Stereoid fungi - A world synopsis

Leif Ryvarden

Synopsis Fungorum 47

Fungiflora

In memory of Derek Reid – a pioneer in studies of stereoid fungi

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Content

INTRODUCTION

Stereoid fungi is a rather vague term and includes taxa with very different evolutionary background. The scope used in this manual includes species where the basidiocarps have a more or less smooth hymenophore and a distinct pileus on a sessile to stipitate basidiocarp.

The purpose of the book is to provide a tool for both amateurs and students. Stereoid genera and species are rather easy to recognize in nature and are thus, well adapted for starting a preliminary inventory of the mycota in restricted areas or for making small ecological studies. The provision of useable identification manuals is especially important in the tropical zone where there is an almost total lack of pertinent literature for almost any group of fungi!

To recruit new students to mycology and to stimulate interest for collecting and mapping of a mycota, it is necessary to develop tools to do so. This manual intend to be a contribution in achieving this.

This book is not 'scientific' (in a restricted sense) since it includes neither descriptions of new species nor new data based on sequencing. It is almost entirely a compilation of available knowledge supplemented with personal observations made during many years of fieldwork in over 80 different countries, the majority in the tropical zone.

Distribution

The distribution indicated for each species is, in most cases, given in rather general terms.
The reason for this is that the areas that have been surveyed are often vast and it is impossible to survey them completely – some have not been investigated at all. This is especially relevant for large areas in the tropical zone where collecting ever been done in a disjunct manner, covering widely scattered sites. Thus, almost all distribution maps really show only where mycologists have been, and do not the true distribution of species.

Based on experience in Europe, which has been rather well investigated mycologically, it will still be a great many years until any genuinely reliable information on fungal distribution is achieved for the tropical zone. The erratic occurrence of many species adds to the problem, since we are dependent on actually having to collect the basidiocarp to make a reliable determination.

Due to their physiology fungi need a good supply of water to produce a basidiocarp and, as all field mycologists know only too well, climatic conditions have to be just right for the production of basidiocarps. Thus, to make reliable record lists is necessary to return to the same area, often over a period of many years, in order.

In addition, many species are, in some manner, restricted in their ability to produce a basidiocarp e.g. they may require a certain type of substrate, or a particular host species or may even be dependent on the stage of decay of the substrate – again, these are all reasons which may be problematic in finding specimens with which to compile good inventories.
Many tropical areas are very difficult to access and expensive expeditions have to be arranged in order to arrive in remotes places. This further accentuates the difficulties of making inventories of fungi. Further still, many species have a tendency to occur erratically even if (to the human sense) conditions seem optimal. It is a well-established fact for most field mycologists, that in a particular year a species may be common and abundant, but will then not reappear for years.
The reasons for this are unknown! Possibly it is because ecological conditions are not right or it may be that it takes years for the fungus to accumulate sufficient resources to produce a basidiocarp. It may also be that the species has simply disappeared after having produced basidiocarps and consequently spores, and that a new supply of spores is then necessary to re-establish it. For all we know there may also be some kind of 'biological clock' at work. This phenomenon is well known and documented for insects and vascular plants, so why not also for fungi?

All this make it difficult and, at times, frustrating to register / record fungi to make an inventory. However, on the other hand, it is always a stimulating exercise since you are never certain about what you will find on a field trip.

Determinations
The author is interested in receiving specimens of stereoid species for determination. Specimens should preferably be duplicates, well dried and enclosed with a proper label showing the locality, substrate, date of collection, host (if possible), and collector. It should also be mentioned that a numbering system of some kind is necessary for making up a list of names to be returned the collector.
In Norway it is not necessary with any forms or papers to receive dried specimens for scientific studies, although this should be indicated on packet.
Send to Professor L. Ryvarden, Institute of biological sciences, Univ. of Oslo, P. O. Box 1066, Blindern, and N-0366 Oslo, Norway.

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Many persons have given information making this book possible. I am especially indebted to Drs. Karl-Henrik Larsson, James Ginns, Karen Nakasone and Scott Redhead who all answered questions and commented on lists of species or genera.
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In Africa I am indebted my PhD students from Uganda, Ethiopia and Zimbabwe who sent steroid specimens as well as poroid ones, which were their main interest. I am especially indebted to Professor A. Masuka, currently minister of Agriculture in Zimbabwe. I am also grateful to Professor T. Henkel of Humboldt University who invited me to join him in his fieldwork Cameroon. Professor C. Decock of Belgium and D. Mossebo from Cameroon have kindly sent specimens for determination.
The mycological staffs of the Kew Herbarium, London, New York Botanical Garden, Uppsala and Stockholm respectively, have been very helpful by sending type specimens or provided logistic help during my many visits to their institutions.

Illustrations

The drawings are of two types, partly by the late professor John Eriksson and taken from Corticiaceae of North Europe and partly by the author. The difference in quality is striking and even if John Eriksson is acknowledged for each of his drawings, there should be no doubt that those without signatures have been done by the author.
Not all species are illustrated partly because of space restrictions, but also since many species in some genera like *Podoscypha* have more or less that same microstructure, being separated by presence or absence of cystidia and size and shape of spores, which can as well be explained by words.
The colour pictures have different origin and hopefully they are all properly acknowledged to the correct photographer. If there are mistakes, I would be grateful for corrections.

‘

Main Key

1. Basidiocarp centrally, dorsally to laterally stipitate, ... **Key A**
1. Basidiocarp cupulate, effused reflexed to sessile..... **2**

2. Spores amyloid in Melzers reagent..... **Key B**
2. Spores non-amyloid in Melzers reagent ..... **Key C**

Key A

1. Hyphal system monomitic..... **2**
1. Hyphal system di- or trimitic **9**

2. Cystidia present and projecting beyond the basidia..... **3**
2. Cystidia absent or being immersed among the basidia **4**

3. Basidiocarps more or less centrally stipitate, light coloured, common species .....
.....**Cotylidia**
3. Basidiocarps dorsally attached, rusty brown, known only from New Guinea .....
.....**Payrodiscus**

4. Hyphae conspicuously inflated in the context, up to 25 µm wide or with coralloid hyphae in the stipe, rare species **5**
4. Hyphae straight and of normal width, 2-6 µm wide **6**

5. Hyphae of the context conspicuously inflated and up to 25 mm wide, stipe ochraceous and glabrous..... **Inflatostereum**
5. Hyphae of the context 2-4 mm wide, coralloid hyphae present in stipe, which is striate to finally velutinate and blackish ..... **Coralloderma**

6. Conidia present on the stipe, very rare genus from Borneo..... **Parastereopsis**
6. Conidia absent, widespread and common species..... 7

7. Basidiocarp white, obconical with widened round apex..... **Caripia**
7. Basidiocarps differently coloured, spatulate to centrally stipitate..... **8**

8. Minute species, rarely more than 10 mm long and 3-8 mm wide, parasitic on mosses or on the ground among algae ..... **Cyphellostereum**

8. Larger species, usually more than 2 cm high, laterally to centrally stipitate, on dead wood or roots..... **Stereopsis**
9. Gloeocystidia absent..... 1**0**
9. Gloeocystidia present 1**1**

10. Basidiocarp dark brown, funnel shaped up to 20 cm high, hyphal system trimitic, binding hyphae non-dextrinoid and basidiospores non-amyloid ....**Aquaschypha**
10. Basidiocarp tan to ochraceous, rarely above 4 cm high, hyphal system dimitic, binding hyphae dextrinoid and basidiospores amyloid..... **Dichopleuropus**

11. Basidiocarp large and robust, in most species with a dense cover of tomentum, hymenial surface with ribs or wart like tuberances, caulo- and pilocystidia absent ....**Cymatoderma**
11. Basidiocarp small, rarely above 5 cm high, often thin and translucent when fresh, pileus in most species more or less glabrous, hymenial surface smooth, caulo- and/or pilocystidia present in most species ..... **Podoscypha**

Key B

1. Basidiospores amyloid **2**
1. Basidiospores non-amyloid 1**0**

2. Basidiospores longer than 15 µm..... **3**
2. Basidiospores shorter than 15 µm..... **4**

3. Hyphal system monomitic .....**Aleurodiscus**
3. Hyphal system dimitic .....**Aleurocystidiellum**

4. Basidiospores ornamented..... **5**
4. Basidiospores smooth **6**

5. On hardwoods, hyphal system monomitic ..... **Laxitextum**
5. On coniferous wood, hyphal system di or trimitic..... **Laurilia**

6. Hyphal system monomitic, basidiocarps soft..... **7**
6. Hyphal system dimitic, basidiocarps tough to hard **8**

7. Pileus white, hymenial surface wrinkled .....**Plicatura**
7. Pileus pale brown, hymenial surface with small ribs..... **Plicaturopsis**

8. Brown encrusted cystidia present in hymenium..... **Amylostereum**
8. Brown encrusted cystidia absent in hymenium..... **9**

9. Acanthophyses present ..... **Xylobolus**
9. Acanthophyses absent, pseudoacanthophyses may be present ..... **Stereum**

Key C. Basidiospores non-amyloid

1. Dendrohyphidia present..... **2**
1. Dendrohyphidia absent..... **6**

2. Encrusted cystidia present, dendrohyphidia brown..... **Dendrophora**
2. Encrusted cystidia absent, dendrohyphidia hyaline or brown **3**

3. Basidiocarp black to brown 4
3. Basidiocarps differently coloured..... **5**

4. Spores elliptic, 6.5-8 x 3.5-4.5 µm, widespread genus..... **Punctularia**
4. Spores subglobose, 8-10 x 6-8 µm, rare Mediterranean genus .....**Adustomyces**

5. Cystidia present, generative hyphae with simple septa .....**Licrostroma**
5. Cystidia absent, generative hyphae with clamps .....**Cytidia**

6. Cystidia absent..... **7**
6. Cystidia present..... **10**

7. Hymenial surface covered with hyaline small teeth or spines .....**Mycobonia**
7. Hymenial surface smooth to slightly folded..... **8**

8. Generative hyphae with simple septa..... **Byssomerulius**
8. Generative hyphae with clamps..... **9**

9. Basidiocarp effused reflexed, hymenial surface folded ..... **Phlebia**
9. Basidiocarps more or less cupulate, hymenial surface more or less smooth .....
.....**Auriculariopsis**

10. Generative hyphae with simple septa..... **11**
10. Generative hyphae with clamps..... **12**

11. Cystidia hyphoid, basidiocarp dark brown, on coniferous wood .. **Boreostereum**
11. Cystidia tubular and thick-walled or encrusted, on hard woods ..... **Hjortstamia**

12. Cystidia smooth **13**
12. Cystidia encrusted **16**

13. Hymenial surface violaceous-purplish, pileus white and tomentose .....
..... **Chondrostereum**
13. Hymenial surface differently coloured, if pileus present, then smooth **14**

14. Basidiospores fusiform..... **Minostroscyta**
14. Basidiospores different **15**

15. Hyphal system dimitic, widespread genus ..... **Cystostereum**
15. Hyphal system monomitic, East Asian genus ..... **Gloeostereum**

16. Basidiospores longer than 18 µm in longest dimension..... **Aleurocystis**
16. Basidiospores smaller..... 17

17. Skeletocystidia finely encrusted and with even width, on coniferous wood .....
..... **Veluticeps**
17. Cystidia coarsely encrusted, often conical, on hard woods **18**

18. Hyphal pegs present, rare Mediterranean genus ..... **Campylomyces**
18. Hyphal pegs absent, widespread and common genera **19**

19. Basidiospores 10-16 µm long, cystidia conical and coarsely encrusted . **Lopharia**
19. Basidiospores generally shorter than 10 µm, cystidia mostly present as
skeletocystidia with apical encrustation ..... **Porostereum**

Description of genera

ADUSTOMYCES Jülich,

Persoonia 10: 326, 1979.
Basidiocarps resupinate, effused or effused-reflexed, perennial, pileus black and glabrous; hymenium smooth; hyphal system monomitic, generative hyphae nodose-septate; simple or slightly branched hyphidia present; basidia large, clavate, tetrasterigmatic; basidiospores subglobose, smooth, non-amyloid. Saprotrophic on living or dead tree trunks and causing a white rot.
Type species: *Stereum repandum* var. *lusitanicum* Torrend.
Remarks. The genus is characterized by its dark colours and stereoid morphology. It shares several morphological characters with *Radulomyces* and differs mainly by its perennial habit and the dark colour of the basidiocarp.

Adustomyces lusitanicus (Torrend) Jülich,

Persoonia 10: 326, 1979. - *Stereum repandum* var. *lusitanicum* Torrend, Brotéria, Sér. Bot. 11: 76, 1913.

Basidiocarps perennial, resupinate or effused-reflexed, adnate, forming orbicular patches with an irregular outline and an abrupt margin, finally confluent, up to 8 mm thick, upper surface when present black, glabrous and finely zonate in narrow furrows or ridges. Hymenophore cream to pale grey to hazel brown in actively growing specimens, becoming greyish brown in various shades, slightly pruinose, smooth to slightly cracked when dry, turning black when treated with KOH, in section deep brown and distinctly zonate (up to ten strata observed), with a dark brown subiculum and a distinct black dense zone next to the substrate.
Hyphal system monomitic, generative hyphae with clamps, subicular hyphae pale brown, agglutinated and more or less parallel to the substrate, often with aggregates of hyaline crystals, subhymenial hyphae hyaline to very pale brown, all hyphae 2–4 µm wide.
Hyphidia abundantly present in the hymenium, thin-walled, sinuous and with irregular outline, either unbranched, obtuse or pointed, up to 80 µm long and 4–5 µm wide, or narrower and apically with irregular, dendroid branching.
Basidia narrowly clavate with a long tapering base, 50–90 × 7.5–15 µm.
Basidiospores subglobose, 8–10 × 6–8 µm, first hyaline, finally slightly pale brown, thin to slightly thick-walled.
Substrate. On stumps or on dead parts of old live trunks of *Olea* and *Quercus*.
Distribution. Mediterranean species known from Portugal, Spain, Morocco and Greece but is probably widespread in the region.

Remarks. This species should be easy to identify by its host, the colour and the distribution.

ALEUROCYSTIDIELLUM Lemke,

Canad. J. Bot. 42:277, 1964.
Basidiocarps discomycete-like, corticioid or stereoid, margins variable, in some species distinctly delimited and ± reflexed, in others not differentiated, basidiospores amyloid, ornamented (warted or echinulate), large, i.e. longer than 15 µm, basidia medium to large, with four prominent sterigmata, sterile elements, such as cystidia or paraphysoid hyphae, usually present, cystidia thin-walled and ± apically moniliform, hyphal system dimitic, generative hyphae with clamp connections, skeletal hyphae present. Two species causing a white rot.
Type species: *Stereum subcruentatum* Berk. & W. A. Curtis.
Remarks: Similar to *Aleurodiscus*, but distinguished by a dimitic hyphal system.

Key to species:
1. On *Quercus* spp. ..... **A. disciformis**
1. On coniferous hosts .....**A. subcruentatum**

Aleurocystidiellum disciformis (Fr.) Boidin & Lanquetin,

Bull. Soc. Mycol. Fr. 84:63, 1968. - *Thelephora disciformis* Fr., Syst. mycol. 1:443, 1821.

Basidiocarp *Stereum*-like, 1-1.5 cm thick with margin slightly loosened from the substrate, normally a few centimetres wide, less often coalesced into larger basidiocarps, hymenial surface more or less finely tuberculate, often cracked when dry, whitish to light grey, sometimes with yellow tinges, consistency dense and hard.
Hyphal system dimitic, 2.5-3.5 µm wide, generative hyphae with clamp connections and thin- to thick-walled, skeletal hyphae thick walled, 2-5 µm wide.
Cystidia similar in size to the basidia, paraphysoid with a moniliform apex, usually abundantly covered with crystals.
Basidiospores 15-17 x 10-12 µm, subglobose to elliptic, amyloid and warted.
Substrate. On old trunks of *Quercus* spp, often 1-5 m above the ground, in locally warm and sheltered localities.
Distribution. Seemingly follows the host genus everywhere.
Remarks. Usually easy to recognize in the field because of the ecology and the greyish stereoid basidiocarps.

Aleurocystidiellum subcruentatum (Berk. & W. A. Curt.) Lemke,

Canad. J. Bot. 42:277, 1964. - *Stereum subcruentatum* Berk. & W. A. Curtis, Proc. Am. Acad. Arts. Sci. 4:123, 1858.
Basidiocarp perennial, discoid to effused-reflexed on vertical Substrate, attached by a central point, up to 10 mm wide, and up to 1.5 mm thick, coriaceous when fresh, stiff

and hard when dry, margin narrow, involute in dry specimens, hymenial surface smooth, cream to isabelline or slightly grey, abhymenial surface or partly reflexed upper margin smooth, greyish brown, often slightly zonate.
Hyphal system dimitic, generative hyphae 2-6 µm wide with clamp connections, scattered and often difficult to find; skeletal hyphae 3-6 µm wide, abundant, hyaline to slightly yellowish, thick-walled, non-amyloid.
Skeletocystidia 5-10 µm wide and up to 200 µm long, abundant, thick-walled to solid, arising deep in the subhymenium and filling up the hymenium, at first smooth, soon irregularly encrusted with small grainy crystals in the upper parts.
Gloeocystidia 5-10 µm wide, up to 120 µm long, few in number, smooth, tubular, often collapsed and difficult to find in dry specimens.
Basidia 55-100 x 8-12 µm, clavate and tetrasterigmatic.
Basidiospores 15-20 x 10-15 µm, elliptic to subglobose, thick-walled, appearing smooth in KOH, amyloid and finely verrucose in Melzer's reagent.
Substrate. On conifers such as *Abies*, *Picea* and *Pinus* spp.
Distribution. In Europe restricted to the Central European mountains from Austria and eastward. Circumpolar to North America.
Remarks. Easily recognized by the discomycete-like basidiocarps on the bark of living coniferous trees and the amyloid, ovoid, basidiospores.

ALEUROCYSTIS G. Cunn.,

Trans. Roy. Soc. New Zeal. 84:234, 1956.
Basidiocarp cupulate to resupinate, pale yellow to ochre, annual, gelatinous and tough when fresh, horny and dense when dry, hyphal system monomitic, generative hyphae with clamp connections, straight or branched, thick-walled in the subiculum, gelatinized in KOH, basidia clavate with 4 sterigmata, thick-walled metuloid cystidia present, these encrusted at least in the upper part, in age also in lower part and becoming more elongated, projecting to enclosed in old basidial layers, paraphysoid hyphae in some cases coming close to dendrohyphidia present in the hymenium, unbranched to slightly branched, basidiospores smooth, large, thin-walled and non-amyloid.
Two species on dead hardwoods, one pantropical, the other only in tropical America.
Type species: *Aleurodiscus capensis* Lloyd.
Remarks. Specimens are frequently collected and determined as belonging to the genus *Aleurodiscus* because of the discoid, scutellate basidiocarp with large basidiospores but the two genera are unrelated. The non-amyloid basidiospores will however, exclude it from *Aleurodiscus* where the spores are amyloid.

Key to species

1. Pantropical species, dendrohyphidia present, spores subglobose, 18-22 x 15-17 µm ..... **A. habgallae**

1. American species, dendrohyphidia absent, spores oblong elliptic, 20-25 x 12-14 µm 2

2. Gloeocystidia present ..... **A. gloeocystidiata**
2. Gloeocystidia absent..... **A. magnispora**

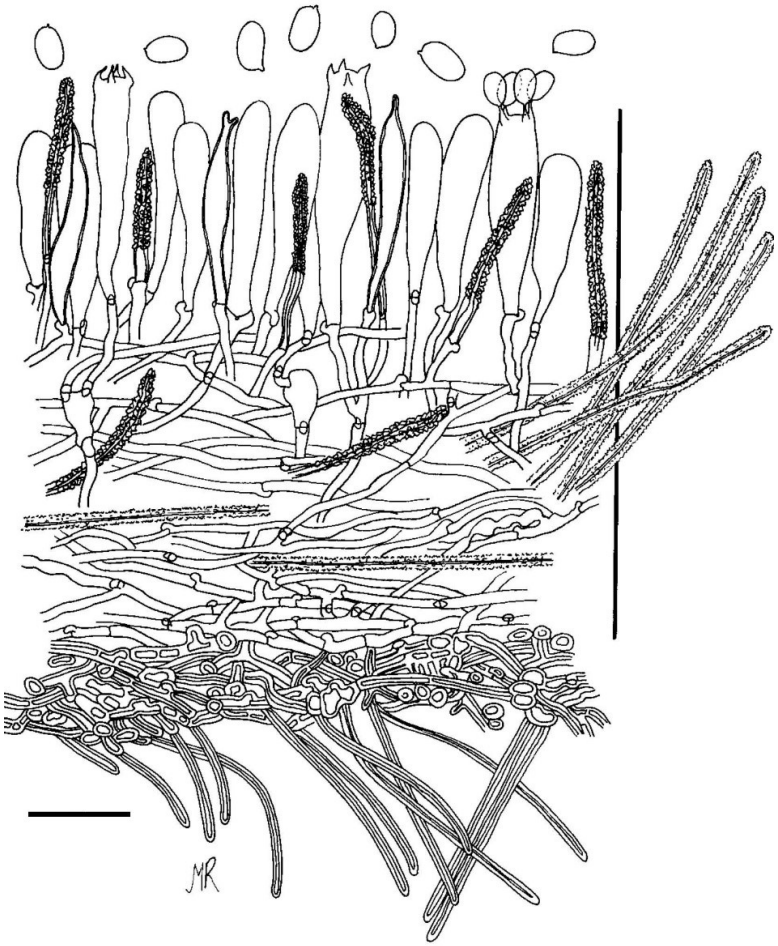


Fig. 1. *Aleurocystis gloeocystidiata*, del. G. Robledo.

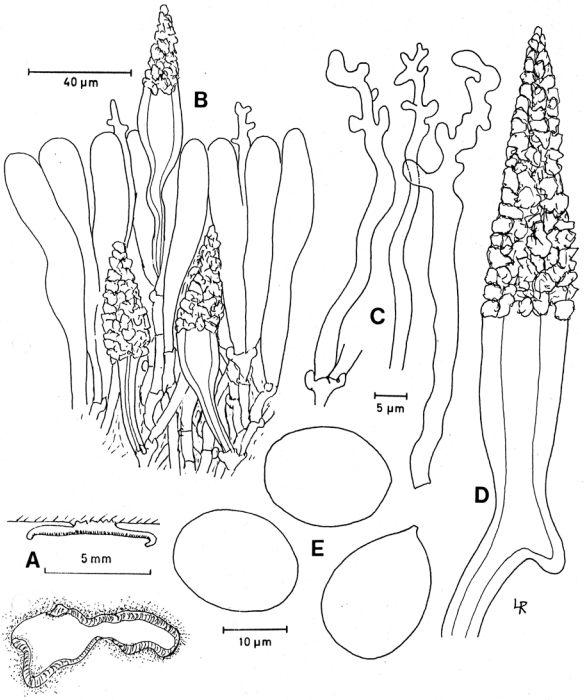


Fig. 2. *Aleurocystis gloeocystidiata* (Robledo 267, holotype), cross section of the basidiome. At the right, detail of the margin. Bar = 50 µm.

Aleurocystis gloeocystidiata Rajchenb. & Robledo, **Fig 1-2.**

Mycotaxon 92:318, 2005.

Basidiocarp annual, pileate, cupulate, discoid to stereoid, dorsally and centraly attached, up to 8 x 6 mm, elliptic to more or less circular-discoid, coriaceous, margin curved inward when dry, externale surface appressed hairy towards the center, scrupose or strigose towards the margin, hairs tomentose and white in the margin, light brown elsewhere, hymenophore light salmon pink, smooth, context cream to very light salmon pink colored.

Hyphal system dimitic (pseudodimitic), skeletal hyphae present as tramal, encrusted skeletocystidia, generative hphaewith clamps, 4-9 µm wide.

Basidia 80-110 x 18-20 µm, claviform, tetrasterigmatic.

Basidiospores 17-24 x 12-15 µm, elliptic.

Cystidia 65-85 x 5-10 µm, metuloid, hymenial to subhymenial, mostly cylindric but some subulate, apicaly encrusted.

Gloeocystidia 90-110 x 6-15 µm, subulate, thin- to thick walled.

Substrate. On branches of living *Polylepis australis.*

Distribution. Known only from Argentina.
Remarks. The species is related to *A. magnispora* (Burt) Lemke, but separated by presence of gloeocystidia, which are absent in the latter.

Aleurocystis habgallae (Berk. & Broome) G. Cunn.,

Trans. Roy. Soc. New Zeal. 84:235, 1956. - *Corticium habgallae* Berk. & Broome, J. Linn. Soc. 14:72, 1873. - *Cytidia cornea* Lloyd, Lloyd Mycol. Notes. 47:656, 1917. - *Aleurodiscus capensis* Lloyd, Lloyd Mycol. Notes 62:930, 1920.
Basidiocarps annual, cupulate to discoid, separable, gelatinous and waxy when fresh, cartilaginous and dense when dry, margin curled and involute when dry, slightly raised up when fresh, abhymenial surface smooth or with a few scattered hyaline hairs. Hymenial surface pale yellow becoming whiter by age, smooth, hymenial layers deep and continuous, sterile subiculum thin and white.
Conidial stage 2-7 mm in diameter, cupulate to disciform, dorsally attached, lower surface smooth, pale buff to tan or slightly tuberculate, margin distinct and raised, outer surface cream to tan, finely tomentose, context dense, cream coloured with numerous groups of conidia, these globose, 17-20 µm in diameter, thick-walled, smooth, non-amyloid, with walls up to 3 µm thick.
Hyphal system monomitic; generative hyphae 4-8 µm wide and with clamp connections. **Metuloid cystidia** 50-150 µm long, 10-14 µm wide in the middle, conical, usually tapering towards the base, coarsely encrusted at least in upper part, in the lower parts of the hymenial layers encrusted in longer sections. In the subhymenium, conical to club like, thick-walled, and projecting or embedded in many layers.
Dendrohyphidia up to 65 µm long, hyphoid and with few blunt and short side branches.
Basidia 60-90 x 14-20 µm, clavate, tetrasterigmatic.
Basidiospores 18-22 x 15-17 µm, subglobose.
Distribution. Pantropical, but not common.
Remarks. Reminiscent of a discoid *Aleurodiscus* or *Cytidia*, but separated easily from these genera by the combination of non-amyloid spores and metuloid cystidia. In the field, it may be mistaken for a small 'jelly fungus' because of its gelatinous to waxy consistency.

Aleurocystis magnispora (Burt) Lemke, Fig. 3

Can. J. Bot. 42: 760, 1964. - *Stereum magnisporum* Burt, Ann. Mo. Bot. Gard. 7:207, 1920. - *Cytidia magnispora* (Burt.) Welden, Mycologia 50:305, 1958.

Basidiocarps annual, cupulate to more widely effused with distinct raised margin especially when dry, resembling a thin *Stereum* basidiocarp, separable, gelatinous and waxy when fresh, cartilaginous and dense when dry, up to 800 µm thick, abhymenial

surface smooth or minutely tomentose, hymenial surface smooth to slightly tuberculate or undulating, deep ochraceous to buff, subiculum thin and white.
Hyphal system monomitic; generative hyphae with clamp connections. In the subhymenium, 4-8 µm wide, thin-walled and richly branched, rapidly gelatinized in KOH and difficult to separate in sections. In the subiculum thick-walled and branched, often with apparent simple septa because the clamp connections are gelatinized, and, in swollen parts, up to 20 µm wide.
Metuloid cystidia 50-100 µm long, 15-20 µm wide in the middle, conical, usually tapering towards the base, coarsely encrusted, thick-walled.
Dendrohyphidia absent.
Basidia 60-90 x 14-20 µm, clavate.
Basidiospores 13 -15 x 22-25 µm, elliptic.
Distribution. Rare Neotropical species, known from Colombia and Jamaica.
Remarks. Related to *A. habgallae*, but is separated by elliptic spores and lack of dendrohyphidia.

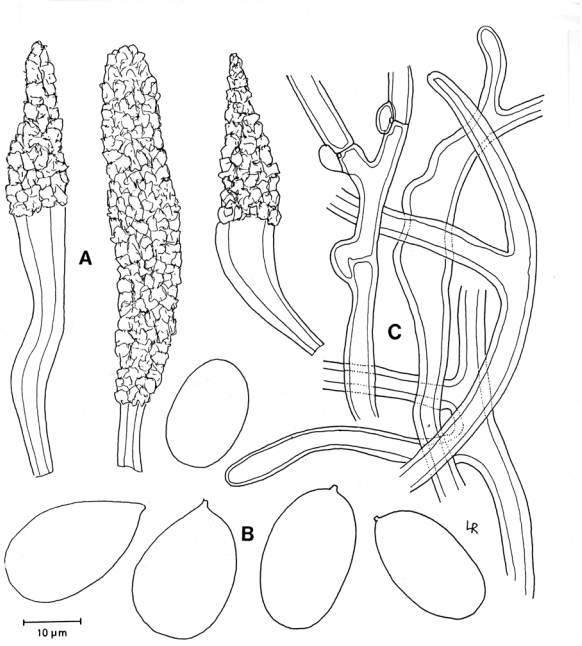


Fig. 3. *Aleurocystis magnispora* A) Cystidia, B) Basidiospores, C) Generative hyphae from the subiculum. Ryvarden 15573 from Colombia. Del. L. Ryvarden.

ALEURODISCUS J. Schröt. in Cohn,

Krypt. Fl. Schles. 3:429, 1888.
Basidiocarps variable in appearances, cupulate, corticioid or stereoid, margin in some species distinctly delimited and ± reflexed, in others not differentiated, basidiospores amyloid, smooth or ornamented, small to large, hyphal system monomitic in most species, subicular skeletal hyphae present in a few species, basidia medium to large, with four (rarely two) prominent sterigmata, sterile elements such as acanthophyses, dendrohyphidia, cystidia and paraphysoid hyphae usually present, cystidia (when present) thin-walled, clavate to moniliform or mammillate and may occur as skeletocystidia in a few species, basidiospores smooth or ornamented and amyloid. On dead wood of broad-leaved trees and gymnosperms, such as dead, still-attached branches, living or dead trunks often in sunny and dry, exposed localities. All species so far reported cause a white rot. Cosmopolitan genus.
Type species: *Thelephora amorpha* Pers.: Fr.
Remarks: *Aleurodiscus* is a large genus, and the reader is referred the synopsis of Nunez & Ryvarden (2000) where all known species are described and illustrated with black and white drawings.

AMYLOSTEREUM Boidin,

Rev. Mycol. (Paris) 23(3):345, 1958.
Basidiocarps resupinate, effused-reflexed to pileate, hymenial surface and context brown with numerous light brown, first thin walled and hyaline, then thick-walled and apically encrusted yellowish brown cystidia, hyphae thin-walled and hyaline or thick-walled and brown, with clamp connections, basidiospores cylindrical or narrowly elliptic, smooth, thin-walled and distinctly amyloid. On gymnosperms and hardwoods, causing with a white rot.
Type species: *Thelephora chailletii* Pers.
Remarks. The genus is undoubtedly related to the genus *Stereum*, but easily separated from it by the numerous encrusted cystidia and the clamped generative hyphae. The four species known in the genus have all almost identical microscopical characters and are mainly separated on their hosts, and in part by type of basidiocarp. This seems to indicate and old taxon, also reflexed in their evolutionary old hosts. *Amylostereum* spp. is transferred to new hosts by the actions of wood-wasps, (*Sirex* spp.), thus making them potentially dangerous pathogens.

Key to species

1. Basidiocarp thick, perennial and with a black line below a thin pilear tomentum. .....**A. areolatum**
1. Basidiocarp annual, thin to moderately thick and without black line below a pilear tomentum..... **2**

2. American tropical species, on *Podocarpus*. ..... **A. ferreum**
2. Temperate-boreal species, on different species of conifers..... 3

3. Basidiocarp resupinate, adnate, usually less than 1 mm thick, on *Juniperus, Taxus* or *Thuja*. .....**A. laevigatum**
3. Basidiocarp 1-3 mm thick often with a reflexed margin, on *Picea abies* and cultivated *Abies* spp. ..... **A. chailletii**

Amylostereum areolatum (Chaillet) Boidin,

Revue Mycol. (Paris) 23(3): 345, 1958. - *Thelephora areolata* Chaillet in Fr., Elench. fung. 1 p. 190, 1828.
Basidiocarp on horizontal substrates more or less resupinate, on vertical ones reflexed, about 2-3 cm wide, 5-10 cm long, reflexed part usually 1-3 mm thick, central part often thicker, up to 1 cm or more, consistency firm and leathery when fresh, hard and brittle when dry. Upper side zonate, in young parts ochraceous or olivaceous brown and finely velutinous, in older parts covered with an uneven black crust, hymenial surface dull purplish to greyish-violet when fresh and actively growing drying pale ochraceous brown and somewhat pruinose, irregularly tuberculate, when dried more or less cracked, in older basidiocarps and when water-soaked darkening to blue brown or dark violet blue, in section with a dark brown upper tomentum, separated by a dark line from the lighter brown trama.
Hyphal system dimitic, generative hyphae 2-3 µm wide, thin-walled, hyaline, skeletal hyphae 3-4 µm wide, thick-walled with a narrow lumen, yellow brown.
Cystidia 30-40 µm long, abundant, fusiform, acute, at first thin-walled, hyaline, then with thickening walls, yellow brown and encrusted with small, dense crystals, there is some variation in the shape of the cystidia, some may be obtuse, constricted, or have an extra lateral apex etc. In old basidiocarps, with a thickened hymenium, cystidia may be arranged in layers, corresponding to the annual growth.
Basidiospores 6-8 x 2.5-3.5 µm, narrowly elliptic.
Substrate. On coniferous wood.
Distribution. European species.
Remarks. Similar to *A. chailletii* and difficult to separate when young and resupinate. Well developed specimens are effused-reflexed with a differentiated, velutinate pileus with a duplex-structure.

Amylostereum chailletii (Pers.) Boidin, **Fig. 4**

Rev. Mycol. (Paris) 23:345, 1958. - *Thelephora chailletii* Pers. Mycol. Eur. 1:125, 1825.
Basidiocarp 1-3 mm thick, small or widely effused, resupinate or effused-reflexed, with a narrow, dark brown, irregular and finely tomentose pileus. Hymenial surface ochraceous to cinnamon or dark brown often greyish-brown when old, somewhat patchy, when dry usually finely rimose, margin somewhat thickened and finely tomentose (lens).

Fig. 4. *Amylostereum chailletii*, Photo N. Legon.

Hyphal system dimitic, generative hyphae 2-5 µm wide thin-walled and with numerous clamp connections, skeletal hyphae 3-4 µm wide, straight, thick-walled and pale brownish. **Cystidia** 15-40 x 4-5 µm, first thin-walled, rounded to subulate, seemingly of gloeocystidial character, often containing oily drops or resinous grains, then becoming thick walled, pigmented and encrusted in the upper half part.
Basidiospores 6-7.5 x 2.5-3 µm, cylindrical or narrowly elliptic.
Substrate. *Picea* or cultivated species of *Abies*.
Distribution. It seems to follow the spruce in Europe.
Remarks. The warm, brown colours of this species combined with the encrusted brown cystidia and amyloid basidiospores make it distinctive and not with a duplex context as seen in *A. areolatum*.

Amylostereum ferreum (Berk. & W. A. Curtis) Boidin & Lanquetin,

Bull. Mycol. Soc. Fr. 100:217, 1984. - *Stereum ferreum* Berk. & W. A. Curtis, J. Lin. Soc. Bot. 10:332, 1868.
Basidiocarp about 1-3 mm thick, small or widely effused, resupinate or rarely with an effused-reflexed, narrow, dark brown, finely tomentose and irregular pileus, hymenial surface ochraceous to brown,
Hyphal system dimitic, generative hyphae 2-4 µm thin-walled, with numerous clamp connections, skeletal hyphae up to 5 µm straight, thick-walled and light brownish.

Fig. 5. *Amylostereum laevigatum*, photo T. H. Hofton.

Cystidia as in *A. chailletii*.
Basidiospores 6-7.5 x 2.5-3 µm, cylindrical or narrowly elliptic.
Substrate. On dead *Podocarpus* spp.
Distribution. Known from Cuba, Jamaica and Brazil.
Remarks. The host and the distribution will help to name this species. Sequencing is necessary to ascertain if it can be accepted as a separate species or only as a form or variety of *A. chailletii*.

Amylostereum laevigatum (Fr.) Boidin **Fig. 5.**

Rev. Mycol. (Paris) 23(3): 345, 1958. - *Thelephora laevigata* Fr., Elench. fung. 1:224, 1828.
Basidiocarp resupinate and closely adnate (but the margin together with the outer layer of the bark may loosen from the substrate in old specimens), smooth, when dry often finely rimose, light brown, isabelline to ochraceous or even grey in older specimens.
Hyphal system monomitic, generative hyphae (2)3-4 µm wide, richly branched, thin- to thick-walled, with clamp connections.
Cystidia up to 130 x 5-10µm, abundant, brown or yellowish- brown, when young thin-walled and subulate, when mature thick-walled and apically encrusted (this part to 20-30 x 5-10 µm).
Basidia 25-30 x 4-6 µm, narrowly clavate, tetrasterigmatic.
Basidiospores 7-12 x 3-4 µm, cylindrical or narrowly elliptic

Substrate. On dead branches of *Juniperus* spp. everywhere, rarely on other coniferous hosts.
Distribution. Follows the host genus from northern subtropical to boreal zones.
Remarks. The hosts and pale isabelline to brown colours of the basidiocarps will usually be sufficient to recognize the species in the field. The species is seemingly present wherever there are dead *Juniperus* spp. r

AQUASCHYPA D. A. Reid,

Nova Hedwigia Beiheft 18:51, 1965.
Basidiocarps lignicolous, coriaceous, infundibuliform and mesopodal; adjacent basidiocarps frequently confluent. Upper surface minutely tomentose or velutinate, usually with flattened, dendroid or antler-like, processes from a few mm to several cm in height, densely tufted, scattered or even absent in old basidiocarps. Hymenium smooth, conspicuously pruinose. Hyphal structure trimitic; generative hyphae thin-walled, hyaline, with inconspicuous clamp-connexions; skeletal hyphae thick-walled, yellowish-brown; binding hyphae thick-walled, hyaline or pale brown, surface tomentum formed of skeletal hyphae. Cystidia and gloeocystidia absent, pseudoparaphyses abundant, thick-walled, cylindrical, often conspicuously echinulate, forming a distinct palisade layer.
Type species: *Aquascypha hydrophora* (Berk.) D. A. Reid.
Remarks: Easy to recognize because of the large, tough and dark brown funnel shaped basidiocarps, often found filled with water.

Aquascypha hydrophora (Berk.) D. A. Reid, Op. cit.

Stereum hydrophorum Berk., Ann. Mag. nat. Hist. 14:327, 1844. - *Hymenochaete crateriformis* P. Hennings, Hedwigia 43:172, 1904.

Basidiocarps 4-12 cm high, 3.5-15 cm wide, dark brown to dark purple-brown, coriaceous, centrally stipitate, infundibuliform, pilei minutely tomentose or velutinate, concentrically zoned, normally with conspicuous, flattened, dendroid or antler-like outgrowths, these from a few mm to several cm long, hymenial surface smooth, often concentrically zonate, distinctly pruinose, ochraceous-buff to white, becoming purple brown in old specimens, context, creamy-white, dark brown towards the hymenium.
Stipe 1. 5 - 3 cm high, 0. 3 - 0.5 cm wide, relatively short, minutely velutinate, dark brown to dark purple-brown, attached to the substrate with a disc of mycelium.
Hyphal system trimitic, generative hyphae, 2-3 µm wide, with conspicuous clamp connections; skeletal hyphae 3 - 7 µm wide, brown, thick-walled; binding hyphae, 2-7 µm wide, thick-walled, pale brown or hyaline, are found in the antler-like processes and the context of the stipe, hymenium is composed of a palisade of thick-walled hyphae, these up to 45 µm long and 2.5-4 µm wide.
Cystidia absent, but the sterile hymenium consists of cylindrical, pale brown, apically rounded hyphae, these minutely echinulate.

Basidiospores not known.
Substrate. On dead wood.
Distribution. Amazonian species.
Remarks. A unique species characterized by its large, dark brown, infundibuliform basidiocarps, and seemingly without any close relatives.

AURICULARIOPSIS Maire,

Bull. Soc. mycol. France 18:102, 1902.
Basidiocarp pileate, cupulate (discomycete-like) and hanging from the substrate, or resupinate. Abhymenial side felted, hymenial surface radially folded, soft and gelatinous when wet, more or less folded when dry. Hyphal texture duplex, consisting of an upper layer of thick-walled, unbranched hyphae and a hymenial layer of gelatinous, densely united hyphae with clamp connections. Cystidia absent. Basidia subclavate, in a dense palisade, basidiospores allantoid to elliptic, smooth, thin-walled, non-amyloid. Causing a brown rot.
Type species: *Cyphella ampla* Lév.
Remarks. Separated from *Cytidia* which has a catahymenium of dendrohyphidia and large basidia, while such organs are absent from *Auriculariopsis* where the hymenium being a dense palisade of basidia, resembling those of the genus *Phlebia*, which it may be related to. Thus, *Auriculariopsis* should be placed in Corticiaceae (in the commonly and widely accepted circumscription of that family), and not in Cyphellaceae, to which it is often referred.

Key to species:

1. Basidiospores 11.5 -14 x 4-4.5 µm, allantoid .....**A. patelliformis**
1. Basidiospores shorter **2**

2. Basidiospores allantoid, 7-10 µm long ..... **A. ampla**
2. Basidiospores elliptic and shorter **3**

3. Basidiospores 3-3.5 µm wide .....**A. albomellea**
3. Basidiospores 2-3 µm wide..... **A. lanata**

Auriculariopsis albomellea (Bondartsev) Kotlaba,

Ceska Mykol. 42:239, 1988. - *Cytidia albomella* Bondartsev, Morbi plant Leningrad 16: 96, 1927. - *Cytidiella melzeri* Pouzar, Ceska Mykol. 8:127, 1954.
Basidiocarps resupinate, at first orbicular, about 1-2 cm wide, then confluent and becoming larger, adnate and ceraceous, when fresh and wet, membranous and with margins revolute when dry, hymenial surface smooth or with low tubercles, light brown

when wet, dark brown when dry, abhymenial side of the revolute margin whitish, smooth, and (under a lens) densely felted.
Hyphal system monomitic, hyphae 3-6 µm wide, mostly thin-walled, especially in the subhymenium, somewhat thickened in the trama and becoming partially gelatinous and swollen in KOH, clamp connections present at all septa.
Basidia 30-40 x 5-6 µm, subclavate, tetrasterigmatic.
Basidiospores 6-7.5 x 3-3.5 µm, elliptic.
Substrate. On wood (dead branches) of *Quercus robur* and *Pinus* spp.
Distribution. Rare species, but known through the temperate zone.
Remarks. Recognized by its resupinate, orbicular, dense and light brown basidiocarps, with a white lower surface when dry.

Fig. 6. *Auriculariopsis ampla*.

Auriculariopsis ampla (Lév.) Maire, Fig. 6

Bull. Soc. mycol. France 18:102, 1902. - *Cyphella ampla* Lév., Ann. sci. nat. III:9:126, 1848.
Basidiocarp pileate, cupulate or bell shaped, pendant, about 1 cm wide, with the abhymenial side white, and appearing as if felted, when fresh and wet with a pale ochraceous to light brown (cinnamon) hymenial surface, this folded in radial ridges, margin even, slightly revolute, finely fibrillose, when dry, becoming shrunken and more or less folded.
Hyphal system monomitic, generative hyphae 2-3 µm wide, with clamp connections. The hairs on the abhymenial layer composed of thick-walled, twisted, non-gelatinizing hyphae with practically no clamp connections or septa. In the lower, tramal layer, gelatinizing richly branched and may swell to 7 - 10 µm wide.
Basidia 25-30 x 4-4.5 µm, subclavate.
Basidiospores 7.5-10 (-12) x 2.5 (-3) µm, allantoid.

Substrate. On wood, often attached branches of hardwoods such as *Alnus, Betula*, *Salix* and *Populus*.
Distribution. Rare species, but known throughout the temperate zone.
Remarks. Easily recognized by the cupulate to bell-shaped, pendant basidiocarps.

Auriculariopsis lanata (W. B. Cooke) Ryvarden,

Synopsis Fung. 28: 53, 2010. - *Cytidia lanata* W. B. Cooke Mycologia 43:205, 1951.
Basidiocarp initially stereoid with a slightly lifted margin, hanging and cupulate with a central point of attachment, about 1-3 cm in diameter and 1-2 mm thick, probably coriaceous to subgelatinous consistency when fresh, becoming corneous, hard and brittle when dry, upper surface tomentose and ochraceous to pale brown, hymenial surface smooth, deep purplish, hymenium dense and up to 60 µm deep, in section with a pale brown context from which the tomentum hyphae arise in bundles.
Hyphal system monomitic, hyphae 5-8 µm wide, gelatinous in KOH, thick walled and with clamps at all septa, strongly agglutinated by gelatinous interhyphal substances, some few hyphae seemingly solid and without clamps and could be interpreted as skeletal hyphae.
Basidia 23-28 x 4-6 µm, clavate, tetrasterigmatic.
Basidiospores 6-7 x 2-3 µm, oblong elliptic.
Substrate. On branches of *Betula* sp.
Distribution. Known only from the type, collected in Idaho.
Remarks. The description given here is taken from the original description and must be regarded as provisional and fresh specimens are desirable to verify the stated characters.

Auriculariopsis patelliformis (Burt) Ryvarden,

Synopsis Fung. 28: 53, 2010. - *Stereum patelliforme* Burt, Ann. Missouri Bot. Garden 7:182, 1920.
Basidiocarp initially stereoid and resupinate with a slightly lifted margin, then more cupulate to oblong with a tendency to be effused reflexed, up about 1 cm wide and 3-5 mm wide, probably coriaceous to subgelatinous consistency when fresh, becoming corneous, hard and brittle when dry, hymenial surface smooth, pale brown when dry, pileus when it occurs, dark brown to almost black and covered with a fine white tomentum which over time presumably is being lost and exposing a dark surface, in section with a brown hymenium about 100 µm deep over a whitish context of same thickness being agglutinated on the surface; margin more or less revolute in dry specimens
Hyphal system monomitic, hyphae 3-4 µm wide, with thickened walls and a darker lumen slightly sinuous to straight, with clamps at all septa, strongly agglutinated by gelatinous interhyphal substances, some few hyphae seemingly solid and without clamps and could be interpreted as skeletal hyphae but this has to be decided on fresh material.
Basidia up to 110 µm long and 5-8 µm wide in the upper part, tetrasterigmatic.

Basidiospores 11.5 -14 x 4-4.5 µm, allantoid.
Substrate. On fallen branches of different hard wood trees.
Distribution. Widespread, but rare in Central United States and adjacent Canadian States.
Remarks. The brown colours and the lack of dendrohyphidia separate it from the reddish and macroscopically similar *Cytidia salicina.*

BOREOSTEREUM Parmasto,

Consp. Syst. Cort. p. 186, 1968.
Basidiocarp usually resupinate to effused-reflexed, rarely distinctly pileate, loosely adnate, coriaceous and tough, distinctly stratified, pileus smooth to tomentose, dark brown, zonate. Hymenial surface smooth to radially plicate or folded, ochraceous to rusty brown. Hyphal system dimitic, generative hyphae thin- to thick-walled, with simple septa, and often with oily content, skeletal hyphae yellow to pale brown, thick-walled, usually with a brown encrustation, this becoming green in KOH. Hyphoid cystidia abundant in hymenium, these arising in the subhymenium, basidia subclavate tetrasterigmatic and a simple septum at the base, basidiospores up to 12 µm long, narrowly elliptic to cylindrical, thin-walled, non-amyloid.
On wood of conifers, rarely on hardwoods, causing a white rot. Boreal species with a circumpolar distribution. Monotypic genus.
Type species: *Boreostereum radiatum* (Peck) Parmasto.
Remarks. The type species is reminiscent of a *Hymenochaete*, but lacks true setae. *Lopharia* and *Porostereum* are separated by their metuloid cystidia and / or skeletocystidia.

Boreostereum radiatum (Peck) Parmasto, Figure 7 and p. 111-112, Cort. 1

Consp. Syst. Cort. p. 187, 1968. - *Stereum radiatum* Peck, Bull. Buffalo Soc. Nat. Hist. 1:62, 1873.
Basidiocarp resupinate, effused-reflexed, usually less than 1 cm wide, rarely distinctly pileate, easily peeled off the substrate, stiff when dry, up to 2 mm thick. Upper surface dark brown, finely tomentose, hymenial surface dark ochraceous to rusty brown, smooth to radially folded or tuberculate, in section distinctly stratified with a rusty brown hymenium and subhymenium and a black subiculum with a transitions to a cottony dark brown tomentum, either close to the substrate or on the pileus.
Hyphal system dimitic, generative hyphae 3-5 µm wide, with simple septa, in the subhymenium hyaline to pale yellowish, thin-walled, freely branched; skeletal hyphae or thick-walled generative hyphae up to 7 µm wide, straight, abundant in tomentum and subiculum, rarely septate, often branched dichotomously, usually with a pale brown encrustation (occasionally smooth), this dark green in KOH,

Fig. 7. *Boreostereum radiatum*, photo V. Kapitonov

Hyphoid cystidia 2-5 µm wide, and up to 45 µm long, abundant in the hymenium, embedded to slightly projecting, hyaline, thin-walled, and finely encrusted to smooth, often dichotomously branched from the base, with a basal simple septum.
Basidia 25-35 x 3-6 µm, clavate, tetrasterigmatic.
Basidiospores 7-11 x 2.5-3.5 µm, cylindrical.
Substrate. On wood. Usually on gymnosperms, rarely on hardwoods such as *Salix* spp.
Distribution. The Czech Republic and Poland. Widespread in boreal areas of North America and Northern Asia.
Remarks. Easy to recognize in the field because of the slightly folded, rusty brown hymenial surface with a dark brown tomentum and a distinct black subiculum in section. Microscopically, the green reaction of the hyphal encrustation is very distinct. It is a matter of opinion whether the hyphoid cystidia should be regarded as cystidioles or just hyphal ends.

BYSSOMERULIUS Parmasto,

Eesti N.S.V Tead. Akad. Toimet. Biol. 16:383, 1967.
Basidiocarp resupinate to pileate, upper surface whitish and tomentose, hymenium initially cream coloured, then brown, dark purplish or almost black, margin remaining white, subhymenium thickening with age, hyphal system monomitic, hyphae thin-walled or slightly thick-walled, lacking clamps, basidia narrowly clavate, tetrasterigmatic, cystidia absent, basidiospores elliptic to subcylindrical, smooth and non-amyloid.
Type species: *Merulius corium* Fr.

Remarks. The genus is characterized by a partly reflexed basidiocarp with a meruloid to semiporoid hymenial surface and simple septate hyphae.

Key to species

1. Hymenial surface purplish, to black, on coniferous wood, preferably *Pinus* ....**B. ambigus**
1. Hymenial surface cream to pale brown, on hardwoods **2**

2. Basidiospores 4.5-5 x 2.5-3 µm, elliptic, hymenial surface golden brown .... **B. sordidus**
2. Basidiospores 5.5-6 (7) x 2.5-3 µm, subcylindrical, hymenial surface pale yellow to pale orange.....**B. corium**

Byssomerulius ambigus (Berk.) Gilbn. & Buddington,

J. Ariz. Acad. Sci. 6:92. 1970. - *Merulius ambigus* Berk., Grevillea 1:69, 1872.
Basidiocarp 0.5-1 mm thick, initially resupinate, soon effused-reflexed, up to 3 cm wide and 4 cm long (rarely larger), when reflexed often in imbricate clusters.
Pileus cream to slightly greyish in old specimens, tomentose and zonate, margin of effused parts, up to 2 mm wide, white to cream, or greyish, finely tomentose. Hymenial surface purplish to brown or almost black, shiny, with a waxy texture when fresh, covered with radiating folds, these sometimes anastomosing and forming shallow pits, 1-3 per mm.
Hyphal system monomitic, all hyphae with simple septa, in the context 3.5-6 µm wide, thick-walled, mostly horizontal, and rather loosely arranged, in the subhymenium up to 3 µm wide, thin-walled, and more closely packed.
Basidia 15-30 x 5-6 µm, narrowly clavate.
Basidiospores 5-8 x 2.2-2.8 µm, elliptic to subcylindrical.
Substrate. On dead branches of coniferous trees, usually on *Pinus* spp.
Distribution. Seemingly following *Pinus* everywhere.
Remarks. Recognized by the dark coloured, purplish, merulioid hymenial surface and usual occurrence on *Pinus*.

Byssomerulius corium (Fr.) Parmasto, Figures, see p. 134 and 135, Cort vol 1.

Eesti N.S.V Tead. Akad. Toimet. Biol. 16:383, 1967. - *Merulius corium* Fr., Elench. fung. p. 58, 1828. - *Thelephora corium* Pers., Syn. meth. Fung.: p. 574 1801.
Basidiocarp 0.5-1 mm thick, resupinate, then with reflexed margins or even pileate, hymenial surface initially white, then yellowish, finally more or less brownish, pilei usually remaining white, sometimes grey or even becoming greenish (due to growth of algae in the context), finely tomentose, context white and very soft.

Hyphal system monomitic, all hyphae lacking clamps, subhymenial hyphae 2.5-3.5 µm wide, thin-walled, densely intertwined, more or less covered with fine crystals, basal hyphae 3-5 µm wide, with thickened walls, forming a loose context.
Basidiospores 5.5-6 (7) x 2.5-3 µm, subcylindrical.
Substrate. On dead branches of hard wood trees.
Distribution. Rather common throughout the area and a cosmopolitan species.
Remarks. A widespread and common species recognized by its narrow, white pileus and a pale isabelline to yellowish, smooth to slightly merulioid lower side.

Byssomerulius sordidus (Berk. & M. A. Curtis ex Cooke) Hjortstam,

Mycotaxon 54:184, 1995. - *Merulius sordidus* Berk. & M. A. Curtis ex Cooke, Grevillea 19:108, 1891. - *Cladoderris platensis* Speg. Anal. Mus. Hist. nat. B. Aires 6: 179, 1898. - *Cladoderris rickii* Lloyd, Mycol. Writ. 7:1196. 1923.
Basidiocarp 0.5-1 mm thick, 2-10 mm wide, initially resupinate, then reflexed-pileate, upper surface smooth, golden brown, hymenial surface slightly reticulate to semi-poroid, more or less golden brown, subiculum white and thin.
Hyphal system monomitic, all hyphae lacking clamps, subhymenial hyphae 3-4 µm wide, thin-walled, densely intertwined, usually covered with fine crystals, basal hyphae 3-5 µm wide, with thickened walls, hyaline to pale yellow, and forming a loose context.
Basidiospores 4.5-5 x 2.5-3 µm elliptic.
Substrate. On dead branches of hard wood trees.
Distribution. Cosmopolitan., but nowhere common.
Remarks. Closely related to *B. corium*, but separated from it by the shorter elliptic (rather than subcylindrical) spores with a sigmoid shape as is typical for *B. corium,* basidiocarps of which usually are pale yellow to pale orange and not brown

CAMPYLOMYCES Nakasone,

Sydowia 56: 261, 2004.
Basidiocarps annual to perennial, gregarious, cupulate or campanulate, deeply lobed or incised, subgelatinous and more or less confluent when fresh, hard and shrinking considerably when drying, up to 2 mm thick, outer surface strigose, felty to pubescent, grey to dark brown; hymenium minutely hydnoid from sterile hyphal pegs, greysh brown; margin distinct, rolled up; hyphal system monomitic, hyphae thin- to thick-walled, with clamp connections; brown cystidia present in the hyphal pegs; basidia narrowly clavate, tetrasterigmatic; basidiospores large, narrowly navicular to subcylindrical, thin-walled, smooth, without reaction in Melzer's reagent.
Type species. *Aleurodiscus tabacinus* Cooke.
Remarks. The genus is recognized by its cupulate brown basidiocarps and numerous hyphal pegs. *Veluticeps*, is a similar genus with similar brownish skeletocystidia, but includes striclty resupinate basidiocarps.

Campylomyces heimii (Malençon) Nakasone,

Sydowia 56: 262, 2004. - *Veluticeps heimii* Malençon, Bull. Trimestriel Soc. Mycol. France 55: 42, 1939.
Basidiocarps probably perennial, resupinate, gregarious, irregularly discoid to cupulate with upturned margin, up to 2 mm thick, brown, individual basidioma usually elongated and deeply lobed, in fresh condition confluent and forming a single, labyrinthoid pseudobasidioma with a subgelatinous consistency, when dried shrinking considerably, curling up along the margins and more or less closing the hymenium, becoming subceraceous to corneous, outer surface strigose, tomentose to felty, grey to golden brown to dark brown, becoming black in KOH but soon fading to original colour, hymenium brown, with numerous hyphal pegs, up to 150 µm high.
Hyphal system monomitic, all septa with clamps, tomentum on upper (outer) side of basidome mainly composed of 2.5–6 µm wide, thick-walled, mainly smooth, yellow to brown hyphae with few septa, subiculum dense, formed by 3–6 µm wide hyphae growing horizontally, hyaline to yellow to brown or even greenish when observed in KOH, partly covered by a fine-grained, golden brown encrustation that partly dissolves in 3% KOH, subhymenium dense, more or less gelatinized, with hyaline, 2–5 µm wide hyphae.
Cystidia present in the hyphal pegs, arising from the subiculum (skeletocystidia), dark yellow to brown, up to 220 µm long and 2.5–6 µm wide, slightly tapering towards the apex, finely to coarsely encrusted by a grainy, yellowish matter.
Basidia 80–100 × 8–10 µm, narrowly clavate to cylindrical.
Basidiospores 18–22 × 6–8 µm, narrowly navicular to subcylindrical.
Habitat. In Europe collected only on fallen branches of *Quercus* spp.
Distribution. Very rare and only known from a few localities in Italy (Sardinia), France (Pyrenées), and Spain. Originally described from Morocco.
Remarks. This is a very distinct species by its dark brown and lobed, aggregated basidiomata, the hymenium that is covered with hyphal pegs and dark brown skeletal cystidia.

CARIPA O. Kuntze,

Rev. Gen. Pl. 3:451, 1898.
Basidiocarps small, more or less centrally stipitate, obconical with apex expanded and discoid, pilei flat, with a slightly depressed central part, whitish, smooth, hyphal system monomitic, generative hyphae with clamp connections, cystidia present, smooth, basidiospores thin-walled, smooth and non-amyloid. On dead wood, causing a white rot. Monotypic, neotropical genus.
Type species: *Hypolyssus montagnei* Berk.
Remarks. The small whitish to ochraceous basidiocarps, rarely more than 2.0 cm high make this a distinct genus. *Cotylidia* is easily separated its thin, flabelliform to spatulate basidiocarps, contrasted with those of *Caripia* which are compact and obconical. DNA

sequencing has shown *Caripia* to be a reduced agaric related to *Gymnopus* (Pers.) S. F. Gray.

Caripia montagnei (Berk.) O. Kuntze, **Fig. 8.**

Rev. Genera Pl. 2:451. 1898. - *Hypolysses montagnei* Berk., Hooker J. Bot. 1:139, 1842. - *Hypolyssus sprucei* Massee, Grevillea 20:251, 1891. - *Hypolyssus foetidus* Massee, Journ. Bot. 30:197, 1892.

Basidiocarp more or less centrally stipitate, up to 2.0 cm high and 3.0-7.0 mm wide, obconical, expanding toward a discoid more or less circular pileus with a weakly undulant margin, initially flat, often developing a central depression and an elevated margin, white, finely tomentose then glabrous and becoming ochraceous, hymenium white to ochraceous, smooth or longitudinally furrowed to semi-lamellate, stipe widened towards the pileus, usually shorter than the fertile part, initially white, then ochraceous, becoming pale brown, attached to the substrate with a small mycelial disk, context white and dense.

Hyphal system monomitic, hyphae 7-10 (12 µm) wide with clamp connections, hyaline, irregularly thick walled with a narrow lumen.

Cystidia 20-25 x 4-5 µm, smooth, thin walled, fusiform.

Basidia 25-30 x 5-6 µm, clavate with 2 to 4 sterigmata.

Basidiospores 5-6 x 3-3.5 µm, elliptic to pip shaped.

Substrate. On all types of dead hard wood, herbs and roots.

Distribution. Tropical American species from Northern Argentina to southern Mexico, often abundantly present.

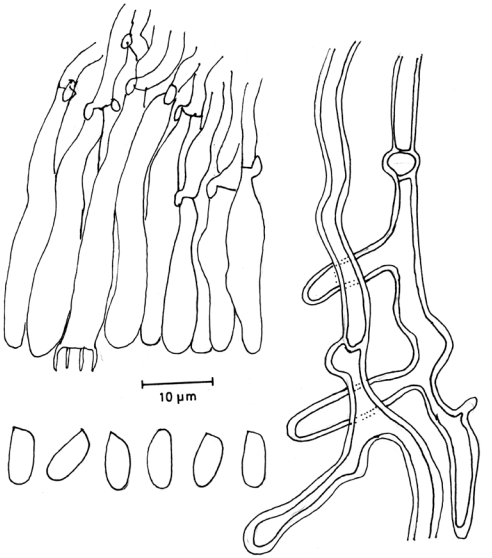


Fig. 8. *Caripa montagnei* A) part of hymenium, B) generative hyphae from the context, C) basidiospores, Ryvarden, coll 40631 from Venezuela.

Remarks. Easily recognizable in the field, due to the small, white, compact and obconical basidiocarps, often occurring in groups.

CHONDROSTEREUM Pouzar,

Ceská Mykol. 13:7, 1959.
Basidiocarp usually pileate, soft and flexible when fresh, firm and brittle when dry composed of several distinct hyphal layers, hyphae with clamps, cystidia present, basidia narrow and compacted in a dense palisade, tetrasterigmatic, basidiospores cylindrical, thin-walled and non-amyloid.
Type species: *Thelephora purpurea* Fr.
Remarks. *Chondrostereum* was derived from *Stereum* but it is apparent that *C. purpureum* is not related to that genus but is more reminiscent of *Phlebia*.

Chondrostereum purpureum (Fr.) Pouz. For figures, see p. 155, Cort. Vol 1.

Ceská Mykol. 13:17, 1959. - *Thelephora purpurea* Fr.:Pers., Syst. mycol. 1:440, 1821. – *Stereum purpureum* Pers., Neues Mag. Bot.1:110, 1794.
Basidiocarp pileate or resupinate, white and tomentose above, hymenium smooth, dark violaceous to purplish or brown-violaceous when fresh, paler after drying., consistency tough when fresh, brittle when dry. In vertical section the white tomentum of the pileus is separated from the lower layers by a dark line visible to the naked eye.
Hyphal system monomitic 2.5-4 µm in diameter, with clamp connections, in the subhymenium thin-walled, more or less thick-walled in other parts of the basidiocarp.
Cystidia 60-80 x 6-8 µm, fusoid or obtuse, sparse, projecting 25-50 µm above the hymenium, thin-walled, smooth or with crystalline deposits.
Basidia 50 x 5 µm, long and narrow, tetrasterigmatic.
Basidiospores 5-8 x 2.5-3 µm, allantoid to subcylindrical.
Substrate. Saprophytic or parasitic on stumps, branches or trunks of hard wood trees, rarely on conifers. Infected fruit-trees, develop a characteristic change to the appearance of the leaves due to a toxin produced by the fungus causing the upper epidermis of the leaf to separate from the layer beneath, causing the so-called “silver leaf” disease.
Distribution. Circumpolar in the Northern Hemisphere and north to 70^0 North in Norway.

CORALLODERMA D. A. Reid,

Beiheft Nova Hedwigia 18:332, 1965.
Basidiocarps spatulate, flabellate to infundibuliform, pileus glabrous, smooth to finely crested, hymenial surface smooth, stipe lateral to central, context black. Hyphal system monomitic, generative hyphae with either clamp connections or with simple septa, hyphae covered with purplish pigment. In old parts of the basidiocarp there is a dense structure of coralloid hyphae. Cystidia absent. Basidiospores elliptic, non-amyloid and smooth.

Terrestrial. One species in America.
Type species: *Thelephora acroleuca* Pat.
Remarks. Characterized by acystidiate, blackish basidiocarps with coralloid hyphae.

Coralloderma guzmanii Welden,

Mycotaxon 48:69, 1993.
Basidiocarps stipitate, up to 3 cm, high and 1.5 cm wide, solitary, narrowly reniform to spatulate, upper surface dirty whitish, drying orange yellow, smooth and glabrous to slightly rugulose. Hymenial surface dirty yellowish becoming unevenly and patchily pale brownish. Stipe round, slightly striate to finely velutinate, widened at the point of attachment, upper part as the hymenial surface becoming black from the base, context deep brown.
In the type, there is hymenium on both side of the basidiocarp, typical of a clavaroid species. Whether this is an aberrant feature or not remains to be seen.
Hyphal system monomitic, generative hyphae, 2-4 µm in wide, with simple septa, those in the stipe coralloid at the apex and covered with fine crystals of a dark purplish pigment.
Basidia 45-54 x 5-7 µm, clavate, with 2 sterigmata.
Basidiospores 5-11 x 3.5-75 µm, elliptic to subglobose.
Substrate. Terrestrial.
Distribution. Pantropical, but rare, described from Mexico.
Remarks. The black stipe with coralloid hyphae is diagnostic.

COTYLIDIA P. Karst.,

Rev. Mycol. Toulouse 3: 22, 1881.
Basidiocarps terrestrial or on woody debris, coriaceous, spatulate, dimidiate, flabellate or infundibuliform to pseudo-infundibuliform, adjacent basidiocarps sometimes becoming confluent, upper surface usually white, yellowish or pale brown, becoming pale fawn, yellowish ochre or purplish brown, hymenial surface smooth, white, cream or bright yellow in fresh specimens, minutely setulose under a lens.
Hyphal system monomitic, generative hyphae with simple septa or clamps, smooth, cystidia present in the hymenium and, in some species also on the pileus and stipe, basidia clavate, basidiospores elliptic, thin-walled, hyaline, smooth and non-amyloid.
Cosmopolitan genus.
Type species: *Cotylidia undulata* (Fr.) P. Karst.

Remarks. The genus is characterized by stipitate basidiocarps with a monomitic hyphal system composed of simple septate generative hyphae and smooth, thin walled and cylindrical cystidia.

Key to species

1. Rare Japanese species **2**
1. Widespread species **3**

2. Basidiocarp whitish, stipe tomentose ..... **C. kombaensis**
2. Basidiocarps pinkish, stipe glabrous ..... **C. harmandii**

3. Basidiocarps growing on mosses ..... **C. muscigena**
3. Basidiocarps on dead wood or the ground **4**

4. Spores broadly elliptic to subglobose, rare European species ..... **C. marsicana**
4. Spores different, wide spread species **5**

5. Basidiocarps whitish to bright yellow when fresh, becoming ochraceous, Neotropical species ..... **C. aurantiaca**
5. Basidiocarps differently coloured, predominantly temperate to boreal **6**

6. Basidiocarps often rosette like, 3-5 cm high, pileus 1 mm thick or more, basidiospores 7-9 x 3.5-4 µm ..... **C. pannosa**
6. Basidiocarps infundibuliform to spatulate, 1-2 cm high, very thin, basidiospores smaller **7**

7. Basidiocarps white to ochraceous, basidiospores 2.7-3.5 µm cystidia absent on the pileus and stipe ..... **C. diaphana**
7. Basidiocarps, greyish to brown, cystidia present also on pileus and stipe **8**

8. Basidiocarp infundibuliform, spores 4-5 x 2-2.5 µm, widespread ..... **C. undulata**
8. Basidiocarp laterally stipitate, spores 3-4 x 1.5-2 µm, Centl. Europe... **C. carpatica**

Cotylidia aurantiaca (Pers.) Welden,

Lloydia 2, 40, 1958. - *Thelephora aurantiaca* Pers., in Gaudichaud, Voyage sur I'Uranie, Botany p. 176, 1827. - *Thelephora spectabilis* Lev., Ann. Sci. nat. Series Ill, 2:206, 1844. - *Thelephora decolorans* Berk. & M. A. Curt., J. Linn. Soc. (Bot.), 10:328, 1868. - *Thelephora sericella* Berk. & M. A. Curt., J. Linn. Soc. (Bot.) 10,328, 1868. - *Thelephora affinis* Berk. & M. A. Curt., J. Linn. Soc. (Bot.) 10: 328, 1868. - *Thelephora quisquiliaris*

Berk. & M. A. Curt., J. Linn. Soc. (Bot.) 10, 239, 1868. - *Stereum alutaceum* Berk. & Cooke, J. Linn. Soc. (Bot.) 15:388,1876. - *Stereum xanthellum* Cooke, Grevillea 9:12, 1880. - *Stereum albostipatum* Lloyd, Lloyd Mycol. Writ. 4:22, 1913.
Basidiocarps 0.6-3.5 cm high, 0.2-4.5 cm wide, stipe up to 1.5 cm. long and 1.5 mm wide, solitary or gregarious, with a papery texture, commonly spatulate or reniform, less often pseudo-infundibuliform or truly infundibuliform, adjacent basidiocarps frequently confluent, pilei bright yellow when fresh, becoming ochraceous or ochraceous-straw coloured when dry, margin usually fimbriate or the pileus may split radially, when dry the upper surface has a distinct silky sheen with numerous radiating fibrils; hymenial surface bright yellow when fresh, yellow ochre or creamy ochre on drying, context very thin.
Hyphal system monomitic, generative hyphae, 3-8 µm in diameter, slightly thick-walled, hyaline or pale yellowish with simple septa.
Cystidia 6-26 µm wide and up to 125 µm long, often projecting up to 65 µm beyond the basidia, cylindrical, clavate or slightly capitate to subglobose or pyriform, some with 1 to 3 transverse and often somewhat constricted septa, walls slightly thickened.
Basidia 26-39 x 3-5 µm, cylindrical or clavate.
Basidiospores (5.5-) 6-8.5 (-9) x 3-3.75 (-4) µm, elliptic.
Substrate. Most frequent on woody substrates, but also terrestrial.
Distribution. Known only from tropical America, where it is common.
Remarks. This is a small, soft, beautiful, and white to yellow species, which may be locally common, often occurring in large numbers on the forest floor.

Cotylidia carpatica (Pilát) Huijsman,

Bull. Soc. Mycol. France 70: 57, 1954. - *Skepperia carpatica* Pilát, Bull. Soc. Mycol. France 43: 52, 1927.
Basidiocarps laterally stipitate, stipe 2 - 10 mm high, and up to 0.3 mm wide, tough, pubescent, pileus thin, reniform or flabelliform to broadly spathulate, margin fringed to undulating, 2 to 7.5 mm wide, pale brownish when fresh, hymenial surface smooth, pilose by protruding cystidia.
Hyphal system monomitic, hyphae simple-septate, mostly 2–2.5 µm in diam., thin-walled.
Cystidia abundant in the hymenium, cylindrical, 50–70 × 5–8 µm, projecting up to 50 µm, similar cystidia occur on the pileus and on the stipe but then slightly more thick-walled.
Basidia 12–16 × 3–4 µm narrowly clavate.
Basidiospores 3-4 × 1.5-2 µm, elliptic.
Habitat. Among mosses in moist forest.
Distribution. Only found three times, the type locality in the Carpathian mountains, also Netherlands and France.
Remarks. The species is similar to *Cotylidia undulata* and differs chiefly by the lateral stipe and smaller spores.

Cotylidia diaphana (Schwein.) Lentz,

US Dept. Agric. Monograph 24:12, 1955. - *Thelephora diaphana* Schwein. in Berk. & W. A. Curtis, J. Acad. Nat. Sci. Phil. Ser. II, vol. 2:278, 1854.
Basidiocarps 1.5-4 cm high, 0.8-3 cm wide, usually solitary, thin, coriaceous, frequently infundibuliform more rarely spatulate, sometimes with pilei split into lobes that then fuse together again, to form a complicated basidiocarp. Adjacent basidiocarps may also fuse to form compound basidiocarps. Pilei white to pale cream when fresh, becoming darker, to straw-coloured, occasionally with darker bands, smooth or with fine radiating fibrils which may be more fibrous to strigose towards the base, hymenial surface smooth to slightly wrinkled white to ochraceous-yellow when fresh, becoming pale reddish-brown in some specimens, usually decurrent on the stipe, stipe to 2.5 cm. long and 1-4 mm wide, white, and finely velutinate to tomentose towards the base.
Hyphal system monomitic, generative hyphae 3-7 µm in diameter, hyaline or very pale yellowish with simple septa.
Cystidia up to 125 µm long and 8-15 µm wide, projecting up to 80 µm beyond the basidia, cylindrical to clavate, with slightly thickened walls, some with 1 to 3 transverse, often somewhat constricted septa.
Basidia 22-30 x 3-5 µm, cylindrical or clavate, with 4 sterigmata.
Basidiospores 4-6 (7) x 2.5-3.5 µm, elliptic.
Substrate. On the ground or on wood of hardwood trees.
Distribution: North America and East Siberia.
Remarks. This species may be looked upon as the temperate, boreal, counterpart of *C. aurantiaca*, separated from that species by shorter basidiospores.

Cotylidia harmandii (Lloyd) D.A. Reid,

Beiheft Nova Hedwigia 18: 76, 1965. - *Stereum harmandii* Lloyd, Mycol. Writings 4:22, 1913.
Basidiocarps 2-4 cm high, 0.8-3 cm wide, usually solitary, thin, translucent, flabelliform, often split along the margin, pileus pinkish to reddish when dry, smooth, hymenial surface smooth dark reddish, stipe to 2.5 cm. long and 1-4 mm and pinkish.
Hyphal system monomitic, generative hyphae 3-8 µm in diameter, hyaline and with clamps.
Cystidia abundant, cylindrical, smooth, up to 80 µm long and 7-10 µm wide, projecting up to 50 µm beyond the basidia, cylindrical to clavate, with slightly thickened walls, some with 1 to 3 transverse septa.
Basidia 20-30 x-4-6 µm, cylindrical to clavate.
Basidiospores 6 x 3, elliptic, only one seen according to Reid (1965:76).
Substrate. On the ground.
Distribution: Known only from the type locality in Japan.
Remarks. The small pinkish to reddish basidiocarps, and if this is also the colour of fresh basidiocarps, it will be a good field character**.**

Cotylidia komabensis (Henn.) D.A. Reid,

Beiheft Nova Hedwigia 18: 77, 1965. – *Thelephora komabensis* Henn., Bot. Jahrb. 31:736, 1902.
Basidiocarps 1-4 cm high, 1-3 cm wide, usually solitary, thin, translucent, flabelliform, spatulate occasionally infundibuliform, pileus white, to cream, smooth, hymenial surface smooth, whitish to cream to pale ochraceous, stipe lateral, up to 1 cm. long, pale cram, tomentose, especially towards the base which is swollen in the type.
Hyphal system monomitic, generative hyphae 3-6 µm in diameter, hyaline and simple septate.
Cystidia abundant, cylindrical, smooth, up to 100 µm long and 7-10 µm wide, projecting up to 40 µm beyond the basidia,
Basidia 20-30 x-3-5 µm, cylindrical or clavate.
Basidiospores 6 -8.5 x 2.5 -3.5 µm, elliptic to slightly flattened on one side.
Substrate. On the ground.
Distribution: Known only from Japan.
Remarks. The large spores and the whitish colours combined with a tomentose stipe characterize this rare species. The description is based on two collections only, thus, it is probably not covering the whole morphological variation.

Cotylidia marsicana Lonati,

Micol. Veg. Medit. 5: 3, 2000.
Basidiocarps more or less centrally stipitate, infundibuliform, 5–15 mm wide and 3–8 mm high, margin lobed, undulating, fimbriate, basidiomata white or with isabellinous tinge.
Hyphal system monomitic, simple septate, hyphae uniformly 2–4 µm wide.
Cystidia cylindrical, 40–60 × 4–6 µm, thin-walled, hyaline.
Basidia 15–20 × 4–5 µm, narrowly clavate.
Basidiospores 4–5 × 3–3.5 µm, broadly elliptic.
Habitat. On burned wood of *Castanea sativa* on the ground.
Distribition. Only known from the type locality in Italy.
Identification. Differs from other species of the genus by the broadly elliptic spores.
Remarks. Little known species. The description is drawn from the protologue. If the habitat on burned wood is typical, it makes this species differ from other members of the genus, where allmost all are associated with mosses.

Cotylidia muscigena L. Remy, **Fig. 9.**

Bull. Soc. Mycol. France 80: 469, 1964. - For figure of microscopical characters, , see Cort. vol 1 p. 179.
Basidiocarps pileate, semi-infundibuliform and deeply incised, about 1.5 cm high and 1 mm thick, pileus thin, ca 2 × 1 cm, translucent, whitish to pale ochraceous, slightly zonate, pilose above by projecting pilocystidia (lens), margin involute, hymenial surface

Fig. 9. *Cotylidia muscigena*, photo L. Zibarova

smooth, setulose under the lens, stipe short, whitish, hairy by hyphae and numerous filiform caulocystidia.
Hyphal system monomitic, hyphae thin-walled, simple-septate, straight, about 2 µm wide, sparsely branched in the trama, densely branched and interwoven in the subhymenium.
Cystidia numerous, in the hymenium thin-walled or slightly thick-walled, originating in the trama, up to 120 µm long and about 10 µm wide, rarely septate, on the pilear surface numerous filiform pilocystidia, as a rule not septate, on the stipe as filiform caulocystidia with or without septa, up to 150 µm long.
Basidia 15–20 × 4–5 µm, narrowly clavate.
Basidiospores 5–7.5 × 2–2.5 µm, subcylindrical.
Habitat. On dead mosses.
Distribution. This is a rare species and only a few collections are known, but found north to Northern Norway, so it is probably widespread, but overlooked.
Remarks. The habitat on mosses is characteristic. This species seems to be well distinguished from *C. undulata*, which is grey or greyish brown and has a regular infundibuliform basidiocarp. *C. carpatica* has smaller spores.

Cotylidia pannosa (Sowerby: Fr.) D. A. Reid, **Fig. 10**

Nova Hedwigia Beih. 18:81, 1965. - *Thelephora pannosa* Sowerby: Fr., Syst. mycol. 1:430, 1821. - *Cotylidia pallida* (Pers.) Boidin, Rev. Mycol. 24:201, 1959.
Basidiocarp 3-5 cm, irregularly infundibuliform, then confluent and often becoming more or less like a rosette, at first white, later more yellowish, upper surface radiately fibrillose, hymenial surface setulose (lens), irregularly veined, initially white, then

Fig 10. *Cotylidia pannosa*, photo L. Zibarova.

yellowish to ochre after drying, stipe short or inconspicuous, covered at the base by a whitish tomentum of hyphae.
Hyphal system monomitic, 3-4 µm wide, hyphae with thin or slightly thickened walls, simple septate, arranged parallel in the trama, irregularly interwoven in the subhymenium.
Cystidia (pseudocystidia) 100-150 x 10-12 µm, tubular-cylindrical, thin-walled, apically rounded, strongly projecting, usually abundantly present.
Basidia 50 x 5-7 µm, subcylindrical, with 2-4 sterigmata.
Basidiospores 7-9 x 3.5-4 µm, elliptic.
Substrate. On soil in hard wood forests.
Distribution. A rare species, known from a few states in the northern United States. In Europe known from England, France, Sweden and Denmark.
Remarks.

Cotylidia undulata (Fr.) P. Karsten. **Fig. 11**

Rév. Mycol. Toulouse 3:22, 1881. - *Thelephora undulata* Fr., Elench. fung. 1:164, 1828.
Basidiocarp 0.5-1.5 cm high, 0.5-1.5 cm wide, stipitate, infundibuliform, pileus thin, indistinctly zonate, greyish to greyish-brown, upper side smooth, fibrillose near the margin with radiating hyphae and pilocystidia (lens), hymenium smooth or slightly veined, greyish or pale ochraceous, setulose (lens) due to projecting cystidia, stipe about 0.5 cm high and 1 mm wide, greyish white, appearing finely hairy due to projecting hyphae and caulocystidia.

Fig. 11. *Cotylidia undulata*, Photo L. Zibarova.

Hyphal system monomitic, hyphae up to 3 µm wide, simple septate, thin-walled, straight, parallel, sparsely branched and distinct in the trama, but densely branched, interwoven and indistinct in the subhymenium.
Cystidia (pseudocystidia), 50-70 x 5-10 µm, subcylindrical, apically rounded, with thin or slightly thickened walls, present in the hymenium and originating in the trama, they penetrate the subhymenium and project above the hymenium. Numerous pilocystidia of similar shape are present on the upper side of the pileus. Abundant, septate caulocystidia (100 µm or more in length) present on the stipe.
Basidia 15-20 x 4-5 µm, narrowly clavate.
Basidiospores 4-5 x 2-2.5 µm, narrowly elliptic.
Substrate. On soil in dry biotopes, sometimes on old fire sites, often associated with mosses, especially those of the genus *Polytrichum.*
Distribution. Circumpolar in the temperate zone but apparently rather rare.

CYMATODERMA Jungh.,

Tijdschr. nat. Gesch. 7: 290, 1840.
Basidiocarps lignicolous, coriaceous, dimidiate, flabellate, infundibuliform, with adjacent basidiocarps frequently becoming confluent, upper surface of the pileus covered with a very thick felty tomentum which may be much thicker than the context. In some species the surface below the tomentum is covered with radiating, knife-like, sharp edged ridges but these may be almost completely obscured by the density of the tomentum, except towards the pileal margins, hymenial surface smooth, warty or spiny, and with folds, ridges, or undulations, stipe lateral or central. Hyphal system di- or trimitic; generative

hyphae frequently of two kinds 1. thin-walled, hyaline, branched, and with clamp connections or 2. very thick-walled with the lumen often obliterated; skeletal hyphae very thick-walled, subhyaline or pale brown; binding hyphae thick walled. Encrusted cystidia present in some species, gloeocystidia present in all species, basidia clavate, usually 4-spored, basidiospores broadly elliptical to subglobose thin-walled, hyaline, non-amyloid. On dead hardwoods, pantropical genus with a white rot.
Type species: *Cymatoderma elegans* Jungh.
Taxonomic synonyms:
Cladoderris Berk., Lond. J. Bot. 1:152, 1842.
Actinostroma Klotzsch, Nova Acta Acad. Leop. Carol. 19 (Suppl.1) 23: 6, 1843.
Beccariella Ces., Atti Accad. Sci. fis. mat. Napoli 8: 95, 1879.
Remarks. Species of the genus are usually easy to recognize in the field because of the large, fleshy basidiocarps with a tomentose to densely hairy pileus, and, in most species, ribs or folds on the lower side. *Podoscypha*, a genus similar to *Cymatoderma*, has species with much smaller basidiocarps, pilei which are smooth or only sparsely covered with simple cystidia and a smooth hymenial surface.

Key to species

1. Basidiospores 7.5-12 µm long **2**
1. Basidiospores much shorter **3**

2. Neotropical species..... **C. caperatum**
2. Paleotropical species ..... **C. elegans**

3. Basidiocarps arising on the ground from a sclerotium. ..... **C. sclerotioides**
3. Basidiocarps on dead wood, no sclerotium present **4**

4. Hymenial surface more or less smooth..... **C. venezuelae**
4. Hymenial surface with ridges, folds or protuberances **5**

5. Hymenial surface with a complex pattern of ribs and folds without protuberances, context brown, gloeocystidia abundant, subhymenial hyphae more or less smooth ... . **C. dendriticum**
5. Hymenial surface with occasional ribs but with numerous small protuberances, context greyish white to wood-coloured, gloeocystidia few, subhymenial hyphae strongly encrusted ..... **C. fuscum**

Cymatoderma caperatum (Berk. & Mont.) D. A. Reid,

Kew Bull. 10:635, 1955. - *Thelephora caperata* Berk. & Mont., Ann. Sci. Nat. Ser 3, 11:241, 1849. - *Stereum goliath* Speg., Ann. Soc Sci. Argent. 17:77, 1884. - *Stereum hylocrater* Speg., Ann. Soc Sci. Argent. 17:77, 1884.

Basidiocarp 4-19 cm high, 3-12 cm wide, thin, pliable, tough, usually infundibuliform, with a central stipe, often confluent. Pilei covered with a thick, straw coloured to golden or rusty brown tomentum under which the surface is radially covered in furrows and sharp ridges, hymenial surface creamy-white to flesh coloured, becoming rusty cream or ochraceous with a pinkish tinge. In dried specimens the surface is covered with obtuse, radiating folds these tending to branch toward the margin.
Stipe central, often short or rudimentary, occasionally well developed, covered with a brownish tomentum and attached to the substrate by a small basal disc.
Hyphal system dimitic, generative hyphae 2-4 µm wide with clamp connections, skeletal hyphae 3-5 µm wide.
Gloeocystidia up to 11 µm wide, undulating, thin-walled, with swollen bases, narrowing toward the obtuse apices, frequently constricted at intervals and appearing irregularly moniliform.
Basidia 30-45 x 4-7 µm, clavate.
Basidiospores 7.5-12 x 2.5-4 (-4.5) µm, subcylindrical to narrowly elliptic.
Substrate: On dead hard wood.
Distribution: American species known from Argentina to southern United States.
Remarks. The large spores and its distribution characterize the species.

Cymatoderma dendriticum (Pers.) D. A. Reid,

Kew Bull. 13, 523, 1958. - *Thelephora dendritica* Pers. in Gaudichaud, Voyage sur I'Uranie Botany 176, 1826. - *Actinostroma crassum* Klotzsch, Nova Acta Acad. Leop. Carol. 19, (Suppl. 1), 237, 1843. - *Cladoderris candolleana* Lev., Ann. Sci. nat., Series Ill, 5, 153 -4, 1846. - *Becariella trailii* Cooke Grevillea 20: 33, 1891. - *Cladoderris imbricata* Pat., Bull. Soc. mycol. Fr. 38, 86-7, 1922. - *Stereum fenixii* Lloyd, Lloyd Mycol. Writ. 7: 1115, 1922.
Basidiocarps up to 10.5 cm from stalk to margin, and 20.5 cm wide, thin, pliable, coriaceous-membranous, dimidiate or flabellate, often deeply imbricately lobed (in some specimens almost down to the short lateral stipe). Pilei usually completely covered with a very well developed felt-like tomentum, this beige or pale fawn to dark ochraceous-brown, up to 8 mm thick near the base of the basidiocarp and obscuring the short and not very prominent, sharply edged ridges on the surface, hymenophore cream to purplish or reddish-brown in older specimens, surface with a complex system of densely crowded, rather sharply edged, branched, radiating ribs.
Stipe lateral, usually short and stout or rudimentary, rarely well developed (but may reach 5 cm and 1 - 5 cm wide), covered by a dense reddish-brown tomentum, context thin, greyish white to wood coloured.
Hyphal system trimitic; generative hyphae 3-5 µm wide and smooth, skeletal hyphae 4-5(-8) µm, hyaline to pale brown, and binding hyphae 2-2.5 µm., the tomentum is composed of thick-walled, smooth hyphae, 3–7 µm wide.
Gloeocystidia abundant, 40-80 x 4-8 µm, undulating, thin-walled, with swollen bases up to 15 µm in diam., often irregularly constricted and rarely forked.

Basidia 25-25 x 4-6 µm, clavate, tetrasterigmatic.
Basidiospores (2.5-) 3-4 x (2-) 2.5-3 (-3.5) µm, broadly elliptic to subglobose.
Substrate. On dead hard wood.
Distribution. Pantropical.
Remarks. The species is characterized by the complex system of ridges on the lower side of the basidiocarp.

Cymatoderma elegans Jungh., **Fig. 12**

Tidschr. Nat. Geschell. 7:290, 1840. – *Cladoderris spongiosa* Fr., K. svensk Vetensk. Akad. Handl. 69:140, 1848. – *Beccariella insignis* Ces., Atti Acad. Sci, fis, Mat. Napoli 8:9, 1874.- *Cladoderris australiaca* Berk., in Saccardo, Syll. Fung. 6:548, 1888. – *Beccariella kingiana* Massee, Grevillea 20:33, 1891. – *Cladoderris roccatii* Mattirolo, Ann. Bot. Roma 7:144, 1908. – *Cladoderris scrupulosus* Lloyd, Mycol. Writing. p. 8, 1913.

Basidiocarp 4-19 cm high, 3-12 cm wide, thin, pliable, tough, dimidiate, but usually infundibuliform, with a central stipe, pileus with a thick, straw coloured to golden or rusty brown tomentum under which the surface is radially covered in furrows and sharp ridges, hymenial surface creamy-white to flesh coloured, becoming rusty cream or

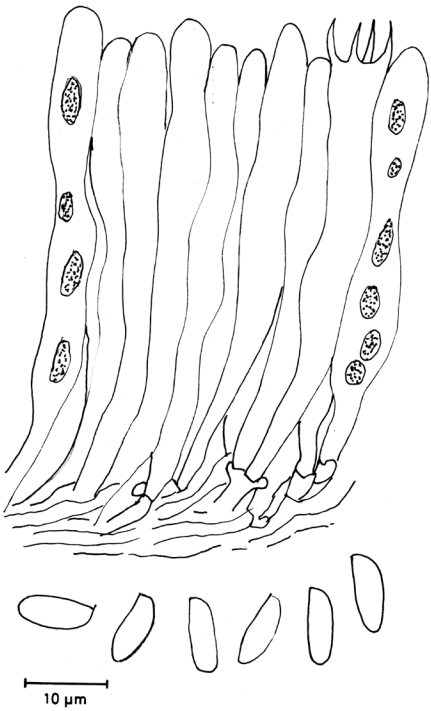


Fig. 12. *Cymatoderma elegans*, A) part of hymenium with gloeocystidia, b) basidiospores, Coll. L. Ryvarden 40501 from Venezuela.

ochraceous with a pinkish tinge, with prominent branched, radiating folds with variable warts and short spines a.
Stipe up to 5 cm long and about 1 cm in diameter, often short or rudimentary, occasionally well developed, covered with a brownish tomentum and attached to the substrate by a small basal disc.
Hyphal system dimitic, generative hyphae 2-4 µm wide, with clamp connections, skeletal hyphae 3-5 µm wide.
Cystidia present, thick walled, encrusted in upper part, 15-50 x 7.5-10 µm, clavate to pointed.
Gloeocystidia up to 11 µm wide, undulating, thin-walled, smooth, often of irregular shape.
Basidia 30-45 x 4-7 µm, clavate, tetrasterigmatic.
Basidiospores 6.5.5-9 x 4-5 µm, elliptic.
Substrate: Dead hard wood.
Distribution: Paleotropical species.
Remarks. The distribution, the pileus brown tomentum and ridged hymenophore is sufficient for an identification of this beautiful species.

Cymatoderma fusca (Cooke) D. A. Reid,

Kew Bull. 13: 526, 1958. - *Cladoderris fusca* Cooke, Grevillea 10: 123, 1882. - *Cladoderris glaziovii* Henn., Bot. Jb. 15, Beiheft 34:15, 1892.
Basidiocarps 3-6 cm high and 4-10 cm wide, coriaceous, dimidiate or flabellate, pileus covered with a thick, brown, felt-like tomentum which obscures the short, radiating, inconspicuous ridges on the surface, except toward the margins, which are very dark brown or black, glabrous and shiny, hymenophore pinkish-beige with a purplish tinge, with several radiating folds and covered with minute granular protuberances, context pale brown.
Stipe rudimentary,
Hyphal system trimitic, generative hyphae with clamps, thin – to thick walled 3-7 µm, skeletal hyphae 4-6 µm, distinctly brown in colour, with those in the subhymenium strongly encrusted, binding hyphae, 2-3µm, with numerous long tapering branches.
Gloeocystidia up to 60 µm long, present, but few, often collapsed and wrinkled.
Basidia not seen.
Basidiospores 3.75 -4 x 2.5 -2.7 µm, broadly elliptical.
Substrate. Dead hard wood.
Distribution. Known only from Rio de Janeiro in Brazil (type locality), Grenada and Louisiana in the United States.
Remarks. Undoubtedly related to *C. dendriticum*, but separated by the hymenial surface which is covered with protuberances, a darker context and encrusted hyphae in the subhymenium. It may be that these characters are a result of environmental factors and that more collections will reveal it to be a form of *C. dendriticum*. Microscopical characters are more or less identical in the two species.

Cymatoderma sclerotioides (Lloyd) D. A. Reid,

Kew Bull. 13: 528, 1958. - *Stereum sclerotioides* Lloyd, Lloyd Mycol. Writ. 7:11, 1922.
Basidiocarps 7 -7.5 cm high, 2.5 cm wide, arising from a very hard, dark brown, strongly ribbed and wrinkled sclerotium up to 4 cm long and 2.5 cm wide, stipe is well developed and expands into a small coriaceous, infundibuliform pileus, 1.75 cm high and 2.5 cm in diam., with wavy margin, pileus surface only slightly radially ridged, covered by a thick, deep rich ochre-brown tomentum, hymenial surface pale creamy-ochre with numerous radial ridges. Stipe up to 6 cm long and 1 cm wide covered at the base by a thick, spongy, deep ochre-brown tomentum.
Hyphal structure dimitic; generative hyphae 2 -4 µm wide and with clamps, skeletal hyphae, narrow, 2.5-3 (-4) µm, hyphae of the surface tomentum thick-walled and with a distinct lumen.
Gloeocystidia 40-75 x 4-8 µm, abundant, undulating, thin-walled with swollen bases, narrowing above and appearing almost moniliform.
Basidia 25-30 x 5-6 µm, clavate, tetrasterigmatic.
Basidiospores (3.5)4-5.5 x 2-3 µm, narrowly elliptic to subcylindrical, often with one guttule.
Substrate. On the ground.
Distribution: Known from Brazil, Panama and Costa Rica.
Remarks. The species is characterized by the sclerotium, unknown in the other species in the genus.

Cymatoderma venezuelae D. A. Reid,

Beiheft Nova Hedwigia 18:132, 1965.
Basidiocarps 0.8-2-0 cm from point of attachment to the margin, 0.3 - 1. 5 cm wide, irregularly spatulate to flabellate with a very short, flattened, stipe like base, which is attached to the substrate by a thick, basal pad of ochraceous mycelium, occasionally more than one basidiocarp may arise from a single mycelial pad, pileus densely covered with a thick, matted, felty tomentum, this ochraceous- or tawny-brown, and which may thin out toward the margin, exposing the underlying surface at the extreme edge, as a narrow, glabrous, shining, translucent, chestnut-brown zone, hymenial surface quite smooth, dark purple-brown to orange brown, with narrow blackish zones.
Stipe very short, flattened and rudimentary.
Hyphal system dimitic, generative hyphae, 2-5 µm wide, hyaline, branched, and with clamp connections; skeletal hyphae, up to 8 µm in diam., thick-walled to almost solid, hyaline and unbranched, tomentum composed of densely compacted, thin-walled, generative hyphae there are widened sections resembling cysts or pseudocystidia, these rather short, but up to 40 µm long.
Cystidia gloeocystidia, up to 80 µm long and 14 µm wide abundant, thin-walled, undulating, arising at different depths in the hymenium and slightly projecting.
Basidia 24-30 x 4-6 µm, clavate, tetrasterigmatic.

Basidiospores 3.5-4 x 2-3 µm narrowly elliptic to ovate.
Substrate. Unknown, but probably on dead hardwood.
Distribution: Known only from type specimen from Venezuela.
Remarks. Recognised by the smooth hymenium and the cysts or pseudocystidia formed in the hairs on the pileus. More collections are desirable in order to ascertain its morphological variation.

CYPHELLOSTEREUM D. A. Reid,

Beih. Nova Hedw. 18: 336, 1965.
Basidiocarps terrestrial, or on mosses, pileate, dimidiate or flabelliform, with or without a short stipe, hymenium smooth, hyphal system monomitic, hyphae thin-walled, lacking clamps, hymenium thickening, cystidia present, basidia small, clavate or subcylindrical, basidiospores small, negative in Melzer's reagent, thin-walled, subglobose or elliptic.
Type species: *Cantharellus laevis* Fr.
Remarks. A unique genus in the Stereales as its type species is parasitic on mosses. In this sense it resembles the genus *Leptoglossum*, which in most literature is placed in the Agaricales. The small whitish basidiocarps are reminiscent of *Cotylidia*, but the type is, as stated, parasitic, a characteristic completely unknown in the latter genus, whilst the other species treated here lack the cystidia, a characteristic of *Cotylidia*.
The genus has its closest relatives among some tropical basidiolichens currently placed in *Dictyonema*.

Key to species

1. Parasitic on mosses, thin-walled cystidia present, basidiospores 4-4.5 x 2-2.5 µm. ..... **C. laeve**
1. On open soil, cystidia absent, basidiospores 5-8 x 3-4 µm. .....**C. pusiolum**

Cyphellostereum laeve (Fr.) D. A. Reid.

Beih. Nova Hedw. 18: 336, 1965. - *Cantharellus laevis* Fr., Syst. mycol. 1:324, 1821.
Basidiocarp pileate, small (about 0.5-1 cm in diam.), rounded or spatulate, usually tapering to a short, often indistinct stipe, upper side flat or somewhat convex, white, with a soft texture, composed of interwoven hyphae, hymenial side concave, white or cream-coloured, smooth or almost so, margin somewhat deflexed.
Hyphal system monomitic, hyphae about 2.5 µm wide (2-3 µm), hyaline, simple septate.
Cystidia 35-55 x 6-7 µm, numerous, projecting, thin-walled, smooth, narrowly fusiform.
Basidia 15-18 x 4.5-6 µm, clavate.
Basidiospores 4-4.5 x 2-2.5 µm, subglobose or sub-elliptic.
Substrate. On living mosses, especially *Polytrichum* spp.
Distribution. Cosmopolitan, apparently rare, but easily overlooked because of its size.

Remarks. Easily recognized by its ecology and substrate.

Cyphellostereum pusiolum (Berk. & M. A. Curt.) D. A. Reid. See p. 198 Cort. Vol 1.

Beiheft Nova Hedwigia 18:342, 1965. - *Stereum pusiolum* Berk. & M. A. Curtis, J. Linn. Soc. (Bot.) 10:330, 1869. - *Stereophyllum pallens* P. Karst., Hedwigia 28: 191, 1889 -*Stereum cyphelloides* Berk. & M.A. Curtis, J. Linn. Soc., Bot. 10: 331, 1868 - *Stereum squamula* Speg., Boln Acad. nac. Cienc. Córdoba 11: 81, 1887 - *Thelephora uleana* Henn., Hedwigia 36: 194, 1897. -

Basidiocarp pileate, up to 2 cm long and wide, spatulate to flabelliform, usually tapering to a short, often indistinct or rudimentary stipe, upper side white to cream coloured, adpressed cottony and radially fibrillose to wrinkled, in old specimens often fimbriate along the margin, hymenial side extending almost to the base of the stipe, white or cream-coloured, smooth or almost so, stipe concolorous with the hymenial side.

Hyphal system monomitic, hyphae about 2- 5 µm wide, hyaline, narrow, sparsely branched, lacking clamps, forming a distinct subhymenium composed of densely interwoven hyphae.

Cystidia absent.

Basidia 10-25 x 4.5-6 µm, clavate.

Basidiospores 5-8 x 3-4µm, elliptic to almost subglobose, or pip shaped, thin-walled, often collapsed in dry specimens and difficult to revive, and then difficult to measure or to ascertain their shape.

Substrate. On open soil, roadsides, river banks and similar places, often present in large numbers.

Distribution. Cosmopolitan and may be rare, but easily overlooked because of its size.

Remarks. Easily recognized in the field due to the white colour, small basidiocarps and occurrence on open ground. The lack of cystidia and larger spores make it microscopically distinct from *C. laeve*. The lack of cystidia also precludes its transfer to *Cotylidia*.

CYSTOSTEREUM Pouzar,

Ceska Mykol. 13:18, 1959.

Basidiocarps perennial, usually resupinate or occasionally pileate, hymenium odontioid or tuberculate, light-coloured, at least when young. Hyphal system dimitic composed of thin-walled generative hyphae with clamp connections, and thick-walled skeletal hyphae. Basidiocarps consist of two layers, a subiculum of mainly horizontal hyphae and a subhymenial trama of vertical hyphae. Gloeocystidia like vesicles present in the hymenium and the subhymenium, but rare in the subiculum. Basidia narrowly clavate, tetrasterigmatic, basidiospores narrowly elliptic or subcylindrical, about 5 x 2.5 µm, thin-walled, smooth, cyanophilous and non-amyloid. Cosmopolitan genus from the Northern hemisphere.

Type species: *Thelephora murraii* Berk. & M. A. Curtis.
Remarks. The whitish tuberculate, perennial basidiocarps make this a distinct genus in which especially the type species is easily recognized in the field. Microscopically, the dimitic hyphal system and the gloeocystidia form a unique combination.

Key to species

1. Basidiospores cylindrical, pointed hyphidia absent. .....**C. murraii**
1. Basidiospores elliptic, pointed hyphidia present. ..... **C. australe**

Cystostereum australe Nakasone,

Mycotaxon 17:270, 1983.
Basidiocarp perennial, effused, resupinate or narrowly reflexed with a narrow pileus, up to12 cm long, 5 cm wide and 2.5 mm thick, woody hard, cracking when drying and with a black zone between the subiculum and the substrate, pileus black, hymenium smooth to tuberculate, light coloured, cream to ivory yellow, discolouring brown, and black with 2% KOH. Subiculum light brown and dense, margin abrupt, often raised from the substrate when dry.
Hyphal system dimitic, consisting of thin-walled, richly ramified hyphae, 2-3.5 µm wide, provided with clamp connections, and sparse, thick-walled skeletal hyphae, 0.5 -1.5 µm wide, these mostly in the subicular layer, generative hyphae are densely agglutinated and separable only in very young basidiocarps. In the trama, generative hyphae are predominant, arranged vertically, and mixed with cystidia.
Gloeocystidia 25-40 x 9-15 µm, ventricose to clavate, numerous, mostly embedded, slightly thick walled, yellowish in the subhymenium.
Hyphidia 15-35 x 1.5-5 µm, present in the hymenium, slender, more or less cylindrical, smooth, hyaline and tapering towards the apex.
Basidia 25-40 x 5 -7 µm, clavate, tetrasterigmatic.
Basidiospores 5.5-6 x 3.5-4 µm, elliptic often flattened adaxially.
Substrate. On hardwoods.
Distribution. A rare species, known United States and Costa Rica.
Remarks. The species is recognized by its basidiocarps and elliptic spores.

Cystostereum murraii (Berk. & M. A. Curtis) Pouzar, Figures, see p. 199-200 in Cort. Vol 1

loc. cit. - *Thelephora murraii* Berk. & M. A. Curtis, Journ. Linn. Soc. London 10:329, 1869.
Basidiocarp perennial, effused, resupinate or reflexed, to partly pileate, variable in size but often very large (several dm) and may extend to 1 metre or more in length, about 1 mm thick, tough to ligneous, brittle when dry, abhymenial side black and hard (carbonaceous), uneven, often with concentric ridges, hymenium tuberculate, light

coloured, mostly greyish white when young, darkening with age, smell characteristic, pleasantly aromatic, especially when fresh.
Hyphal system dimitic, consisting of thin-walled, richly ramifying hyphae, 2-3.5 µm wide, with clamp connections, and sparse, thick-walled skeletal hyphae, 1.5-3 µm wide, these mostly in the subicular layer, generative hyphae densely agglutinated and separable only in very young basidiocarps and mostly arranged horizontally in the subiculum and vertically in the subhymenium.
Gloeocystidia 7-15 µm wide (rarely more) and 30-40 µm long, variable in shape but usually ovate to elliptic, common in the hymenium and very numerous in the subhymenial trama and subiculum, often somewhat longer and narrower in the subiculum.
In the very young basidiocarp they originate from the subiculum and extend into the hymenium, with new gloeocystidia developing in the hymenium as long as it increases in thickness. In thin sections they appear empty but are normally filled with oil droplets. In many specimens some of the gloeocystidia, especially, those in the hymenium, are filled with a homogeneous, yellow substance (dotted in the figure).
Basidia 25-30 x 5 µm, narrowly clavate, tetrasterigmatic.
Basidiospores 4.5-5.5 x 2.5-3 µm, narrowly elliptic to subcylindrical.
Substrate. In America found on both hardwoods and conifers. In Europe almost exclusively on *Picea abies*.
Distribution. Widespread in the coniferous zone, occasionally the subtropical zone, such as Cuba from where it was described.
Remarks. The white colour, the tuberculate hymenial surface and the pleasant smell are usually sufficient for a field determination.

CYTIDIA Quélet,

Fl. myc. France: 25, 1888.
Basidiocarps initially tuberculate and resupinate, then loosening at the margins becoming cupuliform, when fresh and hydrated the texture is coriaceous to somewhat gelatinous and pliable, when dry becoming hard and brittle, hymenium smooth, dark red to violaceous, upper side farinose and whitish. Hyphae 2-3 µm wide, violaceous blue in sulpho-vanillin, agglutinated by gelatinous interhyphal substances to a dense texture, all hyphae with clamps, ramifications mainly from the clamps. No cystidia. Dendrohyphidia present, densely interwoven and forming the surface of the hymenium, these light brown in KOH, violaceous blue in sulpho-vanillin. Basidia large, with 4 curved sterigmata. Basidiospores large, allantoid, smooth, non-amyloid, non-cyanophilous.
Type species*:* *Thelephora salicina* Fr.
Remarks. The genus occupies an isolated position among the corticoid fungi. With regard to the basidia and basidiospores it resembles *Vuilleminia,* but the cupulate basidiocarps make it distinct.

Key to species

1. Basidiocarp red to orange ..... **C. salicina**
1. Basidiocarps differently coloured **2**

2. Basidiospores 8-10 x 6-6.5 µm ..... **C. pezizoidea**
2. Basidiospores 18-22 x 7-8 µm ..... **C. stereoides**

Cytidia pezizoidea (Pat.) Pat., **Fig.** 16.

Essai Taxonomique p. 54, 1900. – *Corticium pezizoideum* Pat., Jour. de Bot. (Paris) 5:314, 1891.
Basidiocarps cupulate and centrally attached, 1-5 mm in diameter, upper surface pale brown, smooth or with a thin tomentum, hymenial surface smooth and pale brown.
Hyphal system monomitic, hyphae 3-4 µm wide with clamps at all septa
Dendrohyphidia present.
Basidia 40-80 x 4-10 µm, tetrasterigmatic.
Basidiospores 8-10 x 6-6.5 µm, elliptic.
Substrate. On different hard wood trees.
Distribution. Louisiana in United States and Panama.
Remarks. The brown basidiocarps characterize the species besides with smaller spores than in *C. stereoides.*

Cytidia salicina (Fr.) Burt, **Figures, see Cort vol 1, p 201-202**

Ann. Miss. Bot. Gard. 11:10, 1924. - *Thelephora salicina* Fr., Syst. mycol. 1:442, 1821.
Basidiocarps initially stereoid and resupinate, then loosening along the margin and becoming cupulate with a central point of attachment (and then resembling a discomycete), about 1 cm wide but often confluent, forming larger, irregular basidiocarps, with a soft and pliable, coriaceous to subgelatinous consistency when fresh, becoming corneous, hard and brittle when dry, hymenium smooth, or somewhat tuberculate, orange red when young, becoming dark red to violaceous red, at first glabrous, then pruinose when fertile, from projecting basidia and basidiospores, externally whitish, farinose or finely floccose; margin more or less revolute.

Hyphal system monomitic, hyphae 2-3 µm wide, with thin to slightly thickened walls, mostly straight, with clamps at all septa, strongly agglutinated by gelatinous interhyphal substances, making the basidiocarp semi translucent.
Dendrohyphidia numerous, richly branched, forming a dense layer on the hymenial surface, best seen in young basidiocarps, which remain sterile for a long while, and in which the hymenial surface consists only of dendrohyphidia.
Basidia up to 50 µm long, clavate, slightly sinuous, tetrasterigmatic.
Basidiospores 12-18 x 4-5 µm, allantoid.
Substrate. *C. salicina* has a preference for *Salix* and *Populus* ssp. on which it grows almost exclusively on dry attached twigs and branches. It is however, occasionally found on *Alnus* and *Betula*.
Distribution. Circumglobal in the northern hemisphere.
Remarks. The orange red colour when fresh, slightly darkened when dry and old, besides the hosts will be sufficient for a field determination.

Cytidia stereoides W. B. Cooke,

Mycologia 43:2006, 1951.
Basidiocarps resupinate to cupulate with a slightly lifted 1-3 mm wide margin, 0.2-1 cm in diameter, often confluent to seemingly more compound structures, individual basidiocarps up to 0.5 mm thick, coriaceous to gelatinous consistency when fresh, becoming corneous, hard and brittle when dry, upper surface covered with a fine whitish tomentum consisting of thick-walled hyphae in bundles, hymenial surface smooth, pink to rose when fresh becoming darker when dry,
in section with a brown hymenium about 100 µm deep over a whitish context of same thickness being agglutinated.
Hyphal system monomitic, hyphae 3-4.5 µm wide with clamps at all septa, arranged more or less vertical above the hymenium, thick walled, strongly agglutinated.
Dendrohyphidia 40-150 x 5-11 µm, hyaline.
Basidia 40-55 x 7 - 15 µm, clavate and tetrasterigmatic.
Basidiospores 18-22 x 7-8 µm, allantoid.
Substrate. On fallen branches of different hard wood trees.
Distribution. Known only from Mount Shasta in California from where it was described.
Remarks. The pink colour, the dendrohyphidia and the large allantoid basidiospores characterize this species.

CYTIDIELLA Pouzar,

Česká Mykol. 8: 128, 1954.
Basidiocarps resupinate, effused or more or less circular, adnate or with uplifted margin, membranaceous; hymenium smooth to tuberculate, brownish with a white subiculum;

hyphal system monomitic, septa with clamps; cystidia lacking; basidia narrowly clavate, tetrasterigmatic, basidiospores narrowly elliptical to subcylindrical, smooth, thin-walled, non-amyloid.
Type species: *Cytidia albomellea* Bondartsev.
Remarks. The genus is characterized by having a cupulate basidiocarp, thus simulating an pileate species s. stricto. The type species is only rarely collected, but has a wide distribution in the Northern hemisphere.

Cytidiella albomellea (Bondartsev) Parmasto, Figure, see p 203 in Cort. Vol 1.

Consp. Syst. Cort. p. 101 1968. - *Cytidia albomellea* Bondartsev, Bolezni Rast. 16: 96, 1927. - *Cytidiella melzeri* Pouzar, Ceská Mykol. 8: 127, 1954.
Basidiomata resupinate, at first orbicular and, about 1–2 cm wide, then confluent and larger, when fresh adnate and waxy, when dry membranous and with revolved margin, hymenial surface smooth or with low tubercles, light brown when wet, reddish to violaceous brown when dry, abhymenial side of the revolved margin yellowish white, under the lens densely felted.
Hyphal system monomitic, hyphae with clamps at all septa, in the subhymenium mostly thin-walled and 2-4 µm wide, in the subiculum 2-3 µm and the walls are somewhat thickened and at least partly gelatinous and swollen in KOH.
Basidiospores elliptic, 6–7.5 × 3–3.5 µm, smooth, thin-walled, non-amyloid.
Habitat. Known from dead, but still attached branches of *Quercus robur* and *Pinus,* but probably able to grow on other hosts as well.
Distribution. A rare continental European species.
Identification. The species is recognized by its resupinate, orbicular, dense and brownish basidiomata, distinctly cupulate when dry. It may resemble pileate specimens of *Chondrostereum purpureum* but differs clearly by lacking cystidia.

DENDROPHORA (Parmasto) Chamuris,

Mycotaxon 28:543, 1987. - *Peniophora* Cooke subgen. *Dendrophora* Parmasto Consp. syst. Cort. p. 131, 1968.
Basidiocarp resupinate, rarely effused-reflexed, tough, adnate but loosening along the margin with age, hymenophore tuberculate (or less often smooth), grey to dark brown, hyphal system dimitic; generative hyphae with clamps, skeleto-ligative hyphae thick-walled, yellow to pale brown, indextrinoid, dominating in the subiculum and branching to form skeleto-dendrohyphidia in the subhymenium, metuloid cystidia usually numerous, hyaline or basally pale brown, gloeocystidia present or absent, basidia tetrasterigmatic and a basal clamp. Basidiospores cylindrical to allantoid, non amyloid and non dextrinoid.
Type species: *Stereum versiforme* Berk. & A. W. Curtis
Remarks. Superficially the genus is reminiscent of *Porostereum*, but easily recognized microscopically by the numerous skeleto-dendrohyphidia and gloeocystidia.

Key to species

1. Basidiospores 7-11 x 3-4 µm .....**D. albobadia**
1. Basidiospores 5-8 x 1.5-2 µm ..... **D. versiforme**

Dendrophora albobadia (Schw.: Fr.) Chamuris,

Mycotaxon 28:544, 1987. - *Stereum albobadium* (Schw.: Fr.) Fr., Epicris. Syst Mycol. p. 551, 1838.

Basidiocarps annual, resupinate to effused-reflexed, young specimens often slightly umbonate with a distinct central point from where the basidiocarp starts to develop, separable from the substrate, coriaceous when fresh, brittle when dry, reflexed part (when present) up to 5 mm wide, elongated along the substrate, undulate to applanate and curling when dry; upper surface adpressed velutinate to finely tomentose and light to dark brown, margin narrow, adnate, white to cream, hymenial surface smooth to even, or slightly tuberculate, finely pruinose with projecting cystidia, often with differently coloured zones, the innermost greyish brown, becoming darker with age whilst the outer zones are paler than the innermost ones, subiculum thin and pale brown. In old specimens there may be two to three distinct layers of old hymenium.

Hyphal system monomitic; generative hyphae 2-5 µm wide, with clamp connections, hyaline to brown, thin- to thick-walled, branched, in the subiculum resembling skeletal hyphae, but scattered clamp connections are present, in the hymenium vertically arranged, often distinctly zonate and agglutinated in a layer, which may be up to 600 µm thick.

Cystidia 30-50 x 8-15 µm, partly in the hymenium and then initially smooth and thin-walled, with age becoming thick-walled, heavily encrusted to distinctly metuloid, and projecting up to 30 µm above the hymenium. In old areas of hymenium completely embedded, hyaline to slightly tinted, very thick-walled and strongly encrusted.

Dendrohyphidia very abundant, markedly arboriform, thick-walled and dark brown or slightly paler towards the base.

Basidia 30-40 x 4-6 µm, clavate.

Basidiospores 7-11 x 3-4 µm, allantoid.

Habitat. On dead hardwoods, often on dead, still attached, branches.

Distribution. Temperate North America.

Remarks. May easily be taken for an old basidiome of *Stereum* in the field due to the dark brown colour, but microscopically, the coloured, thick-walled dendrohyphidia and metuloid cystidia should be sufficient for a diagnosis.

Dendrophora versiformis (Berk. & A. W. Curtis) Chamuris, Figure, see p. 123 Cort. Vol 1.

Mycotaxon 8:544, 1987. - *Stereum versiforme* Berk. & M. A. Curtis, Grevillea 1:164, 1873. – *Stereum erumpens* Burt, Ann. Missouri Bot. Garden 7:209, 1920.

Basidiocarps annual, resupinate to effused-reflexed, young specimens often slightly umbonate with a distinct central point from where the basidiocarp starts to develop, separable from the substrate, coriaceous when fresh. brittle when dry, the reflexed part (when present) up to 5 mm wide, elongated along the substrate, undulate to applanate; upper surface adpressed velutinate to finely tomentose and dark brown, margin narrow, adnate, cream to pale brown, rarely white, hymenial surface smooth to even or slightly tuberculate, often cracking when old and dry in mature specimens, thickly matted by projecting cystidia, dark brown becoming more grey in old and dead specimens, subiculum thin and pale brown.
Hyphal system monomitic; generative hyphae 2-6(8) µm wide, with clamp connections, hyaline to brown, thin- to thick-walled, branched, in the subiculum resembling skeletal hyphae, but scattered clamp connections are present, in the hymenium vertically arranged, often distinctly zonate and agglutinated in a layer, up to 600 µm thick.
Cystidia 30-50 x 8-15 µm, partly in the hymenium and then initially smooth and thin-walled, with age becoming thick-walled and heavily encrusted to distinctly metuloid, projecting up to 30 µm above the hymenium. In old areas of hymenium completely embedded, hyaline to slightly tinted, very thick-walled and strongly encrusted,
Dendrohyphidia very abundant, markedly arboriform, thick-walled and dark brown or slightly paler towards the base. Old embedded dendrohyphidia usually present and, with their dark brown tips, clearly indicate seasonal growth zones in the old hymenial layers.
Basidia 30-40 x 4-6 µm, clavate, with 4-sterigmata, and a basal clamp.
Basidiospores 5-8 x 1.5-2 µm, allantoid, hyaline, smooth, non-amyloid.
Habitat. On dead hardwoods, often on dead, still attached, branches.
Distribution. Widespread in the subtropical and warm temperate zones
Remarks. Separated from *D. albobadia* by the smaller and more narrow basidiospores.

DICHOPLEUROPUS D. A. Reid,

Beiheft Nova Hedwigia 18:329, 1965.
Basidiocarps, terrestrial, coriaceous, spatulate to flabelliform, upper surface glabrous to rugulose. Hymenial surface smooth. Stipe lateral, widened towards the pileus. Hyphal system dimitic, generative hyphae hyaline to pale yellow with simple septate; binding hyphae present, these dichotomously branched, thick-walled and yellowish brown, densely agglutinated on the pileus. Gloeocystidia present. Basidiospores smooth, hyaline, elliptic to subglobose and amyloid. Monotypic genus.
Type species: *Dichopleuropus spathulatus* D. A. Reid.
Remarks. The genus is characterized by the dichotomously branched binding hyphae present both in the hymenium and on the pileus.

Dichopleuropus spathulatus D. A. Reid,

Beiheft Nova Hedwigia 1:330, 1965.

Basidiocarps stipitate, 3 -15 cm, high and 2-7 cm wide, solitary, pleuropodal, narrowly spatulate or flabelliform, upper surface glabrous, radiately rugulose, pale dirty yellow to ochraceous with a distinct blunt white margin, hymenial surface smooth, white, becoming cream on drying, often decurrent, stipe to 3 cm long and 3 mm in diameter, whitish to ochraceous, gradually expanding towards the pileus, slightly tomentose towards the base and point of attachment, context 2-3 mm thick at base, ochraceous and zoned with narrow dark lines.
Hyphal system dimitic, generative hyphae 2-5 µm wide, with simple septa; binding hyphae yellowish brown, with apical parts initially hyaline, thick-walled, dichotomously branched and dextrinoid, both in the hymenium and on the pileus.
Gloeocystidia 250 µm x 6-10 µm, only slightly projecting above the basidia, undulating and with a rounded to pointed apex, filled with yellowish, irregular, and often rod-shaped bodies.
Basidia 54-78 x 7-11 µm, clavate.
Basidiospores 6-9 x 6.5-7.5µm, globose to subglobose, amyloid (although only faintly so in the known collections).
Substrate. Terrestrial.
Distribution. Known only from Singapore.
Remarks. Easily recognised due to the combination of coloured, dextrinoid, dichotomously branched binding hyphae and subglobose, amyloid basidiospores.

GLOEOSTEREUM S. Ito & Imai,

Trans. Sapporo Nat. Hist. Soc. 13: 11, 1933
Basidiocarps broadly cupulate to almost reniform, flabellate or conchate, hyphal system monomitic, generative hyphae with clamp connections, gloeocystidia present, basidiospores 6 -8,5 x 2,7-3,6 µm, subcylindrical or oblong elliptic, non-amyloid. On hard woods. East Asian temperate genus. Monotypic genus.
Type species: *Gloeostereum incarnatum* S. Ito & Imai.
Remarks. The pink colour of the fresh fungus becoming reddish brown and the reniform to flabellate basidiocarps and the gloeocystidia are characteristic features.

Gloeostereum incarnatum S. Ito & Imai,

op.cit.

Basidiocarps rounded, broadly cupulate to almost reniform, flabellate or conchate, sometimes with a resupinate basal part, 3-15 cm wide and long and 0'5-3 cm thick, often in confluent groups, indistinctly zonate, whitish, salmon or salmon when young and fresh, becoming apricot buff, pale ochraceous or pale brown when dry, hymenophore uneven, irregularly rugulose or coarsely tuberculate, sometimes slightly

radiately folded, pale ochraceous, ochraceous pale salmon or salmon to apricot usually whitish pruinose, in herbarium specimens reddish brown, context jelly-like, hygrophanous, up to 3 cm thick, in section glassy, densely zonate, honey colour to pale salmon coloured, upper context denser and darker; hard, horny, up to 1 mm m thick and black.
Hyphal system monomitic, generative hyphae with clamp connections, 2-5 µm wide, tramal hyphae embedded in gelatinous context, irregularly interwoven or subparallel, distinct, often undulate, sparsely branched and anastomosing.
Gloeocystidia 65-140) x 7-13 µm, projecting 20-50 µ beyond hymenium, cylindrical or subclavate, often with one or several constrictions, obtuse, thin-walled, sometimes encrusted with dull, yellow resinous matter near apex.
Basidia 40-50 x 4-6 µm, elongate-clavate and tetrasterigmatic.
Basidiospores 6 -8,5 x 2,7-3,6 µm, subcylindrical or oblong elliptic, non-amyloid.
Substrate: On dead, fallen logs of *Ulmus*, more rarely on *Acer, Fraxinus* and *Tilia*.
Distribution. Hokkaido in Japan, Eastern China and Primorskij and Khabarovskij Territories in Russia.
Remarks. The pink colour of the fresh fungus becoming reddish brown and the reniform to flabellate basidiocarps make this a distinct species.

HJORTSTAMIA Boidin & Gilles,

Bull. Soc. Mycol. Fr. 118:99, 2002.
Basidiocarps resupinate, effused-reflexed to distinctly pileate, broadly attached to dimidiate or fanshaped, upper surface tomentose to felty, often zonate, greyish to deep brown; hymenium smooth to tuberculate, smooth to cracked with age, ochraceous, greyish to pinkish or dark brown; hyphal system di- or trimitic, generative hyphae with simple septa; skeletal hyphae (when present) pale to dark brown; pseudocystidia present or absent, pale brown, encrusted or smooth, hymenial cystidia mostly metuloid, hyaline to brown; basidia tetrasterigmatic, spores cylindrical to elliptic, smooth, hyaline and non-amyloid.Tropical to warm temperate zones. Causing a white rot in hard woods,

Type species: *Thelephora friesii* Lév.
Remarks. Reminiscent of *Porostereum,* but separated by simple septate generative hyphae.

Key to species

1. Basidiome distinctly pileate, sessile to fanshaped, hymenium beige to pinkish brown, hymenial cystidia ventricose, pseudocystidia absent..... **H. papyrina**
1. Basidiome effused-reflexed, hymenium dark gray to dark vinaceous brown, or lilaceous to purplish, hymenial cystidia subulate, skeletocystidia usually abundant . **2**

2. Hymenium lilaceous, metuloid cystidia brown to dark brown .....**H amethystea**
2. Hymenium brown or dark violet, metuloid cystidia almost hyaline to brown.....**3**

3. Brown dendroid binding hyphae present..... **H. mexicana**
3. Brown dendroid binding hyphae absent **4**

4. Basidiocarp resupinate, skeletal hyphae absent, known only on bamboo.....
..... **H. novo-granata**
4. Basidiocarps effused-reflexed, skeletal hyphae present, widespread species.....
..... **H. crassa**

Hjortstamia amethystea (Hjortstam & Ryvarden) Boidin & Gilles., Fig. 13.

Bull. Soc. Mycol. Fr. 118:99, 2002. - *Porostereum amethysteum* Hjortstam & Ryvarden, Synopsis Fung. 4: 27,1989.

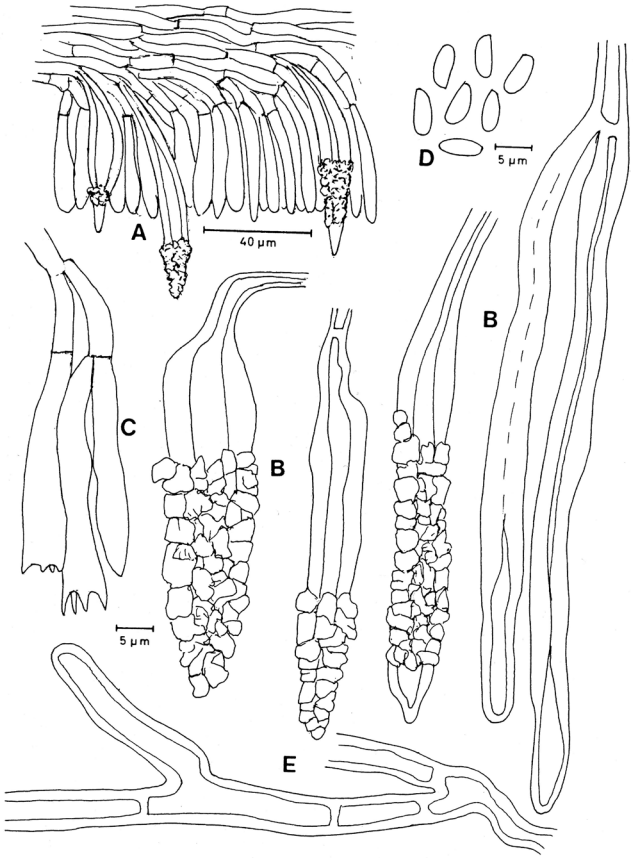


Figure 13. *Hjorstamia amethystae* A) part of hymenium, B) encrusted and smooth cystidia, C) basidia, D) basidiospores, E) generative hyphae, Brazil, coll. Ryvarden 24433.

Basidiocarps resupinate, more rarely with the margin reflexed, membranous, flexible, 0.5-1.0 mm thick. Hymenium smooth to slightly undulating, violet to purplish brown, somewhat cracked and then exposing a brown subiculum.
Hyphal system dimitic, generative hyphae 3-4 µm wide, thin-walled, hyaline to subhyaline and with simple septa; skeletal hyphae present but few, mostly as skeletocystidia, about 4 µm wide, pale yellow brown.
Cystidia abundant, a mixture of metuloid cystidia, 50-70 x 8-10 µm, these brown, thick-walled, and projecting up to 40 µm above the hymenium, and skeletocystidia these fusoid to cuspidate and apically encrusted.
Basidia 30-35 x 5-6 µm, clavate.
Spores 5-6 x 3-3.5 µm, elliptic.
Distribution. South America.
Remarks. Closely related to *H. crassa*, but with darker metuloid cystidia and a distinctly purplish hymenium.

Hjortstamia crassa (Lév.) Boidin & Gilles, **Fig. 14**

Bull. Soc. Mycol. Fr. 118:99, 2002. - *Thelephora crassa* Lév., Ann. Sci. nat. Bot. Ser. 3, 2:209, 1844. -
Porostereum crassum (Lev.) Hjortst. & Ryvarden, Synopsis Fung. 4:29, 1989.
Basidiocarps annual, effused-reflexed with a narrow upper portion, rarely about 1 cm wide, 1 mm thick at the base, coriaceous and flexible, upper surface ochraceous, grey or pale brown, felty to adpressed tomentose but without a dark zone in section, slightly zonate, smooth to sulcate in narrow bands, hymenophore smooth to undulating, pale brown, pinkish brown, bright purple to almost dark violet, with age becoming cracked and exposing a paler (beige) context, context thin and loosely interwoven, intergrading with the upper tomentum.
Hyphal system dimitic; generative hyphae 3-7 µm wide, hyaline**,** thin to distinctly thick-walled with simple septa, skeletal hyphae 4-10 µm wide, thick-walled to solid, pale yellow, rare in the context and tomentum.
Cystidia 30-60 x 4-8 µm, mostly metuloid, almost hyaline to pale brown, weakly developed in young material, abundant in mature specimens, acute with a tapering apex, when young more or less smooth, when mature, encrusted at least in the upper part, and, in mature specimens, the horizontal base may also be encrusted.
Basidia 25-35 x 4-6 µm, clavate, tetrasterigmatic.
Basidiospores 5.5 -7.5 x 3-4 µm, elliptic to subcylindrical.
Distribution. Pantropical and seemingly rather common.
Remarks. Recognized by the pale brown cystidia making the hymenium pinkish-brown to dark brown and the oblong subcylindrical spores. The colour of the hymenium is very variable and young specimens even if fertile, have a beige colour with weakly developed cystidia. Basidiocarps have a tendency to be effused-reflexed and not sessile fanshaped as is often seen in the closely related *H. papyrina*, which has cystidia ventricose, and shorter, more elliptic spores.

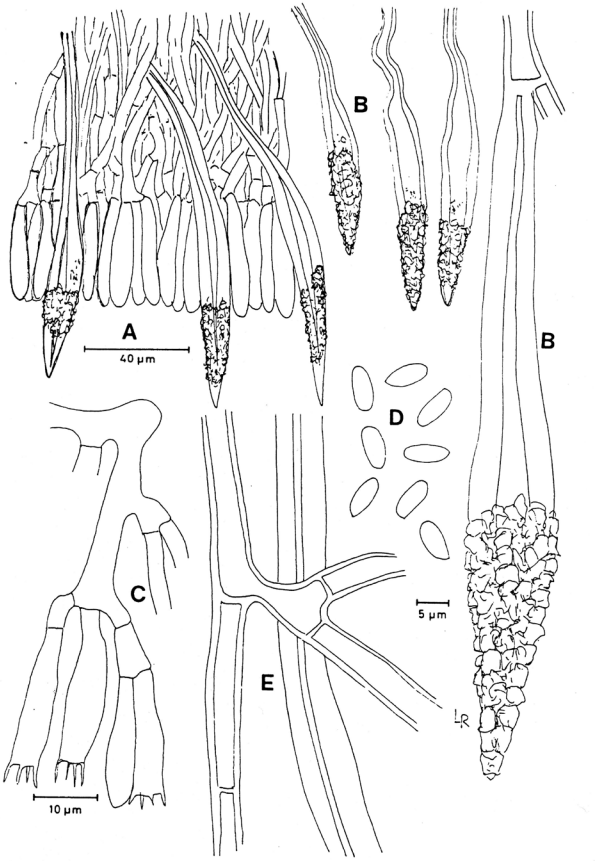


Fig. 14. *Hjortstamia crassa*, A) part of hymenium, B) skeletocystidia, C) basidia, D) basidiospores, E) generative hyphae, Coll. Argentina, Coll. Ryvarden 15653.

Hjortstamia mexicana (A. L. Welden) Boidin & Gilles,

Bull. Soc. Mycol. Fr. 118:99, 2002. - *Lopharia mexicana* A. L. Welden, Tulane Stud. Zool. & Bot. 17:19, 1971. - *Porostereum mexicanum* (A. L. Welden) Hjortstam. & Ryvarden, Synopsis Fung. 4: 39, 1989.

Basidiocarps effused-reflexed, spongy, separable from the substrate, up to 6 cm in diameter in the type, upper surface dark brown, adpressed tomentose to cottony, sulcate. Hymenium smooth to slightly tuberculate, dark snuff brown along the margin, dark reddish brown in fertile areas, finely cracked when dry. Margin rounded and obtuse, context dark brown and cottony, up to 1 mm thick.

Hyphal system dimitic, generative hyphae 4-10 µm wide, hyaline to slightly tinted, freely branched often at wide angles, simple septate, thin-walled in the subhymenium,

distinctly thick-walled in the context, and with transitions from one type to another; binding hyphae arboriform to dendroid, brown, dichotomously branched from a long unbranched lower section, thick-walled to solid, up to 10 µm wide in KOH, narrower in Melzer's reagent.
Cystidia absent, but pointed ends of the binding hyphae may protrude into the subhymenium and thus, simulate cystidia.
Basidia 30-35 x 5-7 µm, clavate, tetrasterigmatic.
Spores 6.5-8.5 x 3.5 - 5 µm, elliptic (teste Welden - the type is sterile).
Distribution. Known only from higher elevations in Mexico.
Remarks. Unique in the genus with its brown dendroid binding hyphae. The lower segments of these are often long and unbranched and may, as broken segments, easily be taken as skeletal hyphae.

Hjorstamia novae-granata (Welden) Hjortstam & Ryvarden, Fig. 15.

Synopsis Fung. 25:19, 2008. - *Lopharia nova-granata* Welden, Mycologia 67:540, 1975. - *Porostereum nova-granatum* (Welden) Hjortstam & Ryvarden, Synopsis Fung. 4:41, 1989.
Basidiocarps rather small, effused, resupinate, orbicular in parts, with a raised margin, separable from the substrate, hymenophore in the type almost smooth along the margin and probably smooth when young and fresh but cracked in the central part when mature, first dark beige, becoming brown and finally blackish, and then strongly cracked, context ochraceous and often exposed in cracks, floccose to cottony and up to 1 mm thick,
Hyphal system monomitic; generative hyphae 3-8 µm wide, hyaline, with simple septa, thin-walled and branched at wide angles in the subhymenium, thick-walled and sparingly branched in the context, sometimes very thick-walled and then simulating skeletal hyphae, but branching and septation clearly show them to be thickened generative hyphae.
Cystidia as scarce hymenial cystidia up to 50 µm long, and skeletocystidia up to 120 µm long, 5-12 µm wide, pale brown, acute to obtuse, smooth, solid to thick-walled at the base, deeply embedded, mainly in the subhymenium and old hymenium.
Basidia 22-25 x 5-7 µm, clavate, tetrasterigmatic.
Spores 5.5-7 x 3-4 µm, subcylindrical.
Substrate. Known only from bamboo.
Distribution. Known only from the type locality in Colombia.
Remarks. The species is related to *H. crassa* which differs in having true skeletal hyphae in the context and projecting, encrusted and normally more numerous skeletocystidia. The floccose and light context in the type of *H. nova-granata*, so conspicuously exposed in old and cracked parts of the hymenium, is normally not as prominent in *H. crassa* although in the latter species some cracking does occur with age and drying. More collections are needed before the status of this taxon can be fully evaluated.

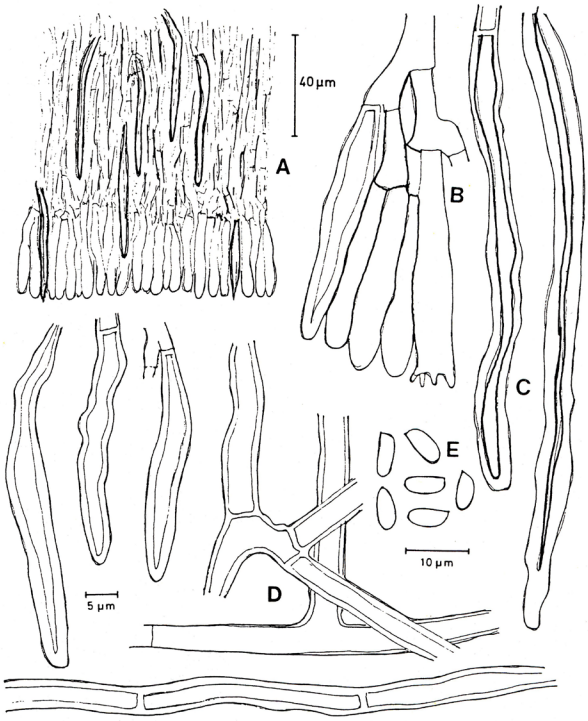


Fig. 15. *Hjortstamia nova-granata* A) part of hymenium, B) basidia, C) cystidia, D) generative hyphae, E) basidiospores, from the holotype, leg. A. Welden.

Hjortstamia papyrina (Mont.) Boidin & Gilles, **Fig. 16**

Bull. Soc. Mycol. Fr. 118:99, 2002. - *Stereum papyrinum* Mont. in de la Sagra (ed.) Hist. Cuba Pl. Cellul. p. 374, 1845.

Basidiocarps effused-reflexed to pileate, umbonate, fanshaped to dimidiate or broadly sessile, flexible and pliable, flat to undulating and wavy, margin entire to lobed or incised, often adjacent basidiomes become fused to form more compound structures, upper surface of pileus felty tomentose to scrupose, sulcately zoned, pale to dark brown, becoming more greyish in weathered specimens, hymenophore concentrically zoned, radially tuberculate to slightly folded, beige in fertile specimens, more brown in dry and sterile ones, margin pale brown in sterile parts, context snuff to umber brown and without a cuticle towards the upper tomentum.

Hyphal system dimitic, generative hyphae 2-5 µm wide, hyaline to very pale yellow, thin to thick-walled and sparingly branched, with simple septa; skeletal hyphae 4-8 µm wide, up to 350 µm, hyaline to yellowish, solid to thick-walled, lacking septa,

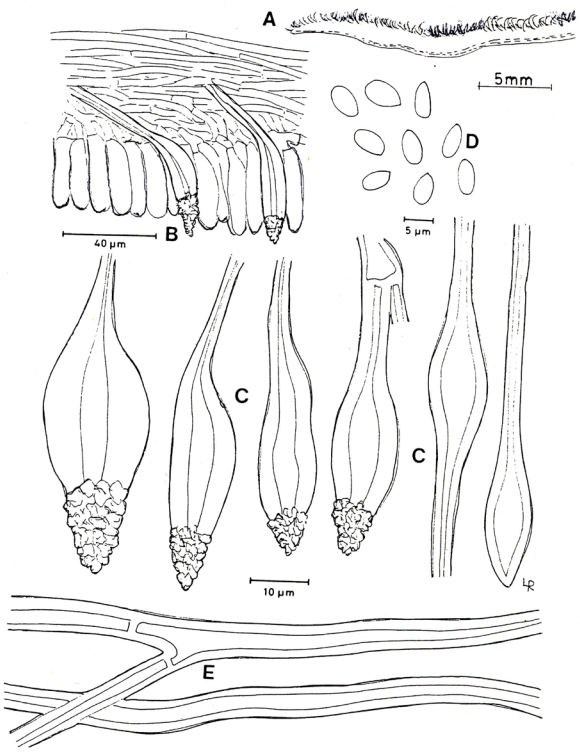


Fig. 16. *Hjortstamia papyrina*, A) section of basidiocarp, B) part of hymenium, C) cystidia, D) basidiospores, e) generative hyphae, F) skeletal hyphae, Coll. A. Hormia from Peru in NY:

unbranched, running parallel to the substrate, some with small swellings apically and partly incalary.

Cystidia 30-80 x 6-15 µm, metuloid, apically encrusted and thick-walled, ventricose to clavate, pale brown, arising from generative hyphae, present in the hymenium.

Basidia 20-35 x 4-6 µm, tetrasterigmatic.

Spores 5-6 x 3.5-4 µm, elliptic.

Distribution. Tropical America from Florida to southern Brazil, seemingly rather common.

Remarks. The distribution, the beige colour of the hymenium and the felty to tomentose brown zoned pileus characterize this species. It is common to find sterile specimens. Microscopically the pale brown metuloid cystidia and the skeletal hyphae are distinctive. *H. crassa* has much slender cystidia, longer spores and usually a darker brown colour.

Fig. 17. *Inflatostereum glabrum*, photo J. Kout.

INFLATOSTEREUM D. A. Reid,

Beiheft Nova Hedwigia 18:143, 1965.
Basidiocarps stipitate, flabellate to spatulate, upper surface glabrous, usually rugulose to slightly radially folded, hymenial surface smooth, hyphal structure dimitic, generative hyphae with clamp connections, thin to slightly thick-walled, skeletal hyphae thick-walled, narrow to wide, cystidia and gloeocystidia absent, basidia 4-spored, hyaline, clavate, basidiospores smooth, hyaline, thin-walled, non-amyloid, elliptical. Monotypic tropical genus.
Type species: *Thelephora glabra* Lev.
Remarks. The genus is characterized by the strongly inflated generative hyphae. It may possibly be related to *Stereopsis*, but separated by the peculiar hyphae and a dimitic hyphal system.

Inflatostereum glabrum (Lev.) D. A. Reid, Fig. 17.

Beiheft Nova Hedwigia 18:144, 1965. - *Thelephora glabra* Lev., Ann. Sci. Nat. Ser. 3, 5:147, 1846. - *Stereum fissum* Berk., Hooker J. Bot. 8:273: 1856. - *Stereum partitum* Berk. & Broome, J. Linn. Soc. (Bot.) 14:65, 1873. - *Guepinia flabellata* Cooke, Grevillea 13:3, 1884. - *Stereum huberianum* P. Henn., Hedwigia 41:15, 1902. - *Podoscypha radicata* Pat., Bull. Mus. Hist. Nat. Paris 29:333, 1923. - *Inflatostereum radicatum* (Pat.) D. A. Reid, Beih. Nova Hedwigia 18:149, 1965? (the type is sterile).

Basidiocarps up to 7 cm long, and 5.5 cm. wide, discrete, coriaceous, spatulate or flabelliform, pileus often split radially, glabrous, yellowish or rarely pale brown, often

conspicuously radially wrinkled, but sometimes dark chestnut-brown and translucent. Hymenial surface smooth and ochraceous, stipe lateral, very short or rudimentary, attached to the substrate by a thin, closely adpressed, creamy-ochre coloured mycelial disc.
Hyphal system monomitic throughout most of the basidiocarp, but dimitic in the basal region, including the stipe, generative hyphae 2-5 µm wide, with clamp connections, and thin or slightly thickened walls, some with conspicuously inflated segments, to 28 µm wide and with walls to 3 µm thick, these present throughout the context and occasionally filled with yellowish-brown contents, skeletal hyphae 2-4 µm wide, present in stipe and basal parts.
Basidia 35-44 x 4-7 µm, clavate, tetrasterigmatic.
Basidiospores (5-) 6.5-8 x (3 -) 4 - 4.5 µm, elliptic
Substrate. Usually on twigs and small branches.
Distribution. South American species.
Remarks. The inflated hyphae are diagnostic. Whether this is sufficient to warrant a specific genus, separated from *Stereopsis,* has to be solved with DNA sequencing.

LAURILIA Pouzar,

Ceská mykol. 13 p. 14, 1959.
Basidiocarps perennial, leathery or ligneous, resupinate, effused and confluent, or partly pileate, especially on vertical substrate, pileus brown to black, hymenophore light-coloured, more or less tuberculate to warted, dense and hard. Hyphal system di- trimitic, comprised of skeletal and binding hyphae thick-walled, generative hyphae, with clamp connections; metuloid cystidia numerous, thick-walled, encrusted; basidia clavate tetrasterigmatic; spores globose, somewhat thick-walled, echinulate, amyloid.
Type species: *Stereum sulcatum* Burt.
Remarks. The genus is characterized by the di- to trimitic hyphal system and echinulate, amyloid spores.

Key to species

1. Basidiocarps occurring on *Picea* or rarely on hard woods, hyphal system trimitic with binding hyphae, widespread in the Northern coniferous zone..... **L. sulcata**
1. Basidiocarps on twigs of living, evolutionary old gymnosperms like *Taxodium* and *Cryptomeria*, hyphal system dimitic without binding hyphae, Southern United States, Japan and Formosa ..... **L. taxodii**

Laurilia sulcata (Burt) Pouzar, Fig. 18

Ceská mycol. 13:.14, 1959. - *Stereum sulcatum* Burt in Peck, N.Y. St. Mus. Ann. Rep. 54: 154, 1901.
Basidiocarps resupinate or partly pileate, perennial, leathery or when old, partly ligneous, first orbiculate, then confluent with age, and often reaching several dm^2; upper side,

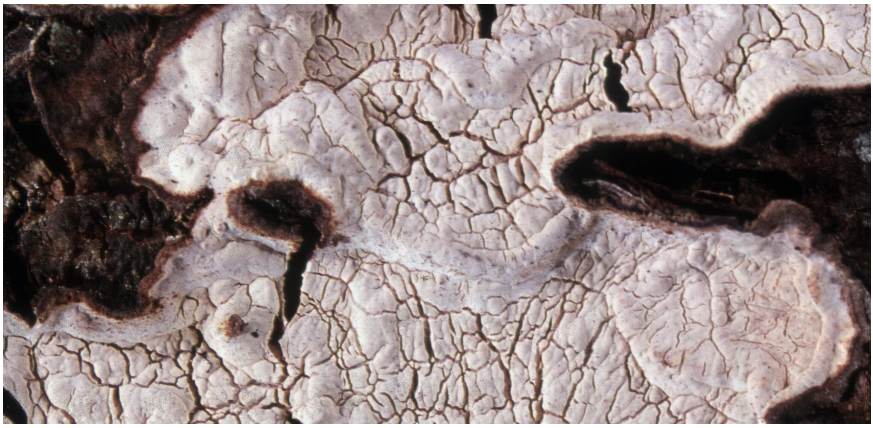


Fig. 18. *Laurilia sulcata*, Coll. Ryvarden 12765 from Norway.

especially in young specimens, often covered with a brown tomentum, 1-5 mm thick. In old specimens this is mostly dark brown to blackish, often with concentric furrows and ridges, resulting from the peripheral growth of the fungus, basidiocarp stratified in section, with an upper tinder-layer, then a thin, hard, resinous layer visible as a dark line, then a subicular trama which is light-coloured like the subicular layer. In old basidiocarps the 'tinder' may be worn off or filled with resinous substances into a single hard stratum, hymenium in young specimens smooth, then tuberculate or concentrically sulcate, light yellowish with a tint of salmon-pink, when old (especially in herbarium material) pale ochraceous, fresh trama s reddish when bruised, margins of young basidiocarps white, finely fibrillose, then more glabrous, smooth or somewhat thickened, in old specimens formed of parallel ridges, this the result of a receding hymenium leaving a new, annual, sterile zone.

Hyphal system trimitic, consisting of straight, thick-walled skeletal hyphae, 2.5-4 um wide, with sparse septa, richly branched, thick-walled binding hyphae, 2-3 um wide, and thin-walled, richly branched, generative hyphae 2-3 um wide, with clamp connections and some adventitious septa.

The upper tomentum consists mainly of brown skeletal hyphae, the subiculum of hyaline or pale yellowish, thick-walled, horizontal skeletal hyphae with numerous binding hyphae between them, as well as (at least in young specimens) a few generative hyphae; subhymenium comprised of vertical skeletal, irregular binding, and generative hyphae, cystidia and old, shrunken basidia.

Cystidia 40-65 x 8-10 um, abundant, thick-walled, apically conical, with an encrusted area 20-30 um long, yellowish or pale ochraceous in the proximal part.

Basidia 25-35 x 4-5 um, tetrasterigmatic.

Basidiospores 5.5-6.5 x 5 um, globose or subglobose, echinulate, amyloid, with somewhat thickened walls.

Substrate. In Europe almost exclusively on fallen wood of *Picea*, on different hard woods in America.
Distribution. Widespread in the boreal and temperate zones, but in Europe with a more restricted distribution and there known only from *Picea abies*.
Remarks. *Laurilia sulcata* is one of the most characteristic stereoid fungi and cannot be mistaken for any other species.

Laurilia taxodii (Lentz & H.H. McKay) Parmasto,

Consp. Syst. Cort. p. 180 1968. - *Lauriliella taxodii* (Lentz & H. McKay) S.H. He & Nakasone, Mycologia 109: 573, 2017. - *Stereum taxodii* Lentz & H. McKay, Mycologia 52: 262, 1961. - *Echinodontium taxodii* (Lentz & H.H. McKay) H.L. Gross, Mycopat. Mycol. Appli. 24: 11, 1964.
Basidiocarps lignicolous, perennial, effused-reflexed to conchate, leathery to woody, 1-5 x 0.5-3 x 0.2-0.5 cm, pileus rimose to rugose, dark brown, tomentose, undulating, hymenophore smooth to warted, whitish to ochraceous, warts more pronounced in reflexed portions, up to 5 mm long, scattered, context slightly darker than the hymenophore.
Hyphal system dimitic, skeletal hyphae thick-walled to solid, 4-6 µm in diam, pale yellow, generative hyphae with clamps, thin-walled, 3-5 µm in diam, hyaline, smooth, hyphae of the tomentum similar to context hyphae except brown colored.
Cystidia 40-80 x 6-10 µm, club-shaped to fusiform, upper portions encrusted, usually protruding up to 10-20 µm, originally thin-walled and hyaline, becoming thick-walled and colored similar to skeletal hyphae.
Basidia 25-40 x 5 -7 µm, tetrasterigmatic.
Basidiospores 5.5 -7 x 5 -6.5 µm, globose to subglobose, hyaline, strongly amyloid, echinulate.
Substrate. On twigs of living gymnosperms like *Taxodium distichum, Cryptomeria japonica, Chamaecyparis formosensis* and *Torreya nucifera*.
Distribution. Southeastern United States, Japan and Formosa.
Remarks. The species is closely related to *Laurilia sulcata* but occur on evolutionary younger genera like *Picea*.

LAXITEXTUM Lentz.,

U.S. Dept. Agric., Monogr. 24: 18, 1955.
Basidiocarps resupinate to subpileate, rather soft and pliable, upper side brown to yellowish, hymenium smooth. hyphal system monomitic with clamps, cystidia smooth; basidia tetrasterigmatic and basal clamp; spores globose - subglobose, echinulate, amyloid.
Type species: *Laxitextum bicolor* (Fr.) Lentz.
Remarks. The genus is well characterized with its stereoid basidiocarps, gloeocystidia and amyloid and echinulate spores.

Key to species

1. Pileus dark brown and velutinate ..... **L. bicolor**
1. Pileus absent, or if present, glabrous and cream to deep yellow..... **2**

2. Spores 4-5 x 3-3.5 µm, hyphae encrusted, gloeocystidia non-amyloid .... **L. incrustans**
2. Spores smaller, hyphae smooth, gloeocystidia amyloid..... 3

3. Spores elliptic, 3.5-4 x 3-3.5 µm, pileus yellowish brown ..... **L. lutescens**
3. Spores globose, 3-3.5 in diameter, pileus ochraceous ..... **L. globosporum**

Laxitextum bicolor (Fr.) Lentz, **Fig. 19**

loc. cit. - *Thelephora bicolor* Pers. ex F r., Syst. mycol. 1:438, 1821. - *Thelephora bicolor Pers*., Syn. meth. fung. p. 568, 1801.
Basidiocarps resupinate or subpileate, upper side brown, in young specimens finely tomentose, in old specimens with more adpressed hyphal hairs, often subzonate and radially striate; hymenium in young fresh basidiocarps pure white, darkens slightly to cream, becoming pale brownish, smooth and glabrous, when dried more or less cracked, in section about 1 mm thick, the upper part of the trama, i.e. the subiculum of resupinate specimens, brown, the subhymenial part whitish; margin white and finely fibrillose in young specimens.
Hyphal system monomitic; hyphae of the brown trama distinct, with thin or somewhat thickened walls, light brown in the microscope, usually 2,5-4 um wide; subhymenial

Fig. 19. *Laxitextum bicolor*, photo T. H. Hofton.

hyphae thin-walled, in old fruitbodies partly collapsed then forming a hyphal net with irregular meshes, penetrated by very thin-walled, plasma filled generative hyphae, 1-3 um wide.

Cystidia present, in the young state fusiform, subulate, often with a moniliform apical appendix, more or less projecting, in old specimen tube like, mostly obtuse, length of cystidia very variable, 40-100 um or more, width 5-10 um, all cystidia filled with a yellowish oily substance.

Basidia 20-30 x 3,5-5 um, narrowly clavate and tetrasterigmatic.

Basidiospores 4,5-5 x 2,5 µm, oblong-elliptic, thin-walled, finely echinulate, amyloid.

Substrate. On decayed hardwood.

Distribution. Cosmopolitan to 70 N in Norway.

Remarks. Rather easily to recognize because of the brown pileus contrasting the pale hymenophore.

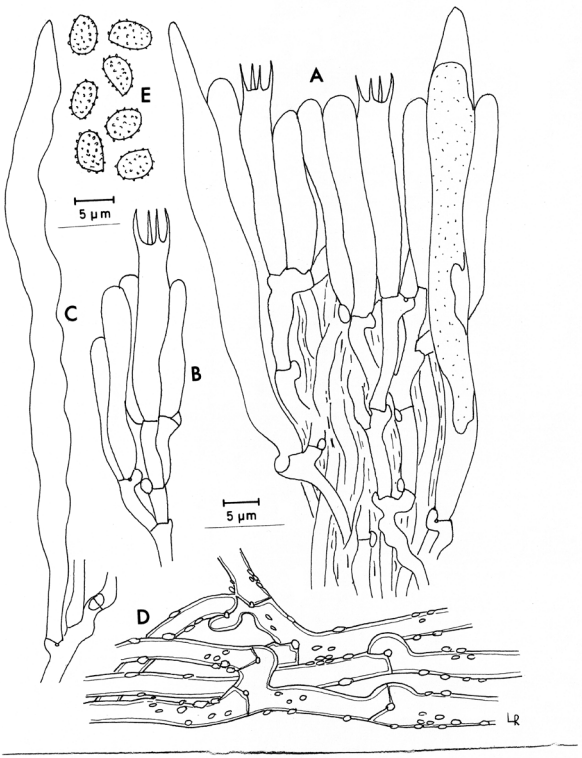


Fig. 20. *Laxitextum incrustans*, A) part of hymenium, B) basidium, C) gloeocystidia, D) subicular hyphae, E) basidiospores, from the holotype.

Laxitextum incrustans Hjortstam & Ryvarden, Fig. 20

Mycotaxon 13:35, 1981.
Basidiocarps resupinate widely effused, bit often loosened along the margin, surface smooth, cream to ochraceous, more or less cracked in dry condition.
Hyphal system monomitic; hyphae with clamps, loosely interwoven, golden yellow, encrusted, 3-6 µm wide hyphal walls thickened, oleiferous hyphae scattered to common and with a slight amyloid reaction.
Gloeocystidia 70-80 x 4-6 µm, in the young state fusiform, subulate, often with a moniliform apical appendix, more or less projecting, in old specimen tube like, mostly obtuse.
Basidia 15-25 x 4-5 µm, narrowly clavate, tetrasterigmatic.
Basidiospores 4-5 x 3-3.3 µm, subglobose to elliptic, echinulate, strongly amyloid.
Substrate. On decayed hardwood.
Distribution. Tanzania, Cameroon, Ethiopia, United States.
Remarks. The resupinate shape and the encrusted hyphae are characteristics for this species.

Laxitextum globosporum Henkel & Ryvarden, Fig. 21 & 22

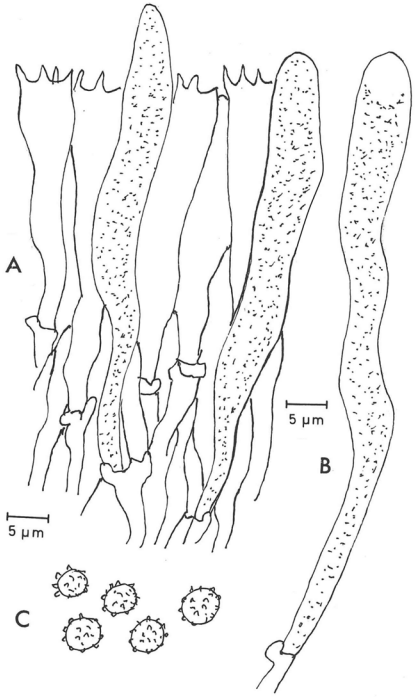
Edinburgh J. Bot. In press.
Basidiocarps flabelliform, semicircular, 2 x 3 cm, about 0.5 m thick, flexible, pileus glabrous, ochraceous, smooth when fresh, slightly radially wrinkled when dry and then bent and curled, hymenial surface smooth, pale wood coloured, hymenium dense, about 30 µm deep, subhymenium distinct, pale ochraceous, 50-80 µm thick context rather loose and semi cottony, about 400 µm thick.
Hyphal system monomitic; hyphae with clamps, tramal hyphae loosely interwoven, pale yellow, 3-5 µm wide, yellow oleiferous hyphae abundant in subhymenium and trama, distinctly amyloid, 4-6 µm wide.
Gloeocystidia present, 60-120 x 4-8 µm, yellow and pointed, distinctly amyloid.
Basidia 18-25 x 4-6 um narrowly clavate.
Basidiospores globose, 3-3.5 µm in diameter, finely echinulate, amyloid.
Substrate. On decayed hard wood stump.
Distribution. Known only from Cameroon.
Remarks. The ochraceous pileus and the small spores, make this a distinct species in the genus.

Laxitextum lutescens Hjortst, & Ryvarden,

Mycotaxon 13:40, 1981.
Basidiocarps resupinate to distinctly reflexed, 0.4-0-6 mm thick, pileus deep yellow to pale brown, velutinate, azonate, trama well developed, pale yellowish brown, hymenial surface cream-yellow to straw coloured with a distinct pale purplish brown tint.

Fig. 21 & 22
Laxitextum globosporum Henkel & Ryvarden,

MER BILDETEKST



Hyphal system monomitic; hyphae with clamps, tramal hyphae loosely interwoven, pale yellow, 3-5 µm wide, oleiferous hyphae abundant in subhymenium and trama, distinctly amyloid 4-6 µm wide.
Gloeocystidia 90-120 x 6-9 µm, subulate, often with a moniliform apical appendix, up to 200 µm long, distinctly amyloid.
Basidia 20-25 x 4-5 um, narrowly clavate, tetrasterigmatic.
Basidiospores 4 x 3-3.3 µm, subglobose to broadly elliptic, finely echinulate, amyloid.
Substrate. On decayed hardwood.
Distribution. Known from Ghana and Cameroon.
Remarks. The species is similar to *L. bicolor* but separated by its deep yellow colour, amyloid gloeocystidia and smaller spores.

LICROSTROMA Lemke,

Canad. J. Bot. 42:762, 1964.
Basidiocarp resupinate to effused-reflexed, pale yellow to ochre, hyphal system dimitic, generative hyphae simple septate, *Bovista*-like branched binding hyphae present especially in the context, cystidia present, smooth, thin to thick walled, up to 250 µm long, basidia clavate tetrasterigmatic, up to 100 µm long, basidiospores globose to subglobose, smooth, large, thick-walled and non-amyloid. Monotypic genus causing a white rot in hardwoods.
Type species: *Corticium subgiganteum* Berk.
Remarks. The combination of simple septate hyphae, dimitic hyphal system with *Bovista* like binding hyphae and the large, smooth, subglobose, non amyloid basidiospores make this genus unique.

Licrostroma subgigantea (Berk.) Lemke,

Canad. J. Bot. 42:763, 1964. - *Corticium subgiganteum* Berk., Grevillea 2:3, 1873.
Basidiocarps resupinate to effused-reflexed, to 15.0 cm long, 1.0-4,0 cm wide along the substrate and up to 1.0 cm thick, pileus, when present, glabrous, cream to ochraceous, hymenophore concolorous, margin determinate, usually lifted and incurved in dry condition, subiculum cream coloured and dense.
Hyphal system dimitic, generative hyphae 2.5-4 µm wide and simple septate in the subhymenium, 2-4 µm wide in the context and subiculum, with *Bovista*-like binding hyphae, hyaline, thick walled to solid, branched at right angles, mostly with tapering ends, and all hyphae non-amyloid.
Cystidia 100-250 x 12-20 µm, clavate to sinuous and apically round to pointed, thin- to thick-walled and frequently with secondary septa.
Dendrohyphidia or paraphysoid hyphae up to 100 µm long and 3-5 µm wide, present among the basidia, slightly branched to unbranched and with some simple septa.
Basidia 70-100 x 13-18 µm, cylindrical.
Basidiospores 16-19 x 14-16 µm, subglobose, smooth.

Substrate. On dead hardwoods.
Distribution. Known from East United States and Japan.
Remarks. Superficially reminiscent of a discoid *Aleurodiscus* or *Cytidia*, but easily separated from these by the combination of non-amyloid spores, long cylindrical cystidia, simple septate generative hyphae and *Bovista*-like binding hyphae.

LOPHARIA Kalch. & McOwan,

Grevillea 10:58,1881.
Basidiocarps effused-reflexed to resupinate, detachable, upper surface, if present, velvety to tomentose, hymenophore smooth to tuberculate or odontoid or semiporoid with shallow depressions, beige to ochraceous; context duplex hyphal system dimitic, generative hyphae with clamps, skeletal hyphae hyaline, abundant in context and tomentum; metuloid cystidia or skeletocystidia present, thick-walled and heavily encrusted, projecting visibly above the hymenium; basidia clavate, longer than 50 µm, tetrasterigmatic, basidiospores cylindrical to oblong elliptic, longer than 10 µm, smooth, hyaline, non- amyloid. On dead hardwoods, tropical to subtropical genus with two species.
Type species: *Lopharia lirellosa* Kalchb. & MacOwan = *Radulum mirabile* (Berk. & Broome) Pat.
Taxonomic synonyms:
Twaitesiella Mass.Geest., Grevillea 21:3, 1892 (*Radulum mirabile* Berk. & Broome).
Lloydella Bres., Lloyd Mycol. Writ. 1:51,1901 (*Thelephora cinerascens* Schw.).
Licentia Pilat., Ann. Mycol. 38:66, 1940 (*Licentia yao-chanica* Pilat).
Remarks. *Lopharia* is characterized by a true dimitic hyphal system, medium to large-sized spores and heavily encrusted, hyaline and projecting cystidia. Species of *Porostereum* and *Hjortstamia* have generally shorter spores and most species have skeletocystidia which bend into the hymenium with a smooth or encrusted apical part.

Key to species

1. Hymenophore irregularly warted or with concentrically arranged dentate ridges, tropical species ..... **L. mirabilis**
1. Hymenophore smooth or slightly tuberculate, subtropical to temperate species .... **L. cinerascens**

Lopharia cinerascens (Schw.) G.H. Cunn., Fig. 23.

Trans. Roy. Soc. N. Z. 83:622, 1956. - *Thelephora cinerascens* Schw., Trans. Am. Philos. Soc. N.S. 4:167, 1822.
Basidiome resupinate to effused reflexed, rather easy to remove from the substratum, tough when fresh, hard and brittle when dry, pileus when present up to 1.5 cm wide, 1-2 mm thick, upper surface tomentose to velvety, usually zoned, gray to pale ochraceous and with a distinct black zone below the persistent tomentum, hymenophore even,

beige to light corky brown, in section with a distinct hymenium and subhymenium with embedded cystidia, context whitish to ochraceous, less than 1 mm thick.
Hyphal system dimitic, generative hyphae with clamps, hyaline, 2-4 µm wide, clamps rather scattered and often difficult to find; skeletal hyphae 3-6 µm wide, thick-walled, hyaline, unbranched, straight to sinuous, the pileus tomentum consisting almost exclusively of skeletal hyphae.
Cystidia large, thick-walled, acute, coarsely encrusted when mature, embedded to slightly projecting, 55-160 x 12-25 (30) µm, hyaline to pale yellowish brown with age, arising from subhymenial hyphae or from skeletal hyphae.
Basidia 40-55 x 8-10 µm, clavate and tetrasterigmatic.
Basidiospores 10-16 x 6-7.5 µm, cylindrical, often slightly bent.
Substrate. On hardwoods.
Distribution. Pantropical and Portugal.
Remarks. The genus is characterized by its large encrusted cystidia, a dimitic hyphal system and large basidiospores.

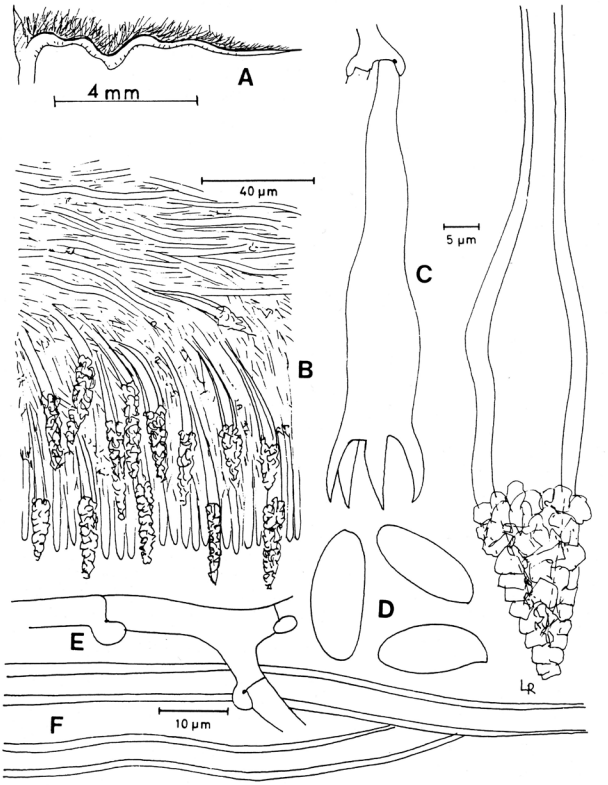


Fig. 23. *Lopharia cinerascens*, A) section of basidiocarp, B) part of hymenium, C) basidium, D) basidiospores, E) generative hyphae, F) skeletal hyphae, Coll. J. Chapman, USA.

Lopharia mirabilis (Berk. & Broome) Pat.,

Bull. Soc. Mycol. Fr. 11:14, 1895. – *Radulum mirabilie* Berk. & Broome, J. Linn. Soc. Bot. 14:61, 1873.
Basidiocarps effused-reflexed, detachable, coriaceous when fresh, hard when dry, pileus when present, finely tomentose, zoned, grey to pale ochraceous, hymenophore tuberculate to odontoid, to semi irpicoid or poroid, cork coloured, finely pruinose due to projecting cystidia,
Hymenium up to 40 µm deep with projecting cystidia, subhymenium of variable thickness and with numerous embedded cystidia, subhymenium separated from the substrate or pileus tomentum by a thin, black line.
Spores and cystidia as in *L. cinerascens.*
Distribution. Paleotropical species.
Remarks: By being separated from *L. cinerascens* only by morphological characters, it may be seen as a form of the former more than a separate species.

EXCLUDED SPECIES:

Lopharia rugulosa (Berk. & M. A. Curtis) Hjortstam

Mycotaxon 54:188, 1995. - *Merulius rugulosus* Berk. & M. A. Curtis, J. Linn. Soc. Bot. 10:323, 1868. Type from Cuba.
The type is described in detail by Ginns (1971) and has a monomitic hyphal system and is lacking cystidia. Thus, it falls wide outside the generic concept given by the type species as described above. Hjortstam has probably been mislead by a misidentified or wrongly named specimen during his work in Kew, which lead him to transfer the species to *Lopharia*. The species seems to belong in *Phlebia* s. lato.

MINOSTROSCYTA Hjortstam & Ryvarden,

Mycotaxon 79:194, 2001.
Basiocarps discoid, smooth, hyphal system dimitic with clamped generative hyphae and skeletal hyphae, cystidia numerous, smooth and elongated, basidia tetrasterigmatic, basidiospores cylindrical to sigmoid, large, smooth, non-reactive in Melzers reagent, on dead hardwood. Monotypic genus, known only from Colombia.
Type species: *Minostroscyta discoidalis* Hjortstam & Ryvarden.
Remarks. The discoid basidiocarps with large basidiospores and numerous cystidia characterize the genus.

Minostroscyta discoidalis Hjortstam & Ryvarden,
Myxotaxon 79:194, 2001.

Basidiocarps more or less discoid, about 1 cm in diameter, rather soft, up to 2 mm thick, hymenophore smooth to slightly tuberculate, cream coloured, subiculum distinct cottony and white.
Hyphal system dimitic, generative hyphae with clamps, thin walled, 3-5 µm wide, skeletal hyphae few, thick walled 1.5-3 µm wide.
Cystidia abundant, smooth, forming with the basidia a dense hymenial palisade, tubular, thin walled, sinuous and oil filled.
Basidia 40-80 x 5-7 µm, clavate, tetrasterigmatic.
Basidiospores 15-18 x 4-6 µm, subfusiform.
Substrate: Dead hardwood.
Distribution. Known only from the type locality in Colombia.
Remarks. The large spores and the numerous cystidia make this a distinct species.

MYCOBONIA Pat.,

Bull. Soc. Mycol. Fr. 10:76, 1894.
Basidiocarps pileate, annual, dimidiate to reniform, upper surface yellowish, glabrous. Lower surface yellowish, often becoming darker when dried, covered with minute sterile spines. Context thin and dense. Hyphal system dimitic, generative hyphae hyaline, with clamp connections, vegetative hyphae arboriform of the *Bovista* type, mostly dichotomously branched, solid to thick-walled and hyaline, not reacting in Melzer's reagent, basidia tetrasterigmatic, cystidia absent, basidiospores hyaline, thin-walled and cylindrical to elliptic and non-amyloid. Tropical genus with two American species.
Type species: *Peziza flava* Sw.:Fr.
Remarks. The species are characterized by its fairly large basidiocarps covered with tiny hyaline spines. Related to *Polyporus* s. str., and having the same microstructure, but easily separated from it by the densely spiny hymenophore.

Key to species

1. Basidiospores cylindrical to navicular..... **M. flava**
1. Basidiospores elliptic ..... **M. brunneoleuca**

Mycobonia flava Pat.

Bull. Soc. mycol. Fr. 10: 77, 1894. - *Peziza flava* Swartz, Nov. Gen. Sp. Plant. Prodromus p. 150, 1788. - *Peziza flava* Sw.: Fr. Syst. Mycol. 2:161, 1822.
Basidiocarp annual, pileate, dimidiate to reniform or flabellate, up to 8 cm wide and 4 cm across, rarely more than 4 mm thick, flexible when fresh, tough, dense and hard when dry, stipe short, expanding evenly into the pileus, yellow to ochre when fresh,

pale purplish to rusty isabelline in some specimens when dry, hymenophore pale ochre to yellow when dry, rarely more darkly coloured, covered with numerous, tiny, conical, sterile spines of the same colour, these up to 0.5 mm long, context whitish to ochre with a dense texture.
Hyphal system dimitic, generative hyphae 2-4 µm wide, thin-walled and hyaline, difficult to observe in dry specimens; arboriform binding hyphae throughout most of the basidiocarp, hyaline, thick-walled to solid, richly branched, and with tapering apices, 2-5 mm wide.
Basidia 30-50 x 9-12 µm, clavate, tetrasterigmatic.
Basidiospores 15-22 x 5-7.5 µm, cylindrical to slightly navicular.
Substrate. On hardwood.
Distribution Widespread in tropical America.
Remarks. Easily recognized in the field due to the delicate yellow basidiocarps with numerous tiny spines on the lower side (lens!). To the naked eye, however, the hymenophore of young specimens can easily be taken to be glabrous.

Mycobonia brunneoleuca (Berk. & M. A. Curtis) Pat.,

Essai Taxon. p. 75, 1900. - *Hydnum brunneoleucum* Berk. & M. A. Curtis, Trans. Linn. Soc. Lond. 22:129, 1857.
Basidiocarps, hyphal system and **basidia** as in *M. flava*.
Basidiospores 17-22 x 9-11 µm, elliptic.
Substrate. On hard wood.
Distribution. Insufficiently known, due to confusion with *M. flava* as only a microscopic examination can separate the two species.
Remarks. Known from Cuba, Mexico and Venezuela (with verified material in Kew), but the distribution is almost certainly wider.

PAPYRODISCUS D. A. Reid,

Beiheft Sydowia 8:333, 1979.
Basidiocarps semicircular, attached dorsally to the substrate, pileus adpressed felty and reddish brown, hyphal system monomitic, generative hyphae simple septate, basidiospores navicular, smooth and non-amyloid. On hard woods. New Guinea. Monotypic, known only form the type specimen.
Type species: *Papyrodiscus ferrugineus* D. A. Reid.
Remarks. The dorsally attached thin basidiocarps with a reddish brown pileus make this a characteristic genus.

Papyrodiscus ferrugineus D. A. Reid,

op.cit.

Basidiocarps papery thin, more or less circular, 2-4.5 cm in diameter, dorsally attached to the substrate, pileus velutinate to tomentose, distinctly zoned, hymenophore cream coloured with a pink tint and smooth.
Hyphal system monomitic, generative hyphae simple septate and pale brown, 3.5-6 µm wide.
Cystidia 20-40 x 4-6 µm, scattered and few, smooth, thin-walled, smooth.
Basidia 12-17 x4-6 µm, suburniform.
Basidiospores 5.0-6.2 x 2-2.2 µm, navicular, smooth and non-amyloid.
Substrate: On dead twigs.
Distribution. Known only from the type locality at about 3000 m a. s. l. in the Kubor Range in New Guinea.
Remarks. The dorsally attach, thin and brown basidiocarps with navicular spores, make this a very distinct species.

PARASTEREOPSIS Corner,

Nova Hedwigia 27:331, 1976.
Basidiocarps centrally stipitate and funnelshaped, up to 6 cm high, hymenophore smooth pale brown, hyphal system monomitic with clamps, basidia tetrasterigmatic, basidiospores elliptic, smooth and non-amyloid, conidia present, on dead wood. Monotypic genus.
Type species: *Parastereopsis borneensis* Corner.
Remarks. The genus is rather unique with its funnel shaped basidiocarps and numerous conidia.

Parastereopsis borneensis Corner,

Nova Hedwigia 27:331, 1976.
Basidiocarps funnelshaped, up to 6 cm high and 5 cm wide, margin incised to lobate, pileus smooth, glabrous, pale brown, hymenophore smooth to slightly radially veined, pale brown, 1-1.3 mm thick.
Stipe 15 x 3 mm and smooth.
Hyphal system monomitic, in the hymenium with clamps, 2-4 µm wide, those of the pileus simple septate, 20-180 x 3-22 µm with shorter cells towards the apex.
Basidia 18-25 x 5-6 µm, tetrasterigmatic.
Basidiospores 4.3-5 x 2.5-3 µm, elliptic.
Conidia present, 16-28 x 15-20 µm, smooth, globose to oval, thin walled, sessile or with short stipe, developed and common on the stipe surface, less so on the rhizomorphs.
Rhizomorphs present, up to 20 µm, individual hyphae 2-4 µm wide.
Substrate. Dead wood.

Distribution. Known only from the type locality in Borneo.
Remarks. This is a distinct species with its numerous conidia and rhizomorphs. Only two collections are known and more specimens are desirable to verify its full variation. This description is taken the Corners original Latin one.

PERPLEXOSTEREUM Ryvarden & Tutka,

Synopsis Fung. 32:75, 2014.
Basidiocarps perennial, pileate dimidiate, pileus dark brown, zonate, finely velutinate to pubescent, hymenial surface smooth, ochraceous, in section with a thin black zone between the hymenial part and the upper surface of the pileus, hyphal system dimitic, generative hyphae hyaline and with clamps, skeletal hyphae pale brown and almost solid, cystidia present in the hymenium, hyaline tubular, thin-walled, basidiospores subglobose hyaline, ornamented and strongly amyloid in Melzer's reagent. On coniferous wood.
Type species: *Perplexostereum nepalense* Ryvarden & Tutka.
Remarks. The genus is unique by its combination of characters. Macroscopically it is indistinguishable from a fairly large specimen of *Xylobolus subpileatum* by its dimidiate basidiocarp with a dark brown velutinate to almost hirsute upper surface and a smooth ochraceous hymenophore,

Perplexostereum endocrocinum (Berk.) Ryvarden & Tutka, Fig. 24.

Op cit. – *Stereum endocrocinum* Berk., Hooker J. Bot. 6:169, 1854.
Basidiocarps perennial, dimidiate, up to 10 cm wide and long, probably flat fresh bent in dry condition and very hard, upper surface dark brown, velutinate to pubescent in narrow concentric zones, margin sharp, hymenial surface smooth, ochraceous, in section

Fig. 24. *Perplexostereum endocrocinum* the holotype, photo, S. Tutka.

concolourous xx thick, separated from the brown upper of the pileus by a thin distinct black line, upper brown part dense.
Hyphal system dimitic with clamped, hyaline generative hyphae, 3-6 µm thick skeletal hyphae pale to distinctly brown, 4-6 µm wide, especially dominating in the brown upper part of the basidiocarp.
Cystidia present, tubular, enclosed, hyaline and thin walled, 6-12 µm wide and up to 100 µm long.
Basidia 22-25 x 5-6 µm, clavate, tetrasterigmatic**.**
Basidiospores subglobose, 5-6 µm in diameter, hyaline, distinctly ornamented by tubercles and small projections, strongly amyloid.
Substrate. On dead coniferous wood.
Distribution. Known from Nepal and India.
Remarks. This is remarkable species by its deceiving external characters being in this respect identical with *Xylobolus subpileatum* (Berk.) Boidin by its smooth brown zonate pubescent pileus and smooth hymenophore. However, the cystidia and the ornamented amyloid basidiospores exclude any relationship to that genus. The spores remind one of those seen in *Dichostereum*, a genus however, where all species have resupinate basidiocarps and where hyaline cystidia are unknown.

PHLEBIA Fr.,

Syst. Mycol. 1: 426, 1821.
Basidiocarps usually completely resupinate, rarely semipileate; hymenium smooth, tuberculate, phlebioid, odontioid, merulioid or poroid; consistency of living basidiocarps (especially the hymenial part) ceraceous - subgelatinous; when dry, becoming firm, membranous to corneous; subhymenium thickening with age; hyphae with clamp connections, thin- or slightly thickened walls, usually embedded in a gelatinous matrix; cystidia absent or, if present, thin- or thick-walled, not encrusted or sometimes strongly encrusted with crystalline or resinous material, basidia normally narrowly clavate, arranged in a dense palisade; spores smooth, allantoid to elliptic, thin-walled and non-amyloid.
Cosmopolitan genus. All species associated with a white rot.
This manual includes only two distinctly pileate species
Type species: *Phlebia radiata* Fr.
Remarks. The genus was originally described only for species with a radially folded (phlebioid) hymenophore. However, in recent years it has grown to accommodate numerous other species, with a smooth or tuberculate hymenium, a waxy-gelatinous consistency, and narrow basidia in a dense palisade. It is, no doubt, an artificial assemblage, and will certainly be split when the species currently included are all genetically sequenced.

1. Basidiocarp reddish ..... **P. incarnata**
1. Basidiocarp white above, pale yellowish below ..... **P. tremellosa**

Phlebia incarnata (Schw.) Nakasone,

Mycotaxon 21:245, 1984. - *Merulius incarnatus* Schw., Schr. Naturf. Gesellschaft Leipzig 1:92, 1822.

Basidiocarp annual, dimidiate to reflexed, often imbricate, up to 11 x 7 cm and 5 mm thick, spongy when young and fresh, dense and cartilaginous when old, pileus pink to pale orange, drying tan with a pink tint, slightly tomentose, margin up to 2 mm wide, tan to reddish orange, hymenium pale pink, drying orange to dark red, distinctly folded, with folds up to 0.4 mm wide and up to 1.5 mm deep, radiating to the margins, with side branches in parts anastomosing and developing into small pits up to 2 mm wide, context duplex, with the lower part dense and concolorous with the hymenium, and the upper one loose and spongy in texture.
Hyphal system monomitic, 2-6 µm wide, thin to thick-walled, with clamp connections, mixed with a yellowish amorphous matter.
Basidia 18-35 x 4-5 µm, narrowly clavate**.**
Basidiospores 4-6 x 2-2.5 µm, cylindrical, often slightly bent near the apiculus.
Substrate. On dead hard wood, especially *Acer* and *Quercus*.
Distribution. An American species known from central parts of the United States and north-eastern and central Mexico.
Remarks: Distinctive by the overall pinkish colours which becomes stronger on drying, and the radially folded hymenium.

Phlebia tremellosa (Schrad.: Fr) Burds. & Nakasone,

Mycotaxon 21:245, 1984. -. *Merulius tremellosa* Schrad. Spicily. Fl. Germ. 1: 139, 1794. - *Merulius tremellosus* Schrad.: Fr., Syst. mycol. 1: 426 1821.
Basidiocarp resupinate, orbicular and confluent, widely effused and may reach a size of several dm, or dimidiate-pileate with pilei 1-5 cm broad, arranged in a radial direction, often elongated lengthwise, occasionally imbricate, when fresh and hydrated carnose-tremellose, but shrunken with the hymenium becoming horn-like in texture when dry, pileus white, tomentose-strigose, often somewhat zonate, when young, fresh and hydrated the hymenium is a watery greyish, yellowish-ochraceous to pinkish-ochraceous, or even reddish when mature. In dried material, becoming dark ochraceous to pale orange or even red. Hymenium reticulate-plicate (merulioid) with irregular alveoli, radial ridges often dominant over the tangential dissepiments, in fully developed specimens more or less poroid, with the edges of the dissepiments fertile; margin radially fibrose in resupinate specimens, tomentose or hispid when pileate.

Hyphal system monomitic, generative hyphae with clamps, 4-5 µm wide, thick- to thin walled.
Cystidia absent, but, thin-walled hyphae, may project 20-30 µm above the hymenium and are frequently often covered with excreted, resinous matter, sometimes to such a degree that they may look like true cystidia.
Basidiospores 4-4.5 x 1-1.5 µm, allantoid.
Substrate. On dead wood of hardwoods, rarely or conifers.
Distribution. Cosmopolitan and common in certain areas, but in general rare in tropical forests.
Remarks: Distinctive due to the yellowish, reticulate to merulioid hymenophore and a white tomentose pileus.

PILEODON Roberts & Hjortstam,

Kew Bull. Add. Series 53:817, 1998.
Basidiocarps hard, perennial, effused reflexed to pileate, brown, hymenophore finely odontoid, hyphal system dimitic, generative hyphae with clamps, skeletal hyphae thick walled and brown, basidia tetrasterigmatic, basidiospores large, up to 30 x 8 µm, brown, non-amyloid, on hardwood. Monotypic genus from Borneo and New Guinea.
Type species: *Pileodon megaspora* Roberts & Hjortstam.
Remarks. The odontoid hymenial surface, the brown colour and the large spores make this a distinct and remarkable genus.

Pileodon philippinensis (Bres.) Nakasone,

Sydowia 56: 269, 2004. - *Veluticeps philippinensis* Bres., Hedwigia 61: 302. 1915. - *Pileodon megaspora* Roberts & Hjortstam, Kew Bull. Add. Series 53:817, 1998.
Basidiocarp probably perennial, effuse-reflexed, sessile, dimidiate, up to 3 x 7 cm, tough and firm, up to 8 mm thick; pileus tomentose, rugulose, brown, concentrically zonate; hymenophore denticulate, daedaloid to semi reticulate, developed from hyphal pegs, pegs 4-6 per mm, 100-180 µm high, single or laterally fused to form thin plates with distinct smooth areas between the plates, plates fusing to develop a shallow, daedaloid to semi reticulate pattern, light brown to dark brown, black in KOH; context with a soft, fibrous texture, brown, stratified with a darker cutis next to substrate, numerous dark brown hyphal pegs penetrating the context and hymenium, immediately turning black in KOH.
Hyphal system dimitic, general hyphae with clamps, 1.5-2.5 µm diam, skeletal hyphae, 1.8-3 µm diam, straight, unbranched, yellow to brown, smooth or encrusted with hyaline to brownish yellow mucilaginous or resinous deposits.
Hyphal pegs and plates sterile, formed from aggregated skeletal hyphae, originating in subhymenium and subiculum, protruding up to 180 µm beyond the hymenium; skeletal hyphae cylindrical to narrowly clavate, up to 165 x 3-6 µm, often slightly swollen.

Basidia 67-105 x 9-15 µm, clavate, typically with a distinct, slender stalk, tetrasterigmatic.
Basidiospores 32-41 x 8-12 µm, cylindrical to fusiform with a distinct, blunt apiculus, first, hyaline, then with slightly thickened and brownish yellow, smooth.
Substrate. Dead hard wood.
Distribution: Brunei on Borneo and Philippines.
Remarks. The large basidiospores and the brown basidiocarp with hyphal pegs, make this an extraordinary species.

PLICATURA Peck,

Ann. Rep. New York St. Mus. 24:75, 1872.
Basidiocarps resupinate - dimidiate, loosely adnate, white, soft, when dried fragile; upper side not especially differentiated, composed of intertwined hyphae similar to those of the trama (= subiculum), in older basidiocarps forming a thin cuticle of collapsed hyphae; hymenial side smooth to more or less wrinkled or irregularly plicate, not forming regular gills or pores; hyphae with clamps, conspicuous especially in the trama, hyphae of the subhymenium thin-walled and richly branched, those of the trama and the upper side with more or less thickened walls, more straight and sparsely branched; no cystidia; basidia subclavate, forming a dense palisade; spores allantoid to ovoid, smooth, thin-walled and amyloid.
Type species: *Plicatura alni* Peck = *Plicatura nivea* (Fr.) P. Karsten.
Remarks. The microscopical characters remind one of *Amylocorticium* and is hence placed in Amylocorticieae by Parmasto, but also of *Ceraceomyces*. In many respects it shows affinities to *Plicaturopsis* Reid, but we prefer to keep them in separate genera.

Key to species

1. Spores ovoid, hymenium smooth, tropical Africa..... **P. alba**
1. Spores allantoid, hymenium wrinkled, temperate species .....**P. nivea**

Plicatura alba Henkel & Ryvarden, Fig. 25

Synopsis Fung. 40, 106, 2020.
Basidiocarp dimidiate, fan shaped, up to 8 cm wide and long, papery thin. loosely attached to the substrate, soft and lax when fresh, fragile and very light when dry, pileus even, white, lower side smooth, white.
Hyphal system monomitic; hyphae with clamps 2-4 µm wide, thin-walled, richly branched.
Basidia 20-24 x 4-6 µm, subcylindrical - narrowly clavate, tetrasterigmatic.
Basidiospores 4-5 x 3-4 µm, ovoid to broadly elliptic.
Habitat. On dead hard wood.
Distribution. Known only from the type locality in Cameroon.
Remarks. The fan shaped, pure white smooth basidiocarp make this a distinct species.

Fig. 25. *Plicatura alba*, the holotype, photo L. Ryvarden.

Plicatura nivea (Fr.) P.A. Karsten,

Bidr. Känned. Finl. Nat. Folk 48:342, 1889. - *Merulius niveus* Fr., Elench. Fung. 1:59, 1828.

Basidiocarp resupinate to dimidiate, orbicular and some cm wide, or confluent, loosely attached to the substrate, in the living state soft and lax, when dried fragile and very light; upper side smooth, in very young specimens and in the growing margin of older ones finely velvety (lens), in the beginning white but turning greyish or pale beige brown; hymenial side white, turning yellowish with age and on drying, even orange or pale brown, smooth in the young basidiocarp but becoming distinctly and irregularly plicate but not forming net-like pores.
Hyphal system monomitic; hyphae with large clamps with a conspicuous "eye" at least in the wider hyphae; in the subhymenium 2-3 µm wide, thin-walled, richly branched; hyphae of the trama (subiculum) 3-6 µm, over the clamp to 8 or 10 µm wide; most hyphae with somewhat thickened walls, straight, sparsely branched.
Basidia 12-18 x 3-4 µm, subcylindrical - narrowly clavate, tetrasterigmatic.
Basidiospores 4-4.5 x 1 µm, allantoid.
Habitat. On dead hanging or fallen branches, standing or fallen trunks etc. of *Alnus* ssp., rarely on other deciduous trees, e.g. *Prunus*, *Salix*, *Betula***,** once found on *Picea*.

Distribution. Circumpolar in the boreal-temperate zones.
Remarks. Easily recognized by its white colour, its irregularly wrinkled hymenophore and hyaline, amyloid spores.

PLICATUROPSIS D. A. Reid,

Persoonia 3:150, 1964.
Basidiocarps pileate, cupulate to sub-resupinate, single, aggregated or imbricately expanded, when fresh soft and pliable, contracted and brittle when dried, upper side subzonate and velutinous or tomentose, margin more or less involute. Hymenium plicate with low, bifurcate, radially arranged gill-like ridges; hyphae with conspicuous clamp connections, mostly thin-walled but, in the upper part of the subiculum (trama), with thickening walls and horizontally layered whilst those of the subhymenium are much intertwined; cystidia absent; basidia subclavate, arranged in a dense palisade, with 4 sterigmata; spores allantoid, thin-walled, amyloid, but in some specimens the reaction is weak whilst in others much stronger and obvious.
Type species: *Cantharellus crispus* Pers.:Fr.
Remarks. The genus agrees in many respects with *Plicatura* and they must be regarded as closely related. Microscopic characteristics are the same, except for the denser texture of *Plicaturopsis*, with thick-walled hyphae on the upper side of the basidiocarp. The genus is monotypic.

Plicaturopsis crispa (Fr.) D. A. Reid, Fig. 26.

Persoonia 3:150, 1964. - *Cantharellus crispus* Pers.: Fr., Syst. mycol 1:323, 1821. - *Merulius crispus* Pers., Icon Descr. Fungi.: pl.32 ,1800.
Basidiocarp usually dimidiate, flabelliform or cupulate, mostly crowded to imbricate, 1.0-2.0 cm wide, seldom more, lacking a stipe or (dependent on the situation of the basidiocarp) pseudostipitate with the basidiocarp narrowed at the point of attachment, into a short, stipe-like part; on the undersides of horizontal substrate, often sub-resupinate and more or less lobed, and on vertical substrate, laterally fixed; initially white when young, the upper side soon pale brown to tobacco-brown, finely velutinous, and often subzonate, hymenium white to glaucous white, darkening when older and in herbarium material, folded into dichotomously branched, gill-like ridges with an uneven to crispate edge; consistency soft and pliable when young, firmer when mature and brittle when dried.
Hyphal system monomitic; hyphae 3-5(-7) µm wide, with large clamp connections, these often with a conspicuous central space, or "eye"; subhymenial hyphae 3-5 µm, mainly parallel, hyphae on the upper side of the basidiocarp 5-7 µm wide, coarse, thick-walled and somewhat swollen in KOH and Melzer's reagent. he ends of such hyphae form the tomentum on the upper side, becoming more or less agglutinated in old basidiocarps, forming tufts of agglutinated hyphae.

Fig. 26.
Plicaturopsis crispa,
photo T, H. Hofton,

Basidia 15-22 x 3.5-4.5 µm, subclavate to subcylindrical.
Basidiospores 3-4.5 x 0.75-1.25 µm, allantoid, thin-walled, smooth, amyloid, with oily contents. The amyloid reaction may be strong and obvious in some specimens or weak and difficult to observe in others.
Substrate. Dead hard wood.
Distribution. Circumglobal in the conifer zone.
Remarks. The species is similar to *Plicatura nivea* but distinguished by its radially folded hymenium and brown pileus.

PODOSCYPHA Pat.,

Essai tax. p. 70-71, 1900.
Basidiocarps lignicolous or terrestrial and then often on buried wood, thin, coriaceous, spatulate, flabellate, infundibuliform; adjacent basidiocarps frequently confluent forming complicated rosette-like structures, upper surface glabrous or covered with a distinct tomentum or bearing branched antler-like processes, pale to dark brown or occasionally ochraceous-fawn, pinkish-fawn or pallid fawn to white, in old dried specimens dark chestnut to blackish-brown often concentrically zonate, hymenium smooth, usually pallid or cream coloured, but in some species dark bay, bright ochraceous or orange, stipe usually well developed, often attached to the substrate by a conspicuous mycelial disc and covered by a felt-like tomentum or minutely hispid due to the presence of numerous well defined caulocystidia, context often very thin, hyphal system dimitic or (rarely) rudimentarily trimitic, generative hyphae thin walled, hyaline, with clamp

connections in all species, thin to thick-walled, skeletal hyphae thick-walled to almost solid, hyaline metuloid cystidia present in few species, gloeocystidia always present, caulocystidia and pileocystidia absent or present, basidia clavate, 2 to 4-spored, of small to medium size, basidiospores smooth, thin-walled, hyaline, non-amyloid, subcylindrical to broadly elliptic to subglobose. All species cause a white rot. Pantropical, with few species in the temperate zone.
Type species: *Stereum surinamense* Lév.
Taxonomic synonym *Stereogloeocystidium* Rick, Broteria 9:79, 1940.
Remarks Distinctions between some species are vague, especially since some of them are known only from the type specimens. Further collecting is desirable to ascertain the validity of some of the species concepts accepted here.

Main key

1. Thick walled, smooth or metuloid cystidia or chlamydospores present ..... **Key A**
1. Thick-walled metuloid cystidia or chlamydospores absent **2**

2**.** Pileus tomentose to hispid or with antler-like outgrowths ..... **Key B**
2. Pileus glabrous, although pileocystidia may be present **3**

3. Neotropical species Key..... **C**
3. Paleotropical species Key ..... **D**

Key A.

1. Thick walled smooth cystidia present, chlamydospores absent **2**
1. Thick walled smooth cystidia absent, chlamydospores present ..... **P. bolleana**

2. Pileus glabrous ..... **P. mellisii**
2. Pileus tomentose **3**

3. Basidiocarps flabellate without distinct stipe, widespread in the paleotropical zone ..... **P. involuta**
3. Basidiocarps distinctly stipitate, known only from Philippine Islands ... **P. moselei**

Key B

1. Pileus with antler-like outgrowths **2**
1. Pileus hispid to finely tomentose **3**

2. Paleotropical species ..... **P. ursina**
2. Neotropical species..... **P. cristata**

3. Basidiocarps effused-reflexed and dorsally attached..... **P. semiresupinata**
3. Basidiocarps spatulate to flabelliform with tapering stipe..... **4**

4. Tomentum ochraceous with greenish tints, basidiospores 3-3.7 x 2-2.5 µm .....
.....**P. viridans**
4. Tomentum whitish to beige, basidiospores 4-4.5 x 3-3.5 µm .....**P. caespitosa**

Key C Neotropical species

1. Basidiospores 5-8 µm long **2**
1. Basidiospores in general shorter than 5 µm **5**

2. Basidiospores subglobose, pileocystidia present **3**
2. Basidiospores elliptic, pileocystidia absent **4**

3. Pilei radially wrinkled, dark chestnut to almost black when dry .....**P. ovalispora**
3. Pilei smooth, cream to greyish when dry .....**P. aculeata**

4. Basidiospores 6-8 (10) x 4-6 µm, on dead grasses ..... **P. thozetii**
4. Basidiospores 5-7 x 3.5-4 µm, on dead wood ..... **P. brasilensis**

5. Pileocystidia or undifferentiated hairs present on pileus..... **6**
5. Pileocystidia absent **11**

6. Basidiocarp with radiating ribs, up to 1.5 mm thick, basidiospores 3-3.5 µm long
..... **P. replicata**
6. Basidiocarps without radiating ribs, basidiospores 3.5-5 µm long..... 7

7. Basidiospores subcylindrical to oblong-elliptic 4-5 x 2-2.5 µm, stipe usually well-developed .....**P. tomentipes**
7. Basidiospores broadly elliptic, wider than 2.5 µm, stipe mostly present as tapering contracted base..... **8**

8. Basidiospores 4-5 (6) x 2.2-3 µm, pileocystidia rare..... **P. macrorhiza**
8. Basidiospores usually wider, pileocystidia common..... **9**

9. Pilei radially wrinkled when dry, hymenium sharply delimited towards the short stipe ..... **P. glabrescens**
9. Pilei becoming smooth, hymenium not sharply delimited towards the stipe..... **10**

10. Basidiocarps whitish when fresh, becoming darker when dry, pilei thin and papery, growing on wood ..... **P. pusilla**
10. Basidiocarps light brown to pinkish brown when fresh, becoming dark when dry, growing on the ground ..... **P. petaloides**

11. Basidiocarps more or less spatulate with only a contracted base **12**
11. Basidiocarps with a distinct stipe **13**

12. Basidiospores 3-4 µm long, pilei azonate, pale brown ..... **P. corbiformis**
12. Basidiospores 2-3.2 µm long, pilei zonate, blackish brown ..... **P. mølleri**

13. Basidiospores 2-4 x 1.5-2.2 µm, basidiocarp funnelshaped ..... **P. curta**
13. Basidiospores larger, pilei more or less spatulate to flabelliform **14**

14. Basidiospores (3.8) 4-6 x 3-4 µm, stipe glabrous ..... **P. nitidula**
14. Basidiospores 4-5 x 2-3 µm, stipe with hairs or thick-walled caulocystidia..... **15**

15. Caulocystidia absent, stipe covered with undifferentiated hairs mixed with gloeocystidia, on the ground ..... **P. ravenelii**
15. Thick-walled caulocystidia present, stipe with fine hairs, on dead wood..... ..... **P. bubalina**

NB. Since the size of basidia do not give discriminating characters and all basidiospores are smooth, these characters are excluded from the descriptions to save space.

Podoscypha aculeata (Berk & M.A. Curtis) Boidin,

Rev. Mycol. 24: 210, 1959. - *Thelephora aculeata* Berk. & M. A. Curtis, Grevillea 1:149, 1873.
Basidiocarps to 10.0 cm wide and 10.0 cm high, consisting of numerous stipitate, flabelliform pilei, fused at the base of the stipe to form a rosette-like structure, upper surface finely ridged or crested, white to cream when fresh, darkening to dark reddish brown when dry, margin finely incised to dentate, hymenium smooth, white to cream when fresh, darkening to light to dark grey when dry. Stipe in effect absent, and the tapering part of the basidiocarp is concolorous with the pilei and hymenium respectively.
Pileocystidia and **caulocystidia** absent.
Gloeocystidia 30-50 x 2.5-3.5µm, thin-walled.

Hyphal system dimitic, generative hyphae 2.5-6.0 µm wide, thin-walled, with clamp connections; skeletal hyphae 2.5-5.0 µm, thick-walled.
Basidiospores 5.0-6.0 (7.0) x 4.0-5.0 µm, subglobose to globose.
Substrate. Terrestrial.
Distribution. Brazil and United States.
Remarks. Macroscopically similar to *P. multizonata*, but that species has pileocystidia and is known only from Europe and Asia.

Podoscypha bolleana (Mont.) Boidin,

Bull. Jard. Bot. Bruxelles 30:323, 1960. - *Stereum bolleana* Mont., Syll. Crypt. p. 177, 1856.
Basidiocarps to 2.0-5,0 cm high and 0.3-2 cm wide in solitary basidiocarps, but often several fused to form more compound structures, spatulate, often lobed or split, flabellate to pseudo-infundibuliform, more rarely truly infundibuliform, upper surface glabrous, silky, shining and with radiating wrinkles imparting a lineate appearance, ochraceus beige to pale brown when fresh, darkening to chestnut brown or yellowish brown, often concentrically zonate, and with a whitish or pale margin, hymenium smooth, ochraceous to ash grey in dried specimens. Stipe attached to the substratum by a conspicuous disc of ochraceous mycelium up to 6.0 mm wide usually short but may attain 4.0 cm long and 0.5-3.0 mm wide covered with a fine ochraceous to brown coloured tomentum, consisting of stiff caulocystidia and skeletal hyphae.
Hyphal system dimitic, generative hyphae 2.5-5 µm wide, hyaline, thin-walled, branched, with clamp connections; skeletal hyphae, to 3-4.5 µm wide, thick-walled to almost solid, unbranched.
Chlamydospores 8-16 x 6-9 µm, present both in the context and stipe, yellow to pale brown, smooth, globose to oblong, very thick walled, either developed singly or more rarely in double structures, as intercalary swellings.
Pileocystidia 25-70 x10-15 µm, abundant, smooth, cylindrical to clavate, yellow to pale brown, thick-walled except at the apex.
Caulocystidia to 120 µm long and 8-13 µm wide, cylindrical or clavate, arising deep in the tissue of the stipe and growing out at right angles through the longitudinally orientated hyphae forming this tissue, hyphal walls thickened, brown, usually darker than the pileocystidia.
Gloeocystidia to 80 µm long and 15 µm wide, elongate, thin-walled, undulant with a slightly swollen base and gradually narrowing to an obtuse apex.
Basidiospores 4-6 x (2.2 -) 2.7-3.5 µm, elliptic to broadly elliptic.
Substrate. On dead wood.
Distribution. Tropical Africa, especially in West Africa.
Remarks. Microscopically, the usually abundant chlamydospores make *P. bolleana* easy to recognize. Macroscopically it is similar to the common *P. nitidula*.

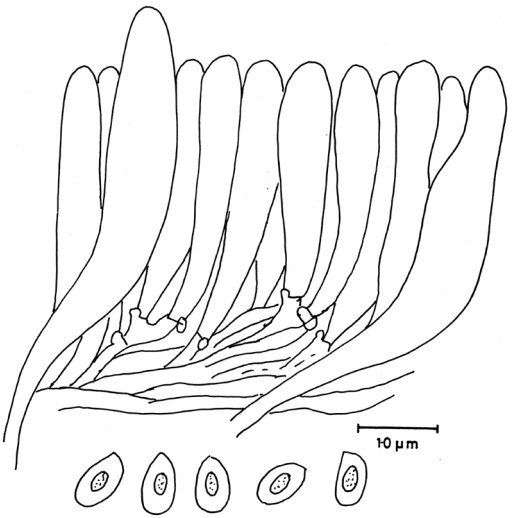


Fig. 27. *Podoscypha brasilensis*, A) part of hymenium with gloeocystidia, B) basidiospores, from Ecuador, from Ryvarden 44552.

Podoscypha brasiliensis D. A. Reid, **Fig. 27**

Beiheft Nova Hedwigia 18:169, 1965.

Basidiocarps to 1.5-3.1 cm high and 0.6-2 cm wide, gregarious, truly infundibuliform, occasionally split almost to the stipe on one side and then appearing flabellate, pileus whitish when fresh, yellowish or ochraceous-brown with slightly darker indistinct zones through reddish- or orange-brown to dark chestnut when dried, hymenium smooth, cream ochre or grey-brown to almost black, usually with an ash-grey pruina, stipe 3.0–8.0 mm long, 0.5-1.0 mm wide, very minutely tomentose, ranging from pale ochre to dark brown and attached to the substrate by a pale ochraceous disc of mycelium up to 5.0 mm wide.

Hyphal system dimitic, generative hyphae 2.5-4.5 µm wide hyaline, thin-walled, branched, with clamp connections and appearing twisted and ribbon-like in microscope preparations; skeletal hyphae, to 5.0 µm wide, hyaline, very thick-walled, unbranched or (very rarely) with short lateral branches of limited growth.

Pileocystidia and **caulocystidia** absent.

Gloeocystidia 30-55 x 6-12 µm, long, narrow, undulant, thin-walled with a swollen base.

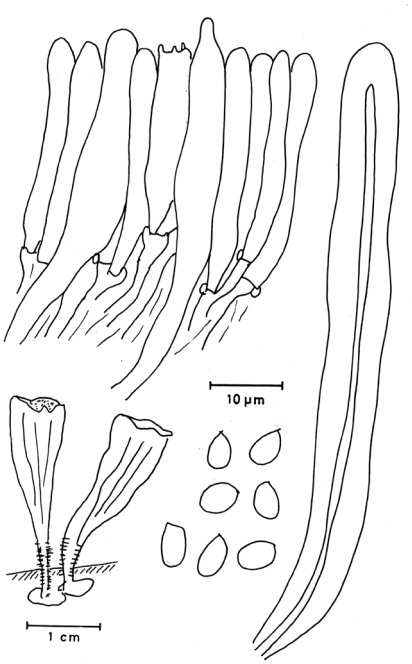
Basidiospores 5-7.3 x 3.0-4.2 µm, elliptic to broadly elliptic.

Substrate. On dead wood.

Distribution. Known from the type locality in Brazil and in Venezuela.

Remarks. *P. brasilensis* might be confused with *P. curta,* but easily distinguished from it by the larger basidiospores.

Fig. 28. *Podoscypha bubalina*, A) basidiocarps, B) section of hymenium with gloeocystidia, C) caulocystidium, D) basidiospores, from Brazil, Coll. T. Gibrtoni.



Podoscypha bubalina D. A. Reid, **Fig. 28**

Beiheft Nova Hedwigia 18:171, 1965.

Basidiocarps to1.0-2.0 cm high and 0.3-1.2 cm wide, truly infundibuliform, pilei glabrous, pale buff when fresh becoming orange-brown or reddish-chestnut in herbarium material, sometimes ornamented with rather indistinct, darker, concentric zones. Hymenium smooth, varying from ochraceous to almost black in dried specimens. Stipe 0.5-0.8 cm long and 0.5-0.7 mm wide, rusty-brown, appearing minutely hispid under a lens due to the presence of caulocystidia, attached to the substratum by a conspicuous disc of ochraceous mycelium up to 6.0 mm wide

Hyphal system dimitic, generative hyphae 2.5-4 µm wide hyaline, thin-walled, branched, with clamp connections; skeletal hyphae 3.5-4.5 µm wide, thick-walled to almost solid.

Pileocystidia absent.

Caulocystidia present, to 80 µm long, and 8-13 µm wide, cylindrical or clavate, often in tufts, hyphal walls thickened, first hyaline then pale brown, arising deep in the context of the stipe and grow to out at right angles to the longitudinally orientated hyphae in the stipe.

Gloeocystidia 30-60 x 5-7 µm, elongate, thin-walled, undulant with a slightly swollen base, gradually narrowed toward an obtuse apex.
Basidiospores 3.7-4.7 x 2.5-3.2 µm, elliptic to broadly elliptic.
Substrate. On dead wood.
Distribution. Known only from the type locality in Brazil.
Remarks: The caulocystidia and its lignicolous habitat characterize this species. More collections are desirable to verify its macro morphological variation.

Podoscypha caespitosa (Burt) Boidin,

Rev. Mycol., Paris, 24, 212, 1959. - *Stereum caespitosum* Burt, Ann. Mo. Bot. Gdn 7: 116-117, 1920.
Basidiocarps coriaceous, thin, caespitose, effused-reflexed or laterally stipitate with a small resupinate part, often forming as a cluster of up to 10 imbricate, reflexed, pileate lobes, to 5.0-10.0 mm wide pilei whitish ochraceous, drying pale brown and minutely adpressed tomentose, but margin remaining glabrous, hymenophore whitish to light buff.
Hyphal system dimitic, generative hyphae 2-5 µm wide, hyaline thin-walled with clamp connections; skeletal hyphae to 3.5 µm wide, hyaline thick-walled.
Pileocystidia present but scattered, to 70 µm long and 6-8 µm wide.
Caulocystidia absent.
Gloeocystidia abundant, up to 85 x 7-10 µm, slender, flexuous with a slightly swollen base, gradually tapering toward the obtuse apex.
Basidiospores 4-4.5 x 3-3.5 µm, subglobose.
Substrate. On dead wood.
Distribution. Known from Jamaica and Venezuela.
Remarks. Typically found growing in small clusters, a characteristic which, together with the small subglobose spores, is diagnostic for this species.

Podoscypha corbiformis (Fr.) D. A. Reid,

Beiheft Nova Hedwigia 18:277, 1965. - *Thelephora corbiformis* Fr., Act. R. Soc. Sci. Uppsala, Series Ill, 1, 108, 1851.

Basidiocarps to 10 cm wide, formed of tufted, sessile, pileate lobes arising from a common base, often imperfectly fused to form sessile, cup-shaped structures, from the inner surface of which innumerable small pileate lobes arise by proliferation, pilei pallid grey-brown, possibly golden brown when fresh and with darker concentric zones, hymenium smooth and dingy grey-brown.
Hyphal structure dimitic, generative hyphae 2-4 µm wide, hyaline, thin walled, with clamp connections; skeletal hyphae, 2-5-5 µm wide, thick-walled to almost solid, unbranched.
Pileocystidia and **caulocystidia** absent.

Gloeocystidia present, but mostly collapsed.
Basidiospores 3-4.2 x 2-2.7 µm, broadly ovate to elliptic.
Substrate. Terrestrial.
Distribution. South America: Known from Brazil, Argentina, Venezuela and Costa Rica.
Remarks. The lack of cystidia on the pileus is typical for this species.

Podoscypha corneri D. A. Reid,

Beiheft Nova Hedwigia 18:172, 1965.
Basidiocarps to 12 cm wide, formed of tufted, sessile, irregular pileate lobes arising from a common base, often imperfectly fused to form sessile, cup-shaped structures, pilei pale ochraceous, glabrous, azonate drying dark to purplish chest coloured, hymenium smooth and ochraceous to greyish. Stipe short and rudimentary.
Hyphal structure dimitic, generative hyphae 2-4 µm wide, hyaline, thin walled, with clamp connections; skeletal hyphae, 2-5-5 µm wide, thick-walled to almost solid, unbranched.
Pileocystidia present, subcylindrical, thick walled, up to 40 µm long and 6-10 µm wide, caulocystidia not observed in the type.
Gloeocystidia present, thin-walled cylindrical, up to 60 µm long.
Basidiospores 2.2-3.2 x 2-2.2 µm subglobose to elliptic.
Substrate. On dead wood.
Distribution. Known only from the type locality in Malaya.
Remarks. The small spores are distinctive for this rare species.

Podoscypha cristata (Berk. & M. A. Curtis) D. A. Reid,

Beiheft Nova Hedwigia 18:174, 1965. - *Stereum cristatum* Berk. & M. A. Curtis, Grevillea 1:163, 1873. - *Stereum rufo-nitens* Speg., Bol. Acad. Cienc. Cordoba 11:81, 1889.
Basidiocarps to 0.6-1.5 cm high, and 0.6-1.2 cm wide, truly infundibuliform or flabelliform, covered on the inner side with a tangled mass of branched, antler-like processes especially toward the base, fulvous or reddish with a silky sheen (but probably straw-coloured when fresh), with somewhat darker, concentric zones and a slightly paler margin, hymenium smooth, pale creamy-ochre to pinkish ochre.
Stipe short, 1.0-5.0 mm high and 1.0-2.0 mm wide, pale reddish to dark brown.
Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline, branched, with clamp connections; skeletal hyphae 3-5 µm wide, hyaline, thick-walled to almost solid. The antler-like pileus processes are comprised mainly of skeletal hyphae with only a few generative hyphae intermixed.
Gloeocystidia 30-60 x 4-8 µm, initially globular or obpyriform but soon long, undulant and thin-walled.
Pileocystidia and **caulocystidia** absent.

Basidiospores 4-4.5 x 1.75-2 µm, narrowly elliptic or subcylindrical.
Substrate. On dead wood or vines.
Distribution. Known from North and South America.
Remarks. The tangled mass of hairs on the pileus makes this a characteristic species. Welden (1960) placed it in *Cymatoderma* because of the dense pileus cover, a characteristic for this genus. Reid (op cit.) placed more emphasis on the hyphal structure and preferred *Podoscypha* as the proper genus, and his solution is accepted here.

Podoscypha curta (Fr.) Ryvarden,

Synopsis Fung. 40:75, 2020.- *Thelephora curta* Fr., Linnea 5:523, 1830. - *Podoscypha fulvo-nitens* (Berk.) D. A. Reid., Beiheft Nova Hedwigia 18:176, 1965. - *Stereum fulvo-nitens* Berk., Ann. Mag. nat. Hist., Series 11, 9:198, 1852.
Basidiocarps to 0.6-5.5 cm high and 0.4-3 cm wide, nearly always truly infundibuliform, although sometimes irregular with uneven sidewalls, and then appearing almost flabellate, upper surface glabrous, very minutely radially wrinkled, with a distinct waxy sheen, golden-orange, to reddish-brown to rich chestnut to deep purplish brown when old, concentrically zonate, with narrow zones, hymenial surface smooth, deep ochraceous-cream or ochre to pale orange brown, darkening grey-brown, purplish-grey to orange-brown when older.
Stipe up to 1.0 cm long, dark brown, glabrous, attached to the substrate by a conspicuous, pale brown basal disc of mycelium.
Hyphal system dimitic, generative hyphae 2.5-4 µm wide, hyaline, thin-walled, branched, with clamp connections; skeletal hyphae 3.5-7 µm wide, thick-walled.
Pileocystidia and **Caulocystidia** absent.
Gloeocystidia present, but often rather scanty, tubular to club-shaped.
Basidiospores 3-4 x 2-2.5 µm, elliptic to broadly elliptic.
Substrate. On dead wood.
Distribution. Central and South America.
Remarks. Probably the most common representative of the genus in America, easily recognized by the glabrous basidiocarp in beautiful shiny brown colours.

Podoscypha glabrescens (Berk. & M. A. Curtis) Boidin, **Fig. 29.**

Rev. Mycol. 24: 210-211, 1959. - *Stereum glabrescens* Berk. & M. A. Curtis, J. Linn. Soc. 10: 330, 1869.
Basidiocarps to 1.7-2.5 cm long and 1.2-3.2 cm wide, spatulate to flabellate, upper surface dark chestnut-brown with darker and paler zones, glabrous and matt although finely pubescent towards the stipe hymenium smooth, pale ochraceous cream, becoming brownish and finally grey towards the stipe, on the lower side of the stipe but sharply delimited from the sterile portion by a distinct ridge.
Stipe very short and flattened to almost rudimentary.

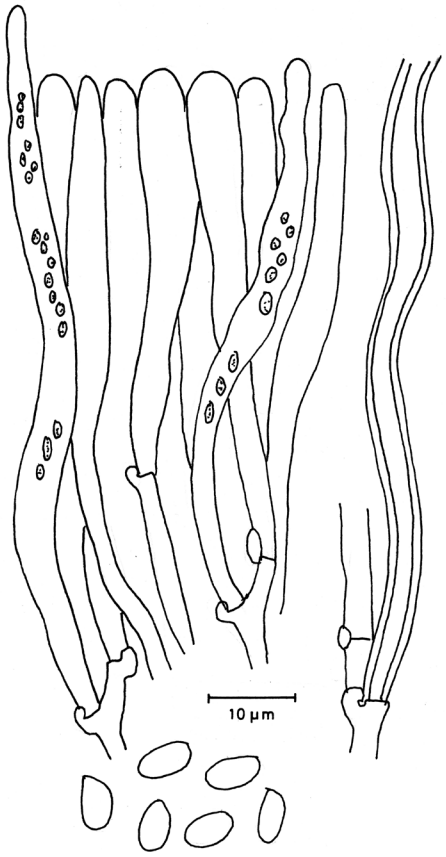


Fig. 29. *Podoscypha glabrescens* A) part of hymenium with gloeocystidia, B) skeletal hypha, C) basidiospores, from Cuba, coll. J. Wright coll. 1870, lectotype.

Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline, thin walled**,** freely branched, with clamp connections; skeletal hyphae 3-5 µm wide.
Pileocystidia up to 90 µm long and 10 µm wide, cylindrical or clavate, with broadly rounded apices, pale brown walls, and often with brown contents.
Caulocystidia to 120 µm long, similar to the pileocystidia.
Gloeocystidia abundant, thin-walled, undulant, gradually tapering toward an obtuse or pointed apex.
Basidiospores 3.7-4.x 2.5-3.5 µm, elliptic to ovate.
Substrate. On dead hard wood.
Distribution. Known only with certainty only from Cuba.
Remarks. The glabrous pileus and the flabellate basidiocarps characterize this species.

Podoscypha involuta (Kl. in Fr.) Imazeki,

Bull. Govt. Forest Exp. Sta. 57:98, 1952. – *Stereum involutum* Kl in Fr., Epicrisis Fung. p. 546, 1838. - *Podoscypha gillesii* Boidin & Lanq., Persoonia, 7: 145, 1973.
Basidiocarps 1-6 cm wide and high, spatulate to flabellate, rarely infundibuliform, pileus tomentose, ochraceus to dark brown, concentrically zoned, lower side smooth or slightly radially folded, yellowish when fresh becoming brown by age and drying.
Stipe up to 12 cm long and 1 cm wide, often rudimentary, flattened, tomentose in dark colours from dark brown to almost black, at base expanded to a mycelial disc.
Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline, thin walled**,** skeletal hyphae 3-5 µm wide, hyaline, thick-walled to almost solid.
Metuloid cystidia present, 15-40 x 6-15 µm, thick walled, oblong obpyriform to cylindrical, hyaline, apically encrusted.
Pileocystidia and **Caulocystidia** absent.
Gloeocystidia less common than the metuloid ones, up to 90 µm long and 10 µm wide.
Basidiospores 2-3 x 1.7-2, elliptic.
Substrate. On dead hard wood.
Distribution. Paleotropical, and rather common.
Remarks. The prominent metuloid cystidia and the tiny spores are distinctive characters,

Podoscypha macrorhiza (Lev.) Pat.,

Essai taxon. p. 71, 1900. - *Thelephora macrorhiza* Lév., Ann. Sci. nat. Series Ill, 5:146, 1846.
Basidiocarps more or less infundibuliform, compound, consisting of several fused individuals arising from a common base, upper surface dark chestnut (stated to be reddish when fresh), glabrous but with radiating wrinkles, hymenium pale when fresh, grey-black when dry.
Stipe 1.0-2.0 mm long, minutely tomentose due to the presence of numerous caulocystidia.
Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline, thin-walled, with clamp connections; skeletal hyphae, 3-5 µm wide, hyaline**,** thick-walled to almost solid, unbranched.
Pileocystidia 30-80 x 5-10 µm, rare, clavate or subcylindrical, with distinctly thickened walls.
Caulocystidia to 45 µm long and 7.5-12 µm wide, short cylindrical or clavate, with distinctly thick, brown walls.
Gloeocystidia 30-60 x 4-7 µm, subcylindrical and thin-walled.
Basidiospores 4-5(-6) x 2.2-3 µm, elliptic.
Substrate. Terrestrial but probably arising from buried wood.
Distribution. Known from South America: French Guiana, Guadeloupe and Martinique.

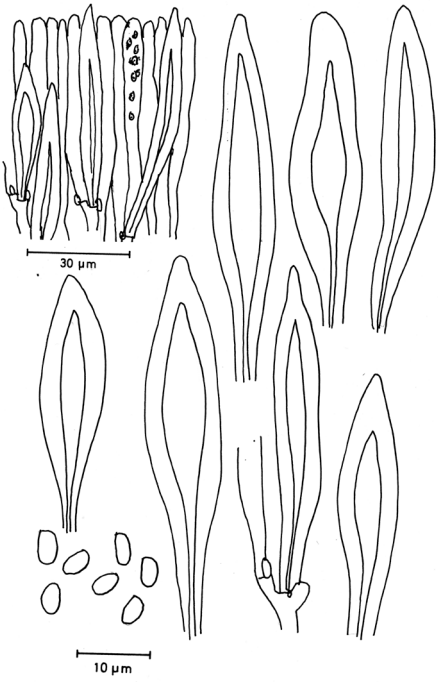


Fig. 30. Podoscypha mellisii, A) part of hymenium, b) metuloid cystidia, C) basidiospores, from Costa Rica, coll. Ryvarden 29655.

Remarks. The presence of both caulocystidia and pileocystidia and the dark pileus make this a distinct species.

Podoscypha mellisii (Sacc.) Pat., **Fig. 30.**

Mem. Acad. Malagache 6:11, 1928. - *Stereum mellisii* Sacc. Syll. Fung. 6:553, 1888.
Basidiocarps to 1.6 cm high and 0.6-4 cm wide, pliable and flexible when fresh, hard and curled with deflexed and bent margin when dried, usually single, rarely confluent and forming more compound structures, flabellate or spatulate to funnel-shaped, bay to brown with even darker chestnut coloured zones, occasionally with some paler zones, surface smooth and glabrous, hymenium smooth, ochre or grey-brown to almost black, stipe to 3 cm long, dark brown to almost black, minutely tomentose (lens) to velutinate, attached to the substrate by a brown to ochraceous disc of mycelium, up to 5.0 mm wide.
Hyphal system dimitic, generative hyphae 2.5-3 µm wide hyaline, thin-walled, branched, with clamp connections; skeletal hyphae, to 5 µm wide, hyaline, thick-walled, usually unbranched but rarely with short lateral branches of limited growth.
Pileocystidia absent.

Caulocystidia to 120 µm long, smooth, brown, thick-walled, straight or bent to sinuous, covering the whole stipe, originating deep in the context, and projecting up to 60 µm.
Metuloid cystidia to 60 µm long, usually abundant, smooth, hyaline, lanceolate and acute or cylindrical with rounded apices. Those deeply buried in the subhymenium and context are usually very thick-walled, whilst those in the hymenium often exhibit a thick-walled base which thins towards the apex.
Gloeocystidia to 90 µm long and to 12 µm wide, narrow, undulant, thin-walled with a swollen base, not as frequent as the metuloid cystidia.
Basidiospores 3-4 x 2.5-3 µm, elliptic.
Substrate. On decayed hardwoods.
Distribution. Pantropical, but rare in America.
Remarks. Macroscopically the hard basidiocarps (when dried) with dark shiny colours and very dark, finely tomentose stipe, should make it possible to recognize in the field.

Podoscypha moselei (Berk.) D. A. Reid,

Beih. Nova Hedwigia 18:2023, 1965.- *Stereum moslei,* Berk., J. Linn. Soc. 16.48, 1877.
Basidiocarps to 1.6 cm high and 0.6-2 cm wide, flabellate to infundibuliform and often different basidiocarp become confluent to more complex bodies, pliable and flexible when fresh, hard and curled with deflexed and bent margin when dried, pileus brown to brownish greyish, smooth, very finely tomentose (lens!) concentrically zoned, hymenium smooth, light rusty brown with a paler margin.
Stipe to 1 cm long, brown, minutely tomentose (lens), attached to the substrate by a brown to ochraceous disc of mycelium.
Hyphal system dimitic, generative hyphae 2.5-3 µm wide hyaline, thin-walled, branched, with clamp connections; skeletal hyphae, to 8 µm wide, hyaline, thick-walled to almost solid.
Pileocystidia present as short brown hairs mixed with a few caulocystidia.
Caulocystidia to 60 µm long, smooth, brown, thick-walled, straight or bent to sinuous scattered on the whole stipe.
Metuloid cystidia to 60 µm long, usually abundant, smooth, hyaline, lanceolate and acute or cylindrical with rounded apices, buried in the subhymenium and context are thick-walled, whilst those in the hymenium often with a thinner apex.
Gloeocystidia to 90 µm long and to 15 µm wide at the base.
Basidiospores not seen.
Substrate. On decayed hard woods.
Distribution. Known only from the Philippine islands.
Remarks. *P. moselei* is similar to *P. mellissii* but separated by the minutely tomentose pileus, shape of cystidia and absence of long setoid hairs on the stipe. *P. involuta* is similar and mostly differentiated by having a distinct tomentose pileus. In the end it may that *P. moslei* is only a form of *P. involutea*.

Podoscypha mølleri (Bres. & Henn.) D. A. Reid,

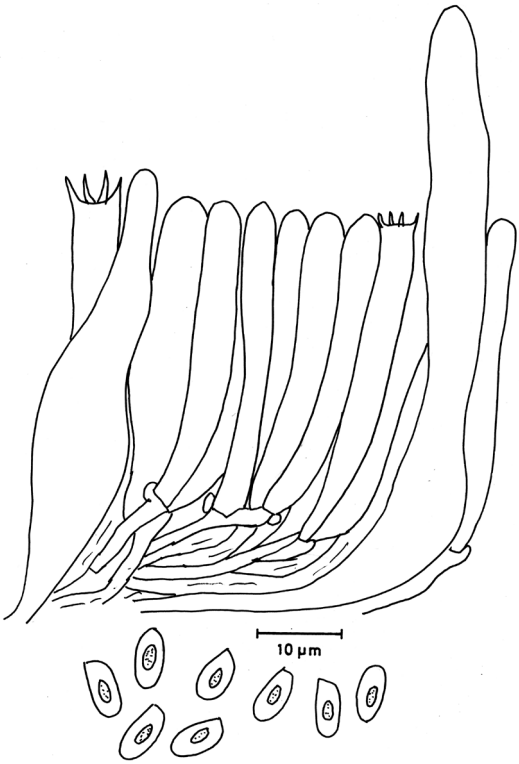
Beiheft Nova Hedwigia 18:202, 1965. - *Stereum mølleri* Bres. & Henn., Hedwigia 35:288, 1896.
Basidiocarps 1.0-2.0 cm wide, flabelliform, upper surface silky, dark blackish brown, with numerous, narrow, concentric zones and a whitish margin. Hymenium smooth and pallid. Stipe 5.0-7.0 mm long and 2.0 mm wide, flattened, dark blackish-brown and similarly zoned like the pilei, and often appearing as little more than a basal prolongation of the cap.
Hyphal system dimitic, generative hyphae 2-3 µm wide, hyaline, thin-walled, with clamp connections; skeletal hyphae, 3-5 µm wide, hyaline, thick-walled, unbranched.
Pileocystidia absent.
Caulocystidia projecting up to 90 µm, 5-8 µm wide, with thick brown walls, often constricted.
Gloeocystidia present, 5-7 µm wide, elongate, thin walled, cylindrical.
Basidiospores 2.2-3.2 x 2-2.2 µm, broadly elliptic.
Substrate. On dead wood.
Distribution. Known only from Brazil: Blumenau, St. Catharina.
Remarks Most easily distinguished by its dark, distinctly zonate pilei.

Podoscypha multizonata (Berk & Broome) Pat.,

Ann. Crypt. Exot. 1:6, 1928. - *Thelephora multizonata* Berk. & Broome, Ann. Mag. Nat. Hist. Series III, 15:321, 1865.

Basidiocarps up to 10 cm wide and 8 cm high, often forming rosettes with several more or less partly independent pilei, pileus glabrous, smooth to radially wrinkled, in parts with knobs or outgrowths, pinkish to pale reddish when fresh, becoming more brownish when dry, often with concentric darker bands or zones.
Hyphal system dimitic, generative hyphae 3-7 µm wide and with clamp connections; skeletal hyphae, 4-8 µm wide, hyaline, thick-walled.
Pileocystidia and **Caulocystidia** absent.
Gloeocystidia present, also on the pileus, 5-12 µm wide, up to 130 µm long, penetrating the whole hymenium.
Basidia clavate, 18-26 x 4-6 µm, tetra- to bisterigmatic.
Basidiospores 5-6 x 3.7-4.7 elliptic to subglobose.
Substrate. On the ground.
Distribution. West European species, especially common in England, and with a single eastern Siberian record.
Remarks. The restricted distribution, the multi shaped basidiocarps and presence of gloeocystidia on the pileus, make this a remarkable species.

Fig 31, *Podoscypha nitidula*, A) hymenium with gloeocystidia, B) spores, from Ecuador, coll. Ryvarden 44514.



Podoscypha nitidula (Berk.) Pat. in Duss., Fig. 31

Enum. champ. Guadeloupe Martinique p. 21, 1903. - *Stereum nitidulum* Berk. in Hooker's Lond. J. Bot. 2: 638, 1843. - *Stereum surinamense* Lév., Ann. Sci. nat. Series Ill, 2:209, 1844.

Basidiocarps to 1.2-4.0 (-8.0) cm high and 0.7-1.5(-5.0) cm wide, usually truly infundibuliform with a folded basidiocarps, although occasionally proliferating from within the cup, but very rarely flabellate specimens are produced, single, but when crowded together some basidiocarps may fuse along their adjacent margins, pilei dirty white, drying dark chestnut-brown, frequently ornamented with concentric zones of a lighter or darker shade, upper surface glabrous and often has a waxy, semi-translucent appearance, hymenium smooth, pale creamy-ochre to grey-brown, but in some basidiocarps marked with dark slate grey or blackish zones especially toward the margin, which is itself often chestnut-brown, stipe rudimentary or up to 2.5 cm long and 1-2 mm wide, brown and with a fine cover of undifferentiated hyphae mixed with gloeocystidia, finally becoming glabrous.

Hyphal system dimitic, generative hyphae 2-4 wide thin-walled, hyaline, branched with clamp-connections at the septa, skeletal hyphae, 3-5 µm wide, thick-walled often almost solid, hyaline and unbranched.
Pileocystidia and **Caulocystidia** absent.
Gloeocystidia present, undulant, and may arise in the context, curve into the hymenium and many continue to grow as the hymenium thickens and may reach a length of 150 µm.
Basidia not seen.
Basidiospores 3.75-5.75 x 3-4 (-4.2) µm, broadly elliptic to subglobose.
Substrate. Usually terrestrial, but also found on dead wood.
Distribution. Widespread in South America.
Remarks. The lack of all types of cystidia on the surface of the basidiocarp and the oblong basidiospores characterize the species.

Podoscypha nuda Boidin,

Cahiers Maboke 4:103, 1966.
Basidiocarps 2-5 cm high centrally stipitate, infundibuliform, often grown together and forming more complex structures, pileus glabrous, white to cream coloured when fresh drying brownish, hymenial surface slightly radially furrowed, whitish to grey when fresh, becoming brownish when dry.
Stipe central, 0.5-2 mm in dimeter, greyish and glabrous.
Hyphal system dimitic, generative hyphae 2,2-4,5 µm wide, skeletal hyphae 2-4,5 µm wide.
Cystidia absent.
Gloeocystidia 15 120 x 5,5 11 µm, abundant.
Basidiospores 3,5-4,2 x 2,5-3,2 µm, elliptic.
Substrate. On dead hard wood.
Distribution. Known only from Gabon.
Remarks. The glabrous pileus and small spores characterize this rare species.

Podoscypha ovalispora D. A. Reid,

Beiheft Nova Hedwigia 18:218, 1965.
Basidiocarp to 4.3 cm high, and 4.0 cm wide, flabellate with a very short stipe, margin deeply divided into numerous small lobes, upper surface yellowish, when fresh, uniformly very dark chestnut to almost black when dry, rather strongly radiately wrinkled and partly cracked in mature specimens, surface glabrous to the naked eye, although sparsely scurfy when viewed with a lens, due to the presence of scattered pileocystidia, hymenial surface greyish rusty-brown, ornamented with radiating folds.
Stipe to 8.0 mm. high and 1.5 mm. wide, densely tomentose to pubescent under a lens.
Hyphal system dimitic, generative hyphae 2.5-5 µm wide, hyaline, thin walled with clamp connections; skeletal hyphae, to 5 µm wide, thick-walled to almost solid.

Pileocystidia present, to 130 µm long and 8-17 µm wide, subcylindrical to clavate, very thick walled and almost solid.
Caulocystidia up to 200 µm long, similar to the pileocystidia.
Gloeocystidia 30-50 x 4-8 µm**,** subcylindrical, elongate, thin-walled, with a slightly swollen base.
Basidiospores 5.5-7 x 4-4.7 µm, elliptic.
Substrate. On dead hardwoods
Distribution. Known only from Brazil.
Remarks. Readily distinguished amongst species of *Podoscypha* with pileo- and caulocystidia by the large oval basidiospores.

Podoscypha petalodes (Berk.) Pat. in Duss., Fig. 32

Enum. champ. Guadeloupe et Martinique, p. 20-21, 1903. - *Stereum petalodes* Berk., Ann. Mag. nat. Hist. Series 11, 9:198, 1852.
Basidiocarps to 2.0-8.0 cm high and 0.8-4.0 cm wide, spatulate or flabellate, usually clustered but discrete, although may form loose clusters in which adjacent basidiocarps become confluent, upper surface finely velutinate due to numerous pileocystidia or fine hair, especially towards the base, margins remaining glabrous, when fresh light brown to pinkish-brown becoming purplish-chestnut-brown, tawny-brown, golden-brown with a purplish tint or pale golden-brown, with darker concentric zones, hymenium ochraceous or greyish buff or concolorous with the pilei.
Stipe short and rudimentary or elongate, minutely tomentose by caulocystidia.
Hyphal system dimitic, generative hyphae 2.5-4.5 µm wide, hyaline, thin walled, with clamp connections; skeletal hyphae, 3.5-6.0 µm wide, thick-walled to almost solid.

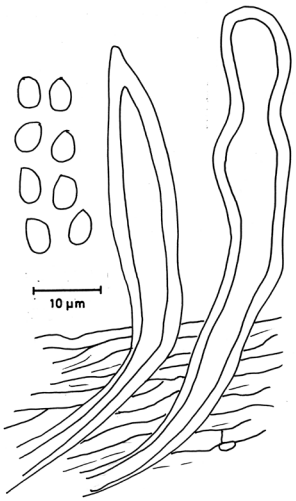


Fig. 32. *Podoscypha petaloides*, A) part of pileus with pileocystidia, B) spores, from Brazil, leg. B. Lowy no 520 (NY).

Pileocystidia 40-80 x 6-12 µm, subcylindrical or clavate with thickened walls.
Caulocystidia similar to the pileocystidia, thick-walled, protruding up to 130 µm.
Gloeocystidia abundant, elongate, thin-walled, with highly refractive contents.
Basidiospores 3.7-5.0 x 2.5 -3.7 µm, ovate to elliptic.
Substrate. On dead wood. Usually on logs, but occasionally terrestrial, then probably arising from buried wood.
Distribution. Neotropical zone.
Remarks. The spatulate basidiocarp becoming purplish chestnut brown and with caulo- and pileocystidia, should make it possible to identify this species.

Podoscypha philippinensis D. A. Reid,

Beiheft Nova Hedwigia 18:240, 1965.
Basidiocarps up to 3 cm tall, 3-5 m wide, flabelliform with a short stipe, pileus blackish to purplish brown and concentrically zoned, smooth to slightly radially wrinkled, almost glabrous but under lens very finely tomentose due to projecting pilocystidia, hymenial surface pale reddish brown to dark purplish.
Stipe short up to 5 mm long and 4 mm wide, concolorous with the pileus.
Hyphal system dimitic, generative hyphae 2.5-4.5 µm wide, hyaline, thin walled, with clamp connections; skeletal hyphae, 3-10 µm wide.
Pileocystidia up to 150 µm long, 8-10 µm wide, subcylindrical or clavate with thickened walls.
Caulocystidia similar to the pileocystidia, thick-walled, protruding up to 130 µm and pale brown.
Gloeocystidia abundant, elongate, thin-walled, and undulating, up to 120 µm long.
Basidiospores 2.5-3.3 x 2-2-2 µm, ovate to elliptic.
Substrate. On dead wood.
Distribution. Only the type from the Philippine Islands is known.
Remarks. Macroscopically it is similar to *P. glabrescens* and *P. mölleri* but distinguished by smaller spores and almost solid pileo-- and caulocystidia.

Podoscypha pusilla (Berk. Ryvarden,

Synopsis Fung. 33: 17, 2015. - *Stereum pusillum*, Berk. Ann. Mag. Nat. Hist. 10:381,1842. – *Stereum affine* Lev., Ann. Sci, Nat. Hist. Ser 3, 2:210, 1844. – *Stereum obliquum* Mont. & Berk., Hooker Lond. J. Bot. 3:334, 1844. - *Podoscypha venustula* (Speg.) D. A. Reid, Beiheft Nova Hedw. 18:260, 1965. - *Thelephora venustula* Speg., Ann. Soc. Cient. Argent. 19:36, 1885. - *Stereum flabellatum* Pat., Bull. Soc. mycol. Fr. 16:179, 1900. – *Stereum translucens* Lloyd, Mycol. Notes no 74, p 1334, 1925, in Mycol. Writings 7. - *Stereogloeocystidium subflabellatum* Rick, Broteria 9:79, 1940.

Basidiocarps to 6 cm high, and 4.0 cm wide, gregarious, flabelliform, narrowing behind to a short but distinct stipe, often laterally fused to form compound structures, upper surface may be white or whitish, pale yellowish or pale cinnamon fawn when fresh, becoming pale to rusty-brown, purplish brown or chestnut to ochre-brown with lighter or darker zones when dried, glabrous but may be minutely radiately wrinkled, hymenium ochraceous-buff or ochraceous-fawn with a greyish to slate-grey or greyish-purple pruina. Stipe concolorous, finely tomentose, usually rather short, occasionally well developed.
Hyphal system dimitic, generative hyphae 2.5-5 (- 6) µm wide, hyaline, freely branched, with clamp connections; skeletal hyphae 3.5-6(-7) µm wide, hyaline**,** thick-walled to almost solid, unbranched.
Pileocystidia to 70 µm long and 13 µm wide, subcylindrical or clavate, with strongly thickened walls.
Caulocystidia similar to the pileocystidia but much longer, projecting up to 130 µm.
Gloeocystidia abundant, elongate, thin-walled with highly refractive contents.
Basidiospores 3.2-4.7 x 2.2-3.5 µm, ovate to broadly elliptic.
Substrate. On fallen branches and dead wood.
Distribution. Widespread in tropical America.
Remarks. The colour change from whitish to darker rusty brown, seems to be a distinct character for this species.

Podoscypha ravenelii (Berk. & M. A. Curtis) Pat., Fig. 33.

Essai tax. p. 71, 1900. - *Stereum ravenelii* Berk. & M. A. Curtis, Grevillea 1:162, 1873. - *Stereum pergamenum* Berk. & M. A. Curtis, Grevillea 1:161, 1873.
Basidiocarps to 2-10 cm high and 0-8-3.5 cm wide, infundibuliform, spatulate or flabellate, usually discrete but when growing in close proximity may become confluent,

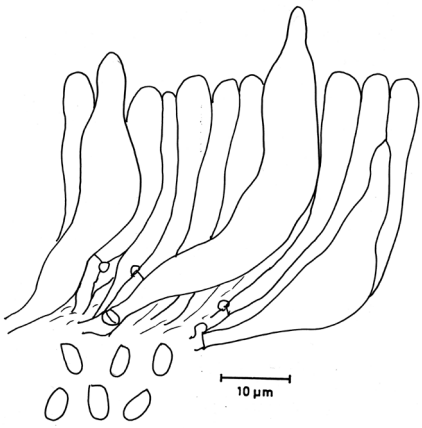


Fig. 33. *Podoscypha ravenelii*, A) part of hymenium with gloeocystidia, B) spores, from Venezuela, coll. Ryvarden 37691.

upper surface more or less smooth, minutely radiately wrinkled or lineate-striate with a distinct waxy lustre, whitish when young, drying pale orange, through reddish-brown, chestnut to dark purplish-chestnut brown, often with darker concentric zones. Hymenium smooth, creamy-ochre or grey-brown, with or without chestnut or blackish zones, to uniform dark purplish-slate-grey. Stipe to 1.5 cm long and 0.5-2.0 mm wide and may extend to the mycelial disk by which it is attached when growing on dead wood, minutely velvety, ochraceus to pale brown which.
Hyphal system dimitic, generative hyphae 2-5 µm wide, hyaline, thin-walled, branched, with clamp connections; skeletal hyphae 3-5 µm wide, hyaline, thick-walled to almost solid, unbranched.
Pileocystidia and c**aulocystidia** absent.
Gloeocystidia 30-50 x 5-6 µm, thin-walled, clavate to slightly sinuous.
Basidiospores 3.7-5.2 x 2.5-3.5 µm, subglobose to elliptic.
Substrate. Usually terrestrial, but may be arising from buried wood, occasionally on dead wood.
Distribution. Known from Brazil to southern part of United States.
Remarks. This species is similar to *P. nitidula* and some authors have been inclined to treat them as one species. However, Reid (1965:247) concludes that the spores of the former are slightly smaller and narrower than those of the latter.

Podoscypha replicata (Lloyd) D. A. Reid,

Beiheft Nova Hedw. 18:249, 1965. - *Stereum replicatum* Lloyd, Lloyd Mycological Writings 7:25, 1339.
Basidiocarps often in clusters from a common base, to 3.0 cm from the base of the stalk to the margin and to 6.0 cm. wide, individual pilei thick, reaching 1.5 mm near the stipe which expands on the substrate as a small, brown, tomentose disc, upper surface strongly ribbed and often with a number of thin lobes, brown and minutely tomentose especially toward the base. Hymenium grey, strongly radiately ribbed and extending along the underside of the stipe to the basal disc.
Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline, branched, with clamp connections; skeletal hyphae 4-6 µm wide, very thick-walled to almost solid.
Pileocystidia and **caulocystidia** absent**.**
Gloeocystidia abundant, narrow, thin-walled, tapering gradually from a somewhat swollen base toward an obtuse or pointed apex.
Basidiospores 3-3.5 x 2-2.5 µm, elliptic.
Substrate. On dead hard wood.
Distribution. Known only from Brazil.
Remarks. This species has the thickest basidiocarp of all the species of *Podoscypha*. It is closely related to *P. viridans* (Lloyd) D. A. Reid, but differs in shape, especially with regard to the thickness of the basidiocarp, and the type of tomentum covering the pileus.

Podoscypha semiresupinata Welden,

Mycotaxon 48:78, 1993.

Basidiocarps to 4 cm wide, effused-reflexed, dorsally attached to the wood, semicircular to elongate, adjacent basidiocarp may fuse to more compound structures, pilei adpressed tomentose especially towards the substrate, white to ochraceous, smooth to slightly rugulose. Hymenium smooth, white to ochraceous,

Hyphal system dimitic, generative hyphae 2-4 µm wide, thin walled and with clamp connections, those of the tomentum on the pilei or lower side of the basidiocarp, up to 7 µm wide; skeletal hyphae 3-6 µm wide, hyaline, thick-walled.

Pileocystidia and c**aulocystidia** absent.

Gloeocystidia present, to 85 µm long and 6-12 µm wide, clavate to cylindrical.

Basidiospores 4.5-7 x 3-4.5µm, elliptic.

Substrate. On dead hardwoods.

Distribution. Known only from the type locality from Rio de Janeiro in Brazil.

Remarks. *The species s*eems closely related to *P. caespitosa* and *P. glabrescens* both of which have shorter spores, and traces of a tomentum at the base which, in both species, besides that the basidiocarps tapers to a rudimentary stipe.

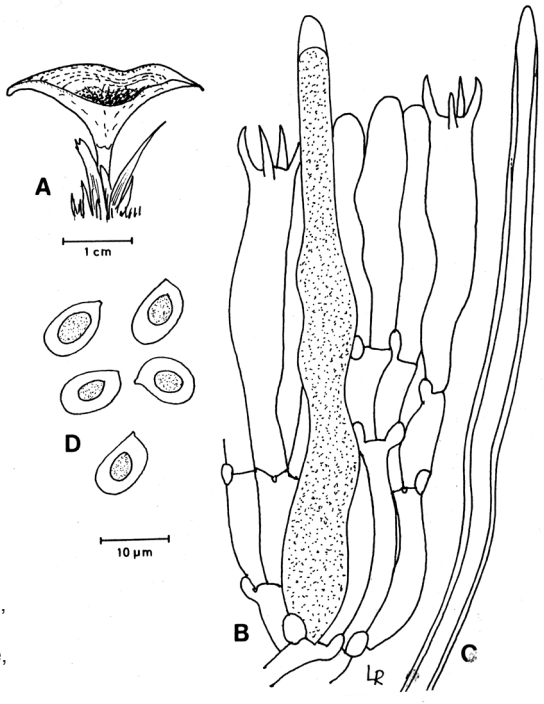


Fig. 34. *Podoscypha thozetii* A) basidiocarp, B) part of hymenium with gloeocystidium, C) part of skeletal hypha, D) basidiospores, from Zimbabwe, coll. Ryvarden 33926.

Podoscypha thozetii (Berk.) Boidin, **Fig. 34**

Rev. Mycol., Paris 24:208, 1959. - *Stereum thozetii* Berk., J. Linn. Soc. 18:85, 1881. - *Stereum cyathoides* Henn., Hedwigia 37:284, 1898. - *Stereum warneckeana* Henn., Bot. Jahrb. 38:120, 1905.

Basidiocarps to 3.0 cm high and 2.0 cm wide, stipitate, infundibuliform to fan shaped, soft and semi-transparent when fresh, denser when dry, upper surface smooth, glabrous, pink to buff, becoming more brownish when dry and with indistinct concentric zones. Hymenium smooth, ochraceous to grey or isabelline, stipe to 1.0 cm long and 3.0 mm wide, grey to pale brown, glabrous and slightly expanded towards the base.

Hyphal system dimitic, generative hyphae 2 - 4 µm wide, thin walled with clamp connections; skeletal hyphae 4-5.5 µm wide, hyaline, thick-walled to almost solid, unbranched,

Pileocystidia and **caulocystidia** absent.

Gloeocystidia present, 50-140 µm long and 8-15 µm wide, undulant, yellowish, thin-walled, tapering towards the apex.

Basidiospores 6.5-7.5 x4.5-6 µm, broadly elliptic.

Substrate. On culms or tufts of dead grasses.

Distribution. Southern United States and pantropical, especially common in Africa.

Remarks The substrate, on dead grasses, should suffice for a field determination**.**

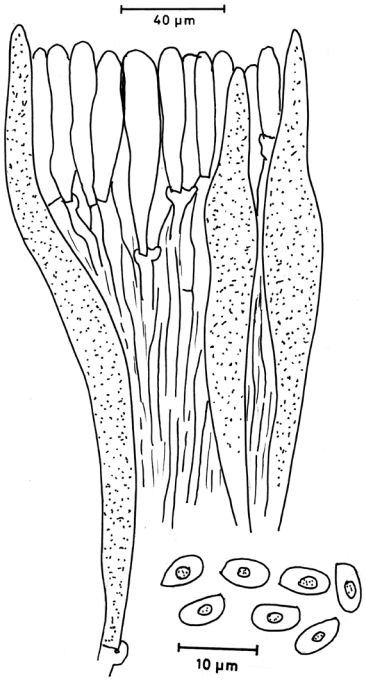


Fig. 35. *Podoscypha tomentipes*, A) part of hymenium with gloeocystidia, B) basidiospores, from Costa Rica, coll. Ryvarden 42701.

Podoscypha tomentipes (Overholts) D. A. Reid, Fig. 35.

Beiheft Nova Hedwigia 18:255, 1965. - *Stereum tomentipes* Overholts, Monogr. Univ. Puerto Rico, Biol. Sci. Series B. No. 2: 308, 1934.
Basidiocarps to 1.0-4.5 cm high and 0.3-2.0 cm wide, flabelliform, upper surface glabrous, pinkish-rusty-brown with indistinct concentric zones when fresh, orange-brown with conspicuous golden-brown zones or rich chestnut with silky sheen when dry, pilei very thin and often diaphanous when held to the light, hymenophore smooth, beige when fresh, becoming ochraceous-buff with a greyish bloom, stipe up to 4 cm long, concolorous with the pilei, becoming dark brown with age, finely tomentose and covered with caulocystidia, arising from a basal disc of mycelium.
Hyphal system dimitic, generative hyphae 2-3 µm wide, thin walled**,** with clamp connections; skeletal hyphae, 4-5 µm wide, hyaline and thick walled**.**
Pileocystidia present, to 100 µm long and 5-8.5 µm wide, subcylindrical to clavate, those in older portions of the basidiocarp very thick-walled and often secondarily septate.
Caulocystidia present and abundant, up to 120 µm long, and 9 µm wide, similar to the pileocystidia with thick brown walls, in some cases appearing almost solid.
Gloeocystidia subcylindrical, elongate, thin-walled, with refractive hyaline contents, with a slightly swollen base.
Basidiospores 4-5 x 2-2.5 µm, narrowly elliptic to subcylindrical.
Substrate. On dead hardwood**s.**
Distribution Tropical South America.
Remarks: Most closely related to *P. pusilla* and *P. parvula* from which it may be distinguished by narrower and more elongate basidiospores.

Podoscypha ursina Boidin & Berthet,

Bull. Jard. Bot. Brux. 30:320, 1950.
Basidiocarps to 6 cm high, and 4 cm wide, truly infundibuliform or flabelliform, pileus covered with an entangled mass of brown to almost black hairs, up to 5 mm thick, hymenial surface smooth, pale creamy-ochre to rusty brown.
Stipe short, up to 1 cm long, 4 mm wide, smooth, yellowish to pale brown.
Hyphal system dimitic, generative hyphae 2-4 µm wide, hyaline; skeletal hyphae 3-5 µm wide, hyaline, thick-walled to almost solid.
Pileocystidia and **caulocystidia** absent.
Gloeocystidia up to 120 µm long, narrow and undulating and thin-walled.
Basidiospores 4-5 x -3-3.5 µm, elliptic.
Substrate. On dead wood.
Distribution. Central Africa and Sri Lanka**.**
Remarks. The tangled mass of hairs on the pileus makes this a characteristic species and it is closely related to the Neotropical *P. cristata*, but separated by wider spores and distribution.

Podoscypha viridans (Lloyd) D. A. Reid,

Beiheft Nova Hedwigia 18:274, 1965. - *Stereum viridans* Lloyd, Lloyd Mycol. Writings 7:1339, 1925. - *Stereogloeocystidium lobato-plicatum* Rick, Broteria 9:79, 1940.
Basidiocarps to 2.5 cm from point of attachment to the margin, and 0.5-2.2 cm wide, flabellate, narrowing behind into a more or less distinct, lateral stipe, sometimes becoming confluent, upper surface with a buff or slightly greenish, matted tomentum, at least toward the base, frequently becoming uniformly glabrous or zonate, glabrous near the margin and then minutely radiately wrinkled with a distinct sheen, chestnut-brown to rich tawny-brown with darker concentric zones. The thickness of the tomentum varies considerably from a dense layer up to 0.3 mm thick, hymenium smooth, pale yellowish-brown to purplish-brown.
Stipe to 1 cm long, and with a dark-brown or buff coloured tomentum.
Hyphal system dimitic, generative hyphae 2-4 µm wide, thin walled with clamp connections; skeletal hyphae, 4-5.5 µm wide, hyaline, thick-walled to almost solid, unbranched,
Pileocystidia present, but difficult to differentiate from surface hairs as they can reach 350 µm long, rarely forked towards the apex.
Caulocystidia to 120 µm long, present in the tomentum of the stipe.
Gloeocystidia to 130 µm long and 10 µm wide, undulant, hyaline, thin-walled, often constricted.
Basidia 12-20 x 4-6 µm**,** clavate.
Basidiospores 3-3.75 x 2-2-3 µm, broadly elliptic to ovate.
Substrate. On dead hardwoods.
Distribution. Known only from Brazil.
Remarks The species is well characterized by the ochraceous-buff or green tinted tomentum which, at least in part, covers the pileus surface.

Podoscypha xanthopus-concinna *(*Lloyd) D.A. Reid,

Contrib. Bolus Herb. 7: 80, 1975. – *Polystictus xanthopus-concinnus* Lloyd, Lloyd Mycol. Writ. 5:618, 1916. - *Podoscypha parvula* (Lloyd) D. A. Reid, Beiheft Nova Hedwigia 18:220, 1965. – *Stereum parvulum* Lloyd, Lloyd Mycol. Writ. 7, Mycol. Notes, p 1225, 1923.

Basidiocarp up to 5 cm high, and 4.0 cm wide, flabellate to subinfundibuliform, pileus first whitish, soon reddish orange to orange brown and even purplish in dry specimens, glabrous to the naked eye, but finely velutinate by lens due to projecting pilocystidia, hymenial surface ochraceous, golden orange to pale brown or slate grey.
Stipe 1-2 cm or only rudimentary developed, up to 1 mm wide, ochraceous to brown with numerous caulocystidia.
Hyphal system dimitic, generative hyphae 2.5-5 µm wide, hyaline, thin walled with clamp connections; skeletal hyphae, to 5 µm wide, thick-walled to almost solid.

Pileocystidia present, to 70 µm long and 8-17 µm wide, subcylindrical to clavate, very thick walled and almost solid.
Caulocystidia to 200 µm long, similar to the pileocystidia.
Gloeocystidia present, up to 120 µm long.
Basidiospores 3-4 x 2,5-3.5 µm, elliptic.
Substrate. On dead hardwoods.
Distribution. Widespread in tropical Africa.
Remarks. The small spores and its distribution are distinctive characters.

Podoscypha yunnansensis C.L. Zhao,

Phytotaxa 387:214, 2019.
Basidiocarps 2 cm wide, 1 cm thick, gregarious, tough to corky when fresh, becoming harder corky upon drying, spatulate to flabelliform, more or less stipitate, projecting up to, pileus slightly tomentose, zonate, buff to ochraceous when fresh and ochraceous to pale brown when dry, hymenial surface, smooth, cream to buff when fresh, buff to pale brown upon drying.
Hyphal system dimitic; generative hyphae with clamps, 2.5–4.5 µm wide, thin- to thick-walled, skeletal hyphae, thick-walled, 3–4.5 µm in diam.
Caulocystidia present, 30–55 × 3–5 µm, cylindrical, thin- to thick-walled.
Basidiospores 3–4 × 2.5–5 µm, elliptic to subglobose.
Substrate. Dead hard wood log.
Distribution. Known only from Yunnan province in China.
Remarks. The lack of gloeocystidia makes this a distinct species besides the distribution.

POROSTEREUM Pilat,

Bull. Soc. Mycol. Fr. 52:330, 1936.
Basidiome resupinate, effused-reflexed to distinctly pileate, broadly attached to dimidiate or fan shaped, upper surface tomentose to felty, often zonate, greyish to deep brown; hymenium smooth to tuberculate, becoming cracked with age, ochraceous, greyish to pinkish or dark brown; hyphal system di- or trimitic, generative hyphae with simple septa or clamp connections, skeletal hyphae pale to dark brown; pseudocystidia present or absent, pale brown, encrusted or smooth, cystidia mostly metuloid, hyaline to brown; basidia narrowly clavate with 4 sterigmata; spores cylindrical to elliptic, smooth, hyaline, non amyloid, acyanophilous. Tropical to warm temperate zones.
Causing a white rot in hardwoods, rarely in conifers.
Type species: *Porostereum phellodendri* Pilat (= *Thelephora spadicea* Pers.:Fr.).
Remarks. Macroscopically similar to *Hjortstamia* and *Amylostereum*, but separated from the former by the simple septate generative hyphae, whilst the latter has amyloid spores. Related also to *Lopharia* but where species have pale coloured basidiocarps, hyaline metuloid cystidia and larger spores with grainy contents. See that genus for further comments.

1. Hymenium ochraceous to beige, on coniferous wood, from higher elevations in Mexico .....**P. sharpianum**
1. Hymenium clay-coloured to dark brown or grey, on hardwoods, widespread species **2**

2. Spores 13-15 um long, hyphal system monomitic ..... **P. pilosiusculum**
2. Spores 5-8 um long, hyphal system dimitic **3**

3. Hymenium lilaceous, spores elliptic 6.5-7.5 µm long .....**P. lilacinum**
3. Hymenium differently coloured, spores cylindrical 4.5-5 µm long..... **P. vibrans**

Porostereum lilacinum (Berk. & Broome) Hjortstam, Fig. 36.

Kew Bull. 44:308, 1989. - *Corticium lilacinum* Berk. & Broome, J. Linn. Soc. Bot. 14:70, 1873.

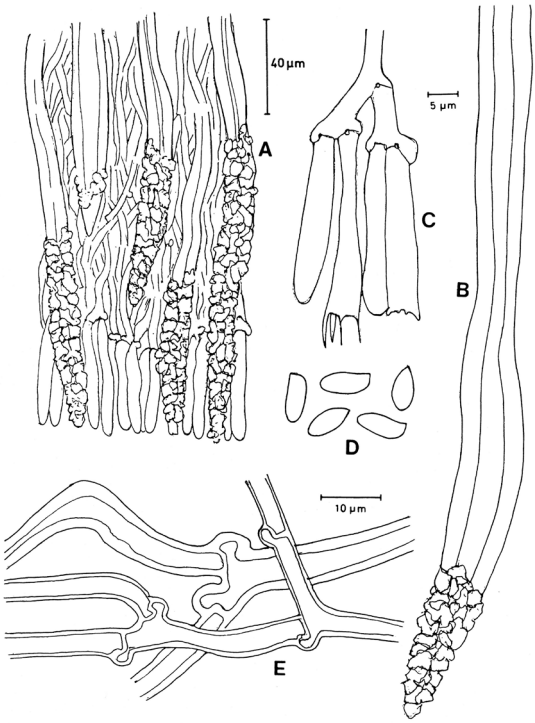


Fig. 36. *Porostereum lilacinum* A) part of hymenium, B) skeletocystidium, C) basidia, D) basidiospores, E) generative hyphae, from Sri Lanka, leg. Broome 997, lectotype (K).

Basidiocarps resupinate, rarely with a reflexed margin, adnate and confluent; hymenium smooth, lilaceous to lilaceous-brown or partly pale brown.
Hyphal system dimitic, generative hyphae 3-6 µm wide, with clamp connections, hyaline to pale brown; skeletal hyphae 6-7 µm wide, brown, thick-walled with transitions to skeletocystidia, these abundant, 100-150 µm long, arising from generative hyphae and usually vertical, thick-walled, strongly apically encrusted, pale yellow in KOH.
Spores 6.5-7.5 x 4.5-5 µm, elliptic.
Distribution. Known from the type locality in Sri Lanka and Sao Paulo in Brazil.
Remarks. Easily recognizable in the field due to the lilaceous colours.

Porostereum pilosiusculum Hjortstam & Ryvarden, **Fig 37.**

Synopsis Fung. 4:49, 1989.
Basidiocarps resupinate, rarely with a reflexed margin, 0.5-1 mm thick, hymenium more or less pilose with protruding cystidia, pale brown to hazel, strongly cracked to expose a brown, felty, stratified subiculum about 0.2-0.8 mm thick.
Hyphal system monomitic; subicular hyphae 5-7 µm wide, interwoven, brown, thick-walled; subhymenial hyphae 3-4 µm wide, hyaline to pale yellow. All hyphae with clamp connections.

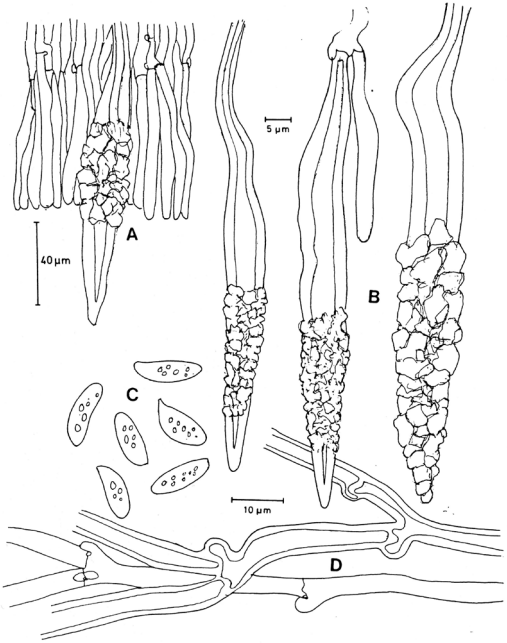


Fig. 37. *Porostereum pilosiusculum*, A) section of basidiocarp, B) section of hymenium, C) basidia, D) basidiospores, E-F) skeletal hyphae, from Brazil, coll. Ryvarden 24340, holotype (O).

Cystidia 100-150 x 10-15 µm wide (in the middle part), projecting up to 50 µm above the basidia, abundant, fusoid to ventricose, metuloid, yellowish-brown, and usually thick-walled.
Basidia 35-40 (60) x 6-8 µm, clavate, more or less sinuous, tetrasterigmatic.
Spores 13-15 x 4-5 µm, elliptic to subcylindrical, often slightly sigmoid.
Distribution. Known only from the type locality in Brazil.
Remarks. Deviating from others species in the genus by the projecting metuloid cystidia, large spores, monomitic hyphal system, and a brown felty subiculum.

Porostereum sharpianum (Welden) Hjortstam & Ryvarden, Fig. 38.

Synopsis Fung. 4.51, 1989. - *Lopharia sharpiana* Welden, Tulane Stud. Zool. Bot. 17:18, 1970.
Basidiocarps effused reflexed, single or fused into more compound basidiomes, up to 1.0 cm wide in reflexed portion and 1-5 mm thick in the basal part, coriaceous; upper surface initially finely tomentose, soon glabrous, sulcate, cinnamon brown when young, becoming dark brown to almost blackish when older, finely radially striate in the glabrous parts. Hymenium smooth to slightly tuberculate, ochraceous to beige, minutely

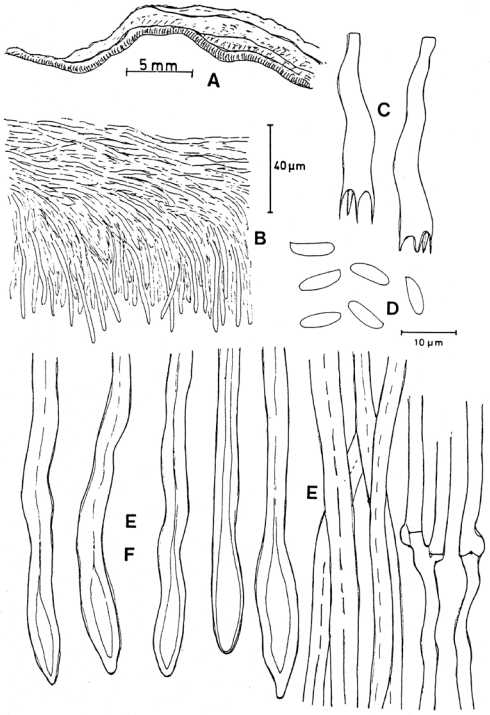


Fig. 38. *Porostereum sharpianum* A) section through basidiocarp, B) part of hymenium, C) basidia, D) basidiospores, E) skeletal hyphae, from Mexico, coll. A. Sharp, isotype (NY).

cracked with age, distinctly stratose in section, young layers distinctly lighter than the older ones and separated by a thin black line, context dark brown towards the substrate and pileus, ochraceous in young parts.
Hyphal system dimitic, generative hyphae 2-3 (5) µm wide, hyaline, thin-walled and with clamp connections; skeletal hyphae 3-6 µm wide dominant in the basidiocarp, pale brown, thick-walled to almost solid, in the context more or less horizontal, bending into the subhymenium and hymenium as pointed skeletocystidia with a rounded to a more or less acute and sometimes widened apex.
Spores 6-7 x 2-3 µm, cylindrical to almost allantoid.
Substrate. On dead wood of conifers. The type collection was collected on *Abies*. It may also occur on *Pinus*.
Distribution. Known only from high elevations (3000-3200 m) in Mexico.
Remarks. Characterized by the reflexed, stratified, basidiocarps with a distinct black line separating the pileus and parts of the context, the skeletocystidia and the cylindrical spores.

Porostereum vibrans (Berk. & W. A. Curtis) Ryvarden, **Fig. 39.**

Synopsis Fung. 18: 76, 2003. - *Stereum vibrans* Berk. & W. A. Curtis, Journ. Linn. Soc. Bot. 10:332, 1868.

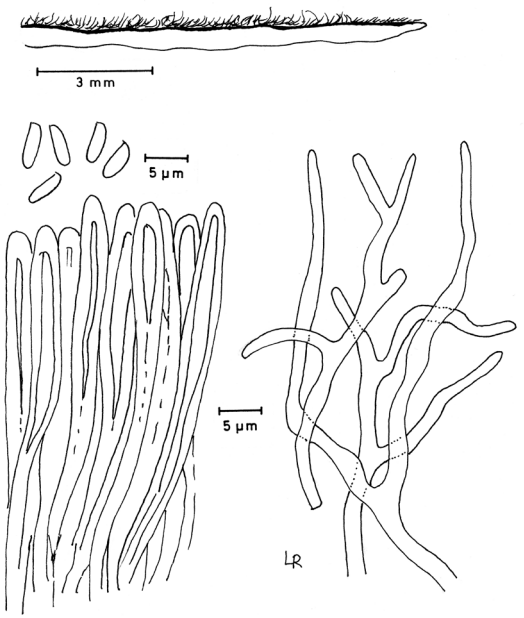


Fig. 39. *Porostereum vibrans*, A) section of basidiocarp, B) basidiospores c) binding hyphae, D) pat of hymenium, from Costa Rica, coll. Ryvarden 29028.

Basidiocarp effused-reflexed to distinctly pileate, tough when fresh, harder when dried, up to 2 mm thick; pilei to 5.0 cm wide, dimidiate to broadly attached and often laterally fused to adjacent basidiocarps or densely imbricate, often lobed and wavy, permanently tomentose – hirsute, densely zoned, dark brown, with a black cuticle present below the tomentum, hymenium smooth or (reflecting growth zones) wavy, pale brown to deep isabelline with a violet tinge, context dark brown.
Hyphal system trimitic, generative hyphae 2-5 µm wide, hyaline, with clamp connections; skeletal hyphae 3-6 µm wide, dominant in the basidiocarp, brown, thick walled to solid, with smooth ends, bending from the subhymenium into the hymenium, to form a catahymenium, binding hyphae 2-4 µm wide, present, but sparse, sparingly branched, pale brown and apparently solid.
Basidiospores 4.5-5 x 1.5-2 µm, cylindrical.
Substrate. On dead hardwoods.
Distribution. Tropical America.
Remarks. In the field easily confused with *Xylobolus subpileatum*, which is macroscopically similar, but that has amyloid spores and acanthophyses, and is thus easily distinguished microscopically.

PUNCTULARIA Pat. & Lagerh.,

Bull. Herb. Boiss. 3: 57, 1895. – *Phaeophlebia* W.Br. Cooke, Mycologia 48: 401, 1956.
Basidiocarp resupinate, reflexed or dimidiate; hymenium subgelatinous, composed of hemispherical nodules or elongate, radial ridges; upper side of reflexed parts zonate; margin determined, narrow, finely fimbriate or velutinate; hyphal system monomitic, hymenial hyphae thin-walled, richly branched, tramal hyphae mainly parallel and horizontal, with more or less thickened walls, swelling in KOH, all hyphae with clamps; dendrohyphidia present, hyaline at first, then yellow or dark-coloured; conidia often present; basidia elongate, flexuous, with 4 sterigmata and basal clamp; spores elliptic, hyaline - yellow. Monotypic genus.
Type species: *Corticium tuberculosum* Pat.
Remarks. The genus is characterized by its dark basidiocarp and the numerous dendrohyphidia.

Punctularia strigozonata (Schw.) Talbot — Fig. 40

Bothalia 7:1 p. 143, 1958. - *Merulius strigozonatus* Schw., Trans. Am. Phil. Soc. n. s. 4: 160, 1834.
Basidiocarps resupinate or often reflexed, orbicular and confluent to rather large size, upper side of refl4xed part zonate with black brown concentric furrows of totally conglutinate hyphae, and lighter brown ridges, velutinate by projecting hyphal-ends; oldest part often ash-grey; margin bright yellow brown to reddish-brown; hymenium dark brown - violaceous, gelatinous in the wet living state, drying hard, in the youngest state smooth,

Fig. 40. *Punctularia strigozonata* from Cameroon, photo D. Mossebo.

then with elongate, radial ridges or irregular protuberances, when fertile with a whitish pruina of spore deposits.

Hyphal system monomitic; all hyphae with clamps, those of the upper side and next to the substrate pigmented brown, about 5 µm wide, often encrusted with lumps of excreted resinous matter, and forming a layer, 30-50 µm thick or sometimes more; major part of the trama composed of mainly hyaline, more or less horizontal hyphae with thick walls, swelling in KOH and with sparse clamps and branches, this layer reaching a thickness of 500-1000 µm; from this trama layer the subhymenium is formed, thickens with age to about 100 µm, composed of vertical, densely interwoven hyphae with thinner walls producing the basidia; in older basidiocarps the hyphae producing the basidia; in older ones the hyphae producing the dendrohyphidia may become pigmented brown, other hyphae hyaline or slightly yellowish.

Dendrohyphidia numerous, richly branched, at first hyaline, then yellowish and in older hymenia grey-brown, in the furrows between the hymenial ridges the hymenial layer may be formed by dendrohyphidia alone, in such spots sometimes covered with a layer of crystals, visible to the eye as white patches.

Basidia 40-50 x 4-5 µm, tetrasterigmatic.

Basidiospores 6.5-8.5 x 3.5-4.5 µm, elliptic to ovate, adaxial side straight or somewhat convex.

Substrate. On hardwoods.

Distribution. Widely distributed in warm-temperate and pantropical.

Remarks. The species is rather easy to recognize because of its dark colour, red-brown margin and numerous dendrohyphidia.

STEREOPSIS D. A. Reid,

Beiheft Nova Hedw. 18:290, 1965.

Basidiocarps lignicolous or terrestrial (but then usually attached to buried wood), coriaceous, pleuropodal, spatulate, flabellate, pseudo-infundibuliform or (rarely) truly infundibuliform, discrete or confluent, sometimes in small rosettes, upper surface glabrous, in dried specimens often radiately rugulose, hymenium smooth or indistinctly radially rugulose, hyphal system monomitic, generative hyphae with or without clamp connections, cystidia absent, gloeocystidia present in some species, basidiospores smooth, hyaline, non-amyloid, broadly elliptical to subglobose, often with a prominent lateral apiculus.

Type species: *Stereum radicans* (Berk.) D.A. Reid

Remarks. The genus is **c**haracterized by a monomitic hyphal system and fairly large basidiocarps lacking coralloid hyphal structures or large cylindrical cystidia.

Key to species

1. Gloeocystidia present in hymenium **2**
1. Gloeocystidia absent..... **5**

2. Generative hyphae with simple septa, on *Raphia* palms .....**S. raphiae**.
2. Generative hyphae with clamps, on hard wood or the ground **3**

3. Basidiocarp changing colour to reddish brown by handling, spores 6-8 x 5-7.5 µm ..... **S. radicans**
3. Basidiocarp not changing colour when handled, spores shorter than 6 µm **4**

4. Spores 5-6 x 3-4.5 µm, Indian species ..... **S. mussoriensis**
4. Spores 4-5 x 2.5-3.5 µm, Northern Chinese species ..... **S. pseudocupulata**

5. Generative hyphae with simple septa **6**
5. Generative hyphae with clamps **12**

6. Tropical species..... 7
6. Temperate boreal species **10**

7. American species, spores subglobose 4-5 µm in diameter .....**S. albida**
7. Asian –African species, spores elliptic to cylindrical **8**

8. Asian species, spores elliptic..... **9**
8. African species, spores cylindrical .....**S. straminea**

9. Pileus ochraceous, spores 4-5 x 3-4 µm, Malayan species..... **S. malaiensis**
9. Pileus dark brown, spores 3.5-4.5 x 2.5-3 µm, Indian species .....**S. sparassoides**

10. American species. ..... **S. burtianum**
10. Asian European species **11**

11. Spores 4.5-6 x 3-4 µm, Mediterranean species..... **S. reidii**
11. Spores 3-4 x 2.2-2.5 µm, North European species .....**S. vitellina**

12. Basidiocarp black to dark brown, tropical South American species ....**S. nigripes**
12. Basidiocarps differently coloured, widespread species **13**

13. Boreal species connected to conifers, basidiospores longer than 6.5 µm .....
.....**S. humphreyi**
13. Tropical to warm temperate zones, connected to hard wood, spores shorter than 6.5 µm **14**

14. Basidiospores 4.5-6.5 x 3.5-5.5 µm, basidiocarp becoming brown to vinaceous when handled or dry, pantropical ..... **S. hiscens**
14. Basidiospores 5-8 x 5-6.5 µm, basidiocarp more or less unchanged by handling or dry, paleotropical .....**S. cartilaginea**
NB. Since basidia give no separating characters and all spores are smooth, thin walled and non-amyloid, there characteristics are omitted from the descriptions.

Stereopsis albida Ryvarden,

Synopsis Fung. 30:26, 2012.
Basidiocarps 0.5 1 cm high, 0.2-2 cm wide and up to 200 µm thick, soft when fresh, very fragile as dry, solitary, spatulate or reniform, pileus white, becoming pale cream coloured when dry, dull, glabrous, bit in parts with a thin cover of appressed hyphal tufts or fibrils, azonate; hymenial surface whitish, sterile base or rudimentary stipe up to 5 mm long.
Hyphal system monomitic, generative hyphae, 3 - 5 µm in diam., thin walled and with simple septa.
Cystidia not seen.
Basidiospores 4-5 µm in diameter, subglobose.
Substrate. On soil.
Distribution. Known only from the type locality in Costa Rica.
Remarks. The small white basidiocarps occurring in large numbers and the subglobose spores make it distinct in the genus.

Stereopsis burtianum (Peck) D.A. Reid,

Beiheft Nova Hedw. 18:292, 1965. - *Stereum burtianum* Peck, Rep. N.Y. St. Mus. No. 57:21, 1904.

Basidiocarps up to 3 cm high, and 2.5 cm wide, thin, submembranous, coriaceous, usually truly infundibuliform, rarely spatulate, adjacent basidiocarps frequently confluent.

Pilei somewhat shiny, pale, often with brown shades, becoming pale ochraceous-brown, more or less zonate in shades of grey-brown, surface, often with numerous, but rarely prominent, radiating, fibrillose strands of hyphae when viewed with a lens, these especially seen towards the base of the funnel. Hymenial surface smooth or faintly radiately striate, pale buff to ochraceous-buff, drying pale creamy-ochraceous, stipe 3-8 mm long and 1-1.5 mm thick, short, tough, solid, minutely tomentose or pruinose-tomentose, becoming concolorous with the pileus in herbarium material.

Hyphal system monomitic, generative hyphae 2.5-3.5 µm wide, simple septate,

Basidiospores 3.5-5 x 2.5-3.5 µm, broadly elliptic to subglobose.

Substrate: Terrestrial.

Distribution: North and South America. Possibly also from Japan.

Remarks. The simple septate generative hyphae and the lack of gloeocystidia set this species apart from the other species in the genus.

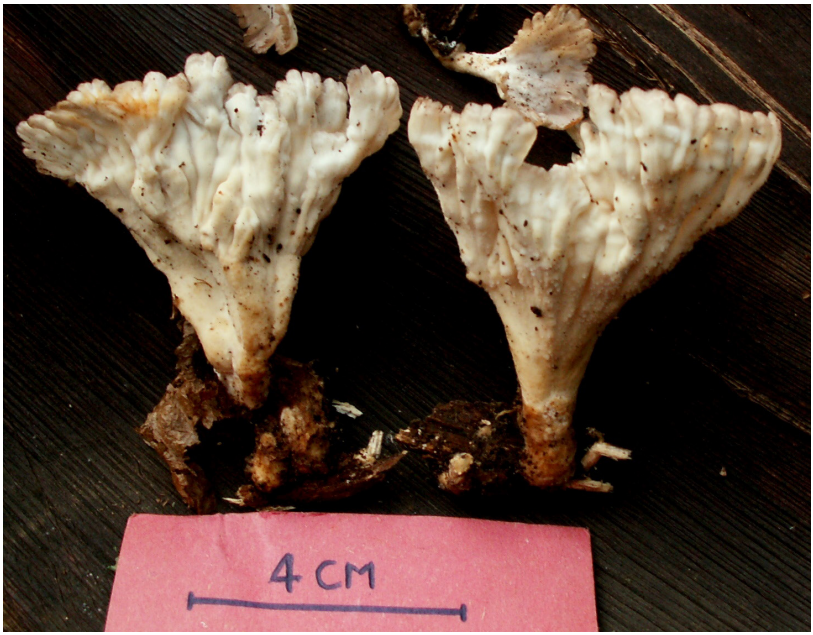


Fig. 41. *Stereopsis cartilaginea*, from Cameroon, photo D. Mossebo.

Stereopsis cartilaginea (Massee) D. A. Reid, Fig. 41.

Beiheft Nova Hedwigia 18:295, 1965. – *Cladoderris cartilaginea* Massee, Kew Bull. p. 172, 1899.

Basidiocarps up to 10 cm high, and 8 cm wide, thin, spatulate to almost infundibuliform, often with several basidiocarps from a common base, pileus dirty white to yellowish or ochraceous, smooth to finely fibrillose towards the stipe, hymenial surface smooth, pale buff to ochraceous, stipe whitish, up to 5 cm long, mostly shorter, round to flattened, finely tomentose or pruinose-tomentose, becoming concolorous with the pileus in herbarium material.

Hyphal system generative hyphae 2.5-5 µm wide and with clamps.

Basidiospores 5-8 x 5-6.5 µm, broadly elliptic to subglobose.

Substrate: Terrestrial.

Distribution: Tropical Africa and Asia.

Remarks. The combination of large spores and absence of gloeocystidia characterize this species.

Stereopsis hiscens Berk. & Rav.) D.A. Reid,

Beiheft Nova Hedw. 18:298, 1965. - *Thelephora hiscens* Berk. & Rav., Grevillea 1:148, 1873. - *Thelephora ravenelii* Berk., Grevillea 1:148, 1873. - *Thelephora pusilla* Currey, Trans. Linn. Soc. Lond. Series 11, 1:126, 1876. - *Thelephora circinella* Pat. & Gaill., Bull. Soc. mycol. Fr. 4: 38, 1888. - *Thelephora ninh-thaiensis* Pat., J. Bot., Paris 11: 34, 1897. - *Thelephora tentaculata* Pat., Bull. Soc. mycol. Fr. 15, 201, 1899. - *Thelephora pusiola* Pat. in Duss, Enum. Champ. Guadeloupe et Martinique p. 12, 1903. - *Stereum insolitum* Lloyd, Lloyd Mycol. Writings 5:665, 1917. - *Stereum incisum* Lloyd Lloyd Mycol. Writ. 6:988, 1920. - *Stereum cuneoforme* Lloyd, Lloyd Mycol. Writ. 6:988-989, 1920. - *Stereum multifidum* Lloyd, Lloyd Mycol. Writ. 7:1311, 1924. - *Stereum divisum* Petch, Ann. R. Bot. Gdns, Peradeniya 9:270, 1925. - *Podoscypha intermedia* Pat., Mem. Acad. Malgache 6:11-12, 1928.

Basidiocarps erect, 1-3 (-6) cm high, either discrete or becoming confluent and then large, complicated, and rosette-like or clavaroid with flattened branches. Upper surface when fresh variable in colour, pale yellowish, pale ochraceous drab, or greyish white, becoming dingy purple or vinaceous in all parts on bruising; dried specimens light brown to greyish-brown with faint zonation, with the surface smooth or minutely adpressed silky-fibrillose.

Hymenium smooth, dark bluish-grey, greyish-purple, or vinaceous-umber, becoming dark purplish-grey or brownish-vinaceous when dried. Stipe to 3.0 cm long, simple or branched, white, pallid yellowish or greyish. Context to 0.35 cm thick near the base of the basidiocarp, coriaceous, firm, pale wood-coloured, or pallid ochraceous, with faint darker zones near the margin.

Hyphal system monomitic: generative hyphae 2.5-3.5(- 5) µm wide, hyaline or very pale brown, with clamp connections.

Basidiospores 4.5-6.5(- 8) x 3-5-5.5 (-7) um, broadly ovate to subglobose.

Substrate. Terrestrial, but probably arising from buried wood or roots.
Distribution. Occurs in most tropical or subtropical regions throughout the world.
Remarks The branching and splitting of basidiocarps, combined with the fusion of adjacent ones, make this probably the most variable in macroscopic appearance of all stipitate stereoid fungi.

Stereopsis humphreyi (Burt.) Redhead & D. A. Reid,

Can. J. Bot. 61:3088, 1983. - *Craterellus humphreyi* Burt, Ann. Mo. Bot. Gard. 1:344, 1914.
Basidiocarps stipitate, up to 3.0 cm, high and 3.0 cm wide, solitary, or rarely two to three pilei together, narrowly reniform or flabelliform becoming more or less circular with the two lobes almost overlapping and with undulating margin. Upper surface dull white, initially with a silky appearance, then more or less glabrous to slightly rugulose and somewhat more floccose or scaly towards the stipe. Hymenial surface well defined, often decurrent onto the stipe, cream coloured, smooth, stipe up to 3.0 cm long and 3.0 mm in diameter, tough and dense, initially white, becoming slightly cinnamon, velutinate to pubescent but becoming glabrous from the top, strigose at the point of attachment.
Hyphal system monomitic, generative hyphae, 2-4 µm wide, with clamp connections.
Basidiospores 6.5-9 x 3.5-5.5 µm, elliptic to subglobose.
Substrate: Terrestrial in coniferous forest, or on wood of conifers such as *Picea* and *Tsuga*.
Distribution. Known from Canada and northern United States.
Remarks. Seemingly restricted to coniferous forests or coniferous wood, thus, easy to separate from the other *Stereopsis* spp. described here.

Stereopsis malaiensis D. A. Reid,

Beiheft Nova Hedwigia 18:310, 1965.
Basidiocarps up to 2 cm high, and 1.5 cm wide, thin, spatulate to flabelliform, often as small tufts, pileus pale to ochraceous brown, darker towards the base, smooth to very finely fibrillose towards the stipe, hymenial surface smooth, pale buff to ochraceous or pale brown, stipe whitish, up to 4 mm, log pale brown.
Hyphal system monomitic, generative hyphae 2.5-4 µm wide, simple septate.
Basidiospores 4-5 x 3-4 µm, broadly elliptic to subglobose.
Substrate. Terrestrial on sandy soil.
Distribution. Known only from the type locality in Malaya.
Remarks. The combination of lack of all cystidia, simple septate hyphae and small spores characterize this species.

Stereopsis mussoriensis (Henn.) D. A. Reid,

Beiheft Nova Hedwigia 18:311, 1965. – *Cladoderris mussoriensis* Henn., Hedwigia 40:324, 1901.
Basidiocarps up to 3 cm high, and 1-4 cm wide, thin, spatulate to flabelliform, often in groups, pileus isabelline and velutinate, hymenial surface smooth, straw coloured with radiating, smooth branched ridges.
Hyphal system monomitic, generative hyphae 4-6 µm wide with clamps.
Gloeocystidia cylindrical, up to 130 µm long and 4-8 µm wide.
Basidiospores 5-6.5 x 3-4.5 µm, broadly elliptic to subglobose.
Substrate.: Terrestrial.
Distribution. Known only from the type locality from Mussorie in India.
Remarks. The combination of gloeocystidia and ribbed hymenial surface characterize this species.

Stereopsis nigripes D.A. Reid,

Beiheft Nova Hedw. 18:312, 1965.
Basidiocarps to 5.5 cm high and 1-1.5 cm wide, solitary, spatulate, or narrowly flabelliform, usually simple but occasionally with 2-3 pilei. Pilei strongly inclined vertically, minutely pruinose-subvillose and appearing almost powdery when viewed with a lens, initially white, becoming more or less deep brown to dark greyish, retaining a white margin, darker and almost blackish when dry. Hymenial surface sharply delimited from the stipe, smooth, waxy, pale ochraceous-fawn becoming dark grey to brown or almost black, context soft, fibrillose-subcoriaceous and brownish with darker zones. The whole basidiocarp becomes exceedingly brittle when dry.
Stipe 2.0-3.0 cm long and 2.0-3.0 mm wide, uneven, erect, dull, black, matt, appearing relatively long compared with the pileus.
Hyphal system monomitic, generative hyphae 2.5-3 µm wide hyaline to pale brown, with clamps.
Basidiospores 5-8 (-9.5) x 3.5-5 µm elliptic to ovate or even subglobose.
Substrate: Terrestrial in woodland and forests, but probably arising from dead roots.
Distribution: South America. Known from Peru and Ecuador.
Remarks A very distinctive fungus, with a long, narrow, black stipe bearing a rather small dark pileus, which could easily be mistaken for the conidial state of some *Xylaria* at a casual glance.

Stereopsis pseudocupulata Z. T. Guo,

Bull. Bot. Res. Harbin 7: 94, 1987.
Basidiocarps up to 3 cm high, and 1-4 cm wide, thin, curved and almost cupulate, pileus isabelline to pale brown, glabrous, hymenial surface smooth, straw coloured to pale brown with radiating, smooth branched ridges.
Hyphal system generative hyphae 4-6 µm wide with clamps.

Fig. 42. *Stereopsis radicans*, from Cameroon, photo J. Kout.

Gloeocystidia cylindrical, up to 130 µm long and 4-10 µm wide.
Basidiospores 4-5 x 2.5-3.5 µm, broadly elliptic.
Substrate: Terrestrial.
Distribution: Known from the type locality in Northern China.
Remarks. The species is similar to *S. mussoriensis*, but separated by slightly smaller spores. The description is taken from the original Latin one.

Stereopsis radicans (Berk.) D.A. Reid, Fig 42

Beiheft Nova Hedwigia 18:314, 1965. - *Thelephora radicans* Berk., Hooker's Lond. J. Bot. 3, 190, 1844. - *Thelephora acanthacea* Lev., Ann. Sci. nat. Series Ill, 5:147, 1846. - *Thelephora xerantha* Berk. & M. A. Curtis, Proc. Amer. Acad. Arts Sci. 4:123, 1860. - *Cladoderris thwaitesii* Berk. & Br., J. Linn. Soc. (Bot.) 14:63, 1873. - *Stereum auriforme* Lloyd, Lloyd Mycol. Writ. 7:1246, 1924. - *Stereum lignosum* Lloyd, Lloyd Mycol. Writ. 7:1336, 1925.
Basidiocarps 1.3-10 cm high, 0.3-4.0(-9.0) cm wide, solitary, gregarious or subcaespitose, considerably variable in shape, from narrowly spatulate or flabellate to pseudo-infundibuliform, the variability often compounded by fusion of adjacent basidiocarps to form large amorphous masses extending for several centimetres,

upper surface minutely radially fibrillose, initially white then pale cream, pale tan or ochraceous, with faint darker zones, darker yellowish-tan in old specimens, hymenial surface smooth or thrown into undulating radial folds, waxy, pale tan-ochraceous or pale cinnamon-ochraceous becoming dingy vinaceous-drab from the base, stipe 0.5-4.5 cm long, 2.-10 mm wide, white, subtomentose or nearly smooth, often with white mycelial fibrils at the base, becoming darker when dried, context fibrillose, white or pallid, brittle when fresh, becoming tough when dried, when fresh, all parts of the basidiocarps rapidly become dull purplish or dull vinaceous-brown where bruised or handled.
Hyphal system monomitic, generative hyphae, 2-3.5 µm wide with clamp connections (which can be difficult to demonstrate). Frequently, some hyphae are found with long, unbranched, aseptate segments which may become thick-walled, and are easily then mistaken for skeletal hyphae unless traced along their length, when they will be seen to be normal thin-walled, clamped hyphae at either end.
Gloeocystidia 40-70 **x** 4-8 µm, cylindrical, and often very abundant.
Basidia 40-70 x 5-8 um, narrowly clavate, bisterigmatic.
Basidiospores (5) 6-8 x 5-7.5 µm, hyaline, but often stained brown when buried in the thickening hymenium, elliptic to subglobose.
Substrate: Terrestrial, but arising from dead wood or roots. Often found growing amongst the roots of bamboo.
Distribution: Cosmopolitan in the tropical zone.
Remarks. The rapid colour change to purplish or dark brown when the basidiocarp is handled or bruised, is a very distinct character for this species and not easily forgotten once experienced. The basidiocarps are thicker than for the other species described here, and this and the long unbranched segments of the generative hyphae may mislead the observer to think it is a *Podoscypha* species.

Stereopsis raphiae D. A. Reid,

Beiheft Nova Hedwigia 18:322, 1965. – *Stereopsis gracilistipitata* Z. T. Guo, Bull. Bot. Res. Harbin 7: 90, 1987.
Basidiocarps up to 10 cm high, and 7 cm wide, thin, spatulate to flabelliform, single or up to 3 basidiocarps from common base, pileus greyish brown to slight vinaceous and with narrow ochraceous zones, hymenial surface smooth, waxy, semi translucent with a white latex when cut, grey to vinaceous grey, drying brownish to darker grey in zones, stipe 1-5 cm long 3-6 mm wide, subcylindrical, concolorous with the pileus.
Hyphal system monomitic, generative hyphae 3-5 µm wide, simple septate.
Gloeocystidia cylindrical, up to 200 µm long and 5-10 µm wide, pale yellow.
Basidia 40-70 x 79 µm, clavate, tetrasterigmatic.
Basidiospores 6-7.5 x 4.5-7 µm, broadly elliptic to subglobose.
Substrate: Terrestrial on palm roots.
Distribution: Singapore and Uganda.

Remarks. The combination of gloeocystidia and the simple septate hyphae are distinct for this rare species. From the Latin description it seems that the Chinese specimens is only a small specimen of *S. raphiae*.

Stereopsis reidii Losi & Gennari,

Riv. Micol. 40:73, 1997.
Basidiocarps stipitate, infundibuliform to spatulate, pileus whitish to pale ochraceous or yellowish, minutely fibrillose, hymenial surface smooth the slightly rugulose, margin undulate, finely fimbriate to incised, stipe whitish, up to 1 cm long and 1–2 mm in diameter.
Hyphal system monomitic, generative hyphae thin-walled and with simple septa, 2–6 µm wide.
Basidiospores 4.5–6 × 3–4 µm, elliptic to subglobose.
Substrate. The type was found on the ground in a mixed forest.
Distribution. A very rare species known only from the type locality in Northern Italy.
Remarks. The species should be easy to recognize by the whitish, thin stipitate basidiocarps.

Stereopsis sparassoides (Henn.) D. A. Reid,

Beiheft Nova Hedwigia 18:325, 1965. – *Thelephora sparassoides* Henn., Hedwigia 40:324, 1901. - *Stereopsis crassipileata* Z. T. Guo**,** Bull. Bot. Res. Harbin 7: 90, 1987.
Basidiocarps 1-4 cm high, and 2-3 cm wide, thin, spatulate to flabelliform, single or up to several basidiocarps from common base, pileus pale brown, strongly lobed or split with radiating ribs or grooves. hymenial surface slightly ribbed when fresh becoming smooth when dry, violet grey, paler when dry, stipe up to 2 cm long, 1-2 mm wide, dark brown and glabrous.
Hyphal system monomitic, generative hyphae 2-4 µm wide, simple septate.
Gloeocystidia absent.
Basidiospores 3.5-4.5 x 2.5-3 µm, broadly elliptic to subglobose.
Substrate: Terrestrial.
Distribution: Known from the type locality in India besides in Northern China.
Remarks. The combination of the simple septate hyphae and the dark colours, is distinct for this rare species.

Stereopsis straminea Ryvarden,

Norw. J. Bot. 2233, 1975.
Basidiocarps stipitate, spatulate, up to 3 cm high and 1.5 cm wide, 2-3 mm thick, pliable when fresh, horny hard when dry, pileus dark straw coloured, smooth, glabrous, at margin finely whitish when actively growing, stipe up to 6 mm long, yellowish to pale brown, hymenophore smooth, straw coloured as pileus..
Hyphal system monomitic, generative hyphae thin-walled and with simple septa, 2–5 µm wide.

Fig. 43. *Stereopsis vitellina*, from Norway, photo T. H. Hofton.

Cystidia absent.
Basidiospores 7.5-8 x 3-4 µm, cylindrical.
Substrate. On humid soil in rain forest.
Distribution. Known only from the type locality in Kenya.
Remarks. The large cylindrical spores and the straw coloured basidiocarps are distinct.

Stereopsis vitellina (Plowr.) D. A. Reid, **Fig. 43.**

Beih. Nova hedwigia 18:326, 1865. – *Thelephora vitellina* Plowr., Journ. Bot. London 39:385, 1901.
Basidiocarps stipitate, variable, infundibuliform to spatulate, 2-3 cm long, pileus whitish to pale ochraceous or yellowish, minutely fibrillose, hymenial surface smooth the slightly rugulose, cream to lemon coloured, orange yellow when dry, margin undulate, finely fimbriate to incised, stipe darker than pileus, up to 1 cm long and 1–2 mm in diameter.
Hyphal system monomitic, generative hyphae thin-walled and with simple septa, 2–4 µm wide.
Basidiospores 3–4 x 2.2-2.5 µm, elliptic.
Substrate. On humid soil, often on disturbed places.
Distribution. Northern Europe.
Remarks. The cream to lemon coloured basidiocarps and the small spores characterize this species.

STEREUM Pers.,

Neues Mag. Bot. 1:110, 1794.
Basidiocarps annual or perennial, resupinate, orbicular, effused- reflexed to pileate, tough and pliable to hard, pileus (if present) initially tomentose, hispid or velutinous,

tomentum white to rusty brown, in most species becoming glabrous in zones to expose a dark coloured cuticle; hymenium smooth to slightly tuberculate, yellow, clay-coloured, orange to beige, some species (in living condition) bleeding or discolouring bright yellow, red or purplish red when damaged; hymenium homogenous or stratose, context thin and dense, in most species separated from the tomentum by a thin brown zone this becoming the cuticle when exposed by loss of the tomentum; hyphal system dimitic, generative hyphae with simple septa, skeletal hyphae moderately thick-walled, hyaline to yellowish.

Cystidia may be present, of three types,

1. Skeletocystidia, smooth, hyaline to yellow to light brown, filled with an oily to granular substance, thick-walled except in the apical part, where often constricted and with one, or occasionally two, schizopapillae, normally originating from horizontal skeletal hyphae in the trama which bend into the hymenium.
2. Acutocystidia, smooth and with a pointed apex.
3. Pseudoacanthocystidia with a few protuberances near the apex.

Basidia elongate to clavate, with 4 sterigmata; spores elliptic, narrowly elliptic to cylindrical, often slightly bent, thin-walled, smooth, hyaline and amyloid.

Cosmopolitan. Causing a white rot in wood of hardwoods and conifers.

Type species: *Stereum hirsutum* (Willd.) S.F. Gray.

Remarks. The genus is well defined by the dimitic hyphal system with simple-septate hyphae, oleiferous skeletocystidia (present in all species), acutocystidia and acanthocystidia (in some species), and smooth, amyloid spores.

A problem in *Stereum* since clamp connections are always absent, is that there may be different strains with morphological characters that may seemingly warrant specific separation seen in isolation.

In some of the complexes described here, especially the tropical S. *versicolor* s. lato, many 'species' have been described, these based on rather subtle differentiating characters. Here, it is regarded as a single species displaying rather wide variations in basidiocarp morphology and characteristics.

For a full list of taxonomic synonyms (over 500!!), see Synopsis Fung. Vol. 40.

Key to species

1. On wood of conifers **S. sanguinolentum**
1. On hardwoods **2**

2. Hymenium bleeding when damaged, in fresh condition **3**
2. Hymenium not bleeding **6**

3. Bleeding red when damaged **4**
3. Bleeding yellowish or rarely slightly reddish **5**

4. Hymenial surface pale orange, resupinate or with a narrow, black, glabrous pileus ..... **S. rugosum**
4. Hymenial surface greyish to pale brown, pileus hirsute, mostly on *Quercus*..... ..... **S. gausapatum**

5. Boreal-temperate, pseudo-acanthocystidia absent ..... **S. arcticum**
5. Tropical to temperate, pseudo-acanthocystidia present..... **S. versicolor**

6. Acanthocystidia present, mostly tropical **7**
6. Acanthocystidia absent, widespread, but predominantly warm temperate to boreal **8**

7. Pileus adpressed tomentose to velutinate, whitish-grey to pale brown, tomentum often intermixed with brown glabrous zones, basidiospores 2-3 µm wide, very common..... **S. versicolor**
7. Pileus tomentose to hirsute, pinkish brown to deep brown lacking glabrous zones, basidiospores 3-4 µm wide ..... **S. illudens**

8. Pileus initially velutinate, radially striate and shiny, with age glabrous, whitish, grey to pale orange, no cuticle between tomentum and context, American species..... ..... **S. striatum**
8. Pileus, velutinate, tomentose to hirsute in concentric zones, whitish grey, with age yellowish grey to dirty brown, dark line absent or present between tomentum and context, wide spread species..... **9**

9. Basidiocarp to 6.0 cm wide, flabelliform to spatulate with contracted base, upper surface whitish grey, tomentum often eroded in zones to expose a brown cuticle; bleeding bright to dull yellowish when fresh..... **S. arctium**
9. Basidiocarps rarely larger than 3.0 cm wide, resupinate, effused-reflexed to cupulate, broadly attached to the substrate, upper surface whitish grey to brownish, tomentum mostly persistent, rarely eroded with age to show a few indistinct zones; never bleeding when fresh **10**

10. Spores elliptic, African species ..... **S. ellipticum**
10. Spores cylindrical to narrowly elliptic, wide spread species..... **11**

11. Basidiocarps usually distinctly pileate, to 4.0 cm wide and 2.0 mm thick, stiff when dry, hymenium orange yellow, tomentum hirsute to striate, dark line always present between tomentum and context .....**S. hirsutum**

11. Basidiocarps cupulate to effused reflexed, often attached by a central point, 0.5-0.8 mm thick, flexible (because of the thin basidiocarp), hymenium ochraceous yellow, tomentum thin and adpressed, soft and velutinous**,** dark line between tomentum and context absent in young basidiocarp, and only weakly developed in old specimens ..... **S. complicatum**

NB Since all species have basidia with 4 sterigmata, all generative hyphae are simple septate, all basidiospores are hyaline, smooth and amyloid, thus, these characteristics are not repeated for each species.

Stereum arcticum Fr., **Fig. 44**

Hymen. Europ. p. 639, 1879. – *Stereum atrorubrum* Ellis & Ev., Proc. Acad. Nat. Sci. Phil. 1890:219, 1890. - *Stereum subtomentosum* Pouzar, Ceska Mykol. 18:147-148, 1964. **Basidiocarp** annual, normally reflexed with a distinct pileus, commonly in dense imbricate clusters, occasionally singly, coriaceous and tough, pilei to 5.0 cm wide and, in fused basidiocarps, 3.0-7.0 cm long, fan shaped to spatulate with a distinctly tapering, short, stipe-like base, or may also be broadly attached, lobed and undulate, involute especially when dried, upper surface initially finely tomentose to velutinate, in narrow zones, yellowish grey to pale brown often more hirsute and grey in older specimens, sometimes with a greenish tint at the base due to algal growth in the tomentum, some of the zones may be separated by dark bands reflecting distinct stages in the development, hymenium smooth, tuberculate or undulate, light beige to ochraceous, when fresh, immediately bright to dull yellowish damaged; context beige to ochraceous, separated from the tomentum by a distinct, dark brown zone of agglutinated hyphae.

Fig. 44. Basidiocarps of *Stereum arctium* Photo I.-J. Fonneland.

Hyphal system dimitic, consisting of simple septate generative hyphae, 3-6 µm wide, in the hymenium thin-walled and abundantly branched; skeletal hyphae 3-10 µm wide, thick-walled and sparsely branched, present in the cortex and the tomentum, often with adventitious 'septa' of contracted protoplasm.
Cystidia present, of two kinds:
1) **Skeletocystidia** 4-12 µm wide, usually longer than 100 µm, thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia and often with an apical appendix.
2) **Acutocystidia** 35-40 x 4-5 µm, abundant, projecting slightly above the basidia.
Basidia 25-40 x 4-6 µm, clavate.
Basidiospores 5.5-8 x 2-3 µm, cylindrical to narrowly elliptic.
Substrate. On dead hard wood.
Distribution. Previously confused with *S. versicolor*, but separated by lacking acanthocystidia and a temperate-boreal distribution. The type (in UPS) was described based on a specimen from Bossekop in Finnmark, Northern Norway at 70° N.
Remarks. Easy to recognize in the field due to large, often distinctly fan shaped to spatulate basidiocarps, with a soft velutinate tomentum and a yellowish bleeding reaction when fresh. The species has more or less the same type of basidiocarp as *S. versicolor* which is however, a southern -tropical species with acanthocystidia.

Stereum complicatum, **(Fr.) Fr.,**

Epicr. Mycol., p. 548. 1838. - *Thelephora complicata* Fr., Elench. Fung. 1:179, 1828. - Stereum bellum (Kunze) Sacc., Syll. Fung. 6:563, 1888. *Thelephora bella* Kunze, Flora (Regensburg) 12:370, 1830. - Stereum ochraceo-flavum (Schw.) Ellis, North. Am. Fungi no 17, 1878. - *Theleporus ochraceo*-flava Schw., Trans Amer. Phil. Soc. New series 4:167, 1832. - *Stereum sulphuratum* Berk. & Ravenel, J. Linn. Soc. Bot. 10:331, 1868. - *Stereum rameale* (Pers.) Burt, Ann. Rep. Mis. Bot. Gard. 7: 169, 1920, (Basionym: *Thelephora hirsuta* rameale Pers., Syn. meth. Fung.: 570, 1801) nom. illegit, non *Stereum rameale* (Berk.) Massee J. Linn. Soc. Bot. 27:187, 1889. *(= Hymenochaete ramealis Berk.,* J. Linn. Soc., Bot. 14: 68, 1875. - *Stereum reflexulum* D. A. Reid, Rev. Mycol. 33:10, 1968.
Basidiocarps annual, cupulate to effused-reflexed, often attached by a more or less central point, often imbricate, individual basidiocarps spatulate to flabelliform, to 3.0 cm wide and long and 2.0-3.0 mm thick, flexible when fresh, stiff when dry, upper surface initially finely tomentose to velutinate, yellowish grey to pale brown in narrow zones, with age often more hirsute and grey, often with a greenish tint due to growths of algae in the tomentum, hymenium smooth, rarely slightly tuberculate, light orange to greyish orange, becoming darker with age, context to 0.5 mm thick, concolorous with the hymenium, cuticle usually absent, but may be weakly developed in old specimens with distinct and persistent tomentum. In living material, not bleeding or discoloured when damaged.

Hyphal system dimitic, generative hyphae simple septate in the hymenium 3-5 µm wide, thin-walled and abundantly branched; skeletal hyphae 3-10 µm wide, present in the in the cortex and the tomentum, thick-walled, sparsely branched, and often with adventitious 'septa' of contracted protoplasm.
Skeletocystidia present, 4-12 µm wide, usually longer than 100 µm, thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia, and often with an apical appendix
Acutocystidia and **Acanthocystidia** absent.
Basidiospores 5-7 x 2-3 µm, cylindrical to narrowly elliptic.
Substrate. Seemingly on all types of hard woods.
Distribution. Widespread in the warm temperate and into the tropical zone,
Remarks. Belongs to the *S. hirsutum* group or complex, but separated from it by the much smaller, thinner basidiocarps, the usual occurrence on small, or thin, sticks and branches, cuticle below pileus tomentum is very thin or and occasionally lacking.

Stereum ellipticum Ryvarden,

Synopsis Fung. 40: 52, 2020.
Basidiocarps effused-reflexed to distinctly pileate, more rarely resupinate or orbicular, with a distinct margin, tough when fresh, hard when dried, to 1.0 mm thick, pileus up to 3.0 cm wide, dimidiate to broadly attached, laterally fused or slightly imbricate, often lobed and wavy, upper surface tomentose in variable zones, greyish at the margin becoming more brown towards the base, in a few narrow zones glabrous with a brown cortex, hymenium smooth, greyish to brownish grey or buff, not bleeding when touched, hymenium about 250 µm thick, subhymenium to 600 µm above white there is a dark brown dense zone.
Hyphal system dimitic, generative hyphae 2-5 µm wide, simple septate, skeletal hyphae thin- to slightly thick-walled 4-8 µm wide, thick-walled, and infrequently branched and bending into the hymenium as skeletocystidia.
Skeletocystidia 7-10 µm wide and often more than 100 µm long, abundant, thick-walled except for the apical part, sometimes with a schizopapillae, in the upper part filled with oily contents, not or rarely projecting above the basidia, arising from the trama and forming a fairly dense layer next to the hymenium.
Acutocystidia and **Acanthocystidia** absent.
Basidiospores 5-6 x 2-2.5 µm, elliptic.
Substrate. Dead *Acacia* sp., and *Juniperus procera*.
Distribution. Beside the type locality, also seen from Ethiopia, indicating a wide distribution in Eastern Africa.
Remarks. The small elliptic spores and the hard consistency characterize this species.

Fig. 45. *Stereum gausapatum* Basidiocarps, Photo I.L. Fonneland.

Stereum gausapatum (Fr.) Fr., Fig 45.

Hymen. Europ. p. 638, 1874. - *Thelephora gausapata* Fr., Elenchus fung. 1: 171, 1828.
Basidiocarps effused, resupinate to reflexed, orbicular and confluent, tough when fresh, rather hard when dried, to 1.0 mm thick; pilei dimidiate to broadly attached, lobed, often laterally fused, to 2.0 cm wide, tomentose or velutinous in narrow zones, grey to pale brown and almost rusty brown with age; tomentum present on the pileus, eventually eroded to expose a glabrous, dark brown cortex, margin paler than the rest of the surface, hymenophore smooth to tuberculate, in larger specimens often partially folded in a radial pattern, wood-coloured to pale olivaceous or buff, darker with age, distinctly red or reddish when damaged, then discoloured to shades of reddish-brown or brown, context pale ochraceous, to 0.5 mm thick, separated from the tomentum by a thick, dark-brown zone of compacted hyphae to 25-75 µm thick.
Hyphal system dimitic, generative hyphae 2-5 µm wide, skeletal hyphae thin- to thick-walled, with transitions to skeletocystidia. In the cortex and tomentum thick-walled, not or only sparsely branched, strongly pigmented and agglutinated by a resinous substance.
Cystidia present, of two kinds:
1. **Skeletocystidia** 5-10 µm wide and often more than 150 µm long, thick-walled except in the apical part, hyaline to yellowish, filled with grainy to oily contents.
2. **Acutocystidia** 20-30 x 2-4 µm, projecting slightly above the basidia and easily observed in thin sections.
Basidiospores 6-9(-10) x 3.5-4.5 µm, elliptic to narrowly elliptic.
Substrate. On dead wood. Most frequent on *Quercus* spp., often dead standing trunks with still attached branches, less commonly on fallen trunks or branches.
Distribution. Follows *Quercus* throughout its range.
Remarks. Easily recognizable in the field by the bleeding reaction of the hymenium and the host.

Fig. 46. *Stereum hirsutum* Photo I.L Fonneland.

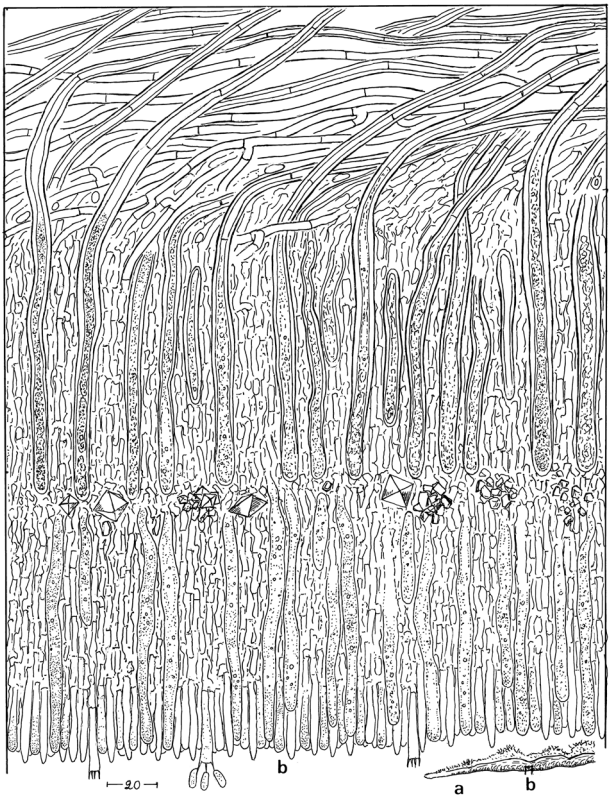


Fig. 47. *Stereum hirsutum*, a) section through basidiocarp, b) section through two-layered hymenium. Del. J. Eriksson.

Stereum hirsutum (Willd.: Fr.) S.F. Gray, Fig 46-47.

Nat. Arr. Br. Pl. 1: 653, 1821. - *Thelephora hirsuta* Willd.: Fr., Syst. mycol. I: 439, 1821. - *Thelephora hirsuta* Willd., Fl. Berol. Prodr. p. 397, 1787.

Basidiocarps effused-reflexed to distinctly pileate, more rarely resupinate or orbicular, with a distinct margin, tough when fresh, harder when dried, to 2.0 mm thick. Pilei to 3.0 cm wide, dimidiate to broadly attached, often laterally fused or densely imbricate, often lobed and wavy, upper surface tomentose, hirsute or hispid, generally zonate, initially white, becoming greyish to unevenly dirty brown; with age the tomentum erodes to expose a glabrous, brown cortex, hymenium smooth to tuberculate, greyish to yellowish or pale orange, with a white margin in actively growing specimens, later more yellow to ochraceous, and, in dead and hibernating specimens, almost buff, context yellow to ochraceous, to 1.0 mm thick.

Hyphal system dimitic, generative hyphae 2-5 µm wide, skeletal hyphae thin- to slightly thick-walled and frequently branched; in the trama 4-6 µm wide, thick-walled, and infrequently branched and bending into the hymenium as skeletocystidia, in the cortex, yellowish brown and thick-walled, and in the tomentum 5-8 µm wide, thick-walled, with numerous adventitious septa.

Cystidia present, of two kinds:

1. **Skeletocystidia** 7-10 µm wide and often more than 100 µm long, abundant, thick-walled except for the apical part, sometimes with a schizopapillae, in the upper part filled with oily contents, not or rarely projecting above the basidia, arising from the trama and forming a fairly dense layer next to the hymenium.

2. **Acutocystidia** 20-30 x 2-4 µm, abundant, projecting slightly above the basidia and easily observed in a thin section.

Basidiospores 5-8 x 2-4(-3.5) µm, narrowly elliptic to cylindrical.

Substrate. On dead wood, of almost any genus of hardwood, very rarely on coniferous wood.

Distribution. Cosmopolitan and common in temperate areas, rarer in the tropical zones.

Remarks. Easily recognized by the white to grey, woolly to hirsute tomentum and the yellow to orange hymenium. It is a highly variable species which has been described several times from different zones.

Stereum illudens Berk., Fig. 48.

London J. Bot. 4:59, 1845.

Basidiocarps annual, cupulate to effuse-reflexed often attached by a more or less central point and often imbricate, up to 3.0 cm wide and long and 2.0-3.0 mm thick, flexible when fresh, stiff when dry, upper surface densely tomentose to strigose, slightly concentrically zonate, initially pinkish brown then deeper brown, hymenium smooth, rarely slightly tuberculate, light brown, pinkish brown at the margin and often with a

Fig. 48. *Stereum illudens*, New Zealand, Auckland, Photo L. Ryvarden

purplish tint towards the centre or point of attachment, context thin and pale brown, separated toward the tomentum by a thin black line.
Hyphal system dimitic, generative hyphae 3-5 µm wide, simple septate, in the tomentum with coloured walls, in the cuticle to 7 µm wide, while those of the context are pale yellow and thick-walled; skeletal hyphae 3-8 µm wide, with thick walls and often with adventitious 'septa' of contracted protoplasm.
Skeletocystidia present, 4-12 µm wide, usually longer than 100 µm, thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia, and often with an apical appendix.
Acanthocystidia present, to 30 µm long and 4-7 µm wide with numerous small tuberances in the apex.
Basidiospores 6-8 x 3-4 µm, subcylindrical to narrowly elliptic.
Substrate. On dead hard woods.
Distribution. Described from Australia, rare in America, Asia and Africa.
Remarks. The species is recognized by the dark brown tomentum with a distinct pinkish tint when fresh and the black line below the tomentum.

Stereum pseudorimosum Boidin & Gilles,

Bull. Soc. Mycol. Fr. 105:147, 1989.
Basidiocarps annual, flabellate, up to 3 cm wide and 0.5 mm thick, often attached centrally with narrow pileus, flexible when fresh, stiff when dry, upper surface densely tomentose to strigose, slightly concentrically zonate, initially snuff brown, hymenium smooth, cracking by age, rarely slightly tuberculate, brown, to ochraceous, becomes red

by touching or cutting, context thin and pale brown, separated toward the tomentum by a thin black line.
Hyphal system dimitic, generative hyphae 3-5 µm wide, simple septate, in the tomentum with coloured walls, in the cuticle to 7 µm wide, while those of the context are pale yellow and thick-walled; skeletal hyphae 3-8 µm wide, with thick walls and often with adventitious 'septa' of contracted protoplasm.
Skeletocystidia present, 4-12 µm wide, usually longer than 100 µm, thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia, and often with an apical appendix.
Acanthocystidia present, to 25 µm long and 4-7 µm wide with numerous small tubercles in the apex.
Basidiospores 5-7.5 x 2-3 µm, cylindrical.
Substrate. On dead hard woods such as *Acacia* spp.
Distribution. La Reunion, Mauritius and Madagascar.
Remarks. The species is recognized by the dark brown tomentum and the numerous acanthocystidia besides bleeding when fresh. It is closely related to *S. illudens,* but separated by its cylindrical spores, small discoid basidiocarps and distribution.

Stereum rimosum Berk.,

Hooker J. Bot. 3:169, 1851.
Basidiocarps broadly effused. narrowly reflexed, narrowly attached and laterally attached or resupinate on larger branches, pileus buff to ochre to fulvous, covered with a thick. felty. pad-like or somewhat spongy tomentum, margin even or lobate, lower side conspicuously rimose and rugose with radiating ridges and tubercles. sometimes appearing. blistered. thicker specimens often cracking to show a pallid silky context. often concentrically furrowed or grooved, pale yellow, buff to cream coloured, saffron to salmon tinged when fresh. sometimes becoming fawn to hazel, bleeding orange to red when bruised, injured parts drying violaceous black., cuticle present relatively thin, orange to rust coloured.
Hyphal system dimitic, generative hyphae, thin-walled, 2.0-3.5 µm wide, skeletal hyphae: 5.0- 10.0 µm, wall thickness 1.0-3.0 µm, lumen often with orange brown contents.
Basidia 30.0-60.0 x 4.0-6.0 µm, clavate to subcylindrical.
Basidiospores 5.0-7.0(- 8.0) x 2.5-3.5 µm, elliptic to cylindrical.
Skeletocystidia sub cylindrical to cylindrical, yellow to orange. somewhat oily contents, relatively thin- to slightly thick-walled. 4.0-9.0 µm diam.
Substrate. Different hardwoods.
Distribution.
Remarks. As *S. rimosum* is a bleeding' species, the colour of the hymenium may vary considerably, becoming cinereous to black when bruised, but dries to pale creamy buff when unharmed.

Fig. 49. *Stereum rugosum*, Photo I.-L Fonneland.

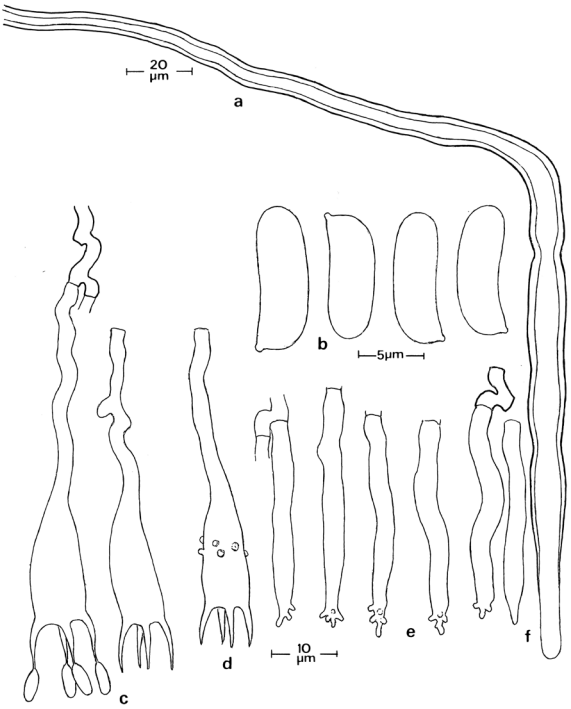


Fig. 50. *Stereum rugosum*, a) skeletocystidium, b) basidiospores, c) acanthocystidia, d) acutocystidium. Del. J. Eriksson.

Stereum rugosum (Pers.: Fr.) Fr., Fig. 49 & 50.

Epicr. Mycol. p. 522, 1838. - *Thelephora rugosa* Pers.: Fr., Syst. mycol. 1: 439, 1821. - *Thelephora rugosa* Pers. Syn. meth. fung.: 569. 1801.

Basidiocarp perennial**,** resupinate to effused-reflexed, coriaceous to very hard, forming as rounded and orbicular patches with a loosening margin, or with a narrow reflexed pileus, often confluent or forming dense imbricate clusters; pilei narrow, undulate to lobate, occasionally lacking, often fused laterally, rarely more then 1.0 cm wide, initially greyish, with a finely depressed tomentum, soon becoming glabrous and dark brown, finally black in narrow and sharp zones and with a distinct cortex in section, margin rounded, white to pale ochraceous; hymenium smooth, tuberculate to undulating, pale ochraceous to buff, pale yellowish brown with age, often with black spots in older specimens, in living material bleeding red where damaged this becoming blackish brown after a while. In section distinctly stratose, each zone clearly defined by a thin dark line, in total to 2 mm thick, in young parts ochraceous, in older parts darker, often greyish to dirty brown, due to oxidization of the contents of the skeletocystidia.

Hyphal system dimitic, generative hyphae simple-septate, 3-4 µm wide, thin-walled, and frequently branched; skeletal hyphae 3-6 µm wide, thick-walled, horizontal; hyphae in the tomentum are of an intermediate type, hyaline to yellowish and sparingly branched, and in the cortex fairly thick-walled and pale brown.

Cystidia present, of two kinds:

1) **Skeletocystidia** 5-12 µm wide, usually more than 100 µm long, smooth, thick-walled except for the apical part, hyaline to yellowish, with oily contents, more or less constricted and slightly projecting.

2) **Acanthocystidia** 30-35 x 3-4 µm, projecting slightly above the basidia, and easily observed.

Basidia 30-50(-100) x 6-8 µm, elongated clavate.

Basidiospores 7-12 x 3-4.5 µm, narrowly elliptic to cylindrical, slightly bent.

Substrate On deciduous wood, often dead standing trunks, on which it may cover large areas. *Corylus, Betula*, and *Alnus* are seemingly the most common hosts, but also known from most other species of deciduous trees in the area.

Distribution. Widespread and common throughout the temperate zone.

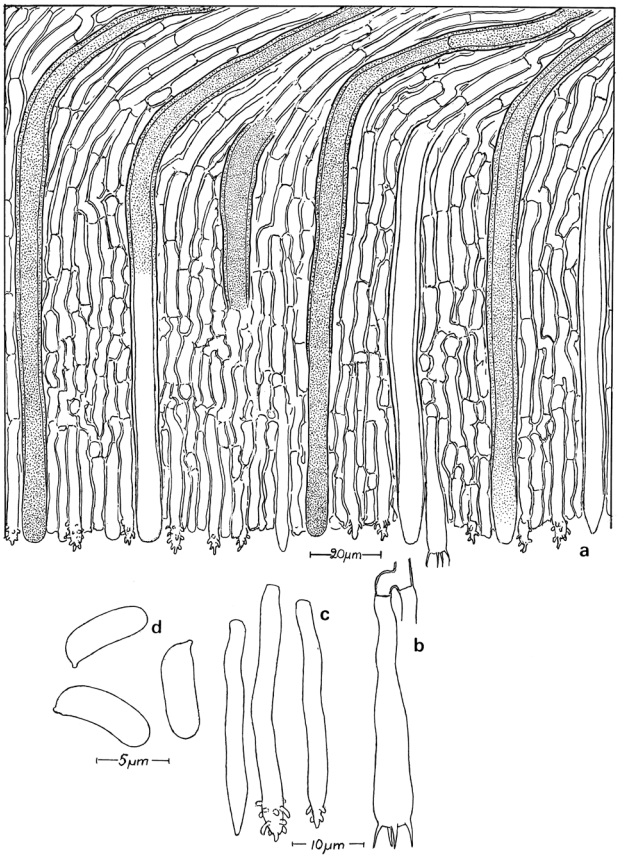
Remarks. Easily recognized by the perennial and often extensive, hard, resupinate to effused reflexed basidiocarps, bleeding red when damaged. The pileus becomes rapidly glabrous with age, and have a much harder texture than all of the other species dealt with here.

Stereum sanguinolentum (Alb. & Schw.:Fr.) Fr., Fig. 51 & 52.

Epicr. p. 549, 1838. - *Thelephora sanguinolenta* Alb. & Schw.: Fr., Syst. mycol. 1: 440, 1821.- *Thelephora sanguinolenta* Alb. & Schw. Consp. fung. Lusat. p. 274, 1805.

Fig. 51. *Stereum sanguionlentum*, photo I.-L. Fonneland.

Fig, 52. *Stereum sanguinolentum*, a) section through hymenium, b) basidium, c) cystidia, d) basidiospores, coll. Hjortstam 12722. Del. J. Eriksson.



Basidiocarps annual to perennial, resupinate and orbicular with a slightly loosening margin, effused-reflexed to distinctly pileate, often covering large areas, especially on the lower sides of logs, to 1.0mm thick, tough when fresh, hard to coriaceous when dried; pileus present or absent, if present then narrow, mostly less than 10.0 mm wide, often laterally fused, undulate, lobed and incised, or as dense imbricate clusters, initially finely adpressed-tomentose to hirsute, greyish white to brownish, soon becoming glabrous in zones and exposing a brown cortex in narrow bands, these dark brown to almost black, with narrow and sharp zones, then almost completely glabrous when old, hymenophore smooth, undulate or tuberculate, beige to buff when young, dark brown when older, bleeding strongly red where damaged, this darkening after a short while and becoming brown, context beige to ochraceous, often with small dark spots, separated from the tomentum by a thin dark brown zone, less than 50 µm thick.
Hyphal system dimitic, generative hyphae simple-septate hyphae, in the hymenium 2-6 µm wide**,** thin- to thick-walled, skeletal hyphae in the tomentum, cortex and trama 3-6 µm wide, thick-walled, hyaline to pale brown.
Cystidia present, of two kinds:
1**. Skeletocystidia** 3-6 µm wide and usually longer than 100 µm somewhat wider in the upper parts (to 4-10 µm), thick-walled except in the apical part, hyaline to yellowish in the basal parts, filled with a pale brown, oily to grainy contents, projecting very slightly above the basidia.
2**. Acanthocystidia** 30-40 x 3-5 µm, projecting above the basidia
Basidia 25-40 x 5-6 µm, elongate clavate.
Basidiospores (6)7-10 x (2.5)3-4.5 µm, narrowly elliptic to cylindrical.
Substrate. On dead wood of numerous conifer species.
Distribution. Very common in the coniferous forests throughout the subtropical and temperate boreal zone.
Remarks. Easily recognized due to the bleeding reaction and occurrence on coniferous wood.

Stereum scutellatum G. H. Cunningham,

Trans Royal. Soc. N. Zeal. 84:210, 1956.

Basidiocarps annual, membranous, resupinate to semi pileate with a raised margin, , first orbicular, then developing into numerous scattered colonies, 2-10 mm in diameter, then growing together to more complex basidiocarps, pileus when present up to 3 mm wide, straw coloured, radially fine fibrillose, hymenium smooth, beige to buff when young, dark brown when older, bleeding strongly red where damaged, this darkening after a short while and becoming blackish, margin narrow, white to pale buff; context beige to ochraceous, often with small dark spots, separated from the tomentum by a thin yellowish zone, less than 50 µm thick.
Hyphal system monomitic, generative hyphae simple-septate, 2-6 µm wide**,** thin- to thick-walled.

Skeletocystidia 3-6 µm wide and up to 100 µm bending into the hymenium somewhat wider in the upper parts, hyaline to yellowish in the basal parts, filled with oily granular content, projecting very slightly above the basidia.
Basidiospores 7-10 x 5-6 elliptic.
Substrate. On dead hard wood.
Distribution. Known only from New Zealand.
Remarks. The species is related to *S. sanguinolentum,* but easily separated by wider spores, its restriction to hard wood hosts and restricted distribution.

Stereum striatum (Fr.) Fr.

Epicr. Syst. Mycol. p. 548, 1838. - *Thelephora striata* Fr. Elench. Fung. 1:179, 1828.
Basidiocarps annual, effused-reflexed, often imbricate, individual basidiocarps dimidiate with a contracted base, or spatulate to flabelliform, to 2.0 cm wide and long and 2.0 mm thick, flexible when fresh, stiff when dry, upper surface initially velutinate, soon more or less glabrous, shiny, sericeous, radially striate, often zoned, grey to greyish white when young, becoming orange to pale brown with age. Hymenium smooth, rarely slightly tuberculate, pale orange to greyish orange, darker with age. Context to 0.2 mm thick, concolorous with the hymenium, cuticle absent, in living material not bleeding or discolouring when damaged.
Hyphal system dimitic, generative hyphae simple septate hyphae 3-5 µm wide, in the hymenium thin-walled and often branched; skeletal hyphae 3-10 µm wide, in the cortex and the tomentum thick-walled and sparsely branched, often with adventitious 'septa' of contracted protoplasm.
Skeletocystidia 4-12 µm wide, usually longer than 100 µm, thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia, and often with an apical appendix
Acanthocystidia absent.
Acutocystidia 15-25 x 4-5 µm.
Basidia 25-35 x 4-6 µm, clavate.
Basidiospores 5-7 x 2-3 µm, cylindrical to narrowly elliptic, often slightly bent.
Substrate. On dead wood, apparently of any genus of hardwoods, but in the southern United States often on *Carpinus caroliniana.*
Distribution. Widespread in America from eastern and southern United States to Brazil.
Remarks. Recognized in the field by the small size, and a shiny, finely striate, greyish pileus.

Stereum versicolor (Sw.:Fr.) Fr. **Fig. 53 & 54.**

Epicr. Mycol. p. 547, 1838. - *Thelephora versicolor* Sw.: Fr., Syst. Mycol. 1:438, 1821. - *Helvella versicolor* Sw., Flora India Occident. 3:1933, 1778 (K!). - *Stereum ostrea* (Blume & Nees: Fr.) Fr., Epicr. Syst. Mycol. p.547, 1838. - *Thelephora ostrea* Blume et Nees, Nova Acta Acad. Caes. Leopl. Carol. 13:13, 1826. ibid Fr. Elench. Fung. 1:175, 1828. – *Stereum*

Fig. 53. *Stereum versicolor*, Costa Rica, photo L. Ryvarden.

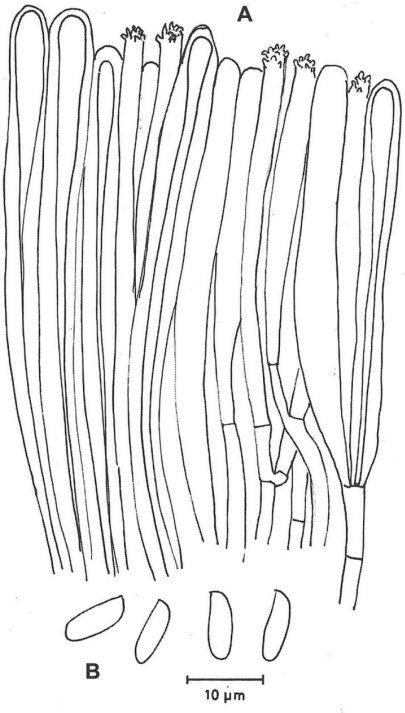


Fig. 54. *Stereum versicolor* A) section through hymenium, B) basidiospores, Coll. Costa Rica, Gomez 24249. Del. L. Ryvarden.

fasciatum (Schw.) Fr. Epicr. Syst. mycol. 546, 1838. – *Stereum lobatum* (Kunze:Fr.) Fr., Epicr. Syst. Mycol. P. 547. – *Stereum australe* Lloyd, Lloyd Mycol. Writ. 4, Letter 48:10, 1913. **Basidiocarps** annual, reflexed to semistipitate, single or more commonly in dense imbricate clusters, coriaceous and tough, pileus to 5.0 cm wide and 3.0-7.0 cm long in fused basidiocarps, fan shaped to spatulate, broadly attached or with a distinctly tapering base, this resembling a short stipe, margin thin and light-coloured, involute (especially when dried), lobed and undulate, initially finely tomentose to velutinate, yellowish grey to pale brown in narrow zones, some of which may be separated by dark bands, these reflecting distinct stages in the development, often becoming more hirsute and greyish with age, and sometimes showing a greenish tint at the base due to the growth of algae in the tomentum, hymenium smooth, tuberculate or undulate, light beige to ochraceous; in living material immediately discolouring yellowish where damaged; context beige to ochraceous, separated from the tomentum by a distinct, dark brown zone of agglutinated hyphae.

Hyphal system dimitic, generative hyphae 3-5 µm wide; skeletal hyphae 3-10 µm wide, in the cortex and the tomentum thick-walled and sparsely branched, often with adventitious 'septa' of contracted protoplasm.

Cystidia present, of two kinds:

1) **Skeletocystidia** 4-12 µm wide, usually longer than 100 µm,
thick-walled except in the apical part, filled with yellowish contents, often constricted, projecting slightly above the basidia and often with an apical appendix.

2) **Acanthocystidia** 35-40 x 4-5 µm, numerous, projecting slightly above the basidia.

Basidiospores 5.5-8 x 2-3 µm, cylindrical to narrowly elliptic.

Substrate. Seemingly on any species of hard woods.

Distribution. Pantropical and common. Replaced by *S. arctium* in temperate zones, which could easily be interpreted as a form of *S. versicolor* although the latter has acanthocystidia.

Remarks. Undoubtedly the most common and variable species of *Stereum* in the tropics. Easily recognized in the field due to the large, often distinctly fan shaped to spatulate basidiocarps with a soft and concentrically zonate, velutinate tomentum in variable colours.

When fresh the yellowish bleeding reaction is distinctive, but this disappears as the basidiocarp dries out. The colour of the lower side is variable and may become dark ochraceous when old.

VELUTICEPS Pat.,

Bull. Soc. Mycol. Fr. 10:78, 1894.

Basidiocarp perennial, coriaceous, stratified, pileate or resupinate, upper surface with dark brown tomentum, hyphal system dimitic, rarely monomitic, skeletal hyphae fuscous and thick-walled, generative hyphae hyaline, thin-walled, with clamp connections; hymenium finely hydnoid to velutinate with numerous projecting cystidia,

spores thin-walled (or somewhat thick-walled when old), smooth, hyaline, non-amyloid. Causing a brown rot, mostly in conifers.
Type species: *Veluticeps berkeleyi* Pat.
Taxonomic synonym: *Columnocystis* Pouzar., Ceska Mykol 13:17, 1959.
Remarks. *Veluticeps* includes perennial species causing a brown rot in the substrate, a rather rare characteristic within the stereoid fungi.

Key to species

1. Hymenial surface covered with sterile odontioid fascicles .....**V. berkeleyi**
1. Hymenial surface smooth, but in actively growing specimens covered with fine, acicular or needle-like projecting cystidia..... **2**

2. Basidiospores 17-25 µm long .....**V. pimeriensis**
2. Basidiospores shorter..... **3**

3. Generative hyphae with clamp connections, black cuticle below pileus tomentum .....**V. abietina**
3. Generative hyphae with simple septa, cuticle absent .....**V. ambigua**

Veluticeps abietina (Fr.) Hjortstam & Telleria,

Mycotaxon 37:54, 1990. - *Thelephora abietina* Fr., Syst. myc. 1:442, 1821. - *Columnocystis abietina* (Fr.) Pouzar, Ceska Mykol. 13:17, 1959.
Basidiocarp perennial, pileate or resupinate, stratose, 1.0-2.0mm thick, initially orbicular then coalescent, margin light brown, with more or less zonate tomentum, in resupinate basidiocarps a black smooth cutis is formed by agglutinated hyphae whilst in pileate specimens this cutis is seen below the tomentum, hymenophore dark violaceous blue when wet, paler when dry.
Hyphal system dimitic, generative hyphae 2-3.5 µm wide, thin-walled with clamp connections, skeletal hyphae 2.5-4 (5) µm wide, thick walled and dark brown.
Cystidia present of two types.
1. Projecting, 150-200 x 8-12 µm, very thick-walled, usually only slightly pigmented (yellow to light brown in the microscope), arising deep in the intermediate layer, apically almost hyaline, externally with a generally thin and delicate crystalline crust which dissolves in Melzer's reagent and in lactic acid.
2. Enclosed, 50-100 x 3-6 µm, thick-walled and strongly pigmented, often with several simple adventitious septa, usually arising from the skeletal hyphae in the intermediate tramal layer. However, this type of cystidium may also develop from thin-walled, slightly encrusted basidia-like cystidioles in the hymenium.
Basidiospores 9-13 x 4-5 µm, narrowly elliptic to subcylindrical.
Substrate. On coniferous wood, rarely on *Salix caprea.*

Distribution. Widespread in the northern coniferous zone.
Remarks. Similar to *Veluticeps ambigua,* but distinguished by lack of clamp connections.

Veluticeps ambigua (Peck) Hjortstam & Telleria,

Mycotaxon 37, 54, 1990. - *Stereum ambigum* Peck, Ann. Rep. N.Y. State Mus. 47:145, 1894. - *Columnocystis ambigua* (Peck) Pouzar, Ceska Mykol. 13:17, 1959.

Basidiocarp perennial, resupinate to effused-reflexed, if reflexed extended laterally, shelf-like, to 5.0 mm wide, tough and coriaceous, pileus surface dark brown, tomentose to matted velutinate, margin distinct, velvety, dark brown, hymenophore smooth to slightly tuberculate, light violaceous brown in young and actively growing specimens, dark brown and slightly cracked when old and dry, in section with distinct strata and lacking a black cuticle towards the substrate or upper surface of the pileus.
Hyphal system dimitic, generative hyphae 2-4 µm wide, with simple septa, thin- to thick-walled, the latter tinted yellow to pale brown; skeletal hyphae 2.5-5 µm wide, thick-walled and brown.
Cystidia present, with two intergrading types,
1. cylindrical to subclavate, up to 100 µm long, 3-7 µm wide, thick-walled, smooth, dark brown, arising as skeletocystidia from the subhymenium, or directly from a simple septum in the generative hyphae.
2. skeletocystidia, 100-300 µm long, thick walled, brown, arising deep in the old hymenial strata, projecting up to100 µm above the hymenium (making the surface pilose), and apically encrusted with coarse, angular crystals.
Basidiospores 12-17 x 3.5.-5 µm, cylindrical to suballantoid.
Substrate. On dead wood of conifers.
Distribution. Canada and northern parts of the United States. Rarer than *V. abietina.*
Remarks. Undoubtedly close to *V. abietina*, but separated from it by the lack of clamp connections on the generative hyphae, the cuticle in the pileus and larger spores.

Veluticeps berkeleyi Pat.,

Bull. Soc. mycol. Fr. 10:78, 1894.
Basidiocarp perennial, resupinate to effused-reflexed, if reflexed then extended laterally, shelf-like, to 3.0 mm wide, tough and coriaceous, pileus surface dark brown, tomentose to matted velutinate, slightly sulcate, margin distinct, velvety, dark brown, hymenophore pale brown, finely hydnoid due to numerous sterile fascicles which extend deep into the surface (appearing as dark lines) and lacking a black cuticle towards the substrate or upper surface of the pileus.
Hyphal system dimitic, generative hyphae 2-7 µm wide, with simple septa, thin- to thick-walled, the latter tinted yellow to pale brown; skeletal hyphae 2.5-8 µm wide, thick-walled and brown.

Cystidia present, in the sterile hymenial fascicles, up to 100 µm long, 3-7 µm wide, cylindrical to subclavate, thick-walled, smooth, dark brown, arising as skeletocystidia from the subhymenium.
Basidiospores 10-14 x 4-5 µm, cylindrical to suballantoid.
Substrate. On dead wood of conifers.
Distribution. Western Northern America.
Remarks. Characterized by the finely hydnoid and brown hymenial surface.

Veluticeps pimeriensis (Gilbn.) Hjortstam & Telleria,

Mycotaxon 37:54, 1990. - *Columnocystis pimeriensis* Gilbn., Fungi that decay Ponderosa pine p. 87, 1974.

Basidiocarp annual, pilei to 10 cm wide, resupinate to effused- reflexed, if reflexed then extended laterally, shelf-like, to 1.0-2.0 mm wide, consistency tough and coriaceous, pileus dark brown, coarsely tomentose, hymenophore smooth, but covered with tiny, shiny, projecting cystidia.
Hyphal system monomitic, generative hyphae 2-4 µm wide, with both simple septa and clamp connections, thin- to thick-walled, hyaline to pale brown; skeletal hyphae apparently absent.
Cystidia 30-80 x 3-6 µm, abundant, cylindrical to sinuous, with constrictions, mostly smooth but occasionally finely encrusted and with a few simple septa, arising deep in the subhymenium and projecting to 100 µm above the hymenium.
Basidiospores 17.5-25 x 7-10 µm, cylindrical to elliptic.
Substrate. On dead wood of *Pinus* spp, especially *P. ponderosa*.
Distribution. Western United States.
Remarks. Characterized by the annual basidiocarp with large basidiospores and tiny, projecting needle like cylindrical cystidia.

XYLOBOLUS P. Karst.

Medd. Soc. Fauna Fl. Fenn. 6:11, 1881.
Basidiocarps perennial, resupinate to pileate, hard and stiff, upper surface deep brown to black, glabrous to tomentose or hirsute, hymenium smooth to undulant, beige to pale brown, hyphal system dimitic, generative hyphae with simple septa, skeletal hyphae thick-walled to solid with vertically arranged, skeletocystidia and acanthophyses present, basidiospores elliptic smooth and amyloid, causes a white pocket rot.
Type species: *Thelephora frustulata* Pers.:Fr.
Remarks. Close to *Stereum* but separated by elliptic spores, numerous acanthophyses and a distinct pocket rot which is unknown in *Stereum*.

Key to species

Fig. 55. *Xylobolus frustulatus* from Norway, photo T. H. Hofton.

1. Basidiocarps resupinate, usually cracked in numerous smaller parts.....**2**
1. Basidiocarps effused reflexed to pileate with a brown tomentum.. **X. subpileatum**

2. Temperate boreal species, usually on *Quercus*..... **X. frustulatus**
2. Neotropical species on different hard woods..... **X. spectabilis**

Xylobolus frustulatus (Pers.:Fr.) Boidin, **Fig. 55.**

Rev. Mycol. (Paris) 23:341, 1958. - *Thelephora frustulata* Pers.:Fr., Syst. Mycol. 1:445, 1821. - *Thelephora frustulata* Pers., Syn. meth. Fung. p. 577, 1801.
Basidiocarp perennial, usually resupinate, rarely with a narrow black, zonate and glabrous pileus, woody textured, normally1-2 mm thick, but in old specimens may be considerably thicker, in section distinctly stratified into several layers, soon cracked into small, angular polygons. Hymenium smooth, young layers pale ochraceous, older ones dull to deep brown.
Hyphal system monomitic, hyphae 3.5-5 µm wide with simple septa, hyaline to yellowish brown (in older layers more strongly pigmented), sparsely branched, vertically arranged with transitions to acanthocystidia.
Cystidia present, of two kinds;
Pseudocystidia, 18-25 x 4-6 µm, thin to moderately thick-walled, barely or not projecting above the basidia and the acanthocystidia.

Acanthocystidia 25-30 µm x 4-5 µm, abundant, especially so in sterile specimens.
Basidia 25-30 x 4-5 µm, elongate clavate, smooth or with a few basal acanthobasidia.
Basidiospores 4.5-5(-5.5) x 3-3.2(-3.5) µm, shortly elliptic.
Substrate. Predominantly on hard, decorticate wood of *Quercus*, usually fallen branches or trunks of, rarely on other types of hard woods.
Distribution. Follows *Quercus* throughout its range, but is rather rare, especially in the north.
Remarks. Easily recognizable in the field due to the strongly cracked often polygonal basidiocarps, and microscopically, the numerous acanthocystidia.

Xylobolus subpileatus (Berk. & M. A. Curtis.) Boidin.

Rev. Mycol. 23:341, 1958. - *Stereum subpileatum* Berk. & W. A. Curtis, Hooker J. Botany 1:238, 1849.
Basidiocarp perennial, effused-reflexed to distinctly pileate and dimidiate to slightly pendant and often attached by a central point, to 7.0 cm wide and long, coriaceous when fresh, dense and hard when dry, pileus velvety to tomentose, various shades of brown, sometimes with violet tints, often furrowed and sulcate, becoming glabrous in zones when older, exposing a black cuticle, hymenophore initially smooth then slightly tuberculate, sometimes concentrically ridged, grey to orange becoming light brown with age, fertile parts often stratified, context pale ochraceous, with a black cuticle below the pileal tomentum
Hyphal system monomitic, hyphae 3.5-5 µm wide, short-celled, simple septate, vertically arranged and with transitions to acanthocystidia.
Cystidia present, of two kinds;
Skeletocystidia 20-50 x 4-8 µm, thin to moderately thick-walled, barely or not projecting above the basidia and acanthocystidia;
Acanthocystidia, 25-30 µm long and 4-5 µm wide, abundant, especially so in sterile specimens.
Basidiospores 4.5-5.0(-5.5) x 2.5-3.0(3.2) µm, shortly elliptic, thin-walled or occasionally slightly thick-walled, smooth, amyloid.
Substrate. Usually on decorticate wood of *Quercus* spp., but also known other hardwoods.
Distribution. Widespread in the southern oak zone, rare in tropical Africa.
Remarks. Recognized by the pileate basidiocarps with an upper brown, often zoned tomentum. Microscopically, the numerous acanthocystidia will immediately separate it from similarly coloured species of *Stereum.*

Xylobolus spectabilis (Klotzsch) Boidin,

Revue Mycol 23: 341, 1958. -Stereum spectabile Klotzsch, Nova Acta Acad. Caesar. Leop. Carol. 19: 238, 1843. The type came from Amazonas.
Similar to X. frustulatus in all microscopical characters, but usually occurring as large basidiocarps not so prominently cracked as in the X. frustulatus.
Probably should specimens named X. frustulatus from the Amazonian jungle be referred to X. spectabilis. However, this has to be sorted out in a separate study taken into account all names given to species in this group. They have all more or less that same microscopical characters making species distinctions difficult.

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