiocarp effused. Hymenial surface even, whitish to pale ochraceous. Hyphae 2–2.5 μm wide. Dichohyphidia thin, main branch up to 2 μm wide, ultimate branches very thin and slender. Gloeocystidia abundant, 13–25 × 4–5.5 μm. Basidia 20–30 × 4–5 μm.
Distr.: N. Am. Ref.: 123, 321.
V. phyllophila (Massee) D.P. Rogers & H.S. Jacks. 1943

10b. Clamps present at nearly all septa. Spores up to 16 μm long. 11

11a. Spores amygdaliform or cylindrical and curved at the apiculate end, (11–)12–14(–16) × 4–4.5 μm. Dichohyphydia thin-walled, with many, but short branches, forming clusters.
Basidiocarp effused, mealy. Hymenial surface even, whitish to buff. Hyphae 1–2.5 μm wide. Gloeocystidia sulpho-negative, with thin to thickened walls, fusiform, ventricose below, often ovoid and mucronate, 25–35 × 5–13(–16) μm. Basidia 25–40(–47) × 4–6 μm.
Distr.: N. Am. Ref.: 123, 398.
V. pectinata (Burt) D.P. Rogers & H.S. Jacks. 1943

11b. Spores lacrimiform, 11–16 × 3–5 μm. Dichohyphidia thick-walled, with long branches which may be several times short dichotomously branched near the apex.
Basidiocarp effused, tomentose. Hymenial surface even, pale ochraceous buff to pinkish buff. Hyphae 1–3 μm wide. Gloeocystidia with thin or somewhat thickened walls, clavate, often with apical bulb, 28–40 × 4–9 μm. Basidia utriform, 40–45 × 5.5–6 μm.
Distr.: N. Am. Ref.: 112.
V. athabascensis Gilberts. 1970

VESICULOMYCES Hagström 1977

Basidiocarp annual, resupinate, effused, membranaceous. Hymenial surface even to tuberculate, sometimes becoming rimose when dry, whitish to yellow or ochraceous. Hyphal system monomitic. Hyphae hyaline, thin-walled, without clamps. Gloeocystidia sulpho-negative, vesicular to sometimes flexuous-cylindrical. Basidia clavate, with 4 sterigmata. Spores hyaline, thin-walled, smooth, globose to subglobose, amyloid.

Substrate: saprophytic on wood of angiosperms and gymnosperms.
Type species: *Thelephora citrina* Pers. 1822
Distribution: in the whole area.
References: 148.

Monotypic. Basidiocarp effused, adnate, up to 500(–800) μm thick, membranaceous. Hymenial surface even to tuberculate, whitish to distinctly yellow, becoming ochraceous when dry. Hyphae thin-walled, 1.5–3 μm wide. Gloeocystidia in subiculum vesicular, 40–70 × 10–20

μm, in hymenium clavate to flexuous-cylindrical or rarely fusiform, 45–80 × 6–9 μm. Basidia clavate, 30–50 × 5–7 μm. Spores globose to subglobose, (4–)5–7 μm in diam. or 6–8 × 5–6.5 μm.
Distr.: whole area. Ref.: 66, 114, 148.
V. citrinum (Pers.) Hagström 1977
Syn.: *Thelephora radiosa* Fr. ex Pers. 1822; *Gloeocystidium alutaceum* (Schrad.) ex Bres. 1897

VUILLEMINIA Maire 1902

Basidiocarp annual, resupinate, effused, ceraceous to somewhat gelatinous, developing on decorticated wood or under the bark, which finally curves back. Hymenial surface even, greyish, cream-coloured, reddish brown and often with a violaceous tinge. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps. Hyphidia present, simple. Basidia utriform to clavate, large. Spores hyaline, ellipsoid to typically cylindrical and curved, thin-walled, smooth, not amyloid.

Substrate: saprophytic on undecayed wood of angiosperms.
Type species: *Thelephora comedens* Nees ex Fr. 1821
Distribution: in the whole area.
References: 66.

Monotypic. Basidiocarp ceraceous to somewhat gelatinous. Hymenial surface cream-coloured, greyish or reddish brown, often with a violaceous tinge. Hyphae hyaline, 1–3 μm wide, with clamps. Hyphidia numerous, hyaline, unbranched. Basidia utriform to clavate, 60–100 (–180) × 9–14 μm. Spores typically cylindrical and curved, rarely ellipsoid, (12–)14–21(–24) × 5–7.5 μm.
Distr.: whole area. Ref.: 66.
V. comedens (Nees ex Fr.) Maire 1902
Syn.: *Thelephora decorticans* Pers. 1822; *Vuilleminia megalospora* Bres. 1926

XENASMA Donk 1957

Incl.: *Xenasmatella* Oberw. 1965

Basidiocarp annual, resupinate, effused, ceraceous to gelatinous, more rarely membranaceous, typically indistinct when dry. Hymenial surface even, sometimes pruinose or pulverulent. Hyphal system monomitic. Hyphae hyaline, thin-walled, with clamps, walls often gelatinized. Cystidia, cystidioles or gloeocystidia may be present. Basidia more or less cylindrical, usually pleurobasidious, with (2–)4(–6) sterigmata. Spores hyaline, thin- or slightly thick-walled, smooth or ornamented, globose to ovoid, ellipsoid, cylindrical or allantoid, amyloid or not. Ornamentation of some species soluble in KOH.

Substrate: saprophytic on decayed wood of angiosperms and gymnosperms, rarely on humus.
Type species: *Corticium rimicola* P. Karst. 1896
Distribution: in the whole area.
References: 66, 241, 303.
Note: The genus is here accepted in a broad sense. The delimitation to some species of *Trechispora* is not yet clear.

1a. Spores amyloid. 2
1b. Spores not amyloid. 5

2a. Spores distinctly allantoid. 3
2b. Spores ellipsoid to slightly curved. 4

3a. Basidia 6–12 × 4–6 μm, encrusted with yellowish granular material, soluble in KOH. Hymenial surface olive brown.
Basidiocarp gelatinous, up to 30 μm thick. Hyphae 1.5–3 μm wide, with gelatinized walls. Spores allantoid, 5–7 × (1.5–)2–3 μm.
Distr.: Eur., N. Am. Ref.: 241, 303.
X. lloydii Liberta 1960

3b. Basidia 5–10 × 3–5 μm, not encrusted. Hymenial surface greyish blue to ochraceous grey.
Basidiocarp gelatinous. Hyphae (0.5–)1–2(–2.5) μm wide, with gelatinized walls. Spores allantoid, 5–6 × 1.5–2(–2.5) μm.
Distr.: Eur. Ref.: 303.
Xenasmatella allantospora Oberw. 1965

4a. Spores ellipsoid to slightly curved, 4–5 × 2–3 μm.
Basidiocarp gelatinous. Hymenial surface greyish white to bluish grey, sometimes greyish ochraceous. Hyphae (0.5–)1–2.5(–3) μm wide, with gelatinized walls. Basidia 5–10(–14) × 4–5 μm.
Distr.: Eur., N. Am. Ref.: 241, 303.
X. grisellum (Bourd. & Galz.) Liberta 1960
Syn.: *Corticium pruina* Bourd. & Galz. 1928; *C. sebacinaeforme* Bourd. & Galz. 1928; *C. sublilascens* Litsch. 1928

4b. Spores ellipsoid to slightly curved, 5.5–7 × 2.5–3.5 μm.
Basidiocarp gelatinous. Hymenial surface greyish to bluish grey. Hyphae 1–2.5 μm wide, with gelatinized walls. Basidia 10–16 × 4–5 μm.
Distr.: N. Am. Ref.: 175, 241, 303.
X. rallum (H.S. Jacks.) Liberta 1960

5a. Cystidia and/or cystidioles present. 6
5b. Cystidia and cystidioles absent. 11

6a. Spores smooth, cylindrical to allantoid, 5.5–8 × 1.5–2.5 μm. Cystidia apically whip-like elongated.
Basidiocarp ceraceous to gelatinous. Hymenial surface whitish to greyish blue. Hyphae 1–2(–3) μm wide, smooth or slightly encrusted.

Cystidia basally cylindrical, becoming abruptly narrowed to a filiform end, 20–60 × 3–5 μm, projecting up to 45 μm, the basal part encrusted. Basidia narrowly cylindrical, 10–20 × 3–4 μm.
Distr.: Eur. Ref.: 66, 303.
X. subcalceum (Litsch.) Oberw. 1965

6b. Spores warted, ornamentation soluble in KOH. 7

7a. Spores globose, warted, 5.5–7.5 μm in diam. Cystidia thin-walled, clavate, cylindrical or subulate, 40–60 × 6–10 μm, some with 1–3 apical bulbs.
Basidiocarp effused, membranaceous. Hymenial surface even, cream-coloured to ochraceous. Hyphae hyaline, 2–3 μm wide. Basidia narrowly clavate to suburniform, often pleurobasidious, 25–35 × 6–7 μm.
Distr.: N.Am. Ref.: 164, 175
Xenasmatella inopinata (H.S. Jacks.) Hjortstam & Ryv. 1979

7b. Spores ellipsoid. Cystidia sometimes capitate, but never with several apical bulbs. 8

8a. Basidia with (3–)4–6(–7) sterigmata. 9
8b. Basidia with (2–)4 sterigmata. 10

9a. Spores ellipsoid, warted, 5–7 × 3–4 μm. Cystidia typically capitate, often with 3–5 blunt lobes at the apex, 20–60 × 2–4(–6) μm.
Basidiocarp gelatinous. Hymenial surface whitish grey to bluish grey. Hyphae 1–3 μm wide, with gelatinized walls. Cystidia cylindrical, basally with thickened walls, (30–)40–100 × 5–10 μm, often biradicate. Basidia cylindrical, 10–25 × 6–8 μm.
Distr.: whole area. Ref.: 174, 241, 303.
X. pruinosum (Pat.) Donk 1957
Syn.: *Peniophora chordalis* Höhn. & Litsch. 1906; *P. subgelatinosa* Litsch. 1928

9b. Spores ellipsoid, warted, 5.5–9 × (3.5–)4–6(–7.5) μm. Cystidia typically capitate, but never lobed, 10–30 × 3–6 μm.
Basidiocarp gelatinous. Hymenial surface whitish to bluish grey. Hyphae 1.5–4 μm wide, with gelatinized walls. Cystidia cylindrical, basally with thickened walls, 50–125 × 5–15 μm, often biradicate. Basidia cylindrical, 15–25(–30) × 6–8.5 μm.
Distr.: Eur., N. Am. Ref.: 174, 241, 303.
X. praeteritum (H.S. Jacks.) Donk 1957

10a. Cystidia cylindrical to slightly subulate, basally thick-walled and often widened, 50–125 × 5–15 μm, often biradicate. Cystidioles cylindrical to capitate, 25–37 × 2–4(–5) μm.
Basidiocarp gelatinous. Hymenial surface bluish grey to ochraceous. Hyphae 1.5–3 μm wide, with gelatinized walls. Basidia cylindrical, (10–)15–25(–30) × (5–)6–8 μm. Spores ellipsoid, warted, (6–)7–10.5 × (3.5–)4–7 μm.

Distr.: whole area. Ref.: 174, 241, 303.
X. rimicola (P. Karst.) Donk 1957

10b. Cystidia thin-walled, cylindrical to capitate, 15–37 × 3–4 μm, apical bulb up to 6 μm wide.
Basidiocarp gelatinous. Hymenial surface whitish to bluish grey. Hyphae 1.5–3.5 μm wide, with gelatinized walls. Basidia cylindrical, 15–40 × 5–8 μm. Spores ellipsoid, warted, 8–12 × 4.5–6 μm, warts spirally arranged around the spore.
Distr.: whole area. Ref.: 158, 174, 241, 303.
X. pulverulentum (Litsch.) Donk 1957

11a. Spores smooth. 12
11b. Spores warted, ornamentation not or hardly soluble in KOH. 14

12a. Spores narrowly ovoid to fusoid, 5.5–7 × 1.5–2 μm.
Basidiocarp ceraceous to gelatinous. Hymenial surface pale grey. Hyphae 1–2 μm wide, becoming gelatinized. Basidia cylindrical, 7–8 × 3.5 μm.
Distr.: N. Am. Ref.: 248.
X. gaspesicum Liberta 1966
12b. Spores ovoid to ellipsoid, at least 3 μm broad. 13

13a. Basidia cylindrical, 10–26 × (4–)5–7.5(–8) μm.
Basidiocarp ceraceous to gelatinous, up to 400 μm thick. Hymenial surface whitish grey to ochraceous. Hyphae 1.5–4(–5) μm wide. Spores ovoid to narrowly ellipsoid, 5–10.5 × 3–5 μm.
Distr.: whole area. Ref.: 241, 303.
X. filicinum (Bourd.) M.P. Christ. 1960
Syn.: *Corticium pseudotsugae* Burt 1926; *C. asseriphilum* Litsch. 1934
13b. Basidia cylindrical, 8–14 × (4.5–)5–7 μm.
Basidiocarp gelatinous, up to 30 μm thick. Hymenial surface hyaline to whitish grey. Hyphae 1.5–4(–5) μm wide, with gelatinized walls. Spores ovoid to ellipsoid, 5–7(–7.5) × 3.5–4.5(–5) μm.
Distr.: whole area. Ref.: 241, 303.
X. subnitens (Bourd. & Galz.) Liberta 1960

14a. Spores at least 3 μm broad. 15
14b. Spores up to 3 μm broad. 16

15a. Spores globose to ovoid, 3.5–6 × 3–6 μm, more rarely ellipsoid, 5–6 × (3–)3.5–4 μm, warted. Basidia 9–17(–20) × 5–8 μm.
Basidiocarp ceraceous to gelatinous. Hymenial surface even or minutely reticulate, rarely raduloid, whitish grey, bluish grey or ochraceous. Hyphae 1–3 μm wide, with gelatinized walls.
Distr.: whole area. Ref.: 241, 303.
X. tulasnelloideum (Höhn. & Litsch.) Donk 1957

Syn.: *Corticium incanum* Burt 1926

Note: *Xenasmatella decipiens* Hjortstam & Ryv. 1979 also keys out here. It differs in the membranaceous to slightly crustaceous basidiocarp and the slightly thick-walled, globose spores, 5–6 μm in diam. Distr.: Eur. Ref.: 164.

15b. Spores ellipsoid, (5–)5.5–7 × 3–4 μm, coarsely warted. Basidia 7–13 × 5–6 μm.

Basidiocarp ceraceous to gelatinous. Hymenial surface even, bluish grey. Hyphae 1.5–3 μm wide, with gelatinized walls.

Distr.: N. Am. Ref.: 246.

X. californicum Liberta 1965

16a. Spores ovoid to ellipsoid, warted to echinulate, 4–5 × 2.5–3 μm.

Basidiocarp ceraceous. Hymenial surface hyaline to whitish. Hyphae 1–3 μm wide, with gelatinized walls. Basidia cylindrical to clavate, (8–)10–14 × (3.5–)4–5 μm.

Distr.: Eur. Ref.: 241.

X. tenuiculum (Litsch.) J. Erikss. 1958

Note: Contrary to Liberta (241), Oberwinkler (303) found no pleurobasidia in the type specimen.

16b. Spores ellipsoid to slightly curved, warted. Hyphal strands often present. 17

17a. Most spores only warted at the abaxial (convex) side, ellipsoid to slightly curved, 4–6 × 2–3 μm.

Basidiocarp gelatinous. Hymenial surface whitish grey, bluish grey or ochraceous. Hyphae 1–2.5(–3) μm wide. Basidia 9–12(–14) × 4–5(–6) μm.

Distr.: Eur. Ref.: 303.

X. subflavido-grisea (Litsch.) Parm. 1968

17b. Spores completely covered with warts, ellipsoid to slightly curved, 4–4.5 × 2–2.5 μm.

Basidiocarp ceraceous to gelatinous. Hymenial surface greyish to bluish grey. Hyphae 1–2.5 μm wide, with gelatinized walls. Basidia 8.5–13(–15) × 4.5–6 μm.

Distr.: N. Am. Ref.: 175, 241, 303.

X. insperatum (H.S. Jacks.) Donk 1957

XENOSPERMA Oberw. 1965

Basidiocarp annual, resupinate, effused, pruinose to ceraceous-crustaceous, adnate. Hymenial surface even, whitish. Hyphal system monomitic. Hyphae hyaline, thin-walled, more or less distinct, with gelatinized walls and clamps. Sterile hymenial structures absent. Basidia typically pleurobasidious, cylindrical to subclavate, with two stout, curved sterigmata. Spores hyaline, pyramidal (turbinate), thin-walled, not amyloid.

Substrate: saprophytic on decayed wood or bark.

Distribution: Europe, North America.
Type species: *Xenasma ludibundum* D.P. Rogers & Liberta 1962
References: 303.

Monotypic. Basidiocarp effused, closely adnate, up to 30 μm thick, pruinose to ceraceous-crustaceous. Hymenial surface even, whitish. Hyphae hyaline, thin-walled, 1–3 μm wide. Basidia cylindrical to subclavate, bifurcate at the base, 6.5–10.5 × 5–8 μm, with two sterigmata up to 10.5 μm long. Spores hyaline, pyramidal, 5–9 × 4.5–8 μm.
Distr.: Eur., N. Am. Ref.: 241, 303.
X. ludibundum (D.P. Rogers & Liberta) Oberw. 1965

XYLOBOLUS P. Karst. 1881

Basidiocarp annual or typically perennial, resupinate, effused, effused-reflexed or flabelliform, coriaceous to corky. Abhymenial surface (when exposed) felty or tomentose, often concentrically zoned. Hymenial surface even or somewhat tuberculate, pale coloured, often cracked. Hyphal system seemingly dimitic. Generative hyphae hyaline to brownish, thin- to thick-walled, clamps absent or rare (except one tropical species with abundant clamps). Acanthohyphidia present, hyaline to brownish, with thin to thick walls. Cystidia and/or gloeocystidia present or absent, hyaline to pale brown, with thin to thickened walls, sometimes encrusted or with yellowish contents. Cystidioles often present. Basidia clavate to nearly cylindrical, in small clusters, with (2–)4 sterigmata. Spores hyaline, thin-walled, smooth, ellipsoid to cylindrical, amyloid.

Substrate: saprophytic on wood of angiosperms.
Types species: *Stereum frustulosum* Fr. 1838
Distribution: in the whole area.
References: 10, 182.

1a. Spores ellipsoid to subcylindrical, rarely cylindrical, 6–9 × 2.5–4 μm. Basidiocarp effused or usually effused-reflexed to flabelliform, coriaceous. Abhymenial surface tomentose to hirsute, pale to dark brown, blackish when old, often zoned. Hymenial surface pinkish yellow to purplish, often cracked. Skeletoid hyphae yellowish to dark brown, 4–6 μm wide, walls 1–2.5(–3) μm thick. Generative hyphae hyaline to yellowish, thin- to thick-walled, 3–7(–8) μm wide, without clamps. Acanthohyphidia cylindrical, thin- to thick-walled. Cystidia hyaline to pale brown, typically thick-walled, often with yellowish contents, up to 8 μm wide. Cystidioles present. Basidia clavate to cylindrical, 24–33(–40) × 5–7 μm.
Distr.: N. Am. Ref.: 62, 401.
X. illudens (Berk.) Boidin 1958
Syn.: *Stereum archeri* Berk. 1860; *S. pannosum* Cooke 1879; *S. spiniferum* Lloyd 1914; *S. zonarium* Lloyd 1917; *S. nitens* Lloyd 1922.

1b. Spores ellipsoid, up to 5.2 μm long 2

2a. Basal layer with hyphae parallel to the substrate absent. Basidiocarp at first tuberculiform, attached by a narrow base, becoming confluent, strongly cracked. Cystidia absent.

Hymenial surface even to slightly tuberculate, pale buff to avellaneous. Skeletoid hyphae yellowish to dark brown, 4–6 μm wide, walls up to 2 μm thick. Generative hyphae hyaline to yellowish, thin- to thick-walled, 3–5 μm wide. Acanthohyphidia hyaline to brownish, thin- to thick-walled. Gloeocystidia rare, sulpho-negative. Cystidioles often present. Basidia clavate to cylindrical, 16–35 × 3.5–5 μm. Spores ellipsoid, 3.5–5.2 × 2.5–3(–3.5) μm.

Distr.: whole area. Ref.: 178, 182, 234, 367.

X. frustulatus (Pers. ex Fr.) Boidin 1958

Syn.: *Thelephora sinuans* Pers. 1822; *Stereum frustulosum* Fr. 1838; *Th. perdix* Hartig 1878; *S. nummularium* Velen. 1922

2b. Basal layer with hyphae parallel to substrate present. Basidiocarp typically effused-reflexed, not consisting of numerous small confluent tubercules. Cystidia typically present, hyaline to yellowish brown, thick-walled, often somewhat encrusted.

Hymenial surface even or slightly plicate, sometimes cracked, light buff to ochraceous. Abhymenial surface tomentose to felty, pale to dark brown. Skeletoid hyphae yellowish to dark brown, 4–7 μm wide, walls up to 3 μm thick. Generative hyphae hyaline to yellowish, 3–5 μm wide, with thin or thickened walls. Acanthohyphidia hyaline to yellowish, thin- to thick-walled, sometimes rare. Cystidioles sometimes present. Basidia clavate to cylindrical, 18–30 × 3.5–5 μm. Spores ellipsoid, 4–4.8 × 2.5–3 μm.

Distr.: whole area. Ref.: 182, 234.

X. subpileatus (Berk. & Curt.) Boidin 1958

Syn.: *?Stereum cinereo-badium* Klotzsch 1843; *S. insigne* Bres. 1891; *Hymenochaete tjibodense* P. Henn. 1899; *S. sepium* Burt 1920; *?S. hiugense* Imazeki 1939

Note: The closely related, but imperfectly known *X. annosus* (Berk. & Br.) Boidin with a (sub)tropical distribution is also reported from North America.

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