

The epiphytic lichens on *Fagus sylvatica* in beech forests of Europe: towards an open and dynamic checklist

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Received: 19 October 2022 / Accepted: 29 January 2023 / Published: 17 April 2023

Abstract. Beech forests are considered one of the most emblematic ecosystems in the temperate deciduous broadleaf forest biome and host a wide variety of specialised cryptogamic organisms such as epiphytic lichens. This checklist is the first compilation focused on the epiphytic lichen diversity occurring on *Fagus sylvatica* L. trees along Europe. The checklist is based on a literature search encompassing 137 studies. We report 683 lichen species differently distributed across 26 European countries. The reported richness of the lichen species ranged from one in Kosovo and Netherlands to 331 species in Ukraine. All information provided in this manuscript is available online (<http://biodiversos.org/epidiversity-lichens-fagus-europe/>) to facilitate the accessibility and updating of the data. Thus, we aim that this checklist becomes an open and dynamic database that continuously expands not only based on new lichenological studies, but also with the information retrieved by lichenologist in the past, data published in a diverse suite of languages and herbarium records.

Keywords. biodiversity, lichenised fungi, literature review, web application, richness, taxonomy.

How to cite: Hurtado, P., Aragón, G., Martínez, I., Mayrhofer, H. & Prieto, M. 2023. The epiphytic lichens on *Fagus sylvatica* in beech forests of Europe: towards an open and dynamic checklist. *Mediterr. Bot.* 44, e84299. <https://doi.org/10.5209/mbot.84299>

Introduction

Beech forests represent one of the most emblematic ecosystems in the temperate deciduous broadleaf forest biome of the Northern Hemisphere (Kaplan *et al.*, 2003). The current area of distribution of the European beech (*Fagus sylvatica* L.) comprises a large latitudinal gradient, from southern Sweden to southern Italy, exemplifying a unique case of expansion from a few isolated glacial refuge areas (Magri *et al.*, 2006; Unesco World Heritage Centre, 1992–2022). Among all *Fagus* species, the European beech is the most widely distributed (Fang & Lechowicz, 2006), which highlights its tolerance to a broad range of environmental conditions. However, human disturbances have resulted in fragmentation and simplification of these forests (Jones, 1945; Bengtsson *et al.*, 2000). Consequently, primeval beech forests are really scarce and mainly occur as remnants in the Carpathians, Balkans and Alps (Parviainen, 2005; Kaufmann *et al.*, 2018). Therefore, the anthropogenic disturbances also impact on the suite of epiphytic lichen species associated with these *Fagus* forests (Berg *et al.*, 2002; Fritz *et al.*, 2008; Hauck *et al.*, 2013; Nascimbene *et al.*, 2013),

which in many cases are included in red lists (Arup *et al.*, 1997; Gärdenfors, 2005).

Lichenologists have done intensive research efforts investigating the lichen diversity along the whole distribution area of *Fagus sylvatica*. As a result, epiphytic lichen species have been recorded in beech forests across different countries in Europe. The set of studies focused on lichens thriving in beech forests is diverse and comprises taxonomic (e.g., Tretiach, 2014; Malíček *et al.*, 2017), floristic (e.g., Gómez & Hladun, 1981; Partl, 2011; Roux *et al.*, 2017), ecological (e.g., Aragón *et al.*, 2012; Dymytrova *et al.*, 2014) and applied approaches (e.g., Moning & Müller, 2009; Brunialti *et al.*, 2013; Ruete *et al.*, 2017). Other studies are compilations and checklists of certain regions and provide records of a high number of species. For instance, Llop (2012–2013) reported 73 lichens on bark of *F. sylvatica* in La Garrotxa (Spain) and Malíček *et al.* (2018) reported 275 species in Uholka-Shyrokyi Luh (Ukraine). Despite the large amount of information available it is not summarised in a single database. On top of this, the research effort is biased towards certain countries such as Poland, Italy or Germany,

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which stresses the need for an open checklist with the possibility of continuously updating, particularly needed in the case of the poorly-investigated areas. Therefore, having a database of the lichen species inhabiting *F. sylvatica* trees would provide crucial information about the diversity in beech forests, and a meaningful baseline for future theoretical and applied studies. Furthermore, this general overview favours biogeographical studies on lichen species that, in many cases, cover a broad distributional range (Nimis *et al.*, 2018). It is also remarkable that it would provide a basis for developing studies focused on effective conservation and management measures for coping with climate change and anthropogenic threats.

This is the first attempt to compile the diversity of lichens on beech trees, which are part of one of the most representative forests in temperate biomes. We aim to provide an open and dynamic checklist that can be updated online including information from new research, from publications not retrieved in our literature search and from herbarium records. To this end, together to the present manuscript, we have developed a web application to facilitate accessibility and updating of the data.

Table 1. Species richness recorded in the beech forests from 26 European countries.

Country	Country code	Richness
Albania	AL	62
Austria	AT	162
Belgium	BE	5
Britain	GB	207
Bulgaria	BG	78
Croatia	HR	55
Czech Republic	CZ	143
Denmark	DK	81
France	FR	176
Germany	DE	100
Greece	GR	24
Italy	IT	221
Kosovo	RKS	1
Luxembourg	LU	52
North Macedonia	MK	54
Montenegro	ME	47
Netherlands	NL	1
Poland	PL	320
Romania	RO	118
Slovakia	SK	237
Slovenia	SI	170
Spain	ES	224
Sweden	SW	151
Switzerland	CH	6
Turkey	TR	8
Ukraine	UA	331

Methods

We searched studies that reported the presence of lichen species on *Fagus sylvatica* trees. The search was done using two databases, Recent Literature on Lichens (Culberson *et al.*, 2015) and Web of Science. The first database covered the period from 1536 to 2021, and the second, from 1900 to 2021. In both cases, we used the following combination of search terms in English: “lichen and *Fagus*”. As a result, we obtained 49 studies in Recent Literature on Lichens and 160 studies in Web of Science. Manuscripts published in non-indexed journals and several published in other languages than English did not appear in the literature search.

The studies were included in the checklist if they specified the country and reported the presence of lichen species on trunks of *Fagus sylvatica* as phorophyte, both in beech forests and solitary trees and excluding those records for *Fagus* sp. different than *F. sylvatica* (e.g., *F. orientalis*, *F. taurica* and *F. moesiaca*). One hundred and thirty-seven studies (S1, Supplementary Material) accomplished these criteria and were included on the final checklist (<http://biodiversos.org/epidiversity-lichens-fagus-europe/>). For species nomenclature, we mainly followed Nimis (2016) and Nimis *et al.* (2018). In those species with varieties or forms, the infraspecific levels have not been considered.

Results and Discussion

The checklist included 683 lichen species (Appendix 1) differently distributed along 26 European countries (Table 1). Seventy-one species appeared in more than ten countries and the most widespread species were: *Lecidella elaeochroma* and *Pertusaria pertusa* (21 countries), *Lepra amara* and *Lecanora argentata* (20 countries), *Parmelia sulcata* (19 countries), *Graphis scripta*, *Lepra albescens*, *Peltigera praetextata*, *Pertusaria leioplaca* and *Pyrenula nitida* (18 countries). Around one third of the species (235 species) were reported from only one country: 40 exclusive species from Poland, 39 species from Ukraine and 36 species from France. The species richness reported broadly differed across the studied countries, with Ukraine, Poland and Slovakia hosting near the 50% of the total species retrieved from the literature search, and Kosovo and Netherlands with only one species recorded (van der Pluijm, 2015; Mayrhofer *et al.*, 2016). These low values are probably due to several factors such as the smaller size of the countries, a lower presence of beech forests, a high amount of publications in a language other than English, and even a sampling bias from lichen specialists. Since the literature search mainly yielded studies in English, the richness of epiphytic lichens in certain countries such as Italy, Spain and Central European countries, with a high literature production in their respective languages, may be underestimated. Moreover, these countries show a wide environmental heterogeneity comprising different biogeographic regions (e.g., Alpine, Atlantic and Mediterranean regions

in Spain), which also points out an underestimation of the species richness. These issues highlight the need to construct an open checklist in which researchers are able to include their records, being possible to generate different maps. Thus, all information provided in this checklist is available online (<http://biodiversos.org/epidiversity-lichens-fagus-europe/>). This is an open and dynamic database and that could be updated by any research group and by different users, including new works and studies in different languages.

Acknowledgements

This research was supported by MINECO (project EPIDIVERSITY CGL2013-47010-P). We thank Luca Di Nuzzo and Manuel Rojo Valencia for their help during data collection.

Authorship contribution

PH: conceptualization, data curation, data gathering, methodology, management of the project, software programming, writing (first draft, review and editing); GA: conceptualization, data gathering, resources, writing (review and editing); IM: conceptualization, fundraising, data gathering, supervision writing (review); HM: data gathering, resources, software programming, writing (review); MP: conceptualization, data gathering, methodology, writing (first draft).

Conflict of interest

None.

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Supplementary Material

- S1.** List of primary studies included in this review.

Appendix 1. List of species. The authors for the different species are available in the online database. Abbreviations of the countries as in Table 1.

Species	Country code
<i>Absconditella delutula</i>	BE
<i>Absconditella lignicola</i>	FR, UA
<i>Acarospora fuscata</i>	UA
<i>Acolium sessile</i>	FR
<i>Acrocordia cavata</i>	AT, ES, FR, IT, SK, SW
<i>Acrocordia conoidea</i>	ES
<i>Acrocordia gemmata</i>	AL, AT, DE, ES, GB, IT, ME, MK, PL, SI, SK, SW, UA
<i>Agonimia allobata</i>	DE, SK, SW, UA
<i>Agonimia borysthenica</i>	UA
<i>Agonimia flabelliformis</i>	CZ, DE
<i>Agonimia octospora</i>	ES
<i>Agonimia repleta</i>	CZ, PL, SK, UA
<i>Agonimia tristicula</i>	AT, ES, SK, SW, UA
<i>Alectoria sarmentosa</i>	IT
<i>Alyxoria culmigena</i>	ES, FR, GB, PL, UA
<i>Alyxoria lichenoides</i>	ES, FR
<i>Alyxoria ochrocheila</i>	DK, FR, GB, PL, SK, SW, UA
<i>Alyxoria varia</i>	AT, BG, CZ, DK, ES, FR, GB, IT, MK, PL, RO, SI, SK, SW, UA
<i>Amandinea punctata</i>	CZ, DE, ES, GB, IT, PL, SK, UA
<i>Anaptychia ciliaris</i>	AL, AT, ES, GR, HR, IT, ME, MK, PL, RO, UA
<i>Anisomeridium biforme</i>	DK, GB, SW, UA
<i>Anisomeridium macrocarpum</i>	UA
<i>Anisomeridium polypori</i>	AT, CZ, DE, DK, ES, PL, SK, SW, UA
<i>Aquacidia trachona</i>	SW
<i>Aquacidia viridifarinosa</i>	SW
<i>Arctomia fascicularis</i>	FR
<i>Arthonia apatetica</i>	PL, UA
<i>Arthonia arthonioides</i>	GB
<i>Arthonia atra</i>	BG, DE, DK, ES, FR, GB, IT, PL, SW, UA
<i>Arthonia didyma</i>	AT, CZ, DE, DK, ES, FR, IT, MK, PL, SK, SW, UA
<i>Arthonia exilis</i>	PL
<i>Arthonia faginea</i>	FR
<i>Arthonia helvola</i>	FR, SK
<i>Arthonia mediella</i>	CZ, FR, IT, PL, UA
<i>Arthonia radiata</i>	AT, BG, CZ, DE, DK, ES, FR, GB, HR, IT, PL, RO, SI, SK, SW, UA
<i>Arthonia reniformis</i>	FR
<i>Arthonia subastroidea</i>	FR
<i>Arthonia vinosa</i>	CZ, PL, SK, SW, UA
<i>Arthothelium ruanum</i>	DK, FR, PL, SK, UA
<i>Arthothelium spectabile</i>	UA
<i>Aspicilia faginea</i>	PL
<i>Aspicilia laevata</i>	PL
<i>Athallia alnetorum</i>	ES
<i>Athallia cerinella</i>	CZ, IT, SK, TR
<i>Athallia cerinelloides</i>	SK
<i>Athallia holocarpa</i>	DE, ES, IT, PL, SK
<i>Athallia pyracea</i>	ES, IT, SK
<i>Bacidia absistens</i>	SW

Species	Country code
<i>Bacidia albogranulosa</i>	UA
<i>Bacidia arceutina</i>	DE, ES, UA
<i>Bacidia biatorina</i>	ES, FR, SK, SW
<i>Bacidia caesiovirens</i>	SI
<i>Bacidia flavicans</i>	FR
<i>Bacidia fraxinea</i>	IT, UA
<i>Bacidia friesiana</i>	GB
<i>Bacidia laurocerasi</i>	CZ, ES, FR, IT, PL
<i>Bacidia polychroa</i>	ES, PL
<i>Bacidia punica</i>	ES
<i>Bacidia rosella</i>	DK, ES, FR, IT, PL, SK, SW, UA
<i>Bacidia rubella</i>	AT, CZ, DE, DK, ES, IT, PL, RO, SI, SK, SW, UA
<i>Bacidina adastra</i>	GB
<i>Bacidina arnoldiana</i>	DE, DK, GB, IT, PL, SK, SW
<i>Bacidina assulata</i>	FR, PL
<i>Bacidina chlorotricula</i>	AT, CZ, DE
<i>Bacidina delicata</i>	DE, GB, IT, SK, UA
<i>Bacidina mendax</i>	UA
<i>Bacidina neosquamulosa</i>	BG, GB
<i>Bacidina phacodes</i>	AT, CZ, DK, IT, MK, PL, SK, SW, UA
<i>Bacidina sulphurella</i>	DE, PL, SK, UA
<i>Bellicidia incompta</i>	BG, CZ, DK, ES, PL, SK, SW, UA
<i>Biatora bacidioides</i>	UA
<i>Biatora beckhausii</i>	PL, UA
<i>Biatora chrysantha</i>	AT, CZ, FR, GB, PL, RO, SK, SW, UA
<i>Biatora efflorescens</i>	AT, CZ, PL, RO, SI, SK, SW, UA
<i>Biatora fallax</i>	AT, CZ, RO
<i>Biatora flavopunctata</i>	SI
<i>Biatora globulosa</i>	MK, PL, SI, SK, SW, UA
<i>Biatora hemipolia</i>	FR
<i>Biatora longispora</i>	UA
<i>Biatora mendax</i>	CZ, FR, SI, UA
<i>Biatora pontica</i>	AT, PL, SI, SK, UA
<i>Biatora subduplex</i>	SI
<i>Biatora vernalis</i>	AT, ES, FR, SI, SK, UA
<i>Biatoridium monasteriense</i>	AT, BG, CZ, PL, SI, SK, SW, UA
<i>Bibbya vermifera</i>	CZ, MK, UA
<i>Bilimbia microcarpa</i>	AT
<i>Bilimbia sabuletorum</i>	AT, PL, SK, UA
<i>Blastenia ferruginea</i>	ES, IT
<i>Blastenia hungarica</i>	ME
<i>Brianaria bauschiana</i>	GB
<i>Bryobilimbia hypnorum</i>	AT, ES, IT
<i>Bryobilimbia sanguineoatra</i>	AT, CZ, HR, SK
<i>Bryoria bicolor</i>	PL
<i>Bryoria capillaris</i>	IT, PL
<i>Bryoria fuscescens</i>	ES, IT, PL, SI, SK, UA
<i>Bryoria implexa</i>	ES, PL
<i>Bryoria nadvornikiana</i>	PL
<i>Bryoria smithii</i>	PL
<i>Bryostigma muscigenum</i>	CZ

Species	Country code
<i>Buellia disciformis</i>	AT, CZ, ES, FR, GB, HR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Buellia erubescens</i>	CZ, IT, SI, SK, UA
<i>Buellia griseovirens</i>	AT, CZ, DK, DE, GB, IT, LU, ME, PL, RO, SI, SK, SW, UA
<i>Buellia schaereri</i>	UA
<i>Calicium abietinum</i>	BG, GB, PL, UA
<i>Calicium adspersum</i>	PL
<i>Calicium glaucellum</i>	GB, PL, SK
<i>Calicium quercinum</i>	PL
<i>Calicium salicinum</i>	AT, CZ, GB, IT, PL, SI, SK, SW, UA
<i>Calicium viride</i>	CZ, GB, PL, SW
<i>Caloplaca cerina</i>	AL, HR, IT, MK, PL, UA
<i>Caloplaca chlorina</i>	MK
<i>Caloplaca herbidella</i>	AT, FR, HR, IT, PL, RO, SI, SK, SW
<i>Caloplaca monacensis</i>	AT, RO, UA
<i>Caloplaca obscurella</i>	GB, SK, UA
<i>Caloplaca stillicidiorum</i>	UA
<i>Caloplaca turkuensis</i>	SK, UA
<i>Candelaria concolor</i>	AT, ES, GB, HR, IT, PL, RO, SW, UA
<i>Candelariella aurella</i>	IT
<i>Candelariella efflorescens</i>	AT, CZ, DK, SK, UA
<i>Candelariella faginea</i>	AL, IT
<i>Candelariella reflexa</i>	AT, BG, BG, DE, GB, IT, LU, ME, MK, PL, RO, SI, SK
<i>Candelariella vitellina</i>	ES, FR, GB, PL, SI, SK, UA
<i>Candelariella xanthostigma</i>	AT, BG, CZ, DE, ES, IT, PL, SI, SK, UA
<i>Candelariella xanthostigmoides</i>	GB
<i>Carbonicola myrmecina</i>	SW
<i>Catapyrenium psoromoides</i>	FR
<i>Catillaria chalybeia</i>	IT
<i>Catillaria nigroclavata</i>	DE, ES, GB, SK, SW, UA
<i>Catillaria rugulosa</i>	FR, PL
<i>Catinaria atropurpurea</i>	GB, UA
<i>Catinaria montana</i>	FR
<i>Cerothallia luteoalba</i>	DK
<i>Cetrelia cetrarioides</i>	AL, AT, BG, CZ, DE, IT, ME, SI, SK, UA
<i>Cetrelia chicitae</i>	AT, RO, SI, UA
<i>Cetrelia monachorum</i>	AT, BG, CZ, DE, RO, SI, SK, UA
<i>Cetrelia olivetorum</i>	AT, BG, DE, ES, FR, HR, IT, PL, RO, SI, SK, UA
<i>Chaenotheca brachypoda</i>	DK, IT, PL, SK, SW, UA
<i>Chaenotheca brunneola</i>	SK
<i>Chaenotheca chlorella</i>	CZ, SK, SW
<i>Chaenotheca chrysocephala</i>	DE, GB, PL, SK
<i>Chaenotheca ferruginea</i>	DE, GB, PL
<i>Chaenotheca furfuracea</i>	DE, DK, ES, IT, PL, SK, SW, UA
<i>Chaenotheca gracilentia</i>	PL, UA
<i>Chaenotheca phaeocephala</i>	PL, UA
<i>Chaenotheca stemonea</i>	CZ, DE, PL, SK
<i>Chaenotheca trichialis</i>	DE, DK, GB, IT, PL, SK, UA
<i>Chaenotheca xyloxena</i>	IT, SK, UA
<i>Cheiromycina flabelliformis</i>	CZ
<i>Chrysothrix candelaris</i>	BG, CZ, DE, DK, GB, IT, PL, SK
<i>Chrysothrix chrysophthalma</i>	GB

Species	Country code
<i>Chrysothrix flavovirens</i>	GB
<i>Circinaria caesiocinerea</i>	UA
<i>Circinaria gibbosa</i>	PL
<i>Cladonia caespiticia</i>	PL
<i>Cladonia cenotea</i>	PL
<i>Cladonia chlorophaea</i>	AT, BG, ES, FR, GB, IT, PL, SI, SK, SW, UA
<i>Cladonia coccifera</i>	RO
<i>Cladonia coniocraea</i>	AT, BG, DE, ES, GB, HR, IT, PL, RO, SI, SK, SW, UA
<i>Cladonia cornuta</i>	GB, SK
<i>Cladonia digitata</i>	BG, DE, GB, PL, SK, SW
<i>Cladonia fimbriata</i>	AT, DE, ES, FR, GB, IT, PL, RO, SI, SK, SW, UA
<i>Cladonia furcata</i>	IT, RO, SI
<i>Cladonia glauca</i>	PL
<i>Cladonia macilenta</i>	DE, GB, PL, UA
<i>Cladonia monomorpha</i>	PL
<i>Cladonia ochrochlora</i>	GB, PL, UA
<i>Cladonia parasitica</i>	GB, IT, SW
<i>Cladonia phyllophora</i>	PL
<i>Cladonia pleurota</i>	SW
<i>Cladonia polydactyla</i>	GB, SK, SW
<i>Cladonia portentosa</i>	GB
<i>Cladonia pyxidata</i>	AT, ES, HR, IT, PL, RO, SI, SK, UA
<i>Cladonia ramulosa</i>	PL, SK
<i>Cladonia squamosa</i>	CZ, GB, SW
<i>Cladonia subulata</i>	UA
<i>Cliostomum griffithii</i>	DE, DK, GB, PL, SW, UA
<i>Coenogonium luteum</i>	AT, FR, GB, SI, SK, UA
<i>Coenogonium pineti</i>	AT, DE, DK, GB, IT, LU, PL, RO, SK, SW, UA
<i>Collema flaccidum</i>	AL, AT, BG, ES, FR, IT, ME, PL, RO, SI, SK, SW, UA
<i>Collema furfuraceum</i>	AL, ES, IT, SI
<i>Collema nigrescens</i>	ES, FR, HR, IT, MK, PL, SI, UA
<i>Collema subflaccidum</i>	BG, FR, HR, IT, MK, SK, UA
<i>Collema subnigrescens</i>	ES, FR, IT
<i>Coniocarpon cinnabarinum</i>	ES, IT, PL
<i>Coniocarpon elegans</i>	PL
<i>Coppinsiella substerilis</i>	MK, SK, UA
<i>Coppinsiella ulcerosa</i>	GB
<i>Cratiria lauri-cassiae</i>	ES
<i>Cresponea premnea</i>	GB
<i>Cyrtidula hippocastani</i>	SK
<i>Dendrographa decolorans</i>	DK, ES, GB
<i>Dendrographa latebrarum</i>	RO
<i>Diarthonis spadicea</i>	AT, CZ, DE, DK, GB, LU, PL, SK, SW, UA
<i>Dichoporis taylorii</i>	GB
<i>Dichoporis ziziphi</i>	ES
<i>Diploicia canescens</i>	GB
<i>Diploschistes muscorum</i>	ES, SI, UA
<i>Diplotomma alboatrum</i>	ES, IT, PL
<i>Diplotomma pharcidium</i>	PL
<i>Dolichousnea longissima</i>	ES, FR, PL
<i>Enterographa crassa</i>	ES, GB, IT

Species	Country code
<i>Enterographa hutchinsiae</i>	LU
<i>Enterographa zonata</i>	SW
<i>Eopyrenula leucoplaca</i>	PL, SK
<i>Evernia divaricata</i>	CZ, PL, RO
<i>Evernia prunastri</i>	AT, BG, DE, DK, ES, FR, GB, GR, HR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Felipes leucopellaeus</i>	CZ, FR, PL
<i>Fellhanera bouteillei</i>	UA
<i>Fellhanera gyrophorica</i>	AT, CH, FR, SK, UA
<i>Fellhaneropsis vezdae</i>	CZ, GB, SW
<i>Flavoparmelia caperata</i>	AT, BG, ES, GB, HR, IT, LU, PL, RO, SI, SK, UA
<i>Flavoparmelia soledians</i>	BG, ES, GB
<i>Flavopunctelia flaventior</i>	PL
<i>Frutidella furfuracea</i>	CZ, PL, SK, UA
<i>Fuscidea arboricola</i>	CH, CZ, PL, SI, SK, UA
<i>Fuscidea cyathoides</i>	AL, FR, HR, IT, LU, ME, PL, SI, SK, SW, UA
<i>Fuscidea lightfootii</i>	ES, GB, LU
<i>Fuscidea pusilla</i>	PL
<i>Fuscopannaria ignobilis</i>	ES
<i>Fuscopannaria leucosticta</i>	AT
<i>Fuscopannaria mediterranea</i>	ES, MK
<i>Gabura fascicularis</i>	MK
<i>Glauc MARIA carpinea</i>	AL, AT, CZ, DE, DK, ES, FR, GB, GR, HR, IT, MK, PL, RO, SI, SK, TR, UA
<i>Glauc MARIA subcarpinea</i>	DE, HR, IT, LU, ME, MK, SI, SK
<i>Graphis betulina</i>	FR
<i>Graphis elegans</i>	ES, FR, GB, SK
<i>Graphis inustuloides</i>	GB, RO
<i>Graphis macrocarpa</i>	FR
<i>Graphis pulverulenta</i>	DE, FR, SK
<i>Graphis scripta</i>	AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, ME, PL, RO, SI, SK, SW, UA
<i>Gyalecta arbuti</i>	FR
<i>Gyalecta carneola</i>	DK, FR, IT, SK, SW, UA
<i>Gyalecta derivata</i>	AT, MK, PL, UA
<i>Gyalecta fagicola</i>	ES, LU, MK, PL
<i>Gyalecta flotowii</i>	AT, CZ, LU, PL, SK, SW, UA
<i>Gyalecta herculina</i>	PL, SI, SK, UA
<i>Gyalecta ophiospora</i>	PL
<i>Gyalecta truncigena</i>	ES, IT, PL, SI, SK, UA
<i>Gyalecta ulmi</i>	AT, PL, SW, UA
<i>Gyalideopsis calabrica</i>	IT
<i>Gyalideopsis helvetica</i>	UA
<i>Gyalolechia flavorubescens</i>	ES, IT
<i>Haematomma ochroleucum</i>	BG, DK, IT, PL, SK, SW, UA
<i>Haematomma solediatum</i>	FR
<i>Halecania viridescens</i>	CZ, UA
<i>Heterodermia obscurata</i>	ES
<i>Heterodermia speciosa</i>	ES, IT, PL, SI, UA
<i>Huneckia pollinii</i>	ES
<i>Hyperphyscia adglutinata</i>	DE, ES, FR, GB, IT, SK
<i>Hypocenomyce scalaris</i>	DE, GB, HR, PL, SK, UA
<i>Hypogymnia bitteri</i>	IT, PL
<i>Hypogymnia farinacea</i>	ES, IT, PL, RO, SK, UA

Species	Country code
<i>Hypogymnia physodes</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, IT, PL, RO, SI, SK, SW, UA
<i>Hypogymnia tubulosa</i>	AL, DE, ES, GB, IT, ME, PL, RO, SI, SK, UA
<i>Hypogymnia vittata</i>	PL, RO, SK, UA
<i>Hypotrachyna afrorevoluta</i>	AT, BE, BG, FR, GB, LU, PL, UA
<i>Hypotrachyna laevigata</i>	IT
<i>Hypotrachyna revoluta</i>	AT, BG, DK, GB, IT, LU, PL, SI, SK, SW, UA
<i>Imshaugia aleurites</i>	PL, SK
<i>Inoderma byssaceum</i>	PL, UA
<i>Ivanpisutia ocelliformis</i>	AT, CZ, RO, SI, SK, UA
<i>Jamesiella anastomosans</i>	CZ, SW
<i>Lathagrium auriforme</i>	ME
<i>Lecanactis abietina</i>	CZ, DK, GB, PL, SW
<i>Lecania chlorotiza</i>	GB, LU
<i>Lecania croatica</i>	CZ, RO, SI, SK, UA
<i>Lecania cyrtella</i>	AT, CZ, DE, DK, GB, MK, PL, SK, SW
<i>Lecania cyrtellina</i>	DK, SW, UA
<i>Lecania erysibe</i>	GB
<i>Lecania naegelii</i>	ES, GB, LU, PL, SW, UA
<i>Lecanographa amylicia</i>	PL, SK
<i>Lecanora albella</i>	AT, BG, CZ, IT, LU, MK, PL, RO, SI, SK, UA
<i>Lecanora albellula</i>	ES, GB, PL, UA
<i>Lecanora allophana</i>	AL, AT, DK, ES, FR, HR, IT, MK, PL, RO, SI, SW, UA
<i>Lecanora argentata</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, MK, PL, RO, SI, SK, SW, TR, UA
<i>Lecanora barkmaniana</i>	GB
<i>Lecanora cenisia</i>	PL
<i>Lecanora chlorotera</i>	AL, AT, BG, DE, DK, ES, FR, GB, GR, IT, MK, PL, RO, SI, SK, SW, UA
<i>Lecanora cinereofusca</i>	FR, GB, RO, UA
<i>Lecanora compallens</i>	CZ, GB
<i>Lecanora confusa</i>	GB
<i>Lecanora expallens</i>	BG, CZ, DE, DK, GB, IT, PL, SI, SK, SW, UA
<i>Lecanora expansa</i>	UA
<i>Lecanora glabrata</i>	BG, CZ, DK, ES, FR, HR, IT, ME, MK, PL, RO, SI, SK, SW, UA
<i>Lecanora horiza</i>	AL, ES, FR, IT, SI
<i>Lecanora hybocarpa</i>	ES
<i>Lecanora hypoptella</i>	ES
<i>Lecanora impudens</i>	PL, UA
<i>Lecanora intricata</i>	UA
<i>Lecanora intumescens</i>	AL, AT, CZ, DE, ES, FR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Lecanora jamesii</i>	AT, GB, LU
<i>Lecanora leptyroides</i>	AL, ES, FR, IT, ME, PL, SK, UA
<i>Lecanora paramerae</i>	ES
<i>Lecanora phaeostigma</i>	UA
<i>Lecanora polytropia</i>	PL, UA
<i>Lecanora pulicaris</i>	AT, CZ, DE, DK, ES, FR, GB, IT, PL, RO, SI, SK, UA
<i>Lecanora saligna</i>	AL, CZ, HR, PL, SI, SK, UA
<i>Lecanora stanislai</i>	UA
<i>Lecanora strobilina</i>	PL, UA
<i>Lecanora subintricans</i>	FR
<i>Lecanora subintricata</i>	SI, SK
<i>Lecanora sublivescens</i>	GB
<i>Lecanora substerilis</i>	CZ, RO, SK, UA

Species	Country code
<i>Lecanora symmicta</i>	GB, IT, PL, SI, UA
<i>Lecidea albohyalina</i>	CZ, PL, UA
<i>Lecidea erythrophaea</i>	PL, UA
<i>Lecidea helvola</i>	AT, CZ, FR, PL, RO, SI
<i>Lecidea nylanderii</i>	CZ, RO
<i>Lecidea sphaerella</i>	CZ
<i>Lecidella albida</i>	FR
<i>Lecidella elaeochroma</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, ME, MK, PL, RO, SI, SK, SW, TR, UA
<i>Lecidella euphorea</i>	AL, ES, IT, SI
<i>Lecidella flavosorediata</i>	ES, PL, RO, SI, UA
<i>Lecidella pulveracea</i>	FR
<i>Lecidella stigmatea</i>	GB
<i>Lecidella subviridis</i>	CZ
<i>Leiorreuma lyellii</i>	ES, FR, GB
<i>Lendemeriella lucifuga</i>	DE, ES
<i>Lendemeriella sorocarpa</i>	UA
<i>Lepra albescens</i>	AL, AT, BG, DE, DK, ES, FR, GB, HR, IT, ME, MK, PL, RO, SI, SK, SW, UA
<i>Lepra amara</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, LU, ME, PL, RO, SI, SK, SW, UA
<i>Lepra borealis</i>	RO
<i>Lepra corallina</i>	PL
<i>Lepra dactylina</i>	ES
<i>Lepra graeca</i>	FR
<i>Lepra multipuncta</i>	DK, GB, IT, PL, SW
<i>Lepra ophthalmiza</i>	FR, SI
<i>Lepra pulvinata</i>	GB
<i>Lepra slesvicensis</i>	IT
<i>Lepra trachythallina</i>	PL
<i>Lepra waghornei</i>	SK
<i>Lepraria caesioalba</i>	ES, LU
<i>Lepraria celata</i>	UA
<i>Lepraria crassissima</i>	LU
<i>Lepraria eburnea</i>	ES, PL, SI, SK
<i>Lepraria ecorticata</i>	ES, UA
<i>Lepraria elobata</i>	PL, SI, UA
<i>Lepraria finkii</i>	AT, ES, GB, RO, SK, UA
<i>Lepraria incana</i>	AT, BG, DE, DK, ES, FR, GB, HR, IT, PL, SI, SK, SW, UA
<i>Lepraria jackii</i>	ES, PL
<i>Lepraria lobificans</i>	BG, DE, DK, GB, GR, IT, ME, PL, SI, SK, UA
<i>Lepraria membranacea</i>	ES, FR, GB, SW, UA
<i>Lepraria rigidula</i>	CH, CZ, DK, MK, PL, SI, SK, UA
<i>Lepraria umbricola</i>	BE, GB
<i>Lepraria vouauxii</i>	PL, SI, UA
<i>Leproplaca chrysodeta</i>	CZ, UA
<i>Leptogium brebissonii</i>	ES
<i>Leptogium burnetiae</i>	ES
<i>Leptogium cyanescens</i>	BG, ES, PL, RO, SK, UA
<i>Leptogium saturninum</i>	AL, AT, ES, FR, IT, PL, SI, UA
<i>Leucodermia leucomelos</i>	ES, GB
<i>Lichenomphalia umbellifera</i>	SK
<i>Lobaria pulmonaria</i>	AL, AT, BG, DK, ES, FR, HR, IT, ME, PL, RO, SI, SK, SW, UA

Species	Country code
<i>Lobarina scrobiculata</i>	ES, FR, IT, PL, SW
<i>Lopadium disciforme</i>	AT, BG, CZ, PL, SI, SK, SW, UA
<i>Loxospora cisionica</i>	AT
<i>Loxospora elatina</i>	CZ, GB, PL, SI, SK, UA
<i>Maronea constans</i>	PL
<i>Megalaria grossa</i>	BG, ES, FR
<i>Megalaria laureri</i>	BG, FR, HR, ME, PL, RO, SI, SW, UA
<i>Megalaria pulverea</i>	GB, PL, SI
<i>Megalospora pachycarpa</i>	FR, PL
<i>Megaspora verrucosa</i>	IT
<i>Melanelixia fuliginosa</i>	AL, AT, ES, FR, GB, HR, IT, PL, RO, SI, SK, SW
<i>Melanelixia glabra</i>	AL, AT, ES, FR, IT, MK, PL, SI, SK, UA
<i>Melanelixia glabratula</i>	CZ, DE, DK, ES, GB, GR, IT, MK, PL, RO, SI, SK, UA
<i>Melanelixia subargentifera</i>	BG, ES, GB, IT, PL, UA
<i>Melanelixia subaurifera</i>	AT, BG, DE, ES, GB, IT, MK, PL, RO, SI, SK, TR, UA
<i>Melanohalea elegantula</i>	DE, ES, GB, IT, PL, SI, SK, UA
<i>Melanohalea exasperata</i>	AL, DE, ES, GB, IT, ME, PL, SI, SK, UA
<i>Melanohalea exasperatula</i>	AL, AT, DE, ES, GB, IT, PL, SK, UA
<i>Melanohalea laciniatula</i>	ES, FR, GB, IT, PL, SI
<i>Menegazzia subsimilis</i>	UA
<i>Menegazzia terebrata</i>	AT, BG, CZ, FR, HR, IT, PL, RO, SI, SK, SW, UA
<i>Micarea adnata</i>	CZ, IT, SW
<i>Micarea botryoides</i>	SK
<i>Micarea cinerea</i>	CZ, PL
<i>Micarea denigrata</i>	CZ, FR, GB, MK, PL, SK
<i>Micarea globulosella</i>	CZ, UA
<i>Micarea lignaria</i>	SI
<i>Micarea melaena</i>	GB
<i>Micarea micrococca</i>	CZ, UA
<i>Micarea misella</i>	UA
<i>Micarea nitschkeana</i>	PL
<i>Micarea peliocarpa</i>	AT, CZ, ES, IT, PL, SI, SK, SW, UA
<i>Micarea prasina</i>	AT, CZ, DE, DK, ES, GB, LU, PL, SK, SW, UA
<i>Micarea pycnidiophora</i>	FR, LU, PL
<i>Micarea synotheoides</i>	CZ
<i>Multiclavula mucida</i>	CZ, SK, UA
<i>Mycobilimbia carneoalbida</i>	AT, ES, IT, PL, SW, UA
<i>Mycobilimbia epixanthoides</i>	AT, DE, PL, SW, UA
<i>Mycobilimbia pilularis</i>	CZ, ES, FR, IT, PL, SW, UA
<i>Mycobilimbia tetramera</i>	AT, ES, PL, SK, UA
<i>Mycoblastus affinis</i>	PL, RO
<i>Mycoblastus sanguinarius</i>	PL, RO
<i>Myriolecis albescens</i>	IT
<i>Myriolecis dispersa</i>	GB
<i>Myriolecis hagenii</i>	AT, BE, DE, HR, IT, PL, RO
<i>Myriolecis persimilis</i>	AL, AT, GB, PL
<i>Myriolecis sambuci</i>	MK, UA
<i>Naetrocymbe punctiformis</i>	GB
<i>Naevia dispersa</i>	ES, PL, UA
<i>Naevia punctiformis</i>	DE, GB
<i>Nephroma bellum</i>	FR, SI, SK

Species	Country code
<i>Nephroma helveticum</i>	FR
<i>Nephroma laevigatum</i>	BG, ES, FR, IT, PL, SK
<i>Nephroma parile</i>	AL, AT, BG, CZ, ES, HR, IT, ME, PL, RO, SI, SK, SW, UA
<i>Nephroma resupinatum</i>	AL, AT, ES, FR, IT, ME, PL, RO, SI, SK, UA
<i>Nephromopsis chlorophylla</i>	PL, SK, UA
<i>Nephromopsis laureri</i>	UA
<i>Nevesia sampaiana</i>	ES, FR
<i>Normandina acroglypta</i>	SI, UA
<i>Normandina pulchella</i>	AT, BG, ES, FR, GB, IT, PL, SI, SK, SW, UA
<i>Ochrolechia alboflavescens</i>	UA
<i>Ochrolechia androgyna</i>	AL, BG, CZ, GB, LU, PL, RO, SI, SK, SW, UA
<i>Ochrolechia arborea</i>	AT, IT, PL, SI, UA
<i>Ochrolechia bahusiensis</i>	PL
<i>Ochrolechia balcanica</i>	ES, IT, ME
<i>Ochrolechia microstictoides</i>	CZ, PL
<i>Ochrolechia pallescens</i>	AT, ES, FR, IT, ME, PL, SI, SK, SW, UA
<i>Ochrolechia subviridis</i>	DK, ES, GB, IT, PL, SI, SK, SW
<i>Ochrolechia szatalaensis</i>	ES, PL, SK, UA
<i>Ochrolechia trochophora</i>	PL
<i>Ochrolechia turneri</i>	ES, GB, IT, MK, SW, UA
<i>Opegrapha fumosa</i>	UA
<i>Opegrapha niveoatra</i>	AT, CZ, ES, FR, GB, PL, SK, UA
<i>Opegrapha phegospila</i>	FR
<i>Opegrapha trochodes</i>	CZ, IT, SK, UA
<i>Opegrapha vermicellifera</i>	BG, CZ, DK, ES, GB, LU, PL, SK, SW, UA
<i>Opegrapha vulgata</i>	BG, DE, DK, ES, GB, LU, MK, PL, RO, SI, SK, SW, UA
<i>Pachnolepia pruinata</i>	IT, PL
<i>Pannaria conoplea</i>	ES, FR, IT, PL, SI, SW, UA
<i>Pannaria rubiginosa</i>	ES
<i>Pannaria tavaresii</i>	ES
<i>Parmelia barroanae</i>	FR, MK
<i>Parmelia ernstiae</i>	AT, BG, DK, FR, MK, SW
<i>Parmelia omphalodes</i>	ES
<i>Parmelia saxatilis</i>	AL, AT, CZ, DE, DK, ES, FR, GB, HR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Parmelia serrana</i>	ES
<i>Parmelia submontana</i>	AL, CZ, ES, IT, MK, PL, RO, SI, SK, UA
<i>Parmelia sulcata</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Parmeliella testacea</i>	FR
<i>Parmeliella triptophylla</i>	AL, AT, BG, ES, FR, LU, PL, SI, SK, SW, UA
<i>Parmelina carporrhizans</i>	CH, ES, HR, RO, SI
<i>Parmelina pastillifera</i>	AL, AT, BG, ES, GB, HR, IT, ME, MK, PL, RO, SI, SK, UA
<i>Parmelina quercina</i>	AL, CH, GR, HR, IT, PL, SI, SK
<i>Parmelina tiliacea</i>	AT, DE, ES, FR, IT, PL, RO, SI, SK, UA
<i>Parmeliopsis ambigua</i>	AT, CZ, DE, GB, IT, LU, PL, RO, SI, SK, SW, UA
<i>Parmeliopsis hyperopta</i>	AT, CZ, GB, GR, PL, SK, SW, UA
<i>Parmotrema arnoldii</i>	PL, SI, SK, UA
<i>Parmotrema crinitum</i>	AT, ES, IT, PL, SI, UA
<i>Parmotrema perlatum</i>	AT, BG, ES, GB, HR, IT, ME, PL, RO, SI, SK, UA
<i>Parmotrema reticulatum</i>	IT
<i>Parmotrema stuppeum</i>	PL
<i>Pectenica atlantica</i>	AL

Species	Country code
<i>Pectenia plumbea</i>	ES, IT, ME, SI
<i>Peltigera canina</i>	ES, SI
<i>Peltigera collina</i>	AL, AT, ES, FR, GB, HR, IT, ME, PL, RO, SI, SW, UA
<i>Peltigera degenii</i>	AL, AT, CZ, RO, SI, SK, UA
<i>Peltigera horizontalis</i>	AT, BG, CZ, ES, GB, HR, IT, ME, RO, SI, SW, UA
<i>Peltigera lactucifolia</i>	BG
<i>Peltigera membranacea</i>	AL, AT, IT
<i>Peltigera polydactylon</i>	GR, IT, PL, UA
<i>Peltigera praetextata</i>	AL, AT, BG, CZ, DE, ES, FR, GB, HR, IT, LU, ME, PL, RO, SI, SK, SW, UA
<i>Peltigera rufescens</i>	ES, IT
<i>Pertusaria alpina</i>	AT, ES, FR, PL, SI, SK
<i>Pertusaria cinereocarneola</i>	FR
<i>Pertusaria coccodes</i>	AL, AT, CZ, DK, ES, FR, GB, GR, HR, IT, LU, PL, RO, SI, SK, UA
<i>Pertusaria constricta</i>	AT, CZ, FR, PL, UA
<i>Pertusaria coronata</i>	AL, AT, BG, CZ, DE, ES, FR, IT, MK, PL, RO, SI, SK, SW, UA
<i>Pertusaria deschatresii</i>	FR
<i>Pertusaria flavida</i>	AL, AT, DK, ES, FR, GB, HR, IT, LU, PL, SI, SW, UA
<i>Pertusaria hymenea</i>	BG, CZ, DE, DK, ES, FR, GB, IT, LU, PL, SI, SK, SW
<i>Pertusaria jurana</i>	FR
<i>Pertusaria laureri</i>	FR
<i>Pertusaria leioplaca</i>	AT, BG, CZ, DE, DK, ES, FR, GB, GR, IT, ME, MK, PL, RO, SI, SK, SW, UA
<i>Pertusaria monogoniza</i>	FR
<i>Pertusaria pertusa</i>	AL, AT, BG, CZ, DE, DK, ES, FR, GB, GR, HR, IT, LU, ME, PL, RO, SI, SK, SW, TR, UA
<i>Pertusaria pulvereosulphurata</i>	FR, PL
<i>Pertusaria pupillaris</i>	CZ, FR, LU, SW, UA
<i>Pertusaria pustulata</i>	BG, ES, GB, PL, SK, UA
<i>Phaeographis dendritica</i>	ES, FR, GB, PL, SI
<i>Phaeographis inusta</i>	FR
<i>Phaeographis smithii</i>	GB, NL
<i>Phaeophyscia ciliata</i>	IT, SK
<i>Phaeophyscia endophoenicea</i>	AL, AT, BG, CZ, ES, IT, PL, SI, SK, SW, UA
<i>Phaeophyscia nigricans</i>	PL, SK, UA
<i>Phaeophyscia orbicularis</i>	AL, CZ, DE, ES, GB, HR, IT, PL, RO, SI, SK, UA
<i>Phaeophyscia pusilloides</i>	ES, FR, SK
<i>Phaeophyscia rubropulchra</i>	RO
<i>Phlyctis agelaea</i>	AT, BG, ES, FR, GB, IT, LU, PL, SI, SK, SW, UA
<i>Phlyctis argena</i>	AT, BG, CZ, DE, DK, ES, FR, GB, IT, LU, PL, RO, SI, SK, SW, UA
<i>Physcia adscendens</i>	AT, DE, ES, GB, GR, IT, LU, PL, RO, SI, SK, TR, UA
<i>Physcia aipolia</i>	ES, DE, GB, IT, MK, RO, UA
<i>Physcia biziana</i>	IT
<i>Physcia caesia</i>	PL
<i>Physcia clementei</i>	ES
<i>Physcia dubia</i>	SK, UA
<i>Physcia leptalea</i>	DE, ES, IT, RO
<i>Physcia stellaris</i>	DE, ES, GB, IT, PL, RO, SI, UA
<i>Physcia tenella</i>	CZ, DE, DK, ES, GB, IT, PL, SI, SK, SW, UA
<i>Physcia tribacia</i>	FR
<i>Physciella chloantha</i>	ES, IT, SI, SK, UA
<i>Physconia detersa</i>	AT, MK, SK, UA
<i>Physconia distorta</i>	AL, AT, ES, GB, IT, MK, PL, RO, UA

Species	Country code
<i>Physconia enteroxantha</i>	AT, ES, GB, IT, UA
<i>Physconia grisea</i>	GB, PL
<i>Physconia muscigena</i>	FR
<i>Physconia perisidiosa</i>	ES, IT, PL, SK, UA
<i>Physconia servitii</i>	IT
<i>Physconia venusta</i>	ES, FR, HR, IT, ME
<i>Piccolia ochrophora</i>	IT, SK, UA
<i>Placynthiella dasaea</i>	BG, CZ, MK, PL
<i>Placynthiella icmalea</i>	BG, DE, GB, IT, PL, UA
<i>Placynthiella oligotropha</i>	PL
<i>Placynthiella uliginosa</i>	GB, PL
<i>Platismatia glauca</i>	AL, AT, CZ, DE, ES, FR, GB, HR, IT, PL, RO, SI, SK, SW, UA
<i>Pleurosticta acetabulum</i>	AL, ES, FR, GR, HR, IT, ME, PL, RO, UA
<i>Polyblastidium subneglectum</i>	ES, FR, UA
<i>Polycauliona candelaria</i>	DE, GB, PL, SI, SK
<i>Polycauliona polycarpa</i>	DE, DK, GB, PL, SK, UA
<i>Polycauliona ucrainica</i>	DE, GB
<i>Porina aenea</i>	AT, BG, CZ, DE, DK, ES, GB, IT, PL, RKS, SI, SK, SW, UA
<i>Porina borrieri</i>	ES, FR, GB
<i>Porina chlorotica</i>	GB
<i>Porina hibernica</i>	AT, ES, SI, UA
<i>Porina leptalea</i>	CZ, FR, GB, PL, SK, UA
<i>Porina pseudohibernica</i>	AT, FR, IT, SI, UA
<i>Porina rosei</i>	FR
<i>Porpidia macrocarpa</i>	UA
<i>Protopannaria pezizoides</i>	AT, FR, SI, UA
<i>Protoparmelia hypotremella</i>	AT
<i>Protoparmelia oleagina</i>	PL
<i>Protoparmeliopsis muralis</i>	ES, UA
<i>Pseudevernia furfuracea</i>	AL, DE, ES, GB, HR, IT, ME, PL, RO, SI, SK, UA
<i>Pseudoschismatomma rufescens</i>	AT, CZ, DE, DK, ES, FR, IT, PL, SK, SW, UA
<i>Psilolechia lucida</i>	SW
<i>Psoroglaena abscondita</i>	CZ
<i>Psoroglaena dictyospora</i>	CZ
<i>Psoroglaena stigonemoides</i>	GB, SK, UA
<i>Punctelia borrieri</i>	GB
<i>Punctelia jeckeri</i>	AT, DE, GB, PL, UA
<i>Punctelia reddenda</i>	GB
<i>Punctelia subrudecta</i>	ES, GB, HR, IT, PL, RO, SI, UA
<i>Puttea exsequens</i>	FR
<i>Pyrenula chlorospila</i>	ES, GB, RO
<i>Pyrenula coryli</i>	UA
<i>Pyrenula dermatodes</i>	FR
<i>Pyrenula laevigata</i>	AT, CZ, FR, PL, UA
<i>Pyrenula macrospora</i>	GB, IT, RO
<i>Pyrenula nitida</i>	AT, BG, CZ, DE, DK, ES, FR, GB, HR, IT, LU, ME, PL, RO, SI, SK, SW, UA
<i>Pyrenula nitidella</i>	FR, GB, IT, PL, SI
<i>Pyrenula occidentalis</i>	GB
<i>Pyrrhospora quernea</i>	DE, DK, GB, PL, SW, UA
<i>Ramalina baltica</i>	PL

Species	Country code
<i>Ramalina calicaris</i>	GR, IT, ME
<i>Ramalina canariensis</i>	AT, ES, IT, RO
<i>Ramalina farinacea</i>	AT, BG, DE, DK, ES, FR, GB, GR, HR, IT, PL, RO, SI, SK, SW, UA
<i>Ramalina fastigiata</i>	AL, AT, BG, ES, GB, HR, IT, ME, PL, SI, SK, UA
<i>Ramalina fraxinea</i>	AL, AT, ES, FR, GB, GR, IT, MK, PL, RO, UA
<i>Ramalina obtusata</i>	PL
<i>Ramalina panizzei</i>	IT
<i>Ramalina pollinaria</i>	ES, IT, PL, RO, SI, SK, UA
<i>Ramalina thrausta</i>	IT, PL
<i>Ramonia luteola</i>	SK, UA
<i>Ramonia subsphaeroides</i>	ES
<i>Reichlingia anombrophila</i>	GB
<i>Reichlingia leopoldii</i>	SK, UA
<i>Reichlingia zwackhii</i>	FR
<i>Rhizocarpon polycarpum</i>	UA
<i>Ricasolia amplissima</i>	AL, AT, ES, FR, IT, RO, UA
<i>Ricasolia virens</i>	ES, FR, GB, IT, SW
<i>Rinodina albana</i>	AL, AT, ME, MK, UA
<i>Rinodina archaea</i>	UA
<i>Rinodina capensis</i>	CZ, IT, ME, PL, UA
<i>Rinodina colobina</i>	IT, SW
<i>Rinodina conradii</i>	UA
<i>Rinodina efflorescens</i>	BG, CZ, SW, UA
<i>Rinodina exigua</i>	AT, GB, IT, PL
<i>Rinodina griseosoralifera</i>	SK, UA
<i>Rinodina oleae</i>	GB
<i>Rinodina orculata</i>	UA
<i>Rinodina pyrina</i>	AT, IT, PL, UA
<i>Rinodina roboris</i>	GB
<i>Rinodina sophodes</i>	ES, GB, IT, ME, PL, SI, UA
<i>Rinodina subpariata</i>	CZ, UA
<i>Rinodina trevisanii</i>	UA
<i>Ropalospora viridis</i>	CZ, DE, DK, LU, PL, RO, SI, SK, SW, UA
<i>Sarcosagium campestre</i>	SK
<i>Schismatomma pericleum</i>	FR, PL, SW
<i>Schismatomma ricasolii</i>	IT
<i>Schizotrema quercicola</i>	FR, GB
<i>Sclerophora amabilis</i>	CZ, SK, SW
<i>Sclerophora farinacea</i>	SK, UA
<i>Sclerophora pallida</i>	IT, MK, PL, SK, UA
<i>Sclerophora peronella</i>	ES, PL, SK, SW
<i>Scoliciosporum chlorococcum</i>	CZ, DE, DK, GB, IT, LU, PL, SI, SK, UA
<i>Scoliciosporum gallurae</i>	ES, LU
<i>Scoliciosporum pruinosum</i>	LU, SW, UA
<i>Scoliciosporum sarothamni</i>	CZ, GB, SK, UA
<i>Scoliciosporum schadeanum</i>	CZ, UA
<i>Scoliciosporum umbrinum</i>	AL, AT, ES, FR, IT, ME, MK, SK, UA
<i>Scutula circumspecta</i>	AT, BE, CZ, DK, ES, FR, IT, MK, PL, SI, SK, UA
<i>Scutula effusa</i>	FR, IT
<i>Scutula igniarii</i>	PL

Species	Country code
<i>Scytinium aragonii</i>	AT, ES
<i>Scytinium fragrans</i>	FR
<i>Scytinium gelatinosum</i>	UA
<i>Scytinium lichenoides</i>	AL, AT, BG, ES, IT, ME, SI, SK, SW, UA
<i>Scytinium pulvinatum</i>	AT, UA
<i>Scytinium tenuissimum</i>	AT, ES
<i>Scytinium teretiusculum</i>	CZ, UA
<i>Sphaerophorus globosus</i>	ES, IT, PL, SW
<i>Sticta fuliginosa</i>	UA
<i>Sticta limbata</i>	ES, GB, IT
<i>Straminella conizaeoides</i>	DE, DK, GB, LU, PL, RO, SI, SK, SW
<i>Straminella varia</i>	PL, SI, SK, UA
<i>Strangospora moriformis</i>	SK
<i>Strangospora pinicola</i>	GB, UA
<i>Swinscowia affinis</i>	ES
<i>Swinscowia glabra</i>	FR
<i>Swinscowia stigmatella</i>	AT, BG, DE, FR, ME, PL, RO, SI, SK, UA
<i>Swinscowia thelopsidoides</i>	FR
<i>Tephromela atra</i>	AL, ES, FR, IT, PL, UA
<i>Tephromela grumosa</i>	LU
<i>Tetramelas chloroleucus</i>	SK, UA
<i>Tetramelas insignis</i>	UA
<i>Thelenella muscorum</i>	AT, ES, UA
<i>Thelocarpon laureri</i>	UA
<i>Thelopsis flaveola</i>	AT, FR, UA
<i>Thelopsis rubella</i>	AT, CZ, ES, FR, GB, PL, SK, SW, UA
<i>Thelotrema lepadinum</i>	AT, BG, CZ, DK, ES, FR, GB, HR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Thelotrema suecicum</i>	AT
<i>Toensbergia leucococca</i>	UA
<i>Toninia populorum</i>	PL
<i>Toniniopsis subincompta</i>	AT, CZ, IT, MK, PL, RO, SI, SK, UA
<i>Trapelia corticola</i>	CZ, GB, PL, SK
<i>Trapelia glebulosa</i>	CZ
<i>Trapeliopsis flexuosa</i>	DK, GB, IT, PL, SK, UA
<i>Trapeliopsis gelatinosa</i>	AT, SK, SW
<i>Trapeliopsis granulosa</i>	GB, SK, SW
<i>Trapeliopsis pseudogranulosa</i>	DK, GB, PL, RO, SW, UA
<i>Trapeliopsis viridescens</i>	PL
<i>Usnea articulata</i>	GB, IT
<i>Usnea barbata</i>	CZ, IT, PL, UA
<i>Usnea cavernosa</i>	PL
<i>Usnea ceratina</i>	GB, PL, UA
<i>Usnea chaetophora</i>	BG
<i>Usnea cornuta</i>	GB
<i>Usnea dasopoga</i>	FR, IT, ME, MK, PL, SI, SK, UA
<i>Usnea flammea</i>	GB
<i>Usnea florida</i>	CH, GB, PL, RO
<i>Usnea glabrata</i>	PL
<i>Usnea glabrescens</i>	IT, PL
<i>Usnea hirta</i>	GR, IT, MK, PL, SI, UA

Species	Country code
<i>Usnea intermedia</i>	AT, PL, RO, SI
<i>Usnea perplexans</i>	PL, UA
<i>Usnea rubicunda</i>	GB
<i>Usnea silesiaca</i>	PL
<i>Usnea subfloridana</i>	AT, ES, GB, IT, PL, RO, SI, UA
<i>Usnea subscabrosa</i>	IT
<i>Usnea substerilis</i>	MK, UA
<i>Usnea wasmuthii</i>	ES, PL, UA
<i>Vahliella saubinetii</i>	FR
<i>Varicellaria hemisphaerica</i>	AT, BG, CZ, DK, ES, FR, GB, GR, IT, LU, PL, RO, SI, SK, SW, UA
<i>Varicellaria lactea</i>	RO
<i>Varicellaria velata</i>	SW
<i>Variospora aurantia</i>	IT
<i>Verrucaria corticola</i>	CZ, UA
<i>Verrucaria hegetschweileri</i>	UA
<i>Verrucaria viridigrana</i>	AT, UA
<i>Verseghya thysanophora</i>	AT, CZ, DE, PL, RO, SI, SK, UA
<i>Vezdaea aestivalis</i>	CZ, PL, SK, SW
<i>Violella fucata</i>	CZ, DK, GB, LU, PL, RO, SI, SK, SW, UA
<i>Vulpicida pinastri</i>	AT, CZ, PL, SI, SK, UA
<i>Wadeana dendrographa</i>	UA
<i>Xanthomendoza fallax</i>	IT
<i>Xanthomendoza fulva</i>	AL, ME, UA
<i>Xanthomendoza ulophyllodes</i>	UA
<i>Xanthoria parietina</i>	AL, AT, CZ, DE, DK, ES, GB, IT, PL, RO, SI, SK, TR, UA
<i>Xylopsora caradocensis</i>	PL
<i>Zwackhia prosodea</i>	RO
<i>Zwackhia soreidifera</i>	DK, GB, SW
<i>Zwackhia viridis</i>	AT, BG, CZ, DK, ES, FR, GB, IT, LU, PL, SI, SK, SW, UA

Supplementary Material

Hurtado, P., Aragón, G., Martínez, I., Mayrhofer, H. & Prieto, M. 2023. The epiphytic lichens on *Fagus sylvatica* in beech forests of Europe: towards an open and dynamic checklist. *Mediterr. Bot.* 44, e84299.

<https://doi.org/10.5209/mbot.84299>

S1. List of primary studies included in this review.

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