Synopsis Fungorum 25

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Printed in Power Print A/S, Stenkjer, Norway
Printing date 25 July 2008.
ISBN 978-82-90724-37-0

Nomenclaturial novelties proposed in this volume:

New genus:
Brevicellopsis Hjortstam & Ryvarden,
Radulodontia Hjortstam & Ryvarden

New Species:
Brevicellicium allantosporum Hjortstam & Ryvarden,
Dichomitus efibulatus Ainsworth & Ryvarden,
Fomitopsis ochracea Stokland & Ryvarden,
Radulodontia pyriformis Hjortstam & Ryvarden,
Repetobasidium azoricum Melo, M. Dueñas & Telleria,
Sistotrema aciferum P. Roberts & Henrici
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New combinations
Brevicellicopsis allantospora (Hjortstam & Ryvarden) Hjortstam & Ryvarden
Hjortstamia nova-granata (Welden) Hjortstam & Ryvarden
Hjortstamia fuscomarginata (Burt) Hjortstam & Ryvarden

Repetobasidium azoricum (Basidiomycotina, Sistotremataceae), a new species from Azores Islands

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Abstrat
Repetobasidium azoricum Melo, M. Dueñas & Telleria, a new corticioid species, is described and illustrated, from a specimen collected in Azores, growing on *Rubus* sp. The new taxon is compared with other species of the genus.
Key words: Corticioid fungi, Macaronesian islands.

Introduction
In 1981, Eriksson *et al*., published a key and descriptions of the six European and two North American known species of the genus *Repetobasidium* J. Erikss. They mentioned also *R. hastatum* Hjortstam & Ryvarden, a species described from Africa, Tanzania, by Hjortstam & Ryvarden (1980), which however they do not consider a typical representative of the genus, deviating in the presence of lageniform cystidia and globose spores but sharing with other species of the genus the general appearance and shape of hyphae and basidia. Later, Stalpers (1985), transferred one more species to the genus, *R. glaucocanum* (G. Cunn.) Stalpers, a species until now only found in New Zealand and very close to *R. mirificum* J. Erikss., only differing in the absence of capitate cystidia. And, finally, Oberwinkler (in Oberwinkler & Tschen, 1989), described *R. intermedium* Oberw. from Taiwan, a species characterized by its smaller spores and pleomorphic cystidia.

Examining material collected in the Azores Archipelago we have came across a thin ceraceous specimen with subglobose, repetitive basidia and frequent cystidia, which was placed in the genus *Repetobasidium*. Because no other *Repetobasidium* species corresponds to the Azorean collection in microscopic characters, it is herewith described as new.

Repetobasidium azoricum Melo, M. Dueñas & Telleria, sp. nov. **Fig. 1**
Fructificatio resupinata, effusa, adnata, cerea, hymenophorum leve. Systema monomiticum hypharum, hyphae fibulatae; cystidia a lageniformibus ad lanceololata 50-65(-70) x 8-12 µm; basidia a subglobosis ad piriformia, (12-)13-20 x (7-)8-11 µm, cum quattor sterigmae usque ad 7 µm, cum interna repetitione; sporae elipticae (7-)7-8.5(-9) x 4.5-5.5 µm, cum notato apiculo.
Holotypus: Azores, Terceira, Angra do Heroismo, Mistérios Negros, 26SMH7587, 630 m, on rotten stem of *Rubus* sp., 2/III/2005, 9094 IM, LISU 178594.
Etymology: *azoricum*, from Azores Islands.

Basidiome resupinate, effuse, adnate, porose, rather thin, ceraceous; hymenophore smooth, whitish-creamish, pale buff when dried; margin indeterminate.
Hyphal system monomitic, hyphae with clamps, thin-walled, basal hyphae attached to the wood, with perpendicular hymenial branches, 2-3.5 µm diam.
Cystidia basally widened, lageniform to lanceolate, 50-65(-70) x 8-12 µm, not encrusted, projecting up to 40 µm above the basidia, sometimes presenting adventitious septa and even true clamped septa.
Basidia subglobose to pyriform, (12-)13-20 x (7-)8-11 µm, with 4 sterigmata up to 7 µm; new basidia produced by inner repetition, leaving the remains of the old ones involving the subbasidial cell, that becomes prolonged to a short stalk-like part, which reaches 25 µm in length.
Spores ellipsoid, (7-)7.5-8.5(-9) x 4.5-5.5 µm, with conspicuous apiculus, thin-walled, smooth, with oil drops in the protoplasm, inamyloid, indextrinoid, acyanophilous.

Discussion
This species is very close to the specimen LY 12788 from the Reunion Island, noticed but not described by Boidin *et al*. (1993), with similar cystidia, differing in the subcylindrical spores, (7-)9-11 x 4-4.5 µm, and short basidia, 10-12 x 8-9 µm. The African species *R. hastatum* Hortstam & Ryvarden (Hortstam & Ryvarden, 1980), presents the same kind of lageniform cystidia with adventitious septa but deviates from *R. azoricum* in the shape of the spores, nearly globose,

and in the thick-walled basidial stalks, up to 6-8 μm wide. Within the group of *Repetobasidium* with conical cystidia, the new species agrees with *R. americanum* J. Erikss. & Hjortstam in spore morphology. It differs, however, in the presence of longer cystidia basally widened, larger spores and shorter basidial stalks which reach 100 μm in the latter species.

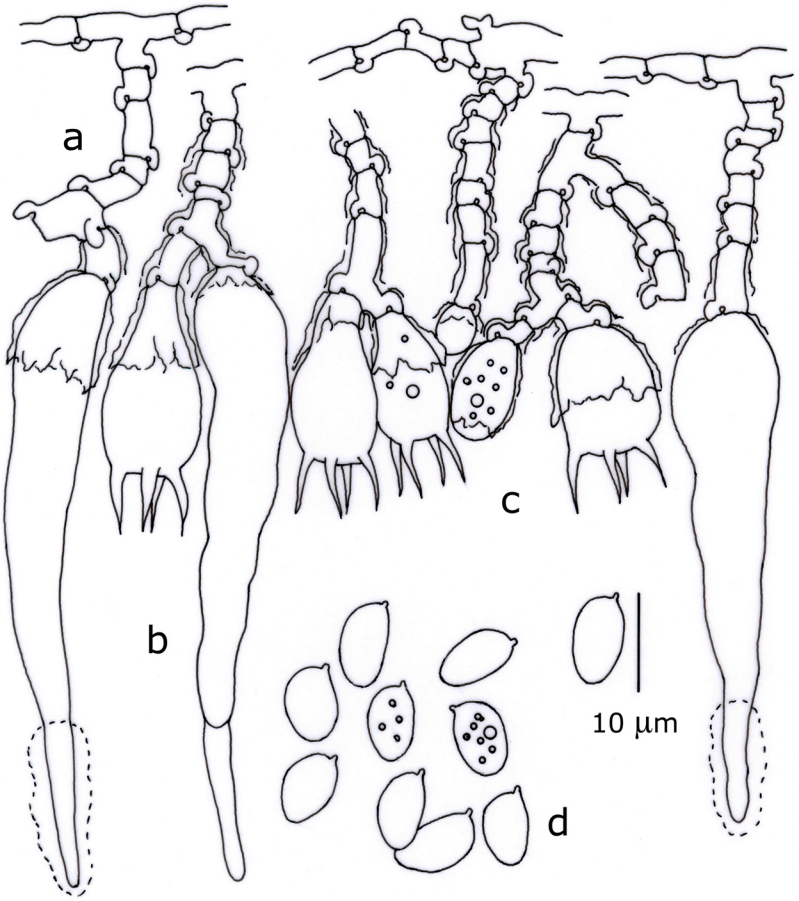

Fig. 1. *Repetobasidium azoricum* (9094 IM): a) hymenial branches, b) cystidia, c) basidia, d) spores.

Key to the genus Repetobasidium [adapted from Eriksson *et al.*, 1981)

1. Cystidia distinctly capitate ……...… 2
1. Cystidia otherwise ……...……. 4

2. Spores globose to subglobose …….……. 3
2. Spores ellipsoid ……... ***R. canadense*** J. Erikss. & Hjortstam

3. Basal hyphae with gelatinuous walls, basidial stalks densely covered with remnants of old basidia, spores 4-5.5 µm diam. ……...***R. vestitum*** J. Erikss. & Hjortstam
3. Basal hyphae not gelatinous, basidial stalks with indistinct remnants of old basidia, spores 5-7 x 4.5-5.5 µm ..……...….. ***R. mirificum*** J. Erikss.

4. Cystidia conical to subconical-ovate .....…….... 5
4. Cystidia tubiform or lageniform ……..…… 9

5. Cystidia conical …… 6
5. Cystidia subconical to ovate …… ***R. glaucocanum*** (C.H. Cunn.) Stalpers

6. Spores globose to subglobose ……..…… 7
6. Spores ellipsoid-allantoid ……..8

7. Spores 5.5-7 x 4-5 µm ……..... ***R. conicum*** (Oberw.) J. Erikss. & Hjortstam
7. Spores 4 (-4.5) x 3-3.5 µm .....… ***R. intermedium*** Oberw.

8. Spores ellipsoid, 6-7.5 x 3.5-4.5 µm .... ***R. americanum*** J. Erikss. & Hjortstam
8. Spores allantoid, 6-8 (-12) x 2-3 (-3.5) µm ……...…….. ***R. vile*** (Bourdot & Galzin) J. Erikss.

9. Cystidia tubiform, obtuse …….....……. 10
9. Cystidia lageniform ……...…. 11

10. Spores allantoid, 8-10 x 3.5-5 µm ……..……... ……***R. macrosporum*** (Oberw.) J. Erikss. & Hjortstam
10. Spores ellipsoid, 5-6 (-7) x 2.5-3.5 µm ……. ***R. erikssonii*** Oberw.

11. Spores globose, 6-7 µm diam. ..... ***R. hastatum*** Hjortstam & Ryvarden
11. Spores ellipsoid, (7-)7.5-8.5 x 4.5-5.5 µm diam. …….....…. ***R. azoricum*** Melo, M. Dueñas & Telleria

Acknowledgments
Financial Support was given by DGI project nº CGL-2005-01192/BOS. We express our thanks to Secretaria Regional do Ambiente and Secretaria Regional de Agricultura e Florestas of Azores for authorizing us to collect fungi in the archipelagos; Doctor Rosalina Gabriel, for her local expertise in the field, making our stay in Terceira a very profitable one.
We are grateful to Mr. J. Muñoz del Riego for his help in preparing the latin diagnosis.

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Eriksson, J., Hjortstam, K. & Ryvarden, L. 1981. The Corticiaceae of North Europe. Vol. 6. *Phlebia-Sarcodontia*. Fungiflora, Oslo, Norway.
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Stalpers, J. 1985. Type studies of the species of *Corticium* described by G.H. Cunningham. New Zealand Journal of Botany 23(2): 301-310.

Sistotrema aciferum: a new, long-spored, corticioid fungus from England

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Abstract
Sistotrema aciferum is described as new, based on an English collection on a dead stem of *Pteridium aquilinum*.

Introduction
An unusual corticioid fungus with narrow, elongated basidiospores and unclamped hyphae was recently collected in Surrey, England, on a dead, attached bracken stem (*Pteridium aquilinum*). The species is described as new, as follows:

Sistotrema aciferum P. Roberts & A. Henrici **sp. nov.**
Basidiomata effusa, laevia, farinacea, albida, inconspicua. *Hyphae* 2 – 8 µm latae, tenui- vel crassitunicatae, efibulatae. *Cystidia* usque 70 µm longa, tubulosa vel clavata vel acuta, laevia, tenuitunicata. *Basidia* c. 25 – 30 x 3 – 6 µm. *Basidiosporae* filiformes, 24 – 30 x 1.5 – 2 µm, laeves, inamyloideae.
Holotype: England, Surrey, Richmond Park, on dead attached stem of *Pteridium aquilinum*, 6 Jul. 2007, A. Henrici, K(M) 153665.
Etymology: from the Latin *acus* (a needle) + *fer* (bearing)

Basidiomes effused, smooth, farinaceous, white, thin and inconspicuous.
Hyphal system monomitic; **hyphae** hyaline, not agglutinated, conspicuous, 2 – 8 µm wide, mostly thin-walled but some basal hyphae with slightly thickened walls, lacking clamp-connexions.

Cystidia apparently present as scattered, +/- tubular, thin-walled elements up to 70 x 6 µm, variously clavate, acute, or rarely furcate.
Basidia in small clusters, c. 25 – 30 x 3 – 6 µm, 4-spored.
Basidiospores filiform (Q = 12 – 18), 24 – 30 x 1.5 – 2 µm, distinctly angled near the apiculus, smooth, inamyloid.

Remarks
This new species is of uncertain disposition, but is tentatively referred to the genus *Sistotrema* Fr. *sensu lato* because of its similarity to species such as *S. pyrosporum* Hauerslev (as illustrated in Eriksson *et al*., 1984) with which it shares a similar hyphal construction (thin, effused, with conspicuous, non-agglutinated, unclamped hyphae, the basal hyphae often wider and slightly thick-walled) and similar basidia (often slightly constricted and produced in small clusters). *Sistotrema aciferum* differs from *S. pyrosporum* in its cystidia, in its consistently 4-spored basidia, and above all in its remarkable filiform spores. It is worth noting that these spores mature unevenly, as illustrated in Fig. 1.

The collection was made in an old, 100 ha, deer park which still contains some 300 red deer (*Cervus elaphus*) and 350 fallow deer (*Dama dama*). Though situated within a London borough, the habitat is open pasture woodland, the woodland mainly consisting of ancient pollarded oaks (*Quercus robur*) several of which support the polypore *Piptoporus quercinus* (Schrad.) P. Karst. Much of the ground is covered by bracken which, at the time of collection, was also host to *Ceratobasidium cornigerum* (Bourdot) D.P. Rogers, *Hyphodontia detritica* (Bourdot) J. Erikss., and the ubiquitous *Phlebiella filicina* (Bourdot) K.H. Larss. & Hjortstam. No further specimens of *S. aciferum* could be found on a return visit a few days after the initial collection.

Reference
Eriksson, J., Hjortstam, K, & Ryvarden, L. (1984). *The Corticiaceae of North Europe*,
Vol. 7: 1282 – 1449.

Fig. 1. ***Sistotrema aciferum***. Basidiospores, cystidium, basidia, and unclamped basal hyphae

Some Corticioid fungi (Basidiomycotina) from Ecuador

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Abstract
Thirty-five species of corticioid fungi are reported from Ecuador. The new genus, *Brevicellopsis* is described to accommodate *Brevicellicium allantosporum*. *Steccherinum perparvulum* is described as a new species and the following combinations are proposed: *Brevicellicopsis allantospora*, *Hjortstamia novagranata*, and *Hjortstamia fuscomarginata*.

All specimens cited below, if not mentioned otherwise, are from Orellana Prov., Yasuni National Park, Yasuni Scientific Research Station, 9-12.III. 2002 and collected by Leif Ryvarden. The specimens are deposited either in (O), (GB) or in Hjortstam Private Herb. (Hjm Priv. Herb.) There are also some specimens forwarded by Thomas Laessøe: Pichincha, El Parque de Pasochoa and areas surrounding the reserve, mixed humid and relative old stunted, montane forest with many bamboo thickets. T. Laessøe, Herb. (AAU, QCA, K, or in Hjm Priv. Herb.).

Auriscalpium villipes (Lloyd) Snell & Dick,
Lloydia 21:35, 1958. - *Hydnum villipes* Lloyd, Mycol. Not. 56:801, 1918.
The species is widely distributed in neotropical areas and there is a description in Ryvarden (2001). Another species known from Ecuador is *A. andinum* (Pat.) Ryvarden and differs mainly by smaller and paler basidiome.
Specimen: 44592.

Australicium singulare (G. Cunn.) Hjortstam & Ryvarden, Synopsis fungorum 15:19, 2002. - *Corticium singulare* G. Cunn., Trans. R. Soc. New Zeal. 82: 325, 1954.
This is possibly a pantropical species, but still little known. The Ecuadorian specimen is almost identical to the type. There is a description in Hjortstam and Ryvarden (2002) and another appears in Burdsall (1985).
Specimen: 44439.

BREVICELLOPSIS Hjortstam & Ryvarden gen. nov.
Basidioma resupinatum, laxe adnatum; hymenio primo albido tum leviter ochraceo, distincte odontioide, aculeis parvis, fragilibus, circiter 0.1-0.2 mm longis; systemate hyphali monomitico; hyphis basalibus rectis; hyphis subhymenialibus dilatatis, parietibus leviter isodiametris, cum fibulis; cystidiis nullis; basidiis clavatis, 4 sterigmatibus; sporis reniformibus vel allantoidibus, tenuitunicatis, fere 4 x 1.5 µm, inamyloideis, indextrinoideis, acyanophilis.
Generic type: *Brevicellicium allantosporum* Hjortstam & Ryvarden
Generitype specimen: Tanzania, Tanga Prov., Usambara Mts., 18-19 Feb 1973 L. Ryvarden 10601 (GB). Isotype: Hjm Priv. Herb.
Microscopically the genus is similar to *Brevicellicium* K. H. Larss. & Hjortstam by having a slight isodiametric hyphal appearance. The latter characteristics is, however, more pronounced in the generic type of *Brevicellicium* (*Corticium exile* H. S. Jacks.). Moreover, the hymenophore in *Brevicellicium* are firmly granular or almost smooth and the spores are rhomboid or rarely short ellipsoid, whereas in the *Brevicellopsis* the hymenophore are fragile and distinctly odontioid with inner part of the aculei almost filled with crystals and the spores are narrowly allantoid.

Brevicellopsis allantospora (Hjortstam & Ryvarden) Hjortstam & Ryvarden comb. nov. Basionym: *Brevicellicium allantosporum* Hjortstam & Ryvarden, Mycotaxon 12:170, 1980.
Basidiome resupinate, loosely adnate, soft and fragile. Hymenophore distinctly odontioid, with small almost subulate aculei, 0.1-0.5 mm long, at first whitish to greyish white, then often pale ochraceous, in the centre with strongly encrusted hyphae. Hyphal system monomitic; basal hyphae thin to moderately thick-walled 2.5-4 µm wide, subhymenial hyphae thin-walled, with a slight isodiametric appearance, 7-8(-10) µm wide, all hyphae with clamp connections. Cystidia absent. Basidia 10-12 x 4 µm, with four sterigmata. Spores reniform to allantoid, thin-walled, often with two oildrops in the protoplasm, 3.5-4 x (1.25-)1.5-1.75 µm, inamyloid, indextrinoid, acyanophilous.
The species has a tropical distribution with all specimens on wood and originally

described from Tanzania. It is, however, besides Ecuador recorded in Brazil, Colombia, Venezuela, and Borneo.
Specimen: 44665.

Byssomerulius ambiguus (Berk.) Gilb.& Budington,
J. Ariz. Ac. Sci. 6:92, 1970. - *Merulius ambiguus* Berk., Grevillea 1:69, 1872.
Type locality: USA (South Carolina) on *Pinus palustris*.
This species has been referred to both *Meruliopsis* by Ginns (1976) and *Gloeoporus* by Zmitrovich, Maylsheva and Spirin (2006) and according to Ginns and Lefebvre (1993) as *Meruliopsis*, it seems fairly common in North America. Another species is *Merulius conchoides* Lloyd, described from Ecuador and placed in synonymy with *Merulius corium* by Ginns (1969), but later with *Merulius ambiguus* (Ginns 1976).
It would be desirable to re-examine the syntypes of *Merulius ambiguus* and type of *Merulius conchoides* Lloyd as well as of additional material from South America. We believe that the specimen given below should be placed at least in vicinity of *B. ambiguus*.
Specimen: T. Laessøe No. TL 069.

Ceraceomyces simulans (Berk. & Broome) Hjortstam,
Kew Bull. 44:312, 1989. - *Corticium simulans* Berk. & Broome, J. Linn. Soc. Bot. 14:72, 1875.
The specimen from Ecuador is apparently very similar to *Corticium simulans*, originally described from Sri Lanka. There are, however, few specimens collected from the neotropical zones to exactly verify the conformity with the original material. Microscopically the species is also extremely similar to *Ceraceomyces borealis* (Romell) J. Erikss. & Ryvarden and *Fibulomyces septentrionalis* (J. Erikss.) Jülich.
Specimen: 44709.

Columnodontia subfascicularia (Wakef.) Jülich,
Persoonia 10:326, 1979. - *Acia subfascicularia* Wakef., Trans. Proc. R. Soc. Australia 54:155, 1930. *Odontia subfascicularia* (Wakef.) G. Cunn., Proc. Linn. Soc. New South Wales 77:294, 1953.
This is a little known species, originally described from Australia. It is somewhat reminiscent of *Mycoacia fuscoatra* (Fr.:Fr.) Donk, but differs mainly by less robust basidiome with an unchanged colour, more or less russet, the spores are a little smaller, ellipsoid or narrowly ellipsoid, with a slight curved appearance 4-4.5 x 1.8-2 µm. At present we prefer to keep it in *Columnodontia*, typified with *C. resupinata* Jülich. Specimen: T. Laessøe TL 099.

Corneromyces kinabalui Ginns,
Mycologia 68:970, 1976.
The species was originally described from Borneo based on a Corner specimen and later on reported from Colombia by Hjortstam and Ryvarden (2001). See also Hjortstam, Spooner and Oldridge (1990).
The species is easily recognized by a smooth brownish hymenophore, basidia 50-70 x 12 µm and spores up to 20-30 x 7-12 µm with a strong amyloid reaction.
Specimens examined: Ecuador, Cuyabeno, Sucumbios Prov., 300 m.a.s.l., on hanging branch, 1990, M. Nuñez MN 306 (Hjm Priv. Herb.) and M. Nuñez MN 304 (GB).

Crustodontia chrysocreas (Berk. & M. A.Curtis) Hjortstam & Ryvarden,
Synopsis Fungorum 20:36, 2005. - *Corticium chrysocreas* Berk. & M. A. Curtis, Grevillea 1:178, 1873.
A variable taxon with many assumed synonyms, the types of which are not yet examined properly. Both specimens from Ecuador are smooth; otherwise conforming to the general concept.
Specimens: 44469 and 4502.

Cystidiodontia laminifera (Berk. & M. A.Curtis) Hjortstam,
Mycotaxon 39:416, 1990. - *Hydnum laminiferum* Berk. & M. A. Curtis, J. Linn. Soc. Bot. 10:325, 1868. - *Cystidiodontia artocreas* (Berk. & M. A. Curtis ex Cokke) Hjortstam, Mycotaxon 17:571, 1983.
Fairly common in South America and recorded in all countries visited and originally described from Cuba.
Specimens: 44666, 44742 and T. Laessøe TL-10122.

Duportella trigonosperma (Boidin et al.) Hjortstam,
Windahlia 17:58, 1987. - *Peniophora trigonosperma* Boidin et al., Trans. Br. Mycol. Soc. 81:282, 1983.
New to South America and the species is further known from Gabon (type locality), Thailand, and Cameroon. All specimens are on palm trees on the ground. This is an odd species in *Duportella*, preferably by clampless hyphae and triangular spores. For a detailed description see Boidin & Lanquetin (1983).
Specimen: 44626.

Fibrodontia brevidens (Pat.) Hjortstam & Ryvarden,
Synopsis Fungorum 20:54 2005. - *Irpex brevidens* Pat., Bull. Herb. Boiss. 3:55, 1895.

Originally a species from Ecuador (Pululahua) and was fully described and illustrated by Langer (1994) as *Hyphodontia brevidens* (Pat.) Ryvarden.
Specimens: 44529, 44595/B, and 44643.

Gloeocystidiellum peroxydatum (Rick) Stalpers & Hjortstam,
Mycotaxon 14:78, 1982. - *Gloeocystidium peroxydatum* Rick, Brotéria (Lisboa) Sér. trimest. Cienc. nat. 3:46, 1934.
Originally described from Brazil and occasionally recorded from other countries in South America, but seems to be rather rare confused with other species in *Gloeocystidiellum* s.l.without clamp connections.
Specimen: 44564.

Gloeopeniophorella rubroflava Rick,
Brotéria (Lisboa) Sér. trimest. Cienc. nat. 3:47, 1934. - *Gloeocystidiellum rubroflavum* (Rick) Hjortstam, Windahlia 23:2, 1998.
Basidiome resupinate, effused, adnate, somewhat membraneous. Hymenophore more or less smooth or with a very slight tuberculate appearance, with protruding cystidia, ochraceous or with a pale rosy tint. Hyphal system monomitic; hyphae hyaline, thin-walled or more commonly with a slight wall thickening, up to 4(-5) µm wide, without clamp connections. Metuloids numerous, hyaline, moderately thick-walled, generally up to 30-50 µm long, without dextrinoid reaction. Gloeocystidia few, sinuose, thinwalled, up to 150 µm long and about 10-12 µm wide in the middle part, apparently without a positive sulfovanillin reaction. Basidia narrowly clavate, 20-35 x 4.5-5 µm, with four sterigmata, without a basal clamp connection. Spores narrowly ellipsoid, verrucose, but mainly appearing smooth in KOH, 4-5,5(-6) x 3.5-4.5 µm, distinctly amyloid.
This species is so far known only from South America. The important characteristics are gloeocystidia, metuloids, and hyphae without clamp connections.
Specimen: 44624.

Hjortstamia Boidin & Gilles,
Bull. Soc. Mycol. France 118:99, 2002.
Generic type: *Thelephora friesii* Lév.
The genus *Hjortstamia* was introduced to accomodate stereoid species with dimitic hyphal system and hyphae without clamp connections. Some species have few clamp connections on the basal hyphae, but they never at the basidia base. Almost all species were previously placed either in *Porostereum* by Hjortstam and Ryvarden (1990) or *Lopharia* by Welden (1975).

Hjortstamia crassa (Lév.) Boidin & Gilles,
Bull. Soc. Mycol. France 118:99, 2002. - *Thelephora crassa* Lév., Ann. Sci. Nat. Bot. ser.III, 2:209, 1844.
The species is generally treated as pantropical and most likely described several times or belongs into a complex of closely related species. Presumed synonyms are not quoted here (see Hjortstam & Ryvarden 1990).
Specimen: 44737.

Hjortstamia nova-granata (Welden) Hjortstam & Ryvarden comb. nov.
Basionym: *Lopharia nova-granata* Welden, Mycologia 67:540, 1975.
For a description see Hjortstam and Ryvarden (1990). Known only from the type locality in Colombia. A monomitic species and apparently similar to the *H. fusco-marginata*, but the latter has spores 7.5-9 x 4.5-5 µm compared with *H. nova-granata* 5.5-7 x 3-5 µm.

Hjortstamia fuscomarginata (Burt) Hjortstam & Ryvarden comb. nov.
Basionym: *Peniophora fuscomarginata* Burt, Ann. Mo. Bot. Gard. 12:335, 1926.

Breif description from RLG 10485 (Arizona) and 10384 (New Mexico).
Duplicates in GB and Hjm Priv. herb.:
Basidiome resupinate, brownish with a distinct brown subiculum composed of thick-walled, yellowish brown hyphae without clamp connexions, basidial clamps not seen. Cystidia few, mainly subhymenial, more or less subulate, apically encrusted. Spores broadly ellipsoid, (7-7.5-)8.5-9 x (4-)4.5-5 µm.
Originally described from U.S.A. (Louisiana) and with a doubtful specimen (sterile) from Florida, see further Liberta (1968). In addition one specimen from Uruguay, see Gazzano (1994) as *Phanerochaete xerophila*, corrected by Martinez and Nakasone (2005).

Key to neotropical species of *Hjortstamia*

1. Hyphal system monomitic, skeletocystidia (pseudocystidia) smooth….2
1. Hyphal system dimitic 3

2. Spores 6-7 x 3.5-4.5 µm, on wood, Argentina and Paraguay **H. monomitica**
2. Spores slightly smaller, 5.5-7 x 3-4 µm, on bamboo, Colombia ..... **H. nova-granata**

3. Basidiome at least with a tinge of violet-purplish colour, metuloids brownish, spores 5-6 x 3-3.5 µm. On wood in Brazil only ..... **H. amethystea**

3. Basidiomes brownish, as a rule on wood 4

4. Basidiome pileate, cystidia mainly as metuloids, 30-80 µm long, spores 5-6(-7) x (3-)3.5-4 µm. Presumably a Neotropical species, but not known from Ecuador ..... **H. papyrina**
4. Basidiome effused-reflexed, cystidia as skeletocystidia, spores 5-7 x 3-4 µm .....**H. crassa**

Hyphoderma argillaceum (Bres.) Donk,
Fungus 27:14, 1957. - *Corticium argillaceum* Bres., Fungi Trid. 2:63, 1898.
It is known to be a cosmopolitan species, although variable. The below specimens are fairly near the concept of the species. The main differences are the somewhat pointed cystidia, and the spores tend to be short ellipsoid. *Hyphoderma gemmeum* (D. P. Rogers) Donk is similar, but has much slender cystidia.
Specimen: 44518 (on a *Ganoderma* sp.), 44525 (on wood), and 44614/b (rather poor, on a *Ganoderma* sp.).

Hyphoderma ayresii (Berk. ex Cooke) Boidin & Gilles,
Cryptog. Mycol. 12:103. 1991. - *Peniophora ayresii* Berk. ex Cooke, Grevillea 8:21, 1879.
Description of the Ecuadorian specimen:
Basidiome effuse, adnate, fairly dense, approximately 0.2-0.3 mm thick. Margin indeterminate. Hymenophore distinctly pilose by projecting cystidia, pale ochraceous to ochraceous. Hyphal system monomitic; basal hyphae 2.5-4(-4.5) µm wide, fairly thick-walled, agglutinated, subhymenial hyphae in a dense layer, thin-walled, narrower, 2-3 µm wide, all hyphae with clamp connections. Metuloids numerous, subulate, projecting, in the upper part thick-walled, hyaline, variable in size, mainly 60-100 µm long and with a 12-15 µm wide encrusted part. Hyphal ends present, often abundant, 1.5-2.5 µm wide, often sinuous and sometimes with a subcapitate ending. Basidia subclavate, with oily contents, sinuous, thin-walled, normally 35-50 µm long and 8-12 µm wide in the upper part, with four sterigmata and a basal clamp connection. Spores oblong-ellipsoid, smooth, thin-walled, with oily contents, variable in size, but mainly 10-13 x 5-7 µm.
In outer appearance it is strongly reminiscent of a *Phlebiopsis* and *Lopharia cinerascens*. The species in the first genus are all monomitic and further characterized by lacking clamp connections and have smaller spores. Species in *Lopharia* can chiefly be characterized by a reflexed margin and a dimitic hyphal system.

It should be noted that the holotype in Kew is somewhat poor, but is a large specimen with typical metuloids which already were mentioned by Cooke in the original description. However, spores have not been observed. The species is obviously similar to *Hyphoderma macrosporum* Sheng H. Wu and should be synonymous according to Boidin and Gilles (op.cit.).
Hyphoderma ayresii was reported from Venezuela by Hjortstam, Ryvarden and Iturriaga (2005), but these specimens representing *Lopharia cinerascens*.
Specimen: 44678.

Hypochniciellum luteolum Hjortstam & Ryvarden,
Mycotaxon 74:247, 2000.
The species was described from Colombia and hitherto known from the type only.
There is a small difference in the spore size between the type and the Ecuadorian specimen, but at present we prefer to place it under this name. The latter has spores about 3-4 x 3-3.5 µm whereas the spores in the holotype are slightly smaller, mainly 3 x 2.25 µm, but variable.
It should also be noted that *Amylocorticiellum subillaqueatum* (Litsch.) Spirin & Zmitr. is extremely similar. The genus *Amylocorticiellum* was described to accommodate *Corticium subillaqueatum* Litsch. See Zmitrovich and Spirin (2002).
Specimen: 44504

Kneiffiella crassa (Rick) Hjortstam & Ryvarden,
Synopsis fungorum 15:14, 2002. - *Odontia crassa* Rick, Egatea 17:279, 1932.
Hyphodontia orasinusensis Gilb. & M. Blackw., Mycotaxon 33: 382., 1988.
This is only known from northern part of South America and originally described from USA (Louisiana).
Specimen: 44530.

Kneiffiella tetraspora (S. S. Rattan) Hjortstam & Ryvarden,
Synopsis fungorum 15:16, 2002. - *Hyphodontia efibulata* f. *tetraspora* S. S. Rattan, Bibl. Mycol. 60: 335, 1977.
For a brief description of this species and its distribution, see Hjortstam and Ryvarden (op.cit. and 2007 respectively).
Specimens: 44461, 44545/C.

Mycoaciella hinnulea (Bres.) Hjortstam & Ryvarden,
Mycotaxon 10:281, 1980. - *Odontia hinnulea* Bres., Annls mycol. (Berlin) 18:42, 1920.

This species is so far known from the northern part of South America and from a single specimen in Dominican Republic (27.II.2001, Omar Paino et Perdomo 642, portion in Hjm Priv. Herb.). The genus is characterised by the dimitic hyphal system and all species in the genus have clamp connections except *M. badia* (Pat.) Hjortstam & Ryvarden. For additional information and a key to the species, see Hjortstam and Ryvarden (2004).
Specimen: 44464.

Odontiopsis ambigua (Berk. & Broome) Hjortstam & Ryvarden,
Mycotaxon 28:35, 1987. - *Hydnum ambiguum* Berk. & Broome, J. Linn. Soc. Bot. 14:60, 1875. - *Odontiopsis hyphodontina* Hjortstam & Ryvarden, Mycotaxon 12:180, 1980.
For further information of its distribution, see Hjortstam and Ryvarden (2007).
Specimen: 44458.

Phanerochaete australis Julich,
J. Linn. Soc. Bot. 81:43, 1980.
A well known species, especially in the northern part of South America.
Specimen: 44465.

Phlebia ludoviciana (Burt) Nakasone & Burds.,
Mycotaxon 14:3, 1982. - *Peniophora ludoviciana* Burt, Ann. Mo. Bot. Gard. 12:244, 1926.
This is a species described from USA (Louisiana) and also reported by Nakasone, Burdsall and Noll from Florida (1982). It is extremely similar to *Phlebia subochracea* (Bres.) J. Eriksss. & Ryvarden, but should be separated by more strongly encrusted cystidia. Also *Phlebia caspica* Hallenb. (type from Iran) seems to be near.
For a full description see the above authors.
Specimens: T. Laessøe TL 73 and 115.

Resinicium friabile Hjortstam & Melo,
Mycotaxon 65:324, 1997.
This is possibly rather common in South America, but not with certainty observed from the investigated area. It should be noted that Nakasone (2007) described several species from Caribbean, obviously closely related to each other. Some specimens from Ecuador may belong among these species.
Specimens: 44513, 44650 (poor), and 44660, seem to be near *R. friabile*; 44570 (with almost globes spores) and 44614.

Rhizochaete radicata (Henn.) Greslebin et al.,
Mycologia 96:268, 2005. - *Corticium radicatum* Henn., Engler Pflanzenwelt Ost-Afrikas, Lieferung 1, Theil C., p. 54, 1895.
This is a pantropical species and for further knowledge about the species and distribution, see Greslebin et al. (op.cit.).
Specimens: 44581, 441582.

Schizopora paradoxa (Schrad.:Fr.) Donk,
Persoonia 5:76, 1967. - *Hydnum paradoxum* Schrad.:Fr., Syst. Mycol. 1:424, 1821.
According to E. Langer (1994) a cosmopolitan species and known from several countries in South America.
Specimen: T. Laessøe TL 094

Scopulodontia latemarginata (Pat.) Nakasone,
Cryptog. Mycol. 24:141, 2003. - *Odontia latemarginata* Pat., J. Bot. (Morot) 11:342, 1897. - *Odontia hirta* Pat. non Fuckel, J. Bot. (Morot) 11:342, 1897. - *Odontia patouillardii* Sacc. & P. Syd., Syll. Fung. 14: 210, 1899, a substitute for *O. hirta* Pat.
Odontia tessellata G. Cunn., Trans. Roy. Soc. New Zeal. 86:89, 1959.
Scopulodontia loricata Hjortstam & P. Roberts, Kew Bull. 53:821, 1998.
This is a rare and supposedly with a pantropical distribution including New Zealand. The specimens from Ecuador are, at least at present, accepted to conform to the concept of the species. The type-material of *Odontia latemarginata* has not been studied in this case. For description and comments see Nakasone (op.cit.) and Hjortstam and Roberts (op.cit.).
Specimens: 44473, 44499 and T. Laessøe TL-155.

Scotomyces subviolaceus (Peck) Jülich,
Persoonia 10:334, 1979. - *Hypochnus subviolaceus* Peck, Ann. Rep. St. Bot. 1893:25, 1894.
Originally described from Canada and has a wide world distribution, there is a good description by Roberts (1999).
Specimens: 44562, 44562/B, 44642.

Steccherícium seriatum (Lloyd) Maas Geest.,
Proc. K. Ned. Akad. Wet. (C) 69:325, 1966. - *Hydnum seriatum* Lloyd, Mycol. Writ. 7:1196, 1923.
Originally described from Borneo and is a pantropical species.
Specimen: 44596.

Steccherinum perparvulum Hjortstam & Ryvarden spec. nov.
Species Steccherinum subochraceum similis sed differt sporis 2.5-2.75 µm diam.
Holotype: Brazil, São Paulo, Campinas, Moji-Guaçu, Fazenda Campininha, on wood, 29-30.I.1987, D. Pegler, K. Hjortstam, L. Ryvarden 24589 (O).
Isotype: Hjortstam Priv. Herb. and possibly in Kew Herbarium under the name *Steccherinum subochraceum*.
Paratype: Ecuador, Orellana Prov., Yasuni National Park, Yasuni Scientific Reasearch Station, on dead wood, 9-12.III.2002, L. Ryvarden 44739 (O).
Basidiome effuse, adnate or reflexed with the margin and subiculum paler then the fertile hydnoid part, margin smooth to byssoid or fimbriate. Hymenophore distinctly hydnoid, pale salmon-coloured, aculei conical, almost smooth, subulate, generally simple to more rarely crowded, about 6-8 per mm and 0.5(-1) mm long. Hyphal system dimitic; skeletal hyphae thick-walled, swelling in KOH, 2.5-3 µm wide, without clamp connections, other hyphae interwoven with skeletal hyphae, 2.5-3.5 µm wide and with clamp connections, thin-walled. Subhymenial hyphae next the basidia difficult to discern and separate. Skeletocystidia numerous in the aculei, rarer in the relatively thin subiculum, in the apical part strongly encrusted as much as 10-30 µm, often considerably longer, generally obtuse, hymenial cystidia (metuloids) in varying numbers, but common in the middle part of the aculei, 25-30 um long, probably with a basal clamp connection. Basidia subclavate, slightly sinuous, 12-15 x 4-4.5 µm, with four sterigmata and a basal clamp connection. Spores almost globose, thin-walled, smooth, 2.25-2.5 x 2 µm, or 2.5 µm diam., inamyloid, indextrinoid, acyanophilous.
This new species can readily be separated from *Steccherinum subochraceum* Bononi & Hjortstam (see below) by shorter and somewhat slender aculei and above all by shorter basidia and smaller spores. The spores are the smallest in size in the genus.

Steccherinum subochraceum Bononi & Hjortstam,
Mycotaxon 25:467, 1986. - *Irpex hydneus* Rick, in Rambo Iheringia Bot. 5:190, 1959 (Illegitimate, type missing).
Brief description:
Hymenophore distinctly hydnoid, pale salmon-coloured, aculei conical, almost smooth, subulate, simple to rarely crowded, about 4-5 per mm and 1-2(-3) mm long. Cystidia of two kinds; skeletal cystidia numerous in the aculei, rare or absent in the subiculum, strongly encrusted as much as 10-20 um in the apical part, blunt to more rarely conical, hymenial cystidia (metuloids) in varying numbers, but common in the middle part of the aculei, 30-40 um long, subconical and apically encrusted, with a basal clamp connection. Basidia

subclavate, slightly sinuous, (-15-)20-35 x 4.5-5 um. Spores almost globose, thin-walled, smooth, (3-)3.5(-4) um in diam., or when subglobose about 3-3.5 x 3.5-4 um.
This species is extremely similar to both the above *Steccherinum perparvulum* and *S. ochraceum* (Pers.:Fr.) Gray. From the first species separated by larger spores and with somewhat longer and more robust aculei. *S. ochraceum* has spores ellipsoid, (3.25-)3.5(-4) x (2-)2.25-2.5 um. All three species seem to have short hymenial metuloids normally observed in the middle part of the aculei, though much less pronounced in *S. ochraceum*.
The species is recorded several times in Brazil and further known from Colombia (Hjortstam & Ryvarden 1997).
Specimen: T. Lassoe, 064/AAU 60814 (K and in Hjm Priv. Herb.).

Subulicystidium longisporum (Pat.) Parmasto,
Conspectus syst. corticiacearum: (Tartu) p. 121, 1968.
About eight species have been described in the genus, mainly separated by the size of the spores. For the distribution see Hjortstam and Ryvarden (2007). All three specimens below have spores of varied appearance, but we prefer to use the epithet *S. longisporum* in a wide sense.
Hypochnus euphorbiae Pat. 1895 seems to belong in *Subulicystidium*, but type not seen.
Specimens: 44648, 44667, 44688.

Trechispora regularis (Murrill) Liberta,
Can. J. Bot. 51:1878, 1973. - *Poria regularis* Murrill, Mycologia 12: 87, 1920.
This is a species fairly common in South America. See further Larsson (1992 Thesis) for description, distribution and remarks.
Specimen: 44645.

Xenasma pulverulentum (Litsch.) Donk,
Fungus 27:25, 1957. - *Corticium pulverulentum* Litsch., Österr. Bot. Zeitschr. 88:112, 1939.
The species was originally described from Austria and apparently with a world-wide distribution and recently also noted from New Zealand (McKenzie E. H. C. et. al. 2000).
Specimen: 44563.

Xenasma rimicolum (P.Karst.) Donk
Fungus 27:25, 1957. - *Corticium rimicolum* P. Karst., Hedwigia 35: 45, 1896.
According to Hjortstam and Ryvarden (2007) it should be a world-wide species.

It should be noted that in the original description by Karsten the epithet was spelled “rimicolum”, thus the author treated it with an adjectival ending, –colus, -cola, -colum. Specimen: T. Laessøe 096 (K?).

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Corticioid species (Basidiomycotina, Aphyllophorales) from Colombia IV

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Abstract
Thirteen species are reported as new from Colombia and one *Mycoacia rubiginosa* is re-collected. One genus, *Radulodontia* is described to accommodate the new species *Radulodontia pyriformis*. It is a hydnoid species with conical aculei, lacking cystidia and with pyriform spores. Finally *Tubulicium erectum* is described as new and can be recognized by large lyocystidia and subglobose thick-walled, large spores.

Introduction
This is the forth contribution to the knowledge of the corticoid fungi of Colombia (for I-III : Hjortstam & Ryvarden 1997, 2000 & 2001). As in previous papers, to avoid lengthy descriptions of localities, the following list is given so the reader can easily find pertinent details as the where the reported specimens were found.

List of localities
15436 - 15787: Bogota, 16 km west of the town, 3. June 1978.
16036 - 16061: Magadalena prov. San Lorenzo, Station Reservo, 16. June 1978.
16245 - 16293: Magadalena prov. San Lorenzo, Station Campano, 20. June 1978.
16329 - 16372: Magadalena prov. San Lorenzo, Station Minca, 21. June 1978.

List of species

Coniophora fusispora (Cooke & Ellis) Sacc.,
Syll. Fung. 6: 650, 1888. - *Corticium fusisporum* Cooke & Ellis, Grevillea 8:11, 1879.
This is not previously reported from South America and seems to be a rare fungus elsewhere. From subtropical regions at least known from USA (Florida) and Zimbabwe, see Hjortstam and Ryvarden (2007). The species is above all characterized by thick-walled fusiform spores, generally 13-20 x 5-7 µm. For a description and illustration see Hallenberg (1985).
Specimen: Ryv. 16364 (fairly scarce).

Haplotrichum curtisii (Berk.) Hol.-Jech.,
Ceska Myk. 30:4, 1976. - *Aspergillus curtisii* Berk., Grevillea 3:108, 1875.
See Partridge et al. (2002) for illustration and description. Not previously reported from Colombia by us. The teleomorph *Botryobasidium curtisii* Hallenb. is not with certainty recorded in South America.
Specimens: Ryv. 15787, 16357, and 16358.

Hyphoderma transiens (Bres.) Parmasto,
Conspectus syst. corticiacearum: (Tartu) p. 114, 1968. - *Odontia transiens* Bres. in Torrend, Brotéria, Bot. 11:72, 1913.
This seems to be a rare or neglected species. One of the few modern descriptions is that of Maekawa (1994) and he reported several specimens from Japan on *Quercus* (mainly on shiitake bedlog). It was also reported from China by Dai et al. (2004) with reference to Pilát, but not mentioned under this epithet by Ginns and Lefebvre (1993). As the species occurs mainly on *Quercus* it is possibly that it appears in parts of North America, but reported under another name.
So far we know there is no information about occurrence from tropical areas except two dubious specimens from Brazil by Hjortstam and Bononi (1987).
The below specimen from Colombia is fairly scarce, but well developed and both macro-and microscopically it is within the concept. The main difference is the spores that are somewhat shorter than normal.

Brief description of the Colombian specimen.
Basidiome effused, adherent. Hymenophore granular, with scattered aculei, dark ochraceous. Aculei sparse, less than 5/mm long. Hyphal system monomitic; hyphae hyaline in a fairly dense tissue, thin to becoming slightly thick-walled, about 3-5 µm diam, with clamp connections. Cystidia cylindrical or tubular, slightly protruding, narrowing slight at the apex, up to 100 µm long, thin-walled and hyaline, apical part slightly narrowing. Basidia somewhat constricted, with

four sterigmata and a basal clamp connection. Spores cylindrical, in general up to 10-12 µm long and 3.5-4 µm wide.
Specimen: Ryv. 16372.

Hyphodontia arguta (Fr.) J. Erikss.,
Symb. bot. ups. 16:104, 1958. - *Hydnum argutum* Fr., Syst. Mycol. 1:424, 1821.
The species is previously not reported from Colombia.
Specimen: Ryv. 16061.

Laxitextum lutescens Hjortstam & Ryvarden,
Mycotaxon 13:40, 1981.
The specimens mentioned below are similar to the general concept of the species, but differs mainly by the non-amyloid gloeocystidia. Also the specimen from Guatemala has inamyloid gloeocystidia. It may be that the specimens belong to a new taxon.
The species was originally described from Ghana and one additional specimen, as cfr., was published by Hjortstam, Ryvarden and Watling (1993), but after a re-examination it is clear that this is conspecific with the type. Several other specimens were reported from Africa by Roberts (2000).
Specimens: Ryv. 16293.
Additional specimen examined: Guatemala, Tzetoc, Ecorregión, Lachuá, on wood, 30.IX.2004, Roxanda López and Maura Quezada (portion in Hjm Priv. Herb.).

Mycoacia meridionalis Burds. & Nakasone,
Mycologia 73:465, 1981.
The species was originally described from U.S.A. (Mississippi) growing on *Pinus teada*. Some other specimens mentioned in the original description were from wood of *Persea*, *Quercus* sp., and *Carpinus*.
The specimens below is in accordance with the type, especially 16036 which has the same colour and other macroscopical characteristics, but in microscopical details it is partly shrunken and there are few well developed basidia and spores. The specimen consists of two pieces of which the smallest one is the best. The other specimen, 16038, is fairly well developed and all micro-characteristics can easily be studied, but macroscopically it is just pale yellow.
The species is previously reported from Brazil by Hjortstam and Ryvarden (2007), but the specimen, São Paulo, Parque Estados das Fontes do Ipiranga, 16-24.I.1987, Ryvarden 24265 (K), has not been re-studied in this case.

Brief description of Colombian specimens.
Basidiome resupinate, odontioid to hydnoid, aculei up 1-1.5 mm long.
Hyphae more or less hyaline, usually thin-walled, 2.5-4 µm wide, with clamp connections, cystidia subcapitate to capitate. Basidia (10-) 12-14 (-18) x 4-5 µm (original description). Spores smooth, hyaline, thin-walled, ellipsoid, 4.5-5(-5.5) x 2.5-3 µm.
Specimens: Ryv. 16036 and 16038 (both on deciduous wood).

Mycoacia rubiginosa Hjortstam & Ryvarden,
Synopsis Fungorum 18:26, 2004.
Previously only known from the type locality (Magdalena, Sierra Nevada de Santa Marta. Reserva Forestal San Lorenzo).
Specimen: Ryv. 16345.

Peniophora primate (Berk. & M.A. Curtis) Burt,
Ann. Mo. Bot. Gard. 12:340, 1926. - *Stereum pruinatum* Berk. & M.A. Curtis, J. Linn. Soc. Bot. 10:332, 1868.
Originally described from Cuba and apparently fairly common at least in some parts of northern South America. Reported from Venezuela by Hjortstam and Ryvarden (2007).

Brief description of the Colombian specimen:
Hymenophore smooth, with a distinct brownish subiculum, all hyphae without clamp connections, brownish, metuloid cystidia at first more or less hyaline, then basally brownish, gloeocystidia absent, basidia with four sterigmata and without a basal clamp bearing spores that are thin-walled, smooth, ellipsoid and up to 4.5-5.5 µm long.
Specimen: Ryv. 16349.

Radulodontia Hjortstam & Ryvarden gen. nov.
Basidioma resupinatum, validum, distincte hydnoideum, in typo pallescens, aculeis plus minus confertis. Systema hyphale monomiticum. Hyphae hyalinae, leviter incrassatae, fibulatae. Cystidia nulla. Basidia tenuitunicata, 4-sterigmata. Sporae leves, tenuitunicatae, hyalinae, in typo ad modum 6-8 x 3.5-4 µm, typice pyriformis, inamyloideae, indextrinoideae, acyanophilae.

Generic type: *Radulodontia pyriformis* Hjortstam & Ryvarden
Generi type specimen: Colombia, Magdalena, 17-19.VI.1978, Leif Ryvarden 16006.

Radulodontia pyriformis Hjortstam & Ryvarden sp. nov. Fig. 1.
Basidioma resupinatum, validum, distincte hydnoideum, pallide ochraceum. Aculeus plerumque conici, modice conferti, 1-2 µm longi. Systema hyphale monomiticum. Hyphae hyalinae, leviter incrassatae, 2-3 µm latae, fibulatae. Cystidia nulla. Sporae leves, tenuitunicatae, hyalinae, pyriformis, 6-8 x 3.5-4 µm
Holotype: Colombia, Magdalena, Sierra Nevada de Santa Marta, Reserva forestal San Lorenzo, 2300, 2100, 1900 m, on decayed deciduous wood, 17-19.VI.1978, Leif Ryvarden 16006 (O).

Basidiome resupinate, effused. **Hymenophore** strongly hydnoid, pale ochraceous with aculei similarly coloured. Aculei in most cases conical, often aggregated and provided with small outgrowths, usually 1-2 mm long and 0.25-0.5 mm wide near the base, without reaction in Melzer or Cotton blue. **Hyphal system** monomitic; especially in the subiculum with abundant crystalline encrustations, subicular hyphae packed together, becoming thick-walled, 2-3 µm wide, aculeal hyphae thin-walled, about of the same width. All hyphae hyaline and with clamp connections. **Cystidia** lacking. **Basidia** 25-30 x 4.5-5 µm, thin-walled, narrowing towards the base, with four sterigmata and a basal clamp connection. **Spores** pyriform, hyaline, smooth, thin-walled 6-8 x 3.5-4 µm, inamyloid, indextrinoid and acyanophilous.
The species can easily be recognized by it strongly hydnoid hymenophore, absence of cystidia and the pyriform spores. The spores are somewhat reminiscent of those of *Cylindrobasidium*, but otherwise there is no conformity.

Sistotrema subtrigonospermum D. P. Rogers, Univ. Iowa Stud. Nat. Hist. 17:22, 1935.
This is a rare species and from tropical areas previously known from Jamaica, Venezuela, and Brazil, originally described from U.S.A. (Iowa).

Brief description of the Colombian specimen:
Basidiome resupinate, adnate, normally very thin and delicate. Hyphal system monomitic; hyphae with clamp connections, thin-walled, hyaline, 2.5-3 µm, some up to 5 µm diam. Cystidia absent. Basidia at first subglobose, when fully developed typically urniform, 12-18 x 4-6 µm, with 6-8 sterigmata and with a basal clamp connection. Spores tetrahedral, 4.5-5 x 3-4.5 µm, smooth, thin-walled.
Specimen: Ryv. 16329.

Steccherinum albofibrillosum (Hjortstam & Ryvarden) Hallenb. & Hjortstam, Mycotaxon 31: 443, 1988. *Phlebia albofibrillosa* Hjortstam & Ryvarden,

Mycotaxon 20: 139, 1984.

Brief description of the type:
Basidiome strongly odontioid, aculei up to 0.5 mm long, conical and approximately 3-5 per mm, margin pubescent or fibrous, whitish. Hyphal system monomitic. Hyphae about 3 µm wide, thin-walled or with slightly thickened walls. Cystidia (skeletocystidia) numerous, usually more than 100 µm long, strongly encrusted, thick-walled and often with several adventitious septa and with a basal clamp. Spores subglobose (seldom globose) 4-4.5(-5) x 3.5-4 µm, thin-walled.

The species was originally described from Nepal and further with certainty known only from Burundi. The report by Hjortstam and Ryvarden (2007) of the occurrence in Colombia and Costa Rica seems doubtful, but seems most likely belong to a closely related taxon.
The difference between the type and the specimens from Colombia is, however, somewhat vague. In the latter the aculei are often 8-10/mm and fairly fragile, skeletal hyphae more pronounced, up to 2.5-3 µm wide, encrusted part approximately 40-60 µm, in most specimens there are also shorter metuloid cystidia, 20-25 µm long and finally the spores are globoid and

slightly smaller, 4-4.5 x 3-3.25(3.5) µm.

Fig. 1. *Radulodontia pyriformis*, A) Basidiospores, from the holotype, *Tubulicium erectum*, B) Basidiospores, C) hymenium with dendrohyphidia, D) Dendrohyphidia, E) Lyocystidia. From the holotype.

In spite of these differences we refrain to describe it as a new specific taxon. The whole group of related species should further be scrutinized by DNA sequences.

It should also be mentioned that *Cabalodontia* Piatik was described to accommodate *Odontia queletii* Bourdot & Galzin (see Piatek 2004).
At least two species, *Cabalodontia queletii* and *Steccherinum conchiforme* (Sacc.) Hjortstam (nom.nov. for *Hydnum plumarium* Berk. & M.A.Curtis, originally from USA (Car. Sup.) on *Viburnum*, No.4936, in Kew) are similar to *S. albofibrillosum* and possibly also *S. aggregatum* Hjortstam & Spooner (described from Malaysia). All these species can immediately be separated from *S. albofibrillosum* by differently shaped spores that are ellipsoid 4-4.5 x 2.5-3 µm (*S. aggregatum*), 5-6 x 3-3.5 µm (*C. queletii)*, and 4-5 x 2.2-2.5 µm (*S. conchiforme*).

Specimens: 15436, 15438, 16338, 16344, 16361, and 16360.
Additional specimen: Costa Rica, Santa Marta de Dota, San José, on hardwood. 16.III.1988, Julieta Carranza 42-88.

Trechispora mollusca (Pers.:Fr.) Liberta,
Can. J. Bot. 51: 1878, 1973. - *Polyporus molluscus* Pers.:Fr., Syst. Mycol. 1:384, 1821.
This species is known from all continents, but easily confused with other poroid species of the genus, above all *T. hymenocystis* (Berk. & Broome) K.H. Larss. and *T. candidissima* (Schwein.) Bondartsev & Singer. The first species has nearly always vesicles in the subiculum and is not with certainty known from tropical areas. The latter species has inflated subicular hyphae and known from Australia and Costa Rica, see Hjortstam and Ryvarden (2007). *T. mollusca* is a white to pale ochraceous species and with fairly narrow and slightly rugose hyphae (2-3 µm diam.). Both the above mentioned species have smooth hyphae.
Specimen: Ryv. 16355.

Tubulicium erectum Hjortstam & Ryvarden sp. nov. Fig. 2
Basidioma resupinatum, tenue, leve. Systema hyphale apparenter monomiticum; hyphae tenuitunicatae vel crassiusculae, 2.5-3 µm latae, fibulatae, dendrohyphidiae rarae, crassitunicatae, efibulatae, 3-5 µm latae. Lyocystidia conica, crassitunicata, ut minimum biradicata, 200-500 µm longa, infirme amyloidal. Basidia circiter 100 x 15 µm, terminala vel raro lateralia, 4 sterigmata. Sporae ellipsoideae vel semiglobosae, hyalinae, leves, tenuitunicatae vel crassitunicatae (KOH), 15-18 x 11-12 µm, inamyloideae.
Holotype: Colombia, Magdalena, Sierra Nevada de Santa Marta, Reserva

Forestal de San Lorenzo, 2300, 2100, 1900 m., on wood, 17.VI.1978, Leif Ryvarden 15921 (O).

Basidiome resupinate, effused, 200-300 (-500) µm thick. Hymenophore pale ochraceous, smooth but strongly pilose by protruding cystidia. Hyphal system monomitic, but some kind of binding or dendroid hyphae occur, at least in the subiculum. Hyphae with clamp connections, thin-walled or with a slight wall thickening, 2.5-3 µm wide. Binding or dendroid hyphae thick-walled, mainly in the subhymenium and projecting slightly above the basidia, but also in the subiculum and sometimes trailing on the lower part of the cystidia, without clamp connexions, 3-5 µm wide, indextrinoid, inamyloid and acyanophilous. Lyocystidia bi-rooted, or rarely with several outgrowths, conical, 200-500 µm long and 10-15 µm wide in the middle part, the longest projecting as much as 200-300 µm above the basidia, strongly encrusted, thick-walled and with a narrow capillary lumen, approximately 3 µm wide, swelling considerably in KOH, weakly amyloid. Basidia terminal or more rarely pleural, up to 100 x 13-16 µm, thin-walled or towards the base with a slight thickened wall, with four sterigmata and a basal clamp connection. Spores ellipsoid to subglobose, smooth, appearing thick-walled, 15-18 x 11-12 µm, inamyloid, indextrinoid and acyanophilous.

For the time being, we prefer to place this species in *Tubulicium*, though it differs in the spore-morphology from all other species. However, *Tubulicium erectum* seems to be closely related to species booth in *Litschauerella* and *Tubulicium* (Tubulicrinaceae) by similar cystidia, but differs from the generic concept of *Tubulicrinis*. The latter genus includes species with a distinct, thin-walled, subulate to capitate apical part of the cystidia and only with an encrusted apex. *Litschauerella* differs mainly by producing pleurobasidia. Booth *Tubulicrinis* and *Litschauerella* lack dendrohyphidia.
Tubulicium erectum is easily recognized by occurrence of dendrohyphidia and smooth, thick walled and large spores.

Tubulicium raphidosporum (Boidin & Gilles) Oberw. et al.,
Rev. Biol. Trop. 45:1313, 1998. - *Tubulicium vermiferum* ssp. *raphidosporum* Boidin & Gilles, Bull. trimest. Soc. Mycol. Fr. 102:283, 1986.
This is possibly a pantropical species, but so far known not recorded in South America. See further Kisimova-Horovitz et al. (1997) for specimens from Costa Rica. It differs mainly from *T. vermiferum* (Bourdot) Oberw. ex Jülich by straight spores 20-35 µm long and with a width of 3-4.5 µm, ad without a sigmoid appearance. Specimen: Ryv. 16245.

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Polyporus elongoporus (Aphyllophorales, Poriaceae) sp. nov.

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Abstract
Polyporus elongoporus is described based on a collecttion from Northeast Brazil. A key to neotropical species of *Polyporus* section *Favolus* is provided.

Introduction
*Polyporu*s P. Micheli ex Adans. is the genus type of Polyporaceae Fr. ex Corda and comprises 32 species by Nunez & Ryvarden (1995). Adding the *P. biskeletalis* Corner (Corner 1984), *P. subpurpurascens* (Murrill) Ryvarden (Ryvarden 1985), *P. albostipes* Ryvarden & Iturr. (Ryvarden & Iturriaga 2003), and *P. ianthinus* Gibertoni & Ryvarden (Gibertoni et al. 2004a), the neotropical species of group *Favolus* represents approximately 22% of these, as well as the neotropical area presents real possibility to increase the knowledge about this group of fungi. There are several works about morphological and taxonomic (Gugliotta et al. 1996, Silveira & Wright 2005), and diversity (Gugliotta 1997, Gibertoni et al. 2004ab, Groposo & Loguercio-Leite 2005, Silva & Gibertoni 2006, Louza & Gugliotta 2007, Drechsler-Santos et al. 2008); and mating tests and isoenzime analysis (Silveira & Wright 2002, Silveira et al. 2003) of

Polyporus in Brazil. During a mycological investigation of the Atlantic Forest in Northeast Brazil, several specimens of a striking *Polyporus* species were collected. We were unable to find a suitable name for this taxon and with a distinct macromorphology besides being fertile, we decided to described it as a new species.

Material and Methods

The Area where were collected the specimens is the Estação Ecológica do Tapacurá (08°01'S, 35°11'W), São Lourenço da Mata Municipality, to 50km of Brazilian Coast in Pernambuco State. The vegetacional type is characterized as seasonal semidecidual forest of lowlands in Northeast Brazil (Rodal et al. 2005). Specimens were studied using macroscopic and microscopic characters (Ryvarden 1991). Colours are based on Watling 1969. Microscopic examinations was made from freehand sections mounted in 5% KOH solution and 1% aqueous phloxine solution, reactions (amyloid or dextrinoid) or not were observed in Melzer's reagent (Melzer 1924). Microscopic structures were observed and measured. Drawings were made with the aid of a Zeiss camera lucida. Delimitation of new species is based on specialized bibliography mentioned throughout the text. Nomenclatural fallowed Index fungorum (http://www.indexfungorum.org/Names/Names.asp).

Polyporus elongoporus Dreschsler-Santos & Ryvarden nova sp. Fig 1. Fructificatio pileatae, pseudo stipitatae, pileus glaber, pori irregulari, 0.5-2 per mm, systema hyharum dimiticum, haphae generatoriae fibulatae, basidiosporae (cyllindricus) 6-8 x 2-3 µm. In lignum emortum in silva tropicalis. Holotyous URM herbarium conservatur.

Holotype: Brazil, Pernambuco State, São Lourenço da Mata municipality, Estação Ecológica do Tapacurá, sub-gregarious on dead wood of unidentified angiosperm, May 2007, col. Wartchow s.n. (URM78877, holotypus; Onº?, isotypus).

Etymology: The name is related to the distinctly elongated pores.

Basidiocarp annual, pileate, sessil to laterally short-stipitate (pseudo-stipitate). Pileus flabelliform, up to 15 cm long, 11 cm wide and 1 cm thick, imbricate, hard when dry; upper surface glabrous, radially striate, buff (52) with fulvous (12) striae; margin sterile, irregularly wavy, buff (52); pore surface poroid to daedaloid with pores irregularly elongated, in parets sinuous hazel (27) to clay buff (32), 0.5 to 2 per mm radialy; tubes concolorous up to 0.5 cm deep; context homogenous, buff (52), up to 0.5 cm thick at the base.

Fig. 1. *Polyporus elongatus* A) Skeletal and binding hyphae from the context, B) Basidiospores. From the holotype.

Hyphal system: dimitic, generative hyphae thin-walled 3-5 µm wide, and arboriform (Bovista type) binding hyphae dominating in the basidiocarp, up to 6 µm wide.
Hyphal pegs: present, globose projecting up to 70 µm out of hymenium.
Fusoid hymenial cystidioles up to 20 µm.
Basidia: clavate, 10-15 x 3-7 µm.
Basidiospores: cylindrical, 1-2 guttulated, thin and smooth walled, hyaline and IKI-, 6-8 x 2-3 µm.
Substrata, on dead wood.
Distribution: known only from the type locality.
Remarks. This new species is apparently related to *P. philippinensis* Berk. which basidiospores are identical with that of the new species. However, *P. philippinensis* has round, often slightly angular pores, only occasionally and rarely elongated. Its basidiocarps are also more fragile and thinner than those of *P. elongoporus*. Further hyphal pegs have however, to our knowledge not been described from *P. philippensis* and they are prominent in the new species.

P. elongoporus may also remind one of *P. biskeletalis* (Corner 1984), but this species has round pores and a white pileus with hydnoid protuberances. Thus, rather different from the new species described here.
The lateral stipe of *P. elongoporus* places it in the group *Favolus* (Nunez & Ryvarden, 1995), which also include *P. ianthinus* (Gibertoni et al. 2004a) also from the Atlantic Rain Forest of Pernambuco State. However, this species has a brown vinaceous to brown pileus and rounded pores, thus easily separated from *P. elongoporus*.
Specimens examined: Brazil: as holotypus (URM78877) and isotypus (O).

Key to neotropical species of Polyporus s. str. subgenus Favolus.

1. Pileus dark chestnut, bay to vinaceous **2**
1. Pileus white to deep tan or leather coloured **3**

2. Pores 1-2 mm wide ..... ***P. subpurpurascens***
2. Pores 5-6 per mm .....***P. ianthinus***

3. Pileus white when fresh, darker when dry, tessellate to smooth.....**4**
3. Pileus leather, orange to brown, radially striate or with small hydnoid processes or squamules at least at the base **5**

4. Pores 1-3 per mm, spores 9-12 µm long ..... ***P. tenuiculus* (P. Beauv.) Fr.**
4. Pores 6-7 per mm, spores 6-7 µm long ..... ***P. albostipes***

5. Pores 2-5 per mm .....***P. grammocephalus* Berk.**
5. Pores 1-2 per mm or larger **6**

6. Pores angular, pileus cream to tan, smooth, but often with radial lines ..... ***P. philippinensis***
6. Pores elongated **7**

7. Pileus whitish with hydnoid protuberances ..... ***P. biskeletalis***
7. Pileus buff, glabrous, with fulvous radial striae..... ***P. elongoporus***

Acknowledgments
The authors thank Felipe Wartchow for collecting the material and CNPq/MCT for providing PhD scholarships to E.R. Drechsler-Santos.

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Fomitopsis ochracea nova species

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Abstract
Fomitopsis ochracea (Basidiomycetes, Aphyllophorales, Polyporaceae) is described as new based on collections from Canada made on *Populus tremuloides*.

Introduction
The Alberta Biodiversity Monitoring Institute (seehttp://www.abmi.ca/abmi/home/home.jsp) organized in June 2005 a field trip to see whether wood-inhabiting fungi should be included in their program. One of us (JNS) participated in the field trip and brought back to Norway a number of collections for identification. Among these there were several specimens of a perennial, brown rot polypore collected on *Populus tremuloides*. Superficially it reminded one of *Fomitopsis pinicola*, but it is easily separated by a smooth ochraceous pileus distinctly different from the red laccate type seen in *F. pinicola*. The often used test with a match flame that melts the crust on the pileus of *F. pinicola* had no effect on this unknown species. A microscopical examination showed that the spores of the unknown taxon also were different from those of *F. pinicola*, i.e. globose broadly ellipsoid in contrast to the cylindrical spores of *F. pinicola*. A search in available literature (Bondartseva 1986, Gilbertson & Ryvarden 1986 and Nunez & Ryvarden 1995, Lindsay 1985) gave no clue to its identity and thus specimens and pictures were sent to Dr. R. L. Gilbertson in Tucson Arizona and Greg Thorn, department of Biology, University of Western Ontario, London, Ontario for possible identification. They both stated that they had not seen such a species earlier and could not suggest any names. A sequence from a specimen

(later used as holotype, see below) was compared with several sequences of *F. pinicola* from North America and showed that it clearly deviated from this species. Thus, it was concluded that the specimens from Alberta represent an unknown species which is described below.

Fig. 1. *Fomitopsis populicola*, A) Basidiocarp, B) Hyphae from the context, C) Basidiospores. From the holotype.

Fomitopsis ochracea Ryvarden & Stokland nova species
Ad *Fomitopsis pinicola* sed pileo ochraceo et sporis ellipsoideae".
Holotype: Canada, Alberta, Slave Lake, 8 June 2005, on a wind-snapped, weakly decayed *Populus tremuloides* log, J. N. Stokland 223, in the herbarium of Oslo University (O), isotype in TRTC (Cryptogamic Herbarium, University of Toronto, Toronto, Canada).
Basidiocarps perennial, usually sessile, rarely effused-reflexed, woody, applanate to ungulate, up to at least 30 x 20 x 8 cm; upper surface glabrous, smooth, and sulcate, whitish to ochraceous to cork-coloured, slightly discolored with black spots in some areas, margin round; pore surface cream to cork coloured and without changes when bruised in fresh condition, pores circular, 5-6 per mm, with thick, entire dissepiments; tube layers, concolorous with the pore surface indistinctly stratified, context cream coloured to buff, woody, azonate, up to 4 cm thick.
Hyphal system trimitic; generative hyphae thin-walled, with clamps, 2-5 µm in diam; skeletal hyphae dominating in the basidiocarp, thick-walled, hyaline, nonseptate, rarely branched, 3-7 µm in diam; binding hyphae rare, thick-walled to apparently solid, nonseptate, much branched, 1.5-4 µm in diam, **Cystidia** not seen.
Basidia clavate, 4-sterigmate, 17-22 x 7-9 µm, with a basal clamp.
Basidiospores broadly ellipsoid, hyaline, smooth, negative in Melzer's reagent, 4-5 x 3-4 µm.
Type of rot. Brown cubical rot of dead *Populus tremuloides*.
Substrate. Hitherto recorded only on *Populus tremuloides*.
Distribution: Canada, Alberta, Slave Lake, Blackfoot Reserve near Edmonton and Salteau River, near Slave Lake.
Remarks. Initially we were reluctant about describing the new species. Its basidiocarps are perennial and some of the rather large and if seen in the forest, it cannot be overlooked. Furthermore, the species occurred frequently in sites with *Populus tremuloides.* However, the remote boreal coniferous forests of Canada are not the most promising hunting fields for mycologists because of its remoteness and seemingly monotonous vegetation.

F. ochracea is easily separated from *F. pinicola* with which it shares the general shape of the basidiocarps, by the cork coloured smooth upper surface and the broadly basidiospores, shorter than those of *F. pinicola*. In a few cases, the upper surface had a color that graduated towards that of *F. pinicola.* The colour change to citric yellow seen in *F. pinicola* when its pore surface is bruised or cut, is absent in the new species and so is the distinct acrid and unpleasant smell of *F. pinicola*.

F. ochracea occurred invariably with basidiocarps on dead *P. tremuloides* and it was seen on at least 30 trees scattered across different localities. Thus, it had a distinctly narrower host range compared to *F. pinicola* that occurred on coniferous trees (most commonly) as well as *P. tremuloides* in the same area. *F. ochracea* was frequently observed on both standing and lying dead trees. It occurred with basidiocarps on weakly to medium decayed trunks (decay class 2 and 3, see Stokland 2001). The basal diameter of the trunks was typically larger than 20 cm and the species was present on trees with diameter up to more than 80 cm. On such big trees the basidiocarps could have even larger dimensions than those indicated above, but unsampled basidiocarps were not measured.

Specimens examined: all on *Populus tremuloides* in Alberta, Canada and deposited in O): Salteau river, near Slave Lake, ALS 17B June 7. 2005, Blackfoot reserve, near Edmonton, ALS 19, Slave Lake , June 8-9, JNS 108,115,116 and153.

Acknowledgements
We wish to thank Anna-Liisa Ylisirniö who participated in the field work and fungus sampling and Alberta Biodiversity Monitoring Institute for inviting Nordic mycologists to participate in the development of their biodiversity monitoring program.

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Dichomitus efibulatus nova species

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Abstract
Dichomitus efibulatus Ainsworth & Ryvarden, distinguished by its large spores and simple septate hyphae, is described as new based on a SW English collection from a fallen branch of *Prunus spinosa*. Two subsequent collections have been examined, one on *P. spinosa* and the other on *Corylus avellana*, from similar Atlantic habitats in SW England. A key to the European species of the genus is provided.

Introduction
The polypores of Europe are very well known and documented by several books, covering discrete regions or the entire continent, such as Ryvarden & Gilbertson (1993-94), Bernicchia 2005 and Niemelä 2005. Nevertheless, collecting in recent years has revealed that undescribed poroid species are still to be found in Europe. Recently described examples from England include *A. pseudosinuosa* (Henrici & Ryvarden 1997) and *Ceriporiopsis herbicola* (Fortey & Ryvarden 2007).

However, it came as a surprise when one of us (A.M.A.) found a white resupinate polypore on a fallen branch of *Prunus spinosa* by the Cornish coastal path in S.W. England for which we could not find a suitable name. In the field, the specimen reminded one of an *Antrodia* or *Antrodiella* species as the wood underlying the fruit body was partly white- and partly brown-rotted. However, a microscopical examination revealed the presence of binding hyphae of the *Bovista* type, i.e. as seen in the white-rotting genus *Dichomitus*. The remarkable character was, however, a complete lack of clamps, a character not yet observed in the genus as is evident from the monograph of Masuka and Ryvarden (2004)

To have the generic affiliation confirmed, Karl Henrik Larsson of the University of Gøteborg kindly sequenced the species and could confirm our initial assignment.

Dichomitus efibulatus Ainsworth & Ryvarden nova. sp. Fig. 1-2
Ad *Dichomitus squalens* (P. Karsten) D. Reid Domanski, sed hyphae generatoriae efibulatae (fibulatae in *D. squalens*) et sporae 10.2-13.4 µm (7-10 µm in *D. squalens)*.
Holotype: England, East Cornwall, Dizzard Point, (National Grid ref. SX162988), 11 August 2004, on fallen branch of *Prunus spinosa* in soil by coastal path, A.M. Ainsworth. K(M), isotype in O.

Basidiocarps annual, effused resupinate to slightly reflexed (5 mm), up to 3 cm in the longest dimension, pileus when present smooth, glabrous, white to ochraceous, pore surface white to wood-coloured with 1-2 mm wide white sterile margin, with age more yellowish or discoloured to light orange-brown when bruised or in contact with KOH, pores irregular to angular, 2-3 per mm, tubes concolorous, up to 2 mm deep, context white, tough-fibrous to corky, azonate, 1-2 mm thick.
Hyphal system dimitic; generative hyphae with simple septa, thin-walled, hyaline, 2.5-3.5 µm in diam, binding hyphae predominant, arboriform, but with long unbranched segments which when broken might easily be mistaken for skeletal hyphae, sparingly branched with sharp tapering apices, up to 5 µm in the main sections but tapering down to thin whip-like ends.
Cystidia absent, fusoid cystidioles present, 22-35 x 5-7 µm.
Basidia clavate, 4-sterigmate, 25-32 x 6-8 µm, with a basal clamp[MA comment: This is worrying me, I have examined material again and can't see these clamps, please can you recheck).
Basidiospores cylindrical, hyaline, thin-walled, smooth, negative in Melzer's reagent, 10.2-13.4 x 4.8 -6.0 µm
Substrata. Recorded only on dead *Prunus spinosa* and *Corylus avellana* (see below) branches with a white rot.
Distribution. Hitherto only recorded from Atlantic habitats in Cornwall and Devon, South West England.
Remarks. The species can above all be recognized by the simple septate generative hyphae. No other species with this type of septation and spore length are known from Europe which should make a determination rather easy. The three known locations are all within the area subjected to the greatest Atlantic climatic influence in England. This largely coastal region has a characteristic and yet poorly known suite of fungi which includes *Hypocreopsis rhododendri*,

Aleurodiscus botryosus and *Perenniporia ochroleuca*. Nevertheless the woody hosts are from two different families which might indicate that the species has a wider distribution than current information suggests.

Other specimens examined.

1) England, North Devon, Bude Canal tow path near Dexbeer (National Grid ref. SS 301095), 19 September 2005, on sawn end of dead attached *Corylus avellana* branch in tow path hedge, A.M. Ainsworth. K(M) O. Fig. 1.

This specimen was associated with an underlying white rot and spores from print were 10.9-13.4 x 4.7-5.8 μm.

2) England, East Cornwall, near Par Sands (National Grid ref. SX 087527), 26 August 2007, on sawn end of dead attached branch (ca. 3 cm diam.) of *Prunus spinosa* by coastal path, A.M. Ainsworth. K(M) O.

This specimen was associated with an underlying white rot and spores from print were 10.2-14.1(16.0) x 4.5-5.8 μm.

Key to European species of *Dichomitus*

(For a description of the other species mentioned below, see Ryvarden & Gilbertson 1993).

1. On dead coniferous wood, basidiospores 8-11 x 2.0-3.3 μm, ... **D. squalens**
1. On hardwoods, basidiospores wider than 3.5 μm 2

2. Basidiospores 4-6 μm long ..... **D. albidofuscus**
2. Basidiospores longer than 10 μm 3

3. Generative hyphae with simple septa, basidiospores 10-13.5 μm long ..... **D. efibulatus**
3. .Generative hyphae with clamps, basidiospores 13-19 μm long .. **D.campestris**

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Fig. 1 legend
Dichomitus efibulatus on dead attached *Corylus* branch, North Devon, England. Photograph © Martyn Ainsworth

Fig. 2. *Dichomitus efibulatus*, A) Elements from the hymenium, B) basidiospores. From the isotype (O).

Biodiversity Of Sardinian Aphyllophoraceous Fungi[1]

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Abstract
412 species representing 153 genera of wood-inhabiting aphyllophoraceous fungi recorded from Sardinia are listed. *Aleurodiscus ilexicola*, *Antrodia sandaliae*, *Antrodiella ichnusana*, *Echinodontium ryvardenii*, *Neolentiporus squamosellus*, *Phellinus juniperinus* have been described as new species during the recent years. *Fibricium gloeocystidiatum* has recently been described, as new to Europe. Some very rare species have been recorded only from the Island and not from other areas in Italy, such as: *Aleurodiscus ilexicola*, *Amyloathelia amylacea*, *Antrodia pulvinascens*, *Antrodia sandaliae*, *Asterostroma cervicolor*, *Botryobasidium asperulum*, *Bulbillomyces farinosus*, *Ceriporia griseoviolascens*, *Chaetoderma luna*, *Dendrothele incrustans*, *Echinodontium ryvardenii*, *Fibricium gloeocystidiatum*, *Hyphoderma cryptocallimon*, *Lenzitopsis oxycedri*, *Melzericium udicola*, *Neolentiporus squamosellus*, *Peniophora malençonii*, *Phellinus juniperinus*, *Piloporia sajanensis*, *Scytinostromella heterogenea*, *Skeletocutis lilacina*, *Thanatephorus cucumeris*, *Thanatephorus ochraceus*, *Thanatephorus sterigmaticus*, *Trametes junipericola*, *Vuilleminia megalospora*. Besides that, *Antrodia sinuosa, Aphanobasidium canariense*, *Athelia neuhoffii, Botryobasidium asperulum*, *Ceratobasidium pseudocornigerum*, *Crustoderma longicystidiatum, Cystostereum pini-canadense, Dacryobolus karstenii*,

Erythrycium laetum, Gloeodontia columbiensis, *Granulocystis flabelliradiata*, *Gyrodontium sacchari*, *Hyphoderma anthracophilum, H. incrustatum*, *H. malençonii*, *Hypochniciellum subillaqueatum, Hypochnicium albostramineum, Leptosporomyces roseus, Lindtneria flava*, *Oligoporus luteocaesius, Peniophorella guttulifera*, *Phlebia subserialis*, *Sistotrema quadrisporum*, *Stypella grilletii*, *Trichaptum laricinum* and *Tubulicrinis propinquus* are reported as new to Italy, while many species have to be considered rare. The presence of *Echinodontium ryvardenii*, *Lenzitopsis oxycedri, Neolentiporus squamosellus*, *Piloporia sajanensis* etc. in Sardinia, must be looked upon as relicts from the last glaciation, and these species could have been left on one of its available hosts in some remote and hardly accessible areas of the island.

Key words: Wood-inhabiting fungi, mycodiversity, ecology, Mediterranean species.

Acknowledgements
We dedicate the present research to to the memory of Gabriele Ricci, mycologist and friend.
We would like to thank all people who to various extent have been of help for their assistance and advice. Among them C. Losi, M. Contu, A. Saitta, C. Spinelli, S. Curreli, M.P. Marotto, F. Porru, S. Murru, M. Giunta, M. Figus, A. Benni, M. Mantovani, S. Mele manager of Forest Corporation of Ogliastra province, S. Moi, A. Canu and A. Loddo of WWW Oasi of Mt. Arcosu, and to the memory of G. Uras. We are also grateful to many members of the State Forest Corps who, over the years, have guided and helped us during forays in many protected areas of the Island, in particular C. Forteleoni, former administrator of the State Forest Office of Nuoro, and the menager S. Alias for enabling us to visit many times the Supramonte of Orgosolo, Gonaria Dettori of the State Forest Corps Environmental Observatory and the staff of Orgosolo Forest Station. A special thank to Professor Mauro Ballero for his chapter on Sardinian vegetation types and to PhD student Sergio Peréz Gorjón for his drawings, photos and for all what he did for us.

Introduction

The study of the Mediterranean flora is becoming more and more interesting both because it is hardly known in continental Europe and often associated with peculiar hosts.

In 1983, Sardinia came into focus for its vast array of *maquis* and Mediterranean woods and there have been almost yearly visits ever since. Sardinia has been visited many times during the wintertime of the last 25 years, and it was love at first sight: Sardinia never lets you down!
The investigations started from the central-western part of the Island, in Oristano province, from Is Arenas Pinery Park to Mt. Arci. They continued in the central mountainous part, in Nuoro and Ogliastra provinces, where there are the best studied forests of Sardinia and, mentioning only few of them, we poited to Supramonte di Orgosolo, Lanaittu Valley, Tascusì pass, and Montarbu Forest.
In the central-southern part of the island, in Medio Campidano and Cagliari provinces we have been not so frequently, but enough to visit some interesting forests such as those of Ingurtosu, Gonnosfanadiga or Portixeddu dunes. Furthermore, quite recently, we were able to find some interesting specimens in Mt. Arcosu Naturalistic Oasis, thanks to WWF efficient assistance.
Fungi have been collected in the most representative forests of Sardinia, in hundred-year-old holm-oak forests, secular juniper thickets, in the extensive Mediterranean scrubs or along the coastal pinery forests very often mixed with maquis. In any case the Sardinian habitats are always extremely changing and interesting from a mycological point of view. Many new species have been discovered, some of which of absolute interest such as *Antrodia sandaliae* which typically grows on *Arbutus unedo* or *Echinodontium ryvardenii* exclusive of Juniper.
In Sardinia, standing specimens of *Juniperus oxycedrus* and *J. phoenicea* can still be admired. They should be safeguarded and protected, not only because they are the hosts of important polyporaceous species but also, most importantly, because they are testimonies of a patrimony which is threatened. Some of the species growing on these substrata should be included in an Italian "red list", as is the case for *Lenzitopsis oxycedri* and *Trametes junipericola*, found on very old trunks of juniper.
The occurrence of very old specimens of *Juniperus* has enabled some lignicolous Aphyllophorales to survive and provides compelling evidence of a by far wider distribution in past ages. This hypothesis is supported out by the discovery of such species as *Piloporia sajanensis*, a boreal polypore growing in association with Fennoscandian and central Asian forests, collected on *Juniperus oxycedrus* in the Supramonte of Orgosolo, very far removed from its typical areas of distribution; *Neolentiporus squamosellus* also collected in the Supramonte and recently in southern France, in both cases on *Juniperus oxycedrus* and, finally, *Echinodontium ryvardenii* on old trunks of *J. phoenicea*, which is not only the unique species of the genus *Echinodontium* occurring in Europe, but is also of paramount importance for its gross features and microanatomical characters and

undoubtedly by far the most noteworthy species ever collected by the authors. It cannot be excluded that all three species happen to grow on *Juniperus* forced by circumstances, but they might also be represent evidence of a wider distribution when Cupressaceae and Taxaceae played a pre-eminent role in forest ecosystems.
Among the numerous species growing in association with old Junipers, most have been gathered within the triangle Lanaittu-Orgosolo-Lanusei in the provinces of Nuoro and Ogliastra. If on the one hand this situation emphasizes the importance of juniper as a substratum, on the other it shows how precarious the existence of several Italian wood-inhabiting species may be. Whether the age-old specimens present on the island will disappear, or be further reduced, we would be faced with a drastic reduction in the number of many rare, at times unique for Italy, Aphyllophorales, or even their complete disappearance.
All these species have to be regarded as endangered. To avert the possible ecological catastrophe, juniper should be included among the plants in need of protection, with special care devoted to the century-old specimens that have a scattered distribution, at times occurring just in the middle of pastureland and showily, badly mutilated by shepherds and their herds.

Materials and Methods

Samples were taken to the laboratory for microscopical examination and identification following Eriksson & Ryvarden (1973, 1975, 1976), Eriksson et al. (1978, 1981, 1984), Burdsall (1985), Hjortstam et al. (1988), Ryvarden & Gilbertson (1993, 1994), Kõljalg (1995), Núñez & Ryvarden (1997), Bernicchia (2005), and. K.H. Larsson (2007). All the specimens are kept in Herbarium HUBO, except some specimens of L. Ryvarden and L. Arras. The list is partially referred to information provided by Bernicchia (1995, 2001), Larsen & Bernicchia (1990), Onofri (2005), and the nomenclature follows mainly Kirk et al. (2001) and CBS (2008) with some minor exceptions in which Donk (1984), Hjortstam (1998), Hjortstam & Ryvarden (1990), Parmasto et al. (2004), Ryvarden (1991) and Ryvarden & Gilbertson (1994) are considered.

Map With Vegetation Types And Collecting Localities

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Sardinia is one of the most remote territories of the Mediterranean zone. It was formed approximately 16 million years ago, in the Oligo-Miocene era, as a result of the migration of small fragments of the European plate from what is now the Golfe du Lion (southern France) towards the African shelf. From this moment on, the present geographical arrangement of the islands of Sardinia and Corsica was slowly established. This process took place over two distinct periods: the first dates from its origins to the Oligo-Miocene epoch, when the vicissitudes of this microcontinent were shared with the territories of France and southern Spain; the second period dates from the Oligo-Miocene to today and concerns exclusively the two Mediterranean islands. In the Messinian epoch, during the various evaporitic cycles that characterize the period, territorial links and associations emerged between the Sardinian-Corsican block and Sicily and North Africa.

This genetic isolation played a vital role in the evolution and philogenetic development of plants and animals that are in part different from those to be found on the continental platform, even though they may have common origins. A further logical consequence of this land migration, which is still under way, was a modification of the ecological conditions influenced by the new climatic parameters. This is confirmed by the paleogeographic, chorologic and phytoclimatic surveys which, on the basis of the limited floristic heritage still present on the island such as the Common yew (*Taxus baccata*), Holly (*Ilex aquifolium*) and Hop-hornbeam (*Ostrya carpinifolia*), bear witness to the presence of a flora also made up of decidedly mesohygrophilous elements that are today partly relegated to small and restricted localities. At our present state of knowledge we can only hypothesize that the ancestral flora of Sardinia was made up of subtropical and laurel-like elements which became slowly depleted due to the climatic modifications through the processes of xeromorphism.

The current vegetation of the Island consists of formations that are well defined in their constitution and distribution, and includes both endemic species, over 200 taxa, and plant formations constituting, on the whole, a fairly heterogeneous and wide-ranging flora sustained by the presence of edaphic conditions of a markedly insular stamp. It has also been influenced by a quite complex geopedologic component, given the events that occurred throughout the various

geological periods.
From a geological point of view, Sardinia is prevalently made up of terranes from the paleozoic era, dating back approximately 500 to 240 million years, such as: porphyries, sandstones, limestones and dolomitic limestones, schists and granites. In addition, this period of time witnessed two orogenetic cycles that gave rise to the contours of the island which were subsequently, and only partially, smoothed out. In the first cycle (caledonian) the cambrian (sandstones, limestones and dolomitic limestones) and ordovician sediments (schists) were firstly folded and raised, and then eroded. The second cycle (Hercynian) was characterized by further modifications, also involving notable metamorphoses of the terranes already affected during the first cycle, and the formation of granites which favoured the stabilization and hardening of the crust of the Island. The tectonic upheavals recorded in the orogenesis of the Alps only partially involved Sardinia where, in the miocenic period, the sea penetrated into the lowered zones, leaving fossil deposits still to be found today.
The flora of Sardinia, as already mentioned, is made up of around 2600 species belonging to almost all the families of systematic importance, some of which represent the remains of belts of *Quercus-Tilia-Acer* and Laurocerasus, formations of a distinctly mesophilic nature which characterized much of the interior of the Island when the climate was considerably cooler. Today there are a few populations of Montpelier maples, common yews, hollies and hop-hornbeams, these being limited to sites that are shady, wet and, for the most part, exposed to the north; mention should also be made of other relic species including *Ophyoglussum lusitanicum* or *Centaurea horrida*, true and proper living fossils. We can therefore affirm that, from a paleobotanic point of view, the flora of Sardinia (Figure 2) consists of indigenous species that were established during the various geological phases, deriving from the tertiary mesophilic flora which colonized the emerged lands of continental Europe around 20 million years ago.
Physiognomically speaking, the vegetation of Sardinia can be summarized into the following five main groups, moving from the coast towards the uplands: scrublands and coastal maquis, forests of thermoxerophilous sclerophylls, mesophilic forests of Holm oak, forests of Holm oak and Downy oak, montane formations of mountain shrubs.
The scrublands and coastal maquis grow in the warmer and drier zones along the coast and are made up of thermoxerophilous chamaephyte shrubs present in roughly structured formations. The most important species include: *Euphorbia dendroides, Juniperus macrocarpa, J. turbinata, Anagyris foetida, Ceratonia siliqua* and *Asparagus aphyllus*, as well as sporadic populations of hemicryptophytes. Of particular importance are the formations of Prickly juniper

(*J. macrocarpa*) that grow along the coastal dunes, since they represent a biotope of considerable interest from a vegetational and ecological point of view in that these gymnosperms are responsible for the consolidation and evolution of the coastal dune system which is highly impressive but extremely delicate and sensitive to anthropic disturbance.
The forests of thermoxerophilous sclerophylls colonize the inland plains and first margins of the hills and are made up of sclerophyllous, thermophilous and xerophilous shrubs and trees, part of which overlap with the previous group. They include: *Olea oleaster, Calycotome spl pl., Rhamnus alaternus, Artemisia arborescens, Pistacia lentiscus* and *Myrtus communis.*
The mesophilic Holm oak forests can be found in the hill and low mountain zones, which are characterized by a moderately cool climate and a surplus of water in the winter months and a deficit during the hot summers. The most important tree species of the group include the Holm oak (*Quercus ilex*) and companion species such as the Strawberry tree (*Arbutus unedo*), Hawthorn (*Crataegus monogina*), Laurustinus viburnum (*Viburnum tinus*) and Broad-leaved phillyrea (*Phillyrea latifolia*); these are often found alongside climbers such as the Elm-leaved blackberry (*Rubus ulmifoius*) and Italian sarsaparilla (*Smilax aspera*). In some parts of the Island the Holm oak is joined by the Cork oak (*Quercus suber*) or wide stretches of therophytic grassland. The structures of these elements are closed and often impenetrable.
The forests of Holm oaks and Downy oaks colonize the most interior sites of the Island with a semicontinental, wet climate, characterized by a high level of rainfall and limited summer aridity with only a modest water deficit. The formations of Holm oak are enriched by strongly mesophilic species such as the Downy oak (*Quercus pubescens*) and the Montpelier maple (*Acer monspessulanum*). Only in a few sites can we find taxa that bear witness to a vegetation that has now become rarefied but which was widespread in the tertiary period when the pedoclimatic conditions were much cooler and wetter. The significant populations include not only the yews, hollies and hornbeams but also the Juniper famliy represented by the Cade juniper (*Juniperus oxycedrus*) in close formations approaching the state of climax. Along the waterways, including those of a torrential character, we find bank colonizing trees such as Alder (*Alnus glutinosa*), Aspen (*Populus tremula*) and Willow (*Salix* several spp.) which not uncommonly extend out onto the plain where they meet and mix with Flowering ash (*Fraxinus ornus*).
The formations of shrubs of the mountain and of the steppes are found in the uppermost zones of the Island's mountain groups, where the climate is typically characterized by harsh winters and not infrequent snowfalls; the summer period is mild with occasional rain. The wind, more than any other aspect,

plays a determining role on the shrubs and therophytic grasslands, which take on the features typical of the cold climates of inland mountainous zones of the Mediterranean. Indicative species of such a climate include the Caraway thyme (*Thymus herba-barona)*, Dwarf juniper (*Juniperus nana)*, Aetna barberry (*Berberis aetnensis*), Mountain cherry (*Prunus prostrata*), which are joined by various perennial therophytes many of which are endemic (*Festuca morisiana, Festuca sardoa, Trisetum gracile* etc.).

The characteristic groups described above are often substituted by regressive formations, a tangible sign of the strong anthropic pressures, most evident in the proximity of towns and villages, which have given rise to the formation of large tracts of cistus or wide areas dominated by asphodels and/or carduus species that lead one to hypothesize an exposed lithosoil in the near future. The thoughtless planting of exotic elements has made these species so common as to appear almost autochthone. It is quite easy, even in Sardinia, to come across extensive formations of eucalyptus (*Eucalyptus* sp. pl.), Monterey pine (*Pinus radiata*) and Ailanthus (*Ailanthus altissima*) which have been imported and planted with great enthusiasm but with less than satisfactory results and consequences. Furthermore, the original plant populations of the plain have been gradually but consistently replaced with farmable steppe aimed at the expansion of cereal cultivation.

In addition, mention should be made of the influence of historical factors that in many parts of the territory have led to the modification of the original floristic-vegetational conditions in order to adapt some areas for the purposes of cultivation, involving, for example, the planting of productive trees such as the chestnut, pine, hazelnut and walnut, whose indigenousness is still open to debate.

At our present state of knowledge we can therefore conclude that the originality of the flora in Sardinia is strictly linked to its geological background and to the various ecological modifications that have taken place over time, together with a genetic evolution that has made the biotic contingent particularly rich in endemic species. This has resulted in a complex system of micro-environments with a biotic and abiotic equilibrium that is particularly sensitive to the action of external anthropic disturbance. The ecosystem and trophic chain are made all the more delicate by the fact that they are often made up of individuals linked exclusively to particular ecological parameters; their alteration could lead to the definitive disappearance of organisms that are now of phylogenetic and systematic importance on account of their reduction in number and space, having once been much more common. It would seem logical, even though this is not so, to set up a well-defined operation for the protection of all the ecosystems to keep intact the biodiversity that still characterizes Sardinia.

FIGURE 1: Map of Italy.

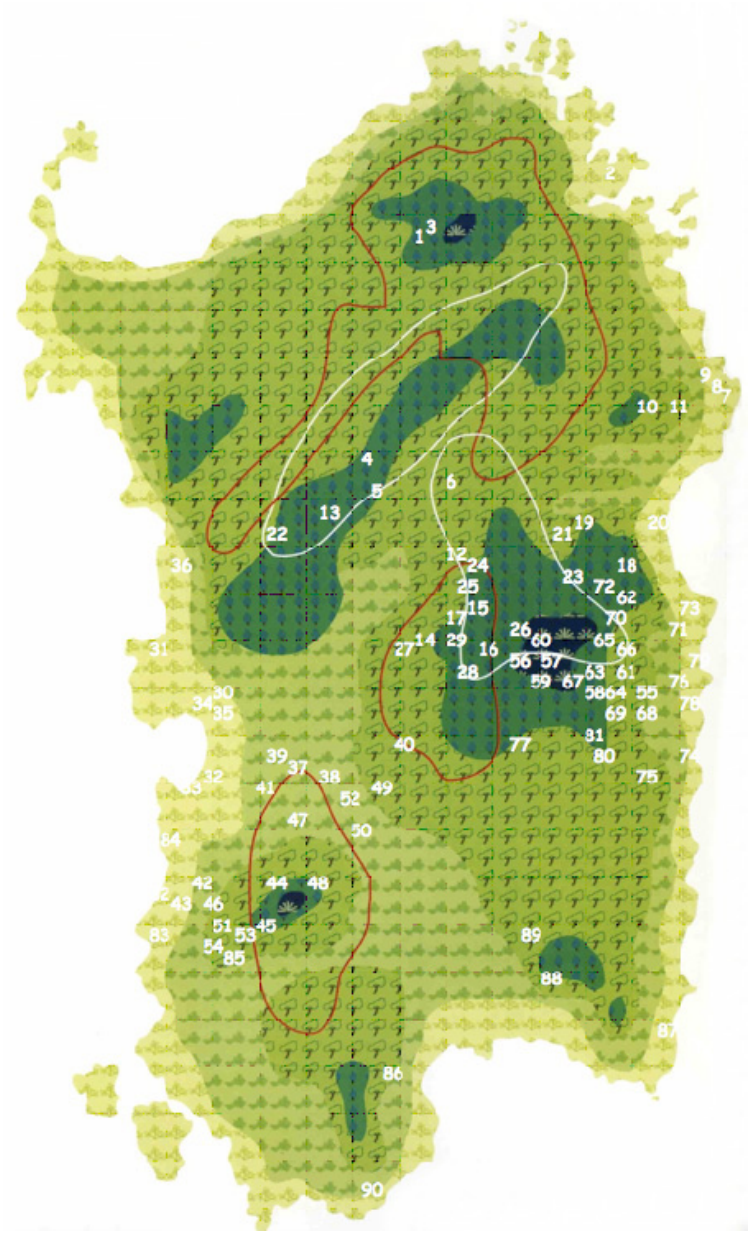

FIGURE 2: Map of Sardinia with vegetation types and collecting localities.

Collecting localities with the altitude on sea level (see also Figure 2):

Olbia-Tempio: (1) Tempio Pausania, 500-1300 m; (2) Marinella Gulf 0-10 m; Sassari: (3) Cantoniera Catara Cetola 80 m; (4) Burgos Forest, 570-800 m; (5) Esporlatu, 400-800 m; (6) Goceano Forest, 500-1000 m, 5; Nuoro: (7) Comino Cape, 15 m; (8) St. Lucia Pinery, 15 m; (9) Siniscola, 40 m; (10) Badde Longa 500-700 m; (11) Mt. Albo, 150-700 m; (12) Mt. Sosu, 800-1250 m; (13) Badde Salighes, 750-1000 m; (14) Sorgono, 570 m; (15) Fonni, 1000 m; (16) Pass Tascusì, Fonni, 1250 m; (17) Fonni, Aratu, 700 m; (18) Lanaittu Valley, 200-500 m; (19) Su Gologone, 99 m; (20) Cala Gonone, 0-300 m; (20a) Biderosa, 50 m; (21) Oliena, 365 m; (22) Macomer, 556-800 m; (23) Supramonte di Orgosolo, 900 m (on average); (24) Mamoiada, 644 m; (25) Sarule, Gavoi, 630-950 m; (26) Piraonni, 1000 m; (27) St. Loisu, Sorgono, 700 m; (28) Aritzo, 800 m; (29) Tonara, 900 m; Oristano: (30) Uliveto Espaderis 20 m; (31) Is Arenas Pinery 0-50 m; (32) Arborea 0; (33) Ala Birdi 0-10 m; (34) S'ena arrubia 0-10 m; (35) Oristano, 10 m; (36) Cuglieri, 479 m; (37) Ales, 194 m; (38) Sini, 170-537 m; (39) Mt. Arci, 300-800 m; (40) Laconi, 500-600 m; (41) Morgongiori, 350 m; Medio Campidano: (42) Montevecchio, 370 m; (43) Ingurtosu, 250 m; (44) St. Gavino, 54 m; (45) Villacidro, 267 m; (46) Gentilis, 130 m; (47) Collinas, 250 m; (48) Sanluri, 135 m; (49) Giara di Gesturi, 500 (on average); (50) Villamar, 108 m; (51) Gonnosfanadiga, 185 m; (52) Turri, 164 m; (53) Sibiri, 314 m; (54) Is Antiogus 250 m; Ogliastra: (55) Arzana pinery, 855 m; (56) Arzana-Gidinis, 600-900 m; (57) Arzana-Lione, 800 m; (58) Arzana-Siccaderba, Baccu Gerduri, 800 m; (59) Arzana-Aredili, 900-930 m; (60) Arzana-Bidda Silisè, 1000-1050 m; (61) Arzana-Abbafrida, 1000 m; (62) Piana di Urzulei, 510 m; (63) Villanova, 850 m; (64) St. Cosimo, 900 m; (65) Villagrande Nursery forest, 800 m; (66) Villagrande, St. Barbara, 850 m; (67) Flumendosa lake, 800 m; (68) Lanusei, Su Longhifresu, 950 m; (69) SS 389 Lanusei-Nuoro, Km 172,5 870 m; (70) Talana, Baccu Nieddu, 500-800 m; (71) Baunei, Golgo, 380 m; (72) Baunei, Genna Silana, 1017 m; (73) Supramonte Baunei, 600-700 m; (74) Marina di Gairo, 0 m; (75) Tertenia, Su Crabiolu, 100 m; (76) Tortolì, 15 m; (77) Montarbu-Seui, 550-1324 m; (78) Marina di Orrì, 10 m; (79) Sughereta di Arbatax, 15 m; (80) Su Mortorgiu 'e su Predi, 950 m; (81) Tricolì Forest, 950-1149 m; Carbonia-Iglesias: (82) Piscinas 150 m; (83) Portixeddu dunes, 0-100 m; (84) Is Arenas, 140 m; (85) Marganai Forest, 214-1009 m; Cagliari: (86) Capoterra, 54 m; (87) Costa Rei, Cala Sinzias, 20 m; (88) Campu Omu, 600 m; (89) Tuvois, 466 m; (90) St. Margherita di Pula, 100 m; (91) Mt. Arcosu, loc. Uta, 550 m.

Notes on some fungi from Sardinia, Italy

Sardinia has a very interesting mycota as is evident from the following list. Over time many ecologically different fungi have established themselves on the island and survived later shifting climates. Especially dramatic changes in the vegetation must have occurred through the many ice ages over the last 3 million years or so, which so fundamentally has influenced the vegetation of the Europe in general.
We have in the following tried to categorize some groups of species which may shed some light on the history of the fungal immigration to the island. In each group we have only listed up some prominent examples and not tried to have every species sorted out. There are too many species where the knowledge of their distribution is too is scanty and were future collections certainly will change the current pattern.

Ubiquitous species
Most of the species in the list have a very wide distribution in Europe and typical examples are *Amphinema byssoides, Athelia epiphylla, Botryohypochnus isabellinus*. *Bjerkandera adusta, Coniophora arida* and *Gloeophyllum sepiarium*. They can be found in any forest on the whole continent north to North Cape and occur also throughout the boreal circumpolar zone east to New Foundland in Eastern Canada.

Southern species
In this group we have placed species which otherwise have a wide distribution in the tropical and the subtropical zone, Thus, they seem to demand a rather high temperature to be able to produce a basidiocarp.
Amaurodon virdis, Gyrodontium sacchari, Perenniporia ochroleuca and *Phellinus rimosus*.

Mediterranean group
This group consists of species with a distinct Mediterranean distribution, only rarely penetrating into the warm parts of Central Europe.
Byssomerulius hirtellus, Ceriporia camaresiana, Hexagonia nitida, Ceriporia griseoviolascens, Inonotus tamaricis, Lenzitopsis oxycedri, Oligoporus inocybe, Peniophora malenconii, Peniophora meridionalis, Phanerochaete aculeata, Phellinus juniperinus, Phellinus rosmarini, Polyporus meridionalis, Skeletocutis percandida, Stereum reflexulum, Trametes junipericola and *Vuilleminia pseudocystidiata*.

Central European group
In this group we have placed species with a distinct Central to Southern European distribution. They are not recorded from the Scandinavian countries and are absent or very rare in Great Britain.
Albatrellus pes-caprae, Antrodia malicola and *Auriculariopsis ampla*.

Boreal group
The group is composed of species which, with an exception for *P. sanjaensis*, have been described from Scandinavia and have a very wide distribution there, far beyond the polar circle.
Amyloathelia amylacea, Antrodia pulvinascens. Antrodiella pallescens, Ceriporiopsis pannocincta and *Piloporia sajanensis*. The latter species is especially interesting since it was described from Central Siberia and have since been recorded a very few times in Scandinavia without any localities otherwise in Europe.

Endemic species
More perhaps than any of the other groups this is a clear manifestation of rich and varied mycota of the island, pointing to a very history of different influxes and isolation.
Some of the species have also been recorded in the Italian mainland.
Two species stand out as remarkable, i.e. *Echinodontium ryvardenii* and *Neolentinus squamosellus* since they are the single representatives of their respective genera in Europe.
Aleurdiscus ilexicola, Antrondia macrospora, Antrodia sandaliae, Antrodiella ichnusana, Echinodontium ryvardenii, Hyphoderma etruriae, Neolentiponus squamosellus and *Vararia maremmana*.

American species
The following species are all described on American collections and have at least for some of the species a wide distribution there. One may wonder when they came to Europe or if their history goes all the way back to times when the continents were more coherent than today.
Fibricium gloeocystidiatum, Junghuhnia semisupiniformis and *Spongipellis delectans*.

Checklist of recorded species

Abortiporus biennis (Bull.) Singer
07/12/1981 **(44)** on stump of broadleaves, coll. 681; 13/11/1983 **(30)**, branch of *Olea europea*, coll. 1968; 23/10/1983 **(45)** coll. 2392; 29/10/1990 **(6)** lying branch of *Taxus baccata*, coll. 5223; 02/11/1990 **(10)** from buried roots of broadleaves, coll. 5286; 05/12/1996 **(39)** at the base of old *Quercus ilex*, 7003; 19/11/1999 **(82)** on *Salix*, coll. 7303.
Albatrellus pes-caprae (Pers.) Pouzar
05/11/1997 **(55)** in a pinery, associated to *Pinus pinaster*, coll. 6970.
Albatrellus subrubescens (Murrill) Pouzar
05/11/1997 **(55)** on the ground, in clearings of conifer forests, associated to *P. pinaster*, coll. 6975. Apparently not a wood decaying species.
Aleurodiscus aurantius (Pers.) J. Schröt.
29/10/1990 **(6)** branch of *Quercus ilex*, coll. 5238; 05/12/1996 **(39)** *Rubus fruticosus*, coll. 6983; 04/12/2000 **(77)** on *R. fruticosus*, coll. 7473; 09/11/1985, 08/11/1986 **(13)** on *R. fruticosus*, coll. 4005, 5072.
Aleurodiscus cerussatus (Bres.) Höhn. & Litsch.
05/12/2000 **(77)** on branch of *Arbutus unedo*, coll. 7460. Rare species, recorded from only very few Italian regions.
Aleurodiscus disciformis (DC.) Pat.
05/11/1986, 04/11/1992, 14/12/1997 **(23)** on the trunk of *Quercus ilex*, coll. 4771, 5788, 7039; 07/11/1992 **(56)** on branch of very old *Q. ilex*, coll. 5806.
Aleurodiscus ilexicola Bernicchia & Ryvarden
13/11/1983 **(13)** on branch of *Ilex aquifolium*, coll. 1939 typus. It is the only record known till now (Bernicchia & Ryvarden 1988, Núñez & Ryvarden, 1997).
Amaurodon viridis (Alb. & Schwein.) J. Schröt.
24/11/1999 **(77)** very copious on trunk of an old *Ficus carica*, coll. 7305; 30/11/2000 *Quercus ilex*, coll. 7462, trunk of *Arbutus unedo*, coll. 7464; 13/12/1997 **(18)** at the base of *Rosmarinus officinalis*, coll. 7001. Rare species, recorded from Lazio and Sardinia regions only (Onofri et al., 2005).
Amphinema byssoides (Pers.) J. Erikss.
12/11/1983 **(33)** on *Cistus incanus*, coll. 1986, *Eucalyptus*, coll. 1988, *Pinus pinea*, coll. 1910, 1912; 14/11/1983 **(31)** on *Acacia cyanophylla*, coll. 2007, *P. pinea*, coll. 2015, 2017, 2025; 05/11/1986 **(23)** *Erica*, coll. 4780; 05/11/1997 **(55)** on lying trunk of *P. pinaster*, coll. 7014; 04/12/2000 **(77)** on litter, coll. 7500; 12/11/2007 **(87)** on burnt trunk of *P. pinaster*, coll. Arras 1131.
Amyloathelia amylacea (Bourdot & Galzin) Hjortstam & Ryvarden
05/11/1986, 06/12/1996 **(23)** loc. Campu'e su mudrecu, on burnt trunks of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5398, 5401, 5402, 5403, 6834;

18/11/99 **(83)** *J. phoenicea*, coll. 7354. Rare species, recorded only from a restricted area of Supramonte of Orgosolo, Sardinia and always on Junipers (Bernicchia, 1996; Onofri et al., 2005). Very easily recognizable, due to its very strongly amyloid basidiospores.

Amylocorticium subincarnatum (Peck) Pouzar

01/07/2007 **(19)** on branch of *Pinus pinea*, coll. Arras 1050.

Amylostereum chailletii (Pers.) Boidin

23/11/1999 **(77)** on *Pinus pinaster*, coll. 7413; **(20a)** on *Pinus pinea* coll. 8165; 02/12/2007 **(1)** loc. Vallicciola, on *Pinus*, coll. Arras 1101.

Amylostereum laevigatum (Fr.) Boidin

13/11/1983, 09/11/1985 **(13)** on *Taxus baccata*, coll. 1957, 3861, 3879, 3880; 29/10/1990 **(6)** *T. baccata*, coll. 5224, 5243; 06/11/1992 **(56)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5764.

Amyloxenasma grisellum (Bourdot) Hjortstam & Ryvarden

03/11/2007 **(68)** loc. Lanusei, on *Erica arborea*, coll. Arras 1042. Rare species, recorded from Emilia-Romagna too.

Antrodia albida (Fr.) Donk

10/01/1983, 15/11/1994 **(44)** trunk of *Populus nigra*, coll. 1523, 2580, *Eucalyptus* coll. 7924; 12/11/1983 **(33)** branch of *Pinus pinea*, coll. 1915; 13/12/1997 **(23)** loc. Sas Baddes, on very old *Quercus ilex*, coll. 7044; 18/11/1983 **(54)** on decorticated branch of *Arbutus unedo*, coll. 2122; 02/11/1990 **(10)** *Cistus*, coll. 5282; 20/11/1999 **(18)** stump of *Phillyrea angustifolia*, coll. 7221, 7229; 22/11/1999 **(62)** branch of *A. unedo*, coll. 7295, 7327; 30/11/2000 **(77)** on pole of *Castanea sativa*, coll. 7463; 01/11/2003 **(70)** on *Phillyrea*, coll. 7789.

Antrodia gossypium (Speg.) Ryvarden

30/11/2003, 04/12/2007 **(55)** lying trunk of *P. radiata*, coll. 7716, 8161, 8162; **(23)** loc. Montes forest, on *P. nigra* subsp**.** *laricio*, coll. 7724, 7725. Infrequent species, even if locally it can be more frequent.

Antrodia macrospora Bernicchia & De Dominicis

06/11/1985 **(46)** on dead, still attached branches of *Phillyrea angustifolia*, coll. 3868; 06/12/1996, 13/12/1997, 20/11/1999, 28/11/2003 **(18)** on *P. latifolia*, coll. 6912, 6846, 7034, 7274; 25/11/1999 **(23)** *P. latifolia*, coll. 7307. The pores have a concentric disposition, and the peculiar characteristic is its growing on dead, but still attached twigs of *Phillyrea*, very often on the broken surface, while the wood below appears crumbly, reduced to brown cubical chunks. Thick white mycelial felts develop in the very decayed wood (Bernicchia 1992, 2005, Onofri et al., 2005). It is a rare species all over Europe, recorded from only few countries.

Antrodia malicola (Berk. & M.A. Curtis) Donk

07/02/2002 **(64)** on lying branch of *Malus*, coll. Arras 162. Uncommon species in Italy.

Antrodia pulvinascens (Pilát) Niemelä

09/11/1994, 14/12/1997, 25/11/1999, 02/12/2004 **(23)** loc. Campu'e su mudrecu, always on burnt trunks of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 6915, 6999, 7292, 6644, 6648, 6699, 7735. It is a rare species in Europe, and with only this, restricted, Italian collecting locality. Interesting is the type of substratum that usually is *Populus tremula* o *Salix* in northern and central Europe while is burnt Juniper in Italy (Bernicchia, 1998, 2005).

Antrodia ramentacea (Berk. & Broome) Donk

14/11/1983, 06/11/1985 **(31)** on lying trunk of *Pinus pinea*, coll. 2005, 4036; 06/11/1985 **(39)** branch of *Quercus ilex*, coll. 4063; 30/11/03 **(66)** on *P. radiata*, coll. 7720; 15/05/05 **(66)** *P. radiata*, coll. 7926.

Antrodia sandaliae Bernicchia & Ryvarden

23/11/1999, 18/12/1999, 30/11/2000, 04/12/2000, 29/11/2003, 03/12/2007 **(77)** loc. Baccu e piras, lying twigs and branches of *Arbutus unedo*, coll. 7337, 7339, 7340, 7348, 7350, 7351, 7352, 7486, 7488 typus, 7513, 7784, 7803, 7804, 8163, coll. Arras 925.

A. sandaliae (Bernicchia & Ryvarden, 2001; Bernicchia 2005) resembles *A. infirma* Renvall & Niemelä, a species known only from the boreal North Europe and collected on dead trunks of *Pinus sylvestris.* Both species have an almost monomitic hyphal system with a dominance of generative hyphae throughout the basidiocarps and both have cylindrical basidiospores. However, those of *A. sandaliae* are longer than the spores of *A. infirma*, while *A. sandaliae* may develop a pileate basidiocarps, this is never the case with *A. infirma*. The former species is frequent in that restricted area, where also occurs the rare *Junghuhnia semisupiniformis* (Murrill) Ryvarden. Montarbu Forest is up to now the only collecting locality in Italy, while, recently it has been collected in Spain, Castilla y León Region (S. Pérez Gorjón, pers. comm.) on the same substratum .

Antrodia serialis (Fr.) Donk

07/11/1985, 01/12/2000 **(23)** on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4128, and *Quercus ilex*, coll. 7487.

**Antrodia sinuosa* (Fr.) P. Karst.

23/09/2007, 01/12/2007 **(20a)** on decayed stump of *Pinus pinea*, coll. Arras 996, 1046. A previous record of *Poria sinuosa* Fr**.** (Erb. Critt. PI, Selva Pisana (Beccari, 1863b; Barsali, 1903; Verona, 1932), after revision, must be referred to *Schizopora flavipora.* Our specimens are the first records till now in Italy.

Antrodia sp.

11/11/1994 **(18)** on stump of *Phillyrea latifolia*, coll. 6659. This specimen could be most probably a new species, but the material is very scanty.

Antrodia vaillantii (D.C.) Ryvarden
05/12/2007 **(16)** on stumps and trunks of *Pinus nigra* sunbsp. *laricio*, coll. 8157, 8158, 8159, 8160. Many trunks were covered by large basidiomata of that brown-rot species, with very variable macroscopic features.
Antrodiella leucoxantha (Bres.) Miettinen & Niemelä
(= *A. genistae* (Bourdot. & Galz.) A. David)
29/11/2000 **(67)** on trunk of broadleaves, coll. 7499, 7679, *Quercus ilex*, coll. 7465; 04/12/2000, 04/12/2007 **(77)** coll. 7501, 8169. Infrequent and sporadic species (Miettinen et al., 2006).
Antrodiella ichnusana Bernicchia, Renvall & Arras
30/11/2003, 04/12/2007 **(58)** on very old trunk of *Populus alba* lying on the ground, coll. 7692 typus; twigs of *Alnus glutinosa*, coll. 7693, 7694, 7695, 8166, 8167 (Bernicchia, 2005). Recorded also from Corno alle Scale Park (Bologna), on *Alnus glutinosa* and from Finland, France and Netherlands in Europe (Miettinen et al., 2006).
Antrodiella romellii (Donk) Niemelä
13/11/1983 **(4)** on *Quercus ilex*, coll. 1936; 17/11/1983, 05/12/1996 **(39)** twig of *Q. ilex*, coll. 2070, 7081; 01/12/2000 **(23)** *Q. ilex*, coll. 7459; 10/11/1994 **(28)** *Q. ilex*, coll. 7923; 29/11/2003 **(77)** on twig of *Arbutus*, coll. 7798.
Antrodiella pallescens Niemelä & Miettinen
08/11/1985 **(4)** *Quercus ilex*, coll. 4110; 29/10/1990 **(6)** on *Q. ilex*, coll. 5215; 29/11/2000 **(67)** on broadleaves, coll. 7476 (Miettinen et al., 2006).
**Aphanobasidium canariense* (Manjón & G. Moreno) Boidin & H. Michel
12/12/1997 **(20)** on still green *Cycas* lying on the ground, cut to pieces and piled up, coll. 7112. It is the first record in Italy and one of the few in Europe (Manjón & G. Moreno, 1982).
Asterostroma cervicolor (Berk. & M.A. Curtis) Massee s.l.
31/10/1990 **(23)** loc. Campu'e su mudrecu, on *Santolina corsica*, coll. 5253; 11/11/1994, 13/12/1997 **(18)** on *Helichrysum italicum*, coll. 6600, 5693. Uncommon species (Bernicchia, 1996, 2000, 2001, Onofri et al., 2005).
Athelia acrospora Jülich
06/11/1992, 08/11/1985, **(4)** on *Castanea sativa*, coll. 4090; 06/11/1992 **(57)** on trunk of *Erica arborea*, coll. 5775.
Athelia arachnoidea (Berk.) Jülich
13/11/1983 **(13)** on small branch of *Quercus pubescens*, coll. 1938, 1950; 07/11/1985, 05/11/1986 **(23)** *Quercus ilex*, coll. 3811, on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4763; 04/12/2007 **(58)** loc. Baccu Gerduri, on *Alnus glutinosa*, coll. 8168.
Athelia binucleospora J. Erikss. & Ryvarden
09/11/1994 **(23)** loc. Is scalas arenas, on trunk of *Juniperus oxycedrus* subs.

oxycedrus, coll. 6616.
Athelia bombacina Pers.
01/11/2001, 29/11/2003, **(65)** branch of *Pinus*, coll. Arras 114, 200, on *Carpinus*, coll. Arras 923; 07/02/2002, **(64)** lying branch of *Populus nigra*, coll. Arras 199, 750; 29/11/2003 **(77)** on *Q. ilex* coll. Arras 923.
Athelia decipiens (Höhn. & Litsch.) J. Erikss.
07/02/2002 **(64)** on broadleaves, coll. Arras 198; 03/12/2007 **(77)** on *Q. ilex*, coll. 8200.
Athelia epiphylla Pers.
01/12/2000 **(23)** *Quercus ilex*, coll. 7457, trunk of *Erica arborea*, coll. 7042; 04/12/2000 **(77)** on *Q. ilex*, coll. 7502; **(1)** loc. Balbo on *Quercus suber*, coll. 8164.
**Athelia neuhoffii* (Bres.) Donk
07/02/2002 **(64)** on broadleaves, coll. Arras 755. It is the first Italian record.
Athelia pyriformis (M.P. Christ.) Jülich
31/10/1990 **(23)** at the base of *Santolina corsica*, coll. 5254. Uncommon species.
Athelopsis glaucina (Bourdot & Galzin) Oberw. ex Parmasto
10/12/1983 **(4)** small branch of *Quercus ilex*, coll. 2317.
Auriculariopsis ampla (Lév.) Maire
16/12/1983 **(47)** lying twig of *Populus nigra*, coll. 2356, 2712.
Basidioradulum radula (Fr.) Nobles
05/11/1986 **(23)** loc. Sas Baddes, on *Quercus ilex*, coll. 4775.
Bjerkandera adusta (Willd.) P. Karst.
10/12/1983 **(44)** on needles of *Pinus pinaster,* coll. 2382; 30/10/1990 **(13)** branch of *Quercus pubescens*, coll. 5217.
Boletopsis leucomelaena (Pers.) Fayod
31/11/1984 **(86)** on the ground, in the maquis, coll. 2332; 05/11/1997 **(55)** in the glades, among *Pinus pinaster*, coll. 7015.
**Botryobasidium asperulum* (D.P. Rogers) Boidin
18/11/2007 **(29)** loc. S'Isca de sa Mela on *Pinus*, coll. Arras 1044. Conf. Gitta Langer.
"The species is intermediate between *B. asperulum* and *B. stigmatisporum* because its nearly thinwalled basidiospores and the lacking of ornamented, wide basal hyphae. Also the basidia are a little larger and more contricted than in the African material. To my mind the thick walled spores are an adaptation to the hot and dry climate in Africa. They are not so necessary for more temperate species" (Langer, pers. comm.).
It is the first Italian record, and very rare species in Europe, recorded the first time from Spain (Dueñas & telleria, 1988), but its distribution is generally in Africa and in Central America (Langer G., 1994).

Botryobasidium candicans J. Erikss.
05/11/1986 **(23)** on *Erica arborea*, coll. 4792; 04/11/1990 **(10)** *Cistus*, coll. 5383.
Botryobasidium intertextum (Schwein.) Jülich & Stalpers
10/11/1986 **(53)** on coniferous wood, coll. 5097.
Botryobasidium obtusisporum J. Erikss.
14/11/1983 **(31)** on *Acacia cyanophylla*, coll. 2004.
Botryobasidium subcoronatum (Höhn. & Litsch.) Donk
28/10/2007 **(1)** loc. Vallicciola, on twig of *Pinus*, coll. Arras 1075.
Botryobasidium vagum (Berk. & M.A. Curtis) D.P. Rogers
28/11/2007 **(1)** loc. Vallicciola on *Pinus* wood, coll. Arras 1073.
Botryohypochnus isabellinus (Fr.) J. Erikss.
08/11/1983 **(53)** on *Eucalyptus*, coll. 2387; 07/11/1992 **(56)** at the base of *Euphorbia characias*, coll. 5795.
Brevicellicium exile (H.S. Jacks.) K.H. Larss. & Hjortstam
05/11/1986 **(23)**, loc. Campu'e su mudrecu, on twig of di *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5409; 29/11/2003 **(77)** on *Q. ilex*, coll. Arras 936; **(89)** *Q. ilex*, coll. Arras 902. Very rare species, with only these records till now (Onofri et al., 2005), and all in Sardinia.
Bulbillomyces farinosus (Bres.) Jülich
10/11/1986 **(3)** lying branch of *Quercus ilex*, coll. 6598. Rare species, this is the only known record (Onofri et al., 2005) from Italy.
Byssocorticium atrovirens (Fr.) Bondartsev & Singer
06/11/1997 **(81)** on lying trunk of old *Pinus pinaster*, coll. 6974.
Byssomerulius albostramineus (Torrend) Hjortstam
10/12/2007 **(68)** on *Carpinus*, coll. Arras 260; 04/12/2007 **(58)** on branch of *Populus*, coll. 8153.
Byssomerulius corium (Fr.) Parmasto
10/11/1982, 12/01/1984 **(52)** *Crataegus*, coll. 1447, branch of *Prunus armeniaca*, coll. 2346, on *Ficus carica*, coll. 2358; 10/01/1984 **(86)** branch of *Ceratonia siliqua*, coll. 2312; 10/12/1982 **(39)** *Quercus ilex*, coll. 1452; 10/12/1982 **(38)** *Q. ilex*, coll. 1309; 12/11/1983 **(33)** *Pinus pinea*, coll. 1913, *Phillyrea angustifolia*, coll. 1913; 30/11/1983 **(46)** *Q. ilex*, coll. 2210; 06/12/1983 **(47)** su *Q. ilex*, coll. 2361, twig of *Cistus*, coll. 2366; 27/12/1983 **(42)** *Q .ilex*, coll. 2378; 20/11/1999 **(18)** branch of *Q. ilex*, coll. 7243. We can consider it one of the most frequent species in Sardinian deciduous forests.
Byssomerulius hirtellus (Burt) Parmasto
12/11/1983 **(33)** lying branch of *Pinus pinea*, coll. 1920; 14/11/1983 **(32)** *P. pinea*, coll. 1995; 07/11/1992 **(56)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5780, 5798, 5814; 06/10/2007 **(64)** on *Pinus,* coll. Arras 1006; 23/09/2007 **(20a)** on *Pinus*, coll. Arras 992. Quite a frequent species.

Ceraceomyces sublaevis (Bres.) Jülich
01/12/2007 **(1)** loc. Aggius, on *Quercus suber*, coll. Arras 1094.
Ceratobasidium cornigerum (Bourdot) D.P. Rogers
14/11/1983 **(32)** on *Phillyrea angustifolia*, coll. 1990; 14/11/1983 **(31)** branch of *Pinus pinea*, coll. 2087, 2002; 06/12/1983 **(47)** *Arbutus unedo*, coll. 4129.
**Ceratobasidium pseudocornigerum* M.P. Christ.
30/11/2000 **(77)** lying trunk of old *Salix*, coll. 7456. It is the first record from Italy.
Ceriporia camaresiana (Bourdot & Galzin) Bondartsev & Singer
03/11/1986 **(31)** on lying trunk of *Acacia cyanophylla*, coll. 6646. It is a rare species, recorded only from Emilia-Romagna and Sardinia regions (Bernicchia, 2005; Onofri et al., 2005).
Ceriporia davidii (D.A. Reid) Pieri & Rivoire
05/12/2007 **(16)**, on trunk of *Pinus nigra* subsp. *laricio*, coll. Arras 1049; 03/12/2007 **(77)** on Q. ilex, coll. 8207. Rare species, recorded from St. Vitale Pine Forest (Ravenna) too.
Ceriporia griseoviolascens Pieri & Rivoire
04/12/2000 **(77)** on small branch of *Arbutus unedo*, close to the rivulet Rio Ermosa, coll. 7370. Rare species in Europe, and no other Italian record is known till now (Bernicchia, 2005).
Ceriporia purpurea (Fr.) Donk
12/11/1983 **(13)** on *Quercus pubescens*, coll. 1955; 08/11/1994 **(31)** trunk of *Tamarix gallica*, coll. 6627; 29/11/2000 **(67)** on branch of broadleaves, coll. 7372; 04/11/2000 **(77)** on *Q. ilex*, coll. 7373; 02/12/2003 **(23)** *Quercus*, coll. 7814, coll. Arras 887; 04/12/2007 **(58)** on *Populus nigra*, coll. 8205, coll. Arras 1066.
Ceriporia reticulata (Hoffm.) Domañski
13/11/1983 **(13)** branch of *Quercus pubescens*, coll. 1934; 06/11/1985 **(39)** *Q. ilex*, coll. 4068; 02/12/2007 **(1)** loc. Aggius on *Q. suber*, coll. 8155.
Ceriporia sp.
06/11/1985 **(31)** on branches of *Acacia cyanophylla* lying on the ground, coll. 4007, 4018, 4019, 4037; 02/12/2003 **(23)** on broadleaves of machia, coll. 8150.
Ceriporiopsis gilvescens (Bres.) Domañski
22/11/1999 **(18)** on *Pistacia*, coll. 7250. Sporadically distributed.
Ceriporiopsis mucida (Pers.) Gilb. & Ryvarden
09/11/1985, 30/10/1990 **(13)** on dead, but still attached branch of *Taxus baccata*, coll. 3859, 5212, 5218, *Ilex aquifolium*, coll. 3882; 05/11/1986 **(23)** at the base of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4789.
Ceriporiopsis pannocincta (Romell) Gilb. & Ryvarden
02/12/2003 **(23)** loc. Sas Baddes, coll. 6409, 6645, 7691. The last record was

growing under the bark of a very old trunk of *Quercus ilex* lying on the ground. The exposed pore surface appeared pure white at the beginning, turning light yellow after exposure to sunlight. It is a rare species in Italy, with sporadic records (Bernicchia, 2005) (Figure 6).

Ceriporiopsis rivulosa (Berk. & M.A. Curtis) Gilb. & Ryvarden
04/02/2007 **(87)** on burnt wood of *Pinus*, coll. Arras 127. Very uncommon species in Italy, often growing on burnt wood.

Cerrena unicolor (Bull.) Murrill
13/11/1983 **(13)** branch of Q*uercus pubescens*, coll. 1953; 05/11/1986 **(23)** *Q. ilex*, coll. 4773.

Chaetoderma luna (Romell ex D.P. Rogers & H.S. Jacks.) Parmasto
05/11/1986, 06/12/1996, 14/12/1997 **(23)** loc. Campu'e su mudrecu, on burnt trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4754, 6851, 7071, 7197. It is a very rare species in Italy, recorded only from this Sardinian locality, always in the same restricted area of Supramonte of Orgosolo (Bernicchia 1996; Onofri et al., 2005).

Chondrostereum purpureum (Pers.) Pouzar
16/01/1999 **(68)** loc. Lanusei, on woody debris, coll. Arras 155.

Coltricia perennis (L.) Murrill
15/01/1983 **(44)** coll. 1517; 10/11/1983 **(14)** coll. 2695, 2717; 05/11/1992 **(56)** coll. 5807; 05/12/96 **(39)** loc. Pau, coll. 6977. On the ground, nearness of fireplaces and ferns.

Conferticium karstenii (Bourdot & Galzin) Hallenb.
13/11/1983 **(4)** branch of *Populus tremula*, coll. 1926, 1947. Recorded only once from Italy (Bernicchia, 1986, Onofri et al., 2005).

Coniophora arida (Fr.) P. Karst
31/10/1990 **(23)** on living *Cupressus sempervirens*, coll. 5232; 13/12/1997 **(18)** lying trunk of *Juniperus phoenicea*, coll. 7103. It is one of the few brown-rotting Corticia.

Coniophora fusispora (Cooke & Ellis) Saccardo
14/10/2007 **(16)** on lying trunk of *Pinus*, coll. Arras 1004. Uncommon species.

Coniophora olivacea (Fr.) P. Karst.
12/10/2004 **(85)** on *Pinus*, coll. Arras 766.

Coniophora puteana (Schumach.) P. Karst.
05/11/1993 **(44)** on standing trunk of broadleaves, coll. 2688; 27/12/1983 **(43)** branch of living *Pinus pinaster*, coll. 2389; 07/11/1992 **(60)** lying trunk of *Alnus nigra*, coll. 5778, on old *Taxus baccata*, coll. 5812.

Coriolopsis gallica (Fr.) Ryvarden
15/01/1981 **(52)** on trunk of *Olea europea*, coll. 2327; 13/11/1983 **(49)** on burnt *Quercus suber*, coll. 2343; 15/11/1983 **(28)** on *Q. suber*, coll. 2714; 14/11/1983

(44) trunk of *Populus nigra* on the ground, coll. 2036, 2381, 2709, 2715; 07/11/1985 **(31)** on *Pinus pinea*, coll. 4015, *Acacia cyanophylla*, coll. 4030; 06/12/1996 **(23)** loc. Campu'e su mudrecu, on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 7222; 12/12/1997 **(20)** on broadleaves, coll. 6986. Widespread species, common on *Populus*.

Corticium jonides Bres.

06/11/1992 **(59)** along a dead trunk of *Erica arborea*, coll. 5801; 07/11/1992 **(60)** on *Hedera helix*, coll. 5802. Till now recorded only from Sardinia, and it seems to have a Mediterranean distribution.

Corticium polygonioides (P. Karst.) Donk

03/11/1986 **(31)** on *Acacia cyanophylla*, coll. 6603; 05/11/1997 **(55)** lying trunk of *Arbutus unedo*, coll. 7010; 14/12/1997, 25/11/1999 **(23)** loc. Campu'e su mudrecu, on *Quercus ilex*, coll. 7045, 7391; 23/11/1999 **(77)** *A. unedo*, coll. 7383; 29/11/2000 **(67)** on broadleaves, coll. 7468; **(89)** 17/04/2003 on *Q. ilex*, coll. Arras 928. Almost all Italian records come from Sardinia, while it can be considered a rare species in the rest of Italy, with few records only from Abruzzo region (Onofri et al., 2005).

Corticium roseum Pers.

20/11/1999 **(18)** on *Pistacia*, coll. 7234.

Cristinia helvetica (Pers.) Parmasto

01/11/1986 **(3)** on trunk of *Erica arborea*, coll. 6599; 02/12/2000 **(18)** on old basidiomata of *Hexagonia nitida*, coll. Ryvarden 43271.

Cristinia rhenana (Grosse-Braukmann)

01/12/2002 **(41)** on broadleaves, coll. Arras 765. Very infrequent species, also recorded from Veneto region (leg./det. Losi).

Crustoderma dryinum (Berk. & M.A. Curtis) Parmasto

07/11/1994 **(31)** on stump of *Pinus pinea*, coll. 6618. It is a very rare species, recorded from Sardinia, Veneto and Montecristo island (Onofri et al., 2005).

**Crustoderma longicystidiatum* (Litsch.) Nakasone

07/11/1994 **(31)** on branch of *Pinus pinea* coll. 6647. It is the first record from Italy (conf. K.H. Larsson), characterized by its long, tubular, emerging cystidia.

Cylindrobasidium evolvens (Fr.) Jülich

04/12/1996 **(13)** on trunk of *Hedera helix*, coll. 6855.

** Cystostereum pini-canadense* (Schwein.) Parmasto

05/08/2007 **(16)** on trunk of *Pinus nigra* subsp. *laricio* lying on the ground, coll. Arras 970. It is the first Italian record.

**Dacryobolus karstenii* (Bres.) Oberwinkler ex Parmasto

01/11/2005, 06/11/2005 **(23)** loc. Montes Forest, on trunk of *Pinus nigra* subsp. *laricio* lying on the ground, coll. 8090, coll. Arras 234.They are the first Italian records.

Dacryobolus sudans (Alb. & Schwein.) Fr., 08/11/1985, 14/12/1997 **(23)** loc. Campu'e su mudrecu, lying trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 7040, branch of *Pinus nigra*, coll. 4089; 06/11/1992 **(57)** *Erica arborea*, coll. 5765.
Daedalea quercina (L.) Pers.
03/12/2201 **(77)** on living *Quercus ilex*, coll. Arras 974.
Daedaleopsis confragosa (Bolt.) J. Schröt.
10/11/1983 **(45)** branch of *Populus nigra*, coll. 2691; 29/11/2000 **(67)** trunk of *Salix*, coll. 7495.
Dendrothele dryina (Pers.) P.A. Lemke
07/11/1985 **(23)** loc. Sas Baddes, on branch of *Quercus ilex*, coll. 3836. It is a rare species (Bernicchia, 1990, Onofri et al., 2005) with only very few and sporadic records.
Dendrothele griseocana (Bres.) Bourdot & Galzin
02/12/2003 **(23)** on *Pinus nigra* subsp. *laricio*, coll. 8151.
Dendrothele incrustans (P.A. Lemke) P.A. Lemke
09/11/1985, 01/11/1986 **(13)** on branch of old *Taxus baccata*, coll. 3995, 5027. It is a very rare species in Europe, and Badde Salighes is the only recorded area in Italy (Bernicchia, 1990, 1996; Onofri et al., 2005).
Dendrothele macrospora (Bres.) P.A. Lemke
17/11/1983, 08/11/1994 **(31)** on *Cistus*, coll. 2096, twig of *Helianthemum*, coll. 2086, 2103, *Pistacia lentiscus*, coll. 6655; 06/11/1992 **(57)** on broadleaves, coll. 5796, *Artemisia*, coll. 5773, trunk of *Erica arborea*, coll. 5776, *C. salvifolius*, coll. 5790, 5831; 08/12/1996 **(32)** *Cistus*, coll. 7195; 14/12/1997 **(23)** *Erica arborea*, coll. 7041; 28/09/2001 **(77)** on *Cistus*, coll. Arras 332, 333; 19/11/1999 **(84)** broadleaves, coll. 7396. It typically grows on maquis shrubs.
Dendrothele nivosa (Höhn. & Litsch.) P.A. Lemke
07/11/1985, 05/11/1986, 31/10/1990, 09/11/1994, **(23)** branches and trunks of *Juniperus oxycedrus* subs. *Oxycedrus*, coll. 3802, 3810, 4752, 4781, 4788, 4795, 5236, 5237, 5244, 6620; 07/11/1992 **(56)** *J. oxycedrus* subs. o*xycedrus*, coll. 5817; 07/12/1996, 13/12/1997, 20/11/1999 **(18)** on *J. phoenicea*, coll. 6853, 6857, 7242, 7257; 28/02/2003, **(58)** loc. Lanusei on *Cupressus sempervirens,* coll. Arras 214. Except the last specimen, it has been always recorded from Italy on living Junipers forming small, chalky, pure white, crustose patches, deeply cracked in dry conditions.
Dichomitus campestris (Quél.) & Domañski Orlicz
10/11/1983 **(47)** on branches of *Quercus ilex*, coll. 2369, 2704; 17/11/1983, 06/11/1985 **(39)** loc. Marrubiu, on *Q. ilex*, coll. 2137, 4081; 29/11/1999 **(18)** *Q. ilex*, coll. 7241. It characteristically grows on dead, but still attached branches.
Diplomitoporus flavescens (Bres.) Domañski

04/12/1996 **(44)** branch of *Pinus pinaster*, coll. 6854; 04/12/2007 **(55)** on *P. radiata*, coll. 8156.

Echinodontium ryvardenii Bernicchia & Piga Fig. 3 & **Plate 1**.

15/12/1997 **(7)** on large branches of a centenary living *Juniperus phoenicea*, coll. 6907 typus; 13/12/1997, 20/11/1999, 28/11/2003 **(18)** on trunks and branches of *J. phoenicea*, coll. 6908, 7238, 7687, 7801; 18/11/1999 **(83)** on trunk of *J. oxycedrus* subs. *macrocarpa*, coll. 7232, 7379. The species has been recorded only from Sardinia, on three-four hundred years old trees, both along the eastern and western coast of the isle, always associated to centenary Junipers. It is very remarkable that this species is the first European collection of *Echinodontium*, while all previous collections are North American and Asiatic. This important record must be looked upon as a relict of a previously larger distribution (Figure 8). The species has not been recorded from any other country in the world (Bernicchia, 1998b, 1999, 2000, 2005).

The ancient Sardinian Junipers very often are selective substrata for new or very rare species, for example: *Echinodontium ryvardenii*, *Lenzitopsis oxycedri, Neolentiporus squamosellus*, *Piloporia sajanensis*, *Trametes junipericola* etc. etc. That these species all occur on old *Juniperus* in Italy may of course be a coincidence, but may as well be a hint that they all flourished and had a wider distribution in times before gymnosperms of *Pinaceae* and angiosperms dominated the vegetation of Europe. Species of the older gymnosperms families like *Taxaceae* and *Cupressaceae* had at that times probably a much more prominent role in the forest ecosystems than today.

Many polypores restricted to larger species of *Juniperus* follow the host genus wherever it occurs with a scattered distributional pattern. This disjunct distribution of such rare species indicates a long evolutionary history through changing climates and beside, that some species just barely survive in very small, specialized, remote and isolated Sardinian localities.

Most of the species associated to centenary *Juniperus* are distributed in the area Nuoro-Orgosolo-Lanusei, where some majestic examples have been recorded. Juniper trees become an irreplaceable substratum, and for this reason, the survival of many wood-inhabiting Italian Aphyllophoraceous species becomes uncertain. Therefore they may be considered threatened species and old Juniper trees should be protected.

Halv side
Fig 1. *Echinodontium ryvardenii*, setion thought the hymenium.

Eichleriella deglubens (Berk. (& Broome) Lloyd
09/11/1985, 30/10/1990 **(13)** branch of *Quercus pubescens*, coll. 5067, *Taxus baccata*, coll. 3854, 3890, 5066, 5216, *Hedera helix*, coll. 5210; 24/11/1999 **(77)** on trunk of *Ficus carica*, coll. 7328.
**Erythrycium laetum* (P. Karst.) J. Erikss. & Hjortst.
17/02/2008 **(16)** on branch of *Quercus,* coll. Arras 1127. It is the first record from Italy and an uncommon species in Europe.
Exidia glandulosa (Bull.) Fr.
10/11/1982 **(49)** on *Quercus suber*, coll. 1454; 27/12/1983 **(42)** branch of *Ficus carica* lying on the ground, coll. 2375.
Fibricium gloeocystidiatum Rajchenb.
Fig. 4
20/05/2002 **(68)** *Fraxinus* coll. 4665; 07/11/2005, 19/11/2005, 20/12/2006, 10/02/2007, **(69)** at the base of *Osmunda regalis*, coll. 5487, 5490, 5583, 7088, 8078, 8080. These are the first Italian and European records, while the type species has been described from Patagonia, Argentine. The species has

characteristic gloeocystidia, particularly numerous, larger, and with a yellow colour in coll. 8078. In the same specimen, basidiospores are mostly ellipsoid and also somewhat larger (6.5-7 (7.2) × 3-3.3 µm), while basidiospores of coll. 8080 are cylindrical and not wider than 2.5 µm. The species may remind one of *Fibricium rude* (P. Karst.) Jülich (Eriksson & Ryvarden 1975), which, however, lacks gloeocystidia and gloeopleurous hyphae.

Although M. Rajchenberg confirmed our collections as *F. gloeocystidiatum*, we note the following differences that distinguish the Sardinian specimens from Argentinean collections 11211 and 11216:

a) Basidiospore shape is more variable and generally cylindrical.
b) The tissues contain many crystals when inspected microscopically.
c) Skeletal hyphae appear concentrated in the rhizomorphs but very sparse in the subiculum.
d) Basidia are larger.
e) Cystidia with at least some clamped septa occur in all the Italian specimens. (No clamped cystidia were found in the Argentinean specimens.)
f) Almost all specimens have smaller and difficult to find Gloeocystidia that are less visible in phloxine.
g) Sardinian host substrata include angiosperms and ferns (*Fraxinus* and *Osmunda regalis)* whereas Argentinean substrates are restricted to the gymnosperm, *Austrocedrus chilensis*.

Fibricium rude (P. Karst.) Jülich
05/08/2007 **(16)** trunk on the ground of *Pinus*, coll. Arras 962; 17/02/2008 **(29)** loc. S'Isca de sa Mela, on twig of *Pinus*, coll. Arras 1141**.**

Fibulomyces fusoideus Jülich
05/10/2003 **(64)** on bits and peaces of *Pinus* wood, coll. Arras 112.

Fistulina hepatica (Schaeff.) Sibth., on old, living *Quercus* spp. and *Castanea sativa* in many areas of island.

Fomes fomentarius (L.) J.J. Kickx
10/01/1984 **(50)** on living *Populus*, coll. 2363; 10/10/1983 **(47)** on *Populus nigra*, coll. 2393; 04/12/2007 **(58)** loc. Baccu Gerduri, on *Alnus glutinosa*, coll. 8199.

Fomitopsis pinicola (Sw.) P. Karst.
15/11/1983 **(31)** on strump of *Pinus pinea*, coll. 2034.

Galzinia incrustans (Höhn. & Litsch.) Parmasto
08/11/1985 **(4)** twig of *Castanea sativa*, coll. 4087, rare and infrequent species.

Ganoderma adspersum (Schulzer) Donk
07/11/1985 **(23)** on centenary living *Quercus ilex*, coll. 3840; 30/10/1990 **(13)** living *Ulmus*, coll. 5155; 20/11/1999 **(18)** stump of *Q. ilex*, coll. 7240.

Fig. 3. *Fibricium gloeocystidiatum*, section through the hymenium

Ganoderma applanatum (Pers.) Pat.
10/12/1982, 05/12/1996 **(39)** trunk of *Quercus ilex*, coll. 1308, 1335, *Q. suber*, coll. 7019.
Ganoderma lucidum (Curtis) P. Karst.
10/12/1982 **(38)** *Quercus ilex*, coll. 1331; 13/11/1983 **(4)** surfacing roots of *Q. ilex*, coll. 1975; 06/11/1985 **(39)** living *Q. ilex*, coll. 4060.
Globulicium hiemale (Laurila) Hjortstam
09/11/1985 **(13)** on *Clematis vitalba*, coll. 3848; 07/11/1986 **(51)** *C. vitalba*, coll. 6610. Uncommon species, and sporadically distributed (Onofri et al., 2005).
Gloeocystidiellum lactescens (Berk.) Boidin
07/11/1985 **(23)** *Quercus ilex*, coll. 3839. Common and widely distributed.
Gloeocystidiellum leucoxanthum (Bres.) Boidin
06/04/2003 **(17)** coll. Arras 413, uncommon species.
Gloeocystidiellum luridum (Bres.) Boidin
13/11/1983, 02/11/1986 **(13)** branch of *Quercus pubescens*, coll. 1932, *Castanea sativa*, coll. 5077; 13/11/1983 **(4)** *Q. ilex*, coll. 1972. Common and widespread species.
Gloeocystidiellum porosum (Berk. & M.A. Curtis) Donk
02/03/2003 **(70)** on broadleaves, coll. Arras 136, 672, 687, 795.
**Gloeodontia columbiensis*Burt ex Burdsall & Lombard
Fig. 5
06/04/2008 **(91)** on *Erica arborea*, coll. Arras 1189. The species is present in Canada and United States (Burdsall & Lombard 1976), Iran (Hallenberg 1978, 1981), Switzerland (Martini 1991) and now in Italy too.
It is a nice species with a tuberculate to odontioid hymenophore and peculiar microscopic characteristics with a monomitic hyphal system, clamped generative hyphae, numerous gloeocystidia with a positive sulphobenzaldehyde reaction, fasciculate, strongly encrusted cystidia, crowded on the apices of the teeth, basidiospores ellipsoid, finely asperulate, strongly amyloid 5.5-7-0 x 4.0-4.5 µm (Figure 11). It is easily separated from other species of gen. *Gloeodontia* by its monomitic hyphal system (it is dimitic in *G. discolor* and *G. pyramidata*), and the presence of heavily encrusted cystidia (they are absent in *G. americana*).

Fig 5 *Gloeodontia columbiensis* section though hymenium.

Gloeophyllum abietinum (Bull.) P. Karst.
05/11/1986 **(23)** branch of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4794.
Gloeophyllum protractum (Fr.) Imazeki
17/02/2008 **(29)** loc. S'Isca de sa Mela on *Pinus*, coll. Arras 1130. Rare species in Italy with very few records.
Gloeophyllum sepiarium (Wulfen) P. Karst.
13/12/1997, 20/11/1999 **(18)** lying trunk of *Juniperus phoenicea*, coll. 6991, 7239; 14/12/1997 **(23)** loc. Is scalas arenas, trunk of *J. oxycedrus* subs. *oxycedrus*, coll. 6985. Common species.
Gloeophyllum trabeum (Pers.) Murrill
10/02/1982 **(37)** on shrubs of maquis, coll. 628.
Gloeoporus dichrous (Fr.) Bres.
06/11/1985 **(31)** on *Acacia cyanophylla*, coll. 4016; 09/11/1994 **(23)** loc. Is scalas arenas. *Quercus ilex*, coll. 6651; 18/11/1999 **(83)** on trunk of *A. cyanophylla*, coll.7390. Very often on lying branches of shrubs.
Gloeotromera alba (Lloyd) Ervin
18/11/1999 **(83)** trunk of *Acacia cyanophylla*, coll. 7388; 25/11/1999 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 7401
**Granulocystis flabelliradiata* (J. Erikss. & Hjortstam) Hjortstam
19/05/2002 **(5)** on broadleaves, coll. Arras 90. Rare species and recorded for the

first time from Italy.
Grifola frondosa (Dicks.) Gray
23/11/1999 **(77)** at the base of *Castanea sativa*, coll. 7336.
**Gyrodontium sacchari* (Spreng.) Hjortstam
31/10/1990 **(8)** on needles of *Pinus pinea*, coll. 5280, 5283. It is the first and the only record in Italy. *Coniophoracea* with several, very small, globose and yellowish basidiospores.
Henningsomyces candidus (Pers.) Kuntze
11/11/1994 **(18)** on *Cistus salvifolius*, coll. 6626.
Hericium cirrhatum (Pers.) Nikol.
Recorded during the European days of C.E.M.M., November 7-13 1994, Oliena (Nuoro).
Hericium coralloides (Scop.) Pers.
05/11/1986, 09/11/1994 **(23)** on old and large trunks of *Quercus ilex*, coll. 5379; 21/11/1999 **(63)** on *Q. ilex*, coll. 7335.
Hericium erinaceum (Bull.) Pers.
10/12/1982 **(15)** on stump of *Quercus ilex*, coll. 1315; 05/11/1986, 09/11/1994 **(23)** lying trunk of *Q. ilex*, coll. 4776, 6657; 24/11/1999 **(77)** on *Q. ilex*, coll. 7410.
Hexagonia nitida Durieu & Mont.
Table 1
10/02/1982, 06/11/1985 **(39)** coll. 2335, 4061, 4062, 4109, 4114; 10/05/1982 **(44)** coll. 1561; 07/11/1985, 31/10/1990, 01/12/2000 **(23)**, coll. 3813, 5255, 7503. Common Mediterranean species in all holm-oak forests, often ignored, growing always on trunks and large branches of *Quercus ilex* at a height of 3-4 metres.
Hymenochaete cinnamomea (Pers.) Bres.
29/10/1990 **(21)** on broadleaves coll. 5225; 06/11/1992 **(57)** on *Quercus ilex*, coll. 5770, trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5572, 5772.
Hymenochaete corrugata (Fr.) Lév.
07/04/2002 **(70)** on *Phillyrea*, coll. Arras 267, 268, 269; 25/08/2000 **(71)** twig of *Cistus*, coll. Arras 777.
Hymenochaete fuliginosa (Pers.) Lév.
17/11/1983 **(39)** on *Quercus ilex*, coll. 2142; 07/11/1985 **(23)** *Q. ilex*, coll. 3832.
Hymenochaete rubiginosa (Dicks.) Lév.
04/11/1990 **(10)** on *Cistus*, coll. 5389.
Hymenochaete rubiginosa subsp. *subfuliginosa* (Bourdot & Galzin) Bourdot & Galzin
25/08/2000 **(74)** on *Cistus*, coll. Arras 270, 773; **(87)** on *Phillyrea*, coll. Arras 42.

Hymenochaete tabacina (Fr.) Lév.
02/11/1999 **(4)** on broadleaves, coll. Arras 273.
**Hyphoderma anthracophilum* (Bourdot) Jülich
14/11/1983 **(31)** on broadleaves, coll. 2016. Very rare species in Europe, known from France, and recorded for the first time in Italy (det. K.H. Larsson). The species is recognized by its lack of cystidia, thick-walled and richly branched subicular hyphae and ellipsoid basidiospores.
Hyphoderma argillaceum (Bres.) Donk
05/11/1997 **(55)** on lying trunk of *Pinus pinaster*, coll. 7009.
Hyphoderma cremeoalbum (Höhn. & Litsch.) Jülich
01/11/1986 **(1)** on *Quercus ilex*, coll. 6632. Infrequent species (Onofri et al., 2005).
Hyphoderma cryptocallimon B. de Vries
05/11/1986 **(23)** loc. Campu'e su mudrecu, on lying trunks of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4814, 4815. Sporadically distributed species, present only in few Italian regions.
Hyphoderma etruriae Bernicchia
15/12/1997 **(7)** growing of large and very old trunks of *Juniperus phoenicea*, coll. 6996, 7035; 18/11/1999 **(83)** on *J. phoenicea*, coll. 7358; 02/12/2000 **(18)** on *J. phoenicea*, coll. 7498. It grows characteristically inside deep cortical ridges or wounds, very often covered with thick spider's web. It seems to be a Mediterranean species, very rare in Italy, recorded from Tuscany, Puglia and Sardinia regions, but from no other European countries.
**Hyphoderma incrustatum* K.H. Larss.
15/11/1983 **(46)** on branch of *Quercus* ilex, coll. 2047. It is very rare species in Europe (Larsson, 1998) and recorded for the first time in Italy, known also from Burano Reserve (Grosseto) on *Phillyrea angustifolia.*
**Hyphoderma malençonii* (Manjón & G. Moreno) Manjón, G. Moreno & Hjortstam
07/11/1994 **(31)** on branches of *Pinus pinea* 6629, 6630, 7532, det. K.H. Larsson; 18/11/1999, **(83)** growing on cortical layers of *Juniperus oxycedrus* subs. *macrocarpa*, coll., 7353, 7355, 7372. Typical Mediterranean species (Hjortstam et al., 1988), known from only these two Italian localities. Mycroscopically the cystidia are numerous, thin-walled, cylindrical, narrower towards the apices, immersed or rarely slightly projecting, irregularly flexuous and moniliform. Basidiospores cylindrical, smooth, thin-walled, with small oil-drops or rather homogeneous contents.
Hyphoderma medioburiense (Burt) Donk
14/11/1983, 03/11/1986 **(31)** on *Acacia cyanophylla*, coll. 2013, branch of *Pinus pinea*, coll. 2023, trunk of *Thymelaea tartonraira*, coll. 7024; 18/12/2002 **(14)**

on broadleaves, coll. Arras 293; 30/10/1990 **(13)** on *Castanea sativa*, coll. 5211; 11/11/1992 **(18)** trunk of *Helichrysum italicum*, coll. 7531; 19/08/2001 **(4)** coll. Arras 295. Infrequent species in Italy.
Hyphoderma multicystidium (Hjortstam & Ryvarden) Hjortstam & Telleria
07/11/1985 **(23)** on *Quercus ilex*, coll. 3806, on *Juniperus oxycedrus*, coll. 5414, 5416; 12/12/1997 **(19)** at the base of *Cistus*, coll. 6993. Rare species, recorded from Sardinia and Burano Reserve (Grosseto).
Hyphoderma occidentale (D.P. Rogers) Boidin & Gilles
07/11/1985 **(23)** on *Quercus ilex* coll. 3845; 07/11/1997 **(79)** on broadleaves of maquis, coll. 6972; 05/10/1999 **(36)** on *Q. ilex*, coll. Arras 287, 745. It is a very rare species in Italian forests, with only very few records (Onofri et al., 2005).
Hyphoderma orphanellum (Bourdot & Galzin) Donk
05/11/1986 **(23)** on branch of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4782. Rare species, recorded also from Abruzzo region, on *Fagus* (Onofri et. al., 2005).
Hyphoderma roseocremeum (Bres.) Donk
13/11/1983 **(13)** on *Quercus pubescens*, coll. 1944; 06/11/1985 **(39)** *Q. ilex*, coll. 4112. 28/12/2007 **(68)** loc. Lanusei, on decorticated broadleaves, coll. Arras 1068. Infrequent species (Onofri et al., 2005),
Hyphoderma setigerum (Fr.) Donk
18/11/1983 **(54)** on *Quercus suber*, coll. 2123; 06/11/1985 **(46)** on small branch of *Q. suber*, coll. 3865; 02/11/1989 **(13)** *Q. pubescens*, coll. 5080.
Hyphoderma sibiricum (Parmasto) J. Erikss. & Å. Strid
01/07/2001 **(25)** coll. Arras 745, 788, both on broadleaves. Rare species with only few records, and this is the first from the southern part of Italy.
Hyphodermella corrugata (Fr.) J. Erikss. & Ryvarden
06/11/1985, 05/12/1996 **(39)** on branch of *Quercus ilex*, coll. 4055, 6979; 11/11/1994 **(18)** *Rosmarinus officinalis*, coll. 6602; 04/12/2000 **(77)**, Loc. Baccu e piras on twig of maquis shrubs, coll. 7490; 29/11/2000 **(67)** on broadleaves, coll. 7496.
Hyphodontia alutaria (Burt) J. Erikss.
13/11/1983, 02/11/1986 **(13)** on *Taxus baccata*, coll. 1961, 5065, 5098.
Hyphodontia arguta (Fr.) J. Erikss.
30/10/1990 **(13)** branch of *Taxus baccata* on the ground, coll. 5481.
Hyphodontia aspera (Fr.) J. Erikss.
09/11/1985 **(13)** on *Taxus baccata*, coll. 4003, twig of *Rubus fruticosus*, coll. 3856; 05/11/1986 **(23)** trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4787; 04/11/1990 **(10)** on *Phillyrea angustifolia*, coll. 5387; 07/11/1992 **(60)** on lying trunk of *T. baccata*, coll. 5805; 19/11/1999 **(83)** on broadleaves, coll. 7299, 7309; 29/11/2003, 18/01/2007 **(77)** on *Carpinus* and *Erica arborea*, coll. Arras 804, 933. Widely distributed species.

Hyphodontia barba-jovis (Bull.) J. Erikss.
19/12/2007 **(68)** loc. Lanusei, on *Juniperus*, coll. Arras 1060. Uncommon species in Italy.
Hyphodontia breviseta (P. Karst.) J. Erikss.
07/11/1992 **(56)** on lying trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5813.
Hyphodontia crustosa (Pers.) J. Erikss.
05/11/1986 **(23)** *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4798 5589; 11/11/1994 **(18)** on *Cistus salvifolius*, coll. 6608; 05/11/1997 **(55)** trunk of *Arbutus unedo* lying on the ground, coll. 7012.
Hyphodontia detritica (Bourdot) J. Erikss.
01/11/2005 **(66)**) on *Osmunda regalis*, coll. Arras 720. Infrequent species
Hyphodontia gossypina (Parmasto) Hjortstam
12/11/1983 **(33)** *Pinus pinea*, coll. 1901; 02/12/2007 **(23)** on *Quercus ilex*, coll. Arras 918.
Hyphodontia hastata (Litsch.) J. Erikss.
06/12/1996 **(23)** loc. Campu'e su mudrecu, on *Quercus ilex*, coll. 7247. Recorded from only few Italian regions (Onofri et al., 2005).
Hyphodontia juniperi (Bourdot & Galzin) J. Erikss. & Hjortstam
07/11/1985, 05/11/1986 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4760, 4766, on *Rosmarinus officinalis*, coll. 3808, 3820; 15/12/1997 **(7)** at the basal trunk of *Juniperus phoenicea*, coll. 6987; 19/11/1999 **(82)** on *J. phoenicea*, coll. 7302; 20/11/1999 **(18)** *J. phoenicea*, coll. 7296. Widespread species.
Hyphodontia nespori (Bres.) J. Erikss. & Hjortstam
23/11/1998 **(75)** on broadleaves, coll. Arras 324.
Hyphodontia pallidula (Bres.) J. Erikss.
09/11/1985, 04/12/1996 **(13)** on *Taxus baccata*, coll. 3992, 6843.
Hyphodontia pruni (Lasch) Svrcek
02/11/1986, 30/11/1990 **(13)** branch of *Ilex aquifolium*, coll. 5099, on *Taxus baccata*, coll. 5240; 29/10/1990 **(6)** on *T. baccata*, coll. 5221; 05/11/1986 **(23)** *Rosmarinus officinalis*, coll. 5384; 06/11/1992 **(57)** *Erica arborea*, coll. 6038.
Hyphodontia quercina (Pers.) J. Erikss.
15/12/1982, 10/01/1984, 06/11/1985 **(39)**, coll. 1297, 1317, 2311, 4059, 4071, 4107; 07/11/1985, 05/11/1986, 14/12/1997 **(23)**, coll. 3841, 4777, 7043; 06/11/1985 **(46)**, coll. 3872, always on trunks of *Quercus ilex*.
Hyphodontia rimosissima (Peck) Gilb.
05/11/1986 **(23)** on *Rosmarinus officinalis*, coll. 5469. Infrequent species, recorded from Emilia-Romagna too.
Hyphodontia sambuci (Pers.) J. Erikss.
10/12/1982 **(39)** on *Arbutus unedo*, coll. 1334; 13/11/1983, 09/11/1985,

09/11/1986 **(13)** *Quercus pubescens*, coll. 1928, on *Hedera helix*, coll. 3849, branch of *Taxus baccata*, coll. 3852, 3858, 5064; 07/11/1985, 31/10/1990 **(23)** on twig of *Rubus*, coll. 3822, on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5227, *Rosmarinus officinalis*, coll. 5392; 11/11/1994 **(18)** at the basal trunk of *Helichrysum italicum*, coll. 6664. Widespread species.

Hyphodontia subalutacea (P. Karst.) J. Erikss.

07/11/1994 **(31)** on *Helichrysum italicum*, coll. 6636.

Hypochniciellum molle (Fr.) Hjortstam

05/11/1986 **(23**) on branch of *Pinus nigra* subsp. *laricio*, coll. 4769, 4778; 23/11/1999, 03/12/2007 **(77)** on *Quercus ilex*, coll. 7411, 8172; 18/11/2007 **(29)** loc. S'Isca de sa Mela on *P. nigra*, coll. Arras 1076; 05/12/2007 **(16)** on *P. nigra* subsp. *loricato*, coll. Arras 1064.

Hypochniciellum ovoideum (Jülich) Hjortstam & Ryvarden

07/11/1992 **(56)** on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5808; 08/11/1994 **(31)** on *Cistus*, coll. 6614; 30/03/2003 **(81)** *Quercus*, coll. Arras 876.

**Hypochniciellum subillaqueatum* (Litsch.) Hjortstam

05/08/2007 **(16)** on wooden construction, coll. Arras 965. Poorly known species and evidently rare; it is recorded for the first time from Italy.

Hypochnicium erikssonii Hallenb. & Hjortstam

21/01/1998 **(55)** on stump of *Pinus pinaster*, coll. Arras 309.

**Hypochnicium albostramineum* (Bres.) Hallenb.

05/12/2007 **(16)** on *Pinus nigra* subsp. *loricato*, coll. Arras 1056. It is recorded for the first time from Italy (Hallenberg 2003).

Hypochnicium lundellii (Bourdot) J. Erikss.

06/11/1985 **(46)** on *Arbutus unedo*, coll. 3866. Uncommon species, recorded also from Lombardia and Veneto regions.

Inonotus cuticularis (Bull.) P. Karst.

07/11/1985, 05/11/1986 **(23**) on branch of *Quercus ilex*, coll. 3838, *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4756; 09/11/1985 **(32)** on *Q. suber*, coll. 3678; 10/01/1986 **(39)** loc. Pau, *Q. ilex*, coll. 3784; 30/11/2000 **(77)** on a injured trunk of living *Acer*, coll. 7497.

Inonotus dryophilus (Berk.) Murrill

10/01/1986 **(44)** loc. Black Mountains, on *Eucalyptus*, coll. 4368. Rare species in Italy with sporadic records.

Inonotus hispidus (Bull.) P. Karst.

05/12/1996 **(39)** loc. Pau, on living *Quercus ilex*, coll. 6982. It usually grows on old trees and fruits-bearing.

Inonotus tamaricis (Pat.) Maire

10/11/1982 **(52)** on branch of *Tamarix gallica*, coll. 1446. Frequent species during spring and summer period, then easily destroyed by insects.

Inonotus tomentosus (Fr.) Teng
14/11/1983 **(32)** growing in the clearings, close to *Pinus* and shrubs, coll. 1993.
Intextomyces contiguus (P. Karst) J. Erikss. & Ryvarden
04/12/2000 **(77)** lying trunk of *Arbutus unedo*, coll. 7477. Very rare species, recorded also from Calabria, in a cork oak forest (Onofri et al., 2005).
Junghuhnia nitida (Pers.) Ryvarden
05/12/1996 **(39)** loc. Pau, on lying trunk of *Arbutus unedo*, coll. 6850; 29/11/2003 **(77)** on *A. unedo*, coll. 7874.
Junghuhnia semisupiniformis (Murrill) Ryvarden
30/11/2000, 29/11/2003 **(77)** on large branches of *Arbutus unedo*, coll. 7364, 7365, 7367, 7793, 7794, 7795. Previously recorded only from Mesola Forest, Ferrara (Ginns & Bernicchia, 1984). Very rare species in Europe, with only few records outside Italy (Jinns & Bernicchia, 1984; Bernicchia, 2005; Onofri et al., 2005). The specimen from Mesola Forest is pileate, effused-reflexed, with yellowish and fibrillose sterile surface, while Sardinian records are all resupinate, and white. Microscopic characteristics are indeed very similar in all the specimens coming from the two different localities.
Kavinia alboviridis (Morgan) Gilb. & Budington
13/12/1997 **(18)** on *Juniperus*, coll. Arras 331. Rare species, with very sporadic records.
Kavinia himantia (Schwein.) J. Erikss.
05/11/1986, 09/11/1994, 01/12/2000 **(23)** trunks of *Rosmarinus officinalis*, coll. 4753, *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4785, 4786, 4791, 6615, on *Helichrysum*, coll. 6612, lying trunk of *Quercus ilex*, coll. 7474; 13/12/1997 **(18)** on *J. phoenicea*, coll. 7029; 23/11/1999 **(77)** trunk of *Populus tremula*, coll. 7380.
Laetiporus sulphureus (Bull.) Murrill
18/09/2007 **(66)** on trunk of *Castanea sativa*, coll. Arras 972.
Laxitextum bicolor (Pers.) Lentz
04/11/1986 **(24)** on branch of *Quercus suber*, coll. 4768.
Lenzites betulina (L.) Fr., 01/11/2005 **(66)**) on stump of *Quercus ilex*, coll. Arras 343.
Lenzitopsis oxycedri Malençon & Bertault
Table 2
05/11/1997, 24/11/1999 **(26)** occurs on *Juniperus oxycedrus* subs. o*xycedrus*, coll. 6909, 7326, 7800; 28/11/2000 **(11)** on *J. oxycedrus* subs. *oxycedrus*, coll. 7475, 7494. This species grows as a rule inside rifts, on deep cortical ridges, wounds, small niches or on burnt wood of majestic exemplars of Junipers, which occur scattered here and there, in grazing lands. These very ancient trees have a diameter of 80-90 cm, and can reach an age of 300-400 years. In Sardinia they

occur in Nuoro, Ogliastra and Cagliari provinces (Bernicchia, 1999, 2005), and moreover in Spain and Morocco (Malençon et Bertault, 1963). The survival of the species depends on the presence of the hundred-year-old Junipers which unfortunately are more and more rare. *L. oxycedri*, for its extremely small population size, may be considered therefore a threatened species.

Leptoporus mollis (Pers.) Quél.

06/11/1992, 02/11/2003, **(23)** on *Cedrus*, coll. 5793, trunk of *Pinus nigra* subsp. *loricato*, coll. 7785.; 05/12/2007 **(16)** on large trunk on *P. nigra* subsp. *loricato*, coll. 8171, coll. Arras 1052. Uncommon species in Italy with a limited distribution.

**Leptosporomyces roseus* Jülich

02/06/2003 **(14)** on polypore growing on coniferous wood, coll. Arras 986. It is the first record from Italy. It occured on an old and partially destroyed, resupinate polypore with round basidiospores, monomitic hyphal system, simple septate hyphae, and with a completely destroyed hymenial layer.

Leptosporomyces septentrionalis (J. Erikss.) Krieglst.

02/12/2003 **(23)** on *Quercus ilex*, coll. Arras 919.

Leucogyrophana mollusca (Fr.) Pouzar

06/11/1997 **(81)** on stump of *Pinus pinaster*, coll. 7020; 14/10/2007 **(16)** on *Pinus nigra* subsp. *laricio*, coll. Arras 1003.

Leucogyrophana pseudomollusca (Parmasto) Parmasto

28/09/2001 **(77)** loc. Seui, coll. Arras 714, 14/10/2007 **(16)** on trunk of *Pinus*, coll. Arras 1003.

Leucogyrophana romellii Ginns

04/12/2007 **(58)** on *Pinus radiata*, coll. Arras 1114.

Lindtneria chordulata (D.P. Rogers) Hjortstam

17/11/1983 **(33)** on *Pinus pinea* coll. 2104; 18/11/1983 **(53)** on *Arbutus unedo*, coll. 2115, det. C. Losi. Only very few records of that species are known from Italy, and it is considered rare in Europe. Hyphae with scattered clamps in the subiculum, basidiospores globose to subglobose, with a prominent apiculus, slightly warted and with thickened walls, strongly cyanophilous, about 5 µm in diam.

**Lindtneria flava* Parmasto

29/11/2000 **(65)** on broadleaves, coll. Arras 108. Amazing record, the first in Italy because the previous Italian specimens have to be referred to *Lindtneria panphyliensis* (Larsen & Bernicchia, 1990), which is similar in colour but with different macro- and microscopic features. The latter is in fact effuse, occurring in small patches readily separable, fragmenting when touched, pelliculose, some parts pellucid and parchment-like. Hymenial surface papillate to odontioid to less frequently smooth, pale yellow, buff-yellow to pinkish buff. *Lindtneria*

flava on the contrary, is effuse, very fragile, yellowish when fresh, has a poroid hymenial surface, with irregularly angular pores, easily flaking off. Subicular and subhymenial hyphae with frequent clamp connections occurring at the septa, in addition to simple septa. Basidiospores ellipsoid to widely ellipsoid, thin- to thick-walled, smooth when young, then tuberculate, or irregularly aculeate, with warts regularly distributed over the spore surface, (7.0) 7.5-9.0 (9.5)x (5.0) 5.5-6.5 µm.
Very rare species in Europe, occurring in Estonia, Ukraina and Netherlands with very few specimens. Previous records from Sweden and Italy have to be referred to *Lindtneria panphyliensis.*
Litschauerella clematitis (Bourdot & Galzin) J. Erikss. & Ryvarden
06/11/1985 **(46)** on *Arbutus unedo*, coll. 3875; 02/11/1986 **(13)** on *Clematis vitalba*, coll. 5400.
Melzericium udicola (Bourdot) Hauerslev
02/11/1986 **(13)** *Clematis vitalba*, coll. 5068, 5081, on *Taxus baccata*, coll. 5069; 04/11/1986 **(15)** broadleaves, coll. 6597; 10/11/1992 **(43)** on branches of *Pinus pinaster* lying on the ground, coll. 5866; 05/11/1986, 14/12/1997, 25/11/1999 **(23)**, loc. Mt. Subiu, at the basal part of *Genista corsica*, coll. 7048, twig of *Rosmarinus officinalis*, coll. 4762, at ground level of *Helichrysum italicum*, coll. 7408; 06/11/1992 **(57)** *H. italicum*, coll. 5803. Rare species, repeatedly recorded but only from Sardinia (Bernicchia, 1996, Onofri et al., 2005).
Membranomyces delectabile (H.S. Jacks.) Kotir. & Saaren.
04/01/2005 **(66)** on corticated *Pinus*, coll. Arras 25.
Membranomyces spurius (Bourdot) Jülich
04/01/2004 **(73)** on *Q. ilex*, coll. Arras 119.
Meripilus giganteus (Pers.) P. Karst.
10/01/1982 **(37)** on *Eucalyptus*, coll. 622; 29/10/1990 **(21)** at the base of trunk of *Quercus ilex*, coll. 5214.
Meruliopsis taxicola (Pers.) Bondartsev
28/10/2007 **(1)** loc. Vallicciola on branch of *Pinus*, coll. Arras 1038.
Merulius tremellosus Schrad.
23/01/1999 **(36)** loc. La Madonnina, on trunk of *Pinus* on the ground, coll. Arras 390.
Mucronella calva (Alb. & Schwein.) Fr.
05/12/2007 **(16)** on large trunks of *Pinus nigra* subsp. *loricato* lying on the ground, growing togheter with *Antrodia vaillantii*, coll. 8173, 8174, 8201; conf. C. Losi. Rare and incospicuous species when fresh, almost invisibile when dry; recorded from Emilia-Romagna too.
Mycoacia aurea (Fr.) J. Erikss. & Ryvarden
19/08/2001 **(4)** branch of *Populus tremula*, coll. Arras 389.

Mycoacia fuscoatra (Fr.) Donk
03/12/2007 **(77)** on *Quercus ilex*, coll. 8104.
Mycoacia nothofagi (G.H. Cunn.) Ryvarden **Table 2**
01/12/2000 **(23)** *Quercus ilex* on the ground, coll. 7479. The brown coloue of basidioma, and the numerous and encrusted cystidia are characteristic. Uncommon species with sporadic records.
Mycoacia uda (Fr.) Donk
29/11/2000 **(67)** on trunk of broadleaves, coll. 7485.
Mycoaciella bispora (Stalpers) J. Erikss. & Ryvarden
23/11/99, 30/11/2000, 04/12/2000 **(77)** on *Ostrya carpinifolia*, coll. 7369, *Arbutus unedo*, coll. 7368, 7369, 7371; 02/12/2000 **(18)** on broadleaves. Infrequent species, recorded till now from Emilia-Romagna, Sardinia and Veneto regions.
Neolentiporus squamosellus (Bernicchia & Ryvarden) Bernicchia & Ryvarden
Fig. 6 **Table 3**

Fig 6: *Neolentiporus squamosellus* part of the hymenium.

07/11/1985, 09/11/1994, 06/12/1996, 14/12/1997, 25/11/1999, 02/12/2003, **(23)** loc. Campu'e su mudrecu, on burnt lying trunks of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 3809, 6649, 6650 typus, 6838, 6913, 7000, 7223, 7293, 7298, 7402, 7712, 7689, 7690, 7713, 7714. It is a really interesting species, recorded only from the type locality, in a restricted area of Supramonte of Orgosolo, famous in the past for being one of the widest juniper forest present in Mediterranean area, and destroyed by a fire in 1931. Recently the species has been recorded from South of France (Rivoire per. comm.).
Macroscopically this species reminds strongly a small *Polyporus tuberaster* because of the minute scaly pileus and the semistipitate basidiocarps. However, growing on and with mycelial strings clinging to a deeply brown rotten substrate, immediately rises suspicion. A microscopical examination confirms the doubt as no binding hyphae of the *Bovista* type are present, on the contrary the trama and the context are dominated by unbranched skeletal hyphae. The combination of brown rot and a dimitic hyphal system with skeletal hyphae pointed early to *Antrodia*. But the remarkable presence of long, projecting, thin-walled, slightly widened cystidia, present in all specimens, and their widened basal part indicates that they are not only hyphal ends growing through the hymenium because of the basidiocarps being placed upside down under slow drying. This character, unknown to *Antrodia* species, has made us reconsider its taxonomic status, especially since Rajchenberg (1995) described the genus *Neolentiporus* Rajchenb. based on *Polyporus maculatissimus* Lloyd as type species. *N. maculatissimus* is macroscopically rather similar to *N. squamosellus* sharing the same scaly to squamulose pileus surface, fairly large pores, a lateral stipe, a dimitical hyphal system, fairly large cylindric and hyaline basidiospores and a brown rot. *N. maculatissimus* is restricted to *Nothofagus* and *Eucalyptus* and it is known from Tasmania, Australia and Argentine, while *N. sqiuamosellus* is known only from burnt *Juniperus* in Italy and from *Juniperus* in the South of France, thus with a quite different ecology and distribution. Thus it seems clear that the two species should be placed in the same genus, even if, more important, the cystidia present in the hymenium of *N. squamosellus* are absent from *N. maculatissimus*. Further the basidiospores of our species are slightly, but distinctly navicular and wider than the cylindrical and narrower basidiospores of *N. maculatissimus*. Thus, it is evident that *N. squamosellus* represents a species of its own, with *N. maculatissimus* exclusive of southern hemisphere and *N. squamosellus* present in the northern one. Very often our species is growing associated to *Antrodia pulvinascens*.
N. squamosellus must be considered a very rare species in Europe, occurring only in a very restricted area, connected to a peculiar habitat, to an exclusive substrate, and therefore it is a species in need of protection (Bernicchia &

Ryvarden, 1996,1998; Bernicchia, 1998, 2005) (Figure 4).
Oligoporus balsameus (Peck) Gilb. & Ryvarden
13/11/1983, 09/11/1985, 30/10/1990, 04/12/1996, **(13)** coll. 1958, 2697, 3883, 3991, 3894, 3998, 3999, 4000, 4001, 4072, 4073, 5086, 6839. It occurs on necrotic and very often burnt tissues of living *Taxus baccata*; 19/11/1994 **(43)** on trunk of *Pinus*, coll. 7922; 05/12/1996 **(39)** loc. Pau on *Arbutus unedo*, coll. 7116. Uncommon species in Italy, with only few known collecting areas.
Oligoporus cerifluus (Berk. & M.A. Curtis) Ryvarden & Gilb.
07/11/1992 **(60)** on living *Taxus baccata*, coll. 5819. It is a rare species in all Italian regions, recorded from few areas.
Oligoporus floriformis (Quél.) Gilb. & Ryvarden
06/11/1997 **(81)** on stump of *Pinus pinaster*, coll. 6968.
Oligoporus fragilis (Fr.) Gilb. & Ryvarden
05/11/1986 **(23)** on branch of *Pinus* subsp. *laricio*, coll. 4770. Widespread species in all coniferous Italian forests.
Oligoporus cfr. *guttulatus* (Peck) Gilbn. & Ryvarden
15/12/1984 **(28)** lying trunk of coniferous wood, coll. 2702. Very infrequent species.
Oligoporus hibernicus (Berk. & Broome) Gilb. & Ryvarden
05/11/1986 **(23)** loc. Is scalas arenas, on branch of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4784. Uncommon species in Italy, with sporadic records. The hyphoid hymenial cystidia are sometimes few and difficult to observe.
Oligoporus inocybe (A. David & Malençon) Ryvarden & Gilb.
25/11/1999 **(23)** on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 7392. Sporadic, known only from the western part of Mediterranean sea; occurring along coastal pinewoods and machia forests, always on coniferous wood.
Oligoporus leucomallellus (Murrill) Gilb. & Ryvarden
10/12/1982 **(39)** branch of *Pinus pinea*, coll. 1330; 23/11/1999, 29/11/2003, **(77)** on *Carpinus*, coll. 7332, on *Arbutus*, coll. 7904, lying trunk of *Pinus*, coll. 7290; 07/11/1994 **(31)** on *Pinus pinea*, coll. 6617; 05/11/1997, 04/12/2007 **(55)** on trunks of *P. radiata*, coll. 6965, 8176; 06/11/1997 **(81)** on *P. pinaster*, coll. 7011.
***Oligoporus luteocaesius** (A. David) Ryvarden & Gilbn.
27/01/2008 **(87)** on burnt branch of *Pinus pinaster*, coll. Arras 1125.
Very rare species in Europe and recorded for the first time in Italy. Characteristically yellow coloured, and with an amyloid reaction of basidiospores in mass.
Oligoporus mappa (Overh. & J. Lowe) Gilb. & Ryvarden
05/11/1986 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4813. Very rare species, recorded from Sardinia and Sicily, unmistakably due to the characteristic and long cylindric basidiospores.

Oligoporus rennyi (Berk. & Broome) Donk
15/11/1983 **(31)** *Pinus pinea*, coll. 2026, 2028; 02/12/2003 **(23)** on *P. nigra* subsp. *laricio,* coll. Arras 899.
Oligoporus simani (Pilát) Bernicchia
05/11/1986, 14/08/1993, **(23)** on twig of *Arbutus unedo*, coll. 4790, *Quercus ilex*, coll. 7925. Rare species, sometimes confused with *O. hibernicus*, and whose distribution, for this reason, is not well known.
Oligoporus subcaesius (A. David) Ryvarden & Gilb.
10/12/1982 **(44)** on broadleaves, coll. 1260; 28/12/1983 **(53)** branch of *Quercus ilex*, coll. 2385; 09/11/1985 **(13)** on *Ilex aquifolium*, coll. 4130; 07/11/1997 **(74)** on twig of machia vegetation, coll. 6962; 29/11/2003 **(77)** on *Arbutus unedo*, coll. 7791, on broadleaves, coll. Arras 929.
Oligoporus tephroleucus (Fr.) Gilb. & Ryvarden
05/11/1997 **(55)** on old trunk of di *Pinus pinaster*, coll. 6980; 23/11/1999 **(77)** on *Alnus glutinosa*, coll. 7398; **(58)** 04/12/2007 on *Populus nigra*, coll. 8175; 05/12/2007 on *P. nigra* subsp. *laricio*, coll. 8105. It frequently grows on conifers in Italy, especially on *Abies alba.*
Oxyporus latemarginatus (Durieu & Mont.) Donk
22/10/1982 **(51)** on lying branch of *Eucalyptus*, coll. 473, 680; 15/11/1983, 07/11/1985, 07/11/1994 **(31)** on *Pinus pinea*, coll. 2027, 2030, *Acacia cyanophylla*, coll. 4008, 6637; 18/11/1999 **(83)** at the base of old *Pinus pinaster*, coll. 7412. Widely distributed species, with a very variable pore surface in shape and size.
Pachykytospora tuberculosa (D.C.) Kotl. & Pouzar
29/11/2000 **(67)** on trunk of *Quercus ilex* lying along Flumendosa river, coll. 7489. It is a rare species in Italy, with characteristic basidiospores, minutely wrinkled and with elongated rounded ridges.
Peniophora boidinii D.A. Reid
04/12/2000 **(77)** on trunk of *Erica arborea*, coll. 7483; 01/07/2007 **(18)** on broadleaves, coll. Arras 1031. Very uncommon species, recorded from Puglia, Tuscany and Sardinia, always following Mediterranean scrubs (Figure 16).
Peniophora cinerea (Fr.) Cooke
10/01/1984 **(52)** on branch of *Prunus armeniaca*, coll. 2359; 08/11/1985 **(4)** on *Quercus ilex*, coll. 4115; 05/11/1986 **(23)** twig of *Genista corsica*, coll. 5391; 24/11/1999 **(77)** on broadleaves, coll. 7406; 29/11/2000 **(67)** on machia scrubs, coll. 7470; 02/02/2007 **(76)** on *Cupressus*, coll. Arras 7.
Peniophora incarnata (Pers.) P. Karst.
13/11/1983 **(13)** *Quercus ilex*, coll. 1946; 13/11/1983 **(4)** on *Q. ilex* coll. 1971; 06/11/1992 **(59)** twig of *Cistus salvifolius*, coll. 5781; 15/11/1999 **(77)** on machia schrub, coll. 7394.

Peniophora junipericola J. Erikss.
05/11/1986, 31/10/1990, 9/11/1994 **(23)** loc. Campu´e su mudrecu, on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4758, 5235, 6619, 6660; 18/11/1999 **(83)** on trunk of *Juniperus phoenicea*, coll. 7389; 28/09/2001 **(77)** on *Juniperus*, coll. Arras 698. Uncommon species, with only few recorded areas.
Peniophora lycii (Pers.) Höhn. & Litsch.
10/02/1982 **(52)** on *Quercus ilex*, coll. 623; 12/11/1983 **(33)** small branch of *Phillyrea angustifolia*, coll. 1919; 14/11/1983 **(31)** *Pinus pinea*, coll. 2014, on *Acacia cyanophylla*, coll. 2000, 2011; 18/11/1983 **(54)** on broadleaves, coll. 2118; 28/12/1983 **(53)** on *Q. ilex*, coll. 2384; 09/11/1985 **(13)** on *Hedera helix*, coll. 4002; 07/11/1985, 31/10/1990 **(23)** trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 3825, *Rosmarinus officinalis*, coll. 5247, *Euphorbia characias*, coll. 5251; 06/11/1992 **(57)** twig of *Artemisia*, coll. 5766; 22/11/1999 **(62)** on broadleaves, coll. 7289.
Peniophora malençonii Boidin & Lanq.
27/06/1988 **(2)** on small trunk of maquis scrub, coll. 7343, leg. E. Zenone, det. J. Boidin. Species restricted to Mediterranean area, and this is the only record from Italy.
Peniophora meridionalis Boidin
17/11/1983 **(34)** on *Pinus pinea*, coll. 2084, *Arundo donax*, coll. 2110; 17/11/1983, 05/12/1996 **(39)** branch of *Quercus ilex*, coll. 2079, 6978; 14/11/1983, 07/11/1985 **(31)** *Acacia cyanophylla*, coll. 2018, 4012, 4013; 10/01/1984 **(49)** on burnt branch of *Q. suber*, coll. 2355; 06/11/1985 **(46)** on *Erica arborea*, coll. 3877; 13/11/1983, 08/11/1985 **(4)** on decorticated wood of *Q. ilex*, coll. 1973, coll. 4083, *Castanea sativa*, coll. 4085; 07/11/1985, 05/11/1986, 03/10/1990, 09/11/1994, 01/12/2000 **(23)** twig of *Thymelaea tartonraira*, coll. 3805, *Rosmarinus officinalis*, coll. 4783, *Helichrysum italicum*, coll. 4774, 5440, *Juniperus oxycedrus* subs. *oxycedrus*, coll. 6661, broadleaves, 7514; 07/12/1996, 20/11/1999 **(18)** on *Phillyrea latifolia*, coll. 7248, *Pistacia*, coll. 7271; 12/12/1997 **(20)** on *Q. ilex*, coll. 6992; 07/11/1997 **(78)** at the base of *Cistus*, coll. 6961; 23/11/1999 **(77)** on broadleaves, coll. 7300, 7308. Southern European species, restricted to the maquis, widespread and frequent in the southern part of Italy.
Peniophora pseudoversicolor Boidin
13/11/1983 **(4)** branch of *Quercus ilex*, coll. 1984. Almost rare species, with sporadic records from Emilia-Romagna and Sardinia regions.
Peniophora quercina (Pers.) Cooke
13/11/1983 **(4)** branch of *Q. ilex*, coll. 1979; 13/11/1983, 09/11/1985, 04/12/1996 **(13)** *Q. pubescens*, coll. 1927, 3881, branch of *Ilex aquifolium*, coll. 4997, 6841; 15/11/1983 **(46)** on *Arbutus unedo*, coll. 2037; 16/10/1983 **(47)** on broadleaves,

coll. 2367; 1954; 17/11/1983 **(39)** on *Q. ilex*, coll. 2064; 10/01/1984 **(49)** branch of *Q. ilex*, coll. 2330, 2345; 20/11/1999 **(18)** on *Pistacia*, coll. 7228; 21/11/1999 **(66)** *Q. ilex*, coll. 7297; 22/11/1999 **(62)** branch of *Q. ilex*, coll. 7378. Common and widespread species.

Peniophora rufomarginata (Pers.) Bourdot & Galzin

22/11/1999 **(62)** on branch of *Arbutus unedo* on the ground, coll. 7331. Uncommon species, with sporadic records.

Peniophora tamaricicola Boidin & Malençon

08/11/1994 **(31)** along the trunk of *Tamarix gallica*, coll. 6628, 6666. Uncommon species, typically and exclusively restricted to this substrate (Figure 17).

Peniophora versicolor (Bres.) Sacc. & P. Syd.

17/11/1983, 05/12/1996 **(39)** on *Arbutus unedo*, coll. 2059, 7018; 18/11/1983 **(54)** *A. unedo*, coll. 2132; 06/11/1985, 03/11/1986 **(31)** trunk of *Acacia cyanophylla*, coll. 4020, 6631; 07/12/1996, 20/11/1999 **(18)** at the base of *Rosmarinus officinalis*, coll. 7192, on *Phillyrea latifolia*, coll. 7226. It seems to be a Southern European species, very often restricted to maquis habitat.

Peniophora violaceolivida (Sommerf.) Massee

10/11/1982 **(49)** on *Quercus ilex*, coll. 1456; 07/11/1985 **(23)** twig of *Thymelaea tartonraira*, coll. 3804; 03/12/2007 **(77)** on *Q. ilex* coll. 8179. It is considered rare in all Italian regions.

**Peniophorella guttulifera* (P. Karst.) K.H. Larss.

30/10/2007 **(25)** loc. Gusana lake, occurring on large branches of *Populus nigra*, coll. 8154, conf. K.H. Larsson. Rare species in Europe, and first record in Italy. Characteristically with both large, incrusted cystidia and some conical and smooth ones (Larsson, 2007).

Peniophorella pallida (Bres.) K.H. Larss.

12/11/1983 **(33)** on lying branch of *Pinus pinea* lying on the ground, coll. 1908, 1909; 15/11/1983 **(31)** on *P. pinea*, coll. 2024; 05/11/1986 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 4748; 03/12/2007 **(55)** on *P. radiata*, coll. Arras 2103; 04/12/2007 **(58)** loc. Baccu Gerduri, on *Pinus radiata*, coll. Arras 1112. These two last specimens have basidiospores always longer than 10-11 µm.

Peniophorella praetermissa (P. Karst.) K.H. Larss.

10/12/1982 **(38)** on *Quercus ilex*, coll. 1290; 18/09/1983 **(54)** on branch of *Eucalyptus*, coll. 2114; 15/11/1983 **(46)** on *Arbutus unedo*, coll. 3818; 12/12/1983 **(33)** *Pinus pinea*, coll. 1903, 1921; 13/11/1983, 09/11/1985, 02/11/1986 **(13)** on small branch of *Taxus baccata*, coll. 5082, 3857, *Ilex aquifolium*, coll. 3887, on lying twig of *Q. ilex*, coll. 1966; 14/11/1983 **(31)** *P. pinea*, coll. 2008, 2010, 2012, 2021, 2019; 27/12/1983 **(42)** on *Q. ilex*, coll. 2374; 10/01/1984 **(49)** *Q. ilex*, coll. 2331; 06/11/1985 **(39)** *Q. ilex*, coll. 4049; 07/11/1985, 05/11/1986, 31/10/1990 **(23)** on *Juniperus oxycedrus* subs.

oxycedrus, coll. 3800, 4759 on lying branch of *Q. ilex*, coll. 5250; 11/11/1994, 20/11/1999 **(18)** at the basal trunk of *Rosmarinus officinalis*, coll. 7236, *Helichrysum italicum*, coll. 6698; 18/11/1999 **(83)** along the trunk of *Juniperus oxycedrus* subs. *macrocarpa*, coll. 7407, 7291; 05/12/2007 **(16)** on *Pinus nigra* subsp. *loricato*, coll. 8170. Widely distributed species in Italian forests, both on coniferous and deciduous wood.

Peniophorella pubera (Fr.) K.H. Larss.

02/11/1986 **(13)** on twig of *Taxus baccata*, coll. 5073.

Peniophorella tsugae (Burt) K.H. Larss.

07/11/1992 **(60)** trunk of *Taxus baccata* lying on the ground, coll. 5799, 5800. Recorded from Calabria on *Pinus laricio*, and Sardinia (Onofri et al., 2005).

Perenniporia fraxinea (Bull.) Ryvarden

30/10/1990 **(13)** at the base of an old *Ulmus campestris*, coll. 5396.

Perenniporia medulla-panis (Jacq.) Donk

24/11/1999 **(77)** on trunk of *Populus tremula*, coll. 7382; 25/11/1999 **(23)** on *Pinus nigra* subs. *laricio*, coll. 7334.

Perenniporia meridionalis C. Decock & Stalpers **Table 3**

30/11/2000 **(77)** loc. Baccu e piras, **(62)** on very large, old trunk of *Quercus ilex* lying on the ground, coll. 7374, 7375, 7376, 7377, coll. Ryvarden 43233; 02/12/2003 **(23)** loc. Campu'e su mudrecu, on fence of *Q. ilex*, coll. 7852. Only few recorded localities are known till now, and the one from St. Vitale Pinery (Ravenna) was growing on trunk of *Juniperus communis*. Close to *Perenniporia medulla-panis*, but with some macro- and microscopical differential characteristics (Decock & Stalpers, 2006; Bernicchia, 2005) (Figure 18).

Perenniporia narymica (Pilát) Pouzar

10/11/1992 **(43)** on branch of *Pinus pinaster*, coll. 5844. Uncommon species, recorded only from Lazio, Piemonte and Sardinia regions.

Perenniporia ochroleuca (Berk.) Ryvarden

10/11/1982, 06/11/1985 **(39)** on dead, but still attached branches of *Arbutus unedo*, coll. 1520, on *Quercus ilex*, coll. 4058; 06/11/1985 **(46)** on *A. unedo*, coll. 3873. Southern European species, widespread in Mediterranean area, and often not taken into consideration.

Perenniporia rosmarini A. David & Malençon

02/11/1990 **(10)** on trunk of *Cistus*, coll. 5289; 09/11/1994 **(23)** loc. Is scalas arenas on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 6621; 11/11/1994, 07/12/1996 **(18)** on *Rosmarinus officinalis*, coll. 6601, 6622, 6844; 12/12/1997 **(20)** *J. phoenicea*, coll. 6988; 15/12/1997 **(7)** on *Alimium halinifolium*, coll. 7031; 18/11/1999 **(83)** on *J. phoenicea*, coll. 7387. It characteristically occurs at the basal part of the trunk, at ground level.

Southern European species, and in some restricted areas of the island it can be very common as it occurs in Lanaittu Valley.
Phaeolus schweinitzii (Fr.) Pat.
14/11/1983 **(32)** on large branch of *Pinus pinea*, coll. 1989; 05/12/2007 **(16)** on large trunk of *Pinus nigra* subsp. *laricio* lying on the ground, coll. 8177. In this last locality many trunks of the forest were lying on the ground, all showing a conspicuous brown rot, and some of them awith *Antrodia vaillantii*, another brown rot species.
Phanerochaete aculeata Hallenb.
18/11/1999 **(83)** at the base of *Acacia cyanophylla*, coll. 7356, 7359, 7360. It is a very rare species in Europe, recorded from Veneto, Calabria and Sardinia regions. It has a peculiar aculeate hymenial surface, and large, cylindrical, emerging cystidia (Hallenberg, 1978).
Phanerochaete avellanea (Bres.) J. Erikss & Hjortstam
28/09/2001 **(77)**, loc. Seui, on broadleaves, coll. Arras 469.
Phanerochaete calotricha (P. Karst.) J. Erikss. & Ryvarden
05/12/2007 **(16)** on *Pinus nigra* subsp. *laricio*, coll. 8178. Rare species in Italy, with only very few records.
Phlebiella fibrillosa (Hallenb.) K.H. Larss. & Hjortstam
20/02/2007 **(65)** loc. Lanusei, on branch of *Ficus carica*, coll. Arras 128.
Phanerochaete jose-ferreirae (D.A. Reid) D.A. Reid
28/09/2001 **(77)**, on *Alnus* glutinosa, coll. Arras 246.
Phanerochaete laevis (Fr.) J. Erikss. & Ryvarden
05/11/1986 **(23)** on *Genista corsica*, coll. 5411; 06/11/1992 **(57)** along the trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5769.
Phanerochaete magnoliae (Berk. & M.A. Curtis) Burds.
06/11/1985, 07/11/1994 **(31)** on *Acacia cyanophylla*, coll. 4023, 6642.
Phanerochaete martelliana (Bres.) J. Erikss. & Ryvarden
10/11/1982 **(88)** branch of *Arbutus unedo*, coll. 1694; 13/11/1983 **(13)** twig of *Rubus fruticosus*, coll. 1940; 15/11/1983 on *Erica arborea*, coll. 3864; 28/12/1983 **(53)** on *A. unedo*, coll. 2383; 10/01/1984 **(49)** on *Cistus*, coll. 2350; 31/10/1990 **(23)** loc. Campu´e su mudrecu, on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5234; 02/11/1990 **(10)** twig of *Cistus*, coll. 5287, 5291; 08/11/1994 **(31)** *Cistus*, coll. 6658; 29/11/2003 **(77)** on lying branch of broadleaves. Widespread species in central-southern Italian regions, common in Mediterranean area. Sardinian specimens shows often a ramification at the apices of hymenial cystidia.
Phanerochaete sanguinea (Fr.) Pouzar
16/12/1983 **(47)** on *Fraxinus*, coll. 2362; 02/11/1990 **(10)** on branch of *Quercus ilex*, coll. 5292; 07/12/1997 **(18)** on trunk of *Rosmarinus officinalis*, coll. 7196.

Phanerochaete sordida (P. Karst.) J. Erikss. & Ryvarden
10/10/1979 **(35)** branch of *Quercus suber*, coll. 816; 10/11/1982 **(49)** *Q. suber*, coll. 1448; 19/11/1999 **(84)** on trunk of maquis schrub, coll. 7400.
Phanerochaete sp.
15/11/1981 **(35)** on *Quercus ilex*, coll. 626.
Phanerochaete tuberculata (P. Karst.) Parmasto
10/12/1982 **(44)** branch of *Quercus ilex*, coll. 1518; 13/11/1983 **(4)** *Q. ilex*, coll. 1959; 13/11/1983, 8/11/1986 **(13)** on *Q. pubescens*, coll. 1967, *Rubus fruticosus*, coll. 5088, 5458; 17/11/1983 **(34)** on the underside of a large branch *Pinus pinea* lying on the ground, coll. 2097; 28/12/1983 **(53)** *Q. ilex*, coll. 2386; 10/01/1984 **(39)** on burnt branch of *Q. ilex*, coll. 1295, 2321; 10/01/1984 **(52)**) on *Prunus armeniaca*, coll. 6225; 07/11/1985 **(23)** on *Erica arborea*, coll. 3803; 10/01/1986 **(47)** on burnt trunk of *Q. suber*, coll. 3782; 06/11/1992 **(59)** twig of *Cistus salvifolius*, coll. 6040; 07/11/1994 **(31)** on *Juniperus oxycedrus* subs. *macrocarpa*, coll. 6641. It is a common and widespread species, and often it occurs on burnt wood.
Phanerochaete velutina (DC.) P. Karst.
10/11/1982 **(49)** on surfacing roots of *Cistus*, coll. 1451; 08/11/1994 **(31)** on stump of *Acacia cyanophylla*, coll. 6638; 05/12/1996 **(39)** loc. Pau on *Quercus ilex*, coll. 7118; 20/11/1999 **(18)** on branch of *Q. ilex*, coll. 7255.
Phellinus contiguus (Fr.) Pat.
06/11/1985 **(31)** *Acacia cyanophylla*, coll. 4024; 05/11/1986 **(23)** on *Arbutus unedo*, coll. 4779; 04/12/2000, 29/11/2003 **(77)** on trunk of *Quercus ilex*, coll. 7478, 7805.
Phellinus erectus A. David, Dequatre & Fiasson
10/12/1982 **(39)** at the base of living *Quercus ilex*, coll. 1304; 15/09/1998 **(77)** branch of schrub, coll. 7191; 03/12/2000 **(18)** trunk of *Q. ilex*, coll. 2342, 7461; 15/11/2004 **(39)** loc. Pau, at the base of *Genista corsica*, coll. 7843. Southern species, with a Mediterranean distribution, occurring very often at the basal part of living trunks, with a preference for *Quercus*. It belongs to *Phellinus* group with dextrinoid basidiospores.
Phellinus ferreus (Pers.) Bourdot & Galzin
20/04/1985, 31/10/1990 **(23)** loc. Sas Baddes, branch of *Quercus ilex*, coll. 5257, 5308.
Phellinus ferruginosus (Schrad.) Bourdot & Galzin
10/01/1982 **(35)** on branch of *Quercus suber*, coll. 624; 05/12/1996 **(39)** loc. Pau, on *Q. ilex*, coll. 6998; 15/12/1997 **(7)** on *Pistacia*, coll. 7033.
Phellinus juniperinus Bernicchia & Curreli
10/03/1988 **(46)** on *Juniperus oxycedrus* subs. *oxycedrus*, typus coll. 4891; 29/10/1990 **(6)** on *J. oxycedrus* subs. *oxycedrus*, coll. 5226; 31/10/1990 **(23)**

J. oxycedrus subs. o*xycedrus,* coll. 5256; 02/11/1990 **(20)** *J. oxycedrus* subs. *oxycedrus*, coll. 5321; 13/12/1997 **(18)** *J. phoenicea*, coll. 7032. It occurs characteristically at the basal part of the trunks of *Juniperus.* It has a bony consistency, two different types of setae and belongs to *Phellinus* group with dextrinoid basidiospores. Recorded in Italy from Sardinia only (Bernicchia, 2005).

Phellinus pini (Brot.) A. Ames

28/12/1983 **(53)** on living *Pinus pinaster*, coll. 2388; 10/11/1985 **(43)** on *P. pinaster*, coll. 4091.

Phellinus pseudopunctatus A. David, Dequatre & Fiasson

13/12/1997 **(20)** on trunk of *Cistus*, coll. 7113; 28/11/2003 **(18)** at the base of trunk of *Juniperus phoenicea*, coll. 7783. It is a rare species, macroscopically identical with *Phellinus punctatus*, but differing for the presence of hymenial setae. Recorded few times from Tuscany, Lombardia and Sardinia (Bernicchia, 2005; Onofri et al., 2005).

Phellinus punctatus (P. Karst.) Pilát

15/11/1983, 06/11/1985, 07/11/1994 **(31)** on living *Quercus ilex*, coll. 2035, *Acacia cyanophylla*, coll. 4031, 6613, 6640; 18/11/1983 **(54)** on living *Arbutus unedo*, coll. 2131; 06/12/1996 **(23)** Sas Baddes, very large trunk of *Q. ilex* lying on the ground, coll. 7202; 18/11/1999 **(84)** trunk of *A. cyanophylla*, coll. 7385; 19/11/1999 **(83)** on old living *Salix*, coll. 7301; 03/12/2000 **(18)** on trunk of *Phillyrea latifolia*, coll. 7493. Widespread and common species on broadleaves.

Phellinus rimosus (Berk.) Pilát

10/11/1988 **(46)** at ground level of *Pistacia lentiscus*, coll. 4890. Very rare species, with only this record in Italy (Onofri et al., 2005).

Phellinus robustus (P. Karst.) Bourdot & Galzin

15/12/1982 **(38)** on *Quercus*, coll. 1328; 10/11/1983. Infrequent species in Italy.

Phellinus rosmarini Bernicchia

02/11/1990 **(10)** on trunk of *Arbutus unedo*, coll. 5293, on *Cistus*, coll. 5285; 15/12/1993 **(44)** at the base of *Cistus*, coll. 6213; 11/11/1994 **(18)** on *Pistacia lentiscus* coll. 6623, 07/12/1997, 13/12/1997 trunk of *Rosmarinus officinalis*, coll. 6989, 7028, *Pistacia*, coll. 7270. It characteristically occurs at the base of the trunk, enveloping it almost completely at the collar level, knitting together with the host. Recorded from only few Italian regions, and from France (Bernicchia, 2005; Onofri et al., 2005).

Phellinus sp.

05/11/1986, 31/10/1990 **(23)** loc. Is scalas arenas, on living *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5843, 5248.

Phellinus torulosus (Pers.) Bourdot & Galzin

10/12/1982 **(39)** on *Arbutus unedo*, coll. 1314; 10/11/1983, 10/01/1984 **(86)**

on *Eucalyptus*, coll. 2313, on surfacing roots of *Arbutus unedo*, coll. 2320; **(28)** *Quercus ilex*, coll. 2696, 2701; 12/11/1983 **(33)** trunk of *Pinus pinea*, coll. 1914; 15/11/1983 **(46)** *Quercus ilex*, coll. 2038; 15/11/1986 **(31)** stump of *Pinus pinaster*, coll. 3783; 06/11/1992 **(59)** *Cistus salvifolius*, coll. 5823; 07/11/1992 **(60)** trunk of *Taxus baccata*, coll. 5815; 20/11/1999 **(18)** *Juniperus phoenicea*, coll. 7231; 03/12/2007 **(77)** on *Q. ilex* coll. 8180. It occurs very often at the base of trunks, reaching remarkable sizes.

Phellinus tuberculosus (Baumg.) Niemelä

10/11/1992 **(29)** trunk of *Prunus*, coll. 5843; 21/06/1998, 23/11/1999 **(77)** *Prunus dulcis*, coll. 7201, 7338, 7341, 7488. Usually restricted to *Prunus*.

Phlebia georgica Parmasto

09/11/1985, 02/11/1986, 04/12/1996 **(13)** on branch of *Taxus baccata*, coll. 3884, 5074, 5075, 5076, 5085, 6856; 29/10/1990 **(6)** on *Quercus ilex*, coll. 5222. Very rare species in Italy, recorded only few times from Sardinia and once from Sasso Fratino Reserve, Emilia-Romagna region, (Bernicchia 2001, Onofri et al., 2005).

Phlebia lilascens (Bourdot) J. Erikss. & Hjortstam

31/10/1990 **(23)** loc. Campu'e su mudrecu on branch of *Quercus ilex*, coll. 5233. Uncommon species, with sporadic records in few Italian regions.

Phlebia livida (Pers.) Bres.

02/12/2003 **(23)** loc. Is scalas arenas on *Quercus ilex*, coll. Arras 889; 29/11/2000 **(68)** on trunk of *Alnus glutinosa*, coll. 7469; 03/12/2007 **(77)** on broadleaves, coll. Arras 1089. Infrequent species.

Phlebia radiata Fr.

13/11/1983 **(4)** on *Quercus ilex*, coll. 1976.

Phlebia rufa (Fr.) M.P. Christ.

07/11/1985 **(23)** on branch of *Quercus ilex*, coll. 3814.

Phlebia subochracea (Bres.) J. Erikss. & Ryvarden

02/12/2000 **(18)** on branch of *Salix* lying on the ground, coll. 7505; 27/10/2007 **(22)** on *Quercus ilex*, coll. Arras 971 (det. N. Hallenberg). Nice species with its tuberculate hymenophore and hymenial subulate, almost thin-walled cystidia. Very rare species, previously recorded only from Venice province.

**Phlebia subserialis* (Bourdot & Galzin) Donk

05/12/2007 (16) on very rotten trunk of *Pinus nigra* subsp. *laricio*, coll. Arras 1059 (det. N. Hallenberg). It is the first record from Italy.

Phlebiopsis gigantea (Fr.) Jülich

15/11/1983 **(31)** stump of *Pinus pinea*, coll. 2032; 05/12/1996 **(39)** loc. Pau on branch of *Quercus ilex*, coll. 7119; 06/12/1996 **(23)** loc. Campu'e su mudrecu on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 7199; 05/11/1997 **(55)** on *P. pinaster*, coll. 6966.

Phlebiopsis ravenelii (Cooke) Hjortstam

10/12/1982, 05/11/1986 **(39)** *Q. ilex*, coll. 1312, 2060, 2062, 6606; 10/11/1983 **(86)** occurring on old basidiocarp of *Ganoderma applanatum*, coll. 2324; 13/11/1983 **(13)** *Q. pubescens*, coll. 1960; 06/11/1985 **(31)** on *Acacia cyanophylla*, coll. 4009; 06/11/1985 **(46)** stump of *Q. ilex*, coll. 3862, 3867; 07/11/1985, 31/10/1990, 01/12/2000 **(23)** loc. Is scalas arenas, on branch of *Q. ilex*, coll. 3829, 3833, 5245, 7484; 23/11/1999, 24/11/1999, 30/11/2000, 03/12/2007 **(77)** on *Q. ilex*, coll. 7409, 8181, *Arbutus unedo*, coll. 7403, 7482; 03/12/2000 **(67)** on broadleaves, coll. 7472.

Phylloporia ribis (Schumach.) Ryvarden

01/11/1989 **(21)** at the basal part of *Pistacia lentiscus*, coll. 5687.

Piloderma sp.

07/11/1985 **(23)** on trunk of *Rubus*, coll. 3823.

Piloporia sajanensis (Parmasto) Niemelä

09/11/1994 **(23)** loc. Campu'e su mudrecu, on burnt trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 6688. *P. sajanensis* is a boreal species, it occurs in central and northern parts of Sweden and Finland and Ural Mts. in Russia, while in Asia is known from Central to Eastern Russia. It is an interesting polypore both with regard to distribution and ecology as well as its systematic position. In its macromorphology it reminds strongly *Datronia stereoides* while the encrusted dissepimental hyphae and the small allantoid basidiospores come near to *Skeletocutis.* However Niemelä, because of the coloured skeletal hyphae, the presence of an upper tomentum, the subiculum and pilear context duplex in section, decided that a separate genus was needed to accommodate the species. Ryvarden (1986) published a map of its distribution in Fennoscandia, even if several localities have been discovered in the boreal part of the area. The Italian collection has been found in Supramonte di Orgosolo, at 1000 m of altitude, in a peculiar Sardinian area, located in central-eastern Sardinia and characterized by a typical karst geomorphology, irregularly and markedly furrowed by deep canyons. These mountains are well characterized within the Sardinian Floristic District due to the presence of an archaic Mediterranean orophilous flora, rich in paleoendemic plants. We believe that the presence of *Piloporia sajanensis* in Sardinia must be looked upon as a relict from the last glacial period which lasted some 100, 000 years and ended approximately 8,000 years ago. During this period all vegetation zones in Europe were pushed southward as the ice reached down to Berlin in Germany. Besides that a large ice sheet also covered most of the Alps. During the maximum glaciation, coniferous forests covered most of the higher areas in the Mediterranean region, and we must assume that much of the biota, characteristic of such forests, existed in the area at that time. When the ice melted, the climate became warmer and the boreal coniferous forests retreated northwards, *Piloporia sajanensis* could have been left on one of its available

hosts in this remote and hardly accessible area (Bernicchia & Ryvarden, 1997). It is the first unique record in Italy, unknown from Central and Southern European countries. (Bernicchia, 2005).
Plicaturiopsis crispa (Pers.) D.A. Reid
06/06/2004 **(68)** on broadleaves, coll. Arras 468.
Podoscypha multizonata (Berk. & Broome) Pat.
31/10/1990 **(38)** on surfacing roots of *Quercus ilex*, coll. 5294. Uncommon species with sporadic records.
Polyporus arcularius (Batsch) Fr.
10/11/1984 **(28)** on lying branch of *Quercus suber*, coll. 2703; 29/10/1990 **(18)** *Q. ilex*, coll. 5220.
Polyporus brumalis (Pers.) Fr.
10/12/1982 **(40)** on *Castanea sativa*, coll. 1329; 10/11/1983 **(46)** on *Arbutus unedo*, coll. 2687.
Polyporus ciliatus Fr.
14/11/1983 **(32)** on twig of *Cistus*, coll. 1996.
Polyporus melanopus (Pers.) Fr.
12/11/1983 **(12)** on root of *Arbutus unedo*, coll. 1888.
Polyporus meridionalis (A. David) H. Jahn
10/01/1984 **(49)** on roots of *Cistus*, coll. 2341; 06/11/1985 **(46)** branch of *Erica arborea*, coll. 3874; 10/11/1984 **(28)** on branch of *Castanea sativa*, coll. 2716; 10/12/1985 **(45)** on *Cistus*, coll. 4075; 05/11/1986 **(23)** loc. Campu'e su mudrecu, on twig of maquis, coll. 4793; 30/10/1990, 12/12/1997 **(20)** on *Cistus*, coll. 5219, 6990; 01/11/1990 **(21)** on lying branch of *Pistacia lentiscus*, coll. 5288; 04/11/1990 **(10)** on *Cistus*, coll. 5388; 04/12/1996, 19/11/1999 **(84)**) on *Helichrysum italicum*, coll. 6835, at the basal part of *Cistus*, coll. 7304, 7395; 07/11/1997 **(78)** *Cistus*, coll. 6960, 6963; 20/11/1999 **(18)** on *Cistus*, coll. 7252. The species seems to follow schrubs of maquis, with a distribution restricted to Mediterranean areas.
Polyporus tuberaster (Jacq.) Fr.
17/11/1983, 06/11/1985 **(39)** branch of *Quercus suber* lying on the ground, coll. 2133, *Q. ilex*, coll. 4056, 4082; 20/10/1983 **(46)** on *Q. ilex*, coll. 2390; 31/10/1990 **(23)** on branch of *Q. ilex*, coll. 5231; 07/11/1997 **(78)** on *Pistacia lentiscus*, coll. 7007, 7016; 20/11/1999 **(18)** on lying trunk of *Phillyrea latifolia*, coll. 7230.
Porostereum spadiceum (Pers.) Hjortstam & Ryvarden
10/01/1984 **(52)** on trunk of *Prunus armeniaca*, coll. 2351, 2357; 13/11/1983 **(4)** on branch of *Quercus ilex*, coll. 1982; 22/11/1999 **(62)** on trunk of *Q. ilex*, coll. 7294.

Punctularia strigosozonata (Schwein.) P.H.B. Talbot
10/01/1983 **(43)** on living *Populus nigra*, coll. 1526; 10/01/1984 **(47)** branch of *Quercus ilex*, coll. 2256; 10/03/1984 **(87)** on living *Pistacia lentiscus*, coll. 2425. Rare species in Italy, recorded only from Sardinia and Emilia-Romagna regions.
Radulomyces confluens (Fr.) M.P. Christ.
10/12/1982 **(49)** on *Quercus suber*, coll. 1298; 09/11/1985, 02/11/1986 **(13)** on *Taxus baccata*, coll. 3885, 3893, branch of *Ilex aquifolium*, coll. 5095; 07/11/1992 **(56**) along the trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5792; 07/11/1992 **(60)** on *T. baccata*, coll. 5816.
Radulomyces molaris (Chaillet) M.P. Christ.
10/12/1982 **(39)** on *Quercus ilex*, coll. 1316, 1521; 18/10/1983 **(54)** *Q. suber*, coll. 2127; 15/11/1983 **(46)** *Q. ilex*, coll. 2054; 10/01/1984 **(49)** *Q. suber*, coll. 2353. It usually grows on dead, but still attached branches.
Radulomyces rickii (Bres.) M.P. Christ.
06/11/1985 **(39)** on small branch of *Erica arborea*, coll. 4057; 31/10/1990 **(23)** loc. Is scalas arenas, on maquis schrub, coll. 5295, 5660. It seems to have a southern and Mediterranean distribution in Europe.
Rigidoporus ulmarius (Sow.) Imazeki
18/11/2007 **(14)** loc. Bingia ‘e Corte, at the base of *Ulmus* stump. It had a gigantic size and a weight of 35 Kg, coll. Arras 1026.
Schizopora flavipora (Berk. & M.A. Curtis ex Cooke) Ryvarden
06/06/2004 **(68)** on *Q. Ilex* coll. Arras 447; 23/11/1998 **(75)** *Q. Ilex* coll. Arras 49, 445; 04/12/2005 **(79)** *Q. ilex* coll. Arras 253.
Schizopora paradoxa (Schrad.) Donk
06/11/1981 **(47)** *Quercus ilex*, coll. 478; 10/12/1982, 17/11/1983, 06/11/1985 **(39)** branch of *Q. ilex*, coll. 1319, 2072; 07/11/1992 **(56)** on trunk of *Euphorbia characias*, coll. 5804; 05/12/2007 **(16)** on *Pinus nigra* subsp. *laricio*, coll. 8183; 04/12/2007 **(55)** on *P. radiata*, coll. 8184. Common and widespread species, one of the most common white-rot species in all Italian forests, and very often not taken into consideration.
Schizopora radula (Pers.) Hallenb.
06/11/1985 **(39)** on *Quercus ilex*, coll. 4054.
Scopuloides hydnoides (Cooke & Massee) Hjortstam & Ryvarden
02/12/2000 **(18)** on broadleaves, coll. 7504.
Scytinostroma aluta Lanq.
07/11/1985, 05/11/1986 **(23)** loc. Campu’e su mudrecu, on branch of *Rosmarinus officinalis*, coll. 3798, 3819, 3821, 4757. The species has a Southern European distribution. It comes very close to *S. portentosum*, but with some microscopical differences concerning the nature of skeletal hyphae.
Scytinostroma praestans (H.S. Jacks.) Donk

06/11/1985, 03/11/1986 **(31)** on *Acacia cyanophylla*, coll. 4035, 6604, branch of *Phillyrea*, coll. 6654. It has a sporadic distribution, recorded from only few Italian regions.
Scytinostromella heterogenea (Bourdot & Galzin) Parmasto
04/12/1996 **(13)** on trunk of *Taxus baccata*, coll. 6845; 29/11/2003 **(77)** on burnt branch of *Arbutus unedo*, coll. 7802, on *Quercus ilex*, coll. 7796, coll. Arras 893. Nice and infrequent species with two kind of cystidia, subglobose, warted and amyloid basidiospores. It is a very rare species in Italy, recorded only from two localities in Sardinia, both on coniferous and deciduous wood.
Sebacina calcea (Pers.) Bres.
05/11/1986 **(23)** loc. Campu'e su mudrecu, on branch of *Quercus ilex*, coll. 4767.
Sebacina deminuta Bourdot
05/11/1986, 01/12/2000 **(23)** trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5394, 7455.
Sebacina grisea (Pers.) Bres.
15/12/2002 **(75)** branch on the ground of *Quercus ilex*, coll. Arras 625
Sebacina helvelloides (Schwein.) Fr.
01/12/2002 **(39)** loc. Mongongiori, *Q. ilex* coll. Arras 626; 02/03/2003 **(70)** on broadleaves, coll. Arras 627.
Sistotrema brinkmannii (Bres.) J. Erikss.
13/11/1983 **(4)** on lying branch of *Quercus ilex*, coll. 1985; 13/11/1983, 09/11/1985 **(13)** *Q. ilex*, coll. 1924; on *Ilex aquifolium*, coll. 3889; 01/11/1986 **(1)** *Q. ilex*, coll. 6635.
Sistotrema confluens Pers.
06/11/1997 **(81)** in a mixed forest, on litter overgrown with mosses, coll. 6969.
Sistotrema coroniferum (Höhn. & Litsch.) Donk
13/11/1983 **(4)** on *Quercus ilex*, coll. 1981.
Sistotrema diademiferum (Bourdot & Galzin) Donk
14/11/1983, 06/11/1985 **(31)** on windbreak pole of *Acacia cyanophylla*, coll. 2009, 4022; 07/11/1985, 09/11/1994 **(23)** lying branch of *Quercus ilex*, coll. 3816, 3830, trunk of *Helichrysum italicum*, coll. 6643; 06/11/1992 **(59)** on trunk of *Q. ilex*, coll. 5787.
Sistotrema muscicola (Pers.) S. Lundell
29/11/2003 **(77)** on wood of *Alnus glutinosa***,** coll. 7788, *Quercus*, coll. 7790; 29/11/2003 on debris of *Q. ilex*, coll. Arras 927. Uncommon species with sporadic and scanty records in few Italian regions.
Sistotrema octosporum (J. Schröt. ex Höhn. & Litsch.) Hallenb.
07/11/1985 **(23)** branch of *Erica arborea*, coll. 3817. Rare species, recorded only few times.

**Sistotrema quadrisporum* Hallenb. & Hjortstam
06/04/2008 **(91)** loc. Uta, on broadleaves, coll. Arras 1172. It is firstly recorded from Italy and easily distinguishable owing to the shape of basidiospores and the presence of four sterigmata.
Sistotrema subtrigonospermum P.D. Rogers
28/09/2001 **(77)** loc. Seui, on broadleaves, coll. Arras 543, 743; 06/04/2008 **(91)** on *Alnus*, coll. Arras 1163. Besides the Sardinian records, it is known only from Circeo Nat. Park (Onofri et al., 2005).
Sistotremastrum niveocremeum (Höhnel & Litsch.) J. Eriksson
17/04/2003 **(89)** on *Quercus ilex*, coll. Arras 897.
Skeletocutis amorpha (Fr.) Kotl. & Pouzar
05/11/1997, 04/12/2007 **(55)** trunk of *Pinus pinaster*, coll. 6967, 8185;
02/11/2003 **(23)** loc. Montes, on *Pinus nigra* subsp. *laricio*, coll. 7786;
05/12/2007 **(16)** on *P. nigra* subsp. *laricio* coll. 8187. Very common species in pine forests.
Skeletocutis carneogrisea A. David
04/02/2007, **(87)** on large trunk of *Pinus* lying on the ground, coll. Arras 11.
Skeletocutis kuehneri A. David
17/02/2008 **(29)** loc. S'Isca de sa Mela on trunk of *Pinus* lying on the ground, coll. Arras 1133.
Skeletocutis lenis (P. Karst.) Niemelä
19/08/2001 **(73)** on *Pinus*, coll. Arras 219; 04/12/2007 **(55)** on *P.radiata*, coll. 8186, 04/12/2007 **(58)** on *P. radiata*, coll. 8188; 05/12/2007 **(16)** on *Pinus nigra* subsp. *laricio*, coll. 8189; 17/02/2008 **(29)** loc. S'Isca de sa Mela, on trunk of *Pinus*, coll. Arras 1134.
Skeletocutis lilacina A. David & Jean Keller
06/11/1997 **(81)** on an old lying trunk of *Pinus pinaster*, coll. 6906; 18/11/2007 **(14)** , loc. S'Isca de sa Mela on *Pinus*, coll. Arras 1080. Rare species in all European countries, and these are the only Italian records.
Skeletocutis nivea (Jungh.) Jean Keller
10/12/1982, 10/01/1984 **(39)** trunk of *Quercus ilex*, coll. 1294, 1322, 2309;
14/11/1983 **(32)** on twig of *Helianthemum*, coll. 1987; 15/11/1983 **(46)** *Q. ilex*, coll. 2049; 16/12/1983 **(47)** branch of *Q. ilex*, coll. 2364; 10/01/1986 **(39)** loc. Pau, on *Q. ilex*, coll. 3785; 09/11/1985, 02/11/1986 **(13)** on broadleaves, coll. 3860, *Q. ilex*, coll. 5071; 07/11/1997 **(78)** along the trunk of *Pistacia lentiscus*, coll. 6964. Common and widespread species in deciduous forests, with a preference for species of gen. *Quercus*.
Skeletocutis percandida (Malençon & Bertault) Jean Keller
10/12/1982 **(44)** on broadleaves, coll. 1262; 12/11/1983 **(33)** *Pinus pinea*, coll. 1904, 1902, 1905, 1907, 1918; 14/11/1983 **(31)** on *P. pinea*, coll. 1999;

15/11/1983, 06/11/1985 **(44)** *Arbutus unedo*, coll. 2039, 3876; 17/11/1983 **(34)** branch of di *P. pinea*, coll. 2001; 10/01/1984 **(86)** *Quercus ilex*, coll. 2326; 07/11/1986 **(51)** on *Erica arborea*, coll. 6605; 02/11/1990 **(10)** at the base of the trunk of *Cistus monspelliensis*, coll. 5281, 5290, 5296, 5385; 08/12/1996 **(32**) on *P. pinea*, coll. 7198; 12/12/1997 **(18)** on *Cistus*, coll. 7004; 18/11/1999 **(83)** on *Acacia cyanophylla*, coll. 7405. It has a Mediterranean distribution, distinguished macroscopically by the presence of white and soft rhizomorphs.

Skeletocutis subincarnata (Peck) Jean Keller

09/11/1994 **(21)** on lying trunk of *Pinus*, coll. 6653; 19/11/1999 **(84)** on broadleaves, coll. 7384; 30/11/2000 **(77)** on branch of *Quercus ilex*, coll. 7458.

Skeletocutis vulgaris (Fr.) Niemela & Y.C. Dai

30/11/2003 **(66)** on old and very decayed trunk of *Pinus radiata*, coll. 7717; 14/10/2007 loc. S'Isca de sa Mela on trunk of *Pinus* lying on the ground, coll. Arras 1007.

Spongipellis delectans (Peck) Murrill

30/10/1990, 14/12/1997 **(23)** inside a large cavity of a very old and living *Quercus ilex*, coll. 5249, 6910. It is a rare species all over Europe.

Steccherinum fimbriatum (Pers.) J. Erikss.

13/11/1983 **(13)** lying branch of *Quercus pubescens*, coll. 1930; 11/11/1994, 07/12/1996 **(18)** on *Helichrysum italicum*, coll. 6697, 6837, 6858; 14/12/1997 **(23)** loc. Is scalas arenas, on the trunk of *Rosmarinus officinalis*, coll. 7046.

Steccherinum litschaueri (Bourdot & Galzin) J. Erikss.

17/02/2008 **(29)** loc. S'Isca de sa Mela on lying branch of *Quercus ilex*, coll. Arras 1149. Very rare species in Italy and infrequent in Europe.

Steccherinum ochraceum (Pers.) Gray

10/12/1982 **(39)** on *Quercus ilex*, coll. 1303; 13/11/1983, 06/11/1985 **(4)** *Q. ilex*, coll. 1970, 4108; 31/10/1990 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5229; 04/11/1990 **(10)** on schrub of maquis, coll. 5386; 06/11/1992 **(59)** *Q. ilex*, coll. 5822; 04/12/1996 **(13)** on branch of *Q. pubescens*, coll. 6840.

Steccherinum sp.

14/03/1984, **(90)** on *Pinus*, coll. 2424.

Stereum gausapatum (Fr.) Fr.

10/12/1982, 05/12/1996 **(39)** branch of *Quercus suber*, coll. 1310, 7017; 10/11/1983 **(44)** on *Quercus*, coll. 2698; 29/10/1990 **(6)** *Q. ilex*, coll. 5242; 07/11/1992 **(61)** on stump of *Quercus ilex*, coll. 5791. Common and widespread species in *Quercus* forests.

Stereum hirsutum (Willd.) Pers.

08/12/1981, 16/09/1983 **(47)** *Quercus ilex*, coll. 465, 2368, 2692; 10/01/1982 **(35)** *Q. suber*, coll. 625; 10/11/1982 **(44)** ramo di *Q. ilex*, coll. 1519; 09/12/1982 **(49)** *Q. ilex*, coll. 1287,1288; 10/12/1982 **(39)** *Q. ilex*, coll. 1293, 1302, 1320,

1325; 30/10/1990 **(13)** *Q. pubescens*, coll. 5239.
Stereum reflexulum D.A. Reid
17/11/1983 **(32)** *Erica arborea*, coll. 2089; 06/11/1985 **(46)** on *E. arborea*, coll. 3870; 05/11/1986 **(23)** *E. arborea*, coll. 4764; 06/11/1992 **(55)** on trunk of *Artemisia*, coll. 5768, on *Cistus monspelliensis*, coll. 5777. Mediterranean species, it characteristically occurs on dried but still attached twigs of maquis.
Stereum rugosum Pers.
06/11/1985 **(39)** on stump of *Quercus ilex*, coll. 4064.
Stereum sanguinolentum (Alb. & Schwein.) Fr.
10/01/1982 **(33**) stump of *Pinus pinea*, coll. 1911; 04/12/2007 **(55)** on *P. radiata*, coll. 8190.
Stigmatolemma poriaeforme (Pers.) W. B. Cooke
06/11/1985 **(31)** on pole of *Acacia cyanophylla*, coll. 4010; 07/11/1985 **(23)** branch of *Quercus ilex*, coll. 3826. Infrequent species.
**Stypella grilletii* (Bourdot) P. Roberts
23/09/2007 **(20a)** branch of *Quercus suber* lying on the ground, coll. Arras 997, confirm. C. Losi.
Subulicystidium longisporum (Pat.) Parmasto
18/11/1983 **(54)** on decorticated wood of broadleaves, coll. 2120; 07/11/1985 **(23)** loc. Sas Baddes, on branch of *Quercus ilex*, coll. 3837; 02/12/2007 **(1)** loc. Baldo on *Q. suber*, coll. 8191.
Terana caerulea (Lam.) Kuntze
16/12/1983 **(47**) on branch of *Quercus ilex*, coll. 2360; 06/11/1985 **(31)** on *Acacia cyanophylla*, coll. 4017; 15/11/1983 **(39)** *Q. ilex*, coll. 1525.
Thanatephorus cucumeris (A.B. Frank) Donk
08/11/1994 **(31)** at the base of *Asphodelus ramosus*, on dried leaves, coll. 6656. Rare and incospicuous species. Till now it is the only known Italian record (Onofri et al., 2005) (Figure 24).
Thanatephorus fusisporus (J. Schröt.) Hauerslev & P. Roberts
02/11/1986 **(13)** on burnt wood of living *Taxus baccata*, coll. 5094 (Figure 25).
Thanatephorus ochraceus (Masseee) P. Roberts
13/12/1997 **(18)** at the basal part of *Rosmarinus officinalis*, coll. 6911. Rare species in Italy, recorded only from Sardinia (Figure 26).
Thanatephorus sterigmaticus (Bourdot) P.H.B. Talbot
31/10/1990 **(23)** loc. Sas Baddes on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5410; 13/12/1997 **(18)** at the basal part of trunk of *J. phoenicea*, coll. 7002. Very rare species, recorded only from Sardinia (Figure 27).
Thelephora caryophyllea Fr.
08/12/1996 **(31)** terrestrial species, in a open spaces of the pinery, coll. 7194.
Thelephora terrestris Fr.

10/11/1983 **(48)** on *Cistus*, coll. 2700; 17/11/1983 **(31)** on branch of *Pinus pinea*, coll. 2105; 08/12/1996 **(32)** on the ground, coll. 7256.
Tomentella bryophila (Pers.) M.H. Larsen
29/11/2003 **(63)** broadleves, coll. Arras 973, conf. C.Losi.
Tomentella punicea (Alb. & Schwein.) J. Schröt.
15/11/1983 **(31)** on burnt stump of *Pinus pinea*, coll. 2699; 17/11/2002. **(77)** loc. Seui, on broadleaves, coll. Arras 585. Rare species, with only very few Italian records.
Tomentella radiosa (P. Karst.) Rick
15/11/1983 **(46)** on branch of *Pistacia lentiscus*, coll. 2041.
Tomentella subtestacea (Bourdot & Galzin) Svrcek
29/11/2003 **(77)** loc. Seui, on *Pinus*, coll. Arras 930.
Tomentellastrum sp.
10/12/1982 **(44)** trunk of *Ruscus aculeatus*, coll. 1263.
Tomentellina fibrosa (Berk. & M.A. Curtis) M.J. Larsen
06/11/1997 **(81)** on stump of *Pinus pinaster*, coll. 6971. Rare species.
Trametes junipericola Manjon, G. Moreno & Ryvarden
Table 4
02/12/2000, 13/12/1997 **(18)** on trunk of *Juniperus phoenicea*, coll. 6916, 7480. Rare Mediterranean species, and this is the only recorded Italian area.
Trametes sp.
07/12/1981 **(32)** *Pinus pinea*, coll. 682.
Trametes versicolor (L.) Pilát
10/11/1982 **(49)** on *Quercus suber*, coll. 1453; 10/12/1982 **(39)** *Q. ilex*, coll. 1300; 07/12/1996 **(18)** *Phillyrea latifolia*, coll. 6842; 05/12/2007 **(16)** on *Q. ilex* coll. 8192. Common and widespread species, almost always not taken into consideration.
Trechispora cohaerens (Schwein.) Jülich & Stalpers
02/11/1986 **(13)** on *Taxus baccata*, coll. 5084; 05/11/1986 **(23)** trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5690; 29/10/1990 **(6)** branch of *Taxus baccata*, coll. 5241; 13/12/1997 **(18)** trunk of *J. phoenicea*, coll. 6994.
Trechispora dimitica Hallenb.
06/04/2003 **(29)** loc. Tiana, on *Quercus ilex*, coll. Arras 906; 13/11/2003 **(55)** on litter of *Quercus* and other broadleaves, coll. Arras 872; 18/12/2003 **(14)** loc. St. Loisu, branch of *Q. suber*, coll. Arras 606. Rare species, recorded the first time from Lazio (Onofri et al., 2005). It has a very sporadic distribution, with only few records in Europe. Characteristically recognizable for the needle-like crystals on generative hyphae, the globose conidia growing on short, thin-walled side-branches on subicular hyphae, and the presence of skeletal hyphae (Figure 29).

Trechispora farinacea (Pers.) Liberta
27/12/1983 **(42)** lying branch of *Quercus ilex*, coll. 2372; 07/11/1992 **(60)** on trunk of *Alnus nigra*, coll. 5794.
Trechispora invisitata (H.S. Jacks.) Liberta
17/06/2007 **(89)** loc. La Madonnina on *Pinus*, coll. Arras 1023.
Trechispora laevis K.H. Larsson
28/11/2005 **(66)** at the base of *Osmunda regalis*, coll. Arras 259.
Trechispora microspora (P. Karst.) Liberta
05/11/1986 **(23)** on *Rosmarinus officinalis*, coll. 4797; 04/12/1996 **(13)** on branch of *Taxus baccata* on the ground, coll. 6859; 12/12/1997 **(19)** on mosses, coll. 6984.
Trechispora praefocata (Bourdot & Galzin) Liberta
11/11/1994 **(18)** on *Pistacia lentiscus*, coll. 6624.
Trechispora stellulata (Bourdot & Galzin) Liberta
06/11/1992 **(57)** on trunk of *Erica arborea*, coll. 5782.
Trechispora stevensonii (Berk. & Broome) K.H. Larsson
29/11/2000 **(67)** on *Alnus glutinosa*, coll. Ryvarden 43187. Very rare species, recorded only few times from Italy.
Trechispora silvae-ryae (J. Erikss. & Rvarden) K.H. Larss.
15/12/2002 **(70)** on *Quercus ilex*, coll. Arras 110, 111, 116, 670; 01/12/2007 (19) on *Pinus pinaster*, coll. 8195. Infrequent species, with smooth basidiospores and a dimitic hyphal system. Crystals of varying shape not common, occurring both in cords and in the subiculum.
Tremella mesenterica Retz.
10/11/1982 **(49)** *Quercus suber*, coll. 1449.
Tremella polyporina D.A. Reid
18/12/2003, **(14)** Loc. St. Loisu, on *Oligoporus tephroleucus*, coll. Arras 695; 04/12/2007 **(55)** on *Oligoporus* sp. growing on *Pinus radiata*, coll. 8152, 8193, 8194 (Figure 30).
Trichaptum biforme (Fr.) Ryvarden
10/02/1982 **(35)** on *Quercus suber*, coll. 627; 10/11/1982, 10/01/1984 **(49)** *Q. suber*, coll. 1455, 1457, 2347; 15/01/1983 **(44)** branch of *Populus nigra*, coll. 1522.
Trichaptum fuscoviolaceum (Ehrenb.) Ryvarden
06/11/1997 **(55)** on *Pinus pinaster*, coll. 6976; 18/11/1999 **(83)** on trunk of *P. pinea*, 7306.
**Trichaptum laricinum* (P. Karst.) Ryvarden
18/05/2008 (29) loc. Su Crecu on branch of *Pinus*, coll. Arras 1188. It is the first record from Italy.
Tubulicium vermiferum (Bourdot) Oberw. ex Jülich

01/11/1986 **(3)** on *Erica arborea*, coll. 6634; 06/11/1992 **(59)** *E. arborea*, coll. 5771.
Tubulicrinis accedens (Bourdot & Galzin) Donk
05/11/1986 **(23)** on *Rosmarinus officinalis*, coll. 6226.
Tubulicrinis calothrix (Pat.) Donk
11/11/1999 **(72)** on *Pinus*, coll. Arras 608, 610, 611; 01/07/2001 **(25)** *Pinus*, coll. Arras 609, 612; 13/08/2007 **(14)** coll. 8182; 01/12/2007 **(19)** on *Pinus pinaster*, coll. 8196.
Tubulicrinis chaetophorus
02/06/2003 **(14)**, coll. Arras 987. Infrequent species.
Tubulicrinis gracillimus (Ellis & Everh. ex D.P. Rogers & H.S. Jacks.) G. Cunn.
01/11/1986 **(1)** on coniferous wood, coll. 6633. Uncommon species, recorded from Emilia-Romagna too.
Tubulicrinis medius (Bourdot & Galzin) Oberw.
16/11/1983 **(39)** *Quercus ilex*, coll. 2056; 09/11/1994 **(23)** loc. Is scalas arenas, on branch of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 6652; 18/11/2007 **(29)** loc. S'Isca de sa Mela on decorticated branch of *Pinus nigra* subsp. *laricio*, coll. Arras 1079.
* *Tubulicrinis propinquus* (Bourdot & Galzin) Donk
03/12/2000 **(75)** on *Erica arborea*, coll. 7466. It is the first and the only record in Italy.
Tubulicrinis sororius (Bourdot & Galzin) Oberw.
07/11/1985, 05/10/1986, 09/11/1994, 06/12/1996 **(23)** on *Juniperus oxycedrus* subs. *oxycedrus*, coll. 3799, 4765, 4796, 5393, 6662, 7225; 07/11/1992 **(56)** trunk of *J. oxycedrus* subs. *oxycedrus*, coll. 5809.
Tubulicrinis subulatus (Bourdot & Galzin) Donk
10/09/2001, 02/03/2003 **(70)** on *Pinus*, coll. Arras 260, 261, 558.
Tulasnella fuscoviolacea Bres., 28/10/1990 **(19)** on living *Pistacia lentiscus*, coll. 5477.
Tulasnella violacea (Johan-Olsen) Juel
09/11/1985 **(13)** on branch of *Taxus baccata*, coll. 4004.
Tulasnella violea (Quél.) Bourdot & Galzin
15/11/1983 **(46)** trunk of *Arbutus unedo* on the ground, coll. 2040; 07/11/1985, 31/10/1990 **(23)** on *Quercus ilex*, coll. 3828, 5246; 08/11/1985 **(4)** branch of *Castanea sativa*, coll. 4084; 06/11/1992 **(57)** *Erica arborea*, coll. 5789; 13/12/1997 **(18)** on *Phillyrea latifolia*, coll. 7005.
Tyromyces chioneus (Fr.) P. Karst.
02/12/2003 **(23)** on stump of angiosperm, coll. 8202, coll. Arras 836.
Vararia gallica (Bourdot & Galzin) Boidin
11/11/1994 **(18)**on *Helichrysum italicum*, coll. 6672. Rare species, recorded only

from Lazio and Sardinia regions.
Vararia investiens (Schwein.) P. Karst.
06/11/1985 **(31)** on branch of *Pinus pinea*, coll. 4026. Uncommon species.
Vararia maremmana Bernicchia
07/11/1992 **(56)** on trunk of *Juniperus oxycedrus* subs. *oxycedrus*, coll. 5779, 5818; 09/11/1994 **(23)**, loc. Is scalas arenas on *J. oxycedrus* subs. *oxycedrus*, coll. 6663; 07/12/1996, 13/12/1997, 20/11/1999, 28/11/2003 **(18)** on *J. phoenicea*, coll. 6852, 6997, 7227, coll. Arras 939; 18/11/1999 **(83)** *J. phoenicea*, coll. 7386. Recorded also from Spain (Moreno et al., 2004; Pérez Gorjón & Bernicchia, 2008 in press.).
Vararia sp.
09/11/1997 **(67)** on branch of *Pyrus*, coll. 7008.
Vesiculomyces citrinus (Pers.) E. Hagstr.
02/03/2003 **(70)** on broadleaves, coll. Arras 107.
Vuilleminia alni Boidin, Lanq. & Gilles
23/11/1999 **(77)** on *Ostrya carpinifolia*, coll. 7333, 7381, 7404; 29/11/2000 **(67)** *Alnus glutinosa*, coll. 7471; 30/11/2003, **(65)** on *Populus nigra*, coll. 7704; 04/12/2007 **(58)** loc. Baccu Gerduri on *Alnus glutinosa*, coll. 8197, 8198. Very rare species. It characteristically occurs, such as all the species of gen. *Vuilleminia*, on decorticated, dead but still attached branches.
Vuilleminia comedens (Nees.) Maire
13/11/1983, 09/11/1985, 04/12/1996, **(13)** *Quercus ilex*, *Crataegus oxyacantha*, coll. 5377, coll. 1943, *Taxus baccata*, coll. 3853, *Ilex aquifolium*, coll. 6847; 16/12/1983 **(47)** *Q. ilex*, coll. 2371.
Vuilleminia coryli Boidin, Lanq. & Gilles
23/11/1999 **(77)** on *Alnus glutinosa*, coll. 7330. Very rare species in all European countries.
Vuilleminia cystidiata Parmasto
02/11/1986, 30/10/1990 **(13)** branch of *Ilex aquifolium*, coll. 5096, *Crataegus oxyacantha*, coll. 5213; 29/11/2000 **(67)** *Crataegus*, coll. 7481. Very rare species, present only in few European countries. Easily distinguished by its thick-walled and pointed cystidia.
Vuilleminia megalospora Boidin, Lanq. & Gilles
17/11/1983, 05/12/1996 **(39)** on branch of *Quercus ilex*, coll. 2057, 6832, 6849; 07/12/1996 **(18)** on *Q. ilex*, coll. 6833, 6836, 6848. It occurs till now only in some Sardinian oak forests. Macroscopically distinguished from other species of the same genus by its pure white colour.
Vuilleminia pseudocystidiata Boidin, Lanq. & Gilles
30/10/1990, 04/12/1996, **(13)** on *Crataegus oxyacantha*, coll. 5399, 7491; 29/11/2000 **(67)** on branch of *Crataegus*, coll. 7491. Very rare species in Europe,

known from only few European countries. It has obtuse cystidia and smaller basidiospores than in *V. cystidiata.* Recorded only on *Crataegus.*
Vuilleminia sp.
09/11/1985 **(13)** on branch of *Taxus baccata*, coll. 3850.
Xenasma pruinosum (Pat.) Donk
28/09/2001 **(77)** on broadleaves, coll. Arras 628.
Xenasma pulverulentum (Litsch.) Donk
30/11/2000 **(77)** on twig of angiosperm, coll. 7467. Uncommon species.
Xenasma tulasnelloideum (Höhn. & Litsch.) Donk
06/06/2004 **(68)**)on *Quercus ilex*, coll. Arras 117; 20/03/2003 **(80)** broadleaves, coll. Arras 630.
Xenasmatella vaga (Fr.) Stalpers
05/11/1986 **(23)** on *Arbutus unedo*, coll. 4761. Common and widespread species, both on broadleaves and coniferous wood, very often not taken into consideration and common in some forests.
Xylobolus frustulatus (Pers.) Boidin
05/12/1996 **(39)** loc. Pau, on trunk of old *Quercus ilex*, coll. 6981. Infrequent species.
Xylobolus subpileatus (Berk. & M.A. Curtis) Boidin
07/11/1985 **(23)** on branch of *Quercus ilex*, coll. 3827; 11/11/1994 **(18)** on *Helichrysum italicum*, coll. 6625; 24/11/1999 **(77)** on lying trunk of *Ostrya carpinifolia*, coll. 7393.

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