Article

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Additions to the flora of lichenicolous fungi of Southern Italy

Abstract

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A re-examination of herbarium material together with some new finds from Southern Italy (the regions Basilicata, Calabria, Campania, Puglia and Sicilia) resulted in a list of 39 lichenicolous fungi (and 8 species of lichenicolous lichens). Six of them are new to Italy [*Arthonia caerulescens* (Almq.) R.Sant., *Arthonia protoparmeliae* Etayo, *Arthonia xanthoparmeliarum* Etayo, *Tremella diploschistina* Millanes & al., *Verrucoccum coppinsii* V. Atienza & al. and *Zwackhiomyces polischukii* Darmostuk & Khodos.] and 13 new to the respective region. The species *Lichenotubeufia calabrica* Brackel, *Sphaerellothecium nimisii* Brackel & Puntillo and *Stigmidium hypogymniae* Brackel are described as new to science.

Key words: Ascomycotina, *Lichenotubeufia*, *Sphaerellothecium*, *Stigmidium*, Mediterranean.

Introduction

Although the lichenicolous fungi in Southern Italy were already subject of some publications of the authors (Brackel 2008a, 2008b, 2011, 2021; Puntillo 2000, 2011; Brackel & Puntillo 2016; Puntillo & Brackel 2017), advances in their systematics and taxonomy have made it possible to restudy unidentified herbarium specimens. The results of this revision are presented here, along with some new records.

Material and Methods

The specimens were studied with a Zeiss stereo microscope at magnifications up to ×40 and an Olympus BX 51 microscope fitted with Nomarski differential interference contrast optics at magnifications up to ×1000. Measurements were taken on thin hand-cut sections mounted in water. Statistical measurements are indicated as (minimum–) {X-SD} – {X+SD} (–maximum), followed by the number of measurements (n) when $n \geq 10$; the length/breadth ratio of ascospores and conidia is indicated as l/b and given in the same way. The following standard reagents and stainings were used for the species identification: 10% potassium hydroxide (K), Lugol's solution (I, KI with pretreatment with K),

paraphenylenediamine (P), sodium hypochlorite (C), phloxin and cotton blue. The examined specimens, with the exception of repetitive samples of common and well known species are housed in the private herbarium of Wolfgang von Brackel (hb Brackel) or in CLU. Geographical names are in Italian. The regions are abbreviated as: BAS (Basilicata), CAL (Calabria), CAM (Campania), PUG (Puglia), and SIC (Sicilia). Species new to a region are indicated with an asterisk (*) at the abbreviation of the region, species new to Italy with two asterisks (**) at the name of the species. Lichenized species and juvenile parasites are indicated with an "[L]" at the name. The authors' names are abbreviated with WB (Wolfgang von Brackel) and DP (Domenico Puntillo).

Results

Abrothallus suecicus (Kirschst.) Nordin

SIC: Prov. di Messina, Nebrodi, Bosco Magalaviti, on *Fagus sylvatica*, on *Ramalina* cf. *fastigiata*, 1200–1300 m, 2014, leg. D. Cataldo, det. WB (hb Brackel 7057, as the *Vouauxiomyces* anamorph).

Arthonia apotheciorum (A. Massal.) Almq.

***CAL**: Prov. di Cosenza, Montalto Uffugo, Bosco di Mavigliano, on stone, on *Lecanora pruinosa*, apothecia, 2.9.2017, leg. DP, det. WB (CLU).

Jatta (1909–1911) writes "In apotheciis *Lecanorae galactinae* Ach. [= *L. albescens*] parasitica totam per Italiam"; recent records are from Sicilia and Veneto.

****Arthonia caerulescens*** (Almq.) R. Sant.

BAS: Prov. di Potenza, Parco Nazionale del Pollino, Serra di Crispo, on *Lecanora varia*, apothecia, 6.7.2012, leg. DP, det. WB (CLU 16655). – **CAL**: Prov. di Cosenza, Parco Nazionale del Pollino, Serra di Crispo, on dead wood, on *Lecanora varia*, apothecia, 8.8.2011, leg. DP, det. WB (CLU 17857, hb Brackel 8015).

Ascomata black, cushion like, on the apothecia of *Lecanora varia*. Epithecium blackish with a greenish tinge, K–, hymenium hyaline, I+ blue, K–, KI+ blue, hypothecium pale brown, K+ reddish; asci c. 38 × 18 µm, (4–)8-spored; ascospores hyaline, 1-septate, 10–12.5 × 4–5 µm.

Jatta (1889: 190, 1892b: 210) reports *A. glaucomaria* on *Lecanora varia* from Campania, which may correspond to *A. caerulescens*.

****Arthonia protoparmeliae*** Etayo

SIC: Prov. Catania, SW slope of the Etna, near Mt. Albano NE Adrano, lava boulders, on *Protoparmelia badia*, 1490 m, 37°43'34,3"N, 14°54'55,3"E, 22.8.2007, WB (hb Brackel 4543, in the specimen of *Muellerella ventosicola*).

The specimen fits perfectly the protologue (Etayo 2010) except for the size of the ascomata (up to 300 µm in diameter vs. 100–250 µm) and the location of the ascomata: we could find them also on the apothecial discs of the host. Until now the species was known only from Spain and from the British Isles (Etayo 2010, Hitch 2015).

Arthonia parietinaria Hafellner & A. Fleischhacker

CAL: Prov. di Cosenza, Luzzi, Gidora, on *Tamarix*, on *Xanthoria parietina*, 10.01.2015, leg. DP, det. WB (CLU).

The species was already reported for several regions of Italy, also from the south, up to 2016 as *Arthonia molendoi*; Fleischhacker & al. (2016) showed that the specimens on *Xanthoria parietina* belong to the then newly described species *A. parietinaria* instead of *A. molendoi*.

*****Arthonia xanthoparmeliarum*** Etayo

SIC: Prov. di Palermo, Bosco della Ficuzza, big rock of sandstone, in sunny situation, on *Xanthoparmelia verruculifera*, 790 m, 37°53’11,1’’N, 13°23’45,8’’E, 14.8.2007, WB (hb Brackel 8525).

Buelliella minimula (Tuck.) Fink ex Hafellner

***SIC**: Prov. di Messina, Nebrodi, between Caronia and Capizzi, SP 168 at km 19/VI, oak forest, on *Quercus cerris*, on *Pertusaria flavida*, 1150 m, 37°57’17,7’’N, 14°30’28,6’’E, 15.8.2007, WB (hb Brackel 8906).

In our specimen we found only one apothecium. A widespread but perhaps overlooked species, causing no visible damages on the host lichen.

[L]*Catillaria mediterranea* Hafellner

SIC: Prov. di Messina, Nebrodi, Bosco Magalaviti, on *Fagus sylvatica*, on *Anaptychia ciliaris*, 1200–1300 m, 2014, leg. D. Cataldo, det. WB (hb Brackel 7055).

[L]*Catillaria lenticularis* (Ach.) Th. Fr.

SIC: Prov. di Messina, Monti Peloritani, S Novara di Sicilia, top of the Rocca di Novara, on limestone rocks, on *Verrucaria nigrescens*, 1380 m, 37°59’42,3’’N, 15°08’47,5’’E, 8.8.2007, WB (hb Brackel 8911). Prov. di Palermo, Bosco della Ficuzza, near the road from Ficuzza to Santa Barbara, on limestone rocks, on *Verrucaria nigrescens* and *V. subfuscella*, 740 m, 37°52’52,5’’N, 13°23’28,8’’E, 14.8.2007, WB (hb Brackel 8912).

Thallus reduced to small squamules, dirty grey, not easy to distinguish from the host thallus. **Apothecia** sessile, black, lecideine, c. 300–450 µm diameter; excipulum of radiating hyphae, dark brown outside (K+ shades of violet), pale within; epithecium brown, hypothecium pale brown, hymenium subhyaline. **Paraphyses** simple to scarcely branched, apically swollen with a dark cap, 1–1.5 µm wide, apically up to 4 µm wide. **Asci** clavate,

8-spored, c. 30–50 × 6–10 µm, with an I+ blue coat and a uniformly blue apical dome. **Ascospores** 1-septate, hyaline, ellipsoid, 8–10 × 3–4 µm.

Most of the members of the genus *Catillaria* are lichenised; some of them are obligately lichenicolous, others autonomous lichens. Among these, *C. nigroclavata* and *C. chalybeia* are known to be facultatively lichenicolous and with this habit they usually show a reduced thallus. This is the first record of a lichenicolous habit of *C. lenticularis*, usually living autonomous on base-rich rocks.

[L]***Catillaria nigroclavata*** (Nyl.) Schuler

CAL: Prov. di Cosenza, Sila, near Varco San Mauro, oak grove, on *Quercus* spp., on *Lobaria pulmonaria*, 1085 m, 39°24’29,0’’N, 16°19’54,6’’E, 29.04.2014, leg. DP & WB, det. WB (hb Brackel 7247); Parco Nazionale del Pollino, Monte Séllaro, oak grove, on *Fraxinus ornus*, on *Melanelixia glabra*, 1010 m, 39°50’44,2’’N, 16°21’44,3’’E, 30.04.2014, leg. DP & WB, det. WB (hb Brackel 7266, CLU 17331); Montalto Uffugo, Bosco di Mavigliano, on *Quercus pubescens*, on *Parmelina quercina*, thallus, 200 m, 25.12.2014, leg. & det. DP, conf. WB, hyperinfected with *Intralichen* sp. (CLU 17312); ibidem, on *Punctelia subrudecta*, thallus, 18.1.2015, leg. DP, det. WB (CLU 17348); ibidem, on *Pyrus* sp., on *Physcia biziana*, 10.2.2016, leg. DP, det. WB (CLU 18175). – Prov. di Catanzaro, Magisano Vallone, Viperano, on *Acer*, on *L. pulmonaria*, thallus, 1300 m, 21.11.2014, leg. DP, det. WB (CLU).

A widespread and common independent lichen, occasionally with a lichenicolous lifestyle and then with a reduced own thallus. *Catillaria lobariicola* (Alstrup) Coppins & Aptroot, an obligately lichenicolous fungus on *Lobaria* spp. and *Pseudocyphellaria anomala*, is distinguished by bigger ascospores [(9.5–)11.5–13(–14) × 4–5 µm vs. 8–10 × (2–2.5(–4) µm]. *Catillaria mediterranea*, also obligately lichenicolous on different host genera, is distinguished by 12–16-spored asci.

Endococcus exerrans Nyl.

***CAL**: Prov. di Cosenza, Madonna delle Armi, siliceous rock, on *Rhizocarpon distinctum*, 30.04.2014, DP & WB (CLU 18184).

Endococcus exerrans is the only species of the genus that grows on yellow as well as on grey-brown species of *Rhizocarpon*. It is very similar to *E. fusiger* (growing exclusively on grey-brown *Rhizocarpon* species) but has narrower ascospores (13–18 × 4–5 µm vs. 12.5–20 × 5.5–7 µm) and the perithecia are more immersed.

The species was known in Italy until now only from Trentino-Alto Adige (Arnold 1879 as *E. complanatae* “var. *videtur*” on *Rhizocarpon distinctum*) and from Sicilia (Brackel 2008).

Endococcus macrosporus (Arnold) Nyl.

***BAS**: Prov. di Potenza, Marsicovetere, Monte Volturino, on siliceous rocks, on *Rhizocarpon geographicum*, 1660 m, 40°24’18.0’’N, 15°48’48.1’’E, 7.8.2012, leg. DP, det WB (CLU 16539a).

Endococcus macrosporus was reported from Calabria (Brackel & Puntillo 2016) and Sicilia (Brackel 2008), but the specimens proved to belong to the newly described *E. sardous*, like several other Italian specimens (Brackel & Berger 2019).

Microscopically, the two species are very similar to each other, but the ascospores of *E. macrosporus* are darkened at both ends, whereas in *E. sardous* they are uniformly brown and in *E. macrosporus* the mean length/breadth ratio (l/b) is less than in *E. sardous*. Macroscopically, *E. macrosporus* causes the formation of swellings or galls on the host thallus and the perithecia are agglomerated and remain almost completely immersed in the thallus, whereas *E. sardous* does not cause any swellings and the perithecia are more or less solitary and erumpent.

In our specimen both species grew side by side, allowing a direct comparison. We measured ascospores of *E. macrosporus* with (12.0–)13.8–16.9(–18.0) × (6.0–)6.6–7.4(–7.5) µm, l/b = (1.6–)1.9–2.5(–2.6) (n = 20) and *E. sardous* with (15.0–)15.8–17.9(–18.9) × (5.0–)5.2–6.1(–6.5)µm, l/b = (2.5–)2.7–3.4(–3.6) (n = 20).

Endococcus sardous Brackel

***BAS**: Prov. di Potenza, Marsicovetere, Monte Volturino, on siliceous rocks, on *Rhizocarpon geographicum*, 1660 m, 40°24'18.0''N, 15°48'48.1''E, 7.8.2012, leg. DP, det WB (CLU 16539b, 16561).

For notes see above under *E. macrosporus*.

Erythricium aurantiacum (Lasch) D. Hawksw. & A. Henrici

SIC: Prov. di Catania, Monte Minardo, slope of the Etna above Adrano, on *Quercus*, on *Physcia leptalea*, 2013, leg. D. Cataldo, det. WB.

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

SIC: Prov. di Messina, Nebrodi, Bosco Mangalaviti, on *Fagus sylvatica*, on *Physcia leptalea*, 2014, leg. D. Cataldo, det. WB (hb Brackel 7056).

Intralichen baccisporus D. Hawksw. & M. S. Cole s. lat.

SIC: Prov. di Ragusa, Acate, on twigs of *Juniperus turbinata*, on *Catillaria nigroclavata*, 2013, leg. D. Cataldo, det. WB (hb Brackel 6704, in the specimen of *Trimmatostroma* sp. on *Arthonia punctiformis*).

Intralichen species are very poor in features and almost nothing is known about their host specifity. *Intralichen baccisporus* was described on *Caloplaca trachyphylla*, so the name in its strict sense should be used only for specimens on hosts of the genus *Caloplaca* s. lat. Nevertheless, records of morphologically not distinguishable specimens may be helpful for further (and necessary) studies in the genus.

[L]***Lambiella insularis*** (Nyl.) T. Sprib.

Syn.: *Rimularia insularis* (Nyl.) Rambold & Hertel

BAS: Prov. di Potenza, Terranova di Pollino, Timpa di Pietrasasso, on siliceous rock, on *Lecanora rupicola*, 16.6.2010, leg. DP & M. Puntillo, det. WB (CLU 18186). – **CAL**: Prov. di Cosenza, Parco Nazionale del Pollino, Monte Séllaro, siliceous rock outcrops, on *Lecanora rupicola*, 1010 m, 39°50'51,2''N, 16°21'28,4''E, 30.04.2014, leg. DP & WB, det. WB (hb Brackel 7293).

A lichenicolous lichen, overtaking the thallus of *Lecanora rupicola*. The species was known already from both regions (Puntillo 1996, Puntillo & al. 2012).

Lichenoconium lecanorae (Jaap) D. Hawksworth

BAS: Prov. di Potenza, Parco Nazionale del Pollino, Serra di Crispo, dead wood of *Pinus leucodermis*, on *Lecanora varia*, apothecia, 2.9.2017, leg. DP, det. WB (CLU 17854).

In Italy known from Abruzzo, Basilicata, Lazio, Molise, Puglia, Sardegna, Sicilia, Toscana, Trentino-Alto Adige and also from Calabria (Puntillo 2011, Brackel & Puntillo 2016).

Lichenoconium usneae (Anzi) D. Hawksw.

CAL: Prov. di Cosenza, Sila Grande, Baracchelle, on a paling fence, 1334 m, 12.6.2017, leg. & det. DP, conf. WB (CLU 18181).

In Italy known from most of the regions, also from Calabria (Brackel & Puntillo 2016).

Lichenostigma chlaroterae (F. Berger & Brackel) Ertz & Diederich

CAL: Prov. di Cosenza, Parco Nazionale del Pollino, Serra del Prete, on dead wood, on *Lecanora varia*, thallus and apothecia, 8.8.2011, leg. DP, det. WB (CLU, hb Brackel 8015)

In Italy known from Abruzzo, Lazio and also from Calabria (Brackel & Puntillo 2016).

Lichenostigma epirupestre Pérez-Ortega & Calat.

***BAS**: Prov. di Potenza, Dolomiti Lucane, Pietrapertosa, on silicious rocks, on *Pertusaria pertusa* var. *rupestris*, 23.02.2020, leg. DP, det WB (CLU 18080, in the specimen of *Rhizocarpon epispilum*; 18078, in the specimen of *Rhymbocarpus geographici*).

Lichenostigma rupicolae Fdez.-Brime & Nav.-Ros.

***BAS**: Prov. di Potenza, Calvello, Cerro Falcone, siliceous rock, on *Pertusaria* (*Lepra*) *leucosora*, 1150 m, 40°26'20.4''N, 15°49'17.0''E, 07.08.2012, leg DP, det. WB (CLU 16676a, hb Brackel 8921).

As in the specimens on *Pertusaria leucosora* from Sardegna (Brackel & Berger 2019) we found only 1-septate ascospores [vs. 1–2(–3)-septate in the protologue, Fernández-Brime & al. 2010]. Possibly the specimens on *P. leucosora* represent a separate taxon.

Lichenotubeufia calabrica Brackel species nova (Figs 1, 2)

Mycobank number MB 846534

Fungus lichenicola in thallo lichenum *Parmelina* sp. crescens. Ascomata superficialia, solitaria, globosa, isabellina, ca. 250 µm in diametro; setae abundantes, hyalinae, 50–75 × 2–6 µm, parietibus crassibus; asci clavati vel saccati, bitunicati, 6-spori, ca. 40 × 20 µm; ascosporae ellipsoidae vel vermiformae, (1–)3–7(–17)-septatae, (10,5–)17,2–31,8(–45,0) × (5,0–)5,9–7,4(–9,0) µm.

Typus: Italy, Calabria, Prov. di Cosenza, Luzzi, Contrada Gidora, on *Ailanthus*, on *Parmelina* sp., 180 m, 4.2.2015, D. Puntillo (CLU 17318).

Ascomata perithecioid, sessile, globose, shiny whitish due to a dense overall cover of hyaline hairs, below the hairs cream, 150–250 µm diameter; peridial hairs hyaline, smooth, straight, curved or falcate, thick-walled, lumen mostly ending far below the apex, non-septate or with one indistinct septum, gradually tapering to the rounded or attenuated apex, 50–75 × 2–6 µm; wall paraplectenchymatic, hyaline, of tangentially elongated cells 3–8 × 1.5–2.5 µm. **Hymenium** insperse, KI–. **Hamathecium** of abundant, persistent, hyaline, septate, scarcely branched and anastomosing filaments, 1–2 µm wide. **Asci** clavate to saccate, c. 40 × 20 µm, 6-spored, KI– except for the dextrinoid plasma. **Ascospores** hyaline, smooth, straight or curved, the longer ones also sigmoid, (1–)3–7(–17)-transseptate, (10.5–)17.2–31.8(–45.0) × (5.0–)5.9–7.4(–9.0) µm, l/b = (1.8–)2.5–5.1(–7.5) (n = 30). **Conidiomata** not observed.

Host and distribution: *Lichenotubeufia calabrica* grows on the thallus (upper and lower side) of a sterile *Parmelina* sp. It is known until now only from the type location in southern Italy.

Observations: The genus *Lichenotubeufia* was segregated from *Tubeufia* by Etayo (2017) for species with a lichenicolous habit and ascomata covered with (sub)hyaline thick-walled hairs. Until now eight species of the genus have been described, almost all of them restricted to the southern hemisphere or the tropics. Only *L. heterodermiae*, described from Spain, is known from several European countries as well as from both Americas.

The new species fits well the concept of *Lichenotubeufia* with its subhyaline perithecia covered with hyaline, thick-walled hairs, abundant septate, branched and anastomosing interascal elements and transversely multiseptate ascospores.

It differs from most of the other species of the genus [*Lichenotubeufia boomiana* Etayo, *L. cryptica* Etayo & Flakus, *L. eriodermae* (Etayo) Etayo, *L. etayoi* Zhurb., *L. heterodermiae* (Etayo) Etayo and *L. tibellii* Zhurb.] in the shorter ascospores (less than 50 µm vs. much more than 50 µm). *Lichenotubeufia tafallae* Etayo differs in the peridial hairs arranged in long fascicles around the ostiole.

Most similar to the new species is *L. pannariae* (Etayo) Etayo regarding colouration and dimensions of ascomata, asci and ascospores; nevertheless, it is well delimited by the shape of the ascospores which are narrowly fusiform with one end strongly attenuated.

Etymology: The new species is named after the Italian region Calabria, where the type was found.

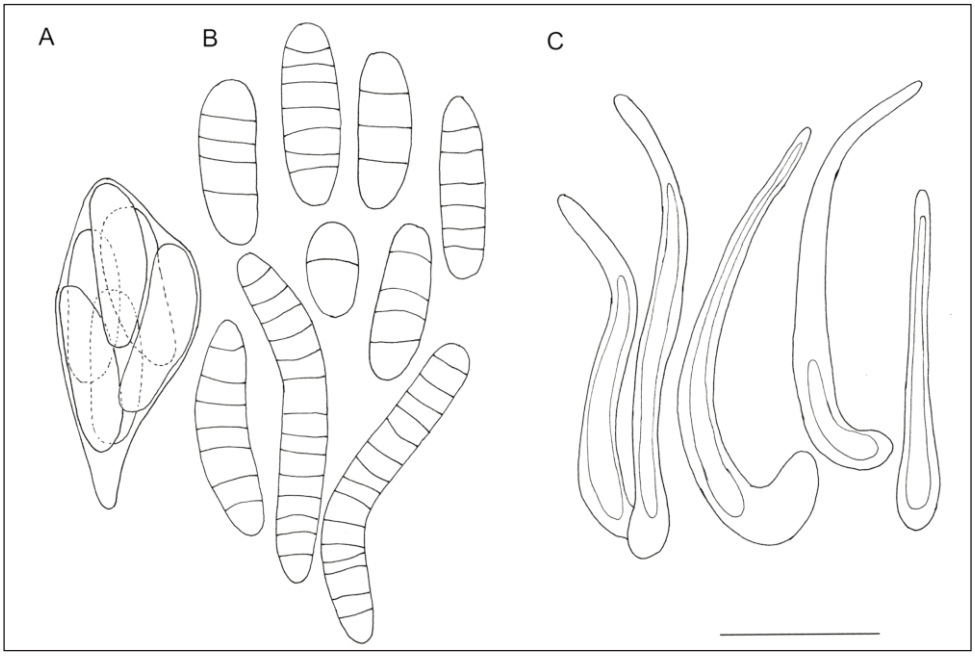

Fig. 1. *Lichenotubeufia calabrica*: A: Ascus with ascospores (septation not shown). B: Ascospores, released from the asci. C: Peridial hairs. Bar = 20 µm.

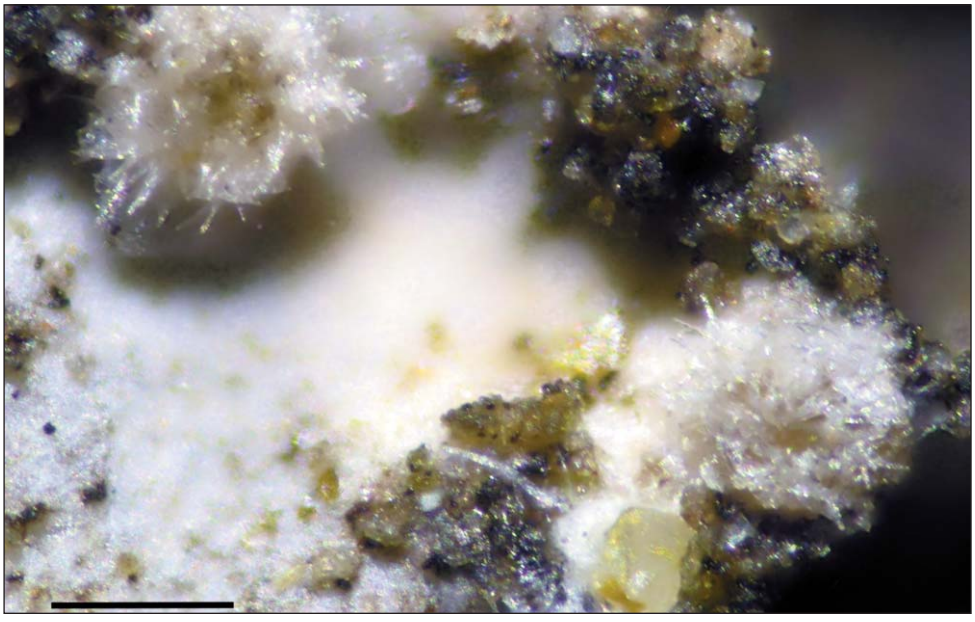

Fig. 2. *Lichenotubeufia calabrica*: habitus (two ascomata) on *Parmelina* sp. Bar = 100 µm.

[L]***Monerolechia badia*** (Fr.) Kalb

CAL: Prov. di Reggio Calabria, Parco Nazionale dell'Aspromonte, San Luca, Pietra Cappa, on diorite rocks in the macchia, on *Xanthoparmelia conspersa*, 715 m, 38°10'56,7''N, 16°01'38,6''E, 06.05.2015, WB & DP (hb Brackel 7623). – Prov. di Cosenza, Luzzi Gidora, siliceous rocks, on *X. conspersa*, 160 m, 39°26'12,0''N, 16°15'54,6''E, 10.1.2014, DP (CLU 18131); ibidem, 8.1.2015 (CLU 17343, 17351).

A lichen, starting the life-cycle as a parasite on other saxicolous lichens; in Italy known from most of the regions, also from Calabria, but not common.

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

***BAS**: Prov. di Potenza, Calvello, Cerro Falcone, siliceous rock, on *Lecidea* sp., 1150 m, 40°26'20.4''N, 15°49'17.0''E, 07.08.2012, leg DP, det. WB (CLU 16676b).

A widespread species mainly on crustose epipetric lichens.

Muellerella pygmaea (Körber) D. Hawksw.

***BAS**: Prov. di Potenza, Marsicovetere, Monte Volturino, on siliceous rocks, on *Aspicilia* sp. and on *Lecidea* sp. (both sterile), 1660 m, 40°24'18.0''N, 15°48'48.1''E, 7.8.2012, leg. DP, det WB (CLU 16539c).

Muellerella ventosicola (Mudd) D. Hawksw. agg.

***BAS**: Prov. di Potenza, Marsicovetere, Monte Volturino, on siliceous rock, on *Rhizocarpon distinctum*, 1665 m, 40°24'50.8''N, 15°48'18.2''E, 7.8.2012, leg. DP, det. WB (CLU 16561).

Ascomata perithecioid, black, half immersed, c. 250 µm diameter, asci c. 32-spored, ascospores ellipsoid, 1-septate, dark brown, thick-walled, finely verruculose, (6.0–)6.5–7.7(–8.0) × (3.0–)3.3–3.9(–4.0) µm, l/b = (1.6–)1.8–2.2(–2.7) (n = 30).

Muellerella ventosicola s. str. is restricted to hosts of the genus *Ophioparma* and characterized by a radially striate ostiole and smooth ascospores (Hafellner & Obermayer 2007). The specimens on *Rhizocarpon* surely represent one or more own taxa.

Nesolechia oxyspora (Tul.) A. Massal. **var. *oxyspora*** (Fig. 3)

***CAL**: Prov. di Cosenza, Montalto Uffugo, Bosco di Mavigliano, on *Quercus pubescens*, on *Parmelina tiliacea*, 210 m, 6.6.2015, leg. DP, det. WB (CLU 18183).

Ascomata ±immersed, ±flat, rounded, up to 300 µm diameter, dark brown to black when dry, pale to medium brown when wet; hypothecium hyaline, hypothecial hyphae I+ violet, hymenium hyaline, epithecium pale brown; asci 8-spored, saccate, c. 40 × 20 µm; ascospores ellipsoid to lemon-shaped, mostly apically acuminate, hyaline, non-septate, 13–20 × 6–7 µm.

Until now the species in its strict sense was known in Italy only from the north (Friuli-Venezia Giulia, Lombardia, Trentino-Alto Adige; see Brackel 2016). *Parmelina* is a new host genus.

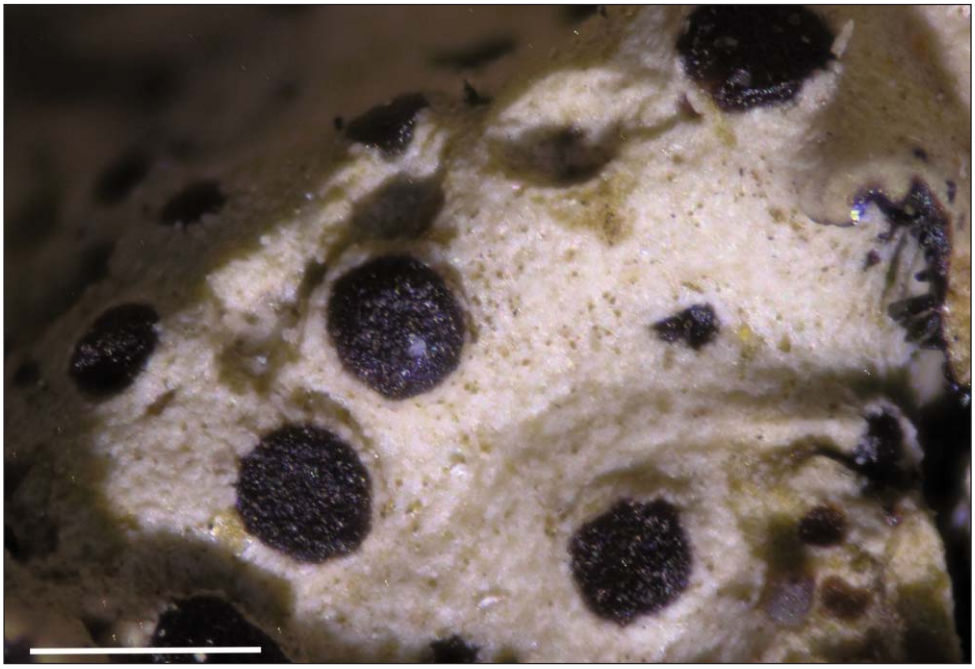

Fig. 3. *Nesolechia oxyspora* var. *oxyspora* on *Parmelina tiliacea*, habitus. Bar = 0.5 mm.

Pronectria pertusariicola Lowen

CAL: Prov. di Cosenza, Catena Costiera, Valico Monte Luta, on *Fagus sylvatica*, on *Pertusaria pertusa*, apothecial warts, 18.3.2017, leg. DP, det. WB (CLU 17803).

In Italy known from Basilicata, Sicilia, Toscana and also from Calabria (Brackel & Puntillo 2016).

Pseudoseptoria usneae (Vouaux) D. Hawksw. (Fig. 4)

CAL: Prov. di Vibo Valentina, Serra San Bruno, Bosco di Santa Maria, on *Abies alba*, on *Usnea* cf. *barbata*, 850 m, 5.12.1993, leg. DP, det. WB (CLU 9706).

A rare species, known from several countries in Europe, the Atlantic Isles, Asia and Central and South America, but always only in one or a few finds. In Italy it was known until now only from the type, collected by Arnold in 1896 on the Monte Roen in Prov. di Bolzano (Vouaux 1914).

In our specimen we found conidiomata of c. 100 µm diameter, black, wall dull bluish black, of a textura angularis; conidia hyaline, non-septate, smooth, irregularly cymbiform, distinctly truncate at the lower end, 10–16 × 2.5–4 µm.

Hawksworth (1981) stated that he had only few conidiomata for his detailed description (after the short protologue of Vouaux 1914) and that it should be emended after more finds

of the species. Combining Vouaux (1914), Hawksworth (1981) and the recent observations (Zhurbenko & Kobzewa 2014, Zhurbenko & Vershinina 2014) as well as own observations results in the following description:

Conidiomata arising from the host thallus first without causing visible damage, later inducing some discoloration; pycnidial, first immersed and later erumpent to 3/4 , singly, scattered but in multitude, black, subglobose, ostiolate (up to 25 µm diameter), 75–200 µm diameter. **Wall** of a textura angularis, with 3–4 layers of pseudoparenchymatous, medium thick-walled, subglobose to polyhedral cells of 4–7(–10) µm, dull bluish to bluish black or dark bluish green (or greenish brown, perhaps only in old specimens?), inside sometimes with a reddish-purplish tinge. **Conidiogenous cells** lining the inner wall of the pycnidial cavity, subcylindrical to ampulliform, percurrently proliferating apically, rarely also sympodially, with annellations, hyaline, smooth walled, (3–)6–12(–15) × (2–)3–5(–6) µm. **Conidia** simple, hyaline, smooth-walled, often guttulate, irregularly cymbiform, straight or slightly curved, tapering to the rounded or slightly attenuated apex, base distinctly truncated, (9.5–)11–14(–17) × (2.5–)3–4(–5.5) µm. An illustration of the conidiogenous cells and conidia is provided in Hawksworth (1981).

Fig. 4. *Pseudoseptoria usneae* on *Usnea* cf. *barbata*, habitus. Bar = 0.5 mm.

[L]***Ramboldia insidiosa*** (Th.Fr.) Hafellner

***BAS**: Prov. di Potenza, Parco Nazionale del Pollino, Serra di Crispo, dead wood of *Pinus leucodermis*, on *Lecanora varia*, thallus and apothecia, 2.9.2017, leg. DP, det. WB (CLU 17854).

A juvenile parasite exclusively on *Lecanora varia*, later developing an own thallus. In Italy it was known until now only from the Alps: Lombardia, Trentino-Alto Adige and Veneto. New to Calabria.

[L]***Rhizocarpon epispilum*** (Nyl.) Zahlbr.

***BAS**: Prov. di Potenza, Dolomiti Lucane, Pietrapertosa, on silicious rocks, on *Pertusaria pertusa* var. *rupestris*, 23.02.2020, leg. DP, det WB (CLU 18080; 18078, in the specimen of *Rhymbocarpus geographici*).

Thallus in small, first greyish, then glossy brown, convex patches, medulla I+ blue. **Ascomata** apothecioid, black, ±immarginate, matt, c. 300 µm diameter; epithecium dark reddish brown, K+ violet; hymenium hyaline, c. 100 µm high; hypothecium dark brown; paraphyses septate, ramified and anastomosing, with brown apices, c. 2 µm wide, up to 5 µm wide apically. **Asci** clavate, (4–)8-spored, 75–100 × 25–35(–60) µm. **Ascospores** dark grey-brown, 1-septate, ellipsoid, heteropolar, the upper cell rounded, the lower cell narrower and somehow attenuated, with a microgranular perispore, (22.0–)24.3–29.6(–32.0) × (14.0–)16.3–18.0(–19.0) µm, l/b = (1.3–)1.5–1.7 µm.

The ascospores in our specimen are somewhat bigger than noted e.g. in Nimis (2016): 19–25(–30) × 9–12(–17) µm or in Poelt (1990): 16–25 × 9–14 µm. Moreover, the hymenium measures c. 100 µm height; according to Hafellner & Poelt (1976) it should be 30–50 µm, whereas *Rhizocarpon schedomyces* Hafellner & Poelt has a hymenium of 100–120 µm height. However, the latter species has a less developed thallus and even smaller ascospores.

Rhymbocarpus geographici (J. Steiner) Vouaux (Fig. 5)

Syn.: *Rhymbocarpus punctiformis* Zopf

***BAS**: Prov. di Potenza, Dolomiti Lucane, Pietrapertosa, on silicious rocks, on *Rhizocarpon geographicum*, 23.02.2020, leg. DP, det WB (CLU 18078).

The rarely found fungus was known in Italy until now only from Alto Adige, collected by Arnold at the end of the 19th century (Arnold 1898; type of *R. punctiformis*).

Roselliniopsis tartaricola (Nyl. ex Leight.) Matzer (Fig. 6)

CAL: Prov. di Catanzaro, near Carlopoli, sweet chestnut grove, on *Castanea sativa*, on *Pertusaria hemisphaerica*, sweet chestnut grove, on *Castanea sativa*, 920 m, 39°02’29,3”N, 16°28’37,5”E, 26.04.2014, DP & WB (CLU 18135, hb Brackel 7427, 8920).

The species was already reported from this site (Brackel & Puntillo 2016). In a re-examination of the specimens we could observe some hyphae of the subiculum turning into coni-

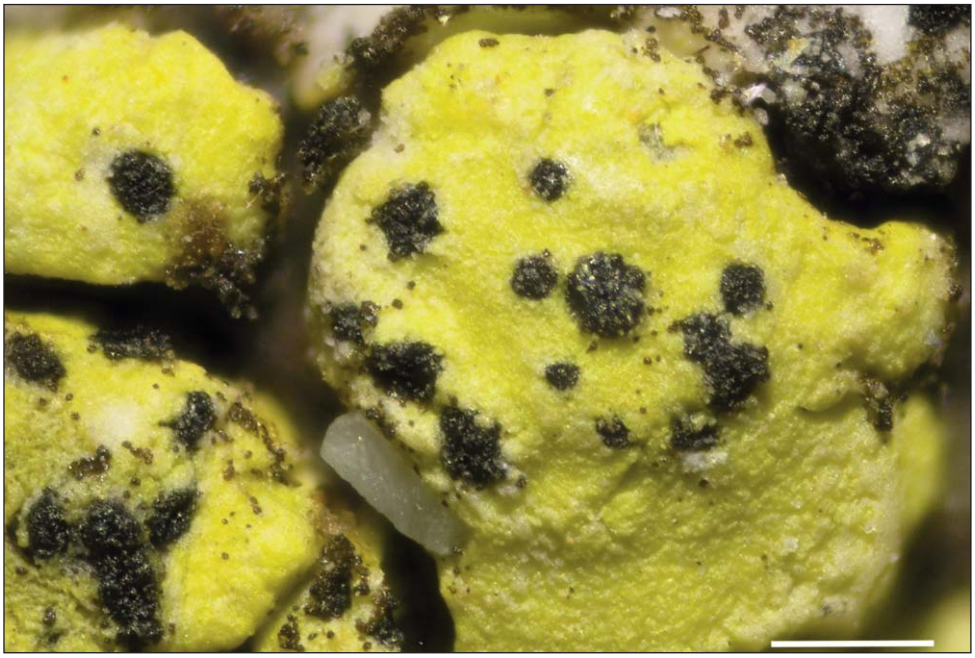

Fig. 5. *Rhymbocarpus geographici* on *Rhizocarpon geographicum*, Pietrapertosa, habitus. Bar = 200 µm.

diophores and producing conidia. Unfortunately, conidiogenesis and conidia are very difficult to see so the description is sketchy:

Conidiophores arising from the surface of the ascomata or from the subiculum, similar to the hairs covering the ascomata, up to 200 µm high and c. 10 µm wide, septate, dark brown downwards and paler upwards, smooth, apically ramified. Conidiogenous cells pale brown, building a head at the apex of the conidiophore, presumably phialidic. Conidia clavate, hyaline, c. 10 × 1.5 µm.

Interestingly, the anamorph of *Roselliniopsis tartaricola* is very similar to the anamorph of *Roselliniella cladoniae*. Also in the latter the conidiophores arise from the mycelium near the perithecia or directly from the surface of the perithecia (Coste & Pinault 2019).

Sclerococcum microsporum (Etayo) Ertz & Diederich agg. (Fig. 7)

Syn.: *Dactylospora microspora* Etayo

***SIC**: Prov. di Messina, Monti Nebrodi, near the road from Caronia to Capizzi, (SP 168 km 15/II), in oak forest, on *Quercus cerris*, on *Melanohalea exasperata*, 865 m, 37°58’01,6’’N, 14°29’14,8’’E, 15.8.2007, WB (hb Brackel 8908). Prov. di Messina, Monti Nebrodi, near the road from Caronia to Capizzi, (SP 168 km 19/VI), in oak forest, on *Quercus cerris*, on *Parmelina quercina*, 1150 m, 37°57’17,7’’N, 14°30’28,6’’E, 15.8.2007,

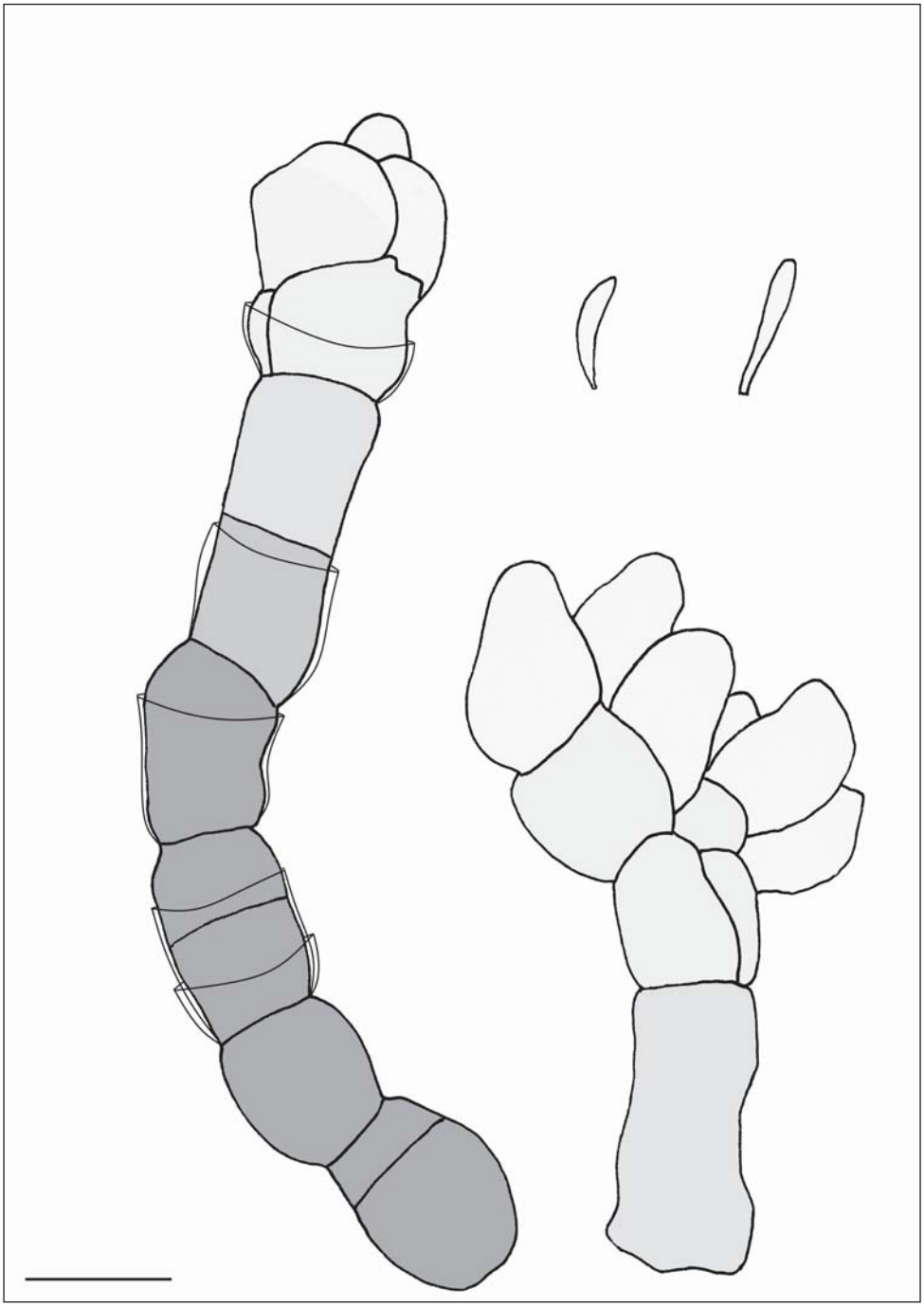

Fig. 6. *Roselliniopsis tartaricola* on *Pertusaria hemisphaerica*, Carlopoli, anamorph: immature conidiophore, head of mature conidiophore and conidia. Bar = 10 µm.

WB (hb Brackel 8910). Prov. di Messina, Monti Nebrodi, between Mistretta and Nicosia, Bosco della Giumenta, N Monte Sambughetti, oak forest, on *Quercus cerris*, on *Melanohalea exasperata*, 1225 m, 37°50’27,2’’N, 14°21’14,8’’E, 16.8.2007, WB (hb Brackel 8909).

Ascomata apothecioid, sessile, black, shiny, marginate, lecideine, 200–300 µm diameter; exciple paraplectenchymatous, dark brown; hymenium c. 90 µm high, hyaline, I+ intensely blue; paraphyses apically swollen, partly with brown caps. **Asci** clavate, 50–75 × 15–25 µm, multispored (c. 60–100/ascus). **Ascospores** 1-septate, pale brown, 6.7–8.1 × 2.6–3.1 µm.

Etayo (1991) described the species on *Catinaria atropurpurea* with ascomata 100–400 µm, asci 40–80-spored and ascospores 4–5(–7) × 2–3 µm. Subsequently, the species was reported from different, non-related lichens such as *Parmeliella triptophylla* (Hawksworth 1994), *Megalaria pulverea* (Holien 2001, Frisch & al. 2020), *Pachyphiale carneola* (Etayo 2010) and an unidentified crusts (Tretiach 2004, Notov & al. 2019). As the species of *Sclerococcum* generally are rather host specific, we treat these finds on hosts other than *Catinaria* as *Sclerococcum microsporum* agg. though Etayo (2010) notes that the species might parasite different species of corticolous lichens.

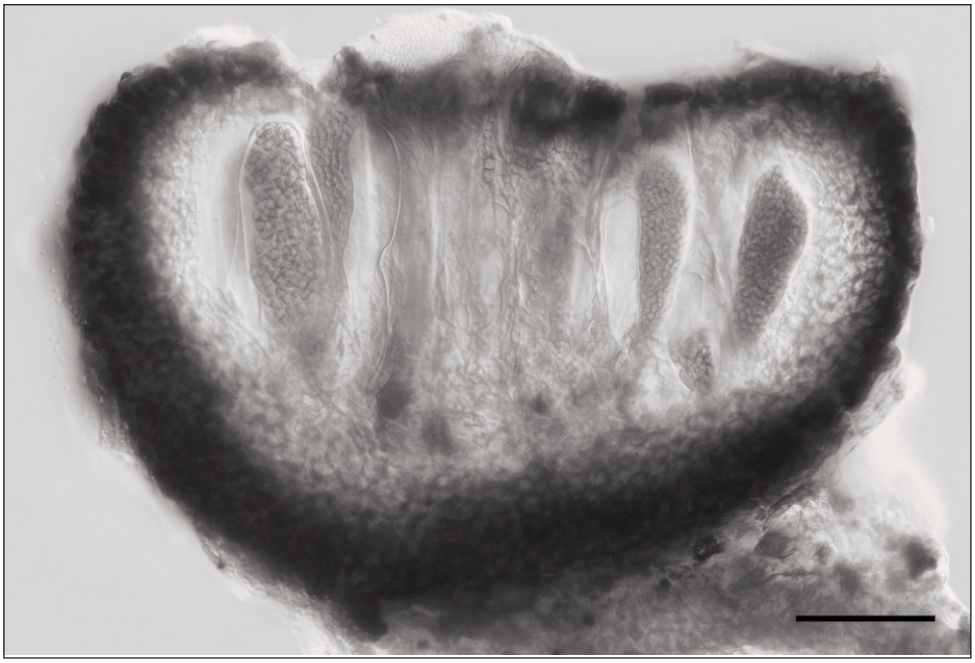

Fig. 7. *Sclerococcum microsporum* agg., section through an ascoma (specimen 8908). Bar = 50 µm.

[L]***Scoliciosporum umbrinum*** (Ach.) Arnold

BAS: Prov. di Potenza, Dolomiti Lucane, Pietrapertosa, on silicious rocks, on *Tephromela atra*, 23.02.2020, leg. DP, det WB (CLU 18080).

Usually an autonomous lichen, sometimes growing parasitically on other saxicolous lichens. In the specimen from the Basilicata the thallus was strongly reduced.

Sphaerellothecium nimisii Brackel & Puntillo species nova (Figs 8–10)

Mycobank number MB 846535

Fungus lichenicola, in apotheciis licheni generis *Xanthoparmelia* crescens, discum nigrum colorans. Ascomata subglobosa vel obovoidea, semi-immersa, nigra, (25–)35–45(–50) µm in diametro. Hamathecium cum periphysibus 5 × 2 µm et paraphysoidibus 1–1,5 µm lati. Gelatina hymeniale KI–. Asci bitunicate, saccati, (4–)8-spori, 19–24 × 10–12 µm. Ascosporae (0–)1(–3)-septatae vel submuriformae, ellipsoidae vel obovoidae, cellulae inaequales, immaturae hyalinae, maturae fuscae, granulosae-verruculosae, non halonatae, guttulatae, ascosporae uniseptatae (9,0–)9,4–11,6(–14,0) × (4,0–)4,3–5,4(–6,0) µm, ascosporae multiseptatae (11,0–)12,5–15,5(–16,0) × (4,5–)5,2–6,0 µm.

Typus: Italy, Calabria, Prov. di Cosenza, Luzzi, Contrada Gidora, siliceous rocks, on *Xanthoparmelia conspersa* & *X. tinctina*, 160 m, 39°26’12,0’’N, 16°15’54,6’’E, 10.1.2014, DP (CLU 18173 – holotypus, hb Brackel 8924 – isotypus).

Vegetative hyphae pale or medium brown to subhyaline, smooth, torulose, septate, ramified, rarely anastomosing, markedly constricted at the septa, 2.5–6 µm wide, with a very thin KI+ bluish coat, BCr+ blue, creeping horizontally in the upper part of the hypothecium below the hymenium of the host, sending vertical strands into the hymenium, where the ascomata are developing. **Ascomata** perithecioid, black, subglobose to ovoid, ostiolate, without appendices, (25–)35–45(–50) µm wide, 30–50(–80) µm high, dispersed, half immersed in the apothecial discs of the host, partly covered by a necrotic layer derived from the hosts hymenium. **Peridial wall** dark brown above, pale brown to subhyaline below, in surface view of textura angularis, cells 2–10 µm wide, in section of 1(–3) layers of tangentially elongated cells, 4–9 × 1–3 µm, medium to dark brown outwards, subhyaline to pale brown inwards, BCr+ blue. **Hymenial gel** KI–, BCr–. **Hamathecium** of periphyses c. 5 × 2 µm and of difficult to observe paraphysoids, 1–1.5 µm wide. **Asci** bitunicate, broadly ovoid to saccate, (4–)8-spored, 19–24 × 10–14 µm; endoascus KI+ orange, BCr+ blue only in young asci. **Ascospores** ellipsoid to soleiform, with a slightly broader upper cell, both apices rounded, (0–)1(–3)-septate or with an additional longitudinal septum, slightly constricted mainly at the primary septum, hyaline with a halo of 0.5 µm in the asci, guttulate, golden to dark brown and granulose-verruculose when released, 1-septate ascospores (9.0–)9.4–11.6(–14.0) × (4.0–)4.3–5.4(–6.0) µm, l/b = (1.8–)2.0–2.4(–2.7) (n = 50), 3-septate ascospores (11.0–)12.5–15.5(–16.0) × (4.5–)5.2–6.0 µm, l/b = (1.8–)2.2–2.9(–3.6) (n = 20); cell content BCr+ violet, except for the vacuoles, septum and epispore BCr–, perispore in older ascospores BCr+ blue. **Conidiomata** very rare, only once observed, located between the ascomata, of similar shape, colour and morphology, conidia bacilliform, hyaline, c. 3–4 × 1 µm.

Hosts and distribution: *Sphaerellothecium nimisii* grows in the hymenium of *Xanthoparmelia conspersa*, *X perrugata*, *X. pulla* and *X. tinctina*; the infection causes a blackening of the apothecial disc and suppresses almost completely the maturation of the asci of the host. Until now it is known only from Italy, from the regions Calabria, Campania and Sardegna.

Observations: Among the until now described 39 species of *Sphaerellothecium* seven species [*S. aculeatae* Khodosovtsev & al., *S. arctoparmeliae* (Brackel & Schiefelbein) Diederich & al., *S. leratianum* Gardiennet & Cl. Roux, *S. parmeliae* Diederich & Etayo, *S. parmotrematis* van den Boom, *S. reticulatum* (Zopf) Etayo and *S. usneicola* Etayo] are growing on members of the family Parmeliaceae. All of them affect the thallus of their host, none grows in the hymenium of the hosts apothecia.

Among the other species of the genus, seven are growing (partly besides of thallus) in the apothecia of their host (in brackets the distinguishing characters): *Sphaerellothecium araneosum* (Rehm) Zopf on *Pertusaria* s. lat. and *Ochrolechia* (bigger asci and ascomata, rugose vegetative hyphae), *S. atryneae* (Arnold) Cl. Roux & Triebel on saxicolous *Lecanora* species (bigger asci and ascomata, BCr+ pale violet epispore), *S. contextum* Triebel on diverse saxicolous lichens (smooth ascospores and BCr– vegetative hyphae), *S. epilecanora* Zhurb. on *Lecanora epibryon* (hyaline, smooth ascospores), *S. parietinarium* on *Xanthoria* spp. (Linds.) Hafellner & V. John (much bigger ascomata, 60–100 µm), *S. propinquellum* (Nyl.) Cl. Roux & Triebel on *Lecanora carpinea* agg. (BCr+ violet epispore) and *S. subtile* Triebel & Rambold on *Teloschistes* spp. [smooth, very small ascospores, (6.5–)7.5–8(–8.5) × 3–3.5 µm].

The new species has also to be compared with members of the similar genus *Stigmidium*; as this genus is very host-specific, we consider only closely related host genera. *Stigmidium neofusceliae* Calatayud & Triebel on brown species of *Xanthoparmelia* and *S. xanthoparmeliarum* Hafellner on beige species of *Xanthoparmelia* grow exclusively on the thalli of their respective hosts, have bigger ascospores and ascomata and the vegetative hyphae are mostly hyaline. Two species of *Stigmidium* grow in the apothecia of parmelioid lichens, *Stigmidium acetabuli* Calatayud & Triebel on *Pleurosticta acetabulum* and *S. exasperatum* Etayo on *Melanohalea exasperata*. Both are distinguished from the new species by their smooth, constantly 1-septate ascospores, the bigger ascomata, less coloured vegetative hyphae and a hamathecium of periphysoids instead of paraphysoids.

Interestingly, as well in the new species as well in other species of the genus which are affecting predominantly the apothecia of their respective hosts, the net of brown vegetative hyphae is not developed superficially but below the hymenium on the surface of the hypothecium and the hyphae are less intensively coloured and not ornamented.

Etymology: The new species is named in honour of our friend, Prof. Pier Luigi Nimis, eminent Italian lichenologist, on the occasion of his 70th birthday in 2023.

Additional specimens examined: **Calabria**: type location, on *Xanthoparmelia tinctina*, 8.1.2015, D. Puntillo (CLU 17343, 17344, 18176 – topotypi); Prov. di Cosenza, Valle del Crati, Ponte Crati near Stazione Acri Bisignano, siliceous boulders of the bank reinforcement, on *X. tinctina*, 39°26’24,7’’N, 16°15’01,2’’E, 28.4.2014, W. v. Brackel & D. Puntillo

(hb Brackel 7274); ibidem, on *X. perrugata* (hb Brackel 7276); Prov. di Cosenza, Mavigliano, siliceous boulders in gabions, on *X. tinctina*, 39°23'35,4''N, 16°12'33,8''E, 28.4.2014, W. v. Brackel & D. Puntillo (hb Brackel 7275a); ibidem, on *X. pulla* (hb Brackel 7275b). **Campania**: Prov. di Salerno, Cilento, between Torre Orsaia and Alfano, olive grove, on sandstone, on *Xanthoparmelia conspersa*, 340 m, 40°10'31,6''N, 15°26'49,5''E, 18.8.2016, W. & G. v. Brackel (hb Brackel 8544). **Sardegna**: Prov. di Carbonia-Iglesias, Iglesiente Arburese, Monte Limas, Veccia Dispensa SW Villacidro, on siliceous rocks, on *X. conspersa*, 305 m, 39°25'38,2''N, 08°40'55,8''E, 19.8.2014, W. & G. v. Brackel (hb Brackel 7801).

Stigmidium lecidellae Triebel, Cl. Roux & Le Coeur

***CAL**: Prov. di Cosenza, Falconara Albanese, Sant'Angelo, on *Corylus avellana*, on *Lecidella elaeochroma*, apothecia, 887 m, 39°17'48.2''N, 16°06'22.3''E, 28.05.1989, leg. DP, det. WB (CLU 6107); Altomonte, Bosco Farnetto, *Quercus cerris*, on *L. elaeochroma*, apothecia, 19.10.2015, leg. DP, det. WB (CLU 17856).

Ascomata black, perithecioid, on the apothecia of *Lecidella elaeochroma*, half immersed

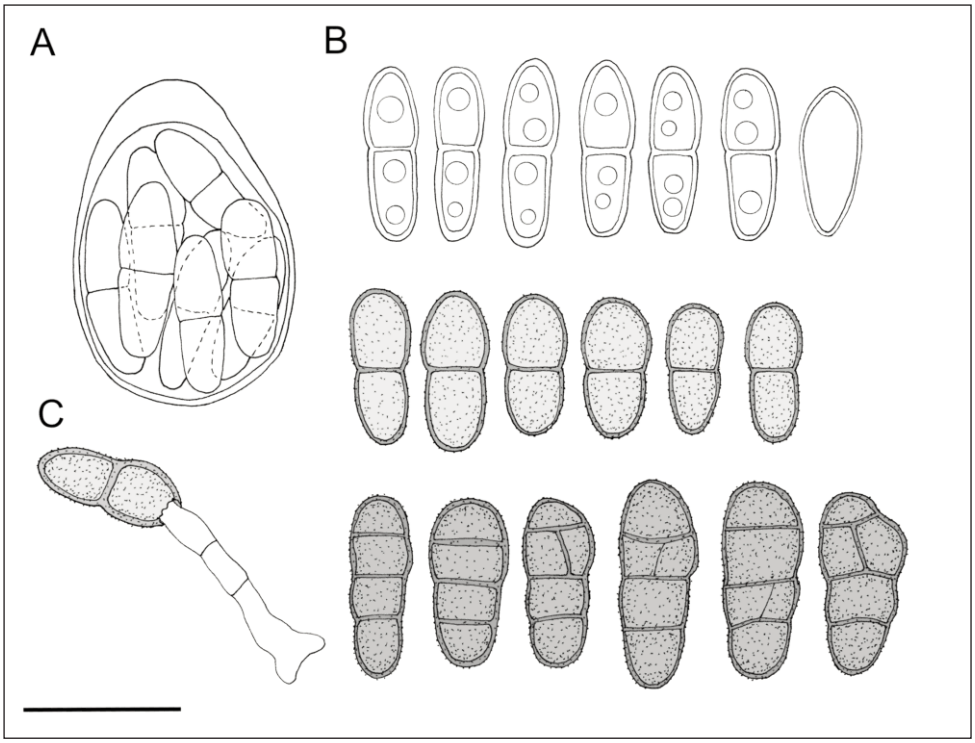

Fig. 8. *Sphaerellothecium nimisii*: A: Ascus with ascospores. B: Ascospores: first line: immature; 2nd line: mature; 3rd line: overmature. C: germinating ascospore. Bar = 10 µm.

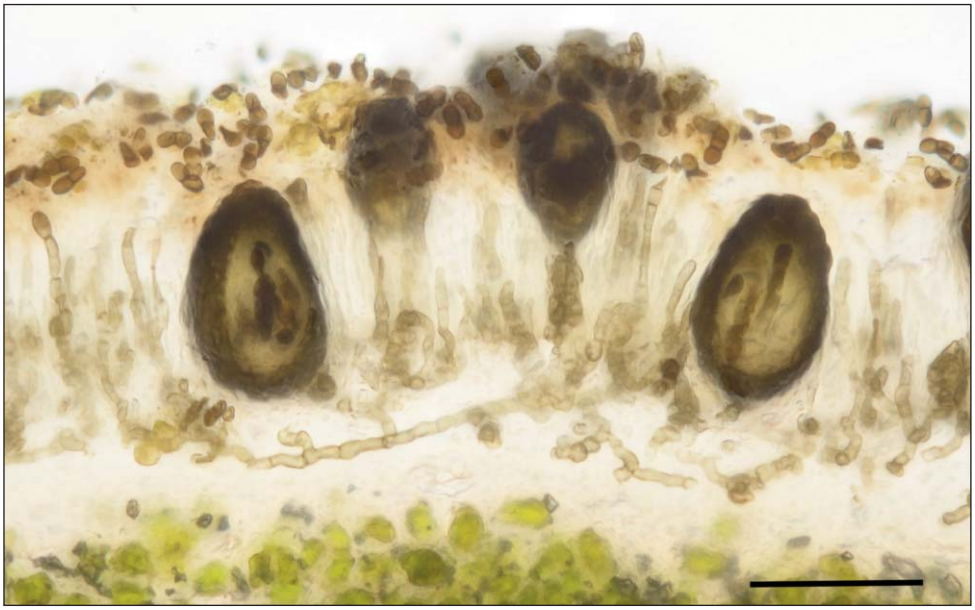

Fig. 9. *Sphaerellothecium nimisii*, holotypus, section through the infected hymenium of *Xanthoparmelia tinctina* with the net of hyphae in the upper part of the hypothecium and ascomata developing on vertical strands. Bar = 50 µm.

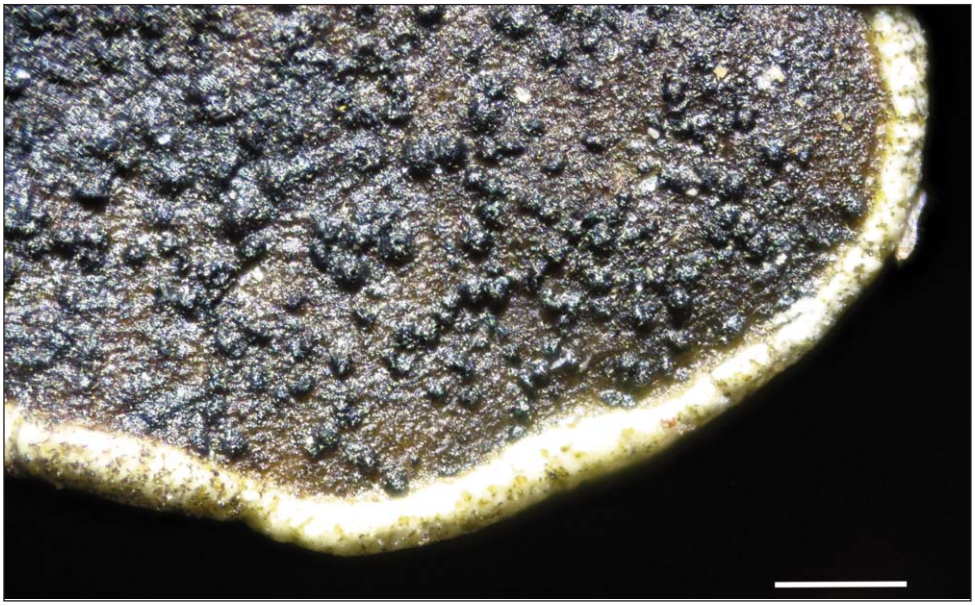

Fig. 10. *Sphaerellothecium nimisii*, holotypus, habitus on the apothecial disc of *Xanthoparmelia tinctina*. Bar = 200 µm.

in the hymenium, c. 73 × 62–65 µm; Asci 6-spored, c. 30 × 12 µm; Ascospores hyaline, narrowly ellipsoid, 1-septate, c. 12–12.5 × 3 µm.

In Italy known from Lazio, Puglia, Sardegna e Sicilia.

Stigmidium hypogymniae Brackel species nova (Figs 11, 12)

Mycobank number MB 846537

Fungus lichenicola, in thallis licheni generis *Hypogymnia* crescens, maculis necroticis provocans. Ascomata subglobosa, semi-immersa, nigra, 42–60 µm in diametro. Hamathecium cum periphysoidibus typo A. Gelatina hymeniale KI–. Asci bitunicate, saccati, 5–8-spori, 20–27 × 10–13 µm. Ascosporae 1-septatae, soleiformae, hyalinae, nonunquam constrictae, cellulae inaequales, non halonatae, non ornamentatae, (7,5–)8,2–9,8(–11,0) × (2,5–)2,8–3,6(–4,0) µm, l/b = (2,3–)2,5–3,2(–3,7).

Typus: Italy, Calabria, Prov. di Cosenza, Sila Grande, Fossiata, on *Pinus laricio*, on *Hypogymnia tubulosa*, 1298 m, 18.12.2014, D. Puntillo (CLU 18174 – holotypus).

Vegetative hyphae immersed in the host tissue, hyaline to pale to medium brown, septate, ramified, torulose, 2.5–5.0 µm wide, BCr+ dark blue. **Ascomata** perithecioid, subglobose, ostiolate, 42–60 µm diameter, black, shiny, first completely immersed then up to ½ erumpent, in loose groups in infection patches. **Peridial wall** dark brown in the upper part, medium brown in the lower part, in surface view of textura angularis, cells 3–10 µm wide, in section of 1–3 layers of variously shaped cells, 3–10 × 2–3.5 µm, outer layer dark brown, inner layers pale brown to hyaline, BCr+ dark blue, K+ with a slight olive tinge. **Hamathecium** of pendent paraphysoids of type A, c. 8–10 × 0.5–1 µm (dissolving); hymenial gel KI–, BCr–. **Asci** bitunicate, saccate, with or without a short foot, 20–27 × 10–13 µm, 8-spored; endoascus KI+ orange-red, BCr+ faintly blue, exoascus BCr–. **Ascospores** soleiform with a broader upper and an elongated lower cell, 1-septate, guttulate and sometimes pseudotetrablastic, slightly or not constricted at the septum, hyaline, without halo, (7.5–)8.2–9.8(–11.0) × (2.5–)2.8–3.6(–4.0) µm, l/b = (2.3–)2.5–3.2(–3.7) (n = 40); epispore and septum BCr–, cell content BCr+ blue. **Conidiomata** not observed.

Hosts and distribution: The new species grows on the hosts *Hypogymnia physodes* and H. *tubulosa*, where it causes severe damage: At the begin of the infection star-like blackish structures are growing on the hosts thallus, then brownish, later greyish patches develop in the centre which finally become necrotic and erode. The ascomata are scattered over these patches. *Stigmidium hypogymniae* is known until now from the type location in Calabria (Italy) and from one location in the Bavarian Alps (Germany).

Observations: On hosts of the family Parmeliaceae up to now eleven species of *Stigmidium* were described (without *S. hafellneri*, which was transferred to *Endococcus*, and the not validly described *S. arctoparmeliae*). As the species of *Stigmidium* generally are very host-specific, we compare the new species with these eleven species.

Seven of them [*S. alectoriae* (Lindsay) Etayo, *S. epinesolechia* Etayo, *S. hypotrachynicola* Etayo, *S. mayrhoferi* E. Zimm. & F. Berger, *S. neofusceliae* Calatayud & Triebel, *S. parmotrematis* F. Berger & E. Zimm., and *S. xanthoparmeliarum* Hafellner have longer ascospores, on average more than 10 µm. Two species (*S. acetabuli* Calatayud & Triebel

and *S. exasperatum* Etayo as well as *Endococcus hafellneri* Zhurb.) have ascospores becoming brown with age. *Stigmidium tribeliae* Etayo does not cause any damage on the host and shows a multitude of ascomata on a dense net of hyphae. *Stigmidium microcarpum* Alstrup & J. C. David has olive-brown vegetative hyphae, a BCr+ blue endoascus and a dark rim around the infection spots.

Additional specimen examined: Germany, Bayern, Oberbayern, Kreis Garmisch-Partenkirchen, Friedergrieß NNE Griesen near Garmisch, on *Pinus* sp., on *Hypogymnia physodes*, 900 m, MTB 8531/2, 47°29’29’’N, 10°57’24’’E, 10.07.2018, W. v. Brackel (hb Brackel 8224).

Telogalla olivieri (Vouaux) Nik. Hoffm. & Hafellner

CAL: Prov. di Cosenza, Luzzi, Contrada Gidora, on *Tamarix*, on *Xanthoria parietina*, 10.01.2015, leg. DP, det. WB (CLU).

A widespread and common species on *Xanthoria parietina*, known from most regions of Italy, becoming rarer in the north.

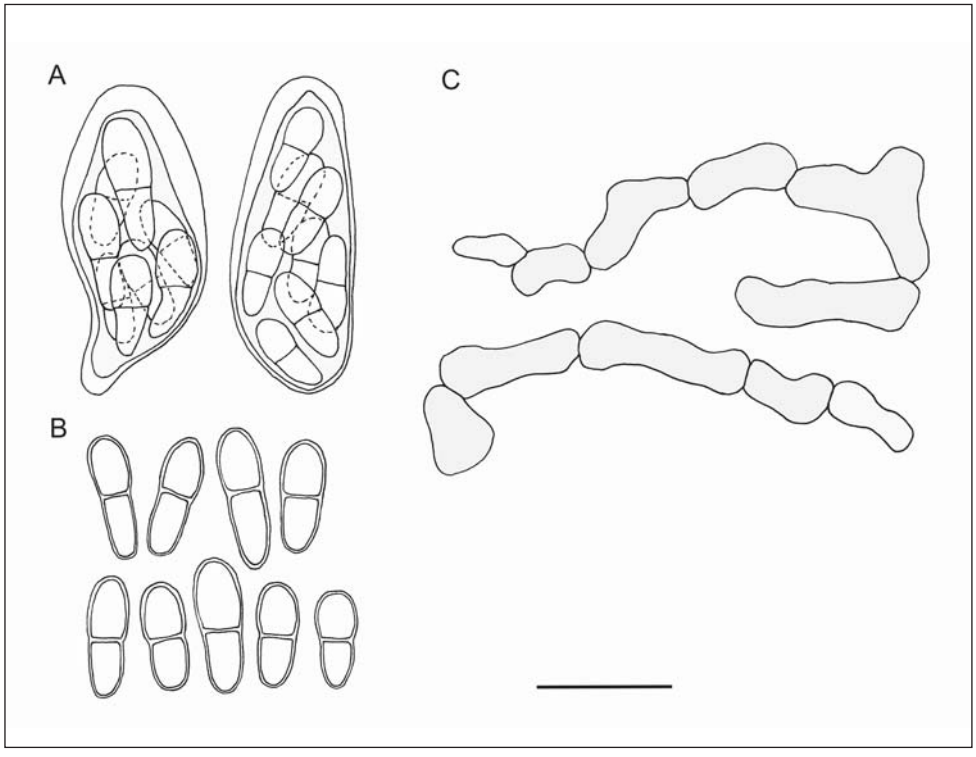

Fig. 11. *Stigmidium hypogymniae*: A: Asci with ascospores. B: Ascospores, released from the asci. C: Vegetative hyphae. Bar = 10 µm.

Fig. 12. *Stigmidium hypogymniae* on *Hypogymnia tubulosa*, holotype, habitus. Bar = 0.5 mm.

Tremella diploschistina Millanes, M. Westb., Wedin & Diederich

CAL: Prov. di Cosenza, Tarsia, Quercia Rotonda, on siliceous rock, on *Diploschistes* sp., 95 m, 6.5.2014, leg. DP, det. WB (CLU 18180).

Tremella diploschistina was known until now only from Belgium, Czech Republic, Germany, Sweden and the USA (Diederich & al. 2022). New to Italy and the Mediterranean.

Tremella aff. ***variae*** Pérez-Ortega, Millanes, V.J. Rico & J.C. Zamora

BAS: Prov. di Matera, Gravina di Matera near Parco dei Mónaci, on *Pistacia lentiscus*, on *Lecanora horiza*, 130 m, 40°36′41″N, 16°38′50″E, 13.8.2010, WB (hb Brackel 8913).

Basidiomata in galls induced on the thallus of *Lecanora horiza*, convex to bullate, cream, ± concolourous with the host thallus, 200–600 µm diameter; context hyphae 1.5–3 µm wide, clamped; numerous ± clavate probasidia in the hymenium; basidia 2(–3)-celled, with a longitudinal septum, thin-walled, 15–27(–44) × 10–16 µm, subglobose to broadly ellipsoid; basidiospores globose, 6–11 µm diameter.

With these features the specimen fits well the description of *Tremella variae*, a species reported until now only on *Lecanora varia* (Zamora & al. 2016). Possibly our specimen represents an own taxon not distinguishable from *T. variae* with morpholgical methods.

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

BAS: Prov. di Potenza, Terranova di Pollino, Timpa di Pietrasasso, on rock, on *Lecanora subcarnea*, 16.6.2010, leg. DP & M. Puntillo, det. WB (CLU 18188).

Unguiculariopsis thallophila, confined to hosts of the genus *Lecanora* s. lat., is known from several regions of Italy and was also reported from the Basilicata (Brackel 2011). All previous finds of the species in Italy, except one from Sicilia, were from epiphytic *Lecanora* species (*L. carpinea*, *L. chlarotera*).

****Verrucoccum coppinsii*** V. Atienza, D. Hawksw. & Pérez-Ort. (Figs 13,14)

PUG: Gargano, Foresta Umbra, on *Lobaria pulmonaria* (thallus), 9.4.1988, leg. R. Mues, det. WB (hb Brackel 6860).

Conidiomata pycnidial, sessile, in groups, ostiolate, black, globose, 130–190 µm diameter; surface unevenly thick-walled, wall multi-layered, pseudoparenchymatous, outer part dark coloured, not continuous below the centrum, inner part hyaline. **Conidiophores** reduced to conidiogenous cells, lining the inner wall of the cavity, short ampulliform, hyaline, smooth, 7–9.5 × 7–8 µm. **Conidia** abundant, singly, more or less ellipsoid with a truncated base, with a central pore in the base, simple, smooth and hyaline when young, minutely granular and brown when old, (9.0–)10.4–12.5(–13.0) × (6.0–)6.5–7.6(–8.0), l/b = (1.3–)1.5–1.8(–2.0) (n=40).

In the specimen only conidiomata were found. All features fit well the protologue (Atienza & al. 2021) except for the granular surface of the older conidia. In the other two known species of the genus (*V. hymeniicola* and *V. spribillei*) the conidia are shorter and the conidiomata grow on the hymenium of the host, apart from several other differences.

The species was known until now only from three finds in Scotland. New for Continental Europe and for the Mediterranean.

Vouauxiella lichenicola (Linds.) Petr. & Syd.

CAL: Prov. di Cosenza, Altomonte, Bosco Farnetto, *Quercus cerris*, on *Lecanora* cf. *chlarotera*, apothecia, 19.10.2015, leg. DP, det. WB (CLU 17856); Prov. di Vibo Valentia, Dinami near Eremo dei Santi Francesco in Soreto, on twigs of *Olea europaea*, on *Lecanora chlarotera*, 259 m, 39°32’46.3’’N, 16°08’41.4’’E, 9.4.2022, leg. DP, det. WB (CLU 18182).

Widespread in Italy, already known from Calabria (Brackel & Puntillo 2016) but new for the province of Vibo Valentia.

****Zwackhiomyces polischukii*** Darmostuk & Khodos.

PUG: Prov. di Foggia, Promontorio del Gargano, SS 89 between Vieste and Mattinata, for-

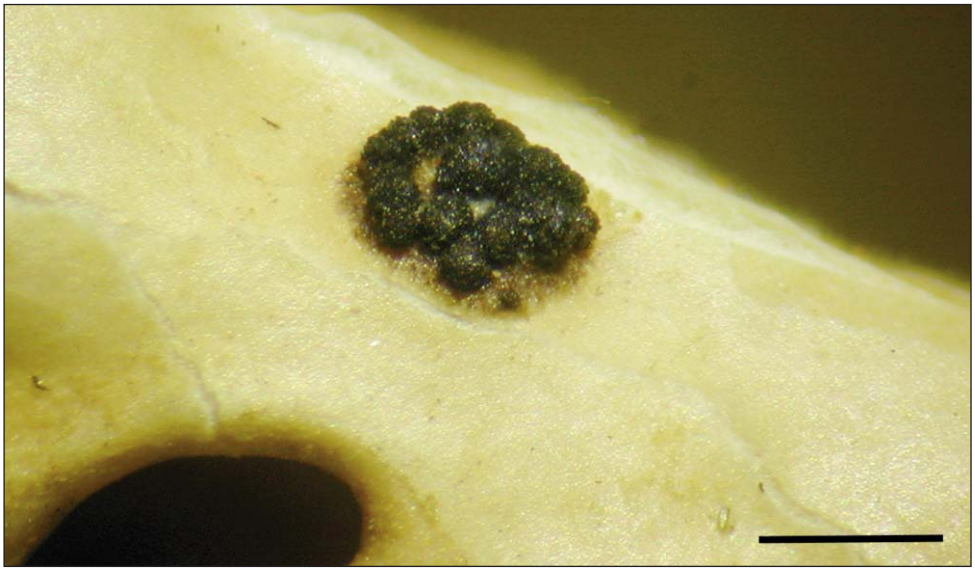

Fig. 13. *Verrucoccum coppinsii* on *Lobaria pulmonaria*, Puglia, Gargano, 1988. Bar = 0.5 mm.

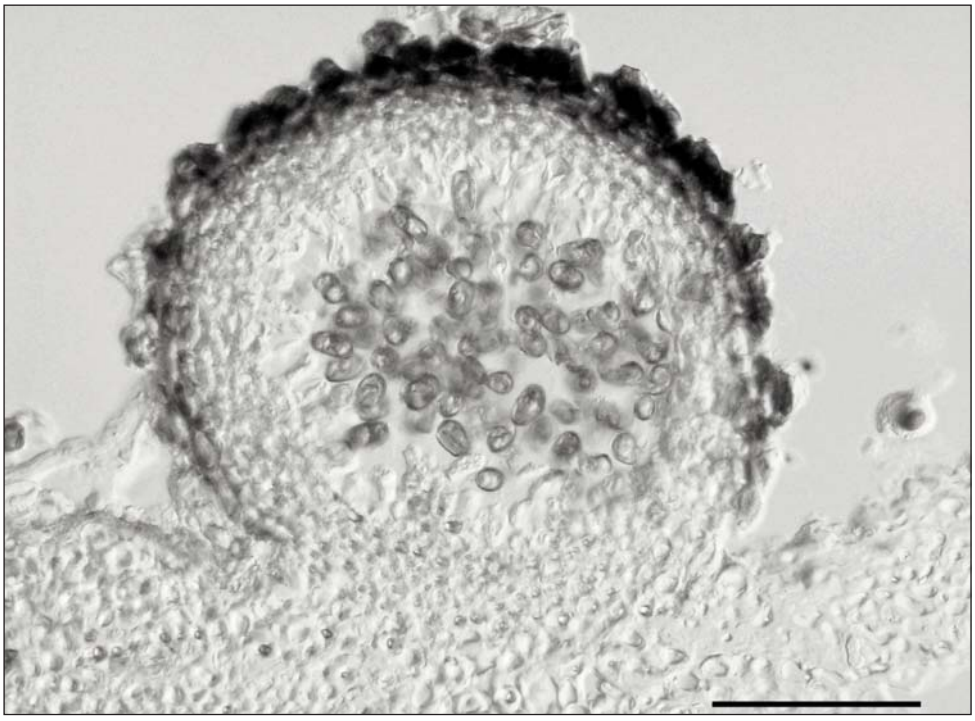

Fig. 14. *Verrucoccum coppinsii*, section through a conidioma. Bar = 50 µm.

est in a small ravine, on *Acer pseudoplatanus*, on *Bacidia rubella*, 590 m, 41°46’07”N, 16°04’44”E, 5.8.2010, WB (loc. 8a; hb Brackel 5439).

A revision of “*Zwackhiomyces* aff. *physciicola*” on *Bacidia rubella* from Puglia (Brackel 2011) showed the conspecificy with a specimen from the Toscana identified as *Z. polischukii*; 2011 *Z. polischukii* was not yet described (Khodosovtsev & Darmostuk 2017).

Ascomata perithecioid, 150–200 µm in diameter, asci 4–6-spored, ascospores hyaline, partly smooth, partly finely verruculose, c. 20 × 7 µm. Some of the perithecia were covered by *Ellisembia lichenicola*, appearing macroscopically like setose.

Zyzygomyces bachmannii (Diederich & M.S. Christ.) Diederich, Millanes & Wedin

Syn.: *Syzygospora bachmannii* Diederich & M.S. Christ., *Heterocephalacria bachmannii* (Diederich & M.S. Christ.) Diederich, Millanes & Wedin

***CAL**: Prov. di Cosenza, Santa Sofia d’Epiro, right shore of the Lago di Tarsia, on acidic soil, on *Cladonia rangiformis*, 56 m, 9.6.2015, leg. DP, det. WB (CLU 18094)

A very characteristic parasite whose basidiomata cause a bending of the podetia of the host. In Italy it was known until now only from Sardegna (Brackel & Berger 2019).

Conclusions

During the last two decades substantial advances have been made in systematics and taxonomy of lichenicolous fungi. Therefore, it has become possible to restudy successfully until now unidentified herbarium specimens of this group. For instance a coelomycete growing on *Lobaria pulmonaria* was impossible to determine, until Atienza & al. (2021) described the new genus *Verrucoccum*, comprising pyrenocarpous lichenicolous fungi on *Lobaria* spp., and their anamorphs. Our coelomycete now could easily been identified as the anamorph of *Verrucoccum coppinsii*.

The lichen flora of Southern Italy is exceptionally rich due to the multitude of different habitats and the very low air pollution in most parts of the landscape, also during the worst times of pollution in the second half of the last century. The knowledge of their parasites is far from being satisfying, but, as has been shown, also the study of put aside herbarium specimens can help to move forward.

Among the 39 lichenicolous fungi listed six are new to Italy, 13 new to the respective region and three are new to science.

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