

Lichenicolous fungi and lichens from Puglia and Basilicata (southern Italy)

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Abstract: BRACKEL, W. v. 2011. Lichenicolous fungi and lichens from Puglia and Basilicata (southern Italy). – *Herzogia* 24: 65–101.

During an excursion to Puglia and Basilicata in summer 2010, 50 sites of lichenological interest were visited. The results of this field study with special emphasis on lichenicolous fungi are presented here. The new genus *Asteroglobulus*, the new species *Asteroglobulus giselae*, *Phoma melanelixiae* and *Unguiculariopsis lucaniae* are described, and a list of 92 taxa of lichenicolous fungi, including some lichenicolous lichens, is provided. Notes on some remarkable lichens (e.g., *Collema italicum*) and on two hepaticolous fungi are added.

Zusammenfassung: BRACKEL, W. v. 2011. Lichenicole Pilze und Flechten aus Apulien und der Basilicata (Süditalien). – *Herzogia* 24: 65–101.

Während einer Exkursion durch Apulien und die Basilicata im Sommer 2010 wurden 50 lichenologisch interessante Stellen besucht. Die Ergebnisse dieser Geländeerhebungen, mit besonderem Gewicht auf den lichenicolen Pilzen, werden hier vorgestellt. Die neue Gattung *Asteroglobulus*, die neuen Arten *Asteroglobulus giselae*, *Phoma melanelixiae* und *Unguiculariopsis lucaniae* werden beschrieben und eine Liste von 92 Arten lichenicoler Pilze (einschließlich einiger lichenicoler Flechten) wird vorgestellt. Erwähnt werden weiterhin einige bemerkenswerte Flechten (z. B. *Collema italicum*) und zwei hepaticole Pilze.

Key words: Ascomycotina, Basidiomycotina, anamorphic fungi, Mediterranean.

Introduction

The two regions Puglia and Basilicata in the southern part of Italy had a glorious past in the Antiquity and in the Middle Ages. They were a part of Magna Graecia with the important cities Taras (Taranto), Metapontion (Metaponto), Heracleia (Policoro), Kallipolis (Gallipoli), and others, before they were conquered by the Romans. After the fall of the Roman Empire a lot of conquerers came and the Italian south lost importance. Under the reign of the famous emperor Federico II they saw a last bloom as a part of the kingdom of Sicilia. The following terrible wars destroyed the cities and the country, and feudalism did the rest, so that Puglia and especially Basilicata belonged to the poorest regions of Europe till the middle of the last century¹, when a land reform and programs for the Mezzogiorno (Italian South) began to work. The economic situation improved a little with tourism especially on the coast of Puglia, whereas the interior of Basilicata is still almost free of tourists.

As in almost all Mediterranean coastal areas the forest was reduced to relics already in ancient times due to the need of wood for vessels and to gain pasture for sheep. Hence in Puglia no

¹ To get an impression of the situation in the Basilicata in the first half of the 20th century, read Carlo Levi's „Cristo si è fermato a Eboli“ (Christ stopped at Eboli) or see some of his pictures; the medician, poet and painter was banned to Aliano in the Basilicata in the fascist era.

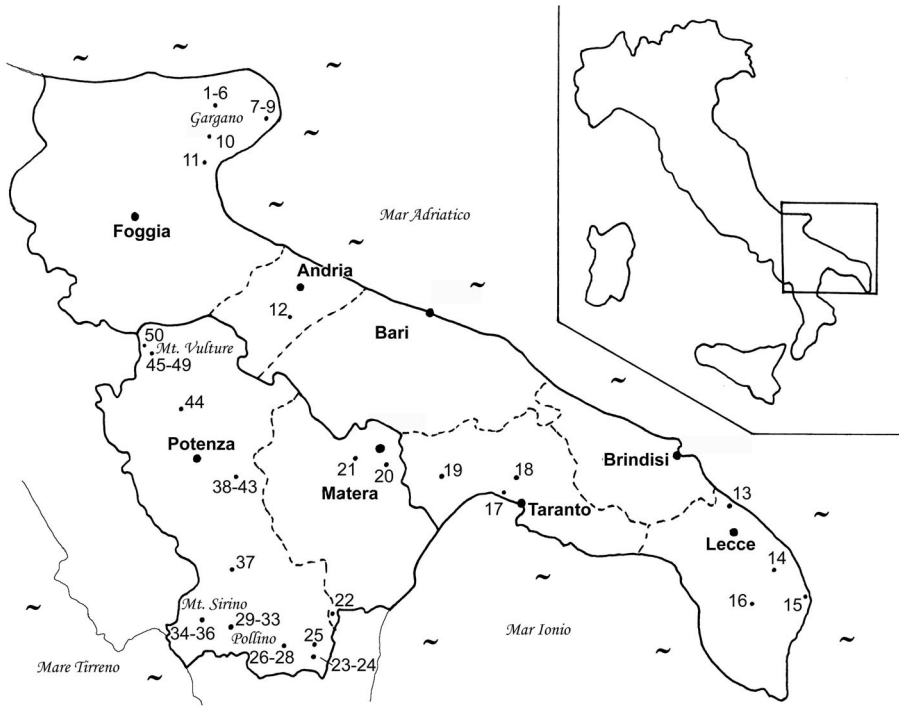


Fig. 1: Collection sites 1–50.

bigger areas of forest are found except of the famous Foresta Umbra at the promontory of Gargano; the situation is better in the mountains of Basilicata, where in several National or Natural Parks large areas covered with forests especially of beeches and different species of oaks can be found. But even in the deforested region Puglia trees are not rare thanks to the vast plantations of olive trees.

In August 2010 we made an excursion of four weeks through both regions, covering all important land forms. The lichens and lichenicolous fungi on rocks might be somewhat under-represented due to the weather conditions.

Material and Methods

The specimens were studied macroscopically with a Zeiss stereo microscope at magnifications up to $\times 40$ and microscopically with an Olympus BX 51 microscope fitted with Normarski differential interference contrast optics. Measurements were taken on thin hand-cut sections mounted in water. Statistical measurements are indicated as (minimum) $\bar{X} - \sigma_x - \bar{X} + \sigma_x$ (–maximum) followed by the number of measurements; the length/breadth ratio of ascospores and conidia is indicated as l/b and given in the same way. For identification and staining the standard reagents 10% KOH, Steiner's solution, lactic acid, Lugol's solution, and cotton blue were used. The specimens are deposited in the private herbarium of the author at the Institut für Vegetationskunde und Landschaftsökologie (hb ivl), the type specimens of the new taxa in M. Only from very common species (e.g. *Athelia arachnoidea*, *Lichenocodium erodens*) the investigated specimens were not kept in the herbarium.

Results

The underlined numbers 1–50 indicate the localities described below. All specimens leg. W. & G. v. Brackel, det. W. v. Brackel. Species marked with an "L" are lichenized (parasitic lichens).

Abrothallus acetabuli Diederich

49: on *Pleurosticta acetabulum*, thallus (hb ivl 5661).

This species is rarely reported from Europe [Belgium (DIEDERICH et al. 2009), Germany (DIEDERICH 1990), France (DIEDERICH 1990, ROUX et al. 2008), Luxembourg (DIEDERICH 1990), Netherlands (APTROOT et al. 2004), Spain (CALATAYUD et al. 1995, ETAYO & LOPEZ DE SILANO 2008)]. We do not know about any previous records from Italy. It is clearly distinguished from *A. parmeliarum* mainly by the missing K reaction of the hymenium (turning greenish in *A. parmeliarum*). In our specimen we found slightly smaller ascospores than given in the original description of DIEDERICH (1990): (12–)12.5–14.6(–16) × (4.5–)4.7–5.7(–6) μm, l/b=(2.3–)2.4–2.8(–3.1) (n=20) vs. (12.5–)13.5–15.5(–16) × 5.5–6.5(–8) μm, l/b=(2–)2.2–2.6(–3) (n=35). Intermixed were pycnidia with conidia of the *Vouauxiomyces* type.

Abrothallus bertianus De Not.

1a: on *Melanohalea exasperata*, thallus (hb ivl 5414); 3a: on *M. exasperatula*, thallus (hb ivl 5429).

A cosmopolitan species with a preference to mountainous regions. In Italy it was known until now from Trentino-Alto Adige, Lombardia, and Sicilia (DE NOTARIS 1845, LETTAU 1958b, BRACKEL 2008b, 2010b).

Abrothallus sp.

28a: on *Lobaria pulmonaria*, thallus (hb ivl 5491).

Apothecia black, slightly greenish-pruinose, c. 0.3 mm in diam.; hypothecium brown, hymenium hyaline to pale brown, K+ greenish, epithecium brown; asci 8-spored, ascospores 1-septate, brown, verrucose, 8–11 × 3.5–4.5 μm, easily splitting into part-spores.

First we were tempted to name this specimen *Abrothallus viduus* Körb., as the description of this species does not show any reliable contradiction to its features. But according to Ave Suija (pers. comm.) the type specimen of *A. viduus* is *Dactylospora lobariella*. No other species of the genus *Abrothallus* was known on *Lobaria* until SUIJA et al. (2011) recently described *A. halei* Pérez-Ortega, Suija, D. Hawksw. & R.Sant., distinguished from our specimen by 4-celled ascospores. The latter was sent to A. Suija and is most probably one of the undescribed species of *Abrothallus* on *Lobaria* being currently studied by Suija (pers. comm.).

Acremonium sp.

31: on *Pertusaria pertusa*, thallus and apothecial warts (hb ivl 5498).

This obviously undescribed taxon will be studied further, as molecular methods are necessary to clarify the relations to its possible teleomorph *Pronectria pertusariicola*.

Arthonia molendoi (Heufl. ex Frauenf.) R.Sant.

20b: on *Xanthoria parietina*, thallus and apothecial disc (hb ivl 5470) and on *Caloplaca cerina*, thallus (hb ivl 5472 in the specimen of *Lichenodiplus lecanorae*).

A cosmopolitan species, growing on *Caloplaca* and *Xanthoria*, usually on the thallus. In Italy it was known from Abruzzo, Sicilia, and Toscana (NIMIS & TRETACH 1999, BRACKEL 2008a, c).

Arthonia subfuscicola (Linds.) Triebel

14a: on *Lecanora horiza* (hb ivl 5455).

This fungus, confined to corticolous species of *Lecanora*, is a rarely recorded, probably cosmopolitan species. In Italy it was known until now from Lombardia and Sicilia (ANZI 1860, BRACKEL 2008b). In our specimen the ascomata of *A. subfuscicola* are infected with *Intralichen* sp., so most of the asci are misformed and only a few ascospores are developed.

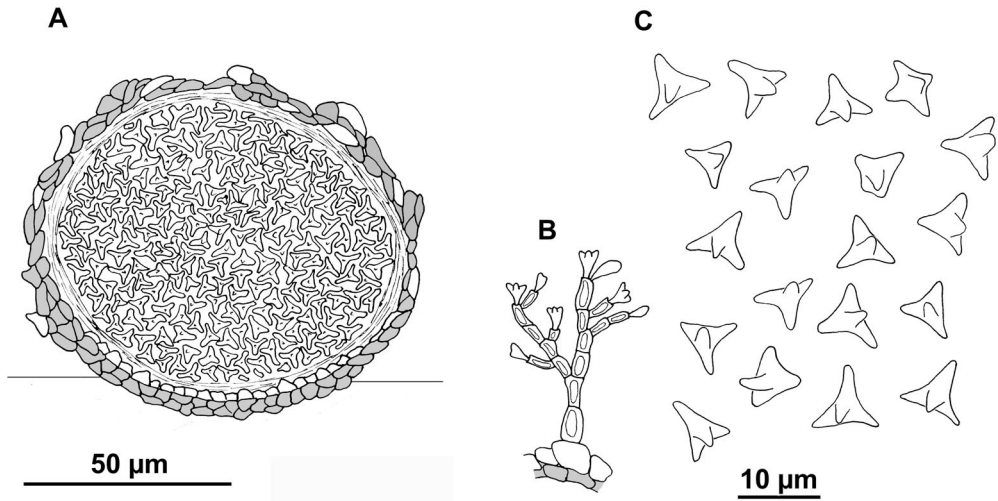


Fig. 2: *Asteroglobulus giselae* (holotypus). **A** – section through a conidioma. **B** – conidiophore with conidiogenous cells and young conidia. **C** – conidia.



Fig. 3: *Asteroglobulus giselae* (holotypus): infected part of the tallus of *Ramalina farinacea* with several conidiomata in different stages.

Asteroglobulus Brackel **gen. nov.** [MycoBank 561009]

Conidiomata lichenicola, superficialia, fusca deinde nigra, globosa. Conidiophora macronemata, hyalina, partim basalis conidiomatis emanens. Cellulae conidiogenae monoblasticae vel raro polyblasticae, terminales vel laterales, integratae, subcylindricae, hyalinae. Conidia solitaria, unicellularis, stellata, hyalina.

Typus generis: *Asteroglobulus giselae* Brackel

Conidiomata superficial, spherical or slightly compressed, pycnidial, opening irregularly by splitting of the upper wall. Conidiomatal wall composed of one or two layers of elongate, dark brown cells, intermixed with hyaline or pale brown, thin-walled cells. In the lower part with an additional inner layer of hyaline, irregular cells. **Conidiophores** originating from hyaline, irregular cells at the bottom of the conidiomatal cavity, macronematous, branched, septate; first filling the conidiomatal cavity, then pressed to the inner wall by the mass of conidia, imitating an additional layer of long and narrow cells, and finally disappearing. **Conidiogenous cells** integrated, appearing laterally and apically, subcylindrical, thin-walled, hyaline, enteroblastic, monoblastic or rarely polyblastic. **Conidia** hyaline, tetrahedral to stellate, base rounded, or pointed, or slightly truncate, expanding in the upper part and forming tapered projections at approximately the same level. The conidia are embedded in a mucilaginous mass.

Etymology: From Greek *astér*=star (referring to the shape of the conidia), Latin *globulus*=small ball (referring to the almost perfectly spherical conidiomata).

Discussion: The new genus is characterized by the tetrahedral to star-like shape of its non-septate conidia. The only other genus with similar conidia is *Asteroconium* Syd. & P.Syd., which is distinguished by subepidermal to acervular conidiomata and the lack of conidiophores. The very long and narrow conidiogenous cells of *Asteroconium* arise directly from a basal stroma. Other conidial fungi with star-like conidia (e. g., *Asterosporium* Kunze), or conidia with several arms (treated in PUNITHALINGAM 2003), are distinguished by septate conidia. The only lichenicolous of them, *Lichenostella* Calat. & Etayo, is also distinguished by the sporodochial conidiomata. Except of the other type of conidiomata and the non-septate conidia the new genus is similar to *Lichenostella* in the type of conidiogenesis and in the formation and shape of the conidia. In the genus *Cornutispora* the conidia show also projections, but the site of attachment is one of the arms in coplanarity with the other arms and not perpendicular to the projections like in *Asteroglobulus*. Moreover the conidia of *Cornutispora* show filiform appendages on each of the three arms. In both of these characters (projections in three instead of two dimensions, missing appendages) the recently described *Cornutispora pyramidalis* (ETAYO 2010a) does not fit the diagnostic characters of the genus given in PIROZYNSKI (1973) and PUNITHALINGAM (2003). However, before formally combining this species to *Asteroglobulus*, the conidiogenesis should be restudied (conidiophores and conidiogenous cells could not be clearly observed in the holotype; see ETAYO 2010a).

Asteroglobulus giselae Brackel **sp. nov.** [MycoBank 561010]

(Fig. 2, 3)

Conidiomata lichenicola, superficialia, fusca deinde nigra, globosa, (30–)60–100 µm diam. Conidiophora macronemata, hyalina. Cellulae conidiogenae monoblasticae vel raro polyblasticae, terminales vel laterales, integratae, subcylindricae, hyalinae, ca. 4 × 2 µm. Conidia solitaria, unicellularia, laevia, stellata, hyalina, 7–10 µm diam.

Typus: Italy, Basilicata, Prov. di Potenza, Parco Nazionale del Pollino, SE Mezzana Frido, beech and fir forest, on *Fagus sylvatica*, on *Ramalina farinacea*, 1420 m alt., 39°57'55"N/16°12'27"E, 15.8.2010, W. & G. v. Brackel (M – holotypus, hb ivl 5485 – isotypus).

Conidiomata superficial, spherical or slightly compressed, pycnidial, (30–)60–100 µm wide, (30–)40–90 µm high, first brown, then black, opening irregularly by splitting of the upper wall. Conidiomatal wall composed of one or two layers of elongate, dark brown, cells, 3–10(–12) × 2–5(–8) µm, intermixed with hyaline or pale brown thin-walled cells; some bigger protruding dark brown cells give the wall a rough texture. In the lower part with an additional inner layer of hyaline, irregular cells of 2–4 µm diam. Vegetative hyphae immersed in a necrotic layer, branched, septate,

of brown, globose to irregular or elongated, somewhat torulose cells, 2–5 × 2–4 µm. **Conidiophores** originating from hyaline, irregular cells of c. 3–5 µm diam. at the bottom of the conidiomatal cavity, macronematous, branched, septate, 2–3 µm wide; first filling the conidiomatal cavity, then pressed to the inner wall by the mass of conidia, imitating an additional layer of long and narrow cells, and finally disappearing. **Conidiogenous cells** integrated, appearing laterally and apically, subcylindrical, thin-walled, hyaline, smooth, c. 4 × 2 µm, enteroblastic, monoblastic or rarely polyblastic. **Conidia** hyaline, smooth, tetrahedral, base rounded, pointed, or slightly truncate, expanding in the upper part and forming 3 (or very rarely 4) tapered projections at approximately the same level, inscribed in a circle of 7–10 µm diam. The projections appear after the release from the conidiogenous cells; at the time of release the conidia are obpyriform to narrowly triangular with at the most small outgrowths. The conidia are embedded in a mucilaginous mass.

Etymology: I dedicate this “globe filled with stars” to my beloved wife Gisela.

Distribution and host: The new species is known from two localities in Basilicata and two others in Sicilia, southern Italy, where it lives in montane deciduous forests on the thallus of *Ramalina farinacea*. The infected areas are blackened and become eroded in an advanced stage, so the fungus is considered to be pathogenic.

Additional specimens examined (all on *Ramalina farinacea*): Italy, Basilicata, Prov. di Potenza, between Cogliandrino and Bagni, oak forest, on *Quercus cerris*, 835 m, 40°05'07"N/15°56'47"E, 16.8.2010, W. & G. v. Brackel (hb ivl 5496); Sicilia, Prov. di Messina, Monti Nebrodi, between Caronia and Capizzi, SP 168 at km 19/VI, mixed oak forest, on *Q. cerris*, 1150 m, 37°57'17.7"N/14°30'28.6"E, 15.8.2007, W. & G. v. Brackel (hb ivl 5667); Sicilia, Prov. di Messina, between Mistretta and Nicosia, Bosco della Giumenta, N of Mte. Sambughetti, mixed oak forest, on *Q. cerris*, 1225 m, 37°50'27.2"N/14°21'14.8"E, 16.8.2007, W. & G. v. Brackel (hb ivl 5668).

Athelia arachnoidea (Berk.) Jülich

7: on *Physcia adscendens*, *P. aipolia* and *Xanthoria parietina*; 10: on *X. parietina*; 23c: on *Physcia aipolia*; 24a, c: on *Physcia leptalea* and *Physconia venusta* (hb ivl 5477); 48a: on *Phaeophyscia orbicularis*, *Physcia tenella*, *Physconia venusta*, and *Xanthoria parietina*; 50: on *Physcia tenella* and *Xanthoria parietina*.

A common and worldwide distributed pathogenic species, unspecific mainly in the Xanthorion parietinae communities. In Italy it was known from Sicilia and Lombardia (BRACKEL 2008b, 2010b), but surely it is distributed all over the country at least in nutrient enriched sites. According to ARVIDSSON (1976) the parasites on lichens and algae with sclerotia belong to *A. arachnoidea*, whilst the saprophytic group of *A. epiphylla* does not develop sclerotia. We list here only finds where sclerotia could be observed.

Buelliella lecanorae Suija & Alstrup

1b: on *Lecanora chlarotera*, thallus (hb ivl 5419).

This recently described species was known until now only from Estonia (SUIJA & ALSTRUP 2004) and from Germany (BRACKEL 2009). New to Italy.

¹*Catillaria mediterranea* Hafellner

27a: on *Anaptychia ciliaris*, thallus (hb ivl 5482); 38: on *A. ciliaris*, thallus (hb ivl 5620).

This lichenicolous lichen is known from the Mediterranean region as well as from the Canary Islands. Italian records are from Basilicata, Calabria, Molise, and Sicilia (HAFELLNER 1982a, NIMIS et al. 1994, TRETIACH & HAFELLNER 1998, NIMIS & TRETIACH 1999, VAN DEN BOOM 2002, NIMIS & MARTELLOS 2008, BRACKEL 2008b).

¹*Catillaria nigroclavata* (Nyl.) Schuler

38: on *Melanelixia glabra*, thallus and apothecial disc (hb ivl 5618).

This autonomous lichen, rather common throughout Italy, is usually living on bark; sometimes it is found growing on lichens. ETAYO (2010b) reported it from Spain frequent on *Melanelixia glabra*.

Cercidospora caudata Kernstock

11: on *Caloplaca aurantia*, apothecial disc (hb ivl 5442 and 5441 sub *Muellerella lichenicola*).

A cosmopolitan species on *Caloplaca* spp. In Italy it was known until now from Trentino-Alto Adige and Sardegna (KERNSTOCK 1895, HAFELLNER 1987b, NIMIS & POELT 1987).

Chalara lobariae Etayo

42: on *Lobaria pulmonaria*, thallus (hb ivl 5640).

This rarely reported hyphomycete was found until now only in the French and Spanish Pyrenees, in Norway, Ukraine, and in Alaska (ETAYO & DIEDERICH 1996b, HOLIEN 2001, ETAYO 2002, KONDRATYUK et al. 2003, ZHURBENKO & DILLMAN 2010). It is confined to necrosed parts of the host *Lobaria pulmonaria*. In our specimen *C. lobariae* grew on thallus parts infested by *Plectocarpon lichenum* and could also be found on the black galls induced by this species. New to Italy.

Cladosporium licheniphilum Heuchert & U.Braun

1b: on *Ramalina fastigiata*, thallus and apothecial discs (hb ivl 5423); 29: on *Flavoparmelia caperata*, thallus (hb ivl 5495); 48a: on *Parmelina tiliacea*, thallus, and *Physcia tenella*, thallus.

This lichenicolous hyphomycete seems to be rather common, but underrecorded. In Italy it was known until now from Lombardia, Toscana, and Sicilia (BRACKEL 2008b, c, 2010b).

Dactylospora lobariella (Nyl.) Hafellner

2: on *Lobaria pulmonaria*, thallus (hb ivl 5427); 31: on *L. pulmonaria*, thallus (hb ivl 5601).

This cosmopolitan but rare species was known in Italy until now only from Friuli-Venezia Giulia and Toscana (BRACKEL 2008c).

Dactylospora parasitica (Floerke ex Sprengel) Zopf

3a: on *Pertusaria albescens* var. *corallina*, thallus (hb ivl 5428); 4: on *P. albescens*, thallus (hb ivl 5433); 28a: on *P. albescens*, thallus (hb ivl 5489); 37: on *Ochrolechia pallescens*, thallus and apothecial disc, and *P. pertusa*, apothecial warts (hb ivl 5612); 42: on *P. pertusa*, apothecial warts (hb ivl 5641); 43b: on *P. albescens*, thallus (hb ivl 5644).

A cosmopolitan species on the members of the family Pertusariaceae. In Italy it was known until now from Trentino-Alto Adige, Toscana, Sardegna, and Sicilia (BAGLIETTO 1879 as *Leciographa floerkei* Massal., BELLEMÈRE & HAFELLNER 1982, NIMIS & POELT 1987, GRILLO & CANIGLIA 2004, TRIEBEL 2006–2010, BRACKEL 2008b). ZEDDA & SIPMAN (2001) reported this species from Sardegna on *Caloplaca ferruginea*, which is an unusual host, as *D. parasitica* seems to be restricted to hosts of the genera *Pertusaria* and *Ochrolechia*; we saw the specimen and confirm the identification of *D. parasitica*, seemingly growing on *Caloplaca ferruginea*. However, the specimen is intermixed with *Pertusaria albescens* and *Pertusaria* sp.; maybe the fungus has contact to the thallus of one of these species.

Ellisembia lichenicola Heuchert & U.Braun

8a: on *Bacidia rubella*, thallus and apothecia (hb ivl 5438) and on the perithecia of *Zwackhiomyces* aff. *physciicola* (hb ivl 5439 sub *Z. aff. physciicola*).

This recently described hyphomycete was known until now only from Denmark, Germany, and Canada (HEUCHERT & BRAUN 2006, BRACKEL 2010a).

Illosporopsis christiansenii (B.L.Brady & D.Hawksw.) D.Hawksw.

3b: on *Physcia tenella*, thallus (hb ivl 5430).

This anamorphic ascomycete is widely distributed over the northern hemisphere. In Italy it was known until now from Lombardia (HAWKSWORTH 1979). The species is a parasite of members of the family Physciaceae; sometimes it seems to attack other species (mainly of the Xanthorion communities), such as *Xanthoria* spp., *Candelariella* spp., *Melanohalea* spp. or *Scoliciosporum chlorococcum*, but we always found at least minute squamules or destroyed thalli of *Physcia* connected with the infection.

Intralichen lichenum (Diederich) D.Hawksw. & M.S.Cole

47: on *Candelariella xanthostigma*, apothecial disc (hb ivl 5649); on *Tremella ramalinae*, basidiocarps (hb ivl 5652 sub *T. ramalinae*).

This cosmopolitan species is reported from different host genera. In Italy it was known until now from Lombardia and Sicilia (BRACKEL 2008b, 2010b).

Leptosphaeria ramalinae (Desm.) Sacc.

1a: on *Ramalina fastigiata*, thallus (hb ivl 5416); 3b: on *Ramalina* sp., thallus (hb ivl 5431); 4: on *R. fastigiata*, thallus (hb ivl 5434); 9: on *R. fastigiata*; thallus, apothecial margin and disc.

A rarely reported species, distributed in Europe and on the Canary Islands, but not rare in the studied area as well as in Sicilia (BRACKEL 2008a, b).

Lichenochora obscuroides (Linds.) Triebel & Rambold

1c: on *Phaeophyscia orbicularis*, thallus (hb ivl 5425).

This species is widely distributed over the northern hemisphere. In Italy it was known until now only from Sicilia (BRACKEL 2008a, b).

Lichenocodium cargillianum (Linds.) D.Hawksw.

49: on *Hypogymnia farinacea*, *H. tubulosa*, thallus (hb ivl 5659).

This cosmopolitan species is very rarely reported. It is mainly growing in the apothecia of different foliose and fruticose lichens of the families Parmeliaceae and Ramalinaceae. We do not know about any previous record from Italy. In our specimen we found the immersed part of the pycnidial wall almost hyaline. The conidiomata measure c. 100 µm in diam., the conidiogenous cells c. 8–10 × 3–4 µm, and the brown and verrucose, strongly truncate conidia (6–)6.4–8.1(–9) × (5–)5.5–6.5(–7) µm, l/b = (1–)1.1–1.4(–1.5) (n=20). The type of infection is very similar to that of *L. erodens*: the infected areas, surrounded by a blackish line, are bleached and become eroded. According to DIEDERICH (2003) more than one species might be involved in the specimens collected under this name.

Lichenocodium erodens M.S.Christ. & D.Hawksw.

8b: on *Parmelia sulcata*, thallus; 16: on *Parmotrema hypoleucinum*, thallus; 28a: on *Ramalina farinacea*, *Pseudevernia furfuracea* and *Evernia prunastri*, thallus; 38: on *Parmelia sulcata*, thallus; 39: on *P. sulcata*, thallus; 41: on *P. sulcata*, thallus; 27a: on *P. sulcata*, thallus; 31: on *Melanelixia subaurifera* and *Parmelia sulcata*, thallus and soralia; 34: on *P. submontana*, thallus; 35: on *P. sulcata*, thallus; 37: on *P. sulcata* and *Ramalina farinacea*, thallus; 40a: on *Usnea* sp., thallus; 40c: on *Evernia prunastri*, thallus (hb ivl 5631 sub *Unguiculariopsis lettaui*); 41: on *Evernia prunastri*, thallus; 42: on *Platismatia glauca*, thallus; 45: on *Parmelia sulcata*, thallus; 46: on *Parmelina tiliacea*, thallus; 48a: on *Melanelixia glabra*, thallus.

This very common species is known in Italy from Lombardia, Emilia-Romagna, Toscana, and Sicilia (TRETACH et al. 2008, BRACKEL 2008a, b, c, 2010b), but surely spread all over the country. We examined most specimens under the microscope but did not keep them in the herbarium.

Lichenocodium lecanorae (Jaap) D.Hawksw.

1b: on *Lecanora carpinea*, apothecial disc; 22b: on *Squamarina lentigera*, apothecial disc (hb ivl 5408); 14a: on *L. horiza*, apothecial disc; 35: on *L. horiza*, apothecial disc (hb ivl 5608).

A widespread and common species mostly found on the apothecial discs of members of the family Lecanoraceae. In Italy it was known from Trentino-Alto Adige, Sardegna, Puglia, and Sicilia (NIMIS & POELT 1987, ROUX & TRIEBEL 1994, NIMIS & TRETACH 1999, BRACKEL 2008a, b). We examined all specimens under the microscope but did not keep all of them in the herbarium.

In loc. 19 we found a similar taxon on *Ochrolechia pallescens* (hb ivl 5672) with smaller, ellipsoid conidia [2.5–4 × 2.5–3 µm vs. (2.5–)3–4(–5.5) µm diam.] and narrower conidiogenous cells [6–8 × 2–2.5 µm vs. (4–)7(–8) × (2–)3–3.5(–4) µm].

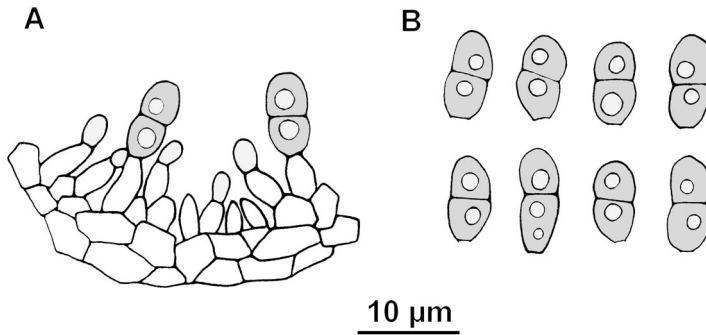


Fig. 4: *Lichenodiplis rinodinicola* (hb ivl 5435, from Gargano, southern Italy): A: section through the basal part of the conidiomatal wall with conidiogenous cells and adhering conidia. B: mature conidia.

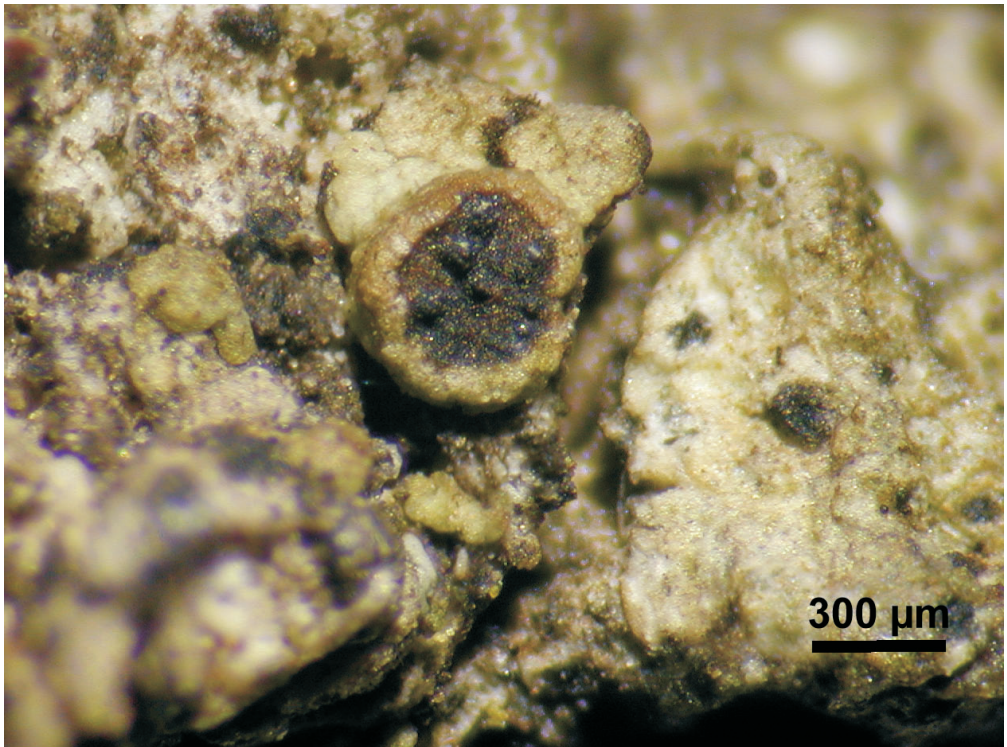


Fig. 5: *Lichenodiplis rinodinicola* (hb ivl 5435, from Gargano, southern Italy): surface view of an infected apothecium of *Rinodina sophodes*.

***Lichenocodium lichenicola* (P.Karst.) Petr. & Syd.**

48a: on *Physcia adscendens*, thallus (hb ivl 5655).

This species, confined to hosts of the genus *Physcia*, is known from Europe, the Canary Islands, and both Americas, but rarely reported. We do not know about any previous records from Italy.

Lichenocodium pyxidatae (Oudem.) Petr. & Syd.

17b: on *Cladonia convoluta*, squamules (hb ivl 5462).

A species widely distributed over the northern hemisphere. In Italy it was known from Lombardia (BRACKEL 2010b).

Lichenocodium reichlingii Diederich

28a: on *Ramalina farinacea*, thallus (hb ivl 5486).

This very rare coelomycete is known only from a few European countries. It is new to Italy.

Lichenocodium usneae (Anzi) D.Hawksw.

3b: on *Physcia tenella* and *Xanthoria parietina*, thallus; 12c: on *Evernia prunastri*, thallus; 14a: on *Ramalina* sp., thallus; 48a: on *Melanelixia glabra*, thallus.

A cosmopolitan species on a wide range of foliose and fruticose lichens. In Italy it was known until now from Trentino-Alto Adige, Lombardia, Abruzzo, and Sicilia (ANZI 1868, HAWKSWORTH 1977a, NIMIS & TRETACH 1999, BRACKEL 2008a). We examined all specimens under the microscope but did not keep them in the herbarium.

Lichenodiplis lecanorae (Vouaux) Dyko & D.Hawksw.

20b: on *Caloplaca cerina*, apothecial disc (hb ivl 5472); 28b: on *Fellhanera* cf. *subtilis*, apothecial disc (hb ivl 5484).

This cosmopolitan and rather common coelomycete is growing mainly on the apothecial disc of *Lecanora*, *Caloplaca* and some other genera. In Italy it was known until now from Sicilia (NIMIS et al. 1994, BRACKEL 2008a, b).

Lichenodiplis lecanoricola (M.S.Cole & D.Hawksw.) Diederich

43a: on *Lecanora chlarotera*, apothecial disc and thallus (hb ivl 5642).

This coelomycete was known until now only from North America (COLE & HAWKSWORTH 2001, DIEDERICH 2003). It is distinguished from *L. lecanorae* by the non-septate conidia. In our specimen we found it growing on the apothecial disc, but also on the thallus. New to Europe.

In a specimen from Sicilia we found slightly bigger conidia of $(4-)-4.3-5 \times 3-3.3(-3.5) \mu\text{m}$, $l/b = (1.3-)-1.4-1.6(-1.7)$ ($n=20$):

Italy, Sicilia, Prov. di Palermo, Bosco della Ficuzza, near Crocifisso, coppice forest, on *Fraxinus excelsior*, on *Lecanora chlarotera*, 925 m, $37^{\circ}51'51.6''\text{N}/13^{\circ}23'00.9''\text{E}$, W. & G. v. Brackel, 13.8.2007 (hb ivl 5669).

Lichenodiplis pertusariicola (Nyl.) Diederich

37: on *Pertusaria pertusa*, ascomatal warts (hb ivl 5614).

This species is rarely reported at least outside of Europe. We do not know about any previous records from Italy.

Lichenodiplis rinodinicola Kocourk. & K.Knudsen

(Fig. 4, 5)

7: on *Rinodina sophodes* (hb ivl 5435).

As our material slightly differs from the type from North America (KNUDSEN & KOCOURKOVÁ 2009), we give here a description of our specimen:

Conidiomata pycnidial, scattered, first immersed in the host hymenium and later erumpent with the upper quarter, ellipsoid, hyaline in the lower part, pale brown to brown in the upper third, c. $120 \times 60 \mu\text{m}$; wall in the lower part composed of 1–2(–3) layers of hyaline, thin-walled cells, up to $7 \mu\text{m}$ thick, in the upper part of 2–3 layers of brownish cells, up to $9 \mu\text{m}$ thick; in surface view irregular to almost isodiametric, $3-7 \mu\text{m}$ diam.; ostiolum not defined. Conidiogenous cells lining the inner wall, narrowly ellipsoid to cylindrical, hyaline, smooth, $4-7 \times 2-3 \mu\text{m}$. Conidiogenesis holoblastic. Conidia ellipsoid, slightly constricted at the septum, pale brown to brown, smooth, 1-septate, thin-walled, with one big guttule in each cell; apex rounded, base truncate with a distinct scar of $1.25-1.75 \mu\text{m}$, $(6.5-)-7.4-9.1(-10) \times (3.5-)-3.9-4.5(-5) \mu\text{m}$, $l/b = (1.4-)-1.8-2.2(-2.6)$ ($n=40$).

The specimen fits the description of *L. rinodinicola* Kocourk. & K.Knudsen from North America, but the conidia as well as the conspicuous scar are broader and the conidiogenous cells are shorter [$4-7 \times 2-3 \mu\text{m}$ vs. $(4-7)-10 \times 2-3.5 \mu\text{m}$]. Another *Lichenodiplis* on the host genus *Rinodina*, *L. lichenicola* Dyko & D.Hawksw., has longer conidia ($9.5-13 \mu\text{m}$) and much longer conidiogenous cells ($8.5-17 \mu\text{m}$) (HAWKSWORTH & DYKO 1979). Examination of more material is necessary to find out if these differences are constant, suggesting the presence of a distinct, undescribed species, or if they just reflect the variability of a poorly known species.

Lichenostigma epipolina Nav.-Ros., Calatayud & Hafellner

20c: on *Diplotomma venustum*, thallus (hb ivl 5474).

A circum-Mediterranean species, also known from Asia, growing on *Diplotomma epipolium* s. l. In Italy it was known from Friuli-Venezia Giulia, Liguria, and Toscana (CALATAYUD et al. 2002).

Lichenostigma maureri Hafellner

38: on *Evernia prunastri*, *Pseudevernia furfuracea*, *Ramalina fastigiata*, *R. fraxinea*, thallus (hb ivl 5623, 5625); 39: on *R. fraxinea*, thallus; 49: on *Pseudevernia furfuracea*, thallus (hb ivl 5660).

This cosmopolitan species is known from most European countries. Previously known Italian records are from the Alps, from Lombardia and Trentino-Alto Adige (HAFELLNER 1982b). According to HAFELLNER (1996) it is a "widely distributed and common inhabitant of epiphytic macrolichens". Known host genera are *Evernia*, *Hypogymnia*, *Letharia*, *Pseudevernia*, *Protousnea*, *Ramalina*, and *Usnea*. In our specimens 5623 and 5660 it grew intermixed with its putative anamorph *Phaeosporobolus usneae*.

Marchandiomyces corallinus (Roberge) Diederich & D.Hawksw.

1b: on *Physcia stellaris* and *P. tenella*, thallus (hb ivl 5418); 7: on *Xanthoria parietina* and *Physcia aipolia*, thallus (hb ivl 5436); 24a: on *Physcia leptalea*, thallus (hb ivl 5480).

A cosmopolitan species that is not rare on many lichen genera, often on Parmeliaceae, but also on *Physcia* spp. and *Xanthoria parietina*. Unlike *Marchandiobasidium aurantiacum* (mainly on *Physcia*), it shows no preference to nutrient enriched respectively air polluted sites. We do not now about any previous records from Italy.

Merismatium nigrtellum (Nyl.) Vouaux

(Fig. 6)

19: on *Rinodina exigua*, thallus (hb ivl 5466).

The genus *Merismatium* is in an urgent need of a revision, as some of its species show a very broad host spectrum and a large variability of some morphological characters, such as ascospore dimensions. *M. nigrtellum* was described by NYLANDER (1865) as a terricolous species, living between the squamules of *Catapyrenium cinereum* (as *Verrucaria tephroides*), with ascospores of $21-36 \times 9-14 \mu\text{m}$; TRIEBEL (1989) neotypified it with a specimen on *Lopadium pezizoideum*, described by ANZI (1868) as *Celidium lopadii* with 5-septate ascospores of $14 \times 8 \mu\text{m}$. ETAYO & SANCHO (2008) mention three samples on different hosts with different features.

Our specimen on *Rinodina exigua* fits *M. nigrtellum* in the broad concept of TRIEBEL (1989), but as we presume that this is a complex of more than one species (see also ZHURBENKO 2009, HAFELLNER 2011), we give a short description of our material:

Ascomata perithecioid, black, almost superficial, $125-175 \mu\text{m}$ diam. Asci broadly claviform, 8-spored, $65-70 \times 25-35 \mu\text{m}$. Hamathecium not visible. Ascospores (sub-)muriform, with $(3-5)-7$ transeptae and $(0-1)-2$ longitudinal septae in each cell, medium greyish brown, end cell often paler, smooth, in mature state slightly constricted at the septae, $(14.5-15.2-18.8(-20)) \times (7-7.6-9.1(-10)) \mu\text{m}$, $l/b = 1.9-2.2(-2.4)$ ($n = 20$).

Minutoexcipula mariana V.Atenza

4: on *Pertusaria albescens*, thallus (hb ivl 5432); 16: on *Pertusaria pertusa*, thallus and ascomatal warts (hb ivl 5458).

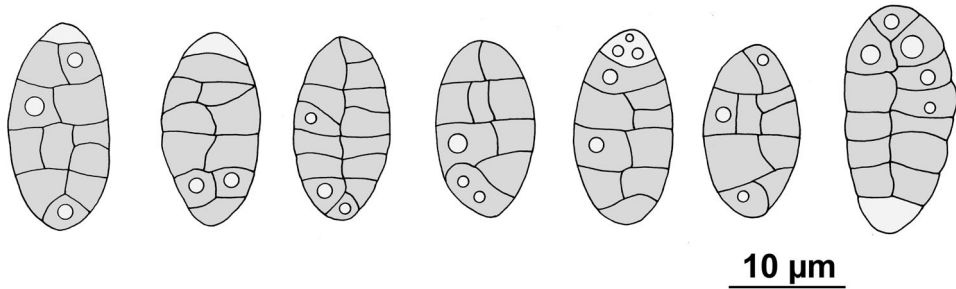


Fig. 6: *Merismatium nigrifellum* (hb ivl 5466): Ascospores.

This rarely reported species is confined to hosts of the genus *Pertusaria*. We do not know about any previous records from Italy. In our specimen 5458 the conidia are a little smaller than in the description of ATIENZA (2002): $5-6.3 \times 2-3 \mu\text{m}$ vs. $6.25-7.5 \times 2.5-3.75 \mu\text{m}$; also VAN DEN BOOM & ETAYO (2006) found smaller conidia ($5.5-6.5 \times 2.5-3.5 \mu\text{m}$) in their specimen on *Pertusaria pluripuncta*.

Muellerella erratica (A.Massal.) Hafellner & V.John

13b: on *Lecania cyrtella*, thallus and margin of apothecia.

This cosmopolitan species is growing on a lot of host genera. In Italy it was known from Trentino-Alto Adige, Lombardia, Marche, Abruzzo, and Sicilia (NIMIS et al. 1994, NIMIS & TRETACH 1999, TRIEBEL 2006–2010, BRACKEL 2008b, 2010b).

Muellerella hospitans Stizenb.

8a: on *Bacidia rubella*, apothecial disc (hb ivl 5437).

A widely distributed species in the northern hemisphere confined to the apothecial discs of *Bacidia* species. In Italy it was known until now from Piemonte, Sardegna, and Abruzzo (FERRARIS 1906, KESSLER 1930, NIMIS & POELT 1987, NIMIS & TRETACH 1999).

Muellerella lichenicola (Sommerf.: Fr.) D.Hawksw.

11: on *Caloplaca aurantia*, thallus (hb ivl 5441); 20b: on *C. cerina*, thallus (hb ivl 5471 sub *Rosellinula* sp.); 20c: on *C. aurantia*, thallus and apothecia (hb ivl 5475); 44: on *C. cerina*, apothecial disc (hb ivl 5646).

A cosmopolitan and common species, preferably on crustose lichens on limestone rocks. In Italy it was known until now from Trentino-Alto Adige, Sardegna, and Sicilia (NIMIS & POELT 1987, TRIEBEL 1989, NIMIS et al. 1994, BRACKEL 2008a, b).

Nectriopsis physciicola D.Hawksw. & Earland-Benn.

50: on *Physcia biziana*, thallus, apothecial margin, and apothecial disc (hb ivl 5664).

This recently described species was known until now only from Spain and from the British Isles (EARLAND-BENNETT et al. 2006, HITCH 2010). *Physcia biziana* is a new host.

Our specimen fits in all features the original description (EARLAND-BENNETT et al. 2006), except of the colour of the ascomata and the size of the ascospores. The ascomata in our specimen are orange in a young state and brownish at maturity (instead of pinkish), and also the colour of the peridial wall in section is orange instead of subhyaline to pinkish. We could find only ascomata either with immature asci or filled with mature ascospores, released from the asci. The ascospores are somewhat bigger and especially broader than in the original description: $(19.5-20.1-22.3(-23) \times (8-8.9-10.8(-11.5) \mu\text{m}$, l/b = $(1.8-1.9-2.4(-2.6)$ (n=20) vs. $(14-14.5-18(-22.5) \times 5.5-8 \mu\text{m}$. According to the measurements, they are broadly ellipsoid with both ends broadly rounded. Some narrower ascospores (with a shape similar to the drawings in the original description) are most probably misbuilt. The mentioned differences may be due to the different stages of maturity.

Nectriopsis rubefaciens (Ellis & Everh.) M.S.Cole & D.Hawksw.

37: on *Ramalina farinacea*, thallus (hb ivl 5611).

From this cosmopolitan species only a few non European records are known. In Italy it was known from Lombardia and Sicilia (BRACKEL 2008b, 2010b). All previous records are from hosts of the family Parmeliaceae.

Opegrapha rotunda Hafellner

25: on *Physconia distorta*, thallus (hb ivl 5481).

This rarely recorded European species is confined to *Physconia distorta*. In Italy it was known until now only from Sicilia (BRACKEL 2008b).

Opegrapha rupestris Pers.

11: on *Verrucaria nigrescens*, thallus (hb ivl 5443 and 5441 sub *Muellerella lichenicola*).

This species is widely distributed over the northern hemisphere. It is parasitic on different species of *Verrucaria*. There are several records for Italy in NIMIS (1993), NIMIS & MARTELOS (2008) and from other authors (ALBO 1926, VAN DEN BOOM 1992, PUNTILLO 1996, GRILLO & CANIGLIA 2004, NIMIS & POELT 1987) but used in a broad sense (incl. *O. parasitica* and others) or not indicating the lichenicolous habit.

Pezizella aff. *epithallina*

(Fig. 7)

24c: on *Physcia leptalea*, thallus (hb ivl 5674).

The species of the genus *Pezizella*, most of them saprophytes on flowering plants, are rather host specific (HAWKSWORTH 1980), and *P. epithallina* has been found until now only on species of the

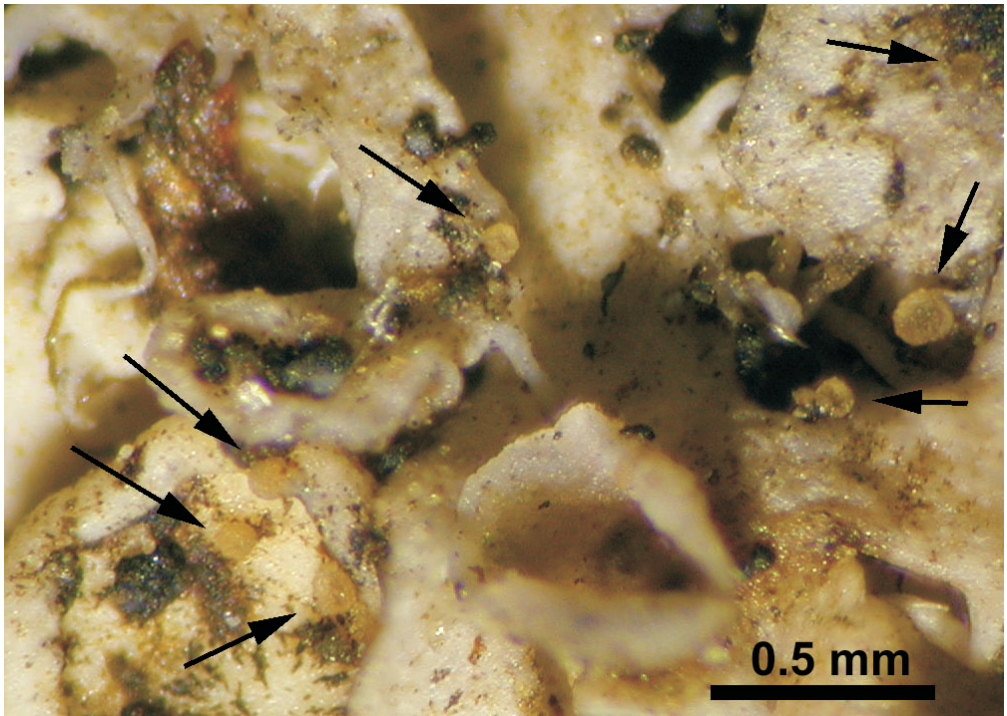


Fig. 7: *Pezizella* aff. *epithallina*: ascomata of the fungus on the apothecia and the thallus of *Physcia leptalea*.

genus *Peltigera*. Hence it is very unlikely that our specimen (unfortunately poor, with only very few ascomata and few mature asci), belongs to this species. It is very similar to *P. epithallina* in several features, as the superficial, very pale and translucent ascomata, the numerous, unbranched, non-septate paraphyses, and the small amyloid structure in the ascus apex. It differs from that species by the smaller ascomata [100–225 vs. (250–)300–400 µm], the thinner, apically not enlarged paraphyses, and the broader ascospores [8.5–1.5(–12) × (4–)4.5–5 vs. (7–)8–10(–12) × 2–3(–3.5) µm]. As this is apparently an undescribed taxon (the other two known lichenicolous species, *P. stictae* and *P. ucrainica*, have distinctly smaller ascospores), we give here a short description:

Ascomata apothecia, superficial, very pale ochre to orange, translucent, 100–225 µm diam., on the apothecial discs, margins and on the thallus of *Physcia leptalea*. Excipulum at the base composed of more or less isodiametric cells, c. 5 µm diam., upwards more elongated and narrower, hyaline. Hypothecium c. 25 µm high, hymenium c. 50 µm high, both hyaline. Paraphyses numerous, non-septate, unbranched, apically not enlarged, 1–1.5 µm thick. Asci cylindrical, wall slightly thickened at the apex, with an annular I+ blue ring, 8-spored, 38–50 × 8–10 µm. Ascospores irregularly uni- to biseriata in the asci, simple, hyaline, 8.5–11.5(–12) × (4–)4.5–5 µm (n = 10).

Phacographa zwackhii (A.Massal. ex Zwackh) Hafellner

43a: on *Phlyctis argena*, thallus (hb ivl 5643).

This species, restricted to hosts of the genus *Phlyctis*, is known until now only from Europe (HAFELLNER 2009). New to Italy.

The genus *Phaeosporobolus* actually comprises four species (LAWREY & DIEDERICH 2011, Index fungorum), and the description of one additional species is in preparation (BERGER & BRACKEL, in prep.). The main distinguishing features are the size of the conidiomata, conidia, and individual cells of the conidia, the structure of the outer layer of the conidiomata, and the number of cells of the conidia. Whereas *P. usneae* has a wide range of host lichens (many corticolous fruticose and foliose genera), the host spectrum of the other species is restricted to one or two related genera: *P. alpina* on *Ochrolechia* and *Pertusaria*, *P. fellhanerae* on *Fellhanera*, and *P. minutus* on *Coccotrema* and *Pertusaria*.

Phaeosporobolus alpinus R.Sant., Alstrup & D.Hawksw.

2: on *Pertusaria albescens*, thallus (hb ivl 5426); 14a: on *Diploicia canescens* (hb ivl 5454); 14b: on *P. pertusa*, thallus; 16: on *P. albescens*, thallus, on *P. pertusa*, thallus (hb ivl 5460, and 5457 sub *Sphinctrina tubiformis*); 33: on *P. albescens*, thallus and soralia (hb ivl 5604); 41: on *P. amara*, *P. sp.*, thallus and soralia (hb ivl 5638; 5634 sub *Sphaerellothecium parmeliae*).

A cosmopolitan species, rather common in mountainous and boreal regions. In Italy it was known from Sicila (BRACKEL 2008b). *Diploicia canescens* is a new host.

In the specimen of *Dactylospora parasitica* from Sardegna (see above) we could find *P. alpinus* on *Pertusaria* sp. and report it here as new to Sardegna: ***Phaeosporobolus alpinus***: Italy, Sardegna, Prov. di Nuoro, Supramonte, Campo de Su Disterru, E of Fontana Bona (Orgosolo), 40°09'N/9°28'E, c. 900 m, stunted forest of *Quercus* and *Juniperus* on rocky limestone plateau, on *Juniperus oxycedrus*, on *Pertusaria* sp., H. Sipman & L. Zedda, 12.4.1997 (B – 60 0104513).

Phaeosporobolus* aff. *minutus

20b: on *Diplotomma alboatrum*, thallus (hb ivl 5473).

This specimen represents most likely an undescribed taxon. In several features it is very similar to *Phaeosporobolus minutus*, especially in the very small conidiomata and the conidia composed of only 4–5 individual cells. The main difference is the shape of the individual cells of the conidia: in *P. minutus* they are described as subglobose and in the drawing they look somewhat angular, some cells with almost attenuated ends (ETAYO & SANCHO 2008). In our specimen on *Diplotomma alboatrum* the individual cells are perfectly orbicular to slightly ellipsoid.

Conidiomata 20–40(–50) µm, conidia 4–5-celled, 9–11 × 7–8 µm, single cells 3.5–4.5 µm diam., minutely verruculose, orbicular, subhyaline to pale brown.

***Phaeosporobolus usneae* D.Hawksw. & Hafellner**

1a: on *Ramalina fastigiata*, *R. fraxinea*, thallus (hb ivl 5412); on *Lecanora chlarotera*, thallus (hb ivl 5415); 16: on *Parmotrema hypoleucinum*, thallus (hb ivl 5461); 28a: on *Pseudevernia furfuracea*, thallus (hb ivl 5488); 38: on *Ramalina fraxinea*, thallus (hb ivl 5619; 5623 sub *Lichenostigma maureri*), on *Anaptychia ciliaris*, thallus (hb ivl 5620 sub *Catillaria mediterranea*); 40c: on *Evernia prunastri*, thallus (hb ivl 5631 sub *Unguiculariopsis lettaui*); 47: on *Hypogymnia tubulosa*, thallus and soralia (hb ivl 5648); 49: on *Pseudevernia furfuracea*, thallus (hb ivl 5660 sub *Lichenostigma maureri*).

A cosmopolitan and very common species, living on several genera of mostly foliose and fruticose lichens. In Italy the species was known until now only from Trentino-Alto Adige (HAWKSWORTH & HAFELLNER 1986). *Lecanora chlarotera* is an unusual host of this fungus; here *Lecanora* was growing between dense cushions of different species of *Ramalina*, all infected with *Phaeosporobolus usneae*. So some of the conidia produced here abundantly managed to grow also on *Lecanora*. This may be a similar phenomenon like the occurrence of epiphytic lichens on stone or even on iron under trees richly covered with epiphytes.

***Phaeosporobolus* sp.**

(Fig. 8, 9)

41: on *Fuscidea stiriaca* (hb ivl 5635).

As our specimen shows a distinctly verrucose ornamentation and does not fit any of the described species, we give a description:

Conidiomata superficial, suborbicular or flattened, up to 250 µm diam., single, black, slightly constricted at the base, composed of orbicular to suborbicular cells, 3–8 µm diam.; the inner ones smooth, hyaline, and thin-walled, the outermost brown, outwardly dark brown and thick-walled, rough; the outermost cells at the base (in contact with the host) less brown and, with thinner walls, but clearly delimited from the host tissue. Conidiophores and conidiogenous cells rarely to see, developing from the stromatic cells, of different shape, hyaline. Conidia suborbicular to ellipsoid, medium brown, delicately but distinctly echinulate (visible already at ×400), 12–18 µm diam., composed of 12–15(–20) individual cells, 4–6(–7) µm diam.

The only described species of *Phaeosporobolus* with ornamented conidia is *P. usneae*, which is found on several mainly fruticose lichen genera; occasionally it is able to colonize also crustose lichens living between the fruticose species. Our specimen 5635 is distinguished from *P. usneae* by the echinulate ornamentation, visible already at a magnification of ×400; in *P. usneae* the minute ornamentation is visible with difficulties at a magnification of ×1000. Furthermore, the conidiomata of our specimen are much bigger (up to 250 µm diam. vs. up to 130 µm in *P. usneae*), and the outermost cells are (sub-) orbicular and do not form a pellicle-like layer of narrower cells. The outermost layer of brown cells is continuous at the base of the conidia, forming a well-defined border against the host tissue.

According to DIEDERICH (pers. comm.) the value of the ornamentation as a diagnostic feature in *Phaeosporobolus* is uncertain. He found also echinulate conidia in *P. alpinus* on *Ochrolechia* (www.lichenology.info).

Similar specimens: both on *Lecanora carpinea*: 38: (hb ivl 5675); 47: (hb ivl 5649): The specimens on *Lecanora carpinea* are similar in all metric features to the specimen 5635, but have paler conidia with a less visible ornamentation. However, they are also different from *P. usneae* by the missing pellicle-like structures on the outermost wall.

***Phoma cytospora* (Vouaux) D.Hawksw.**

48a: on *Pleurosticta acetabulum*, thallus (hb ivl 5657).

This species, confined to hosts of the family Parmeliaceae, is widely distributed in Europe and in both Americas. In Italy it was known until now from Lombardia and Sardegna (NIMIS & POELT 1987, BRACKEL 2010b).

***Phoma epiphyscia* Vouaux**

13: on *Xanthoria parietina*, thallus (hb ivl 5446); 28b: on *Physcia tenella*, thallus.

This species, distributed over the northern hemisphere, is confined to species of the family Physciaceae and of the genus *Xanthoria*. In Italy it was known from Sicilia (BRACKEL 2008b).

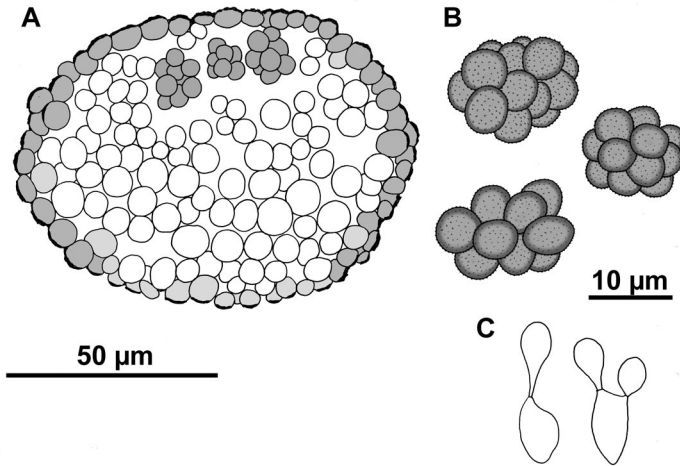


Fig. 8: *Phaeosporobolus* sp. (hb ivl 5635, from Basilicata, southern Italy): A: section through a conidioma with conidia. B: conidia. C: conidiophores with conidiogenous cells.

Phoma ficuzzae Brackel

1b: on *Ramalina fastigiata*, thallus and margin of apothecial discs (hb ivl 5420); 34: on *R. fraxinea*, thallus and apothecia (hb ivl 5605); 47: on *R. fraxinea*, thallus and rarely apothecial disc (hb ivl 5651).

This rarely reported coelomycete is known until now only from Italy (Sicilia, Toscana: BRACKEL 2008a, b, c) and from Lithuania (MOTIEJŪNAITĖ et al. 2011). It is confined to hosts of the genus *Ramalina*. The here listed specimens fit well the description, especially concerning the size of conidiomata and conidia; one specimen with different conidia on *R. fastigiata* is not included.

Phoma foliaceiphila Diederich, Kocourk. & Etayo

19b: on *Cladonia convoluta*, thallus (hb ivl 5467).

This recently described coelomycete (DIEDERICH et al. 2007) is known from several European countries and confined to the squamules of *Cladonia* species. The fungus is new to Italy, and *Cladonia convoluta* is a new host. The type specimen of the species was found on *Cladonia foliacea*, others were found on *C. fimbriata* and *C. rangiferina*. According to PINO-BODAS et al. (2010) there are no constant differences between *C. foliacea* and *C. convoluta*; the host in our specimen is the taxon we consider as *C. convoluta*, with broader and less dissected squamules than the taxon on acid soil.

Phoma lobariae Diederich & Etayo

28b: on *Lobaria pulmonaria*, thallus (hb ivl 5492); 36: on *L. pulmonaria*, thallus (hb ivl 5609).

This species is known from several European countries, as well as from North America. We do not know about any previous records from Italy. The conidia of the species were described as "subglobose to shortly ellipsoid, often angular due to mutual compression, distinctly truncate at the base, ..." (ETAYO & DIEDERICH 1995). According to ETAYO (2006) it does not belong to *Phoma* s. str. because of the slightly truncate base and the single guttule of the conidia. In our specimen we found conidia according to the description but slightly smaller ($2.5\text{--}3 \times 2 \mu\text{m}$ vs. $3\text{--}4 \times 2.5\text{--}3 \mu\text{m}$), also sometimes angular but not distinctly truncate, and with (0–)1–2(–4) guttules. Intermixed with the conidiomata of *P. lobariae* were very similar conidiomata of another, obviously undescribed coelomycete; in this taxon, surely not a member of the genus *Phoma*, the conidia have a distinctly truncate base and one big guttule.

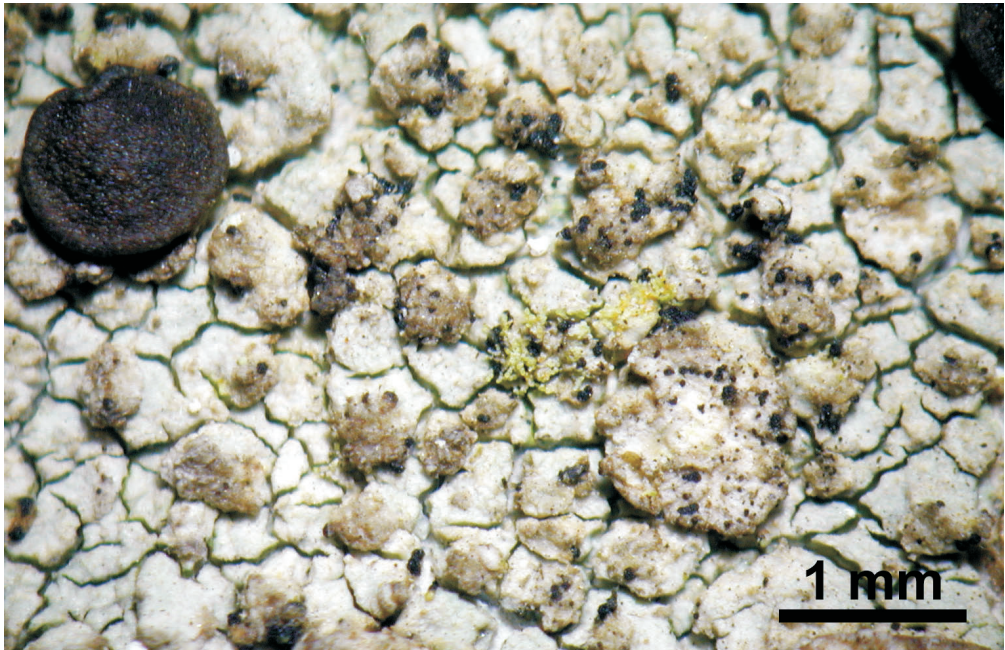


Fig. 9: *Phaeosporobolus* sp. (hb ivl 5635, from Basilicata, southern Italy): infected area of the thallus of *Fuscidea stiriaca* with one apothecium of the host and the minute black conidiomata of the fungus.

***Phoma melanelixiae* Brackel sp. nov.** [Mycobank 561013]

(Fig. 10, 11)

Fungus lichenicola in thallo lichenis *Melanelixia glabra* vigens. Conidiomata immersa, (sub-)globosa, 90 μm diam. Cellulae conidiogenae ampulliformes, 4–5 \times 3–4 μm . Conidia ellipsoidea, (4–)4.4–5.3(–5.5) \times 3–3.5(–4) μm , l/b=(1.1–)1.3–1.7(–1.8) (n=40).

Typus: Italy, Basilicata, Prov. di Potenza, Monte Vulture, near “Femmina Morta”, 1145 m alt., 40°57'24"N/15°37'17"E, in mixed forest of oaks, elders and maples, on the bark of *Acer pseudoplatanus*, on *Melanelixia glabra*, 22.8.2010, W. & G. v. Brackel 5658 (M – holotypus).

Conidiomata pycnidial, immersed in the host thallus, black in macroscopical view, in section brown in lower parts and dark brown around the ostiole, (sub-)spherical, ostiolate, 60–90 μm diam.; conidiomatal wall 5–10 μm thick, pseudoparenchymateous, composed of 2–3(–4) layers of polyhedral cells, 3–8(–10) \times 2–5 μm in section, 4–8 μm diam. in surface view; the outermost radially compressed, brown, and with moderately thickened walls, the inner cells more isodiametric and hyaline with thinner walls. **Conidiogenous cells** lining the inner wall of the pycnidial cavity, short ampulliform, hyaline, smooth, 4–5 \times 3–4 μm ; conidiogenesis enteroblastic. **Conidia** abundantly produced, arising singly, ellipsoid, rounded at both ends, hyaline, simple, smooth-walled, with one big excentric guttule or rarely with two smaller guttules, (4–)4.4–5.3(–5.5) \times 3–3.5(–4) μm , l/b=(1.1–)1.3–1.7(–1.8) (n=40).

Distribution and host: The species is known only from the type locality in Italy, Basilicata, where it grows on the thallus of *Melanelixia glabra*. *Phoma melanelixiae* causes severe damage to the host. The infected parts are bleached and surrounded by a blackish line. In a later stage they become eroded. The type of infection is very similar to that of *Lichenocodium erodens*.

Observations: *Phoma melanelixiae* is similar to *P. melanohaleicola* D.Hawksw. & Earl.-Benn. in the size of the conidiomata and the length of the conidia, but in *P. melanelixiae* these are broader and the length/breadth ratio is 1.3–1.7 instead of 2–2.5 in *P. melanohaleicola* (EARLAND-BENNETT et al. 2006). In addition, *P. melanelixiae* misses the almost seta-like hyphae rising from the wall of

the pycnidia mentioned for *P. melanoaleicola*, and the type of infection is completely different (*P. melanoaleicola* is not discolouring the thallus nor forming necrotic patches). Unfortunately nothing is mentioned about guttules in the description of the latter; also no guttules are shown in the drawings. Another *Phoma* occurring on hosts of the family Parmeliaceae is *P. cytospora*, but in this species the conidia are much narrower ($5-7 \times 1.5-2 \mu\text{m}$). The only other species of *Phoma* with similar dimensions of the conidia is *P. physciicola* ($4-5.5 \times 2.5-3.5 \mu\text{m}$); this species is distinguished by the broader conidiogenous cells, the two-guttulate conidia (with one small guttule near each end) and the occurrence on hosts of the family Physciaceae. KESSLER (1911) described it as growing in the apothecia of *Physcia aipolia*, whilst in a specimen from Sweden mentioned by HAWKSWORTH (1981) it was growing in the apothecia of *Physconia distorta*. In our specimens on the thallus of *Physcia tenella* and *Phaeophyscia orbicularis*, only a moderate bleaching of the host thallus is visible. All other known lichenicolous species of *Phoma* are distinguished by the size of the conidia. Our new species additionally differs from most lichenicolous species of *Phoma* in the presence of only one big guttule in each conidium instead of two small ones.

This characteristic feature of two small guttules in bipolar position is not constant in the multitude of *Phoma* species on vascular plants (see SUTTON 1980); even the type species of the genus, *Phoma herbarum*, has eguttulate conidia resp. conidia with one or several irregularly arranged guttules (BOEREMA et al. 2004).

Compared specimens: *Phoma physciicola*: Germany, Bavaria, Unterfranken, Kreis Kitzingen, Gereutholz NE Willanzheim, 245 m alt., on twigs of *Quercus robur*, on *Physcia tenella*, 14.12.2006, W. v. Brackel (hb ivl 4236); Oberbayern, Kreis Garmisch-Partenkirchen, Garmisch, 720 m alt., on trunk of *Carpinus betulus*, on *Phaeophyscia orbicularis*, 23.4.2009, W. v. Brackel (hb ivl 4956).

Plectocarpon lichenum (Sommerf.) D.Hawksw.

Always on *Lobaria pulmonaria*, thallus: 27a: (hb ivl 5483); 28a: (hb ivl 5494; 5493); 31: (hb ivl 5602); 40c: (hb ivl 5633); 42: (hb ivl 5640 sub *Chalara lobariae*).

This cosmopolitan species is known in Italy from Basilicata, Calabria, Campagna, Lazio, Lombardia, Molise, Puglia, Sardegna, and Toscana (ANZI 1860, JATTA 1875, 1880, BAGLIETTO 1879, NIMIS & POELT 1987, NIMIS 1993, NIMIS & TRETACH 1999, HAFELLNER 2009a, etc.).

Plectocarpon* aff. *nashii

(Fig. 12, 13)

30: on *Ramalina farinacea* (hb ivl 5673).

Plectocarpon nashii Hafellner is known from North America, growing on *Niebla robusta* (HAFELLNER et al. 2002, ERTZ et al. 2005). In the Basilicata we found a taxon of *Plectocarpon* growing on *Ramalina farinacea*, in most features similar to this species. Because of differences in the measurements of the ascospores and macroconidia and a different host we give here a description:

Ascomata developing on the thallus of the host, often in or at the edge of the soralia, single or in small groups, first black but soon covered with a rusty yellow pruina, rounded, 120–350 μm diam.; not inducing galls. Pruina of crystalline granules, shining golden in polarized light, K+ dissolving into a transiently violet solution. Stromatic tissue dark brown, composed of interwoven hyphae, 3–4 μm thick, penetrating without a distinct border into the host tissue; with a dark brown, granulose pigment, K+ dark olivaceous brown, not dissolving. Ascumatal wall dark brown, in the upper (free) part 10–15(–20) μm thick, composed of irregular cells, 2–4 \times 2–8 μm . Hymenium hyaline, up to 130 μm high, sometimes separated into parts by stromatic tissue, hymenial gel I+ deep red, KI+ pale blue. Paraphyses richly branched and anastomosing, hyaline, 1.5–2.5 μm wide, apically not markedly thickened. Asci (2–)4(–8)-spored, narrowly ellipsoid to claviform, straight or slightly curved, 50–60(–80) \times 15–18 μm , I+ with a faint blue tube structure in the apex. Ascospores (3–)4-celled, hyaline, not constricted between the cells, (14–)15.8–18.7(–20.5) \times (4–)4.6–5.9(–6) μm , l/b=(2.6–)2.9–3.8(–4.6) (n=40, measured without perispore); perispore distinct, hyaline, 0.5–1.5 μm wide; overmature ascospores brownish, with a verruculose perispore.

Ascomata intermixed with pycnidia of similar size (or smaller) and structure of the wall. Conidiogenous cells lining the inner wall of the cavity, hyaline with some brownish granules at the base and some-

what striate above, 2–3 µm wide and up to 25 µm high, with multiple annellations. Conidia (macroconidia) 2-celled, claviform to slightly soleiform, hyaline, thick-walled, septa up to 1 µm thick, truncate, (10–)11.2–12.6(–13) × 4–4.8(–5.5) µm, l/b = (2.2–)2.5–3(–3.3) (n=40).

With its hymenium enclosed in a carbonized stromatic tissue that sometimes extends between parts of the hymenium and divides the ascomata into loculi, the KI+ blue hymenial gel, asci of the *Opegrapha*-type, the 3-septate, hyaline ascospores surrounded by a hyaline perispore that later becomes brownish and granulose, and the ascomata covered by a pruina, our specimen belongs to *Plectocarpon* s.lat. Like in *P. nashii* the septation of the hymenium in several loculi is not as evident as in other species of the genus. Following the key in ERTZ et al. (2005), our specimen has to be compared with *P. nashii* and *P. leuckertii*, the only two species in which the hymenial disc is covered with an orange or reddish pruina that dissolves with K into a purplish solution. In *P. leuckertii* the ascospores are distinctly longer, 21.5–25.5 µm. Moreover, in *P. leuckertii* the ascomata are lirellate. Except of the bigger ascospores, the bigger asci and the longer macroconidia [(12–)15–17 µm vs. (10–)11.2–12.6(–13) µm] *P. nashii* is very similar to our specimen. Moreover it is the only species of the genus with similar macroconidia. Whereas most *Plectocarpon* species grow on members of the Lobariaceae, *P. nashii* grows on *Niebla robusta*, a member of the Ramalinaceae and hence related to *Ramalina farinacea*, the host of our specimen.

***Pronectria echinulata* Lowen**

23c: on *Physcia aipolia*, thallus (hb ivl 5410); 24b: on *Physconia venusta*, thallus (hb ivl 5478); 47: on *Physcia stellaris*, thallus (hb ivl 5650); 50: on *Phaeophyscia orbicularis*, thallus (hb ivl 5665).

A rarely reported species, known from Europe and North America, living on the thallus of members of the family Physciaceae. In Italy it was known until now from Lombardia and Sicilia (BRACKEL 2008b, 2010b).

***Pronectria pertusariicola* Lowen**

31: on *Pertusaria pertusa*, apothecial warts (hb ivl 5600); 38: on *P. pertusa*, apothecial warts (hb ivl 5622); on *P. albescens*, *P. pertusa*, thallus and apothecial warts (hb ivl 5632); 41: on *P. pertusa*, apothecial warts (hb ivl 5636).

This species is known from several European countries as well as from the Canary Islands and Madeira. In Italy it was known until now only from Sicilia (one specimen from the author in TRIEBEL 2006–2010).

The ascospores in specimen 5622 measured (11.5–)12.2–13.7(–14.5) × (5–)5.4–6.0 µm, l/b = (1.9–)2.0–2.5(–2.6) (n=20), which fits well the measurements given in SERUSIAUX et al. (2003) and MOTIEJONAITĖ et al. (2007), whereas the stated values in ROSSMAN et al. (1999) are inconsistent. We measured only ascospores with well developed, perfectly rounded guttules (one per cell); ascospores with elongated guttules or with more than one guttule per cell are narrower.

***Pronectria septemseptata* Etayo**

23b: on *Melanelixia glabra*, thallus (hb ivl 5409).

Until now this very rare species was known only from the type locality in the Sierra de Urbasa, Navarra, Spain (ETAYO 1998) and from some neighbouring locations in northern Spain (J. Etayo, pers. comm.). Recently we found it in Bavaria, Germany, on *Melanohalea elegantula*. The type specimen was found on *Melanelixia glabratula* in northern Spain in a beech forest at the altitude of 1100 m. New to Italy.

***Pronectria xanthoriae* Lowen & Diederich**

48b: on *Xanthoria parietina*, apothecial disc and thallus (hb ivl 5653).

This species, confined to the host genus *Xanthoria*, is known from several European countries as well as from Turkey. In Italy it was known until now only from Sicilia (BRACKEL 2008b). The features of our specimen fit well the description given in LOWEN & DIEDERICH (1990), although the ascospores are a little bigger and show a wider variation in the dimensions: (18–)20–25.5(–28) × (4.5–)5–5.8(–6) µm, l/b = (3.3–)3.6–4.9(–6) (n=40) vs. 17–24 × 4–5 µm in the original description. Also IHLEN & WEDIN (2005) found larger ascospores in their Swedish material (c. 15–30 × 4–6 µm), whereas HALICI et al. (2009) report shorter ascospores (15–16 × 4–5 µm) from their Turkish material. Probably the latter is due to immature ascospores (as mentioned by the authors and as the ascospores were said to be smooth).

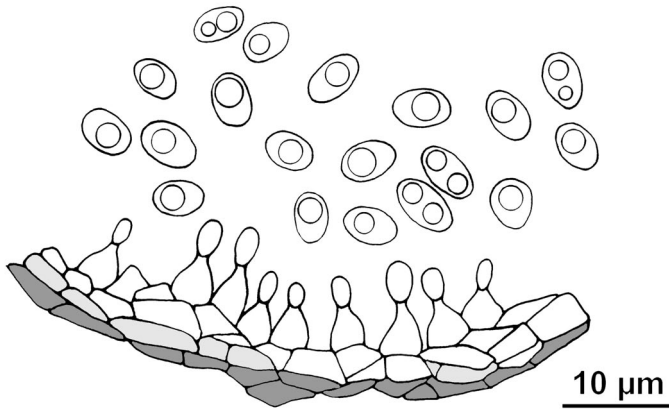


Fig. 10: *Phoma melanelixiae* (holotypus): section through the basal part of the conidiomatal wall with conidiogenous cells and adhering young conidia, free mature conidia.



Fig. 11: *Phoma melanelixiae* (holotypus): surface view of the infected area of the thallus of *Melanelixia glabra*.

Pyrenochaeta xanthoriae Diederich

18: on *Xanthoria parietina*, thallus, apothecial disc and margin; 21: on *X. parietina*, apothecial disc and margin (hb ivl 5385); 24c: on *Physcia leptalea*, thallus (hb ivl 5674 sub *Pezizella* sp.); 50: on *Physcia biziana*, decaying thallus (hb ivl 5662).

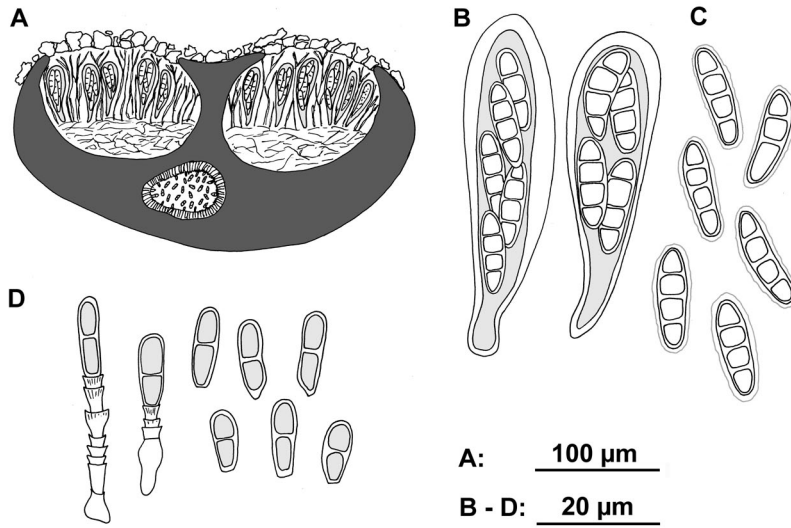


Fig. 12: *Plectocarpon* aff. *nashii* (hb ivl 5673, from Basilicata, southern Italy): A: section through an ascoma, two loculi with asci, one pycnidium. B: asci. C: ascospores. D: conidia, partly with conidiogenous cells.



Fig. 13: *Plectocarpon* aff. *nashii* (hb ivl 5673, from Basilicata, southern Italy): surface view of the infected area of the thallus of *Ramalina farinacea*.

This "very rare lichenicolous coelomycete" (ERTZ et al. 2008) is known only from some European countries, always growing on *Xanthoria*. In Italy it was known from Sicilia (BRACKEL 2008b). In our specimen 5674 we found it on the decaying thallus of *Physcia leptalea*, infected by *Peizella* sp., in 5662 on *P. biziana*, infected by *Nectriopsis physciicola*, *Athelia arachnoidea*, and *Szyzgospora physciacearum*. As the hosts were weakened, this may be a secondary infection and *Physcia leptalea* and *P. biziana* are paratenic hosts. Both should not be included in the host spectrum of *Pyrenochaeta xanthoriae* without the mark "paratenic host".

***Pyrenochaeta* sp.**

1b: on *Lecanora chlarotera*, apothecial disc (hb ivl 5422).

In our specimen the fungus is growing on the apothecial disc of *Lecanora chlarotera*. The similar *P. xanthoriae* is growing on the thallus of *Xanthoria* species, mainly *X. parietina*. Our specimen is distinguished from *P. xanthoriae* by the bigger conidia, $(3.5-4(-5) \times (1.8-2(-2.2)) \mu\text{m}$ vs. $3-3.5(-4) \times 1.4-1.8(-2) \mu\text{m}$ according to DIEDERICH (1990). Unfortunately the material of this apparently undescribed taxon is too poor for further investigations and for a formal description.

***Rosellinula* sp.**

20b: on *Rinodina exigua*, thallus (hb ivl 5471).

Our specimen does not fit any of the described *Rosellinula* species. As the members of the genus seem to be rather host-specific and no species is described on the host genus *Rinodina* or a member of the family Physciaceae, we consider it as an undescribed species. Unfortunately our specimen is too poor for a formal description and so we give here a provisional description:

Ascomata perithecia, scattered, erumpent from the host thallus or apothecial margin, black, c. 60–80 μm wide and 100–120 μm high. Ascomatal wall in the lower part of a textura angularis, single cells irregular to isodiametric, 4–7 μm diam., hyaline, not clearly delimited from the host tissue, in the upper part brown, of interwoven hyphae. Hamathecium of septate, anastomosing, and guttulate elements, 1.5–2.5 μm wide. Asci broadly claviform, 55–75 \times 25–35 μm , more than 200-spored, wall I+ blue, with a up to 6 μm thick, amyloid gelatinous layer mainly around the apex. Ascospores simple, hyaline to pale brown, (sub-)globose, c. 3–4 \times 3 μm .

The taxon is similar to *Rosellinula lopadii* (Vouaux) D.J.Galloway in the size and number of the ascospores, but the ascomata are much smaller [60–80 μm diam. vs. (150–)200–300 μm] and the hamathecium elements are wider [1.5–2.5 μm vs. (0.25–)1 μm] (VOUAUX 1913, HAFELLNER 1985). Another species of *Rosellinula* with more than 200 ascospores per ascus is *R. kalbii*, also with bigger ascomata (c. 200 μm diam.) and narrower hamathecium elements (1–1.5 μm). The other two species of the genus differ in the smaller number of ascospores per ascus, c. 50 in *R. haplospora* and c. 100 in *R. frustulosae* (HAFELLNER loc. cit.). All members of the genus *Muellerella*, also with multispored asci, differ in the missing interascal filaments.

***Sclerococcum serusiauxii* Boqueras & Diederich**

38: on *Parmelina quercina*, thallus (hb ivl 5617).

This species is known only from a few European countries. We do not know about any previous records from Italy. Until now it was reported only from the hosts *Parmelina pastillifera* and *P. tiliacea*, so *P. quercina* is a new host.

^L*Scoliosporum umbrinum* (Ach.) Arnold

41: on *Pertusaria amara*, thallus (hb ivl 5637).

Scoliosporum umbrinum is a widespread and common autonomous lichen, which rarely assumes a lichenicolous habit (RAMBOLD & TRIEBEL 1992, HAFELLNER 2002). Except slight decolorations no damage of the host thallus is visible.

***Sphaerellothecium parmeliae* Diederich & Etayo**

28a: on *Parmelia sulcata*, thallus (hb ivl 5490); 41: on *P. sulcata*, thallus (hb ivl 5634).

This species is widespread over the northern hemisphere, but measured against the commonness of its host, rather rarely recorded. We do not know about any previous records from Italy. The small black perithecia on the black necrotic patches are not easy to see in the field; a helpful hint is the presence of radiating dark hyphae on the edges of the black necrotic areas.

Sphaerellothecium reticulatum (Zopf) Etayo

16: on *Flavoparmelia caperata*, thallus (hb ivl 5456); 38: on *Parmelina quercina*, thallus (hb ivl 5615).

A cosmopolitan species on members of the genus *Parmelia* s. l. In Italy it was known from Trentino-Alto Adige, Sardegna, and Sicilia (ARNOLD 1897, NIMIS & POELT 1987, BRACKEL 2008b).

Sphinctrina tubiformis A.Massal.

16: on *Pertusaria pertusa*, thallus (hb ivl 5457).

This cosmopolitan species was known in Italy from Trentino-Alto Adige, Lombardia, Piemonte, Veneto, Liguria, Toscana, Lazio, Sardegna, Campania, Puglia, and Calabria (NIMIS & POELT 1987, NIMIS 1993 – see here for further references, PUNTILLO 1996).

Stigmatidium acetabuli Calatayud & Triebel

46b: on *Pleurosticta acetabulum*, apothecial disc (hb ivl 5647).

This rare species was known until now only from France and Spain (CALATAYUD & TRIEBEL 2001), and in Italy from Sicilia (BRACKEL 2008b). Possibly it is overlooked, because the multitude of minute perithecia is causing no visible damage or discoloration on the apothecial disc. Notwithstanding the production of ascospores is suppressed in the infested apothecia and on the discs starts a colonisation of algae; so the fungus is not commensalistic but shows at least a slight pathogenic effect.

Stigmatidium congestum Triebel

37: on *Lecanora chlarotera*, apothecial disc (hb ivl 5610).

This cosmopolitan fungus is confined to corticolous species of *Lecanora*. In Italy it was known from Abruzzo, Campagna, Lombardia, Marche, Molise, Puglia, Sardegna, and Sicilia (JATTA 1875, 1880, NIMIS & POELT 1987, NIMIS & TRETACH 1999, TRIEBEL 2006–2010, BRACKEL 2008a, b).

Stigmatidium lecidellae Triebel, Roux & Le Coeur

8b: on *Lecidella elaeochroma*, apothecial disc (hb ivl 5440).

Despite of the commonness of its host (*Lecidella elaeochroma* group) this species is quite rarely collected and known only from Europe. Italian records are from Sardegna and Sicilia (NIMIS & POELT 1987, ROUX et al. 1995, BRACKEL 2008b).

Stigmatidium tabacinae (Arnold) Triebel

12b: on *Toninia opuntioides*, thallus (hb ivl 5445).

According to HAFELLNER & CASARES-PORCEL (2003) *Stigmatidium tabacinae* is „one of the most common lichenicolous fungi on terricolous lichens in arid habitats“. We know only about reports on species of the genus *Toninia*. In Italy it was known from Emilia-Romagna, Veneto, Sardegna, and Sicilia (ARNOLD 1881, NIMIS & POELT 1987, TRIEBEL 1989, NIMIS et al. 1996b, BRACKEL 2008b).

Stigmatidium* aff. *ramalinae (Müll.-Arg.) Etayo & Diederich

30: on *Ramalina farinacea*, thallus (hb ivl 5497); 39: on *Ramalina* sp., thallus (hb ivl 5628; x443 sub *Lichenoconium* aff. *lecanorae*).

This species, including *S. epiramalina* (Vouaux) Hafellner (see ETAYO & OSORIO 2004), is spread over both hemispheres, but rarely recorded. It seems to have a preference for warmer climates. In our specimens we found the ascospores turning brown when mature, a feature also mentioned by ETAYO & OSORIO (loc. cit). With $7.5 \times 3 - 3.5 \mu\text{m}$ the ascospores are constantly smaller than in the published descriptions of *S. ramalinae*: $12 - 15 \times 4 - 5 \mu\text{m}$ (VOUAUX 1913), $11.5 - 13.5 \times 2.5 - 3.5 \mu\text{m}$ (ETAYO & OSORIO 2004) and $10 - 11 \times 3 - 5 \mu\text{m}$ (VAN DEN BOOM & ETAYO 2006). For *S. epiramalina* VOUAUX (1913) gave them as $8 - 12 \times 2.5 - 3.5 \mu\text{m}$

Syzygospora physciacearum Diederich

1b: on *Physcia tenella*, thallus; 50: on *P. biziana*, thallus (hb ivl 5663).

A cosmopolitan and common species with a preference to nutrient enriched sites. We do not now about any previous records from Italy. Several species of the family Physciaceae, all potential hosts, are abundantly spread over the investigated area, but we could find *S. physciacearum* only twice. At least in the case of loc. 50, an impact of nutrients from a neighboured factory farming seems probable.

Taeniolella phaeophysciae D.Hawksw.

All on *Phaeophyscia orbicularis*, thallus: 1c: (hb ivl 5425 sub *Lichenochora obscuroides*); 24c; 44: (hb ivl 5645); 48a, b: (hb ivl 5654).

This species is widely distributed over the northern hemisphere. In Italy it was known until now only from Lombardia (BRACKEL 2010b).

Taeniolella pertusariicola D.Hawksw. & H.Mayrhofer

2: on *Pertusaria albescens*, thallus (hb ivl 5426, sub *Phaeosporobolus alpinus*).

This species is distributed over the northern hemisphere, mainly in the boreal zone, but there is also a record from Turkey (HALICI 2010). We do not know about any previous records from Italy.

Teloggalla olivieri (Vouaux) Nik.Hoffm. & Hafellner

18: on *Xanthoria parietina*, thallus (hb ivl 5463); 20a, b: on *X. parietina*, thallus (hb ivl 5468).

A widespread species in Europe and Asia, always on thalli of *Xanthoria* species. In Italy it was known from Lombardia and Sicilia (BRACKEL 2008a, b, 2010b).

Toninia* aff. *subfuscae (Arnold) Timdal

20c: on *Verrucaria nigrescens*, thallus (hb ivl 5476).

Our specimen fits in all features the descriptions of *Toninia subfuscae* (ARNOLD 1864, TIMDAL 1991). We are in doubts of the identity because *T. subfuscae* was described on *Lecanora subfusca* agg. and no other reports than from *L. campestris*, *L. horiza*, *L. muralis*, and *Lecidella scabra* are known.

Tremella ramalinae Diederich

All on *Ramalina fraxinea*, thallus: 1a: (hb ivl 5413); 34: (hb ivl 5607); 38: (hb ivl 5626); 47: (hb ivl 5652).

A widespread but rarely recorded species in the northern hemisphere. In Italy it was known from Sicilia (BRACKEL 2008a, b). In specimen 5652 some of the basidiocarps are hyperparasitized by *Intralichen lichenum*.

Unguiculariopsis lettai (Grummann) Coppins

(Fig. 14, 15)

28a: on *Evernia prunastri*, thallus (hb ivl 5487); 40c: on *E. prunastri*, thallus (hb ivl 5631).

This species, confined to *Evernia prunastri*, is widespread over the northern hemisphere, but measured against the commonness of its host, rarely recorded. In Italy it was known from Toscana and Trentino-Alto Adige (DIEDERICH & ETAYO 2000).

Unguiculariopsis thallophila (P.Karst.) W.-Y.Zhuang

38: on *Lecanora carpinea*, thallus (hb ivl 5616).

This species is widely distributed over the northern hemisphere, but outside of Europe it is rarely reported. In Italy it was known until now only from Sicilia (BRACKEL 2008b).

Unguiculariopsis lucaniae Brackel **sp. nov.** [MycoBank 561015]

Fungus lichenicola in thallo lichenis *Lecidella elaeochroma* crescens. Ascumata superficialia, fusca, 100–200 µm diam. et ca. 100 µm alta. Setae excipulariae hyalinae, basaliter turgidae, apicaliter uncinatae, 13–25 × 1–5 µm. Excipulum fusco-aurantiacum, hypothecium et hymenium hyalinum. Asci clavati vel subcylindrici, octospori, 24–35 × 5–6.5 µm. Ascospores ellipsoideae, simplices, 2-guttulatae, (4.5–)5–6 × 2–2.6 µm.

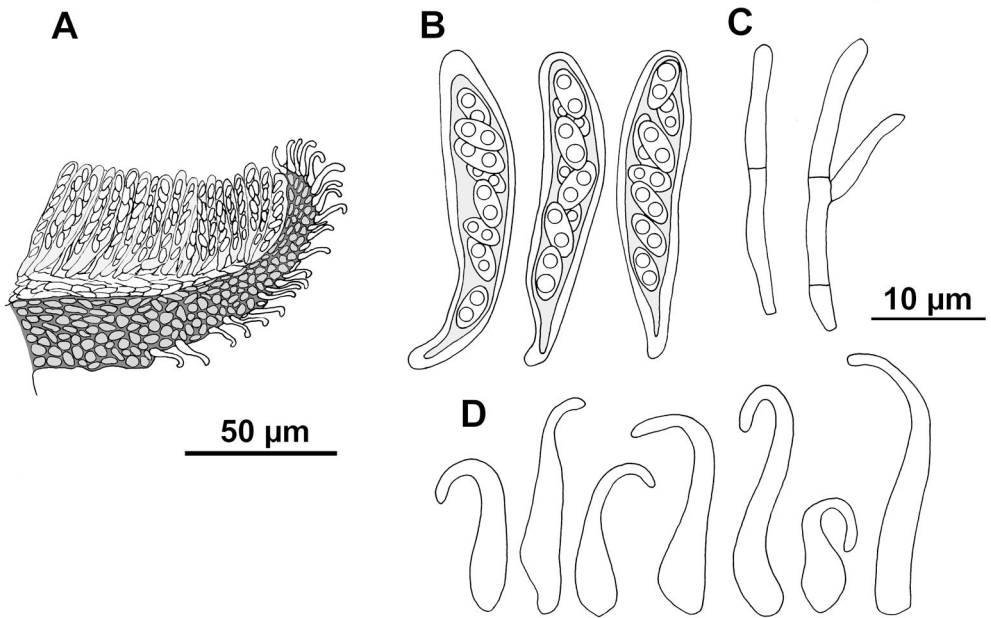


Fig. 14: *Unguiculariopsis lucaniae* (holotypus): **A** – section through an ascoma. **B** – asci with ascospores. **C** – paraphyses. **D** – excipular hairs.

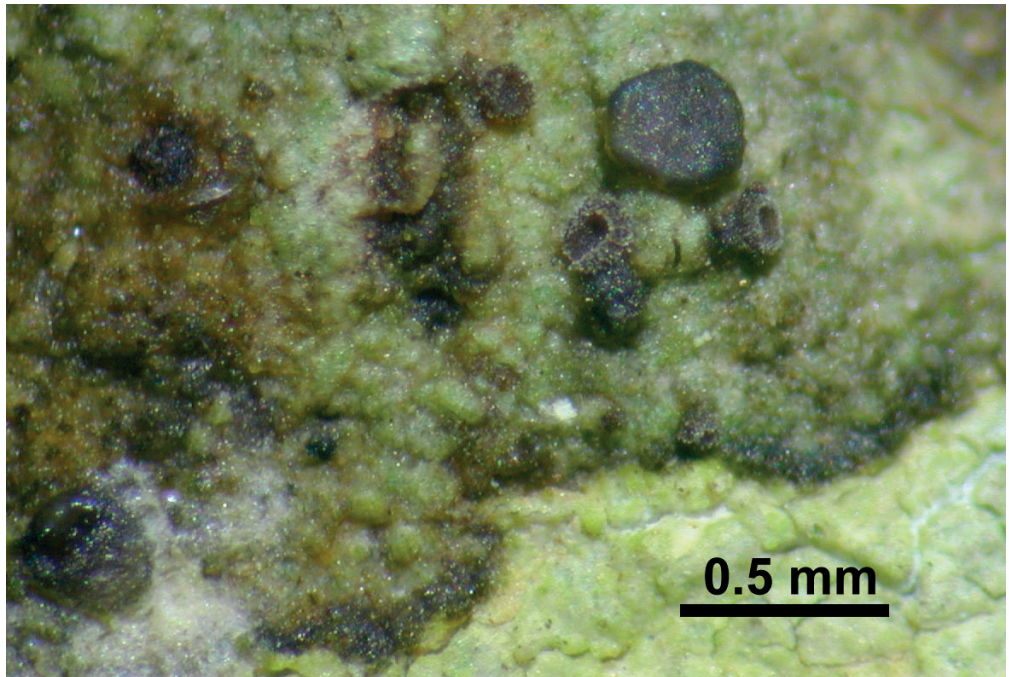


Fig. 15: *Unguiculariopsis lucaniae* (holotypus): part of the infected thallus of *Lecidella elaeochroma* with the bigger ascomata of the host and the smaller ascomata of *Unguiculariopsis*.

Typus: Italy, Basilicata, Prov. di Potenza, Parco Nazionale dell'Appennino Lucano, between Laurenzana and Monte Caldarosa, mixed beech and fir forest in a small valley, on twigs of *Abies alba*, on *Lecidella elaeochroma*, 40°24'24"N/15°57'26"E, 1120 m, 18.8.2010, W. & G. v. Brackel (M – holotypus).

Ascomata superficial, dark brown to almost black, at the apothecial margin covered with whitish hairs, first urceolate and later cupulate, 100–200 µm diam. and c. 100 µm high. Exciple orange to reddish brown, pigment K+ brown without a reddish tinge, paraplectenchymatous, cells subglobose, 3–5(–8) µm diam., longer and thinner versus the hypothecium. **Excipular hairs** densely covering the margin, hyaline, unseptate, smooth, with a broad base and a hooked apex, 13–25 µm long, 3–5 wide at the base and 1–1.5 µm at the tip. Hypothecium hyaline, 5–10 µm thick, hymenium hyaline, 30–40 µm thick, epihymenium not distinguishable; paraphyses scarce, unbranched or rarely branched, sparsely septate, thin-walled, apically not swollen, 1–2 µm thick. **Asci** clavate, wall apically not conspicuously thickened, basally with a short stipe, 8-spored, 24–40 × 5–6.5 µm. Hymenium and asci I–, KI–. **Ascospores** irregularly obliquely uni- to biseriolate, simple, ellipsoid, 2-guttulate, (4.5–)5–6 × 2–2.6 µm, l/b = (2–)2.2–2.6(–2.7) (n = 20).

Etymology: Lucania is the name of the Roman province situated in southern Italy on the territory of the region Basilicata, named after the tribe of the Lucani. The old name is still used in the popular language and in poetry.

Distribution and host: The new species is known from the type locality in Italy, Basilicata and from one locality in Spain, Catalunya. It lives on the thallus of *Lecidella elaeochroma* without causing any visible damage to the host. The Spanish specimen was already reported as *Unguiculariopsis* aff. *thalophila* resp. *Unguiculariopsis* sp. (NAVARRO-ROSINÉS et al. 1994, BOQUERAS 2000).

Additional specimen examined: Spain, Catalunya, Prov. de Tarragona, Montsianès, La Sènia, Font del Bassiol (Serra dels Ports), sobre líquens estèrils que creixen sobre *Juniperus communis*, on *Lecidella elaeochroma* f. *soralifera*, UTM 31TBF6513, 1140 m, 1.8.1984, M. Boqueras & R. Balada (BCN–lich. 18013).

Observations: The genus *Unguiculariopsis* is characterized by orange to brown apothecia with non-septate excipular hairs with swollen bases and often curved or hooked apices, and simple hyaline ascospores. According to LAWREY & DIEDERICH (2011) until now 13 species of *Unguiculariopsis* were known, plus *Llimoniella muralicola*, which might belong to the genus as well (DIEDERICH et al. 2010); the very recently described *U. fasciculata* was transferred to *Protounguicularia* (ETAYO & TRIEBEL 2010, ETAYO 2010b). Until now no species of *Unguiculariopsis* was known on hosts of the genus *Lecidella*. As the lichenicolous species appear to be very host specific, this is a strong hint that the taxon on *Lecidella* is not conspecific with one of the described species. Four of the known lichenicolous species of *Unguiculariopsis* have similarly sized ascospores: *U. manriquei* on *Lobaria*, *U. lesdainii* on *Lecanora*, *U. acrocordiae* on *Acrocordia*, and *U. damingshanica* on an unidentified crustose lichen thallus on Bamboo. All other species have either bigger (at least 6 µm long) or globose ascospores (*U. cribriformis*). The first three of the species with a similar size of ascospores are distinguished from the new species by straight, curved, or flexuose, but not hooked excipular hairs. Furthermore, *U. lesdainii* and *U. acrocordiae* are distinguished by the K+ reddish exciple, and *U. manriquei* by the orange hymenium and epithecium. The fourth, *U. damingshanica*, is very similar in several features to the new species, especially in the size of the ascospores and in size and shape of the excipular hairs. However, there are some distinguishing features: *U. damingshanica* has much bigger ascomata (up to 1000 µm vs. 100–200 µm), a thicker hymenium (60–65 µm vs. 30–40 µm), longer and narrower asci (40–48 × 4–5 µm vs. 24–40 × 5–6.5 µm), ascomata of another colour (dark vinaceous inside with a grey margin vs. dark brown to almost black), and the hairs are subhyaline at apex and brown at base, whereas they are almost throughout hyaline in *U. lucaniae*; in addition the ascospores of *U. lucaniae* are wider (2–2.6 vs. 2 µm). Unfortunately the host of *U. damingshanica* is not known, it is described as “a thin layer of lichen thalli on bamboo” (ZHANG 2000, W.-Y. Zhuang, pers. comm.). Since no species of *Lecidella* is known to live on bamboo in China (A. Aptroot, pers. comm.), also the hosts of the two species are most likely different.

Vouauxiella lichenicola (Linds.) Petr. & Syd.

16: on *Lecanora chlarotera*, apothecial disc (hb ivl 5459).

A cosmopolitan species, growing on the apothecia of corticolous *Lecanora* species. In Italy it was known from Lombardia and Sicilia (LETTAU 1958b, NIMIS et al. 1994).

Vouauxiella verrucosa (Vouaux) Petr. & Syd.

20b: on *Lecanora horiza*, apothecia and thallus (hb ivl 5469).

This species is widely distributed over the northern hemisphere; according to HAFELLNER (1996) it is rather common in the Mediterranean region, but we do not know about any previous records from Italy.

Vouauxiomyces ramalinae (Nordin) D.Hawksw.

1b: on *Ramalina fastigiata*, apothecial disc (hb ivl 5424); 31: on *R. farinacea*, thallus; 34: on *R. fastigiata*, apothecial disc (hb ivl 5606); 38: on *R. fraxinea*, apothecial disc and rarely margin (hb ivl 5621); 39: on *R. fraxinea*, apothecial disc, *R. fastigiata*, thallus and apothecial disc (hb ivl 5629, 5630).

A widespread but not very common species. In Italy it was known until now only from Sicilia (BRACKEL 2008a, b). *V. ramalinae*, the anamorph of *Abrothallus suecicus*, is confined to species of the genus *Ramalina* and occurs mainly on the apothecial disc, rarely on the margin or on the thallus. Both thallus and apothecial disc turn deep black in the infected areas, but as the apothecial discs are covered by a pruina-like necrotic layer, they appear greyish. In specimen 5424, *V. ramalinae* grew on the apothecial disc, whereas the thallus was infected by *Phoma ficuzzae*.

***Vouauxiomyces* sp.**

27a: on *Lobaria pulmonaria*, thallus (hb ivl x433); 28a: on *Lobaria pulmonaria*, thallus (hb ivl 5493; 5491 sub *Abrothallus* sp.); 31: on *Lobaria pulmonaria*, thallus (hb ivl 5603).

In some specimens of *Lobaria pulmonaria* we found an undescribed species of *Vouauxiomyces*, which might be the anamorph of the above mentioned *Abrothallus* sp. In 5491, it grew intermixed with this taxon. The conidia are 1-celled, hyaline, and truncate with a broad scar, $3.5 \times 2.5 \mu\text{m}$.

Xanthoriicola physciae (Kalchbr.) D.Hawksw.

All on *Xanthoria parietina*, apothecial disc and sometimes also on the thallus: 19: (hb ivl 5465); 20a; 47; 48: (hb ivl 5653 sub *Pronectria xanthoriae*).

This widely distributed and common species is reported from Europe and its neighbourhood. In Italy it was known from Lombardia, Toscana, Basilicata, and Sicilia (SANTESSON 1994a, NIMIS et al. 1994, NIMIS & TRETACH 1999, BRACKEL 2008c).

Xenonectriella leptaleae (Steiner) Rossman & Lowen

48a: on *Physconia venusta*, apothecial disc and margin, rarely thallus (hb ivl 5656).

This rarely reported species is confined to hosts of the family Physciaceae; contrary to *Pronectria echinulata* it is mostly found on the apothecial disc. In Italy it was known until now only from Sicilia (BRACKEL 2008a, b).

Zwackhiomyces* aff. *physciicola

8a: on *Bacidia rubella*, thallus (hb ivl 5439 and 5438 sub *Ellisembia lichenicola*).

This specimen fits in all features *Zwackhiomyces physciicola* Alstrup (ALSTRUP 1993b, CALATAYUD & BARRENO 1995): perithecia 150–200 μm in diam, asci 4–6-spored, ascospores hyaline, partly smooth, partly finely verruculose, c. $20 \times 7 \mu\text{m}$. We only have doubts because of the different host. Some of the perithecia were covered by *Ellisembia lichenicola*, looking macroscopically like setose.

Notes on some remarkable lichens

The lichen flora of Italy is very well investigated, and new records of lichens for a certain province are not easily made. Apparently this is not the case for Puglia (except of the promontory of Gargano), perhaps due to the absence of mountainous regions and extensive forests. Nevertheless the old and widespread olive plantations with a very long tradition are of high

lichenological interest. As reference for the occurrence of species we refer mainly to the database ITALIC (NIMIS & MARTELOS 2008).

Caloplaca cerinelloides (Erichsen) Poelt

13b.

According to NIMIS & MARTELOS (2008) this species was not reported until now from Puglia. We found it once in a hedge of *Myoporum* sp. at the coast of the Adriatic Sea near Lecce. New to Puglia.

Collema italicum de Lesd.

16: conf. S. Ravera (R).

This epiphytic species is very rare in Italy, known only from one (lost) locality in Liguria and two localities in Lazio (RAVERA & GIORDANI 2007). In GBIF some additional records are listed from Portugal, France, Montenegro, Croatia, and Slovenia; it is also known from Spain, including the Canary Islands (MARCOS LASO 1985, PÉREZ-ORTEGA & ÁLVAREZ-LAFUENTE 2006, etc.) and East Africa (SWINSCOW & KROG 1988). We found it once in an old olive plantation S of Lecce. New to Puglia and southern Italy.

Collema occultatum Bagl.

24c: (hb ivl 5531).

This easily overlooked lichen is known from several Italian regions with gaps in the north and in the south (NIMIS & MARTELOS 2008). We found it once in the Parco Nazionale del Pollino (Basilicata) in a valley on *Tilia platyphyllos*. New to the Basilicata.

Lobaria amplissima (Scop.) Forssell

30: (hb ivl 5538).

This oceanic species, member of the Lobarion community, is widely spread over Italy but everywhere extremely rare (NIMIS & MARTELOS 2008). We found it once in the Parco Nazionale del Pollino. POTENZA (2006) mentions the species for the Appennino Lucano, indicated as "new to Basilicata". PUNTILLO et al. (2009) give another recent record from the Basilicata.

Lobaria pulmonaria (L.) Hoffm.

2; 4; 24: (hb ivl 5534); 27; 28; 30; 31; 36; 40; 42.

According to NIMIS (1993) and NIMIS & MARTELOS (2008) *Lobaria pulmonaria* is spread all over Italy except of some coastal plains and the great plain of the Po in northern Italy, but everywhere it ranges from extremely rare to rare. The eye-catching species is used as a flagship in conservation strategies for ancient forests (NASCIMBENE et al. 2009). We found some big populations of the species in the mountainous forests of the promontory of Gargano in Puglia and in the mountains of the Parco Nazionale del Pollino and the Parco Nazionale dell'Appennino Lucano in Basilicata.

Melanohalea exasperatula (Nyl.) O.Blanco et al.

3; 7; 28.

According to NIMIS & MARTELOS (2008) this species, of a cool-temperate to boreal-montane distribution, was not reported until now from Puglia. We found it in two localities on the promontory of Gargano (Puglia) and once in the Parco Nazionale del Pollino (Basilicata).

Pannaria conoplea (Ach.) Bory

30: (hb ivl 5539).

This member of the Lobarion community is spread over Italy, but indicated as "extremely rare" in all regions (NIMIS & MARTELOS 2008). POTENZA (2006) mentioned it for the Appennino Lucano as a recovery after the last record of Jatta at the end of the 19th century. We found it once in an oak forest in the Parco Nazionale del Pollino.

Parmotrema hypoleucinum (J.Steiner) Hale

14: (hb ivl 5520); 16: (hb ivl 5525).

According to NIMIS & MARTELOS (2008) this “mediterranean-atlantic lichen is found in undisturbed Mediterranean maquis along the coast, exclusively Tyrrhenian in Italy” and is known from Toscana, Lazio, Sardegna, Basilicata, Calabria, and Sicilia. POTENZA (2006) and POTENZA et al. (2010) reported it from the Ionian coast of the Basilicata. We found it twice in big populations in plantations of olive trees in the southeastern part of Puglia; new to this region.

Protopannaria pezizoides (Weber) M.Jörg. & S.Ekman

24b: (hb ivl 5533).

This arctic-alpine to boreal-montane lichen is extremely rare in the mountains of southern Italy (NIMIS & MARTELOS 2008). We found it at the base of *Quercus pubescens* in a valley in the Parco Nazionale del Pollino.

Ramalina pusilla Duby

14: (hb ivl 5522).

This very characteristic species with an almost orbicular growth and apothecia deeply sunk in the ends of the inflated branches was known until now only from the Tyrrhenian coasts of Italy in Toscana, Lazio, Sardegna and Sicilia (NIMIS 1993, NIMIS & MARTELOS 2008). We found it once on the twigs of *Pinus halepensis* in the southeastern part of Puglia; new to this region.

Strangospora moriformis (Ach.) Stein

12: (hb ivl 5513).

This species seems to be extremely rare in Italy. In southern Italy it was known until now only from Calabria (PUNTILLO 1996) and from Sicilia (FALCO SCAMPATELLI 2005). We found it once on the bark of *Pinus halepensis* near Castel del Monte in Puglia; new to this region.

Hepaticolous fungi

We mention here two fungi on liverworts that were found by chance in the collected specimens under the dissecting microscope.

Bryocentria brongniartii (P.Crouan & H.Crouan) Döbbeler

24b: on *Frullania dilatata* (hb ivl 5479).

According to DÖBBELER (2006) this species is “widely distributed in Europe”. In Italy it was known from Toscana (DÖBBELER, loc. cit.).

Octospora ornithocephala Döbbeler

31: on *Radula complanata*, leaves (hb ivl 5499).

This species, parasitic on the hepatic *Radula complanata*, was known until now from Finland (DÖBBELER 1980), France (ASCOFRANCE) and Germany (DÖBBELER 1984, BRACKEL, in prep.).

Localities with lists of lichens checked for lichenicolous fungi.

Puglia (provinces: BT=Barletta-Andria-Trani, FG=Foggia, LE=Lecce, TA=Taranto):

- 1) FG, Promontorio del Gargano, Foresta Umbra, SSE Vico del Gargano, forest of *Quercus cerris* (a), *Q. ilex*, *Acer pseudoplatanus* (b), *Fagus sylvatica* (c), 590 m, 41°51'39"N/15°59'51"E, 4.8.2010. – a: *Candelariella reflexa*, *C. xanthostigma*, *Catillaria nigroclavata*, *Evernia prunastri*, *Hypogymnia tubulosa*, *Lecanora chlarotera*, *Lecidella elaeochroma*, *Melanelixia subaurifera*, *Melanohalea elegantula*, *M. exasperata*, *Parmelia sulcata*, *Parmelina carporrhizans* (hb ivl 5508), *Physcia stellaris*, *P. tenella*, *Physconia servitii*, *Ramalina calcicaris*, *R. farinacea*, *R. fastigiata*, *R. fraxinea*, *Xanthoria parietina*; b: *Caloplaca holocarpa*, *Lecanora carpinea*, *Physcia adscendens*, *P. stellaris*, *P. tenella*, *Ramalina farinacea*, *R. fastigiata*, *Xanthoria parietina*; c: *Phaeophyscia orbicularis*, *Phlyctis argena*, *Physcia tenella*.
- 2) ibid., beech forest, on *Fagus sylvatica*, 765 m, 41°48'32"N/15°58'58"E, 4.8.2010. – *Lobaria pulmonaria*, *Pertusaria albescens*.

- 3) *ibid.*, mixed beech forest, on *Fagus sylvatica* (a) and on twigs of *Acer pseudoplatanus* (b), 800 m, 41°49'02"N/15°59'23"E, 4.8.2010. – a: *Melanohalea exasperatula*, *Melanelixia subaurifera*, *Parmelia saxatilis* s. l., *P. sulcata*, *Pertusaria albescens* var. *corallina*, *P. leucostoma*; b: *Evernia prunastri*, *Lecania cyrtella*, *Lecanora carpinea*, *L. chlarotera*, *Lecidella elaeochroma*, *Melanohalea exasperata*, *Parmelia sulcata*, *Parmelina pastillifera*, *Pertusaria leucostoma*, *Physcia leptalea* (hb ivl 5509), *P. stellaris*, *P. tenella*, *Physconia venusta*, *Ramalina calcicaris*, *R. farinacea*, *R. fastigiata*, *Xanthoria parietina*, *X. polycarpa*.
- 4) *ibid.*, mixed beech forest, on *Acer pseudoplatanus*, 820 m, 41°49'19"N/15°59'54"E, 4.8.2010. – *Lecanora chlarotera*, *Lobaria pulmonaria*, *Pertusaria albescens*, *Phlyctis argena*, *Physcia adscendens*, *P. tenella*, *Ramalina farinacea*, *R. fastigiata*.
- 5) *ibid.*, beech forest, on *Ilex aquifolium*, 775 m, 41°49'38"N/16°00'29"E, 4.8.2010. – (no lichens, but *Denisiella babingtonii* and *Atichia glomerulosa*, hb ivl A002).
- 6) *ibid.*, old *Quercus cerris* near the road in the forest, 355 m, 41°51'17"/16°02'41"E, 4.8.2010. – *Pertusaria coccodes*.
- 7) FG, Promontorio del Gargano, SS 89 between Vieste and Mattinata, solitary *Quercus cerris* in the macchia, 550 m, 41°45'33"/16°04'56"E, 5.8.2010. – *Hyperphyscia adglutinata*, *Lecanora chlarotera*, *Lecidella elaeochroma*, *Melanelixia glabra*, *Melanohalea exasperata*, *M. exasperatula*, *Parmelina tiliacea*, *Pertusaria albescens*, *Physcia adscendens*, *P. aipolia*, *P. stellaris*, *P. tenella*, *Physconia venusta*, *Rinodina sophodes* (hb ivl 5435 sub *Lichenodiplis rinodinicola* var. *garganica*), *Xanthoria parietina*.
- 8) *ibid.*, forest in a small ravine, on *Acer pseudoplatanus* (a), *Carpinus betulus* (b), limestone rock (c), 590 m, 41°46'07"/16°04'44"E, 5.8.2010. – a: *Bacidia rubella*, *Opegrapha varia*, *Phaeophyscia orbicularis*, *Physcia tenella*, *Physconia venusta*; b: *Lecanora chlarotera*, *Lecidella elaeochroma*, *Melanelixia subaurifera*, *Parmelia sulcata*, *Pertusaria leucostoma*, *Physconia venusta*; c: *Collema auriforme*.
- 9) *ibid.*, old oak on the roadside, 575 m, 41°45'42"/15°52'16"E. – *Evernia prunastri*, *Parmelia sulcata*, *Parmelina tiliacea*, *Ramalina farinacea*, *R. fastigiata*, *R. fraxinea*.
- 10) FG, Promontorio del Gargano, SS 272 between Monte Sant'Angelo and San Giovanni Rotondo, oaks on the roadside, 655 m, 41°42'46"/15°52'16"E, 6.8.2010. – *Candelariella reflexa*, *Hyperphyscia adglutinata*, *Lecanora carpinea*, *L. chlarotera*, *Lecidella elaeochroma*, *Melanelixia subaurifera*, *Parmelina carporrhizans*, *Phaeophyscia orbicularis*, *Physcia adscendens*, *P. biziana* var. *biziana*, *P. leptalea*, *P. stellaris*, *P. tenella*, *Rinodina sophodes*, *Xanthoria parietina*.
- 11) FG, Promontorio del Gargano, SP 57 near Masseria Valente, garden with olive and almond trees, limestone outcrops, 205 m, 41°39'48"/15°53'24"E, 6.8.2010. – *Bagliettoa parmigera*, *Caloplaca aurantia*, *Verrucaria nigrescens*.
- 12) BT, Castel del Monte S Andria, outcrops (a), walls with clefts (b) and trees of *Pinus halepensis* (c) near the castle, 530 m, 41°05'04"/16°16'15"E, 6.8.2010. – a: *Aspicilia calcarea*, *Bagliettoa parmigera*, *Caloplaca aurantia*, *C. flavescens*; b: *Squamarina cartilaginea*, *Toninia opuntioides*; c: *Evernia prunastri*, *Lecidella elaeochroma*, *Physcia adscendens*, *Strangospora moriformis* (hb ivl 5513), *Xanthoria parietina*.
- 13) LE, coast between Casalabate and Torre Rinalda, on *Olea europaea* (a) in a hedge of *Myoporum* sp. (b), 7 m, 40°29'03"/18°08'54"E, 7.8.2010. – a: *Lecanora pulicaris*, *Lecidella elaeochroma*, *Physcia tenella*, *Xanthoria parietina*; b: *Caloplaca cerina*, *C. cerinelloides*, *Lecania cyrtella*, *P. biziana* var. *biziana*, *Xanthoria parietina*.
- 14) LE, Masseria Ferranterusso between Martano and Otranto, garden of olive trees (a) and forest of *Pinus halepensis* (b), 60 m, 40°10'25"/18°23'45"E, 9.8.2010. – a: *Diploicia canescens*, *Lecanora horiza*, *Opegrapha celtidicola* (hb ivl 5516 sub *Schismatomma decolorans*), *Ramalina* sp., *Schismatomma decolorans* (hb ivl 5516), *Tephromela atra* var. *torulosa* (hb ivl 5517), *Xanthoria parietina*; b: *Diploicia canescens*, *Lecanora horiza*, *Lecidella elaeochroma*, *Parmotrema hypoleucinum* (hb ivl 5520), *Pertusaria pertusa*, *Physcia adscendens*, *Ramalina farinacea*, *R. fastigiata*, *R. pusilla* (hb ivl 5522), *Xanthoria parietina*.
- 15) LE, Otranto, walls of the castle, 20 m, 40°08'40"/18°29'34"E, 9.8.2010. – *Roccella phycopsis* (hb ivl 5521).
- 16) LE, between Máglie and Cutrofiano, garden with old olive trees, on *Olea europaea*, 120 m, 40°05'01"/18°13'50"E, 10.8.2010. – *Cladonia pyxidata*, *Collema italicum* (conf. S. Ravera; R), *Flavoparmelia caperata*, *Lecanora chlarotera*, *Lecidella elaeochroma*, *Parmotrema hypoleucinum* (hb ivl 5525), *Parmotrema reticulatum* (hb ivl 5523), *Pertusaria albescens*, *P. pertusa*, *Phlyctis argena*, *Xanthoria parietina*.
- 17) TA, Lido Azzurro, dunes with *Pinus halepensis*, *Salix* spp. (a), and bare soil (b), 10 m, 40°31'23"/17°06'17"E, 10.8.2010. – a: *Xanthoria parietina*; b: *Cladonia convoluta* (hb ivl 5526), *Cladonia furcata* ssp. *furcata*.
- 18) TA, Gravina di Leucaspide near Statte, young fruit trees on a meadow, 150 m, 40°34'43"/17°12'06"E, 11.8.2010. – *Lecidella elaeochroma*, *Physcia adscendens*, *P. tenella*, *Xanthoria parietina*.
- 19) TA, Gravina di Laterza, *Quercus cerris* shrubbery, on *Quercus cerris* and *Qu. ilex* (a), and on soil (b), 325 m, 40°36'58"/16°48'37"E, 11.8.2010. – a: *Caloplaca cerinella*, *Catillaria nigroclavata*, *Flavoparmelia soredians*

(hb ivl 5527), *Hyperphyscia adglutinata*, *Lecanora chlarotera*, *Lecidella elaeochroma*, *Melanelixia subaurifera*, *Parmelia sulcata*, *Physcia adscendens*, *P. leptalea*, *Ramalina farinacea*, *R. fastigiata*, *Rinodina exigua*, *Tephromela atra* var. *torulosa*, *Xanthoria parietina*; b: *Cladonia convoluta*, *Cladonia subrangiformis*.

Basilicata (provinces: MT=Matera, PZ=Potenza):

- 20) MT, ravine of the Torrenta Gravina di Matera near Parco dei Mónaci, macchia with *Robinia pseudacacia* (a), *Pistacia lentiscus* (b) and limestone rocks (c), 130 m, 40°36'41"/16°38'50"E, 13.8.2010. – a: *Caloplaca cerina*, *Lecidella elaeochroma*, *Xanthoria parietina*; b: *Amandinea punctata*, *Caloplaca cerina*, *Diplotomma alboatrum* (hb ivl 5529), *Lecanora horiza*, *L. sambuci*, *Lecidella elaeochroma*, *Rinodina exigua*, *Xanthoria parietina*; c: *Aspicilia calcarea*, *A. farinosa*, *Caloplaca aurantia*, *C. flavescens*, *Catapyrenium* sp., *Diplotomma venustum*, *Fulgensia fulgida* (hb ivl 5530), *Lecanora dispersa*, *Lobothallia radiosa*, *Verrucaria muralis*, *V. nigrescens*.
- 21) MT, northern shore of the Lago di San Giuliano, on *Ostrya carpinifolia*, 120 m, 40°37'25"/16°30'00"E, 13.8.2010. – *Lecidella elaeochroma*, *Physcia tenella*, *Xanthoria parietina*,
- 22) MT, valley of the Sarmento near Tenuta Rosando, river bed with *Populus* sp. (a) and open soil (b), 170 m, 40°09'18"/16°25'14"E, 14.8.2010. – a: *Lecanora chlarotera*, *Lecidella elaeochroma*, *Physcia adscendens*, *P. biziana* var. *biziana* (hb ivl 5505), *P. stellaris*, *P. tenella*, *Xanthoria parietina*; b: *Fulgensia fulgens* (hb IVL 5503), *F. subbracteata* (hb IVL 5504), *Placidium squamulosum*, *Psora decipiens*, *Squamarina lentigera* (hb IVL 5502), *Toninia opuntioides*.
- 23) PZ, Parco Nazionale del Pollino, 2 km SW Terranova, valley of the Sarmento, forest of *Quercus pubescens* (a), *Acer monspessulanum* (b), and *Fraxinus excelsior* (c), 850 m, 39°58'01"/16°17'02"E, 14.8.2010. – a: *Anapychia ciliaris*, *Collema nigrescens*, *Evernia prunastri*, *Lecidella elaeochroma*, *Melanelixia glabra* (hb ivl 5507), *Parmelia tiliacea*, *Physcia stellaris*, *P. tenella*, *Physconia perisidiosa*, *P. servitii* (hb ivl 5506), *P. venusta*, *Pleurosticta acetabulum*, *Ramalina calcicaris*, *R. farinacea*, *R. fastigiata*, *R. fraxinea*; b: *Lecidella elaeochroma*, *Melanelixia glabra*, *Parmelia tiliacea*, *Physconia venusta*, *Pleurosticta acetabulum*; c: *Lecidella elaeochroma*, *Melanohalea exasperata*, *Physcia aipolia*, *P. tenella*, *Xanthoria parietina*.
- 24) *ibid.*, forest of *Quercus cerris* (a), *Qu. pubescens* (b), and *Tilia platyphyllos* (c), 900 m, 39°58'03"/16°16'41"E, 14.8.2010. – a: *Anapychia ciliaris*, *Lecanora carpinea*, *L. chlarotera*, *Lecidella elaeochroma*, *Lobaria pulmonaria* (hb ivl 5534), *Melanohalea elegantula*, *Melanelixia glabra*, *Parmelia tiliacea*, *Physcia leptalea*, *Physconia servitii*, *Pleurosticta acetabulum*; b: *Cladonia coniocraea*, *Lepraria incana* agg., *Nephroma laevigatum* (hb ivl 5532), *Physconia venusta*, *Protopannaria pezizoides* (hb ivl 5533); c: *Collema nigrescens*, *C. occultatum* (hb ivl 5531), *Lecanora carpinea*, *L. chlarotera*, *Lecidella elaeochroma*, *Parmelia tiliacea*, *Phaeophyscia orbicularis*, *Physcia aipolia*, *P. leptalea*, *Physconia distorta*, *P. servitii*, *P. venusta*.
- 25) PZ, Parco Nazionale del Pollino, SW San Costantino Albanese, Piano Martorino, solitary old *Quercus frainetto*, 880 m, 40°02'21"/16°16'40"E, 14.8.2010. – *Anapychia ciliaris*, *Caloplaca cerina*, *Caloplaca cerina*, *Candelariella aurella*, *C. reflexa*, *Collema nigrescens*, *Lecanora carpinea*, *L. chlarotera*, *Melanelixia glabra* (hb ivl 5535), *Melanohalea exasperata*, *Parmelia carporrhizans*, *P. tiliacea*, *Pertusaria* sp., *Phaeophyscia orbicularis*, *Physcia aipolia*, *P. tenella*, *Physconia distorta*, *P. grisea*, *P. venusta*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *Rinodina exigua*, *Xanthoria parietina*.
- 26) PZ, Parco Nazionale del Pollino, near San Severino, forest of *Fagus sylvatica* and *Alnus glutinosa* (a) with limestone outcrops (b) in a small valley, 980 m, 40°00'46"/16°06'26"E, 15.8.2010. – a: *Lepraria incana* agg., *L. rigidula*, *Melanohalea elegantula*, *Parmelia sulcata*; b: *Collema crispum*.
- 27) PZ, Parco Nazionale del Pollino, SE Mezzana Frido, forest of *Fagus sylvatica* (a) in a small valley with outcrops (b), 1280 m, 39°57'48"/16°11'48"E, 15.8.2010. – a: *Anapychia ciliaris*, *Evernia prunastri*, *Lecanora chlarotera*, *Lobaria pulmonaria*, *Parmelia sulcata*, *Parmelia pastillifera*, *Physconia venusta*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*; b: *Peltigera praetextata*.
- 28) *ibid.*, forest of *Fagus sylvatica* (a) and *Abies alba* (b, twigs), dry, 1420 m, 39°57'55"/16°12'27"E, 15.8.2010. – a: *Bryoria fuscescens*, *Collema furfuraceum* (hb ivl 5537), *C. nigrescens*, *Evernia prunastri*, *Lecanora horiza*, *Lecidella elaeochroma*, *Lobaria pulmonaria*, *Melanelixia subaurifera*, *Nephroma resupinatum* (hb ivl 5536), *Parmelia sulcata*, *Pertusaria albescens*, *P. pertusa*, *Pseudevernia furfuracea*, *Ramalina farinacea*; b: *Caloplaca cerina*, *Fellhanera* cf. *subtilis*, *Melanohalea exasperatula*, *Physcia adscendens*, *P. tenella*.
- 29) PZ, NW shore of the Lago di Cogliandrino between Lauria and Latrónico, oak forest, on *Quercus cerris*, 715 m, 40°05'36"/15°55'18"E, 16.8.2010. – *Flavoparmelia caperata*, *Parmelia sulcata*.
- 30) PZ, between Cogliandrino and Bagni, oak forest, on *Quercus cerris*, 835 m, 40°05'07"/15°56'47"E, 16.8.2010. – *Agonimia tristicula*, *Anapychia ciliaris*, *Evernia prunastri*, *Lecidella elaeochroma*, *Lobaria amplissima* (hb ivl 5538), *L. pulmonaria*, *Normandina pulchella*, *Pannaria conoplea* (hb ivl 5539), *Parmelia sulcata*, *Pertusaria albescens*, *P. amara*, *P. flavida*, *Physconia venusta*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*.

- 31) PZ, Bosco Teduri near Bagni, old beech forest, on *Fagus sylvatica*, 1260 m, 40°06'26"/15°58'25"E, 16.8.2010. – *Lecanora horiza*, *Lobaria pulmonaria*, *Melanelixia subaurifera*, *Nephroma resupinatum* (hb ivl 5540), *Parmelia saxatilis*, *P. sulcata*, *Parmelina pastillifera*, *Pertusaria albescens*, *P. pertusa*, *Ramalina farinacea*, *R. fastigiata*.
- 32) PZ, above Bosco Teduri near Bagni, meadow, 1445 m, 40°06'21"/15°58'34"E, 16.8.2010. – *Peltigera rufescens*.
- 33) PZ, below Bosco Teduri near Bagni, old *Quercus cerris* tree, 1155 m, 40°05'42"/15°58'18"E, 16.8.2010. – *Pertusaria albescens*.
- 34) PZ, Monte Sirino, Lago Laudermino, beech forest near the lake, on *Fagus sylvatica*, 1575 m, 40°08'20"/15°50'11"E, 17.8.2010. – *Anaptychia ciliaris*, *Lecidella elaeochroma*, *Parmelia submontana* (hb ivl 5541), *P. sulcata*, *Parmelina pastillifera*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*, *R. fraxinea*.
- 35) PZ, Monte Sirino, beech forest on N-exposed slope, on *Fagus sylvatica*, 1540 m, 40°08'46"/15°49'55"E, 17.8.2010. – *Lecanora horiza*, *Lecidella elaeochroma*, *Parmelia sulcata*, *Pertusaria albescens*, *Platismatia glauca*, *Tephromela atra* var. *torulosa*.
- 36) *ibid.*, beech forest on N-exposed slope, on *Fagus sylvatica*, 1500 m, 40°08'50"/15°49'52"E, 17.8.2010. – *Lobaria pulmonaria*.
- 37) PZ, Val d'Agri, Grumentum, Parco Verde, oak forest, on *Quercus cerris* and *Qu. pubescens*, 600 m, 40°17'06"/15°54'00"E, 17.8.2010. – *Anaptychia ciliaris*, *Caloplaca ferruginea* (hb ivl 5543), *Catillaria nigroclavata*, *Evernia prunastri*, *Lecanora carpinea*, *L. chlarotera*, *Lecidella elaeochroma*, *Melanelixia glabrata*, *Parmelia sulcata*, *Parmelina tiliacea*, *Pertusaria albescens*, *P. pertusa*, *Phlyctis argena*, *Physcia adscendens*, *P. stellaris*, *P. tenella*, *Physconia venusta*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*, *R. fraxinea*, *Xanthoria parietina*.
- 38) PZ, Parco Nazionale dell'Appennino Lucano, SS 92 between Corleto Perticara and Laurenzana, oak forest, on *Quercus cerris*, 1040 m, 40°25'17"/16°01'32"E, 18.8.2010. – *Anaptychia ciliaris*, *Calicium salicinum* (hb ivl 5622, sub *Pronectria pertusariicola*), *Candelariella vitellina*, *Hypogymnia tubulosa*, *Lecanora carpinea*, *Lecidella elaeochroma*, *Melanelixia glabra*, *Melanohalea exasperata*, *Ochrolechia pallescens*, *Parmelia sulcata*, *Parmelina quercina*, *P. tiliacea*, *Peltigera horizontalis*, *Pertusaria albescens*, *P. pertusa*, *Physcia leptalea*, *P. stellaris*, *Pleurosticta acetabulum*, *Pseudevernia furfuracea*, *Ramalina farinacea*, *R. fastigiata*, *R. fraxinea*.
- 39) PZ, Parco Nazionale dell'Appennino Lucano, between Laurenzana and Monte Caldarosa, oak forest, on *Quercus cerris*, 1170 m, 40°24'54"/15°58'03"E, 18.8.2010. – *Melanohalea elegantula*, *Ochrolechia pallescens*, *Parmelia sulcata*, *Phlyctis argena*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*, *R. fraxinea*.
- 40) *ibid.*, mixed forest, on *Fagus sylvatica* (a), *Abies alba* (twigs, b), and *Quercus* spp. (c) in a small valley, 1120 m, 40°24'24"/15°57'26"E, 18.8.2010. – a: *Anaptychia ciliaris*, *Hypogymnia physodes*, *Lecidella elaeochroma*, *Parmelia sulcata*, *Pertusaria albescens*, *P. amara*, *P. pertusa*, *Phlyctis argena*, *Physcia tenella*, *Physconia venusta*, *Ramalina farinacea*; b: *Caloplaca cerina*, *Graphis scripta*, *Phlyctis argena*, *Porina aenea*, *Usnea* sp.; c: *Evernia prunastri*, *Lobaria pulmonaria*.
- 41) PZ, Parco Nazionale dell'Appennino Lucano, N Marsico Nuovo, beech forest, on *Fagus sylvatica* on S-exposed slope, 1260 m, 40°28'15"/15°44'58"E, 19.8.2010. – *Fuscidea stiriaca*, *Hypogymnia tubulosa*, *Leptogium lichenoides*, *Melanelixia subaurifera*, *Nephroma* sp., *Parmelia sulcata*, *Parmelina tiliacea*, *Peltigera praetextata*, *Pertusaria amara*, *P. pertusa*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*.
- 42) *ibid.*, beech forest on hilltop, on *Fagus sylvatica*, 1430 m, 40°28'51"/15°45'06"E, 19.8.2010. – *Lobaria pulmonaria*, *Nephroma resupinatum*, *Parmelia sulcata*, *Pertusaria pertusa*, *Platismatia glauca*.
- 43) PZ, SW Calvello, small ravine with flowing water, mixed beech forest, on *Fagus sylvatica* (a), *Carpinus betulus* (b), and on rocks (c), 1015 m, 40°27'42"/15°48'08"E, 20.8.2010. – a: *Lecanora chlarotera*, *Phlyctis argena*; b: *Pertusaria albescens*, *Porina aenea*; c: *Collema auriculatum*, *C. crispum*, *Dermatocarpon minutum*.
- 44) PZ, Castel Lagopesole, on young *Robinia pseudacacia* trees, 825 m, 40°48'26"/15°43'58"E, 20.8.2010. – *Caloplaca cerina*, *Candelaria concolor*, *Phaeophyscia orbicularis*, *Physcia biziana*, *P. leptalea*, *P. stellaris*, *Physconia grisea*, *Pleurosticta acetabulum*, *Xanthoria parietina*.
- 45) PZ, Monte Vulture, Laghi di Monticchio, slope S of the bigger lake, beech forest, on *Fagus sylvatica*, 700 m, 40°55'32"/15°36'24"E, 20.8.2010. – *Bacidia rosella*, *Lecanora chlarotera*, *Lepraria incana* agg., *Melanelixia fuliginosa*, *Parmelia sulcata*, *Pertusaria albescens*, *P. pertusa*, *Phlyctis argena*.
- 46) PZ, Monte Vulture, near the top, beech forest with firs, on *Fagus sylvatica* (a) and *Abies alba* (b), 1255 m, 40°57'08"/15°37'56"E, 22.8.2010. – a: *Parmelia sulcata*, *Parmelina tiliacea*; b: *Candelariella xanthostigma*, *Lecidella elaeochroma*, *Melanohalea elegantula*, *Parmelina tiliacea*, *Pertusaria albescens*, *Physconia venusta*, *Pleurosticta acetabulum*, *Ramalina fastigiata*.

- 47) PZ, Monte Vulture, near "Femmina morta", oak forest on S-exposed slope, on *Quercus cerris*, 1025 m, 40°57'18"/15°37'01"E, 22.8.2010. – *Buellia griseovirens*, *Candelariella xanthostigma*, *Hypogymnia tubulosa*, *Lecanora carpinea*, *L. horiza*, *Lecidella elaeochroma*, *Melanelixia glabra*, *M. subaurifera*, *Melanohalea exasperata*, *Parmelia sulcata*, *Parmelina quercina*, *P. pastillifera*, *P. tiliacea*, *Physcia adscendens*, *P. leptalea*, *P. stellaris*, *P. tenella*, *Physconia venusta*, *Pleurosticta acetabulum*, *Ramalina fraxinea*, *Rinodina exigua*, *Xanthoria parietina*, *X. polycarpa*.
- 48) *ibid.*, above, old trees of *Acer pseudoplatanus* (a) and *Ulmus glabra* (b), 1145 m, 40°57'24"/15°37'17"E, 22.8.2010. – a: *Candelariella xanthostigma*, *Evernia prunastri*, *Lecidella elaeochroma*, *Melanelixia glabra*, *M. subaurifera*, *Melanohalea elegantula*, *Parmelia sulcata*, *Parmelina carporrhizans*, *P. pastillifera*, *P. tiliacea*, *Phaeophyscia orbicularis*, *Phlyctis argena*, *Physcia adscendens*, *P. aipolia*, *P. tenella*, *Physconia distorta*, *P. enteroxantha*, *P. perisidiosa*, *P. venusta*, *Pleurosticta acetabulum*, *Ramalina fraxinea*, *Xanthoria parietina*, *X. polycarpa*; b: *Candelariella reflexa*, *Phaeophyscia orbicularis*, *Xanthoria parietina*.
- 49) *ibid.*, above, old pine tree forest, on *Pinus nigra*, 1205 m, 40°57'17"/15°37'30"E, 22.8.2010. – *Evernia prunastri*, *Hypogymnia farinacea*, *H. tubulosa*, *Platismatia glauca*, *Pleurosticta acetabulum*, *Pseudevernia furfuracea*.
- 50) PZ, Monticchio Bagni, avenue of *Aesculus hippocastanum*, 450 m, 40°56'59"/15°33'50"E, 23.8.2010. – *Flavoparmelia caperata*, *Lecanora chlorotera*, *Parmelia sulcata*, *Parmelina tiliacea*, *Phaeophyscia orbicularis*, *Physcia biziana*, *P. tenella*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *R. fastigiata*, *Xanthoria parietina*.

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