Article

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Lichenicolous fungi from the northern Apennines and foreland (Italy)

Abstract

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During several excursions between 2013 and 2024 to the northern Apennines (including the Tyrrhenian coast near Donoratico) in the regions Lazio, Umbria, Marche, Toscana, Emilia-Romagna and Liguria, we visited 151 locations of potential lichenological interest. The results of these field studies are presented here. It comprises 140 taxa of lichenicolous fungi, 127 of which are non-lichenised, obligatory lichenicolous, validly described species. The new species *Arthonia donoraticensis* Brackel (Italy and France), *Cercidospora appennina* Brackel (Italy) and *Pronectria lilae* Brackel (Italy) are described. Provisional descriptions are given for *Arthonia* aff. *subvarians* (on *Lecanora carpinea*), *Cercidospora* sp. (on *Seirophora villosa*), *Lichenoconium* sp. (on *S. villosa*), *Lichenostigma* sp. (on *Diplotomma hedinii*), *Muellerella* sp. (on *S. villosa*), *Polycoccum* sp. (on *Xanthoparmelia conspersa*) and *Zwackhiomyces* sp. (on *Collema fuscovirens*). New to Italy are *Abrothallus parmotrematis*, *Acremonium antarcticum* agg., *Cladophialophora denigrans*, *Codonmyces lecanorae*, *Cylindromonium lichenicola*, *Gonatophragmium licheniphilum*, *Lichenostigma rouxii*, *Parmeliicida pandemica*, *Phaeoseptoria peltigerae*, *Polycoccum alboatrae*, *P. thallicola*, *Sarcopyrenia gibba*, *Stigmidium leprariae*, *Trimmatostroma rouxii*, *Weddellomyces erythrocarpae*, *Xenonectriella zimmermannii*, and *Zwackhiomyces lithoiceae*. Several species are new to the respective regions. Furthermore, a list of all noted lichens from the 151 visited sites is given.

Key words: Ascomycota, Basidiomycota, lichens, *Arthonia*, *Cercidospora*, *Pronectria*, Mediterranean.

Introduction

This study is part of the project “Lichenicolous fungi of Italy”, which began in Sicily in 2006. In the succeeding years, several other regions followed, generally moving to North. Apart from a side trip to some locations in the Italian Alps, this paper covers the northernmost part of Italy studied so far.

Material and methods

The specimens were studied macroscopically with a Zeiss stereo microscope and microscopically with an Olympus BX 51 microscope fitted with Nomarski differential interference contrast optics. Measurements were taken on thin hand-cut sections mounted in water. Statistical measurements are indicated as (minimum–) {$\bar{x}$-SD) – {$\bar{x}$+SD} (–maximum) followed by the number of measurements (n) for n ≥ 10; 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 (I, K/I with pretreatment with KOH), Phloxin and Cotton blue were used. Specimens are kept in the private herbarium of the author (hb Brackel), except the type specimens that were deposited in M. For common species (e.g., *Athelia arachnoidea*, *Lichenoconium erodens*), not all investigated specimens were kept in the herbarium. The bold numbers following the species name (199–209, 335, 381–453, 510–556, 596–611) indicate the localities (listed below); some localities visited on former excursions are given directly under the respective finds. All specimens were collected by the author and Gisela v. Brackel if not indicated otherwise. The regions are abbreviated as: EMI (Emilia-Romagna), LAZ (Lazio), LIG (Liguria), PIE (Piemonte), MAR (Marche), TOS (Toscana), UMB (Umbria). Administrative entities below the regional level are consistently written in the Italian notation. The nomenclature of the host lichens follows ITALIC 8.0 (Nimis & Martellos 2025).

Localities

Emilia-Romagna (provinces: BO = Bologna, FE = Ferrara, FO = Forli, MO = Modena, PC = Piacenza, PR = Parma): **199**: PC, Riserva Naturale Piacentino, Valle near Gropparello, *Salix* sp. on the roadside, 255 m, 44°50'15,6''N, 09°44'33,2''E, 2.10.2013. – **200**: PC, above Gropparello, on *Quercus* spp. (a), on *Prunus spinosa* (b), 44°49'49,8''N, 09°44'36,5''E, 2.10.2013. – **201**: PC, Castellana near Gropparello, mixed forest, on *Quercus pubescens*, 500 m, 44°48'26,4''N, 09°43'34,6''E, 2.10.2013. – **202**: PC, Croviano near Gropparello, dry grassland on limestone with dwarf oaks, 485 m, 44°47'48,9''N, 09°42'33,3''E, 2.10.2013. – **203**: PC, Case Riglio near Celleri N Gropparello, alley of *Tilia* sp. between road and fields, 165 m, 44°52'59,4''N, 09°45'39,4''E, 2.10.2013. – **204**: PC, Missano N Bettola, on *Juglans regia* at the roadside, 460 m, 44°48'54,9''N, 09°36'18,6''E, 3.10.2013. – **205**: PC, Missano N Bettola, on *Prunus avium*, 585 m, 44°48'50,3''N, 09°35'47,8''E, 3.10.2013. – **206**: PC, Castano W Bettola, on solitary *Quercus pubescens*, 685 m, 44°46'54,9''N, 09°34'04,2''E, 3.10.2013. – **207**: PC, Passo del Cerro W Bettola, loose oak forest, on *Quercus pubescens* (a), on *Quercus cerris* (b), on limestone rocks (c), in dry grasland on limstone (d), 760 m, 44°47'13,8''N, 09°33'03,3''E, 3.10.2013. – **208**: PC, Grazzano Visconti N Piacenza, on *Populus italica*, 145 m, 44°55'58,2''N, 09°40'16,0''E, 3.10.2013. – **389**: FO, Colle di Carnaio near Bagno di Romagna, memorial at the SP 26, light mixed forest with oaks, on *Quercus pubescens* (a), on *Robinia pseudacacia* (b), on *Cupressus* sp. (c), 770 m, 43°53'08,2''N, 11°57'32,2''E, 8.8.2015. – **390**: FO, N Corniolo near Santa Sofia, Campeggio, loose tree stand of *Fagus sylvatica*, *Acer pseudoplatanus*, *Fraxinus excelsior*, etc., 625 m, 43°55'03,4''N, 11°47'20,7''E, 8.8.2015. – **391**:

FO, N Corniolo near Santa Sofia, on *Acer pseudoplatanus* (a), on *Aesculus hippocastanus* (b), 605 m, 43°54’34,1’’N, 11°47’33,8’’E, 8.8.2015. – **392**: FO, Parco Nazionale delle Foreste Casentinesi, Monte Guffone WSW Santa Sofia, mixed forest, on *Alnus* sp. (a), on *Acer pseudoplatanus* (b), 755 m, 43°56’00,5’N, 11°45’53,0’’E, 9.8.2015. – **396**: FO, Parco Nazionale delle Foreste Casentinesi, below Passo la Calla above Campigna, mixed mountain forest, on *Abies alba* (a), on *Acer pseudoplatanus* (b), on *Fagus sylvatica* (c), 1120 m, 43°52’19,1’’N, 11°44’02,6’’E, 9.8.2015. – **397**: FO, Parco Nazionale delle Foreste Casentinesi, below Passo la Calla, km 33 of the SS 310, patchy, stony dry grassland, 735 m, 43°53’43,7’’N, 11°46’32,9’’E, 9.8.2015. – **398**: BO, Parco Regionale Gessi Bolognesi e Calanchi di Abbadessa, Buca di Ronanza, gypsum rock heads and dry grassland, 250 m, 44°25’30,8’’N, 11°24’32,5’’E, 12.8.2015. – **399**: BO, Castiglione dei Pepoli, Chiesa Vecchia, roadside trees and park, on *Tilia platyphyllos* (a), on *Castanea sativa* (b), on *Prunus avium* (c), 630 m, 44°08’38,1’’N, 11°08’55,2’’E, 12.8.2015. – **400**: BO, Passo di Zanchetto W Castiglione dei Pepoli, oak forest, on *Quercus cerris*, 770 m, 44°08’19,5’’N, 11°05’27,2’’E, 12.8.2015. – **401**: BO, Lago di Suviana, western shore below Campeggio, mixed forest, on *Quercus pubescens* (a), on *Pinus nigra* (b), on *Fraxinus* sp. (c), 485 m, 44°07’30,0’’N, 11°02’04,2’’E, 12.8.2015. – **402**: MO, between Sestola and Fanano, above the Calanchi, open soil with pebbles in dry grassland (a), on *Quercus pubescens* (b), 875 m, 44°14’29,8’’N, 10°47’33,2’’E, 13.8.2015. – **403**: MO, Le Polle at Monte Cimone, beech forest, on *Fagus sylvatica*, 1265 m, 44°13’03,9’’N, 10°41’21,5’’E, 13.8.2015. – **404**: MO, above Fanano, Passo della Croce Arcana, on slate plates (a), on wet rocks near the stream (b), 640 m, 44°11’05,3’’N, 10°47’43,4’’E, 14.8.2015. – **405**: MO, Ospitale S Fanano, on *Juglans regia* (a), on *Prunus avium* (b), 905 m, 44°09’59,9’’N, 10°47’20,7’’E, 14.8.2015. – **406**: MO, between Dogana and Roveri above Pievepelago, dry grassland and rocks (limestone and sandstone), 1315 m, 44°09’54,4’’N, 10°37’36,7’’E, 15.8.2015. – **407**: MO, between Dogana and Roveri above Pievepelago, on *Fraxinus* sp., 1165 m, 44°10’06,3’’N, 10°38’02,1’’E, 15.8.2015. – **409**: MO, Val di Luce SW Abetone, mixed forest, on *Fagus sylvatica* (a), on *Abies alba* (b), on *Picea abies* (c), 1330 m, 44°09’02,5’’N, 10°38’02,0’’E, 15.8.2015. – **410**: MO, Le Pozze above Fiumalbo near Pievepelago, on sandstone fragments, 1395 m, 44°09’05,8’’N, 10°37’49,4’’E, 15.8.2015. – **412**: MO, Montecreto, Parco dei Castagni, on *Castanea sativa* (a), on dead wood of *Castanea sativa* (b), 845 m, 44°14’50,4’’N, 10°42’50,3’’E, 16.8.2015. – **413**: MO, Prignano sulla Seccia, solitary trees, on *Quercus cerris* (a), on *Acer campestre* (b), on *Carpinus betulus* (c), 605 m, 44°26’10,6’’N, 10°45’15,6’’E, 16.8.2015. – **414**: MO, N Montebaranzone, limestone rocks and dry grassland, 420 m, 44°29’27,0’’N, 10°47’14,1’’E, 16.8.2015. – **415**: PR, above Berceto at the SS 62, solitary trees, on *Acer pseudoplatanus* (a), on *Quercus cerris* (b), in dry calcareous grassland (c), 915 m, 44°31’28,7’’N, 09°59’42,0’’E, 17.8.2015. – **416**: PR, besides the SS 62 near Corniana, gappy dry calcareous grassland, 795 m, 44°36’09,1’’N, 10°04’17,6’’E, 17.8.2015. – **417**: PR, Riserva Naturale Monte Prinzera, siliceous rocks, 635 m, 44°38’21,6’’N, 10°04’56,8’’E, 17.8.2015. – **418**: PR, Valle Gotra near Boschetto SW Borgo Val di Taro, mixed forest, on *Castanea sativa*, 680 m, 44°24’55,9’’N, 09°41’08,4’’E, 17.8.2015 – **419**: PR, Passo Cubiarrea, SW Borgo Val di Taro Above Montegroppo, shrubbery of *Prunus spinosa*, 1030 m, 44°24’09,8’’N, 09°39’47,9’’E, 17.8.2015. – **420**: PR, below Passo Cubiarrea, solitary trees, on *Acer pseudoplatanus* (a), on *Fraxinus excelsior* (b), 925 m, 44°24’14,4’’N, 09°40’10,7’’E, 17.8.2015. – **421**: PR,

between Brunelli and Porciagatone N Borgo Val di Taro, mixed forest, on *Quercus pubescens* (a), on *Castanea sativa* (b), 685 m, 44°31’09,5’’N, 09°44’35,3’’E, 18.8.2015. – **422**: PR, Passo S. Donna N Borgo Val di Taro, dry grassland with base-rich sandstone (a), on *Quercus* sp. (b), 935 m, 44°32’43,8’’N, 09°43’56,1’’E, 18.8.2015. – **423**: PR, Monastero near Bardi, rocky slope with stunted oaks, on base-rich slate (a), on *Quercus pubescens* (b), 585 m, 44°35’38,3’’N, 09°45’59,9’’E, 18.8.2015. – **424**: PR, Bardi, Piazza, on *Tilia platyphyllos*, 615, 44°37’55,5’’N, 09°43’53,6’’E, 18.8.2015. – **425**: PR, Passo Montevacca NE Bedónia, edge of mixed forest, on *Castanea sativa* (a), on *Pyrus communis* (b), on *Quercus pubescens* (c), 800 m, 44°32’06,4’’N, 09°36’38,9’’E, 18.8.2015. – **450**: PC, Castello Vigoleno near Salsomaggiore, wall on the parapet walk of the main tower, 355 m, 44°49’00,2’’N, 09°54’01,3’’E, 30.8.2015. – **451**: PR, Pietra Nera W Salsomaggiore, ophiolitic rock, 195 m, 44°48’59,0’’N, 09°54’55,3’’E, 30.8.2015. – **452**: PR, Parco Ducale, eastern end, on *Platanus* sp. (a), on *Aesculus hippocastanus* (b), 55 m, 44°48’22,4’’N, 10°19’14,9’’E, 31.8.2015. – **453**: PR, Busseto, alley in front of Palazzo Pallavicino, on different trees, 35 m, 44°58’36,0’’N, 10°02’23,8’’E, 1.9.2015. – **523**: FE, Ferrara, Campeggio, on *Morus alba*, 4 m, 44°51’12,3’’N, 11°38’03,5’’E, 7.8.2018.

Lazio (provinces: VT = Viterbo): **598**: VT, Bagnoregio, road to Civita, tuff wall, 435 m, 42°37’31,4’’N, 12°06’18,7’’E, 11.6.2022. – **599**: VT, between Bagnoregio and Sterpeti, oak forest, on *Quercus cerris*, 400 m, 42°36’21,8’’N, 12°05’43,9’’E, 11.6.2022. – **600**: VT, Bagnoregio, Celleno, way to Borgo Fantasma, tuff wall, 340 m, 42°33’46,6’’N, 12°08’36,7’’E, 11.6.2022. – **601**: VT, between Bolsena and Borghetto, olive grove, 325 m, 42°39’23,9’’N, 11°55’43,8’’E, 12.6.2022. – **602**: VT, Riserva Naturale Monte Rufeno NE Acquapendente, La Bandita, coppice forest, on *Quercus pubescens* (a), on *Acer campestre* (b), 305 m, 42°46’18,5’’N, 11°55’08,5’’E, 12.6.2022. – **603**: VT, Riserva Naturale Monte Rufeno NE Acquapendente, olive grove, on *Olea europaea*, 385 m, 42°47’03,9’’N, 11°51’50,0’’E, 12.6.2022. – **604**: VT, Monti Volsini, near Evangelista, oak at the roadside, on *Quercus cerris*, 650 m, 42°38’39,6’’N, 11°48’11,6’’E, 12.6.2022.

Liguria (provinces: GE = Genova, SP = La Spezia, SV = Savona): **426**: SP, below Passo di Cento Croci, calcareous outcrops, 860 m, 44°23’52,3’’N, 09°37’01,7’’E, 19.8.2015. – **427**: SP, W Cassego NW Varese Ligure, mixed forest, on *Carpinus betulus* (a), on outcrops of slate (b), 1015 m, 44°24’45,8’’N, 09°28’53,3’’E, 19.8.2015. – **428**: GE, Passo della Forcella, slate rocks and dry grassland, 880 m, 44°27’44,1’’N, 09°20’07,9’’E, 20.8.2015. – **429**: GE, Valle Aveto W Priosa, beech forest, on *Fagus sylvatica* (a), on soil/on outcrops (b), 920 m, 44°28’29,3’’N, 09°15’01,6’’E, 20.8.2015. – **430**: GE, Rovegno, S village entry, trees along the roadside, on *Quercus pubescens* and *Acer pseudoplatanus*, 620 m, 44°34’09,7’’N, 09°16’43,5’’E, 20.8.2015. – **431**: GE, Rovegno, N village entry, loc. Fontanelle, chestnut grove, on *Castanea sativa*, 620 m, 44°34’56,7’’N, 09°16’30,9’’E, 20.8.2015. – **432**: GE, Cassingheno NE Torriglia, mixed forest, on *Castanea sativa*, 920 m, 44°33’21,4’’N, 09°14’45,7’’E, 21.8.2015. – **433**: GE, above Carpeneto NE Torriglia, limestone scree with sandstone, 1095 m, 44°34’19,7’’N, 09°14’31,2’’E, 21.8.2015. – **434**: GE, Rondanina above Diga Lago di Brugneto, on slate rocks (a), on *Quercus cerris* (b), 1005 m, 44°32’55,5’’N, 09°12’54,9’’E, 21.8.2015. – **435**: GE, above Torriglia, on *Quercus cerris* near the roadside, 985 m, 44°31’45,5’’N, 09°09’41,4’’E, 21.8.2015. – **437**: SV, Sassello, E

village entry, trees along the roadside, on *Quercus pubescens* (a), on *Fraxinus excelsior* (b), 395 m, 44°29’18,2’’N, 08°30’20,3’’E, 22.8.2015. – **438**: SV, Sassello, E village entry, siliceous rocks and grus, 405 m, 44°29’22,5’’N, 08°30’19,9’’E, 22.8.2015. – **439**: SV, by the road from Sassello to Urbe, open soil with pebbles in dry grassland, 55 m, 44°29’58,3’’N, 08°32’28,1’’E, 22.8.2015. – **440**: SV, above Urbe by the road to Piampaludo, siliceous bolder scree, 685 m, 44°28’33,0’’N, 08°34’54,3’’E, 22.8.2015. – **441**: SV, above S. Pietro d’Olba near Urbe, orchard, on *Pyrus* sp., 625 m, 44°29’39,5’’N, 08°35’12,2’’E, 22.8.2015. – **442**: SV, between Giusvalla and Galletti near Dego, calcareous and sandstone rocks and dry grassland, 395 m, 44°27’29,6’’N, 08°21’13,3’’E, 22.8.2015. – **443**: SP, Baracchino, by the SS 1, granite rocks and grus, 575 m, 44°15’17,9’’N, 09°33’04,3’’E, 23.8.2015. – **444**: SP, Passo del Bracco, granite grus, 515 m, 44°15’00,5’’N, 09°36’25,5’’E, 23.8.2015.

Marche (provinces: AP = Ascoli–Piceno, FM = Fermo, MC = Macerata, PU = Pesaro e Urbino): **381**: MC, Santuario delle Macchie W San Severino, on solitary *Quercus pubescens*, 435 m, 43°13’41,7’’N, 13°05’15,4’’E, 4.8.2015. – **382**: MC, Cimiterio di Pioraco, on *Fraxinus* sp., 365 m, 43°10’35,7’’N, 13°00’06,1’’E, 4.8.2015. – **383**: MC, W Pioraco, at the Potenza, on *Juglans regia* (a), on *Corylus avellana* (b), on *Prunus avium* (c), 445 m, 43°10’45,1’’N, 12°58’13,2’’E, 4.8.2015. – **384**: MC, between Setro and Sorlí S Pioraco, on limestone rocks, 550 m, 43°08’01,8’’N, 12°57’04,2’’E, 4.8.2015. – **385**: MC, between Jesi and Cingoli, on old oaks by the roadside, 250 m, 43°24’50,2’’N, 13°12’16,7’’E, 6.8.2015. – **386**: MC, Cingoli, below the city wall S the old town, alley of *Tilia* sp., 610 m, 43°22’19,4’’N, 13°13’02,1’’E, 6.8.2015. – **387**: MC, Elcito, village entry, on *Fraxinus ornus*, 805 m, 43°19’20,6’’N, 13°06’12,0’’E, 6.8.2015. – **388**: MC, Monte La Forchella W Elcito, mixed forest, on *Fagus sylvatica* (a), on *Acer campestre* (b), on *Carpinus betulus* (c), 1085 m, 43°18’03,6’’N, 13°04’19,6’’E, 6.8.2015. – **524**: AP, Monti Sibillini, SW Montegallo, on *Quercus pubescens*, 920 m, 42°49’53,1’’N, 13°19’30,5’’E, 13.8.2018. – **525**: AP, Monti Sibillini, between Montegallo and Montemonaco, sweet chestnut grove, on *Castanea sativa* and dead wood, 910 m, 42°51’56,5’’N, 13°20’09,2’’E, 14.8.2018. – **526**: AP, Monti Sibillini, S Foce, on *Tilia* sp., 960 m, 42°52’23,4’’N, 13°16’10,3’’E, 14.8.2018. – **527**: AP, Monti Sibillini, S Foce, on *Acer campestre*, 1015 m, 42°52’01,1’’N, 13°15’57,5’’E, 14.8.2018. – **528**: AP, Monti Sibillini, above Stinco near Sarnano, dry calcareous grassland with outcrops, 1350 m, 43°00’38,0’’N, 13°14’33,9’’E, 14.8.2018. – **529**: FM, Santuario Madonna dell’Ambro, parking area, on *Tilia* sp., 700 m, 42°57’06,7’’N, 13°17’22,0’’E, 15.8.2018. – **530**: MC, 1,5 km SW San Ginesio, on *Quercus* sp. by the roadside, 510 m, 43°05’42,8’’N, 13°18’21,6’’E, 15.8.2018. – **531**: MC, Monti Sibillini, between Bolognola and Acquacanina, on *Ostrya carpinifolia* and *Prunus* sp. (a), dry calcareous grassland with outcrops (b), 1130 m, 42°59’19,4’’N, 13°14’00,8’’E, 16.8.2018. – **532**: MC, Monti Sibillini, Fiastra–Cocconi, stunted *Quercus petrea* (a), on soil/rocks (b), 700 m, 43°02’23,6’’N, 13°08’38,3’’E, 16.8.2018. – **533**: MC, Monti Sibillini, between Santuario di Macerata and Ussita by the SP 18, loose oak coppice forest, on *Quercus pubescens*, *Acer monspessulanum* and *Prunus* sp., 1100 m, 42°57’51,2’’N, 13°08’22,1’’E, 16.8.2018. – **544**: PU, SE Pian di Lucchio near Cantiano, mixed forest, on *Juglans regia*, 620 m, 43°26’07,6’’N, 12°41’35,1’’E, 21.8.2018. – **596**: PU, Gola di Furlo, on limestone rocks in narrow gorge, 190 m, 43°38’49,6’’N, 12°43’35,9’’E, 8.6.2022. – **597**: PU, Santuario di

Santa Maria del Pelingo near Acqualagna, grove of *Tilia* sp., 215 m, 43°38’25,2’’N, 12°41’31,9’’E, 8.6.2022. – **611**: MC, Monti Sibillini, Pintura above Bolognola, forest of *Fagus sylvatica*, 1350 m, 42°59’14,5’’N, 13°16’33,1’’E, 28.7.2024.

Toscana (provinces: AR = Arezzo, FI = Firenze, GR = Grosseto, LI = Livorno, PI = Pisa, PT = Pistoia, SI = Siena): 335: LI, Marina di Castagneto Carducci, dunes south of the camping site, dune shrubbery, on *Juniperus macrocarpus*, 5 m, 43°10’09,4’’N, 10°32’22,8’’E, 14.10.2014. – **393**: FI, Parco Nazionale delle Foreste Casentinesi, Valico dei Tre Faggi E Passo del Muraglione, stony dry calcareous grassland on calcareous sandstone, 990 m, 43°55’38,6’’N, 11°40’41,9’’E, 9.8.2015. – **394**: FI, Parco Nazionale delle Foreste Casentinesi, Castagneto near San Godenzo, on *Castanea sativa* (a), on sandstone (b), 530 m, 43°56’22,5’’N, 11°36’55,8’’E, 9.8.2015. – **395**: AR, Parco Nazionale delle Foreste Casentinesi, NW Stia, by the SP 556 near Mori, mixed forest, on *Quercus pubescens*, 815 m, 43°50’35,9’’N, 11°38’21,5’’E, 9.8.2015. – **408**: PT, Val di Luce SW Abetone, mixed forest, on *Fagus sylvatica* (a), on *Abies alba* (b), on bolders (c), 1330 m, 44°09’00,6’’N, 10°38’07,8’’E, 15.8.2015. – **411**: PT, Rifugio Selletta above Abetone, on sandstone bolders on the ski slope, 1690 m, 44°07’50,8’’N, 10°39’27,1’’E, 15.8.2015. – **445**: LI, Marina di Castagneto Carducci, dune scrub, on *Juniperus macrocarpus*, 5 m, 43°10’22,6’’N, 10°32’23,9’’E, 24.8.2015. – **446**: LI, N Marina di Castagneto Carducci, dune scrub, on *Juniperus macrocarpus*, 10 m, 43°11’04,3’’N, 10°32’16,3’’E, 27.8.2015. – **447**: LI, N San Vincenzo, dune scrub, on *Juniperus macrocarpus* (a), on *Quercus ilex* (b), 10 m, 43°06’52,9’’N, 10°32’23,5’’E, 29.8.2015. – **448**: LI, between San Vincenzo and Marina di Castagneto Carducci, dune scrub, on *Juniperus macrocarpus* (a), on *Phyllyrea angustifolia* (b), 10 m, 43°07’39,4’’N, 10°32’26,2’’E, 29.8.2015. – **449**: LI, between San Vincenzo and Marina di Castagneto Carducci, dune scrub, on *Juniperus macrocarpus*, 10 m, 43°09’00,4’’N, 10°32’27,5’’E, 29.8.2015. – **512**: GR, Castel del Piano, Campeggio, on *Tilia* sp., 655 m, 42°53’02,2’’N, 11°32’06,8’’E, 31.8.2016. – **513**: GR, Monte Amiata, above Castel del Piano, sweet chestnut grove, on *Castanea sativa* (a), on soil with sandstone pebbles (b), 755 m, 42°53’30,0’’N, 11°33’18,3’’E, 1.9.2016. – **514**: GR, Monte Amiata, above Castel del Piano, forest of *Fagus sylvatica*, 1275 m, 42°53’14,4’’N, 11°35’25,3’’E, 1.9.2016. – **515**: GR, Monte Amiata, above Castel del Piano, forest of *Fagus sylvatica*, 1515 m, 42°52’57,2’’N, 11°36’45,9’’E, 1.9.2016. – **516**: GR, Monte Amiata, above Abbadia San Salvatore, sweet chestnut grove, on *Castanea sativa*, 1080 m, 42°53’49,1’’N, 11°38’57,6’’E, 1.9.2016. – **517**: GR, Monte Amiata, above Bagnolo, mixed forest, on *Acer pseudoplatanus* (a), on *Pinus* sp. (b), 1135 m, 42°51’27,5’’N, 11°37’08,7’’E, 1.9.2016. – **518**: GR, Monticello Amiata, Parco Comune, sweet chestnut grove, on *Castanea sativa*, 690 m, 42°53’11,4’’N, 11°28’38,0’’E, 2.9.2016. – **519**: GR, between Sasso d’Ombrone and Paganico, on dead twigs of *Acer campestre*, 60 m, 42°56’26,7’’N, 11°19’25,3’’E, 2.9.2016. – **520**: GR, Colline Metallifere, between Meleta and Prata, mixed forest, on *Quercus* sp. (a), on *Carpinus betulus* (b), on *Acer campestre* (c), 430 m, 43°02’34,0’’N, 11°02’57,2’’E, 2.9.2016. – **546**: AR, NE Arezzo, between Tavernelle and Scille, on *Quercus pubescens* by the roadside, 445 m, 43°32’56,8’’N, 11°58’44,3’’E, 22.8.2018. – **547**: FI, Londra, olive grove, on *Olea europaea*, 440 m, 43°51’33,8’’N, 11°35’10,0’’E, 22.8.2018. – **548**: FI, Passo della Futa near Barberino di Mugello, on *Acer pseudoplatanus* by the roadside, 895 m, 44°05’24,1’’N, 11°16’52,2’’E, 22.8.2018. – **549**: PT, Pistoia, Corso Antonio Gramsci, on

Quercus ilex, 70 m, 43°55’51,5’’N, 10°54’46,5’’E, 28.9.2018. – **550**: PT, Monteferrato N Prato, sunny serpentinite rocks, 110 m, 43°54’42,7’’N, 11°05’16,8’’E, 28.9.2018. – **551**: PT, between Pracchia and Frassinoni, at Torrente Faldo, on shady siliceous rocks in and near the stream (a), on *Corylus*, *Carpinus*, *Fagus* (b), 650 m, 44°03’39,4’’N, 10°55’09,4’’E, 29.9.2018. – **552**: PT, between Pracchia and Frassinoni, limestone wall by the roadside, 640 m, 44°03’43,3’’N, 10°55’05,1’’E, 29.9.2018. – **553**: PT, between Pracchia and Frassinoni, near Bambocchia, mixed forest, on *Acer pseudoplatanus* (a), on *Prunus avium* (b), 650 m, 44°03’51,1’’N, 10°55’13,4’’E, 29.9.2018. – **554**: PT, between Pracchia and Frassinoni, above Case Novelli, on *Castanea sativa* in old sweet chestnut grove, 700 m, 44°04’01,0’’N, 10°55’25,0’’E, 29.9.2018. – **555**: PT, between Pracchia and Frassinoni, Case Andreani, dry stone wall by the roadside, 730 m, 44°04’01,0’’N, 10°55’41,8’’E, 29.9.2018. – **556**: PT, Pracchia, Station square, row of old *Acer pseudoplatanus*, 620 m, 44°03’18,1’’N, 10°54’23,6’’E, 29.9.2018. – **549**: PT, Pistoia, Corso Antonio Gramsci, on *Quercus ilex* on the roadside, 70 m, 43°55’51,5’’N, 10°54’46,5’’E, 28.9.2018. – **550**: PT, Monteferrato N Prato, on serpentinite rocks, 110 m, 43°54’42,7’’N, 11°05’16,8’’E, 28.9.2018. – **551**: PT, between Pracchia and Frassinoni, valley of Torrente Faldo, on siliceous rocks near the stream (a), on deciduous trees (b), 650 m, 44°03’39,4’’N, 10°55’09,4’’E, 29.9.2018. – **552**: PT, between Pracchia and Frassinoni, limestone wall by the roadside, 640 m, 44°03’43,3’’N, 10°55’05,1’’E, 29.9.2018. – **553**: PT, between Pracchia and Frassinoni, S Bambocchia, mixed forest, on *Acer pseudoplatanus* (a), on *Prunus avium* (b), 650 m, 44°03’51,1’’N, 10°55’13,4’’E, 29.9.2018. – **554**: PT, between Pracchia and Frassinoni, above Case Novelli, on *Castanea sativa* in on old sweet chestnut stand, 700 m, 44°04’01,0’’N, 10°55’25,0’’E, 29.9.2018. – **555**: PT, between Pracchia and Frassinoni, Case Andreani, old dry stone wall at the roadside, 730 m, 44°04’01,0’’N, 10°55’41,8’’E, 29.9.2018. – **556**: PT, Pracchia, station forecourt, on *Acer pseudoplatanus*, 620 m, 44°03’18,1’’N, 10°54’23,6’’E, 29.9.2018. – **605**: GR, between Celena and Triana, oaks along the roadside, on *Quercus cerris*, 715 m, 42°45’22,5’’N, 11°34’09,9’’E, 13.6.2022. – **606**: GR, Monticello Amiata, camping site, sweet chestnut grove, on *Castanea sativa* (a), on *Acer* sp. (b), 720 m, 42°52’57,9’’N, 11°28’35,2’’E, 13.6.2022. – **607**: GR, Arcidosso, mortared wall at the castle, 665 m, 42°52’20,3’’N, 11°32’10,7’’E, 14.6.2022. – **608**: GR, Riserva Naturale Monte Labbro S Arcidosso, limestone rocks, 955 m, 42°49’43,6’’N, 11°32’02,4’’E, 14.6.2022. – **609**: GR, Monticello Amiata, camping site, Alley of *Quercus pubescens*, 710 m, 42°52’57,3’’N, 11°28’36,7’’E, 14.6.2022. –**610**: PI, Volterra, camping site, loose tree stand, on *Olea europaea* (a), on *Aesculus* sp. (b), 470 m, 43°24’45,7’’N, 10°51’04,1’’E, 18.6.2022.

Umbria (provinces: PG = Perugia, TR = Terni): **510**: TR, Orvieto, parking area in front of the castle, on *Aesculus hippocastanus*, 280 m, 42°43’16,3’’N, 12°07’10,2’’E, 31.8.2016. – **511**: TR, Monti Volsini, W Castel Giorgio near Orvieto, on *Quercus cerris* between road and meadow, 530 m, 42°41’52,1’’N, 11°56’34,7’’E, 31.8.2016. – **534**: PG, Monti Sibillini, Piano Grande, Monte Ventoso, dry grassland with outcrops, 1475 m, 42°45’59,5’’N, 13°11’25,0’’E, 17.8.2018. – **535**: PG, Monti Sibillini, Piano Grande, Monte Ventoso, beech forest, on *Fagus sylvatica*, 1480 m, 42°45’55,1’’N, 13°11’23,9’’E, 17.8.2018. – **536**: PG, Monti Sibillini, between Todiano and Campi N Norcia, coppice forest, on *Acer monspessulanum* and *Quercus pubescens*, 720 m, 42°50’59,8’’N, 13°04’08,0’’E, 17.8.2018. – **537**:

PG, N Piedipaterno, Valle di Nera, grove, on *Acer campestre* and *Prunus* sp., 345 m, 42°46'37,8''N, 12°52'03,3''E, 18.8.2018. – **538**: PG, Assisi, Campeggio Fontemaggio, on *Olea europaea* (a), on *Pinus* sp. (b), 530 m, 43°03'50,9''N, 12°37'58,7''E, 18.8.2018. – **539**: PG, Lago Trasimeno, Castiglione del Lago, park at the lake shore, on *Acer* sp. and others, 265 m, 43°07'59,2''N, 12°02'45,6''E, 20.8.2018. – **540**: PG, N Piccione S Gubbio, dry grassland with outcrops (calcareous sandstone), 595 m, 43°12'25,4''N, 12°31'36,2''E, 20.8.2018. – **541**: PG, Monte Cucco, Le Gorghe, coppice forest in dry valley, on *Fraxinus excelsior*, 550 m, 43°20'34,7''N, 12°45'12,7''E, 20.8.2018. – **542**: PG, Costacciaro near Gubbio, Campeggio Rio Verde, loose grove of *Quercus ilex*, *Juglans regia*, *Prunus avium*, *Acer campestre*, 450 m, 43°21'00,7''N, 12°41'02,5''E, 20.8.2018. – **543**: PG, between Madonna della Cima and Troppola, on *Quercus pubescens* on the roadside, 710 m, 43°23'17,7''N, 12°36'54,3''E, 21.8.2018. – **545**: PG, N Isola Fossara, dry calcareous grassland with outcrops, 505 m, 43°26'56,1N, 12°44'47,5''E, 21.8.2018.

Results

Species new to a region are indicated with an asterisk (*) placed before the regional abbreviation, species new for Italy with two asterisks (**) preceding the species name. Saprophytes are indicated with an "S" placed before the species name.

Abrothallus microspermus Tul.
***LIG: 431**: (hb Brackel 8693). – **TOS: 546**; **553b**: (hb Brackel 8036). All on *Flavoparmelia caperata*, thallus, as the *Vouauxiomyces* anamorph.
In 8693 the conidia are smaller than usual, 4–5.5 ×3–4 µm (vs. 6.5 × 3.5 µm in Tulasne 1852 and 6.5–8.5 × 4–5.5 µm in Hawksworth & Dyko 1970); in the specimens from the Toscana, they measure 6–8 × 3.5–4 µm.

****Abrothallus parmotrematis*** Diederich
TOS: 547: on *Parmotrema perlatum*, thallus (hb Brackel 9211).
Ascomata cushion-like, rimless, black, epruinose, basally constricted; epithecium greenish brown, hymenium subhyaline, hypothecium brown; asci 8-spored; ascospores 1-septate, soleiform, light olive-brown, verruculose, 12–16 × 5–6 µm.

Abrothallus suecicus (Kirschst.) Nordin
***TOS: 335:** on *Ramalina canariensis*, thallus (hb Brackel 7226b, as the *Vouauxiomyces* anamorph).

Abrothallus teloschistis Brackel, Pérez-Ortega & Suija
TOS: 446: on *Seirophora villosa*, thallus (hb Brackel 8814); **449**: on *S. villosa*, thallus (hb Brackel 8819).
These are the second and third finds of *Abrothallus teloschistis* for Italy, only 1.7 km north and 2,1 km south of the type locality, all in the dune shrubbery of Marina di Castagneto Carducci. In addition to the description given in Brackel (2015) in 8814 the fungus was growing also on the apothecial discs.

Acremonium antarcticum (Speg.) D. Hawksw. agg.
TOS: Prov. di Pistoia, Migliorini S San Marcello Pistoiese, at the fork to Piteglio, sweet chestnut grove, on *Castanea sativa*, on *Parmelia saxatilis* agg., 755 m, 44°01'31,1''N, 10°46'11,1''E, W. & G. v. Brackel, 13.10.2014 (hb Brackel 7068; loc. 334 in Brackel 2015). Our specimen fits well the features given in Hawksworth (1979) but we prefer to include it under the "agg.", as we suppose that under this name a complex of morphologically similar but distinct taxa may be involved.

Acremonium pertusariae Brackel & Etayo
TOS: 553a: on *Pertusaria pertusa*, thallus and ascomatal warts (hb Brackel 8037).

Adelococcus interlatens (Arnold) Matzer & Hafellner
***EMI: 406**: on *Sarcogyne pruinosa*, thallus (hb Brackel 8903).
The poor specimen contains some ascomata of the fungus with young asci and not fully developed hyaline ascospores, ca. 11–12.5 × 6 µm. The ascomata measure ca. 180 µm, are dark brown in the upper part and very pale brown in the lower part. The hymenial jelly reacts KI+ blue, the interascal filaments are almost simple.
The species was known until now in Italy only from three finds of Arnold from Alto Adige, all from the end of the 19th century (BSM 2006–2025).

Arthonia diploiciae Calatayud & Diederich (Fig. 1)
TOS: 449: on *Diploicia canescens*, thallus (hb Brackel 8884).

Arthonia donoraticensis Brackel **species nova** (Figs. 2, 3)
MycoBank # 858885
Diagnose: Fungus lichenicola in thallo lichenis *Flavoparmelia soredians* crescens. Ascomata arthonioidea, solitaria vel aggregata, nigra, 100–175 µm in diametro. Epihymenium fuscum, hymenium subhyalinum vel pallido fuscum, hypothecium pallido fuscum. Paraphyses apicaliter fuscae. Asci fissitunicati, globosi vel saccati, 3–8-spori, 20–28 × 15–20 µm. Ascosporae uniseptatae, soleiformae vel irregulariter ellipsoideae, hyalinae, laeves, (7–)7,4–9,6(–10) × (3–)3,2–4,2(–5) µm.
Typus: Italy, Toscana, Provincia di Livorno, N San Vincenzo, SSW Donoratico, dune scrub, on *Juniperus macrocarpus*, on *Flavoparmelia soredians*, 10 m, 43°06'52,9''N, 10°32'23,5''E, 29.8.2015, leg. W. & G. v. Brackel (M – holotypus, hb Brackel 8694 – isotypus) (Fig. 2).
Description: Ascomata arthonioid, breaking through the host's cortex, then superficial on the thallus, roundish pillow-like, convex, immarginate, black, dark brown to black when moist, rough but shiny, sometimes covered with remnants of the host cortex, 100–175 µm diameter, scattered or in loose groups. Exciple lacking; epithecium thin, medium to dark brown, irregularly tinted, K–; hymenium subhyaline to very pale brown, K–, I+ wine red, KI+ persistently blue, ca. 40 µm high; hypothecium pale brown, K–, ca. 20 µm high. Paraphysoids indistinct in the lower part; in the upper part septate, ramified, anastomosing, 1–2 µm wide, (sub)hyaline, apically perpendicular bent over the asci for up to 8 µm (and more), this part up to 2.5 µm wide, sometimes ramified, pigmented pale brownish grey to almost black at the most exposed parts. Asci fissitunicate, globose to saccate, 3–8-spored, with a tiny but distinct KI+ blue ring in the chambre oculaire and a thin KI+ blue layer

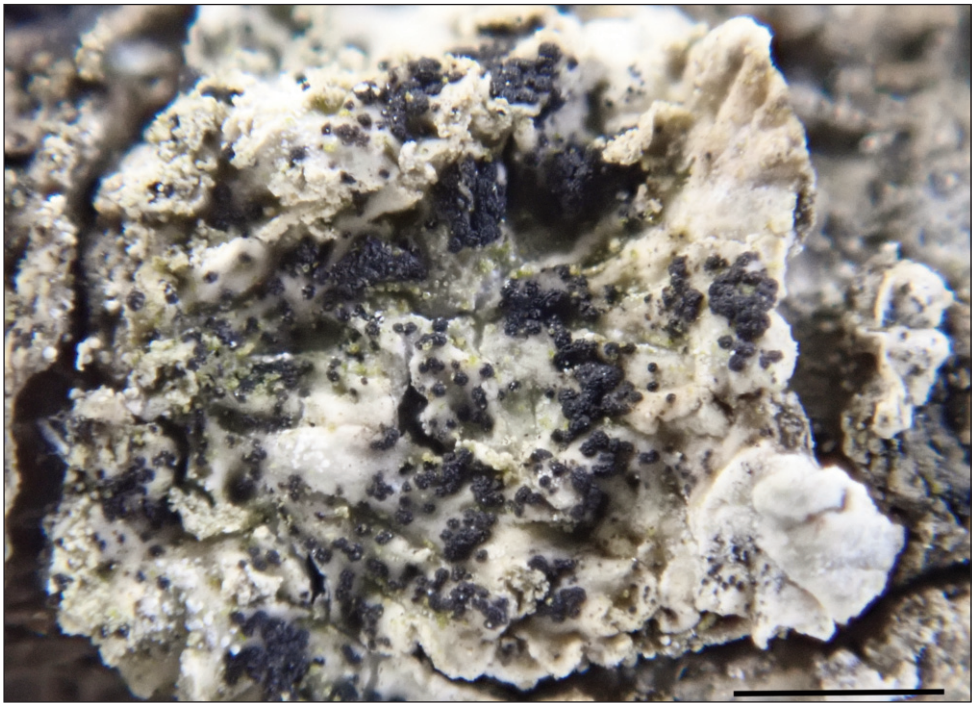

Fig. 1. *Arthonia diploiciae* on *Diploicia canescens*, San Vincenzo, 2015. Bar = 1 mm.

around the ascus wall, endoplasm I+ deep orange, 20–28 × 15–20 µm. Ascospores hyaline, smooth, 1-septate, narrowly ellipsoid to soleiform or somehow irregular, heteropolar with a broader upper cell, (7.0–)7.4–9.6(–10.0) × (3.0–)3.2–4.2(–5.0) µm, l/b = (1.6–)2.0–2.7(–3.0) (n = 30). Conidiomata not observed (Fig. 3).

Etymology: Named after the village Donoratico, the main settlement in this coastal area.

Host and distribution: The new species is known from the type locality in Italy, where it grows on the thallus and soralia of *Flavoparmelia soredians* and from northwestern France, growing on *Flavoparmelia caperata*, also on thallus and soralia. The infection does not induce the formation of galls nor does it cause any visible damage to the host. In the type specimen it is accompanied by an unknown *Talpapellis*, the latter slightly discolouring the host's cortex.

Discussion: With almost 170 taxa, *Arthonia* s. lat. is one of the genera with the most lichenicolous species. As the phylogeny of *Arthonia* s. lat. is far from being fully explored, we treat here *A. donoraticensis* as a part of this complex of genera under the name *Arthonia*, though it might belong to the *Bryostigma* clade.

As lichenicolous species of *Arthonia* s. lat. generally are rather host specific, the new species has to be compared with the other twelve species growing on members of the family Parmeliaceae. *Arthonia coronata* Etayo growing on *Flavoparmelia* is easily distinguished by the brown setae on the ascomata, the missing KI reactive apical ring in the asci

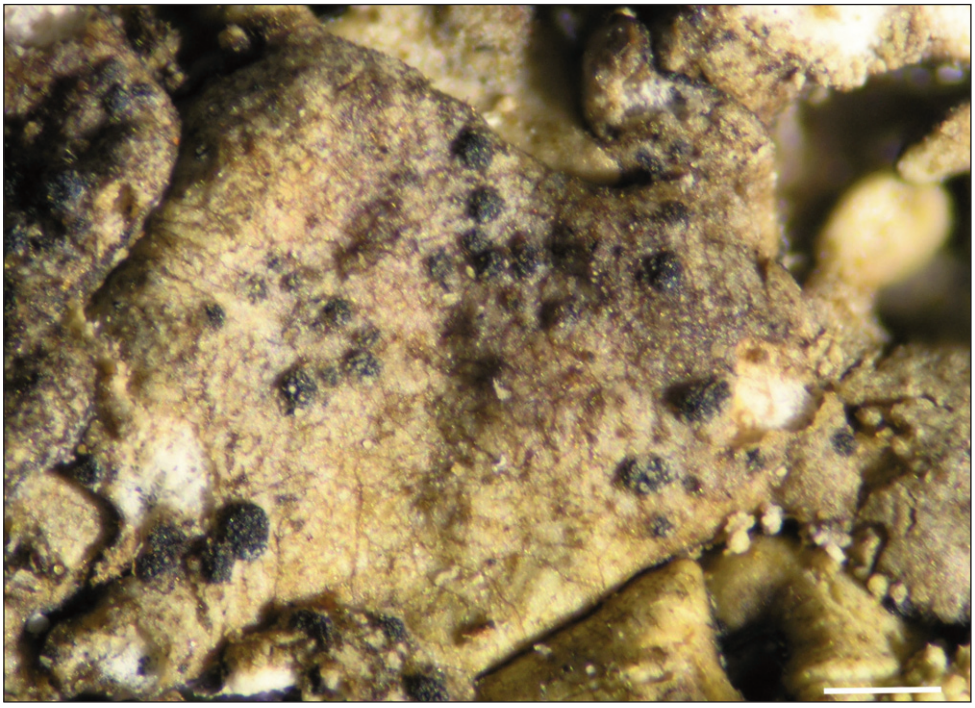

Fig. 2. *Arthonia donoraticensis*, holotype: habitus on *Flavoparmelia soredians*. The net of brown belongs to an undescribed *Talpapellis* species. Bar = 250 µm.

and the longer ascospores [(10–)11–14 vs (7.0–)7.4–9.6(–10.0)] (Etayo 1996). Also, all other *Arthonia* species growing on Parmeliaceae have distinctly longer ascospores; the shortest has *A. pepei* with (8–)9.5–11 µm, all others measure at least 10 µm (Etayo & Pérez-Ortega 2016).

All other species on different hosts with such short ascospores have thoroughly 8-spored asci, except for *A. rangiformicola* Brackel and *A. diploiciae* Calat. & Diederich. These two are distinguished by much narrower asci (10–15 µm and 7–12 µm rsp., vs 15–20 µm in *A. donoraticensis*) (Brackel 2015, Calatayud & al. 1995).

A species very similar to *A. donoraticensis* is the lichenised *Bryostigma lapidicola* (Taylor) S. Y. Kondr. & J.-S. Hur. It was described as *Lecidea lapidicola* Taylor in Mackay (1836) from England on stone, then as *Arthonia muscigena* Th. Fr. by Fries (1865) from Sweden on bryophytes and finally as *Bryostigma leucodontis* Poelt & Döbbeler (Poelt & Döbbeler 1979) from Austria on Bryophytes. To further complicate matters, the name *Bryostigma lapidicola* was used in the meantime for a lichen now referred to as *Arthonia fusca* (A. Massal.) Hepp. (Fryday 2004). Unfortunately, Fryday's suggestion to conserve the name *A. muscigena* was not followed by Kondratyuk & al. (2020). Etayo & Sancho (2008) suppose that *B. lapidicola* is conspecific with several samples of an *Arthonia* on various lichens, such as *Bacidia*, *Bacidina*

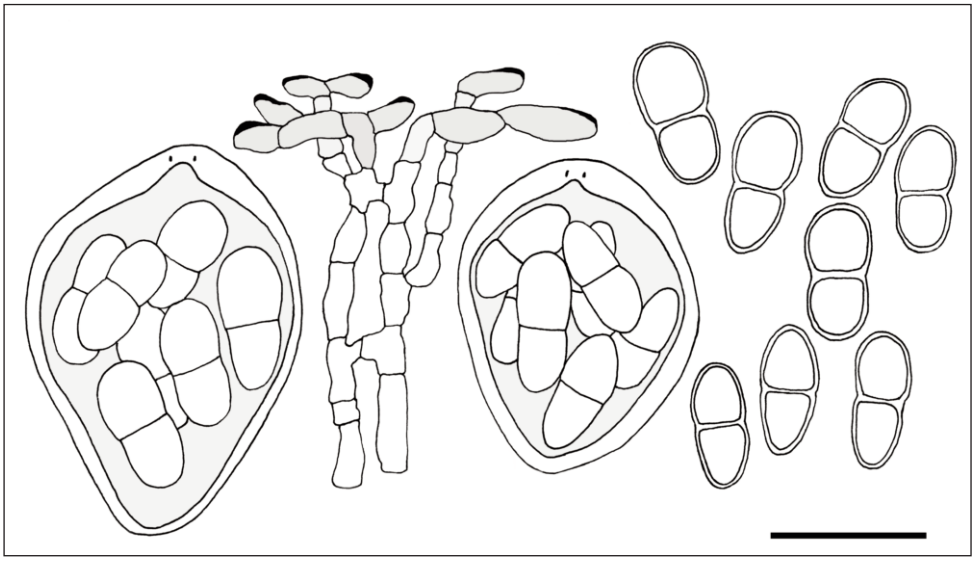

Fig. 3. *Arthonia donoraticensis*, asci, paraphysoids, ascospores. Bar = 10 µm.

Cetrariastrum, *Nephroma*, *Peltigera*, and *Pseudocyphellaria* and state "with very fine thallus or hardly lichenised".

Nevertheless, in our specimen no evidence of lichenisation was observed, and additional morphological differences were noted between the two entities. In *A. donoraticensis* the ascospores are slightly shorter but distinctly broader than in *B. lapidicola*, resulting in a smaller l/b ratio [(1.6–)2.0–2.7(–3.0) vs. (2.3–)2.6–3.6(–4.5)]. Contrary to *B. lapidicola*, in *A. donoraticensis* the asci are not constantly 8-spored but sometimes 4- or even 3-spored. In both species the interascal elements tend to expand periclinally over the asci, assuming a brown-grey colour. In *A. donoraticensis*, however, the darkened paraphyseal ends often also have black caps; consequently, the ascomata remain black also when wet, whereas in *B. lapidicola* they become at least partly translucent. In *B. lapidicola* hymenium, epithecium and hypothecium show a K+ olive hue, missing in *A. donoraticensis*.

Additional specimens examined: **France**: Brittany, dép. Finistère, S of Quimperlé, commune de Quimperlé, forêt de Carnoët, mixed deciduous forest, on twigs of *Quercus* sp., on *Flavoparmelia caperata*, 25 m, 47°50'33,4''N, 03°32'35,1''W, 22.7.2023 (hb Brackel 9052); this specimen was reported as "*Arthonia muscigena* Th. F. s. lat." in Brackel (2024).

Specimens examined for comparison: ***Bryostigma lapidicola***: **Germany**, Schleswig-Holstein: Kiel-Moorsee, Feldgehölz am Nordrand des Kleinflintbecker Moores, auf Holunder, MTB 1726/23, 50 m, P. Neumann, 6.4.2021 (hb Neumann 2047); Kiel Gaarden-Süd, Holunder am Nordrand Viehbrooker Gehölz, MTB 1626/43, 26 m, P. Neumann, 12.1.2023 (hb Neumann 2473); Dreggers, Holunder in Gebüsch an der Tegelbek, MTB 2128/11, 19 m, P. Neumann, 21.10.2022 (hb Neumann 2494, hb Brackel 8758).

Arthonia parietinaria Hafellner & A. Fleischhacker
LAZ: **602b**; **603**. – **MAR**: **381** (hb Brackel 8804a); **382**; **530**. – **TOS**: **445**; **547**; **449**. All on *Xanthoria parietina*, thallus.

Arthonia phaeophysciae Grube & Matzer
EMI: **204**; **405a**: (hb Brackel 8675). – ***UMB**: **537**. All on *Phaeophyscia orbicularis*.

Arthonia* aff. *subvarians Nyl.
UMB: **535**: on *Lecanora carpinea*, apothecia (hb Brackel 9204b).
Ascomata arthonioid, cushion-like, black, on the apothecial disc of the host. Epithecium medium (olive-)brown, hymenium pale olive-brown to subhyaline, hypothecium medium to dark brown. The addition of K results in an intensification of the greyish part of the colours. Asci saccate, 8-spored. Ascospores soleiform, hyaline, smooth, 9–12(–14) × 4–5 µm.
Our specimen does not belong to *A. subfuscicola*, the only known *Arthonia* species on the host *Lecanora carpinea*, as the ascospores are constantly 1-septate and the hypothecium is medium to dark brown, whereas in *A. subfuscicola* the ascospores are (1–)3-septate and the hypothecium is hyaline (Grube 2007, Etayo & Diederich 2009). The very similar *A. subvarians* is restricted to species of the *Lecanora dispersa* group.

Athelia arachnoidea **(Berk.) Jülich**
MAR: **386**: on *Xanthoria parietina*; **526**: on *X. parietina*; **529**: on *Physconia distorta*; **530**: on *X. parietina*; **596**: on *P. distorta*. – **EMI**: **200b**: on *Hyperphyscia adglutinata*, *Phaeophyscia orbicularis*, *Physcia tenella*, *X. parietina*; **203**: on *Candelariella reflexa*; **207**: on *Melanelixia glabratula*; **412**: on *Parmelina tiliacea*; **415a**: on *Lecanora carpinea* (hb Brackel 8860b); **420**: on *Evernia prunastri*; **424**: on *Parmelina tiliacea*. – ***TOS**: **512**: on *Physconia venusta*; **547**: on *X. parietina*; **549**: on *P. orbicularis*, *P. adscendens*, *Candelaria concolor*, *Punctelia subrudecta*; **556:** on *Physconia grisea*; **610a**: on *P. adscendens*. – **UMB**: **543**: on *P. distorta* and *X. parietina*. All overgrowing entire lichen stocks, thalli as well as apothecia.

S*Bloxamia truncata* Berk. & Broome
TOS: **517**: on *Pertusaria pertusa*, ascomatal warts (hb Brackel 8600).
Bloxamia truncata is a sporodochial hyphomycete usually growing on bark and wood of different deciduous trees and was also reported from fungal fruiting bodies (Ellis 1971, Nag Raj & Kendrick 1975, Glawe 1984, Brackel & al. 2024). According to Hawksworth (1979), *Hymenella veronensis* C. Massal. is a synonym of *B. truncata*; it was found on the bark of *Platanus* near Verona. Until now there were no records of a lichenicolous habit of the species in Italy. It is known to grow fortuitously on lichens (*Aspicilia*, *Pertusaria* s.l., *Xanthoria*) from Europe (Austria, France, Germany, Switzerland) and Macaronesia (Madeira) (Berger 2000, Brackel 2014, Roux 2012, Brackel & al. 2024). Our specimen grows directly on the host lichen and has no connections with the bark, presenting clearly a lichenicolous habit.

Briancoppinsia cytospora (Vouaux) Diederich, Ertz, Lawrey & van den Boom
TOS: **605**: on *Parmotrema perlatum*, thallus and soralia (hb Brackel 9220).

Carbonea supersparsa (Nyl.) Hertel (Fig. 4)
***EMI**: **406**: on *Lecanora polytropa*, thallus and apothecia (hb Brackel 8858b). – ***LIG**: **428**: on *L. polytropa*, thallus (hb Brackel 8831a).

Carbonea vitellinaria (Nyl.) Hertel
LIG: **428**: on *Candelariella vitellina*, thallus (hb Brackel 8880).

Cercidospora appennina Brackel **species nova** (Figs. 5, 6)
MycoBank # 858889
Diagnose: Fungus lichenicola in thallo et apotheciis lichenum generis *Polyozosia* crescens. Ascomata perithecioidea, solitaria, 60–150 µm in diametro, in thallum hospitii immersa. Excipulum in parte superiore aeruginosum, in parte inferiore hyalinum. Asci bitunicati, (4–)6–8-sporae, 45–65 × 10–13 µm. Ascosporae uniseptatae, hyalinae, anguste ellipsoideae cum cellula inferiore paulo angustiore, (13,0–)14,3–16,5(–17,5) × (4,0–)4,5–5,5(–6,0) µm. Conidiomata perithecii similia sed minora, ca. 55 µm in diametro; cellulae conidiogenae ca. 6 × 2 µm; conida bacilliformia, 4–5 × 1 µm.
Typus: Italy, Emilia-Romagna, Provincia di Modena, between Dogana and Roveri above Pievepelago, dry grassland and rocks (limestone and sandstone), on *Polyozosia albescens*, 1315 m, 44°09’54,4’’N, 10°37’36,7’’E, 15.8.2015, leg. W. & G. v. Brackel 8900 (M – holotypus) (Fig. 5).
Description: Ascomata perithecioid, suborbicular to cup-shaped, 60–150 µm diameter, completely immersed in the host’s thallus or hymenium, with only the ostiolar region as a black spot visible, ostiolate, ostiole ca. 25 µm diameter, scattered. Exciple in the upper part greyish blue to aeruginose, K– or K+ blue intensifying, up to 25 µm wide, in the lower part hyaline, not clearly delimited from the host’s tissue. Hamathecium of mostly simple, rarely branched and anastomosing interascal elements, 1–1.5 µm wide, not swollen apically. Hymenial gel I–, KI–. Asci bitunicate, cylindrical to narrowly obclavate, straight or slightly bent, short-stalked, (4–)6–8-spored, ascospores irregularly biseriate, endoascus apically thickened and developing a small *chambre oculaire*, I–, KI–, endoplasm I+/KI+ brownish orange, 45–65 × 10–13 µm. Ascospores hyaline, smooth, guttulate, 1-septate, narrowly ellipsoid, slightly heteropolar with the lower cell slightly narrower and more attenuated, constricted at the septum only in K, (13.0–)14.3–16.5(–17.5) × (4.0–)4.5–5.5(–6.0) µm, l/b = (2.5–)2.7–3.6(–4.1) (n = 20). Conidiomata similar to the perithecia in shape and colour, but smaller, ca. 55 µm diameter; conidiogenous cells lining the inner wall of the cavity, hyaline, ca. 6 × 2 µm; conidia hyaline, bacilliform, 4–5 × 1 µm (Fig. 6).
Etymology: The epithet refers to the Latin name of the mountain range (Appenninus), which runs through all of Italy and where the new species was found.
Host and distribution: The new species is known only from the type locality in Italy, where it grows on the thallus and apothecia of *Polyozosia* (*Lecanora*) *albescens*. The infection does not induce the gall formation nor does it cause any visible damage.
Discussion: To date ca. 40 described species of *Cercidospora* are known, plus more than ten published but not validly described taxa. Apart from *Cercidospora decolorella* (Nyl.) O. E. Erikss. & J. Z. Yue and *C. punctillata* (Nyl.) R. Sant., which may be aggregates (or one aggregate) of several cryptic species, *Cercidospora* species are rather specific for one

Fig. 4. *Carbonea supersparsa* (black apothecia on the thallus) and *Cercidospora stenotropae* (small black perithecia on the apothecia) on *Lecanora polytropa*, Passo della Forcella, Liguria.

host species or at least genus. So, the new species has to be compared with species growing on Lecanoraceae and, to be on the safe side, on Megasporaceae.

Among all these *C. appennina* has the shortest ascospores. The three species nearest in ascospore length are *C. galligena* Hafellner & Nav.-Ros. (on *Aspicilia* s. lat.), *C. verrucosaria* (Linds.) Arnold (on *Megaspora verrucosa*) and *C. epipolytropa* (Mudd) Arnold (on *Lecanora polytropa* group). The first is easily distinguished from the new species by the induction of galls and the dark brown to violet-black colour of the upper part of the epithecium, the second by the much bigger perithecia [130–200(–300) vs 60–150 µm] and the longer asci [65–95(–105) vs 45–65 µm]. *Cercidospora epipolytropa* is very close to the new species in all features, apart from larger dimensions in all parts, especially the ascospores [(14–)15–19(–22) × (4.5–)5–6(–7) and (16.0–)17.3–20.4(–23.0) × (4.0–)4.5–5.9(–6.0) respectively vs (13–)14.3–16.5(–17.5) × (4–)4.5–5.5(–6) µm] and ascomata [130–220 and 100–200 respectively vs 60–150 µm] (Calatayud et al. 2013, own measurements). Moreover, there are slight differences in the colour of the exciple: in the new species the colour is greyish blue to aeruginose, in *C. epipolytropa* a brown component especially in the uppermost part is involved.

Compared specimens: *Cercidospora epipolytropa*, both on *Lecanora polytropa*: Italy,

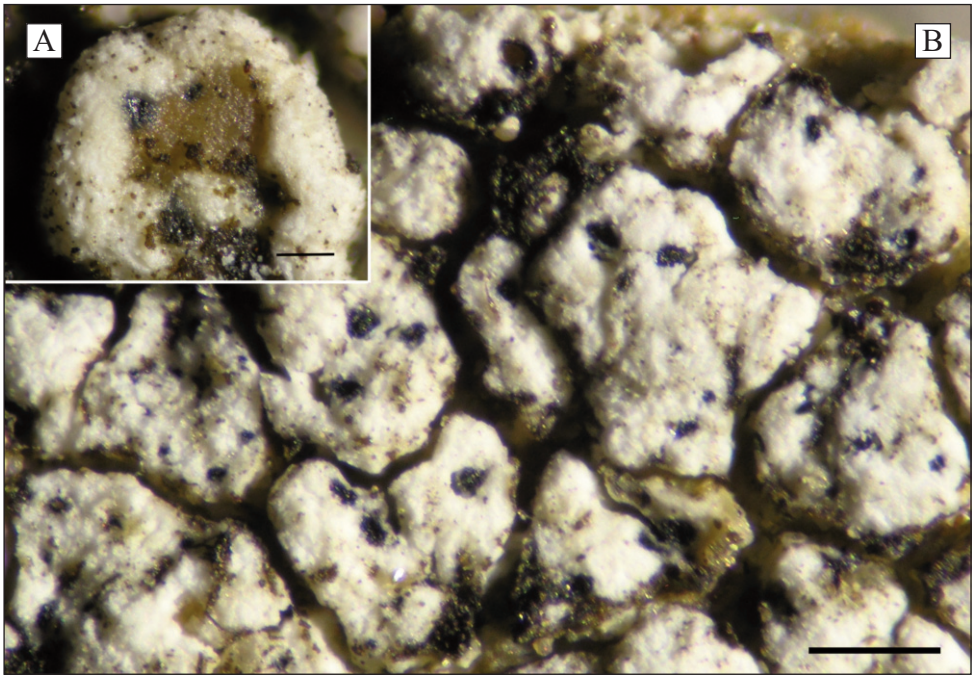

Fig. 5. *Cercidospora appennina*, holotype: habitus on *Lecanora albescens*. A: on apothecium, B: on thallus. Bars: A = 100 µm, B = 250µm.

Lombardia, Prov. di Sondrio, Passo dello Spluga, gneiss rocks and outcrops, 1915 m, 46°28'30,0''N, 09°21'07,2''E, W. & G. v. Brackel, 2.11.2007 (hb Brackel 6314); Calabria, Prov. di Reggio Calabria, Parco Nazionale dell'Aspromonte, Montalto, loc. Nardello II, sunlit siliceous rocks, 1820 m, 38°09'10,1''N, 15°54'02,6''E, W. v. Brackel & D. Puntillo, 5. 5.2015 (hb Brackel 7607).

Cercidospora caudata Kernst.
***EMI**: **423a**: on *Xanthocarpia* (*Caloplaca*) *lactea*, apothecia (hb Brackel 9186).

Cercidospora lobothalliae Nav.-Ros. & Calat.
***LIG**: **426**: on *Lobothallia radiosa*, thallus (hb Brackel 9188a).
A species known from all continents in the Northern Hemisphere but rarely reported. In Italy until now known only from Sardegna (Brackel & Berger 2019).

Cercidospora macrospora (Uloth) Hafellner & Nav.-Ros.
EMI: **451**: on *Protoparmeliopsis* (*Lecanora*) *muralis*, thallus (hb Brackel 8874).

Cercidospora stenotropae Nav.-Ros. & Hafellner ad int.
***LIG**: **428**: on *Lecanora polytropa*, apothecia (hb Brackel 8696b; 8831b).

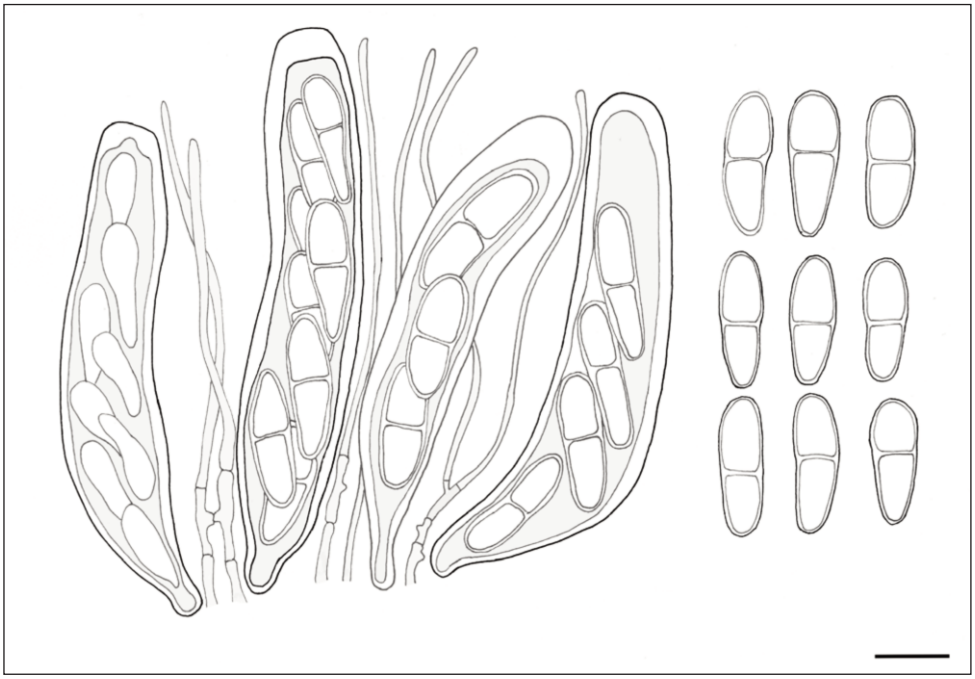

Fig. 6. *Cercidospora appennina*, asci in different states of maturity, interascal elements, ascospores. Bar = 10 µm.

Cercidospora sp.
TOS: **446**: on *Seirophora villosa*, apothecia (hb Brackel 8817).
Ascomata perithecioid, suborbicular to obpyriform, completely immersed in the host's apothecial disc, black, ca. 100–150 µm diameter. Peridial wall dark bluish grey above, slightly paler downwards, pigment intercellular between cells of a textura intricata, K–. Vegetative hyphae hyaline to very pale brown, 2–3.5 µm wide, in the host's hymenium. Hamathecium of abundant septate, sparsely ramified interascal elements, 1–1.5 µm wide. Asci cylindrical to narrowly clavate, 55–70 × 8–10 µm, (2–)4(–8)-spored. Ascospores overlapping uniseriate in the ascus, fusiform, hyaline,1-septate, 15–20 × 4.5–6 µm, not caudate, single cells ± equal.
On members of the family Teloschistaceae several taxa of *Cercidospora* were described or at least sketched. The group of *C. caudata* Kernst. [including *C. epicarphinea* (Nyl.) Grube & Hafellner, *C*. aff. *epicarphinea* sensu van den Boom & Etayo (2017) and *Cercidospora* sp. sensu Freebury (2014)] shows similar measurements of ascospores, but the peridial wall is rather greenish or brown than bluish and the ascospores have unequal cells, the lower one often more or less caudate (Navarro-Rosinés & al. 2004, Freebury 2014, van den Boom & Etayo 2017). In *C. xanthoriae* (Wedd.) R. Sant. the ascospores are also of similar dimensions and have ± equal cells, but the peridial wall is blackish green, the infection affects the thallus and the ascomata are much bigger, 300–400 µm diameter (Hafellner &

John 2006, Zhurbenko 2009b). The provisional names *C. pseudoxanthoria* Roux et al. and *C. epidesertorum* Nav.-Ros. & Calatayud lack a description.

*****Cladophialophora denigrans*** (Diederich) Boers, Diederich & Ertz
Syn.: *Trimmatostroma denigrans* Diederich
TOS: **448b**: on *Lecanora argentata*, thallus and apothecia (hb Brackel 8891).
This species was recently described from Malta (Diederich 2021) and now is known from several European countries and North America on different not closely related hosts (Diederich & al. 2024a).

Cladophialophora aff. ***dimorphospora***
UMB: **535**: on *Physcia stellaris*, apothecial margin (hb Brackel 9207).
The taxon is similar to the recently described *Cladophialophora dimorphospora* (Diederich & al. 2024a), but the conidia are narrower (3–4µm vs. 4–5 µm) and it is growing on the host *Physcia stellaris* instead of Parmeliaceae.

Cladosporium licheniphilum Heuchert & U. Braun
LAZ: **603**: on *Ramalina fastigiata*, *Ramalina* sp., thallus (hb Brackel 9218). – **MAR**: **386**: on *Physconia distorta*, apothecial margin.

Clypeococcum hypocenomycis D. Hawksw.
EMI: **412b**, on *Hypocenomyce scalaris*, thallus (hb Brackel 8879).
Many of the infection spots contained only pycnidia of *C. hypocenomycis*, smaller than the ascomata, conidia bacilliform, apically rounded, basally truncate, hyaline, 4–6 × 1 µm. These should not be confused with the pycnidia of *Hypocenomyce scalaris*, also found in the specimen, growing superficially on not discoloured or blackened squamules, with conidia narrowly ellipsoid, apically rounded, basally truncate, hyaline, ca. 6–7 × 2.5–3 µm.

*****Codonmyces lecanorae*** Calat. & Etayo
LAZ: **600**: on *Protoparmeliopsis* (*Lecanora*) *muralis*, apothecial disc (hb Brackel 9214).
The specimen 6658, also from Lazio, noted under "*Codonmyces* aff. *lecanorae* Calatayud & Etayo" in Brackel (2015), also belongs to the species (see Diederich & Zhurbenko 2024). This became clear when more finds of the species on *P. muralis* showed a continuum of features connecting it with the finds on *Lecanora valesiaca*, the host of the type.

S*Cryptocoryneum condensatum* (Wallr.) E. W. Mason & S. Hughes
TOS: (loc. 222 in Brackel 2015) Prov. di Massa-Carrara, entrance to the Valle della Verde, above Stazione Grondola, small sweet chestnut grove, on *Castanea sativa*, on *Melanelixia glabratula*, 430 m, 44°25'29,2''N, 09°50'20,0''E, 6.10.2013 (hb Brackel 6977).
Cryptocoryneum condensatum is an at least regionally common hyphomycete, widespread in the northern hemisphere (Heftberger & al. 1997). It grows as a saprophyte on dead wood and bark of different trees and shrubs; Etayo & López de Silanes (2020) reported it for the first time as lichenicolous on *Pertusaria* cf. *pertusa* from Portugal. It is well characterised by the conidia consisting of some dark basal cells and several

long, pluriseptate arms more or less parallelly arranged. It is already known from Italy as a saprophyte (e.g. Rambelli 2011), but not yet as lichenicolous.

****Cylindromonium lichenicola*** (W. Gams) Crous
MAR: 611: on *Parmelia submontana* (hb Brackel 9112).
This hyphomycete grew, together with *Lichenoconium erodens*, on the soralia of the host. *Parmelia submontana* is a new host.

Didymocyrtis cladoniicola (Diederich, Kocourk. & Etayo) Ertz & Diederich
EMI: **398**: on *Cladonia foliacea*, squamules and on *Cladonia rangiformis*, podetia (hb Brackel 8825); **423**: on *C. rangiformis*, podetia. – ***LIG**: **438**: on *C. rangiformis* (hb Brackel 8836); **439**: on *C. rangiformis*. – ***MAR**: **528**: on *C. rangiformis*, squamules and podetia (hb Brackel 9196); **531**: on *C. foliacea*, squamules and on *C. rangiformis*, podetia. Conidiomata completely immersed in the host thallus, only the ostiolar region visible, black, obpyriform, up to 150 µm diameter; wall dark brown throughout, of textura angularis; conidia non-septate, hyaline, smooth, guttulate, 4.5–5.2 × 2.2–3.0 µm (specimen 8825). All specimens as the anamorph; a teleomorph of the species until now is not known.

Didymocyrtis epiphyscia Diederich & Ertz s. lat.
EMI: **200b**: on *Physcia tenella*, thallus. – **MAR**: **381**: on *Phaeophyscia orbicularis*, thallus.

Didymocyrtis epiphyscia Diederich & Ertz s. str.
EMI: **389a**: on *Physcia stellaris*, apothecia.

Didymocyrtis peltigerae (Fuckel) Hafellner
***TOS**: **394b**: on *Peltigera horizontalis*, thallus (hb Brackel 8886a); **410**: on *P. praetextata*, thallus.

Didymocyrtis ramalinae (Roberge ex Desm.) Ertz, Diederich & Hafellner
Syn.: *Leptosphaeria ramalinae* (Desm.) Sacc., *Phoma ficuzzae* Brackel
All on *Ramalina fastigiata*, thallus: **EMI**: **396b**: (teleomorph; hb Brackel 8877). – **TOS**: **516**: (teleomorph); **610**: (teleomorph; hb Brackel 9226).

Didymocyrtis slaptoniensis (D. Hawksw.) Hafellner & Ertz
All on *Xanthoria parietina*, thallus and apothecia: **MAR**: **381** (as the *Phoma*-anamorph); **382** (as the *Phoma*-anamorph). – **TOS**: **448b** (hb Brackel 8808a, as the teleomorph); **547**; **605**. – **LAZ**: **602** (as the *Phoma*-anamorph); **603** (hb Brackel 9216b, as the teleomorph).

Ellisembia lichenicola **Heuchert & U. Braun**
***UMB**: **542**: on *Alyxoria varia*, thallus (hb Brackel 9210).

Endococcus hafellneri (Zhurb.) Zhurb.
UMB: **534**: on *Cetraria islandica*, thallus (hb Brackel 9200).
This recently described species was known until now from a few European and Asian countries (Austria, Estonia, Mongolia, Russia, Switzerland; see Berger & Zimmermann

2021). In our specimen we measured ascospores with 7–8(–9.5) × 3–3.5 µm, fitting well the measurements given in the protologue: (7–)7.5–8.5(–11) × (2.5–)3–3.5(–4.5) µm (Zhurbenko 2009a).
Contrary to the protologue we found clearly visible brown vegetative hyphae in the necrotic layer around the perithecia of *Endococcus hafellneri*. Moreover, between the perithecia grew the possible anamorph, quite similar to the teleomorph in the habit, but smaller (20–30 µm diam.). The conidiogenesis was not visible, the abundantly produced conidia are hyaline, smooth, (sub-)orbicular, thick-walled, 3–5 ×3 µm.

Epicladonia sandstedei (Zopf) D. Hawksw.
***LIG**: **429b**: on *Cladonia caespiticia*, squamules (hb Brackel 8833).

Epicladonia simplex D. Hawksw.
***UMB**: **534**: on *Cladonia furcata* subsp. *subrangiformis*, podetia (hb Brackel 9203).

Erythricium aurantiacum (Lasch) D. Hawksw. & A. Henrici
MAR: **381**: on *Physconia distorta*, thallus; **387**: on *Physcia aipolia*, thallus (hb Brackel 8671); **427**: on *Physcia stellaris*, thallus; **523**: on *Physcia leptalea*, thallus. – **TOS**: **609**: on *Xanthoria parietina*, thallus.

*****Gonatophragmium lichenophilum*** F. Berger & U. Braun
MAR: **383a**: on *Xanthoria parietina* and *Physcia leptalea*, thallus and apothecia (hb Brackel 8666a).
This recently described hyphomycete is known from several European countries (Berger & al. 2015, Ertz & al. 2024), growing on *Xanthoria parietina* and several other unrelated lichen genera. In the Italian specimen it grows on *X. parietina* and on adjacent *Physcia leptalea*, which is a new host. The species is characterized by an immersed mycelium, branched and septate conidiophores, terminal and intercalary conidiogenous cells with numerous conidiogenous loci, and (0–)1(–2)-septate conidia with a truncate base and a refractive frill, subhyaline to pale brown in all parts.

Illosporiopsis christiansenii (B.L. Brady & D. Hawksw.) D. Hawksw.
***MAR**: **524**: on *Physcia aipolia*, thallus.

Intralichen baccisporus D. Hawksw. & M.S. Cole
***EMI**: **204**: on *Athallia* (*Caloplaca*) *cerinella*, ascomata (hb Brackel 8871b).

Laetisaria lichenicola Diederich, Lawrey & Van den Broeck
EMI: **419**: on *Physcia leptalea*, thallus (hb Brackel 8679); **TOS**: **210**: on *Physcia adscendens*, thallus.

Lichenochora physciicola (Ihlen & R. Sant.) Hafellner
***EMI**: **423b**: on *Physcia adscendens*, thallus (hb Brackel 8682). – ***TOS**: **519**: on *Physcia adscendens* (hb Brackel 8578).

Lichenochora aff. ***wasseri***
EMI: **397**: on unidentified white sorediata crust (hb Brackel 8898).
Ascomata perithecioid, black, subglobose, completely immersed in the host thallus, ca. 220 µm diameter, asci ca. 75 × 13 µm, 8-spored, interascal filaments 1–3 µ thick, thin-walled, with many oil-guttules, ascospores 1-septate, ellipsoid, hyaline, smooth, 15–17 × 7.5–8 µm. As the species of *Lichenochora* are rather host specific and *L. wasseri* grows on *Caloplaca* s. lat., this specimen cannot be assigned to *L. wasseri*.

Lichenochora weillii (Werner) Hafellner & R. Sant.
***EMI**: **208**: on *Physconia grisea*, thallus (hb Brackel 8665); **450**: on *P. grisea*, thallus (hb Brackel 9190).

Lichenoconium erodens M.S. Christ. & D. Hawksw.
All on thallus if not otherwise mentioned: **EMI**: **200b**: on *Physcia adscendens*, *Physcia tenella*; **207b**: on *Flavoparmelia caperata*; **390**: on *Parmelia sulcata*; **399**: on *P. sulcata*; **400**: on *P. sulcata*; **409**: on *Hypogymnia physodes* (hb Brackel 8685b), *P. sulcata*; **412**: on *P. sulcata*; **420b**: on *Lecanora carpinea*, apothecia (hb Brackel 8862); **421**: on *Parmelina tiliacea*; **425**: on *P. sulcata*. **LAZ**: **599**: on *F. caperata*, *Ramalina farinacea*; **602b**: on *P. sulcata*. – ***LIG**: **427**: on *P. sulcata*; **430**: on *F. caperata*; **434b**: on *P. sulcata*; **441**: on *P. sulcata*. – **MAR: 611:** on *Parmelia saxatilis* and *P. submontana* (hb Brackel 9112, sub *Cylindromonium lichenicola*). – **TOS**: **513**: on *Melanelixia glabra*; **516**: on *P. saxatilis*; **517**: on *Ramalina fastigiata*; **518**: on *Lecanora chlarotera*, *P. tiliacea*, *P. sulcata*; **520a**: on *Evernia prunastri*, *P. sulcata*; **553b**: on *Pertusaria pertusa* (hb Brackel 8038); on *P. sulcata*; **546**: on *F. caperata* and *P. sulcata*; **554**: on *Cladonia parasitica*, squamules (hb Brackel 8047); on *P. sulcata*; **599**: on *F. caperata*; **605**: on *F. caperata*, *Parmotrema perlatum*. – **UMB**: **511**: on *E. prunastri*; **535**: on *P. sulcata*.
In 8685 the species grew also on the galls of *Tremella hypogymniae* on *Hypogymnia physodes*.

Lichenoconium lecanorae (Jaap) D. Hawksw.
***EMI**: **399c**: on *Lecanora carpinea*, apothecia; **412a**: on *Parmelina tiliacea*, thallus (hb Brackel 8687); **415a**: on *L. carpinea*, apothecia (hb Brackel 8860a).

Lichenoconium lichenicola (P. Karsten) Petr. & Syd.
***EMI**: **423b**: on *Physcia adscendens* (hb Brackel 8681). – ***LAZ**: **603**: on *Physcia tenella*, thallus (hb Brackel 9219). – ***UMB**: **510**: on *P. adscendens*, thallus (hb Brackel 8430).

Lichenoconium pyxidatae (Oudem.) Petr. & Syd.
UMB: **534**: on *Cladonia cariosa*, podetia and apothecia (hb Brackel 9201).

Lichenoconium usneae (Anzi) D. Hawksw.
TOS: **449**: on *Seirophora villosa*, thallus (hb Brackel 8818). – ***UMB**: **510**: on *Xanthoria parietina*, apothecia (hb Brackel 8429). – ***LIG**: **439**: on *Cladonia foliacea*, squamules (hb Brackel 8838).
8429: Conidiomata on the apothecial discs of *Xanthoria parietina*, 30–100 µm diameter, conidiogenous cells 7–8 × 2.5 µm, conidia brown, distinctly verruculose, suborbicular to

ellipsoid, some truncate, 3–4 × 2.5–3 µm. *L. xanthoriae*, which usually is found on the apothecia of *X. parietina*, is distinguished by bigger conidiomata and by globose to subglobose conidia almost without ornamentation by light microscopy. 8818: Conidia (3.0–)3.1–3.9(–4.0) × 3.0–3.4(–3.5) µm. l/b = 1.0–1.3 (n = 20).

Lichenoconium sp. (Fig. 7)
TOS: **446**: on *Seirophora villosa*, thallus and apothecia (hb Brackel 8815).
Conidiomata almost completely immersed in the host thallus and apothecia, black, obpyriform, up to 135 µm wide; conidiogenous cells (7.0–)7.9–10.2(–10.5) × (2.0–)2.3–3.2(–3.5) µm (n = 12); conidia suborbicular, ovoid or obpyriform, dark brown, mostly truncate, with a distinct scar, minutely but distinctly and densely spinulose, (3.5–)3.8–5.2(–7.0) × (2.5–)2.7–3.5 µm. l/b = (1.1–)1.2–1.8(–2.3) (n = 30). The taxon causes no visible damage on the host.
In several features the taxon is close to *Lichenoconium xanthoriae* M. S. Christ., also growing on members of the family Teloschistaceae; similar are for instance the size of the ascomata, growing on both the apothecia and the thallus of the host and causing no visible damage, but it differs in the dark brown, delicately spinulose conidia often truncate and a l/b relation of (1.1–)1.2–1.8(–2.3) vs. 1–1.2. The only other species of *Lichenoconium* known from Teloschistaceae are *L. erodens* M. S. Christ & D. Hawksw. and *L. usneae* (Anzi) D. Hawksw. Both of them have smaller (sub)orbicular conidia, for instance a specimen of *L. usneae* on *Seirophora villosa* from the neighbourhood (hb Brackel 8818): (3.0–)3.1–3.9(–4.0) × 3.0–3.4(–3.5) µm. l/b = 1.0–1.3 (n = 20).
Regarding the dimensions of the conidiogenous cells and conidia, *L. aeruginosum* is close to the taxon discussed here; nevertheless, the former has pale to medium brown vs dark brown conidia, a bluish pigment in the wall and causes a discoloration of the affected parts of the host. All other species of *Lichenoconium* have either smaller or larger conidia, among other differentiating features. Despite all this, we refrain from describing it here formally, as the one specimen with only a few dozen conidiomata surely does not show all the variety of features.

Lichenodiplis lecanorae (Vouaux) Dyko & D. Hawksw.
***EMI**: **204**: on *Athallia* (*Caloplaca*) *cerinella*, apothecia (hb Brackel 8871a). – **MAR**: **382**: on *Caloplaca* sp., apothecia.

Lichenosticta alcicorniaria (Linds.) D. Hawksw.
TOS: **393**: on *Cladonia symphycarpa*, squamules (hb Brackel 8823).

Lichenostigma alpinum (R. Sant. et al.) Ertz & Diederich
EMI: **206**: on *Lepra* (*Pertusaria*) *albescens*, thallus (hb Brackel 8846a); **405b**: on *L. albescens*, thallus. – ***LIG**: **437b**: on *L. albescens*, thallus (hb Brackel 8853). – ***MAR**: **524**: on *Lecanora carpinea*, apothecia; **525**: on *L. albescens* and *Ochrolechia androgyna*, thallus. – **TOS**: **513a**: on *Pertusaria* s.l. sp., thallus; **606**: on *L. albescens*, thallus; **609**: on *L. albescens*, thallus.
All specimens represented by the *Phaeosporobolus*-anamorph.

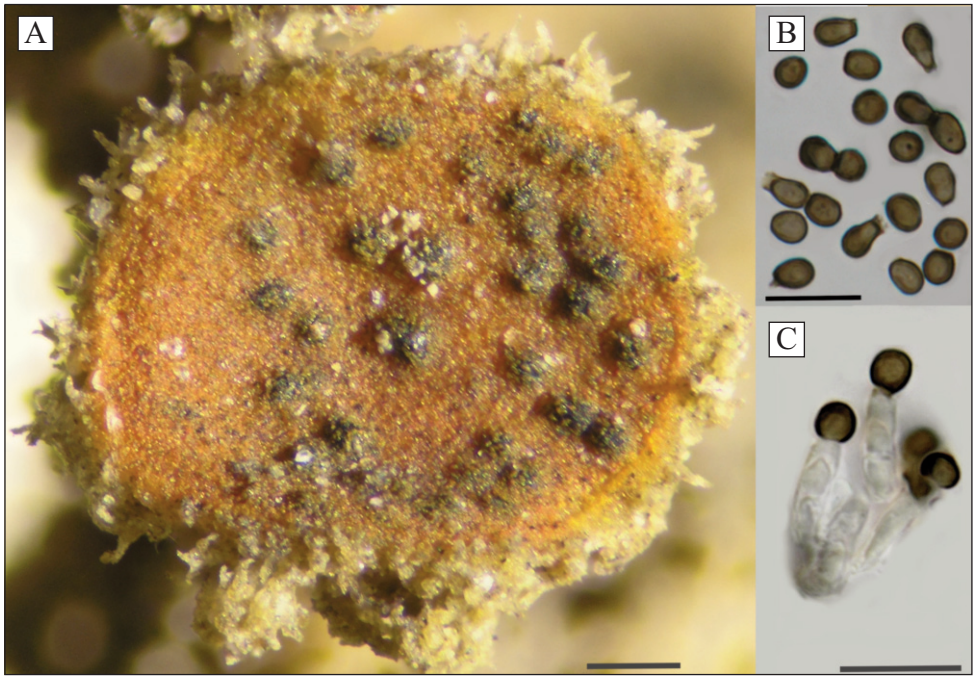

Fig. 7. *Lichenoconium* sp. on *Seirophora villosa*; A: Habitus of the infection on the apothecial disc of the host. B: Conida. C: Conidiogenous cells with adhering conidia. Bars: A = 200 µm, B & C = 10 µm.

Lichenostigma chlaroterae (Berger & Brackel) Ertz & Diederich
***EMI**: **402b**: on *Lecanora carpinea*, apothecia and thallus (hb Brackel 8856).
The species is known until now only as the *Phaeosporobolus*-anamorph.

Lichenostigma cosmopolites Hafellner & Calatayud
***EMI**: **417**: on *Xanthoparmelia conspersa*, thallus (hb Brackel 8695). – ***LIG**: **428**: on *X. conspersa*, *X. stenophylla*, thallus and apothecia (hb Brackel 8696a); **439**: on *X. conspersa*, thallus; **443**: on *X. conspersa*, thallus.

Lichenostigma elongatum Nav.-Ros. & Hafellner (Fig. 8)
EMI: **397**: on *Circinaria* (*Aspicilia*) *calcarea*, thallus (hb Brackel 8867a, 8866b); **417**: on *Aspicilia* sp., thallus (hb Brackel 9185). – **LIG**: **426**: on *Lobothallia radiosa*, thallus and apothecia (hb Brackel 9187); **433**: on *L. radiosa*, thallus and apothecia; **434a**: on *L. radiosa*, thallus and apothecia; **442**: on *L. radiosa*, thallus and apothecia. – **TOS**: **393**: on *C. calcarea*, thallus (hb Brackel 8895). – **UMB**: **540**: on *L. radiosa*, thallus (hb Brackel 9208).
In specimen 8895 on several of the ascomata macroconidia were found, not noted in the description of Navarro-Rosinés & Hafellner (1996). They measure 5–13 × 4–6 µm, are 0–2-septate, medium to dark brown rough due to the splitting outer wall. *Lichenostigma elongatum* belongs to a group described in *Lichenostigma* but with more affinities to

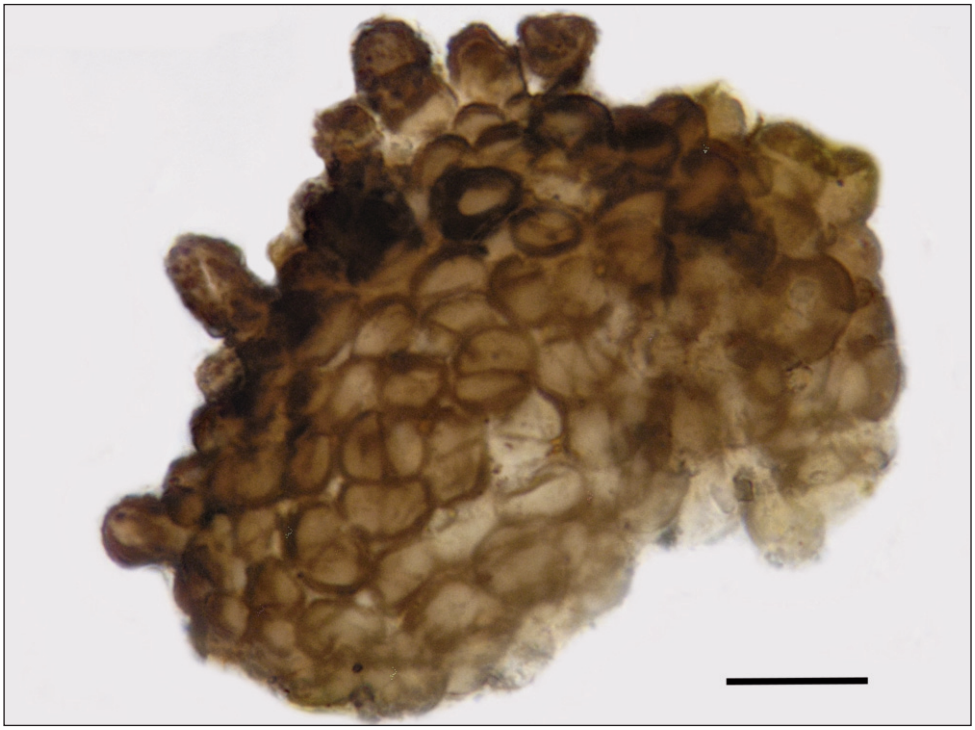

Fig. 8. *Lichenostigma elongatum* on *Aspicilia* (*Circinaria*) *calcarea*, specimen 8895, young ascoma with macroconidia. Bar = 10 µm.

Lichenothelia (see Ertz & al. 2013, Diederich & al. 2018). A diagnostic feature that distinguishes *Lichenostigma* s. str. from the species with affinities to *Lichenothelia* is the missing of true septa (except for the ascospores); in *Lichenostigma* septation takes place by budding.

Lichenostigma maureri Hafellner
Syn.: *Phaeosporobolus usneae* D. Hawksw. & Hafellner
***EMI**: **415b**: on *Lecanora chlarotera*, thallus and apothecia; **422b**: on *Pseudevernia furfuracea*, thallus (hb Brackel 8686). All as the *Phaeosporobolus*-anamorph.

Lichenostigma rupicolae Fdez.-Brime & Nav.-Ros.
***LIG**: **427b**: on *Pertusaria rupicola* (hb Brackel 8849); **443**: on *P. rupicola* (hb Brackel 8854). Both specimens from Liguria are sterile, but regarding the host, the habitus with vegetative strands and the shape of the macroconidia there is no doubt on the species affiliation. First records for peninsular Italy.

****Lichenostigma rouxii*** Calatayud, Nav.-Ros. & Hafellner
MAR: **532b**: on *Squamarina stella-petraea*, thallus (hb Brackel 9199).
This species, confined to hosts of the genus *Squamarina*, was expected in Italy, as it is

known from several of the country's Mediterranean neighbours (Spain, France, Bosnia-Herzegovina, Albania, Greece; see Calatayud & al. 2002).

Lichenostigma sp. (Fig. 9)
LIG: **442**: on *Diplotomma hedinii*, thallus (hb Brackel 8844b).
In the specimen 8844 a *Phaeosporobolus* anamorph was found, that shows similar features to "*Phaeosporobolus* aff. *minutus*" reported in Brackel (2011) from Matera/Basilicata on *Diplotomma alboatrum*: Conidiomata stromatic, superficial, dispersed, black when dry, brown translucent when wet, subglobose to flattened, 30–60 µm diameter, composed of (sub)globose brown cells, the outermost layers darker brown, covered by a pellicle-like layer of hyphae. Conidiophores and conidiogenous cells not distinguishable from the cells of the stroma. Conidia irregular, 6–9(–11) µm diameter, composed of (1–)2–3(–5) subglobose cells, individual cells 3–5 µm diameter, subhyaline to pale brown, almost smooth to delicately verruculose, released through irregular breaks in the stromatal surface layers.
In the locality 20 in Basilicata (Brackel 2011), the teleomorph of *Lichenostigma epipolina* (on *Diplotomma venustum*) and the mentioned *Phaeosporobolus* anamorph (on *Diplotomma alboatrum*) occurred in close vicinity, which led us to the assumption that the latter might be the anamorph of the former. As *L. epipolina* shows a net of hyphal strands between the ascomata, it does not belong to *Lichenostigma* s. str. and therefore cannot have a *Phaeosporobolus* anamorph.

****Lichenothelia convexa*** Henssen
EMI: **406**: on *Kuettlingeria* (*Caloplaca*) *erythrocarpa*, thallus (hb Brackel 8902).
Lichenothelia is a genus of either rock-inhabiting or lichenicolous fungi; some rock-inhabiting species, for instance *L. convexa*, are facultatively lichenicolous. Many of the *Lichenothelia* species described by Henssen are not identifiable, but *L. convexa* is a well characterised species (Kocourková & Knudsen 2011), known from several European countries, Asia and North America (see Brackel 2014).
The ascospores in the Italian specimen are dark brown, heteropolar with a broader upper cell, delicately verruculose, 1–3-septate, 10–11(–12) × 6–6.5(–7) µm; characteristically, at the first septum the ascospores are distinctly constricted, but not at the following septa.

Llanorella ramalinae Diederich & Brackel
***TOS**: **335a**: on *Ramalina canariensis*, thallus (hb Brackel 7226a).
This newly described species was already known from Campania and Sardegna (Diederich & Brackel 2024).

Llimoniella phaeophysciae Diederich, Ertz & Etayo
***MAR**: Prov. di Ascoli Piceno, SW of Montemonaco, on *Tilia* sp., on *Phaeophyscia orbicularis*, 980 m, 25.4.2020, R. Cezanne & M. Eichler (hb Cezanne-Eichler 6254).

Marchandiomyces corallinus (Roberge) Diederich & D. Hawksw.
EMI: **418**: on *Parmelia saxatilis*, thallus (hb Brackel 8689). – **LIG**: **432**: on *P. saxatilis* (hb Brackel 8690). – **MAR**: **381**: on *Physcia leptalea*, thallus; **385**: on *Physconia distorta*,

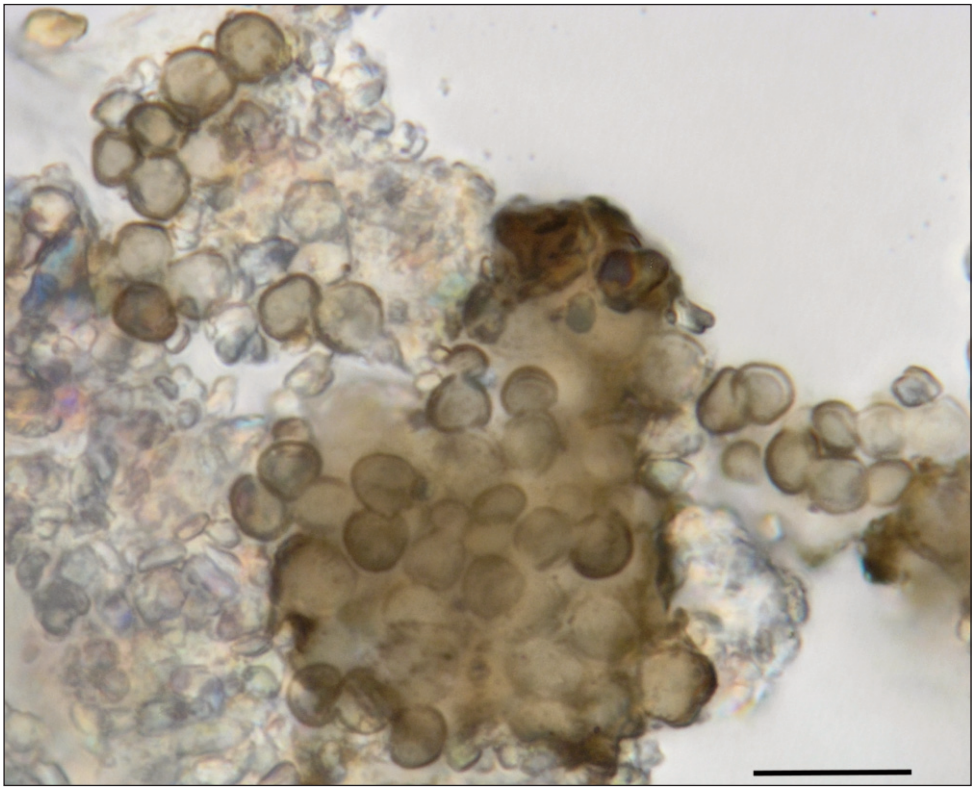

Fig. 9. *Lichenostigma* sp. (specimen 8844b), squashed conidioma with conidia, in water. Bar = 10

thallus; **597**: on *P. distorta*, *Physcia tenella*, *Xanthoria parietina*, thallus. – **TOS**: **605**: on *Parmotrema perlatum*. – **UMB**: **539**: on *Xanthoria parietina*, thallus and apothecia.

Merismatium decolorans (Rehm ex Arnold) Triebel
TOS: **393**: on *Cladonia foliacea*, squamules (hb Brackel 8824); **397**: on *Cladonia pyxidata* f. *pocillum*, squamules (hb Brackel 8827). – **LIG**: **438**: on *C. foliacea*, thallus (hb Brackel 8835). 8824: Scarce specimen with only a few ascomata, most of them empty. Ascomata ca. 150 µm diameter, ascospores light brown, (1–)2–3-septate (sometimes one septum oblique), 10–14.5 × 4.5–5 µm. The diversity of *Merismatium* species on *Cladonia* is still unsolved and needs further study (see also Zhurbenko & Pino-Bodas 2017).

Muellerella erratica (A. Massal.) Hafellner & V. John
LIG: **426**: on *Lobothallia radiosa*, thallus (hb Brackel 9188c). – ***TOS: 551b**: on *Lecanora campestris*, apothecia and thallus (hb Brackel 8021).

Muellerella lichenicola (Sommerf.) D. Hawksw.
***EMI**: **207c**: on *Protoblastenia rupestris*, apothecia (hb Brackel 8875); **414**: on

Lobothallia radiosa, thallus (hb Brackel 9184). – ***LIG**: **433**: on *Gyalolechia* (*Caloplaca*) *flavovirescens*, apothecia and thallus (hb Brackel 8811). – ***MAR**: **388c**: on *Athallia* (*Caloplaca*) *pyracea*, apothecia (hb Brackel 8812). – **TOS**: **447b**: on *Lecidella elaeochroma*, thallus (hb Brackel 8888); **552**: on *G. flavovirescens*, apothecia and thallus (hb Brackel 8035).
Possibly the taxon is a complex of different species. The specimen 9184 on *Lobothallia radiosa* showed ascomata (125–130 µm) and ascospores [(4.0–)4.6–6.2(–6.7) × (2.5–)2.8–3.3(–3.8) µm, l/b = (1.3-)1.5-2.0(-2.1) (n = 20)] within the measurements for *M. lichenicola*, but the asci had only 32–64 ascospores instead of "almost always clearly more than 64" (Triebel 1989).

Muellerella pygmaea (Körber) D. Hawksw. s. str.
***LIG**: **439**: on *Lecidea fuscoatra*, thallus (hb Brackel 8873). – **TOS**: **607**: on *Aspicilia* sp., thallus (hb Brackel 9223).

Muellerella rhizocarpicola Brackel
EMI 417: on *Rhizocarpon geographicum*, thallus (hb Brackel 8879).
This find was already reported in the description of the species, segregated from *M. ventosicola* (Brackel 2023).

Muellerella ventosicola (Mudd) D. Hawksw. s. lat.
***EMI**: **397**: on *Circinaria* (*Aspicilia*) *hoffmanniana*, thallus (hb Brackel 8896).
In specimen 8896 the ascomata are about 200 µm diameter, the asci ca. 64-spored and the ascospores dark brown, 7–8.5 × 4.5–5 µm, which fits well the description of *M. ventosicola*; however, the specimen was growing on *Aspicilia* s. lat. and *M. ventosicola* s. str. is restricted to hosts of the genus *Rhizoplaca*.

Muellerella sp.
TOS: **446**: on *Seirophora villosa*, thallus and apothecial disc (hb Brackel 8813).
Ascomata perithecioid, suborbicular, ostiolate, half to completely immersed in the thallus and the apothecial disc of *Seirophora villosa*, 55–75 µm wide, black, peridial wall dark brown in the upper third, medium to pale brown downwards, of a textura angularis; hamathecium missing except for periphyses lining the ostiolar channel. Vegetative hyphae reaching from the perithecia downwards, hyaline (in the host's apothecium) to pale brown (in the thallus), torulose, septate, branched, 2–3 µm wide. Asci bitunicate, saccate, ca. 30 × 10 µm, ca. 34-spored. Ascospores narrowly ellipsoid, (0–)1-septate, pale brown, smooth, 5–8 ×2–4 µm.
Habitually the taxon recalls a *Stigmidium* with the small black perithecia scattered over the host's thallus or apothecia. Until now no species of *Muellerella* is known from *Seirophora* or *Teloschistes*, nor is any *Muellerella* known with this combination of features. Unfortunately, our material is too poor for a formal description.

Nectriopsis hirta Etayo
TOS: **515**: on *Pertusaria pertusa*, thallus and ascomatal warts (hb Brackel 8604).
Ascomata perithecioid, superficial, orbicular, orange-brown, densely covered by whitish

hairs, in dry state collapsed from the top, ca. 300–350 µm diameter; asci (6–)8-spored, ca. 50–65 × 12–15 µm; ascospores ellipsoid with rounded ends, some slightly attenuated or even mucronate, hyaline, smooth, multi-guttulate, (0–)1-septate; 1-septate ascospores (15.5–)16.5–20.1(–22.0) × (6.5–)6.7–7.8(–8.5) µm, l/b = (1.9–)2.2–2.9(–3.4) (n = 20).
Nectriopsis hirta was described from Spain on *Lepra amara* and *Pertusaria pertusa* and following reported also from other hosts like *Buellia griseovirens*, *Lecidella elaeochroma*, *Melanelixia glabratula*, *Melanohalea exasperatula*, *Parmelia sulcata*, *Phlyctis argena*, *Physcia tenella* and *Physconia venusta*. It is dubious, if all these records really refer to *N. hirta*, as most of the species of the genus *Nectriopsis* are rather host specific. Nevertheless, the find from Toscana on *Pertusaria* fits perfectly the features of *N. hirta* and surely belongs to this species.
Niesslia cladoniicola D. Hawksw. & W. Gams
***LIG**: **428**: on *Cladonia furcata*, podetia (hb Brackel 8832).

Paranectria oropensis (Ces.) D. Hawksw. & Piroz.
***EMI**: **389c**: on *Lepraria* sp., thallus (hb Brackel 8876). – **MAR**: **386**: on *Physconia distorta*, thallus; **529**: on *Parmelina tiliacea*, thallus. – **TOS**: **513a**: on *Cladonia parasitica*, basal squamules (hb Brackel 8404); **610a**: on *Physconia enteroxantha*, thallus. – ***UMB**: **536**: on *P. distorta*, thallus.

*******Parmeliicida pandemica*** Diederich, F. Berger, Etayo & Lawrey (Fig. 10)
EMI: **418**: on *Parmelia saxatilis* and *P. sulcata*, thallus (hb Brackel 8689); **LIG**: **432**: on *P. saxatilis* & *Melanelixia glabratula*, thallus (hb Brackel 8690).
A recently described species, known until now only from Austria, France, Spain and Sweden (Diederich & al. 2022, Westberg & al. 2023). *Melanelixia glabratula* is a new host.

Phacothecium varium (Tul.) Trevis.
All on *Xanthoria parietina*, thallus: ***TOS**: **446**: (hb Brackel 8807a); **447b**; **448b** (hb Brackel 8808b); **449**.

*******Phaeoseptoria peltigerae*** Punith. & Spooner (Fig. 11)
TOS: **394b**: on *Peltigera neckeri*, thallus (hb Brackel 8886b).
A very rare species, until now known only from Germany (three finds), England (one find, Sanderson 2019), Netherlands (one find on *Peltigera*; van der Kolk & al. 2024), Norway (one find, type) and Russia (two finds) (see Brackel 2014). With conidia measurements of ca. 15–20 × 2.5–3.5 µm the Italian specimen is nearer to the type (Punithalingam & Spooner 1997: 13–19 × 3–3.5 µm) than one of the Russian finds with (16.4–)19.6–23.8(–27.0) × (2.4–)2.6–3.0(–3.5) µm and the find from the Netherlands (19–26 × 3–3.5 µm). Also, the septation of the conidia corresponds to the type [(1–)3-septate] vs. (1–)3(–7)-septate in the Russian specimen (Zhurbenko 2013).

Plectocarpon lichenum **(Sommerf.) D. Hawksw.**
***UMB**: **535**: on *Lobaria pulmonaria*, thallus (hb Brackel 9205).

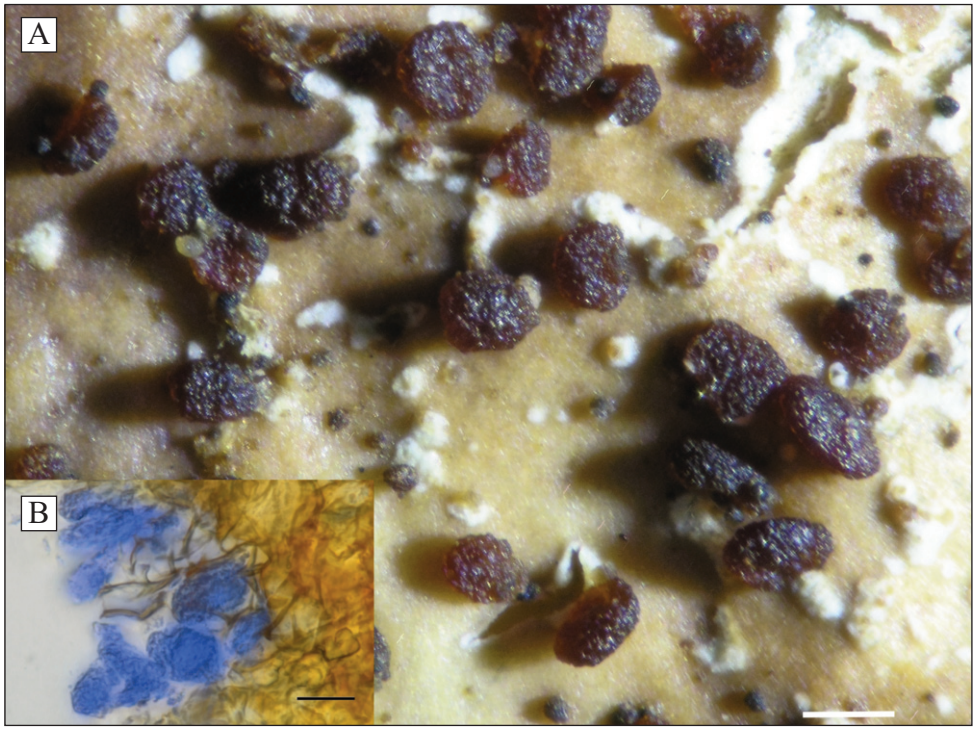

Fig. 10. Bulbils of *Parmeliicida pandemica* on *Parmelia saxatilis* (specimen 8689). A: Habitus. B: Squash preparation showing the granular content of dead cells coloured with cotton blue. Bars: A = 200 µm, B = 10 µm.

Pleospora physciae (Brackel) Hafellner & E. Zimmermann
***EMI**: **204**: on *Physcia adscendens*, thallus (hb Brackel 8870a); **400**: on *P. stellaris*, thallus (hb Brackel 8673).

****Polycoccum alboatrae*** (Vouaux) Etayo (Fig. 12)
LIG: **442**: on *Diplotomma hedinii*, thallus (hb Brackel 8844a).
The species was described by Vouaux (1913) from France as *Didymosphaeria microstictica* var. *alboatrae* Vouaux. Later Etayo (2010) found it in Spain and combined it to *Polycoccum*. These are the only two finds of *Polycoccum alboatrae*, as the record of Lamb (1947) on *Placopsis gelida* is doubtful and most probably belongs to one of the later described species of the genus.
Ascomata perithecioid, in small loose groups almost completely immersed in slightly elevated bulges of the host thallus, ellipsoid to ovoid, black, 100–150 µm diameter; peridial wall dark brown; hamathecial elements abundant, septate, ramified and anastomosing, hyaline, 1.0–1.5 µm wide; asci claviform, 8-spored, 50–85 × 12–20 µm, ascospores irregularly biseriate; ascospores ellipsoid with a slightly narrower lower cell, 1-septate, dark brown, verruculose, (14.0–)14.5–16.0(–17.0) × (6.5–)6.6–7.4(–8.0) µm, l/b = (2.0–)2.1–2.3 (n = 20).

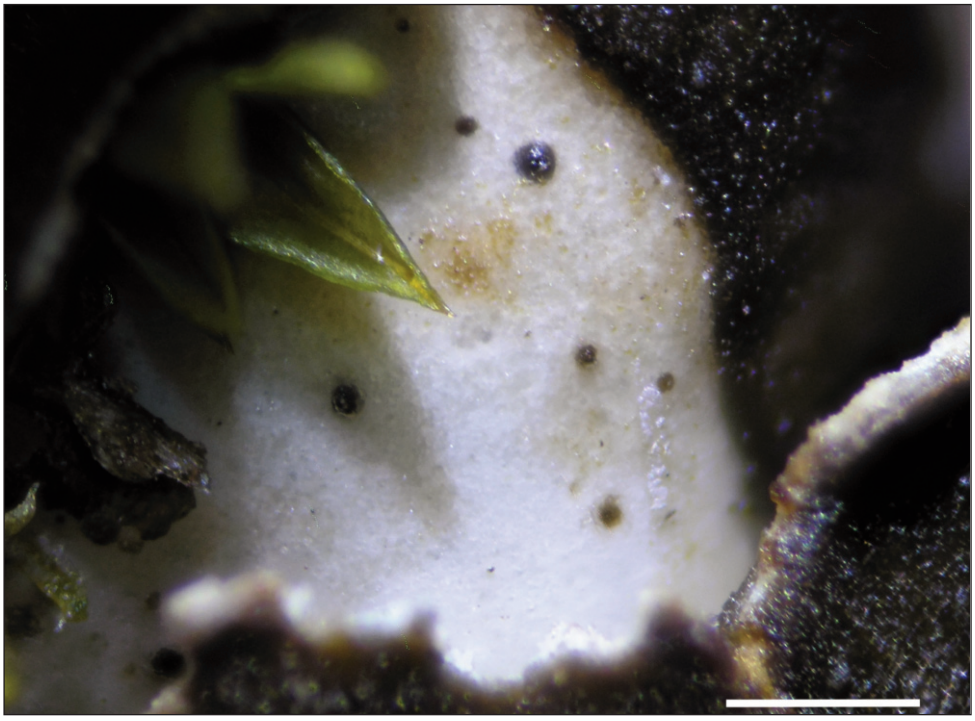

Fig. 11. Infection spot of *Phaeoseptoria peltigerae* on *Peltigera neckeri*, San Godenzo. Bar = 0.5 mm

Vouaux (1913) measured ascomata 140–200 µm, asci 64–80 × 14–17 µm and ascospores 13.5–17 × 5.5–8 µm. Etayo (2010) measured ascomata 100–140 µm, asci 47–50 × 13–14 µm and ascospores 14–18 × 6–8 µm.

****Polycoccum thallicola*** Arnold (Figs. 13, 14)
EMI: **406**: on *Aspicilia candida*, thallus (hb Brackel 8901).
Perithecia black, completely immersed in the host thallus, only the ostiolar region visible, suborbicular, ca. 150 µm diameter; wall dark brown; hamathecium of sparse, septate, ramified and anastomosing paraphysoids, ca. 2.5 µm wide; asci clavate to saccate, 45–60 × 15–17 µm, (2–)4-spored; ascospores 1-septate, ellipsoid, heteropolar, the upper cell wider and more rounded than the lower one, dark brown, delicately verruculose, (14.0–)15.1–18.1(–19.0) × (7.5–)7.9–9.1(–9.5) µm; l/b = (1.7–)1.8–2.1(–2.2) (n = 20).
Except for *Polycoccum thallicola*, on *Aspicilia* s. lat. only one more *Polycoccum* is known, *P. aksoyi* Halici & V. Atienza. It has smaller, smooth ascospores [(11–)13.5–15(–16) × 6.5–7.5 µm], and 8-spored asci (Halici & al. 2007). According to Arnold (1896) *Polycoccum thallicola* has 4-spored asci, 60–66 × 15 µm and ascospores 15–22 × 8–10 µm, fitting well with the features of the Italian find.
The determination of the host brought difficulties, as the apothecial margin did not react yellow with KOH. However, the thallus forms bright white roundish flecks with an effig-

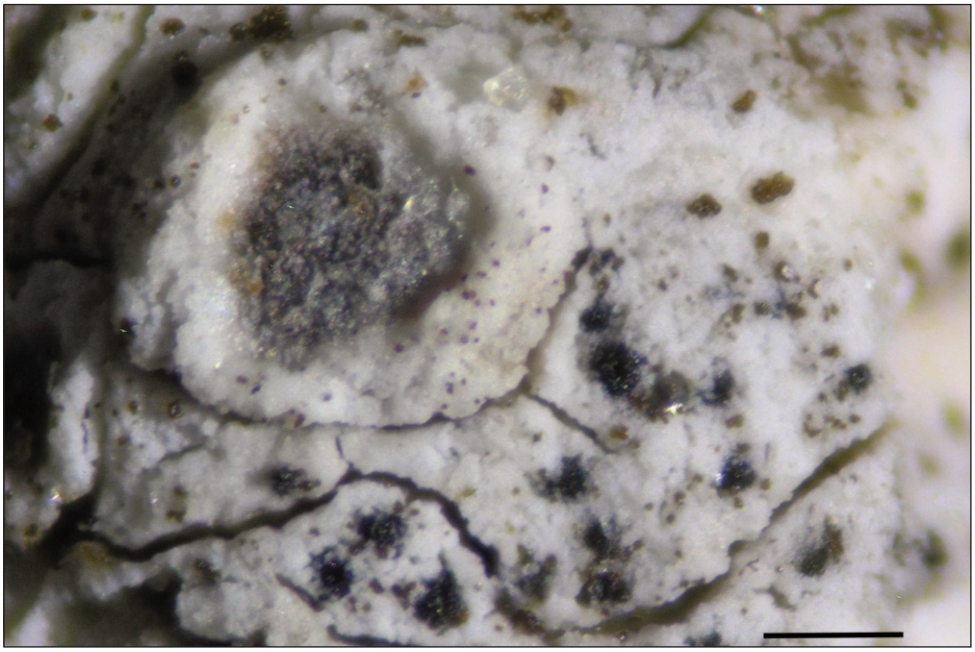

Fig. 12. *Polycoccum alboatrae* on *Diplotomma hedinii*. Left above an apothecium of *D. hedinii*, right down a group of perithecia of *P. alboatrae* with only the ostiolar region visible. Bar = 200 µm.

urate margin, thallus and apothecia are whitish pruinose, the asci are 8-spored and the ascospores are 18–22(–25) × 12.5–15 µm.
Until now, the species was known only from the type location in Austria (Tirol) on *Aspicilia* cf. *candida* (Arnold 1896, Triebel 1989) (Fig. 14).

Polycoccum sp.
LIG: **443**: on *Xanthoparmelia conspersa*, thallus (hb Brackel 8699).
Perithecia black, completely immersed in the host thallus, only the ostiolar region visible, orbicular to pyriform, 80–120 µm in diameter; wall brownish, of a textura intricata; interascal filaments present; asci 4–8–spored, ascospores distichously arranged; ascospores 2–celled, ellipsoid to soleiform, (very) dark aeruginose greyish–brown, distinctly warted, warts partially in rows, perispore bursting in small plates when old, (11,0–)11,9–13,1(–13,5) × (5,5–)5,9–6,8(–7,5) µm, l/b = (1,7–)1,8–2,1(–2,2) (n = 30).
The fungus causes small roundish infection spots on the host thallus, which are slightly discoloured to somewhat greyish and sometimes slightly elevated. In several features the taxon is similar to *Clypeococcum cladonema*, but the clypeus (as well as the resulting the black infection spot) is missing and the ascospores are shorter [(13.5–)14–16(–18) × (5.5–)6–7(–7.5) µm in *C. cladonema*; Hawksworth 1977]. Superficially, especially regarding the infection type, the taxon is also similar to *Endococcus xanthoparmeliae* but in this species the interascal filaments are missing and the ascospores are less dark,

Fig. 13. *Polycoccum thallicola* on *Aspicilia candida*, habitus (specimen 8901). Bar = 1 mm.

without a distinct ornamentation and smaller [(8–)10–12 × 4–5(–6) µm in *E. xanthoparmeliae*; Joshi & al. 2015].

Pronectria echinulata Lowen (Fig. 15)
MAR: **386**: on *Physconia distorta*, thallus (hb Brackel 8670).
In specimen 8670 besides the ascomata the putative *Acremonium*–anamorph was found: Colonies confluent, translucent–whitish, building sporodochial–like cushions. Conidiophores semi-marcronematous, richly branched, septate, hyaline, smooth. Conidiogenous cells discrete, terminal, hyaline, thin–walled, smooth, subulate, phialidic, 20–40 µm long, 3–4.5 µm wide at the base and 1.5–2 µm wide at the apex. Conidia solitary, simple, smooth, hyaline, ellipsoid, apically rounded, basally truncate, guttulate, (5.5–)6.2–8.8(–10.0) × (3.5–)3.7–4.4(–4.5) µm. l/b = (1.3–)1.6–2.2(2.3) (n = 20), appearing in mass as smooth orange amorphous patches on the host thallus. Though the conidia are somewhat smaller, the features correspond to those of the anamorph found in the specimens 4375 and 4558 on *Physconia venusta* from Sicilia in Brackel (2008) [conidia: (7–)8.2–10.1(–11.2) × (4–)4.5–5.8(–6.7), l/b = (1.3–)1.5–2.1(–2.4) (n=40)]. Diederich & Braun (2009) report *Acremonium hypholomatis* (Boedijn) D. Hawksw. on *Physcia stel-*

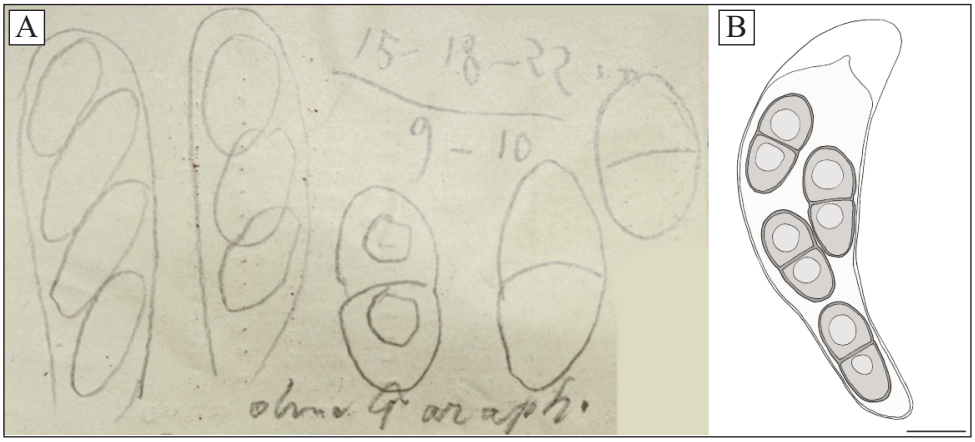

Fig. 14. *Polycoccum thallicola*. A: Sketch on the label of Arnold's specimen from Tyrol. B: Ascus with ascospores, specimen 8901. Bar = 10 µm.

laris, which, in contrast to specimen 8670, has pinkish colonies, simple conidiophores and much larger conidia (11.5–20 × 5.5–7 µm). Consequently, *A. hypholomatis* is not the anamorph of *Pronectria echinulata* as stated erroneously in Berger & al. (2020). See also Diederich & al. (2024a).

Pronectria leptaleae (J. Steiner) Lowen
***EMI**: **405a**: on *Physcia aipolia*, apothecia (hb Brackel 8676).

Pronectria lilae Brackel**, species nova** (Figs. 16, 17)
MycoBank # 858891
Diagnose: Fungus lichenicola in thallo et apotheciis lichenum generis *Seirophora* crescens. Ascomata perithecioidea, solitaria, 120–190 µm in diametro, in thallum vel hymenium hospitii immersa. Asci (4–)6(–8)-sporae, 35×60 × 7–12 µm. Ascosporae (0–)1-septatae, hyalinae, ellipsoideae, (9,0–)10,2–12,0(–12,5) × (4,5–)4,9–5,9(–6,5) µm.
Typus: Italy, Toscana, Prov. di Livorno, N Marina di Castagneto Carducci, dune scrub, on *Juniperus macrocarpus*, on *Seirophora villosa*, 10 m, 43°11'04,3''N, 10°32'16,3''E, 27.8.2015, leg. W. & G. v. Brackel (M – holotypus, hb Brackel 8816 – isotypus) (Fig. 16).
Description: Ascomata scattered, perithecioid, suborbicular, 120–190 µm diameter, ostiolate, papillate, dry almost black, wet (dark) red, completely immersed in the host's thallus or hymenium, with only the ostiolar region visible. Exciple of textura angularis, ca. 30 µm wide above, ca. 20 µm downwards, outer layer 2–3 rows of ± isodiametric or slightly compressed orange cells 4–10 × 3–4 µm, inner layer 4–5 rows of hyaline, tangentially compressed cells, 5–12 × 1–2 µm, K–. Periphyses lining the inner channel of the ostiole, ca. 15 × 1.5 µm, interascal elements gelatinised, absent at maturity. Asci cylindrical or clavate, (4–)6(–8)-spored, apically convex, wall not thickened, 35–60 × 7–12 µm with the ascospores arranged uniseriate or irregularly biseriate, KI–. Ascospores ellipsoid, hyaline, (0–)1-septate, not constricted at the septum, delicately verruculose, guttulate, 2-celled

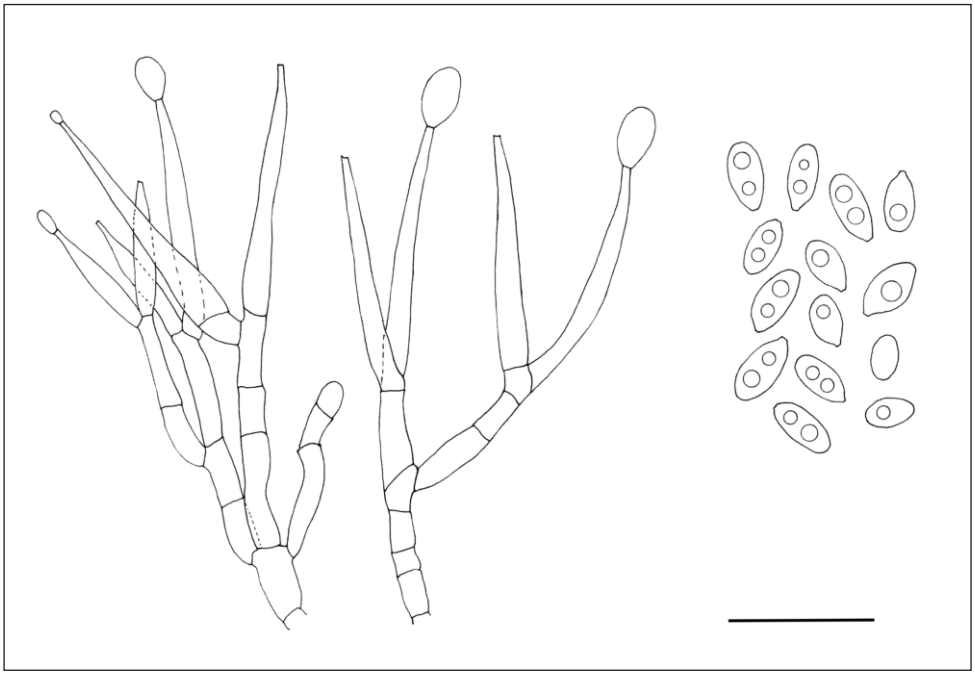

Fig. 15. *Pronectria echinulata*, Acremonium–anamorph. Bar = 20 µm.

ascospores (9.0–)10.2–12.0(–12.5) × (4.5–)4.9–5.9(–6.5) µm, l/b = (1.5–)1.9–2.3(–2.4) (n = 30), 1-celled ascospores slightly shorter. Asexual morph not seen (Fig. 17).

Etymology: Named after my daughter Julia ("Lila"), who provided me with material for the microscope since kindergarten, then with cushions of *Grimmia* and *Tortula* from the walls on the way home: "Hast Du das schon im Herbar?" ("Do you have this in the herbarium already? ").

Host and distribution: The new species is known only from the type locality in Italy, where it grows on the thallus and apothecia of *Seirophora villosa*. The infection does not cause any visible damage.

Discussion: With its immersed, orange-red perithecioid ascomata, not reacting with KOH, without peridial hairs or setae, the lack of persisting interascal elements, the 1-septate hyaline and delicately ornamented ascospores, the new species belongs to the genus *Pronectria*. To date 50 described species of *Pronectria* are known. Apart from the not clearly lichenicolous species, all of them are rather specific, most of them to a genus or even a species, few at least to a family. So, the new species has to be compared with species growing on Teloschistaceae: *Pronectria caloplacae* Khodos., Vondrák & Naumovich and *Pronectria xanthoriae* Lowen & Diederich (Khodosovtsev & al. 2012, Lowen & Diederich 1990). Both of them have distinctly longer ascospores, (12.5–)13.75–16.75(–20) µm and 17–24 µm respectively vs (9–)10.2–12(–12.5) µm.

Among all other known species of *Pronectria* (differing from the new species in the

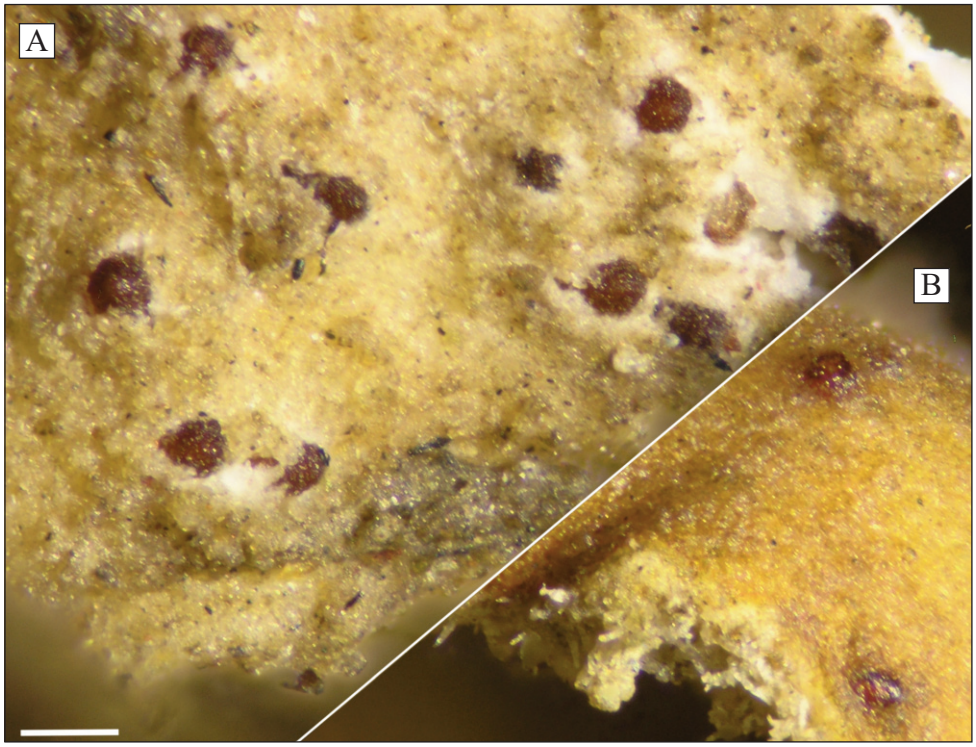

Fig. 16. *Pronectria lilae* on *Seirophora villosa*, holotype. A: on thallus, B: on apothecium. Bar = 200 µm.

host selection) three share similar dimensions of ascospores: *Pronectria dillmanniae* Zhurb. (on *Catapyrenium*; Zhurbenko & al. 2005), *P. rhizocarpicola* Brackel (on *Rhizocarpon*; Brackel 2013) and *P. biglobosa* Etayo (on *Hypotrachyna*; Etayo 2017). *P. dillmanniae* is distinguished by the one-layered peridial wall, the appearance of interascal elements, longer asci [(50–)62–77.5(–80) µm vs 35–60 µm] and the granulate ascospores. *Pronectria rhizocarpicola* has bigger ascomata, about 250 µm, and is strongly pathogenic, bleaching and finally destroying the host. *Pronectria biglobosa* is in all features very close to the new species, except from its ascospores, showing a strong constriction at the septum and finally two subglobose cells. *Pronectria robergei* (Mont. & Desm.) Lowen (on *Peltigera* and *Solorina*; Zhurbenko 2009b), probably a heterogeneous taxon, has ascospores with a wide range of dimensions [8–16 × (3–)4–8 µm], including those of the new species. However, the ascospores in *P. robergei* are generally narrowly ellipsoid [l/b = (1.5–)2.6–3.8(–6.0) vs (1.5–)1.9–2.3(–2.4)].

Pronectria oligospora var. ***octospora*** Etayo
***UMB**: **542**: on *Punctelia* sp., thallus, destroyed (hb Brackel 9209).

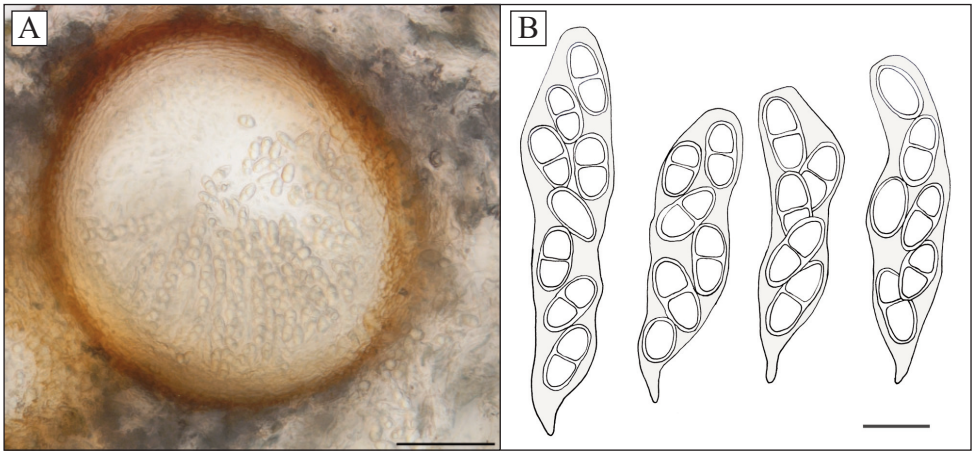

Fig. 17. *Pronectria lilae* on *Seirophora villosa*, holotype. A: section through an ascoma, B: asci with ascospores. Bars: A = 50 µm, B = 10 µm.

Pronectria pertusariicola Lowen
TOS: **513**: on *Pertusaria pertusa*, ascomatal warts; **514**: on *P. pertusa*, ascomatal warts (hb Brackel 8602); **554:** on *P. pertusa*, ascomatal warts (hb Brackel 8061).

Pronectria santessonii (Lowen & D. Hawksw.) Lowen
LAZ: (Brackel 2015: loc. 081): Prov. di Rieti, Amatrice, road to Campotosto, alley of *Aesculus hippocastanum*, on *Anaptychia ciliaris*, 970 m, 42°37'33,7''N, 13°17'49,4''E, 9.8.2011, W. & G. v. Brackel (hb Brackel 6434; as the *Acremonium* anamorph; loc. 82 in Brackel 2015).

Pseudocercospora lichenum (Keissl.) D. Hawksw.
TOS: **518**: on *Pertusaria pertusa*, ascomatal warts (hb Brackel 8606).

Pyrenochaeta xanthoriae Diederich
***EMI**: **199**: on *Xanthoria parietina*, apothecia (hb Brackel 8802b).

Roselliniella cladoniae (Anzi) Matzer & Hafellner
***EMI**: **423a**: on *Cladonia rangiformis*, podetia (hb Brackel 8830). – ***LIG**: **439**: on *C. rangiformis*, podetia (hb Brackel 8837); **444**: on *C. rangiformis*, podetia (hb Brackel 8840).
In 8830 besides the characteristic big, obpyriform ascomata also the anamorph of *Roselliniella cladoniae* was found (see Zhurbenko & Pino-Bodas 2017, Coste & Pinault 2019, Diederich & al. 2024b).

Roselliniopsis tartaricola (Nyl. ex Leight.) Matzer
***LIG**: **432**: on *Lepra albescens*, thallus (hb Brackel 8852).

Sarcopyrenia gibba (Nyl.) Nyl.
LIG: **426**: on *Lobothallia radiosa*, thallus (hb Brackel 9188b).
It was impossible to decide, whether our specimen belongs to the variety *gibba* or to the variety *geisleri*. The measurements of the ascospores are: 33.0–41.0(–45.0) × (3.0–)3.1–4.1(–4.5) µm, l/b = (8.5–)9.3–11.4(–11.5), taille = (1.2–)1.3–1.7(–1.8) (n = 12). Navarro-Rosinés & al. (2009) give for var. *gibba*: (28) 29,5–35 (39) × 2–4 µm, l/b = (7.7) 9.1–15.0 (16.5), taille = 1–1.5 (2) µm, and for var. *geisleri*: (26) 28–38.5 (41) × (3) 4–5 (6) µm, l/b = (5.0) 6.5–10.5 (11.0), taille = 1–1.5 µm. Also, the shape of the ascospores did not help, we found intermixed straight and curved and sinuose ones. None of the two varieties of *Sarcopyrenia gibba* was reported from Italy until now, so the species is new to Italy.

Sclerococcum lobariellum (Nyl.) Ertz & Diederich
Syn.: *Dactylospora lobariella* (Nyl.) Hafellner
***LIG**: **431**: on *Lobaria pulmonaria*, thallus (hb Brackel 8843).

Sclerococcum parasiticum (Flörke ex Spreng.) Ertz & Diederich
Syn.: *Dactylospora parasitica* (Flörke ex Spreng.) Zopf
TOS: **395**: on *Pertusaria pertusa*, thallus (hb Brackel 8847); **514**: on *P. pertusa*, thallus (hb Brackel 8601).

Sphaerellothecium cladoniae (Alstrup & Zhurb.) Hafellner
***EMI**: **398**: on *Cladonia foliacea*, squamules (hb Brackel 8826); **406**: on *Cladonia* cf. *grayi*. – **LIG**: **444**: on *Cladonia pyxidata*, squamules (hb Brackel 8839). – ***MAR**: **528**: on *Cladonia pyxidata* f. *pocillum* (hb Brackel 9195); ***UMB**: **534**: on *C. pyxidata* f. *pocillum* (hb Brackel 9202).

Sphaerellothecium parietinarium (Linds.) Hafellner & V. John
All on *Xanthoria parietina*, apothecia and rarely thallus: ***TOS**: **445** (hb Brackel 8806a); **446**; **448b** (hb Brackel 8889).
In the specimen 8889 the ascospores are smaller than described in Roux & Triebel (1994): (8.0–)8.8–10.4(–11.0) × (3.2–)3.5–4.5(–5.0) µm, l/b = (1.9–)2.1–2.7(–3.1) (n = 40) vs. (10.5–)11–13(–14) × (4–)4.5–5.5(–6) µm.

Sphaerellothecium propinquellum (Nyl.) Cl. Roux & Triebel
***UMB**:**535**: on *Lecanora carpinea*, apothecia and thallus (hb Brackel 9204).
An aggressive parasite of *Lecanora carpinea* and related species, easily to detect due to the blackened apothecial discs of the host. Obviously, a rare species in Italy, known only from one other location in Abruzzo (Nimis & Tretiach 1999).

Spirographa intermedia (Punith. & D. Hawksw.) Flakus et al. agg.
EMI: **423b**: on *Physcia* sp. (hb Brackel 8683, anamorph).
Spirographa intermedia s. str. was described on the host *Ochrolechia* (Punithalingam 2003). According to Flakus & al. (2019) the species of *Spirographa* seem to be quite specific; so, all records of specimens with the features of *S. intermedia* (as the *Cornutispora*–anamorph) on hosts other than *Ochrolechia* should be assigned to the aggregate.

Spirographa lichenicola (D. Hawksw. & B. Sutton) Flakus et al.
TOS: **551b**: on *Lepraria* sp., thallus (hb Brackel 8027).
The species was described on *Parmelia sulcata* (Hawksworth 1976, as the *Cornutispora*-anamorph); it is not yet clear if all the specimens from other hosts belong to the same species.

Spirographa triangularis (Diederich & Etayo) Flakus et al.
Syn.: *Cornutispora triangularis* Diederich & Etayo
***TOS**: **514**; on *Pertusaria pertusa*, thallus and ascomatal warts (hb Brackel 8607, anamorph); **515**; on *P. pertusa*, thallus and ascomatal warts (hb Brackel 8605, anamorph).
Only recently the anamorphic species *Cornutispora triangularis* was combined to *Spirographa triangularis* (Flakus & al. 2019) and possible anamorph–teleomorph connections were shown. The species seems to be restricted to epiphytic *Pertusaria* spp. and was known in Italy until now only from Sardegna and Molise (Brackel & Berger 2019, Brackel 2020), always in the asexual state.

Stigmidium cladoniicola Zhurb. & Diederich
TOS: **408c**: on *Cladonia* cf. *grayi* and on *C. gracilis* squamules and podetia (hb Brackel 8828).

Stigmidium congestum (Körb.) Triebel
All on *Lecanora chlarotera*, apothecia: ***EMI**: **392a**: (hb Brackel 8855). – **TOS**: **518**: (hb Brackel 8428a); **606a**: (hb Brackel 9222).

Stigmidium eucline (Nyl.) Vězda
***LIG**: **432**: on *Lepra albescens*, thallus (hb Brackel 8851).

****Stigmidium leprariae*** Zhurb.
TOS: **513a**: on *Lepraria* sp. (hb Brackel 8405).
Until now the species was known only from Norway (Zhurbenko 2007), Poland (Kukwa & Flakus 2009), Russia (Zhurbenko 2009a and others) and from the Czech Republic (Malíček et al. 2009). – New to the Mediterranean and Italy.
Stigmidium microspilum (Körb.) D. Hawksw.
TOS: 551b: on *Graphis scripta*, thallus (hb Brackel 8026).

Stigmidium psorae (Anzi) Hafellner
EMI: **398**: on *Psora decipiens*, thallus (hb Brackel 8809).

Stigmidium squamariae (de Lesd.) Cl. Roux & Triebel
***EMI**: **406**: on *Lecanora polytropa*, apothecia (hb Brackel 8858a); **450**: on *Protoparmeliopsis* (*Lecanora*) *muralis*, apothecia (hb Brackel 8863).

Stigmidium xanthoparmeliarum Hafellner
***LIG**: **428**: on *Xanthoparmelia conspersa*, thallus (hb Brackel 8697). – **TOS**: **513b**: on *X. conspersa*, thallus (hb Brackel 8554).

Taeniolella delicata M.S. Christ & D. Hawksw.
***EMI**: **206**: on *Lepra albescens*, thallus (hb Brackel 8846b); **412a**: on *L. albescens*, thallus (hb Brackel 8848). – ***MAR**: **525**: on *L. albescens* and *Ochrolechia androgyna*, thallus (hb Brackel 9193). – ***UMB**: **510**: on *Physcia adscendens*, thallus.

Taeniolella glebarum (Brackel) Diederich
Syn.: *Trimmatostroma glebarum* Brackel
***LIG**: **431**: on *Flavoparmelia caperata*, thallus. – **TOS: 554**: on *F. caperata*, thallus (hb Brackel 8046).

Taeniolella phaeophysciae D. Hawksw.
***MAR**: **385**: on *Phaeophyscia orbicularis*, thallus (hb Brackel 8667).

Talpapellis beschiana (Diederich) Zhurb., U. Braun, Diederich & Heuchert
***EMI**: **422**: on *Cladonia rangiformis*, podetia (hb Brackel 8829).

Telogalla olivieri (Vouaux) Nik. Hoffm. & Hafellner
All on *Xanthoria parietina*, thallus: ***EMI**: **199** (hb Brackel 8821; 8801b). – **LAZ**: **599**; **602**; **603** (hb Brackel 9216a)**. – MAR**: **381** (hb Brackel 8804b); **383c**; **532**; **544; 596**. – **TOS**: **445** (hb Brackel 8806b); **446**; **447**; **448**; **449**; **519; 547**. – **UMB**: **538**; Prov. di Terni, forest edge SE Monterivoso, on *Acer monspessulanum*, 2014, R. Cezanne & M. Eichler.

Tetramelas pulverulentus (Anzi) A. Nordin & Tibell
***TOS**: **609**: on *Physconia distorta*, thallus (hb Brackel 9225).

Tremella hypogymniae Diederich & M.S. Christ.
***EMI**: **409c**: on *Hypogymnia physodes*, thallus (hb Brackel 8685a).

Tremella parietinae Freire-Rallo, Diederich, Millanes & Wedin
***UMB**: Prov. di Terni, forest edge SE Monterivoso, on *Acer monspessulanum*, on *Xanthoria parietina*, 2014, R. Cezanne & M. Eichler.

Trichonectria anisospora (Lowen) van den Boom & Diederich
TOS: 520a: on *Hypogymnia physodes*, thallus (hb Brackel 8557).
In a pale, almost yellow morph; usually the species is pale orange.

Trichonectria rubefaciens (Ellis & Everh.) Diederich & Schroers
Syn.: *Cylindromonium rubefaciens* (Ellis. & Everh.) Diederich & Ertz
***LIG**: **434b**: on *Parmelina pastillifera*, thallus (hb Brackel 8691). – ***MAR**: **527**: on *Pleurosticta acetabulum*, thallus (anamorph & teleomorph; hb Brackel 9194). – **TOS**: (loc. 344 in Brackel 2015): Prov. di Pistoia, Valle Sestaione S Abetone, mixed mountain forest with stream, on *Abies alba*, on *Parmelia saxatilis* agg., 44°07’28,0’’N, 10°39’39,7’’E to 44°07’21,2’’N, 10°39’28,6’’E, 18.10.2014 (hb Brackel 7069, as the anamorph).

Trimmatostroma rouxii Diederich, Tehler & van den Boom (Fig. 18)
TOS: **448b**: on *Arthonia atra*, thallus (hb Brackel 8892).
This species was described recently (Diederich 2021) from *Opegrapha durieui* and *Arthonia* species on coastal limestone rocks. Our specimen on twigs of coastal shrubs fits exactly the description, especially the 0–2-septate conidia with the second septum perpendicular to the first, a feature rarely observed in *Trimmatostroma*. Obviously, the ecology of the dune shrubs with their bark incrusted by salt and calcareous sand is similar enough to the costal limestone rocks.

Unguiculariopsis lettaui (Grummann) Coppins
TOS: 520a: on *Evernia prunastri*, thallus (hb Brackel 8556); **546**: on *E. prunastri*, thallus.

Unguiculariopsis thallophila (P. Karst.) W. Y. Zhuang
TOS: **605**: on *Lecanora chlarotera*, thallus and apothecia (hb Brackel 9221a).

Vouauxiella lichenicola (Linds.) Petr. & Syd.
All on *Lecanora chlarotera*, thallus and apothecia: **TOS**: **513**; **518** (hb Brackel 8428b); **605** (hb Brackel 9221b); **606**.

Weddellomyces erythrocarpae Nav.–Ros. & Roux (Fig. 19)
TOS: **393**: on *Kuettlingeria* (*Caloplaca*) *erythrocarpa* (hb Brackel 8810).
Ascomata perithecioid, globose, almost completely to half immersed, black, matt, opening by radial fissures, 2.5–5.5 mm wide; peridial wall brown, pseudoparenchymatic, formed of elongate cells; hamathecium of septate, ramified and anastomosing interascal elements, 1–2 µm wide, abundant; asci cylindrical, 8–spored, ca. 130 × 20 µm, ascospores arranged mono– to distichously in the asci; ascospores ellipsoid, slightly heteropolar, (1–)2(–3)–septate, constricted at the septa, pale olive brown, finely but distinctly granulose, (26.0–)28.3–33.3(–35.0) × (9.0–)10.0–12.6(–14.0) µm. l/b = (2.3–)2.5–3.0(–3.1) (n = 20).
Weddellomyces erythrocarpae was known until now only from the type locality in Spain and the description is based on a single specimen (Navarro-Rosinés & Roux 1995). The differences between *W. erythrocarpae* (on Kuettlingeria *erythrocarpa*) and *Weddellomyces protearius* [on *Leproplaca* (*Caloplaca*) *proteus*], which also was described from collections from only one locality (Navarro-Rosinés & Roux 1997), are rather small. The former has somehow bigger ascospores [(28.5–)30–40(–45) × (10–)11–15(–15.5) µm vs. (24.5–)27–32.5(–39) × (10.5–)11–13.5(–14.5) µm] with a granular perispore (vs. smooth by light microscopy) and prominent tholi in the young ascospores (vs. non-prominent tholi).
The dimensions of the ascospores of the specimen from the Toscana are in the range of both species but fit better *W. protearius*. Tholi in the septa of the ascospores could be observed, some are prominent, others less distinct. The perispore is distinctly granular. Regarding all this and the host the specimen from the Toscana is assigned to *Weddellomyces erythrocarpae*. This is the second find of the species.

Xanthoriicola physciae (Kalchbr.) D. Hawksw.
All on *Xanthoria parietina*, mainly on the apothecia: **EMI**: **199** (hb Brackel 8802a); **200b**;

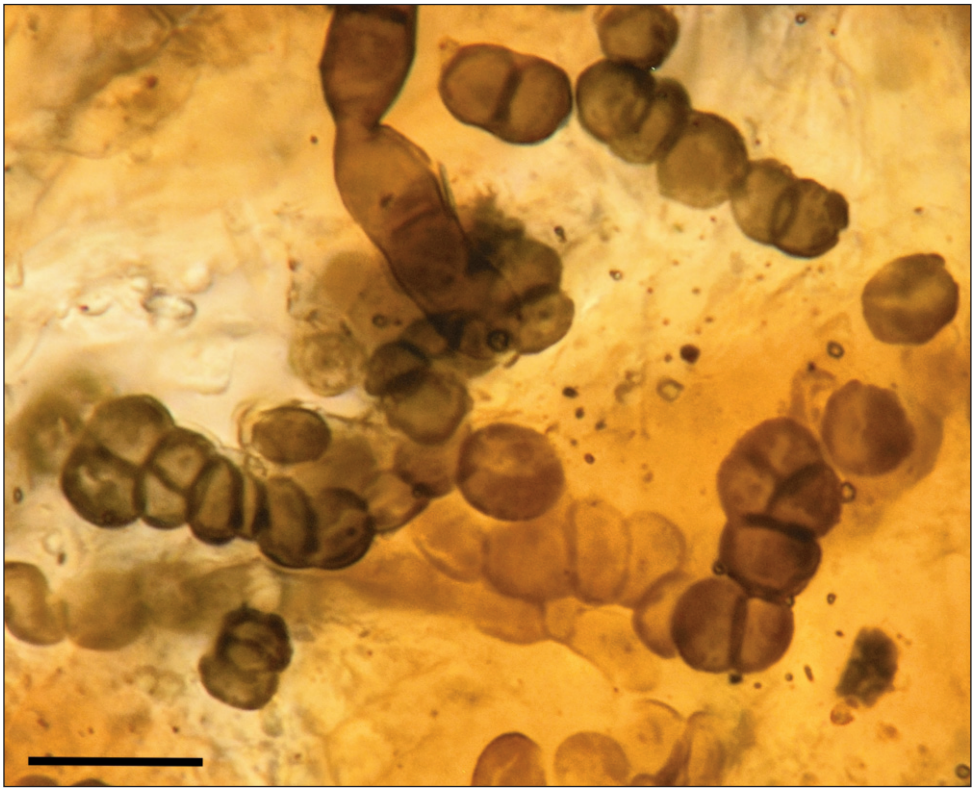

Fig. 18: *Trimmatostroma rouxii* on *Arthonia atra* (specimen 8892). Bar = 10 µm.

206; **419**; **423b**. – **LAZ**: **603** (hb Brackel 9216c). – ***LIG**: **437b** (hb Brackel 8822). – **MAR**: **381**; **383a** (hb Brackel 8666b); **383b**; **387**; **596**. – **TOS**: **446** (hb Brackel 8807b); **610**.

Xenonectriella physciacearum F. Berger, E. Zimm. & Brackel
***EMI**: **400**: on *Physcia* cf. *stellaris*, thallus (hb Brackel 8669); **401**: on *P. stellaris*, thallus; **415a**: on *Physconia distorta*, thallus, apothecial margin and apothecial disc (hb Brackel 8677). – **MAR**: **524**: on *P. stellaris*, thallus (hb Brackel 9192); **597**: on *Physcia aipolia*, thallus (hb Brackel 9213). – **TOS**: **609**: on *Physconia venusta*, thallus and apothecial disc (hb Brackel 9224).
Differing from the protologue (Berger & al. 2020) in 8677 the ascomata grew also on the apothecial disc.

Xenonectriella septemseptata (Etayo) Etayo & van den Boom
***MAR: 611:** on *Melanelixia glabra*, thallus (hb Brackel 9114).
A small specimen with only one perithecium and immature asci with up to 3-septate young ascospores.

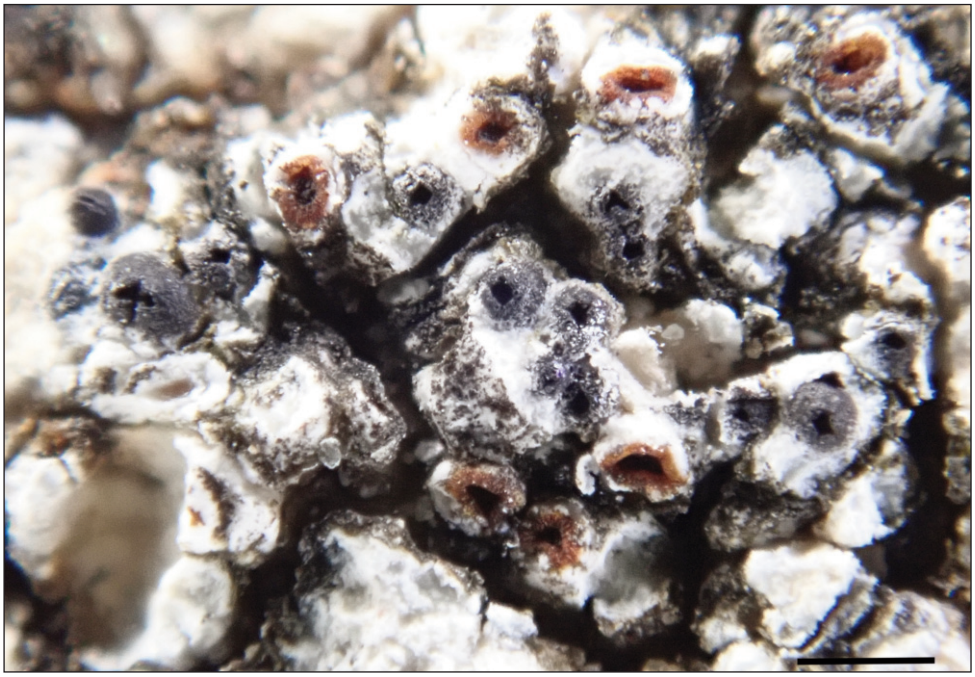

Fig. 19. *Weddellomyces erythrocarpae* on *Kuettlingeria erythrocarpa*, habitus (specimen 8810). Bar = 0.5 mm.

Xenonectriella subimperspicua (Speg.) Etayo var. ***subimperspicua***
LAZ: **602**: on *Parmelia sulcata*, thallus (hb Brackel 9215).

****Xenonectriella zimmermanni*** F. Berger & Brackel
EMI: **415b**: on *Physcia stellaris*, thallus (hb Brackel 8678).
Even with the naked eye *Xenonectriella zimmermanni* differs from *X. physciacearum* in the missing darker papilla. Microscopically it can be distinguished by the always K+ violet wall and the smaller, often non-septate ascospores. The recently described species is known from a few European countries and from the Bermudas (Berger & al. 2020).

Zwackhiomyces calcariae (Flagey) Hafellner & Nik. Hoffm.
***EMI**: **406**: on *Circinaria* (*Aspicilia*) cf. *caesiocinerea*, thallus (hb Brackel 8899).
Ascomata perithecioid, subglobose, half immersed, black, ca. 250 µm diameter; wall of textura angularis, dark brown throughout, pigment granular, intercellular; hamathecium of septate, ramified, anastomosing interascal elements, 2–3 µm wide; asci clavate to cylindrical, 4-spored, ca. 65 × 12 µm; ascospores 1-septate, the upper cell wider than the lower one, constricted at the septum, ellipsoid to narrowly ellipsoid, hyaline, smooth, (17–)18.1–23.2(–26.0) × (5.0–)5.3–7.1(–7.5) µm, l/b = 2.7–4.1(–5.2) (n = 12).

Here *Zwackhiomyces calcariae* is understood including *Didymella sphinctrinoides* var. *aspiciliicola* (Zopf) Vouaux, as supposed by Grube & Hafellner (1990) and Hoffman & Hafellner (2000). The type specimen of *Z. calcariae* has ascomata 170–270 µm diameter, 8-spored asci and ascospores 15–20 × 6–7 µm, whereas *in D. sphinctrinoides* var. *aspiciliicola* the ascomata measure 120–190(–260) µm diameter, the asci are 4–6(–8)-spored and the ascospores measure 20–26 × 6–8.5(–9) µm (Grube & Hafellner 1990, Hoffman & Hafellner 2000). In a specimen from Turkey, Candan & Halici (2008) measured ascomata of 200–250 µm diameter, (4–)6-spored asci and ascospores 19–23 × 6–7 µm. Halici & Candan (2009) described a *Zwackhiomyces aspiciliae* Halici & Candan on *Circinaria* (*Aspicilia*) *hoffmanniana* with ascomata 200–270 µm diameter, (6–)8-spored asci and ascospores (18–)20–25(–28) × (5–)6–8(–9) µm, without mentioning neither *Z. calcariae* nor *D. sphinctrinoides* var. *aspiciliicola* or the differences between their taxon and these. The relationship to *Z. calcariae* is unclear.

Zwackhiomyces lithoiceae (B. de Lesd.) Hafellner & V. John
EMI: **397**: on *Verrucaria* sp., thallus (hb Brackel 8866a, 8897).
Ascomata perithecioid, black, half immersed to almost completely superficial, (150–)200(–250) µm dimeter, wall dark brown, pigment granular and intercellular, hamathecium of septate, ramified and anastomosing elements, ca. 1–1.5 µm wide, asci clavate, 55–65 × 15–20 µm, 6–8-spored, KI–, endoascus dextroid, ascospores 1-septate, soleiform, hyaline, smooth, 13–17 × 4–6 µm.
The species was described by Bouly de Lesdain (1910) from Northern France; Vouaux (1913) saw the type specimen and gave a more detailed description, then the type was lost during the war. Grube & Hafellner (1990) and Darmostuk (2019) added new descriptions, based on specimens from Germany and Ukraine respectively. The last two descriptions differ from the type description mainly in the number of ascospore per ascus: in the type they were at 8, in the German specimen (2–)4–6 and in the Ukrainian specimens 4–6. M. Eichler and R. Cezanne (pers. comm.) found two specimens in the Odenwald (Southern Germany) with (6–)8 and with mainly 4 ascospores/ascus respectively. In the Italian specimen 6–8 ascospores per ascus were found. Following the descriptions or a part of them are cited: Bouly de Lesdain (1910: 274): *Pharcidia lithoiceae* (type, lost): „Differt a *Pharcidia lichenum*, ascis elongatis, sporis majoribus 18–21 µ long, 6–7 crass., et praesertim paraphysibus bene discretis“. – Vouaux (1913: 93): *Didymella sphinctrinoides* var. *lithoiceae* (type, lost): „… avec des asques à 8 spores sur deux rangs, de 57–75 × 12–15 µ, et des spores parfois inéquilatérales, de 15–21 × 4–7 µ“. – Grube & Hafellner (1990: 340): „*Didymella*“ *sphinctrinoides* var. *lithoiceae* (specimen from Thuringia/Germany, leg. Lettau, W): Asci 45–65 × 13–15 µm, mostly 4–6-spored, rarely only 2-spored, ascospores 15–20 × 5–7,5 µm. – Darmostuk (2019: 308): *Zwackhiomyces lithoiceae* (2 specimens from the Ukraine, KHER): Asci (45–)48–52(–54) × (14–)15–22(–25) µm, 4–6-spored, ascospores (16.8–)17.8–20.4(–24.6) × (5.6–)6.4–7.8(–8.7) µm.

Zwackhiomyces martinatianus (Arnold) Triebel & Grube
***EMI**: **404**: on *Porpidia crustulata*, thallus (hb Brackel 8887).

Zwackhiomyces polischukii Darmostuk & Khodos.
TOS: **449**: on *Bacidia parathalassica*, apothecia and thallus (hb Brackel 8882).
Ascomata perithecioid, immersed to half erumpent in the thallus and the apothecia of the host, black, orbicular, 110–250 µm diameter, ostiolate, the ostiole radially torn; peridial wall dark brown, cells rounded and partially torulose elongate in the upper part (textura intricata), becoming more or less isodiametric in the lower part (textura angularis), brown pigment granulose, intercellular; paraphysoids abundant, septate, ramified and anastomosing, hyaline, 1.5–2 µm wide; asci (4–)8-spored, ca. 55 × 11 µm; ascospores ellipsoid, 1-septate, heteropolar, hyaline, strongly verrucose to almost smooth, constricted at the septum, (15.0–)16.5–19.2(–20.0) × (5.5–)6.0–6.9(–7.0) µm, l/b = (2.0–)2.3–3.0(–3.2) (n = 20), upper cell rounded and wider than the slightly attenuated lower cell. Conidiomata smaller than the ascomata but of the same structure, conidia hyaline, ellipsoid, truncate at one end, ca. 2 × 1 µm.
These features fit well the protologue (Khodosovtsev & Darmostuk 2017), apart from the slightly smaller dimensions of the ascospores in the Italian specimen.

Zwackhiomyces sp. (Fig. 20)
LIG: **429b**: on *Collema fuscovirens*, thallus (hb Brackel 8885).
Ascomata perithecioid, black, immersed to half erumpent, ostiolate, ca. 110 µm diameter, wall brown, pigment granular, intercellular; hamathecium of septate, ramified and anastomosing elements; asci (4–)6-spored, ca. 45 × 8 µm; ascospores 1-septate, heteropolar, hyaline, verrucose, (12.5–)13.2–15.1(–16.0) × (4.5–)4.9–5.8(–6.0) µm, l/b = (2.3–)2.4–3.0(–3.3) (n = 20), upper cell rounded and wider than the attenuated lower cell.
On the first view the new species reminds of *Didymellopsis pulposi* (with hosts of the

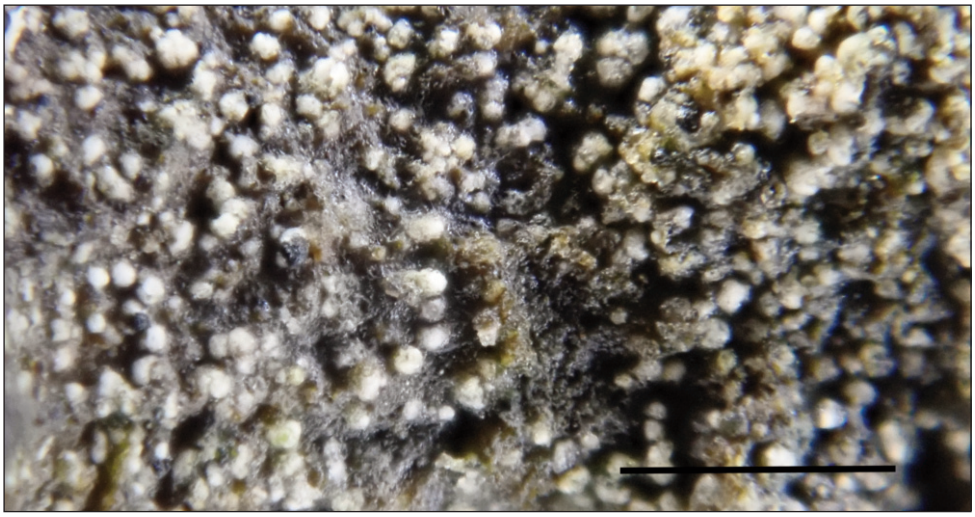

Fig. 20. *Zwackhiomyces* sp. on *Collema fuscovirens*, habitus of the infection with the white dotted surface of the host thallus and minute black perithecia of the parasite. Bar = 1 mm.

genus *Collema*), but the intercellular granular pigmentation of the peridial wall and the verrucose ascospores clearly show it is a member of the genus *Zwackhiomyces* and not *Didymellopsis*. Interestingly, the infection causes a bleaching of the isidia and the elevated granules on the surface of the host thallus, giving him a white dotted appearance.

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