

## Miscellaneous records of lichens and lichenicolous fungi from the Apuan Alps and the Tuscan-Emilian Apennine (central Italy)

Mauro TRETACH, Pier Luigi NIMIS & Josef HAFELLNER

**Abstract:** TRETACH, M., NIMIS, P. L. & HAFELLNER, J. 2008. Miscellaneous records of lichens and lichenicolous fungi from the Apuan Alps and the Tuscan-Emilian Apennine (central Italy). – *Herzogia* 21: 93–103.

252 infrageneric taxa of lichenised and lichenicolous fungi are reported from several localities of the Apuan Alps and the Tuscan-Emilian Apennine (central Italy), visited during two short excursions in summer 2001. *Catillaria atomarioides* and *Anema tumidulum* are new to the Italian lichen flora. Eleven lichens (*Acarospora badiofusca* subsp. *badiorubra*, *Bilimbia accedens*, *Caloplaca obliterans*, *Cystocoleus ebeneus*, *Fuscidea recensa*, *Porpidia glaucophaea*, *Rhizocarpon carpaticum*, *Rh. lavatum*, *Sporastatia polyspora*, *Trapeliopsis gelatinosa* and *Verrucaria praetermissa*) are new to Central Italy, 25 to Tuscany and 38 to Emilia-Romagna. The affinities of the lichen flora of Emilia-Romagna with surrounding territories and the attribution of this region to northern Italy are discussed.

**Zusammenfassung:** TRETACH, M., NIMIS, P. L. & HAFELLNER, J. 2008. Diverse Nachweise von Flechten und lichenicolen Pilzen aus den Apuanischen Alpen und dem Toskanisch-Emilischen Apennin (Mittelitalien). – *Herzogia* 21: 93–103.

Von einigen Fundpunkten in den Apuanischen Alpen und dem Toskanisch-Emilischen Apennin (Mittelitalien), die anlässlich zweier kurzer Exkursionen im Sommer 2001 besucht wurden, werden 252 infragenerische Taxa von Flechten und lichenicolen Pilzen gemeldet. *Catillaria atomarioides* und *Anema tumidulum* sind neu für die italienische Flechtenflora. Elf Flechtentaxa (*Acarospora badiofusca* subsp. *badiorubra*, *Bilimbia accedens*, *Caloplaca obliterans*, *Cystocoleus ebeneus*, *Fuscidea recensa*, *Porpidia glaucophaea*, *Rhizocarpon carpaticum*, *Rh. lavatum*, *Sporastatia polyspora*, *Trapeliopsis gelatinosa* und *Verrucaria praetermissa*) werden erstmals in Mittelitalien nachgewiesen, 25 für die Toskana und 38 für Emilia-Romagna. Die Beziehungen der Flechtenflora von Emilia-Romagna und die Zurechnung dieser Region zu Norditalien werden diskutiert.

**Key words:** Ascomycetes, biodiversity, Emilia-Romagna, flora, Tuscany.

### Introduction

In this paper we shortly present and discuss the results of two field trips, carried out in the Apuan Alps, and along the ridges of the northern Tuscan-Emilian Apennine, as a contribution to the knowledge of the lichen flora of these potentially interesting, but still scarcely explored areas.

The Apuan Alps, famous worldwide for the statuary Carrara marble carved since Roman times, lie at only a few kilometres from the Tyrrhenian Sea, abruptly rising from a hilly landscape. Notwithstanding their name, the Apuan Alps are not higher than the nearby Apennines, reaching a maximum elevation of only 1945 m (Mt. Pisanino). They are a well known focus

of biodiversity, not only for higher plants (FERRARINI & MARCHETTI 1994, FERRARINI et al. 1997, FERRARINI 2000), but also for animals (CASINI 1995, LANZA 1997), due to their insularity and peculiar pedo-climatic conditions, with pronounced karstic phenomena, and very high precipitation (more than 3000 mm per year) (FERRARINI & MARCHETTI 1994). The lichen flora of the Apuan Alps was never studied in detail, and most of the records, summed up by BENESPERI (2002), derive from erratic sampling, mostly carried out by famous phanerogamists who visited the area in the nineteenth century.

At only 25 kilometres NE of the Apuan Alps, separated by the Garfagnana valley, stand the highest peaks of the Tuscan-Emilian Apennine, with a maximum elevation of 2121 m (Mt. Cusna). Also in this case, the lichenological knowledge of the area is quite poor, and mainly derives from sporadic sampling carried out by non-lichenologists. The Tuscan-Emilian Apennine represents an important transitional area between the two zonobiomes, Mediterranean and central European, that encompass Italy, the boundary being alternatively traced at the northern foot, southern foot, or along the watershed of this chain (PIGNATTI 1995). This uncertainty derives from the fact that the vegetation along the two Apennine slopes is almost identical, and almost entirely lacks the markers of both zonobiomes, i.e. the evergreen forests typical of the Mediterranean zonobiome, and the conifer forests typical of the central Europe orbiomes, which are represented by small, relict fragments (PIGNATTI 1995). The boreal affinity of this area is however testified by the presence of dwarf shrub heaths and herbaceous communities rich in boreal and arctic-alpine plants that are scattered above timberline throughout the highest peaks, although often restricted to small patches (TOMASELLI 1991, FERRARI & ROSSI 1995, ROSSI et al. 2006). As shown by BENESPERI et al. (2007), also some boreal and arctic-alpine lichens find there their southernmost limit of distribution, although several others cross it, reaching the Aspromonte Massif in Calabria via the highest peaks of the central Apennine (NIMIS & TRETIACH 1995, 1999).

## Material and methods

The collection sites (Fig. 1) were visited in July 2001 during, respectively, a social excursion of the Italian Lichen Society (sites 1–4) and a field trip that continued along the western Alps (sites 5–10). Both common and rare species were collected. None of the species lists from each locality approaches its real lichen flora, as the time devoted to the exploration of each site was rather limited, varying from c. 1 to 3 hours.

A list of localities, numbered as in Fig. 1, is given below [collectors abbreviated as follows: H: J. Hafellner (GZU); NT: P. L. Nimis and M. Tretiach (TSB); T: M. Tretiach (TSB); acronyms of herbaria according to HOLMGREN et al. 1990].

- 1) Tuscany, Prov. Massa-Carrara: Natural Park of the Apuan Alps, road between Monzone and Vinca, 44°08'18"N/10°08'42"E, 650 m, calcareous rocks along a small creek, 06.07.2001, leg. T.
- 2) Tuscany, Prov. Massa-Carrara: Natural Park of the Apuan Alps, trail from Vinca to Mt. Pizzo d'Uccello, 44°08'08"N/10°09'58"E, c. 1000 m, siliceous rocks with *Castanea* trees, 07.07.2001, leg. T.
- 3) Tuscany, Prov. Massa-Carrara: Natural Park of the Apuan Alps, Sella di Foce a Giovo, below Mt. Pizzo d'Uccello, 44°07'51"N/10°11'10"E, 1500 m, siliceous rocks, crystalline marble, 07.07.2001 leg. T.
- 4) Tuscany, Prov. Massa-Carrara: Natural Park of the Apuan Alps, Uglianaldo, 44°10'24"N/10°10'55"E, c. 800 m, chestnut cultivations, on *Castanea*, 08.07.2001, leg. T.



The material was identified in the laboratory using the keys of CLAUZADE & ROUX (1985), WIRTH (1995), PURVIS et al. (1992), NIMIS & MARTELOS (2004), and several monographic treatments (e.g., NIMIS 1992, PUNTILLO 1989, TORRENTE & EGEA 1989). External morphology of specimens was studied under a dissecting microscope. Anatomical observations of thallus and ascomata were carried out by light microscopy. Measurements were taken on hand cut-sections and squash preparations mounted in glycerine or in water. Ascospores, hamathecial filaments, etc. were measured at 1000× magnification. Reference material from TSB and GZU was used for comparison. The standardised method of thin layer chromatography (TLC) (e.g., CULBERSON & AMMANN 1979) was employed for checking the presence of lichen substances in selected specimens.

The overall floristic list, based on 343 samples identified at infrageneric level, is organised alphabetically. Critical notes on distribution and ecology of selected taxa are reported at the end of the list. Records of species of *Lepraria* collected in sites 1–10 were published elsewhere (BARUFFO et al. 2006).

Substrates investigated, abbreviations and symbols used:

Abi, on <i>Abies alba</i> Mill.	sil, on siliceous rock
bry/dtr, on detritus	sil-par, on siliceous rock, parasitic
bry-calc, on saxicolous bryophytes over limestone	Smr, on <i>Sambucus racemosa</i> L.
bry-cor, on corticolous bryophytes	ter-calc, on soil over limestone
bry-sil, on saxicolous bryophytes over siliceous rock	ter-sil, on soil over siliceous rock
calc, on limestone	xyl, on wood
calc-par, on limestone, parasitic	! new to Italy
Cast, on <i>Castanea sativa</i> Mill.	* new to Central Italy
Fag, on <i>Fagus sylvatica</i> L.	§ new to Tuscany
	° new to Emilia-Romagna

### Lichenised taxa

- \**Acarospora badiofusca* subsp. *badiorubra* Clauzade & Cl.Roux 3T (sil)  
*Acarospora fuscata* (Schräd.) Th.Fr. 3T (sil); 8H (sil)  
*Acrocordia conoidea* (Fr.) Körb. 1T (calc)  
*Amandinea punctata* (Hoffm.) Coppins & Scheid. 5H (Smr)  
*Anaptychia ciliaris* (L.) Körb. 6H (Fag)  
!*Anema tumidulum* Henssen ined. 2T (sil)  
*Arthonia punctiformis* Ach. 7H (Abi); 10H (Cast), NT (Cast)  
*Arthonia radiata* (Pers.) Ach. 6H (Fag); 7NT (Fag)  
*Arthonia vinosa* Leight. 8NT  
*Aspicilia candida* (Anzi) Hue 8NT (calc)  
*Aspicilia contorta* (Hoffm.) Kremp. subsp. *contorta* 5H (sil)  
*Aspicilia polychroma* Anzi 8NT (calc)  
§*Bacidina arnoldiana* (Körb.) V.Wirth & Vězda 1T (calc) det. E. Llop  
*Belonia russula* Nyl. 5H (sil), NT (sil); 9H (sil), NT (sil)
- \**Bilimbia accedens* Arnold 9NT (ter-sil)  
*Bilimbia sabuletorum* (Schreb.) Arnold 2T (bry-calc)  
*Buellia griseovirens* (Sm.) Almb. 6H (Fag); 9H (Abi), NT (Fag)  
*Calicium quercinum* Pers. 10H (xyl), NT (xyl)  
*Calicium salicinum* Pers. 4T (Cast)  
§*Caloplaca chrysoidea* (Räsänen) Dombr. 2T (calc)  
*Caloplaca crenularia* (With.) J.R.Laundon 3T (sil); 8NT (sil)  
*Caloplaca ferrarii* (Bagl.) Jatta 6NT (calc)  
*Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth. 2T (sil)  
*Caloplaca herbidella* (Hue) H.Magn. 9H (Fag)  
*Caloplaca holocarpa* (Ach.) A.E.Wade 6NT (calc)  
\**Caloplaca obliterans* (Nyl.) Blomb. & Forssell 2T (sil)  
*Calvitimela armeniaca* (DC.) Hafellner 6NT (sil)  
*Candelariella aurella* (Hoffm.) Zahlbr. 3T (calc)  
*Candelariella vitellina* (Hoffm.) Müll.Arg. 10H (sil)

- ! *Catillaria atomarioides* (Müll.Arg.) H.Kilius 3T (sil)
- § *Catillaria minuta* (A.Massal.) Lettau 3T (calc)
- Cetrelia cetrarioides* (Duby) W.L.Culb. & C.F.Culb. 10NT (Cast)
- Chaenotheca ferruginea* (Sm.) Mig. 10NT (xyl)
- Chromatochlamys muscorum* (Fr.) H.Mayrhofer & Poelt var. *muscorum* 2T (bry-calc); 3T (bry-calc)
- Chrysothryx candelaris* (L.) J.R.Laundon 2T (Cast); 4T (Cast); 10NT (Cast)
- Cladonia chlorophaea* auct. 8NT (ter-calc)
- Cladonia coniocraea* (Flörke) Spreng. 10NT (Cast)
- Cladonia fimbriata* (L.) Fr. 8NT (ter-calc)
- Cladonia furcata* (Huds.) Schrad. 7NT (ter-sil); 10NT (ter-sil)
- Cladonia macilentata* Hoffm. 10NT (Cast)
- Cladonia parasitica* (Hoffm.) Hoffm. 10H (xyl)
- Cladonia polydactyla* (Flörke) Spreng. 9NT (sil)
- Cladonia pyxidata* (L.) Hoffm. 5H (bry-sil)
- Clauzadea immersa* (Weber) Hafellner & Bellem. 3T (calc)
- Clauzadea monticola* (Schaer.) Hafellner & Bellem. 5H (sil)
- Collema flaccidum* (Ach.) Ach. 9NT (sil)
- Collema rysssoleum* (Tuck.) A.Schneider 2T (sil)
- Collema undulatum* Flot. 6NT (sil); 8NT (sil)
- Cyphelium marcianum* de Lesd. 3T (sil-par) (host: *Pertusaria* spec.)
- \* *Cystocoleus ebeneus* (Dillwyn) Thwaites 9NT (sil)
- Degelia atlantica* (Degel.) M.Jørg. & P.James 6H (Fag)
- Dermatocarpon minutum* (L.) W.Mann 2T (calc); 8NT (calc)
- Dimerella pineti* (Ach.) Vězda 9H (bry/dtr)
- Diploschistes muscorum* (Scop.) R.Sant. 10NT (Cast)
- Diploschistes scruposus* (Schreb.) Norman 9H
- Eiglera flavida* (Hepp) Hafellner 8H (calc)
- Ephebe lanata* (L.) Vain. 2T (sil), 9NT (sil)
- Evernia prunastri* (L.) Ach. 10NT (Cast)
- Flavoparmelia caperata* (L.) Hale 8NT; 10H (Cast)
- Fulgensia schistidii* (Anzi) Poelt 8NT (ter-calc)
- Fulgensia subbracteata* (Nyl.) Poelt 2T (ter)
- Fuscidea cyathoides* (Ach.) V.Wirth & Vězda 2T (sil)
- Fuscidea kochiana* (Hepp) V.Wirth & Vězda 6NT (sil)
- \* *Fuscidea recens* (Stirt.) Hertel, V.Wirth & Vězda 5NT (sil)
- Fuscidea stiriaca* (A.Massal.) Hafellner 9H (Fag)
- Fuscopannaria ignobilis* (Anzi) M.Jørg. 4T (Cast)
- Graphis scripta* (L.) Ach. 1T (Fag)
- Gyalecta hypoleuca* (Ach.) Zahlbr. 1T (calc)
- Gyalecta jenensis* (Batsch) Zahlbr. 1T (calc); 3T (calc)
- Hymenelia prevostii* (Duby) Kremp. 3T (calc)
- Hypocenomyce scalaris* (Ach.) M.Choisy 10H (xyl), NT (xyl)
- § *Immersaria athrocarpa* (Ach.) Rambold & Pietschm. 3T (sil); 5H (sil), NT (sil)
- ° *Imshaugia aleurites* (Ach.) S.L.F.Meyer 2T (Cast); 4T (Cast); 10H (xyl), NT (Cast)
- Ingvariella bispora* (Bagl.) Guderley & Lumbsch 5H (sil)
- Lecania cyrtella* (Ach.) Th.Fr. 5H (Smr); 6NT (Fag)
- Lecanora aghardiana* Ach. subsp. *agardhiana* 3T (calc); 8NT (calc)
- Lecanora albescens* (Hoffm.) Branth & Rostr. 8NT (calc)
- Lecanora argentata* (Ach.) Malme 6H (Fag); 9NT (Fag)
- Lecanora bolcana* (Pollini) Poelt 3T (sil)
- Lecanora campestris* (Schaer.) Hue 10H (sil)
- Lecanora carpinea* (L.) Vain. 6H (Fag)
- Lecanora cenisia* Ach. 5H (sil), NT (sil); 8H (sil)
- Lecanora chlarotera* Nyl. 9H (Abi)
- Lecanora crenulata* Hook. 8H (calc), NT (calc)
- Lecanora expallens* Ach. 4T (Cast)
- Lecanora flotoviana* Spreng. 8NT (calc)
- Lecanora glabrata* (Ach.) Malme 6H (Fag)
- § *Lecanora intricata* (Ach.) Ach. 3T (sil); 5H (sil), NT (sil)
- Lecanora intumescens* (Rebent.) Rabenh. 10H (Cast)
- Lecanora muralis* (Schreb.) Rabenh. 3T (sil)
- Lecanora polytropa* (Hoffm.) Rabenh. var. *polytropa* 3T (sil); 5H (sil), NT (sil)
- Lecanora pulicaris* (Pers.) Ach. 9H (Abi)
- Lecanora rupicola* (L.) Zahlbr. subsp. *rupicola* 3T (sil); 5H (sil), NT (sil)
- Lecanora subcarnea* (Lilj.) Ach. 2T (sil)
- Lecanora sulphurea* (Hoffm.) Ach. 3T (sil)
- § *Lecanora swartzii* (Ach.) Ach. 3T (sil)
- Lecidea confluens* (Weber) Ach. 5H (sil), NT (sil); 9NT (sil)
- Lecidea fuscoatra* (L.) Ach. var. *fuscoatra* 5H (sil)
- Lecidea lapicida* (Ach.) Ach. var. *lapicida* 5H (sil), NT (sil); 8NT (sil)
- Lecidea lapicida* var. *pantherina* Ach. 3T (sil); 8NT (sil)

- Lecidella carpathica* Körb. 5H (sil), NT (sil); 8NT (sil)  
*Lecidella elaeochroma* (Ach.) M.Choisy 9NT (Fag); 10H (Cast)  
*Lecidella euphorea* (Flörke) Hertel 6H (Fag)  
*Lecidella patavina* (A.Massal.) Knoph & Leuckert 8NT (calc)  
*Lecidella scabra* (Taylor) Hertel & Leuckert 9NT (sil)  
*Lecidella stigmataea* (Ach.) Hertel & Leuckert 10H (sil)  
*Lobaria amplissima* (Scop.) Forssell 6H (Fag); 10NT (Cast)  
*Lobaria pulmonaria* (L.) Hoffm. 2T (Cast); 6H (Fag); 10NT (Cast)  
*Lobarina scrobiculata* (Scop.) Nyl. 10NT (Cast)  
*Lobothallia radiosia* (Hoffm.) Hafellner 3T (calc)  
*Melanelia elegantula* (Zahlbr.) Essl. 10NT (Cast)  
*Melanelia fuliginosa* (Duby) Essl. subsp. *fuliginosa* 10H (sil)  
*Melanelia fuliginosa* subsp. *glabratula* (Lamy) Coppins 6H (Fag); 10H (Cast), NT (Cast)  
*Melanelia glabra* (Schaer.) Essl. 10NT (Cast)  
*Melanelia subaurifera* (Nyl.) Essl. 6H (Fag)  
*Micarea melaena* (Nyl.) Hedl. 4T (xyl)  
*Micarea peliocarpa* (Anzi) Coppins & R.Sant. 9H (Abi), NT (sil)  
*Micarea prasina* Fr. 2T (xyl)  
 §*Mycobilimbia tetramera* (De Not.) Hafellner & Türk 2T; 3T (bry-calc)  
*Naetrocymbe punctiformis* (Pers.) R.C.Harris 9NT (Fag)  
*Nephroma parile* (Ach.) Ach. 6H (Fag); 10NT (Cast)  
*Nephroma resupinatum* (L.) Ach. 9NT (Fag)  
*Normandina pulchella* (Borrer) Nyl. 1T (Cast)  
*Ochrolechia arborea* (Kreyer) Almb. 6H (Fag)  
*Ochrolechia pallescens* (L.) A.Massal. 6H (Fag)  
*Ochrolechia parella* (L.) A.Massal. 10H (sil), NT (sil)  
*Ochrolechia subviridis* (Høeg) Erichsen 9NT (Fag)  
*Opegrapha conferta* Anzi 2T (sil)  
 §*Opegrapha gyrocarpa* Flot. 2T (sil); 9H (sil), NT (sil)  
*Opegrapha rupestris* Pers. 3T (calc)  
*Opegrapha varia* Pers. 6H (Fag)  
*Opegrapha zonata* Körb. 5NT (sil), 9NT (sil)  
*Ophioparma ventosum* (L.) Norman 3T (sil)  
*Pachyphiale fagicola* (Hepp) Zwackh 5H (Smr); 9NT (Fag)  
*Pannaria conoplea* (Ach.) Bory 2T (Cast); 10NT (Cast)  
 °*Pannaria tavaresii* M.Jørg. 9NT (sil)  
*Parmelia saxatilis* (L.) Ach. 2T (Cast); 9H (Abi); 10H (Cast), NT (Cast)  
*Parmelia submontana* Hale 10NT (Cast)  
*Parmelia sulcata* Taylor 6H (Fag), NT (Abi); 10NT (Cast)  
*Parmeliella testacea* M.Jørg. 4T (Cast)  
*Parmelina pastillifera* (Harm.) Hale 6H (Fag); 9H (Fag)  
*Parmelina tiliacea* (Hoffm.) Hale 10H (Cast), NT (Cast)  
*Parmeliopsis ambigua* (Wulfen) Nyl. 4T (Cast); 10NT (Cast)  
*Parmotrema perlatum* (Huds.) M.Choisy 2T (Cast)  
*Peltigera collina* (Ach.) Schrad. 10NT (Cast)  
*Peltigera degenii* Gyeln. 9NT (sil)  
*Peltigera elisabethae* Gyeln. 5H (bry-sil), NT (bry-sil)  
*Peltigera horizontalis* (Huds.) Baumg. 8NT (ter-sil)  
*Peltigera praetextata* (Sommerf.) Zopf 10H (sil), NT (sil)  
*Pertusaria albescens* (Huds.) M.Choisy & Werner var. *albescens* 6H (Fag); 10H (Cast), NT (Cast)  
*Pertusaria amara* (Ach.) Nyl. 10NT (Cast)  
*Pertusaria coccodes* (Ach.) Nyl. 6H (Fag)  
*Pertusaria corallina* (L.) Arnold 3T (sil); 5NT (sil); 9H (sil)  
*Pertusaria coronata* (Ach.) Th.Fr. 10NT (Cast)  
*Pertusaria flavicans* Lamy 3T (sil); 5NT (sil)  
*Pertusaria flavida* (DC.) J.R.Laundon 4T; 6H (Fag); 10H (Cast), NT (Cast)  
*Pertusaria hemisphaerica* (Flörke) Erichsen 10NT (Cast)  
*Pertusaria lactea* (L.) Arnold 5H (sil), 9NT (sil)  
*Pertusaria pertusa* (Weigel) Tuck. var. *pertusa* 6H (Fag); 8NT (Fag); 9H (Fag), NT (Fag); 10H (Cast), NT (Cast)  
*Pertusaria pseudocorallina* (Lilj.) Arnold 3T (sil)  
*Petractis clausa* (Hoffm.) Kremp. 3T (calc)  
*Phaeophyscia chloantha* (Ach.) Moberg 6H (Fag)  
*Phlyctis argena* (Spreng.) Flot. 6H (Fag); 9NT (sil); 10NT (Cast)  
*Physcia adscendens* H.Olivier 9NT (Fag)  
*Physcia biziana* (A.Massal.) Zahlbr. var. *biziana* 6H (Fag)  
*Physcia caesia* (Hoffm.) Fürnr. var. *caesiella* (de Lesd.) Clauzade & Cl.Roux 3T (sil)  
*Physcia stellaris* (L.) Nyl. 3T (ter-sil)  
*Physconia distorta* (With.) J.R.Laundon 6H (Fag)  
*Piccolia ochrophora* (Nyl.) Hafellner 5H (smr)  
*Placynthiella icmalea* (Ach.) Coppins & P.James 10H (xyl), NT (xyl)  
*Placynthium nigrum* (Huds.) Gray 2T (calc)

- Platismatia glauca* (L.) W.L.Culb. & C.F.Culb. 10NT (Cast)
- \**Polyblastia tarvesedis* (Anzi) Bagl. & Carestia 9NT (sil)
- Porina chlorotica* (Ach.) Müll.Arg. 5NT (sil)
- Porina lectissima* (Fr.) Zahlbr. 2T (sil); 9NT (sil)
- \**Porpidia glaucophaea* (Körb.) Hertel & Knoph 2T (sil); 6 NT (sil); 9NT (sil)
- Porpidia speirea* (Ach.) Kremp. 6NT (sil); 9NT (sil)
- Porpidia tuberculosa* (Sm.) Hertel & Knoph var. *tuberculosa* 5H (sil), NT (sil)
- Protoblastenia calva* (Dicks.) Zahlbr. 3T (calc)
- Protoblastenia incrustans* (DC.) J.Steiner var. *incrustans* 3T (calc)
- Protoblastenia incrustans* var. *coniasis* (A.Massal.) Nimis 6NT (calc)
- Protoblastenia siebenhaariana* (Körb.) J.Steiner 8NT (calc)
- Protopannaria pezizoides* (Weber) M.Jørg. & S.Ekman 6NT (ter-sil)
- Protoparmelia badia* (Hoffm.) Hafellner var. *badia* 5H (sil), NT (sil); 8H (sil)
- Psilolechia lucida* (Ach.) M.Choisy 9NT (sil)
- Psora decipiens* (Hedw.) Hoffm. 2T (calc)
- §*Punctelia jeckeri* (Roum.) Kalb 4T (Cast)
- Punctelia subrudecta* (Nyl.) Krog 4T (Cast)
- Pycnothelia papillaria* (Ehrh.) Dufour 6NT (ter-sil)
- Pyrenula nitida* (Weigel) Ach. 6H (Fag), NT (Fag)
- Ramalina farinacea* (L.) Ach. var. *farinacea* 6H (Fag), NT (Fag)
- Ramalina fraxinea* (L.) Ach. 6H (Fag), NT (Fag)
- Ramalina subfarinacea* (Cromb.) Nyl. 7NT
- Rhizocarpon atroflavescens* Lynge 5H (sil), NT (sil)
- \**Rhizocarpon carpaticum* Runemark 3T
- Rhizocarpon geographicum* (L.) DC. subsp. *geographicum* 3T (sil); 5H (sil), NT (sil); 8H (sil)
- \**Rhizocarpon lavatum* (Fr.) Hazsl. 9NT (sil)
- Rhizocarpon umbilicatum* (Ramond) Flagey 3T (sil)
- Rimularia insularis* (Nyl.) Rambold & Hertel 3T (sil-par); 5H (sil-par), NT (sil-par) (host: *Lecanora rupicola*)
- Rinodina milvina* (Wahlenb.) Th.Fr. 8NT (sil)
- Rinodina sophodes* (Ach.) A.Massal. 10NT (Cast)
- Sarcogyne regularis* Körb. var. *regularis* 8H (calc)
- Sarcogyne regularis* var. *platycarpoides* (Anzi) N.S.Golubk. 8NT (calc)
- §*Schaereria fuscocinerea* (Nyl.) Clauzade & Cl.Roux 3T (sil)
- Schismatomma graphidioides* (Leight.) Zahlbr. 4T (Cast)
- Scoliciosporum chlorococcum* (Graewe ex Stenh.) Vězda 7H (Abi)
- Scoliciosporum umbrinum* (Ach.) Arnold var. *umbrinum* 5NT (Fag); 9NT(sil); 10H (sil), NT (Cast)
- \**Scoliciosporum umbrinum* var. *compactum* (Körb.) Clauzade & Cl.Roux comb. inval. 6H (Fag)
- \**Sporastatia polyspora* (Nyl.) Grumann 6NT (sil)
- Squamarina cartilaginea* (With.) P.James 2T (ter-calc)
- Squamarina gypsacea* (Sm.) Poelt 8H (ter-calc)
- Squamarina oleosa* (Zahlbr.) Poelt 8NT (calc)
- Stenhammarella turgida* (Ach.) Hertel 5H (sil)
- Strigula stigmatella* (Ach.) R.C.Harris var. *stigmatella* 9H (bry-cor), NT (bry-cor)
- Tephromela atra* (Huds.) Hafellner var. *atra* 3T (sil); 5H (sil), NT (sil); 7NT (sil)
- Thelidium incavatum* Mudd 8H (calc)
- Thelidium papulare* (Fr.) Arnold 3T (calc); 8NT (calc)
- §*Toninia alutacea* (Anzi) Jatta 2T (ter-calc); 6NT (ter-calc)
- Toninia candida* (Weber) Th.Fr. 3T (ter-calc)
- Toninia taurica* (Szatala) Oksner 2T (ter-sil)
- Trapelia coarctata* (Sm.) M.Choisy 9NT (sil)
- Trapelia corticola* Coppins & P.James 4T (Cast)
- Trapeliopsis flexuosa* (Fr.) Coppins & P.James 4T (Cast); 10H (xyl), NT (Cast)
- \**Trapeliopsis gelatinosa* (Flörke) Coppins & P.James 4T (ter-sil); 9H (ter-sil)
- Trapeliopsis pseudogranulosa* Coppins & P.James 10NT (xyl)
- Umbilicaria deusta* (L.) Baumg. 3T (sil)
- §*Umbilicaria nylanderiana* (Zahlbr.) H.Magn. 3T (sil)
- Umbilicaria polyphylla* (L.) Baumg. 3T (sil)
- Verrucaria hydrela* Ach. 1T (calc)
- Verrucaria phaeosperma* Arnold 8NT (calc)
- \**Verrucaria praetermissa* (Trevis.) Arnold 1T (calc)
- Xanthoparmelia conspersa* (Ach.) Hale 10H (sil)
- Xanthoparmelia pulla* (Ach.) O.Blanco et al. 3T (sil)
- Xanthoria contortuplicata* (Ach.) Boistel 8H (calc), NT (calc)
- Xanthoria parietina* (L.) Th.Fr. 6H (Fag)

### Lichenicolous, non-lichenized taxa

- Arthonia epiphyscia* Nyl., on *Physcia* spec. 3T  
*Arthonia excentrica* Th.Fr., on *Lepraria* spec. 5H  
*Arthonia glaucomaria* Nyl., on *Lecanora rupicola* 5H, NT  
*Carbonea vitellinaria* (Nyl.) Hertel, on *Candelariella vitellina* 3T  
*Cecidonia umbonella* (Nyl.) Triebel & Rambold, on *Lecidea* spec. 5H, NT; 8NT  
*Clypeococcum hypocenomycis* D.Hawksw., on *Hypocenomyce scalaris* 10H  
*Cornutispora lichenicola* D.Hawksw. & B.Sutton, on *Lecidella euphorea* 6H  
*Dactylospora australis* Triebel & Hertel, on *Porpidia* spec. 5H  
*Dactylospora saxatilis* (Schaer.) Hafellner, on *Pertusaria* spec. 3T  
*Endococcus propinquus* (Körb.) D.Hawksw., on *Porpidia* spec. 9H  
*Lichenocodium erodens* M.S.Christ. & D.Hawksw., on *Pertusaria pertusa* 6H  
*Muellerella polyspora* Hepp ex Müll.Arg., on *Arthonia radiata* 6H  
*Muellerella pygmaea* (Körb.) D.Hawksw., on *Lecidea* spec. 3T; 5H  
*Opegrapha glaucomaria* (Nyl.) Källsten ex Hafellner, on *Lecanora rupicola* 5H  
*Roselliniopsis groedensis* (Zopf) Matzer & Hafellner, on *Pertusaria lactea* 9H; 10NT  
*Sclerococcum sphaerale* (Ach.) Fr., on *Pertusaria corallina* 9H  
*Stigmatidium eucline* (Nyl.) Vězda, on *Pertusaria lactea* 5H

### Taxonomic remark

*Anema tumidulum* Henssen ined.

In accordance with WIRTH (1995), we apply this name to a squamulose, peltate, marginally lobed cyanolichen characterised by a shiny black upper surface and spherical isidia-like outgrowths, collected on metamorphic siliceous rock with periodic seepage of water. Our material is congruent with two specimens from STU identified by Prof. A. Henssen (Marburg). Morphologically similar material occurring on dolomite or compact limestone was referred by NIMIS & TRETIACH (1999) to *A. moedlingense* Zahlbr., a taxon variously interpreted by the authors (compare e.g. HENSSEN & JØRGENSEN 1990 and HAFELLNER & TÜRK 2001 with MORENO & EGEA 1992), which lacks the characteristic spherical outgrowths of *A. tumidulum* (ZAHLEBRUCKNER 1898). The Italian species of *Anema* are in urgent need of a thorough revision.

### Discussion

This list was intended as a small contribution to the knowledge of the lichen flora of the Northern Apennines, which, despite their high biogeographical interest (NIMIS & BOLOGNINI 1993, BENESPERI et al. 2007), have received scarce attention by lichenologists.

Ninety-five lichens and 4 lichenicolous fungi were collected in Tuscany. Twenty-four lichens are new to the flora of this region. Tuscany has the best-known lichen flora among all the administrative regions of peninsular Italy, also due to a number of floristic surveys organised by the Italian Lichen Society, from the Tyrrhenian Archipelago (Capraia island: NIMIS et al. 1990; Pianosa island: Tretiach et al., in prep.) to the Apennines (BENESPERI et al. 2007). However, several promising sites still await thorough investigation, such as the isolated limestone outcrops of southern Tuscany (Mt. Cetona, Mt. Labbro, Mt. Penna), the extinct volcano of Mt. Amiata, and the highest peaks of the Apennines. The ascension to Mt. Pizzo d'Uccello revealed that the metamorphic carbonates, which form the core of the Apuan Alps, host a rather poor and trivial flora. The lichen cover, very scanty in S-exposed faces, is more dense only in forested areas or in N-exposed situations. In this case most of the species are hemi- or euendoliths. As they deserve a thorough study, we cannot exclude that they will reveal some



surprises. In our case, the most interesting lichens were collected from siliceous metamorphic rocks which emerge around the base of the marble peak of Pizzo d'Uccello (site 3 of Fig. 1). *Catillaria atomarioides* for example, is new to Italy, whereas *Caloplaca obliterans*, *Cystocoleus ebeneus*, *Immersaria athrocarpa*, *Lecanora intricata*, *L. swartzii*, *Rhizocarpon carpaticum*, *Schaereria fuscocinerea*, *Umbilicaria nylanderiana*, among others, are new to Tuscany, extending their known geographical distribution southwards. Most of these species belong to the alpine element, otherwise rare or absent from Tuscany, and were collected at relatively low elevations (c. 1500–1600 m). Although sampling was not exhaustive, other interesting species were collected from siliceous rocks shaded by chestnut woods, at lower elevations, e.g. *Opegrapha conferta*, a mild-temperate to Mediterranean lichen, often confused with other species in the past and certainly not common in Italy; the congeneric *O. gyrocarpa*, and *Porina lectissima*, particularly frequent on rocks along some small creeks, where also *Verrucaria praetermissa* was found on rocks submerged for short periods.

In Emilia-Romagna we collected 170 lichens and 14 lichenicolous fungi. With 623 species (NIMIS & MARTELOS 2003), Emilia-Romagna was, and remains, the least-known region of northern Italy, which explains the high number of species (38) cited here as new to its lichen flora. Most of them are rather trivial lichens (*Lecanora flotoviana*, *Lecidella patavina*, *Pertusaria corallina*, *P. flavicans*, *Porina chlorotica*, *Protoblastenia incrustans* var. *coniasis*, *P. siebenhaariana*), certainly common throughout the region. Some others are more interesting, as they are generally rare throughout Italy, or they were rarely collected in the last years (e.g. *Belonia russula*, *Pachyphiale fagicola* and *Xanthoria contortuplicata*). Finally, some species (*Calvitimela armeniaca*, *Eiglera flavida*, *Imshaugia aleurites*, *Porpidia tuberculosa*, *Rhizocarpon atroflavescens*, *Sporastatia polyspora*, *Stenhammarella turgida*) enrich the alpine element of the lichen flora of this area, whose mountains were rarely explored by lichenologists (NIMIS 1985, NIMIS & DALLAI 1985).

As suggested by NIMIS & TRETIACH (1995), the biogeographic attribution of Emilia-Romagna to northern Italy (NIMIS 1993, 2003, NIMIS & MARTELOS 2003) is problematic. On the basis of a numerical classification of the frequencies of biogeographical elements in each regional lichen flora of the country, NIMIS & TRETIACH (1995) demonstrated that Emilia-Romagna, together with Venezia Giulia, has an intermediate position between the “truly” northern regions, and those of the eastern Apennines. This is due to the fact that both regions have a small flora (the former, for the poor exploration; the latter, for the limited altitudinal range of its small territory). Furthermore, Emilia-Romagna consists of two quite distinct geomorphological districts, each of them with their own evident affinities with neighbouring territories. The lowland district, located in the northern part of the region and corresponding to c. 50 % of the territory, geographically belongs to the Po plain, that extends throughout Piedmont and Lombardy, and continues eastwards in the Venetian and Friulian plains. This area shares similar climatic conditions, geology and land use, and therefore NIMIS (2003) described for it a biogeographic area called “Padanian”. The hilly-montane district, on the contrary, forms a compact geographical unit with the Tuscan Apennines, sharing with them the same climate, geology, plant vegetation and land use. The two districts differ in the lichen flora. The lowland district, which hosts most of the population and industries of the region, has an intensive agriculture, and lacks natural habitats such as woods and rock outcrops, hosts a small number of pollution resistant, wide ranging species (BASSI 1995). The hilly-montane district, on the contrary, has a varied, relatively rich lichen flora, that shows evident affinities with that of the whole Apennine chain. Emilia-Romagna still awaits a thorough lichenological exploration, but we are confident that

such an investigation will suggest to reconsider critically the arbitrarily decision of assigning Emilia-Romagna to northern Italy (NIMIS 1993, NIMIS & TRETACH 1995). The inclusion of Emilia-Romagna in the regions of central Italy would leave in the North a true functional geographical entity, i.e. the administrative regions whose territory comprises important portions of the southern Alps and their foreland.

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### Addresses of the authors

Mauro Tretiach & Pier Luigi Nimis, Dipartimento di Biologia, Università degli Studi di Trieste, Via L. Giorgieri 10, I-34127 Trieste, Italy. E-mails: tretiach@units.it, nimis@units.it

Josef Hafellner, Institut für Pflanzenwissenschaften, Karl-Franzens-Universität, Holteigasse 6, A-8010 Graz, Austria. E-mail: josef.hafellner@uni-graz.at